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The 'Good Farmer' concept and the diffusion of innovations in rural Africa

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Abstract

Endogenous agricultural development is needed to improve food productivity and address the socioeconomic and environmental challenges facing Africa in the near future. Considering the failure of past top-down development policies, the integral development of Africa's agricultural sector, requires tailoring technological and technical improvements to the local rural realities while respecting their cultural identities and social norms. This paper focuses on the "Good Farmer" concept in a framework of symbolic interactionism, social capital production and shared identity. The study analyzes how the "Good Farmer" concept is perceived in rural Africa through textual analysis of a 2019 survey conducted in Mozambique. The results are compared with the definition of the "Good Farmer" in Western Countries from a Structured Literature Review. The analysis reveals that there is a key difference in Western and rural African conceptions of what is considered being a "Good Farmer". In rural Africa, there is strong emphasis on community aspects and knowledge transfer, which can be of great importance in influencing the diffusion of innovation processes for its rural development.

Keywords Good farmer · Mozambique · Bourdieu · Text analysis · Structured literature review

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1 Introduction

Africa's agricultural sector plays a fundamental role in the economy and has a strategic role in boosting sustainable development processes to improve living conditions for a vast majority of its people (de Souza, 2015). Since most of Africa's poor and malnourished populations depend largely on farming, agricultural development can be particularly effective in reducing poverty and hunger since the agricultural sector has a high multiplier effect on poverty alleviation[1] (Benin, 2016). Agricultural production accounts for approximately 15% of the continent's GDP, although there are significant variations among African countries[2] (OECD and Food and Agriculture Organization of the United Nations, 2016). Moreover, approximately 45% of the 1.4 billion people living on the African continent reside in rural areas; most are employed in the agricultural sector and roughly 40% of young Africans work in agricultural activities (Sakho-Jimbira & Hathie, 2020).

Africa's agricultural sector focuses mainly on the production of grains, roots and tubers intended mainly for domestic consumption (FAOSTAT, 2024). However, many African countries are net importers of staple food items such as flour, rice and processed food products (Badiane, 2018). Furthermore, high exposure to foreign markets makes many African countries vulnerable to highly volatile food prices[3] (Minot, 2014), thus affecting both food security (on the demand side) and the development of the entire agricultural sector (on the supply side) (Sakho-Jimbira & Hathie, 2020). Another important challenge for the continent is the rapidly growing population and urbanization that many African countries are experiencing[4]. Africa's population is becoming wealthier and more urban, leading to structural dietary changes, which is likely to result in a greater demand for processed and higher-value food products. This could produce, both directly and indirectly, significant shifts in African agricultural production towards more intensive, industrial systems analogous to those in Western countries, thereby increasing anthropogenic pressure on local ecosystems, which are already significantly degraded. Many areas in Africa are affected by soil degradation (desertification, soil pollution, salinization, and acidification) and water scarcity. The current situation could be further exacerbated by climate change - inten-

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[1] Benin (2016) estimated that a mere 1% of growth of the agricultural sector could reduce the poverty rate by 20% (in Burkina Faso) to 50% (in Senegal) and lift millions of people out of poverty.

[2] The share of agricultural GDP over the total GPD vary from less than 3% in Botswana and South Africa to more than 50% in Chad (OECD and Food and Agriculture Organization of the United Nations, 2016).

[3] Price volatility refers to how much the market price of an asset varies (up or down) over time, compared to its average trend. An asset characterized by high volatility experiences high prices and unpredictable variations. The high exposure to international markets and the strong dependence of family budgets on food spending (52% of family budgets on average are spent on food) can have a devasting impact, especially on the most vulnerable, if food prices suddenly increase due to market fluctuations as was the cases during the 2008–2009 food crises (FAO, 2011; Sakho-Jimbira & Hathie, 2020).

[4] One of the main challenges facing the continent is the rapidly growing population, which has not yet gathered demographic momentum. Sub-Saharan African countries have the highest fertility growth rate in the world (4.6 in 2019), the population growth rate is around 2.8% annually - twice the rate of South Asia and four times the rate of East Asia and the Pacific. The projected population by 2050 is 2.2 billion and 4 billion by 2100, making the Africa the most populous continent globally (Sakho-Jimbira & Hathie, 2020).

sifying pressure on natural resources while shrinking arable land – increasing the potential for social conflicts (Cappelli et al., 2023; IPBES, 2018).

Developing the African agricultural sector is, therefore, central to addressing the demographic, socio-economic and environmental challenges in the near future of many African countries. Indeed, fostering improvement in agricultural productivity and accelerating agricultural growth in Africa are commonly seen as core strategies for the overall development of the African continent (Malabo Declaration, 2014; Maputo & Declaration, 2003). One of the main issues of the African agricultural sector is the low productivity, of both land and labor, which could be stimulated through the introduction of new techniques and technologies that enable higher yields (Badiane & Collins, 2016; Benin, 2016).

Several empirical studies on innovation adoption and technology diffusion processes highlight the importance of social aspects within farming communities that are characterized by peer-to-peer aspects in knowledge transmission and imitation processes for reducing technology change risks and adaptation costs (Banerjee & Duflo, 2007; Duflo et al., 2011; Xiong et al., 2016). When considering the classical innovation diffusion framework applied to introducing new technologies within a farming community, we know that few agents innovate in the initial phases (innovators and early adopters), while in subsequent phases, the rest of the community may follow suit if the technology is profitable in a broad sense (e.g., increase production or efficiency, and reduced working hours). The diffusion process ends as all the members, even the most refractory ones (i.e. late adopters), have adopted the new technology, thus leading to a transition in the production systems and in the "way of doing things". This scheme follows a typical "S-shaped" curve which describes the diffusion process of the innovation within the community with a decreasing marginal diffusion rate characterized by an inverted "U-shaped" marginal curve (Rogers, 1971).

The diffusion process is driven by many factors that directly impact farmers' adoption strategies (e.g., institutional aspects, farmers' absorption capacity, level of education, availability of financial resources) (Feder et al., 1985; Foster & Rosenzweig, 2010; Stoneman & Battisti, 2010). Many other factors, mainly related to social and cultural aspects, have an indirect effect and they are usually not directly observable (e.g., social norms, networks, rituals, informal communication, co-learning, local imitation and reproduction processes) (Ahsanuzzaman et al., 2022; Xiong et al., 2016). Diffusion drivers are strongly based on social norms and symbolic capital and can be very effective in places where 'rurality' and traditional culture play an important role, and where access to capital and high technology is limited, as in many African countries.

In rural African societies, social aspects are determinants of farmers' strategies and can strongly influence the innovation adoption decision. Some literature on the African context has pointed to the importance of social and cultural aspects in rural development, highlighting important differences from Western countries in which individualistic aspects appear to be more important (Bandiera & Rasul, 2006; Banerjee & Duflo, 2007; Duflo et al., 2011). This concept is remarked by Ikuenobe (2018) who notes the importance placed on each member contributing to the wellbeing of the rural communities in sub-Saharan African societies, and calls this societal characteristic *African Communalism*.

Social norms and interactions between community members play a key role in this context. The adoption and diffusion of innovations is linked to several social aspects and unique local characteristics (e.g. peer-to-peer learning processes, social networks, imitation processes and shared norms) (Scholz & Methner, 2020). This is especially true in 'pre-capitalist societies' and in the rural areas of the Global South where other forms of capital may be important in outlining either individual or collective actions and influencing the effectiveness of public programs (Eichholz et al., 2013; Levien, 2015). Social practices, considered as the actual doings and sayings of social actors in everyday life can be extremely important in traditional rural societies. They can bridge collective lifestyles, beliefs and inherited "ways things are done" with socio-technical systems and the diffusion of technologies within the community itself. As a result social practices can provide a holistic framework for analyzing these societies (Mengistie et al., 2017). Bourdieu's theory on *habitus* and symbolic capital[5] offers an optimal framework for analyzing the 'hidden' social-dynamics that shape social rules and collective habits (Silvasti, 2003) that are not straightforwardly observable. This approach is in contrast with agency theories or neoclassical marginalists approaches based on individual utility maximization such as those of Brekke et al. (2003), Bénabou and Tirole (2003) and Andreoni (1990).

Rural sociology based on the Bordieuan framework has conceived the "Good Farmer" concept (GF), which in the last three decades has been used to explore the symbolic interactionism influencing collective and individual decisions within farming communities. The GF concept, therefore, offers valuable insights that can be adapted and expanded to rural African contexts. This approach could drive the way to increasing the diffusion of agricultural practices, while enabling inclusive and sustainable development. An in-depth knowledge of the social processes that drive, influence, or block the diffusion of agricultural improvements in rural Africa is of paramount importance to drive concrete processes of integral development (which includes an ecological and fair transition) that are fully inclusive and based on local knowledge and culture. To our knowledge, literature on the GF concept for the African context has not yet been developed.

In this paper, we analyze the concept of a GF applied to African countries using data from a specific 2019 survey developed in Mozambique by Crudeli et al. (2022), where specific questions were proposed in open-ended form to analyze the main considerations and interpretations of the concept of GF in rural Africa. Our aim is to investigate the main and accepted definitions of a GF that emerged from the 769 definitions collected through the survey. Moreover, we analyze whether differences emerge with respect to the commonly accepted definitions of a GF in Western Countries. Throughout our analysis, particular attention was devoted to the role of the GF concept in the innovation diffusion/adoption process of agricultural practices. We also explored how fostering long-standing beliefs in symbolic capital building can contribute to agricultural development in Africa. Our paper sheds light on the interpretations of the GF concept in rural Mozambique and links the definition to different

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[5] In Bourdieu's theory *symbolic capital* refers to the various forms of distinction, reputation and prestige accorded to a community member, which may be institutionalized or tacitly acknowledged to her/him by other community members.

aspects of African rural life including social norms, beliefs, farming activity, wealth, and gender.

The paper is structured as follows: Sect. 2 provides a theoretical background on the GF concept. Section 3 describes the principal methods of analysis employed and the data used. Section 4 presents the results and main findings. The paper concludes with some discussions on the main results that emerged and with a few final remarks in Sect. 5.

2 Theoretical background: bourdieu's theory and the "Good Farmer" concept

2.1 Bordieuan symbolism

The social world in which we live as human beings can be analyzed through the lens of objectivism as stated by Bourdieu's theory (1990), according to which the definitions of *field*, *habitus* and *symbolic capital* can be used to de-structure the ongoing decision and strategy processes of the members of communities (agents).

The *field* is an elementary social organization in which agents struggle and compete for resources and power (Bourdieu, 1990). A field is a semi-autonomous and interconnected system; its structure does not determine the behavior of the agents. Fields are dynamic, they are constantly evolving through interactions by agents and influences from other fields (Eichholz et al., 2013; Raedeke et al., 2003). Examples include the fields of economics, politics, law, science and education.

Habitus is a set of internalized beliefs and social practices derived from everyday social actions occurring within a community which produce recurring patterns of agents' attitudes that define social norms, shared ideas and common behavior (Bourdieu, 1990). The social environment in which agents grow-up determines the mutually accepted habits and customs of interaction that define the social norms, social institutions and shared informal rules (Eichholz et al., 2013; Mondolo, 2019). While habitus is not dynamic like fields, it can adjust to changes more or less rapidly depending on the adaptive capacity to variations in rules, norms, ranking, and dominance of the social agents involved; some may be resistant to change (conservatives), while others may embrace it more eagerly (innovators).

Bourdieu considers different types of capital, but all of them are directly or indirectly used as strategic tools for gathering material (physical) or immaterial (symbolic) benefits such as establish domination, power, social rank, recognition, respect, prestige, visibility or social acceptance (Bourdieu, 1990). Namely they are economic capital, cultural capital, political capital, social capital and symbolic capital.

Economic capital represents an agent's control of material resources, *cultural capital* consists of acquired resources in the form of knowledge skills, dispositions, and possession of culturally significant objects, *political capital* is that which enables an agent to take advantage of public services or goods for her/his own advantage by using her/his political power, whereas *social capital* is made by all the resources that can be mobilised via social connections and mutual obligations, it is the aggregate

of durable networks, relationships and recognition within a community (Bourdieu, 1990; Burton & Paragahawewa, 2011; Eichholz et al., 2013; Levien, 2015).

The most important aspect in Bourdieu's theory is related to the definition of *symbolic capital*, which represents all the shared ideas and symbols (e.g., codes, rituals, inherited habits, unconscious practices, proverbs and all immaterial social symbols) that grant legitimacy to other forms of capital and provide a real shared value of the material and immaterial forms of capital to the members of a given community by shaping the social relationships among members, social power, ranking, and dominance (Bourdieu, 1990). Symbolic capital, like social norms, is not static. They are in constant struggle with new norms absorbed from outside the community in an intangible clash between the preservation of pre-existing social norms and new modes of economic behavior (Levien, 2015; Thomas et al., 2019).

According to Burton and Paragahawewa (2011), central to Bourdieu's theory is the idea that all forms of capital are transferable via *symbolic capital* which represents the status, prestige, credentials, and reputation of the agent within the community, both when it is institutionalized and when it is tacitly acknowledged by the community. For example, cultural capital can generate symbolic capital which can in turn increase and strengthen social and political capital through higher levels of social relations and reputation within the community (Burton & Paragahawewa, 2011; Hollenbach & Ruwanpura, 2011; Levien, 2015) (See Fig. 1).
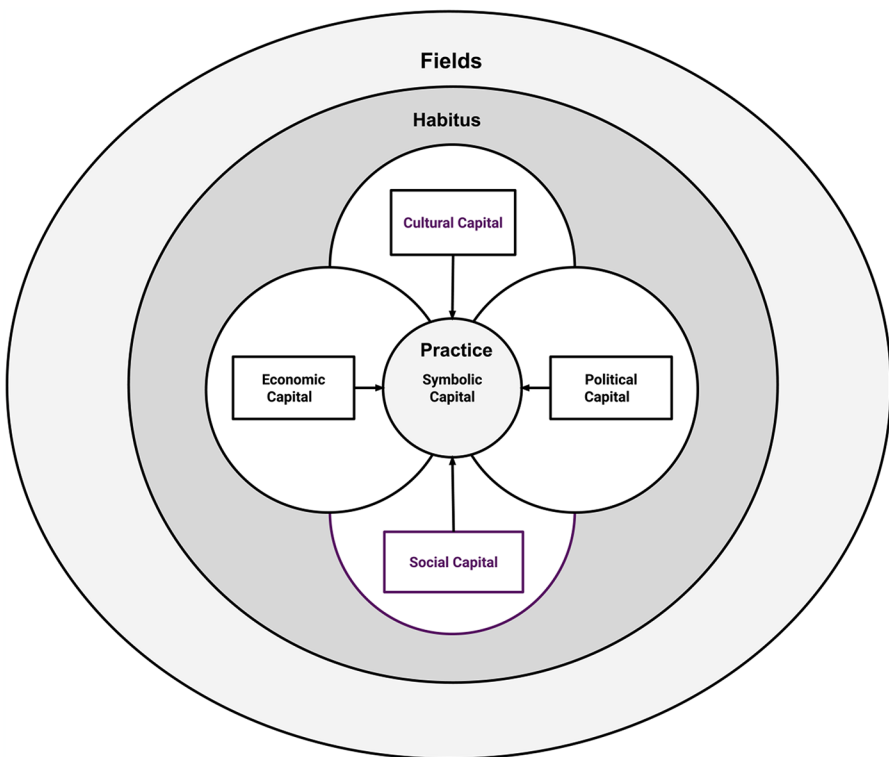

Fig. 1 Graphical representation of Bourdieu's theory of symbolic capital. Source: Authors' elaboration

In this analytical framework, the production of shared meanings and collective beliefs gives rise to 'symbolic interactionism', according to which the individual and the society are identified as part of a dynamic and constantly interacting system in which the self is conceptualized as "*a social structure arising out of one's social experiences*" (Burton et al., 2008).

Society itself is seen as composed of different groups or different communities, each with their own shared experience and specific symbolic understanding of the world. Through interactions with different social groups, individuals develop an understanding of the symbolic meaning of group identification (e.g., shared behavior, meanings, vision of the world) (Burton, 2004). Over time, a particular understanding of the world is internalized by individuals as it comes to be perceived as common to both the fellow community members and to themselves.

In doing so, each member adopts self-referential or positional labels that create an identity of self ("I am a member of…"), the community, its members, and non-members. This implies the creation of positive and normative visions of behavior within the community through the identification of ideal figures ("A member is…"), which do not exist, but are full of symbolism that guide the actions of the community's members ("A good member does ….").

2.2 The "Good Farmer" concept

Several social scientists have delved into this area of study by analyzing the symbolic creation of the ideal farmer within their communities. These studies have mainly been carried out in Western countries, highlighting the chief elements that are used for symbolic production based on farmers' habits and visions that are shared with the other members of the community in their everyday life.

Burton (2004) defines the activities of symbolic production as "hedgerow farming" according to which many farmers pay greater attention to the care of agricultural activities, such as livestock or crops, in the most visible areas as a means of symbolic production to convey an idea of their farming and agricultural management skills. In fact, shared symbols and ideas create images of a hypothetical GF which is then used as a measure for evaluating one's own skills or for judging the work of others (e.g., work activities or social interactions). Such symbols forge a sense of identity for individuals and the community as well as cultivate a shared vision of a mythical GF capable of guiding the farming community's actions as a shared 'institution' within it.

A farmer's investment in symbolism (e.g., everything that can be used to judge her/his work and her/his identity as a GF) is part of her/his symbolic capital (Burton et al., 2008). The farmer invests in symbolic capital to achieve social status such as acceptance by others and belonging to the farming community. This can substantially influence the adoption, or non-adoption, of new agricultural practices, techniques or technologies, depending on how the community perceives them. Various studies have shown that the perception of a GF in relation to the acceptance of sustainable measures and practices is a very important factor in influencing the acceptance and diffusion of innovation adoption in rural communities (Burton et al., 2008; McGuire et al., 2013; Sutherland, 2013).

Over the past twenty years, a vibrant literature has emerged on the concept of a GF, based on Bourdieu's sociological framework, with important findings on farmer decision making. The effects of rural communities' collective behavior in driving adoption (or disadoption) of specific farming practices have been evident in Europe after the introduction of voluntary schemes aimed at slightly modifying traditional ways of farming, seeking to incentivize new forms of practices and permanent changes in agricultural production, such as environmental protection and natural resource conservation, provisions for recreational facilities or landscape conservation (Burton, 2004; Burton et al., 2008). The limited success of these voluntary schemes in nudging farmers to abandon their traditional productivist approach highlights the complexity of rural social structures, which seem to respond to stimuli and motivations other than simple rational economic and utilitarian behavior. The loss of self- and group identity resulting from the adoption of new practices may reduce the effectiveness of policies focused only on economic incentives. This has given impetus to the concept of a GF primarily based on shared social symbolism and norms, recognizing the existence of other forms of capital to consider for lasting behavioral change (Burton et al., 2008).

Burton (2004) describes society as composed of different groups and communities which have their own experience and symbolic understanding of the world (e.g., social norms, internalized beliefs, rituals, proverbs, …) arising from the social experience and deriving from constantly dynamic interactions among the social agents. It is through the interactions within and between social groups that an individual develops an understanding of the symbolic significance of belonging to a specific group and its collective behavior (Burton & Wilson, 2006).

The adherence of an agent to a group's behavior creates a particular understanding of the world through the adoption of a 'positional label' that creates self-identity and ideal figures: "*I am a Farmer …*", "*A Farmer is…*", "*A Good Farmer does ….*" (Burton, 2004). The ideal figure of the GF is a mythical figure permeated with symbolism to which all the members of the community are committed, and which guides everyday practices, the "*way of doing things*" and "*the right thing to do*" of the community's members (Burton, 2004; Burton et al., 2008; Hunt, 2010).

Rural communities each have their concept and definition of a GF. They each have their distinct habits, shared ideas and values, common beliefs, ideal social rankings and judgments over the other members of the community (Burton & Wilson, 2006). A dynamic concept of a GF derives from the works of McGuire et al. (2013, 2015) who state that members of a rural community continuously compare their self-identity and social roles to adhere and conform to the community's "identity and role standards" using feedback-control processes from fellow members in a framework of structured symbolic interactionism.

Farmers reinforce their self-identity through the importance given to the norm they comply with, whereas their behavior is modified after comparing if the action is not consistent with the shared idea of the community (Morton et al., 2017). Therefore, farmer identity is forged daily by social interactions in a highly complex control system that utilizes feedback received from the social environment. However, shared identity is dynamic; and beliefs can change slightly through small adjustments to the identity standards produced by the community which depend on the daily actions and practices of the individual agents (McGuire et al., 2013; Raedeke et al., 2003).

External nudges by policy makers can, therefore, modify codes, rules and symbols helping the transition from one shared habitus to another by following societal trends when existing habitus are no longer suitable for the new context (Sutherland & Darnhofer, 2012). This process can either occur slowly, through daily changes in farmers' behaviors, or rapidly due to exogenous changes absorbed by the community if they adhere to the common norms (McGuire et al., 2013, 2015).

3 Methods of analysis and data description

Extant literature on the Good Farmer mainly focuses on Western countries (Northern EU and US); moreover, studies on this topic in developing countries remain limited. This paper aims to fill the current gap by providing an initial analysis of the GF concept applied to a survey conducted in rural Mozambique in 2019. We assess the possibility of extending the study to rural areas in Africa by focusing on the GF concept and the diffusion/adoption process for agricultural practices, taking into consideration how lasting beliefs and human capital building can contribute to agricultural development.

After having analyzed the principal literature on the GF concept, we proceeded to analyze the GF concept, contextualized to rural areas in Africa, employing a pure qualitative approach with text analysis. Our main research questions are:

- RQ1: "How is the 'Good Farmer' concept/idea interpreted in Africa?"
- RQ2: "What are the main differences from the definitions of Good Farmer in Western countries?"
- RQ3: "What are the main characteristics evidenced in the definition of what a Good Farmer is and what can be interesting for the diffusion of innovation in Africa (lasting beliefs and human capital building)?"

We performed a Structured Literature Review (SLR) on the existing literature on the GF concept following a similar analysis applied to other fields (Dumay & Cai, 2014; Massaro et al., 2015; Secundo et al., 2020). The SLR is an upgrade of the standard literature review as it can be used to systematize main trends, methods, findings and gaps in the current stream of scientific works on a very specific topic to develop critical reflections on the status of the literature and to open up to potential extensions and improvements based on a critical assessment of past studies (Massaro et al., 2016; Petticrew, 2001). One of the strengths of the SLR is its ease of interpretation; trends and key findings in the literature are schematized in tables and figures (Paul & Criado, 2020).

The superiority of SLRs over standard literature reviews lies in their greater analytical rigor, transparency and replicability of the methods adopted, the use of a research protocol and a logical structure to answer specific research questions (Massaro et al., 2015, 2016). Regarding the last point, our main research question is linked to mapping the main studies on the GF concept present in the literature in terms of journals, time frame, methods and geographical distribution to obtain a comprehensive state of the art. Our review of the literature identified key findings applicable to

the GF concept. We then conducted a critical analysis of the main relevant results that emerged (Massaro et al., 2016; Secundo et al., 2020).

Once the primary objective is identified, the SLR follows these key steps: (a) select relevant scientific databases, (b) identify and collect the most relevant papers on the topic, (c) refine the initial selection to ensure a consistent dataset. This involves eliminating duplicates and non-peer reviewed material (e.g., book chapters, reports), (d) select the most relevant papers for an in-depth analysis, (e) conduct the chosen analysis (Mishra et al., 2017).

Our SLR was of the Scopus database (web platform) which contains the more scientific papers on our subject (Secundo et al., 2020; Waltman, 2016). The SLR strictly focused on papers on the GF concept within a Bordieuan framework. Following Massaro (2016), to increase analytical precision, we made a stringent selection of papers, focusing only on the targeted topic. Purely conceptual, theoretical or methodological studies as well as papers without a focus on Bordieuan symbolism were excluded (e.g., papers referring to the GF without a clear link to symbolism or symbolic capital).

Papers were identified using the following selection string: "Good" AND "Farmer" AND "Bourdieu". In the first phase, 162 documents were identified, after a first selection of only scientific papers (excluding grey literature, conference reports and book chapters) 139 papers remained, then after reading keywords and the abstract of the selected papers another 81 papers were excluded (either they did not strictly focus on the GF concept, or they did not use the Bordieuan framework). The remaining 58 papers were read carefully. At the end of this last phase, 19 papers were discarded since they were not consistent with the SLR protocol (e.g., not focused enough on GF, did not use the Bordieuan framework or both, or just theoretical analysis). At the end of the selection process, we had a subset of 39 relevant papers which were used for the final content analysis.

To answer our research questions, we based our analysis on the survey made in Crudeli et al. (2022) in which field interviews were conducted in Mozambique, in the provinces of Nampula and Manica, providing specific insights in relation to the GF concept. Mozambique is one of the least developed countries in the world its Human Development Index is ranked at 181 out of 189 (UNDP, 2020). The agricultural sector is very important in terms of the Mozambican economy (it represents 26% of the country's GDP), and national employment (it absorbs 70% of the work force) (World Bank, 2022). The two study areas were selected for their different climates and productions; one is inland and the other a coastal area. Both are characterized by subsistence agriculture as the main sector of the economy, with low levels of infrastructure and high levels of rural poverty.

In the area of Manica, bordering with Zimbabwe, the food crop sector is run by family farmers growing maize, sorghum, and millet during the main season. The most important cash crops are tobacco and cotton which are mostly cultivated on large private estates. The province of Manica is characterized by high levels of rainfall and mild climate and three main geographical features: the western mountain range, a central plateau, and three river valleys (the Pungwe, Save and Zambezi, and their tributaries).

The province of Nampula is one of the most important agricultural production areas with fertile land in the inland districts, whereas the areas located along the coastline bordering the Indian Ocean are drier and less fertile. Cotton and cashews are important cash crops, grown thanks to the favourable weather conditions. Agriculture activities are run mainly by family farmers dedicated to the production of staple foods (maize, cassava, sorghum).

The survey was made in collaboration with local institutions and NGOs working in the field. The questionnaire was administered after a period of internal pretesting and training of enumerators from October 30th to November 13th in 2019. The local partners collaborating in a development project run by USAID gathered field work data in the provinces of Manica and Nampula, targeting a representative random sample of 300 farmers in the two provinces (150 from Manica and 150 from Nampula). In collaboration with public extension supervisors and local leaders, each district provided a list of farmers to be potentially selected. The list was used to calculate the proportion of farmers to interview in each province. In most cases, farmers who attended the meetings organized by the public extension service agents were chosen through a computer generated random selection process. The enumerators (5 assigned to Nampula, and 4 assigned to Manica) collected between 8 and 20 daily interviews, depending on the distance between villages and the location of the interviewees. Every day, at the end of the interviewing process, the enumerators checked the interviews for errors and sent the data to the central database reporting also unrepaired errors in daily reports. The team composed of nine enumerators, one manager, two supervisors, one technician, six public extension service agents and two drivers, interviewed 300 farmers (105 women and 195 men) in 36 different localities of Manica and Nampula, travelling approximately 3300 km. For more detailed information see Crudeli et al. (2022).

In this paper, we focus on a relatively small part of the survey in which the interpretation of the GF concept was asked to farmers. The enumerators provided semistructured survey questions on different aspects of innovation adoption and on the GF concept to 300 small farmers, such as:

> Do you think a good farmer exists in your community?
> If yes, which are the features that characterize him/her as good farmer? (3 answers/features)
> If no, could he/she exist?
> If yes, which features may define him/her as a good farmer? (3 answers/features)

In total, the 300 respondents gave 703 "Yes Features" and 66 "No Features" and 769 definitions of GF. To the best of our knowledge, this is the widest collection of the GF definitions available in the literature.

We analyzed the answers through text mining and text analysis following Hearst (1999), Lacity and Janson (1994) and Bolasco (2005). These methods allow to compute the statistics of large amounts of text to discover useful semantics and linguistic patterns (Hearst, 1999). We used the R package 'Quanteda' to perform our analysis (Benoit et al., 2018). We adopted a standard procedure to prepare the text for analysis following these steps: (a) cleaning the text from errors, typos and symbols; (b) taking

out stepping words (commonly used words in a language is, and, or, are, etc.); (c) stemming the text: reducing the text at its linguistic base (just for robustness). Then we performed descriptive statistics analysis (word-clouds and distributional graphs) to describe the main patterns within the corpus analyzed. We then considered the co-occurrence networks of words to cluster the main connection of words found within the various definitions of a GF to obtain a semantical understanding of how these words are associated within the corpus (Garg & Kumar, 2018; Radhakrishnan et al., 2017). We answered RQ1 and RQ2 by adopting this approach. For answering RQ3, we extracted and classified the farmers' relevant answers by using a content analysis based on the main keywords identified in the first part of the text analysis.

Subsequently, we divided the answers into those stating that a GF exists within the community and those answering that a GF does not exists. We did this to consider possible heterogeneity within the two groups to assess whether structural differences might emerge between the two macro visions (i.e., the belief that a good farmer exists or does not exist in the community). As a robustness check, we replicated this exercise by dividing the corpus into subsamples to analyze whether differences in the definition of a GF between categories of subgroups might emerge. We divided the subsamples into the following subgroups: (a) gender (sample sizes: 'Female' 241, 'Male' 528); (b) literacy (i.e. able to read or illiterate) (sample sizes: 'No read 242, 'Able to read' 527); d) education (sample sizes: 'Educated 659, 'No Education' 110); e) farming as main activity (sample sizes: 'Farming as primary activity' 734, 'Farming as non-primary activity' 35); f) land owners or renters (i.e. if the household owns the land used for the main agricultural activities) (sample sizes: 'Land owner' 351, 'Non-Land owner' 418); g) language (i.e. speaks more languages or one-language) (sample sizes: 'Mono-language' 192, 'Multi-language' 577), h) level of income (i.e. a high income was identified if the household earns 50,000 MZM or more monthly; low income was identified as households that earned less than 50,000 MZM) (sample sizes: 'High-income' 110, 'Low-income' 659); i) number of persons with income in the family (one or more) (sample sizes: 'Mono-Income' 590, 'Multi-Income' 179); l) religion (sample sizes: 'Christian' 635, 'Non-Christian' 134); m) radical adopters or non-adopters (i.e. Radical innovators were identified as those households which adopted at least one innovation among: chemical fertilizers, pesticides and herbicides; non-innovators were identified as households which did not adopt any innovation) (sample sizes: 'Radical-innovators' 78, 'Non-innovators' 691) ; n) location (province) (sample sizes: 'Manica' 377, 'Nampula' 392); o) remote location (i.e. enumerators identified during the interview whether the farm was far from marked or main roads) (sample sizes: 'Land non-far away' 362, 'Land non-far away' 407). The paper provides the main results related to dividing the subgroups of farmers according to the presence (or not) of a Good Farmer within the communities. The remaining analysis is provided in Appendix 3.

4 Results

4.1 Results of the structured literature review on the Good Farmer concept

4.1.1 Publication distribution (time frame, journals, geography and methods)

The literature defining Good Farmers began to emerge at the beginning of the new millennium and had a slow growth-path during that first decade while the theory started to gain consensus among social scientists. However, only recently, since 2016 has the literature begun to flourish, and with a markedly upward trend most recently from 2019 to 2021. Figure 2 presents the time distribution of publications. It highlights how this topic became important in rural sociology and other sciences with a peak in publications since 2021, when seven studies were added to the literature. Overall, from 2003 to 2022 (when this paper was written) thirty-nine articles were published on the GF concept. When considering scientific journals, the literature is mainly concentrated in a few clusters of publications which mostly focus on rural sociology, evidencing that the subject is still a niche-topic in social sciences dealing with agricultural development. The main journals with more than one article on the GF concept are: *Journal of Rural Studies* with eleven, *Sociologia Ruralis* with nine, *Agricultural Human Values* with seven, *Land Use Policy* and *Rural sociology* each with two publications, other journals had shown just one publication (see Fig. 10, Appendix 1).

The literature on the GF, as already noted, primarily focuses on Western case studies. In fact, considering all 39 of the papers analyzed in the SLR, most of them concern Europe and the US. From Fig. 11, Appendix 1, it is possible to see the country distribution of the studies; it is evident that the topic is disproportionally addressed in Western countries especially in the US (9 studies) and UK (16 studies). Finland, Germany and Ireland each had 2 studies, while other Western countries had just one (New Zealand, Australia, Canada, Belgium, Sweden and the Netherlands). Only three out of the 39 papers focused on Africa: Bottazzi et al. (2020) studied the GF in Senegal, Crudeli et al. (2022) used Mozambique as a case study, and Beumer and Swart (2021) focused on South Africa. This may reflect the clusterization of
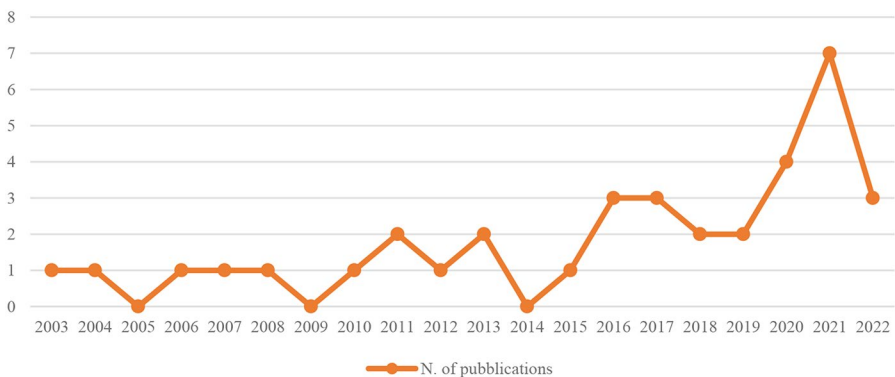

Fig. 2 Number of publications on the "Good Farmer" concept by year. Source: Authors' elaboration

specific scientific expertise (sociological and anthropological skills) in some countries. Unfortunately, those studies do not provide a comprehensive definition of a GF applied to the cultural and social specificities of the African context. While still other authors analyzed farmer identity and the definition of good farming practices in Africa (McEwan et al., 2017; Sumberg, 2011; Talanow et al., 2021), Mexico (Badstue et al., 2007) and India (Kumar, 2016), they did not use the sociological framework of the GF concept developed in the literature by Burton (2004), therefore they were not included in the SLR.

To analyze the different methodological approaches used in the literature, we divided the studies into methodological macro-categories, dividing them mainly into qualitative and quantitative approaches. The methods adopted by most of the papers analyzed in the SLR are based on sociological analysis using a qualitative approach. Most of these studies used the analysis of key informant interviews (mainly farmers) as the research method. The main qualitative methods used were: semi-structured interviews (26 studies), open-ended interviews (2), in-depth interviews (2), and focus groups (2). Other studies included in the SLR employed quantitative methods by collecting data from surveys, the methods adopted in these studies mainly include econometric analysis (4) and principal components analysis (2). We found no overlaps between methodological macro-categories (i.e. none of the studies adopt both a qualitative and a quantitative approach), but three qualitative studies, which analyzed semi-structured interviews, additionally provided some descriptive statistical analysis of survey data (Conway et al., 2021; Franklin et al., 2021; McGuire et al., 2013).

Figure 3 shows all the methods used in the papers analyzed through the SLR. Figure 4 depicts the main topics assessed by the papers: environmental sustainability (20 studies), production and agricultural practices (8 studies), and landscape management (5 studies).
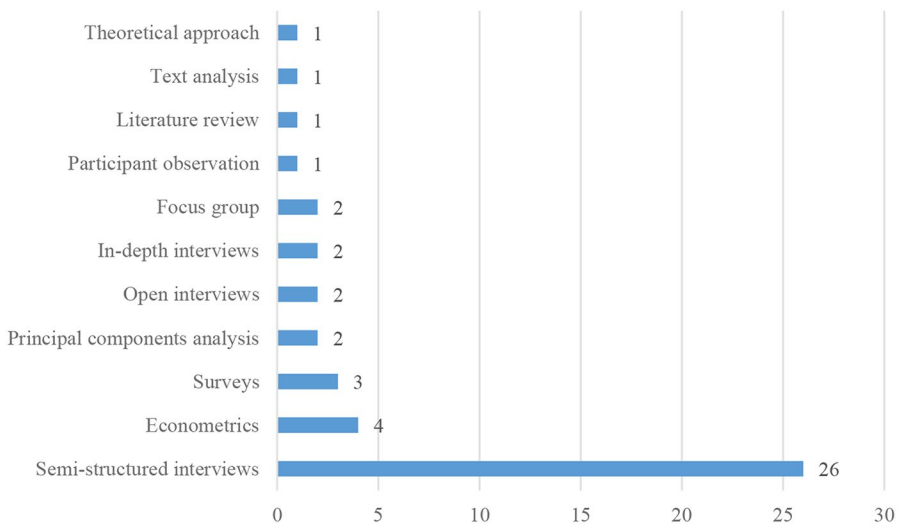

Fig. 3 Number of publications on the GF concept by type of analysis. Source: Authors' elaboration
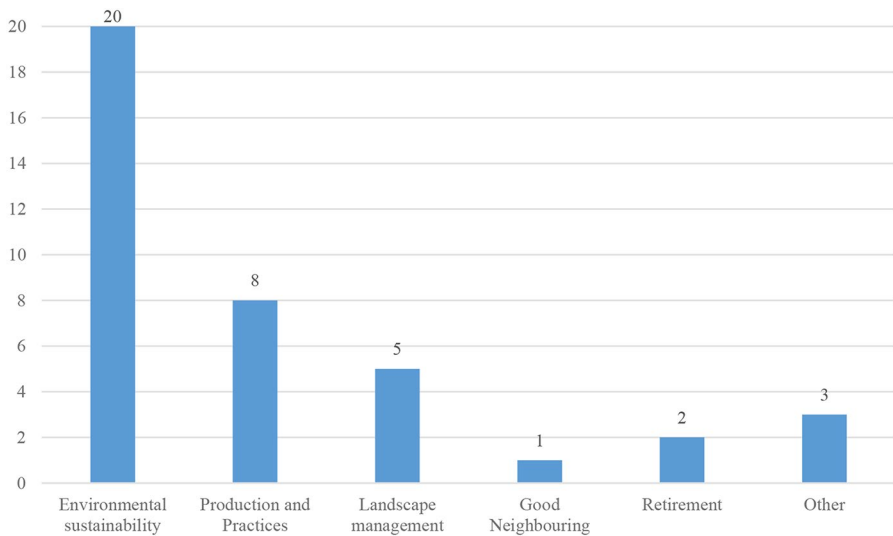
Fig. 4 Main topics analyzed in the papers considered in the SLR. Source: Authors' elaboration

4.1.2 Main results of the publications on the "Good Farmer" concept

Burton (2004) was the first to conceptualize the "Good Farmer" concept as the result of an indirectly observable representation of rural reality by farmers through symbolic interactionism. He coined the term "*hedgerow - roadside farming*" to identify the method of transmission of symbols among farmers. This concept resumes the effort spent by farmers in symbolic production and symbolic capital accumulation through investing in time, effort and economic resources in farming activities that were visible to others to highlight their farming abilities in specific activities recognized by the community as indicators of good farming (e.g., animal welfare, good crop status, field cleanliness) (Burton, 2004). Building on concepts developed almost two decades ago, rural sociology literature has seen a flourishing of applied research on the GF concept, primarily focused on Western contexts.

Several studies found that despite farmers classifying themselves in specific farmer-type categories[6], the core reference of symbolic interactionism, and social positioning is linked mainly to a productivist consideration of agriculture. The empirical literature on the GF developed after the seminal work of Burton (2004) found a diverse set of indicators of what a "GF is" or what "a GF should do". Most indicators are linked to the positive image of the field (e.g., straight lines, cleaned and controlled landscapes, no visible weeds, aesthetic-appeal of the fences, good health of visible herds), machinery and chemical input use, and the productivity of the farm. Various applied works, particularly within rural sociology, corroborate the shared productivist vision of a GF in Western countries (Saunders, 2016; Sutherland and Burton, 2011).

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[6] I.e. traditional, agribusiness, conservationists and entrepreneurs in Burton and Wilson (2006) or productivists, conservationists, civic-minded and naturalists according to McGuire et al. (2015).

The main aspects of the empirical studies on defining Good Farmers, i.e., the main characteristics, or principal symbols identifying the figure of a GF, have focused on productive aspects such as the efficient use of agricultural inputs (e.g., fertilizers and pesticides), yields, herd's wellbeing, and the cleanliness of the field. Other important aspects considered were producing food (Birge & Herzon, 2019), conducting a viable and profitable business (Sutherland, 2013; Sutherland & Darnhofer, 2012), making good use of natural resources (Sutherland, 2013), soil maintenance and landscape tidiness (Hunt, 2010), and good livestock conditions (Burton, 2004). There was a slight fragmentation in the literature of the GF's ideals (Sutherland & Calo, 2020), especially in sub-groups of farmers such as professional or hobbyist farmers (Naylor et al., 2018; Shortall et al., 2018), conventional and organic farmers[7] (Stock, 2007; Sutherland, 2013; Sutherland & Darnhofer, 2012), and new-entrant or incumbent farmers (Sutherland & Calo, 2020).

Other works explore the concept of a GF from other stances. Naylor et al. (2018) and Shortall et al. (2018) study the GF concept applied to exotic animal disease management and biosecurity among animal keepers in England. They found that farmers have a strong tendency to use individual and collective labels to categorize themselves and other farmers. This is especially true for broad categorizations (e.g., poultry, swine, sheep) and primary occupations (e.g., commercial, herders, hobby farmers). These categories then serve to identify "good" and "bad" farmers based on the use (or non-use) of specific practices. Moreover, both studies found that an important aspect for describing a GF is the adoption of practices to reduce the risk of diseases spreading, good neighboring, and the sector overall. Good neighboring was already mentioned by Sutherland and Burton (2011) who identified the creation of trustful relationships and mutual support among neighboring farmers as elements of symbolic investment.

Morton et al. (2017) use the farmers' values and beliefs framework to analyze strategic decisions related to implementing climate change adaptation strategies in the US corn belt. Their findings show that self-identification in farmer categories such as conservationists or productivists influence the type of interventions selected by the farmers to cope with events related to climate change (long term protection vs. annual interventions). Riley (2016) analyzed the self-identity of British farmers at retirement-age who decide to remain active in farming activities and found that the decision to not retire is mainly linked to the loss of their sense of identity as farmers, and demonstrate that the ideal GF helps the rest of the family, since after retirement their reputation continues to contribute to the intertemporal symbolic capital of the farm. Along the same lines, the study by Conway et al. (2021) analyzes how farmer identity can influence retirement and inheritance decisions in Ireland.

More recent studies have applied the GF concept to other topics, for example to the definition and symbols of new comers to farming in deterritorialized areas (Sutherland & Calo, 2020), the stigma effect of environmental degradation caused

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[7] The literature has not revealed marked differences between conventional and organic farmers on the importance of productive aspects in the definition of a GF. The only main difference noted is that organic farmers put place additional importance to the environmental and labor aspects of farming (e.g. landscape diversification, habitat conservation, or being a 'good employer') (Sutherland, 2013; Sutherland & Darnhofer, 2012).

by conventional practices (Carolan, 2020; Kessler et al., 2016), the application of agri-environment-climate (AES) schemes for biodiversity conservation and environmental sustainability (Birge & Herzon, 2019; Cusworth, 2020; de Krom, 2017; Riley et al., 2018; Thomas et al., 2019). Noteworthy is that the studies by Roesch-McNally et al. (2018), Cusworth and Dodsworth (2021) and Westerink et al. (2021) found evidence of a minor shift from an exclusively 'productivist view of the farmer', highlighted in the previous studies as the main aspect in farmer symbolism towards coexistence with a more 'environmentally conscious' view whereby public goods and environmental conservation programs are accepted since they indirectly prompt integrating new practices into the GF's identity.

As highlighted in Sect. 4.1.1 very few studies have applied the GF framework to developing countries. Beumer and Swart (2021) applied the GF concept and farmer identity to study the potential of introducing genetically modified crops in African agriculture by using an extended literature review of documents and institutional declarations at the 2002 World Summit on Sustainable Development and a case study of genetically modified crop implementation by a group of smallholder farmers in South Africa. The authors found diverging definitions of a GF and farmer identity, highlighting the challenges in a clearcut application of the concept to technological and agrarian change. Beumer and Swart (2021) argued that an African farmer identity and a GF concept are not easy to identify even if it is crucial for agricultural and societal development in rural Africa, suggesting the need for further analysis since the concept has not been explored in detail in the literature applied to rural African society.

Bottazzi et al. (2020) assessed potential symbolic divergences of the GF concept between agroecological and conventional farmers in Senegal. The authors noted that symbols and cultural capital are crucial for agricultural development in Africa, highlighting that the adoption of agroecology in rural Africa can be easily absorbed using pre-existing social norms and symbols and focusing on collective development which is not in contrast with preexisting cultural and symbolic capital and habitus. Crudeli et al. (2022) use the GF framework to analyze whether pro-social aspects influence the adoption of innovation in two rural areas of Mozambique using econometric analysis. The authors found that the GF concept is related to certain community and social aspects that were not highlighted in prior literature. GF is not a barrier to innovation adoption, rather, it is positively correlated to *radical* innovation adoption (i.e., innovations that combine previously separate knowledge domains. Crudeli et al. (2022) consider pesticides, herbicides, and fertilizers as radical innovations). For the sake of space, we cannot add further detail of other recent publications' results; for additional information, refer to Table 1 in Appendix 2 where all the works analyzed on the GF concept are cited, briefly summarized and the link to each article is provided.

To offer a clearer overview of the main meanings of the GF concept from the research articles of Western contexts, we analyzed all the papers and extracted the main definitions that emerged from each framework of analysis. We summarized the main concepts in form of keywords, shown in Fig. 5 below. The most recurrent definitions were linked to aesthetic aspects which we have used as the main unit of measure for considering whether a farmer is a GF. The descriptors considered include tidy lines, field cleanliness, healthy animals and good crops as signs of good farm management, defined as "hedgerow farming" by Burton (2004); these aspect were
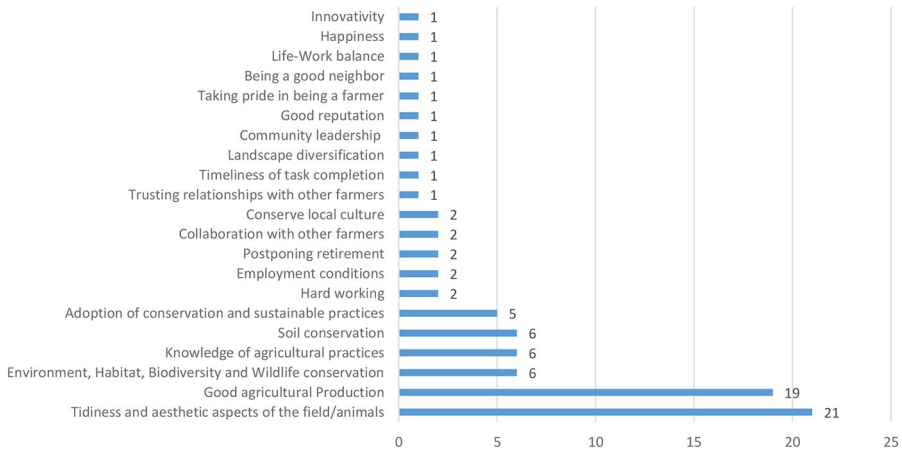
Fig. 5 Main concepts related to the GF in the papers analyzed in the SLR focusing on Western Countries. Source: Authors' elaboration

mentioned in 21 studies. Another main descriptor was 'good agricultural production' (i.e., high yields, positive profits) which is seen as the core element for judging a farmer's ability. This aspect was a defining factor for a GF in 19 papers. The 'knowledge of agricultural practices' in relation to specific farming activities (e.g., correct use of fertilizers and pesticides, timely controls of animal health status) were found to be important GF defining factors in 6 studies. Environmental stewardship, habitat and biodiversity conservation, the adoption of sustainable practices, and the use of soil conservation practices were considered key factors for defining a GF in 6 studies. Several other factors emerged recursively as descriptors for defining a GF in a smaller number of studies. These factors are shown in Fig. 5. The main keywords in connection to each paper analyzed in the SLR are shown in Table 2, Appendix 2.

4.2 Results of the survey text analysis

The text analysis survey confirmed that two of the most important aspects for the Mozambican farmers interviewed are agricultural production and productivity, nonetheless other aspects seem to have an important influence in defining what a GF is. Figures 6 and 7 show the answers of the respondents in word clouds. All results are shown in the original language (Portuguese) to avoid inappropriate translations that could hide informative meanings on the GF concept. Appendix 4 (Table 3) contains a small dictionary that translates the main words found in the analysis from Portuguese to English. Figure 6 shows the answers of the whole sample, while Fig. 7 divides the sample between those who believe a GF exists in their community and those who do not. The figures show that other words defining the ideal GF are present; many are linked to the concept of solidarity, assistance and community. There are no apparent diversities between the two subgroups (those who believe a good farmer exists in their community and those who do not). Therefore, believing or not believing in the existence of a GF in one's community does not change the main definition of how a GF is perceived by the other farmers.

Fig. 6 Word cloud on the meaning of "Good Farmer" for the whole sample. Source: Authors' elaboration

This is confirmed also by Fig. 8 which shows the frequency of the main recurring words in the definitions of a GF provided by the respondents. In this case, the important are linked to production activities ("produção", "produz"), mutual support ("ajudar"), fellow members ("outros") and community ("comunidade"). Notably, the meanings are quite related, creating a semantic pattern which appears to be different from the evidence provided in the GF literature in Western countries. By analyzing the relationships between words through a co-occurrence network, we can visualize how these meanings are interconnected (Fig. 9). Terms linked to production, helping, fellow members, and the community present clusters of co-occurrences in the definitions provided by the survey respondents.

Similar patterns emerged among subsamples with no structural differences from the analysis using the whole sample, this shows that the main meanings of a GF are constant and consistent among all the subgroups. However, some diversity is present in specific subgroups where the perception of community-related aspects in the definition of a GF seems to differ. The results of the analysis on subsamples are available as word clouds in Appendix 3 (from Figs. 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22 and 23).

The main differences in the GF concept among subgroups lie in the emphasis of words associated with solidarity, community and mutual support.

Subdividing the sample by farming as a primary household activity shows that professional farmers (Fig. 13), or households who rely solely on farming activities, are more likely to define the GF concept with a communitary view than those who

Fig. 7 Word cloud on the meaning of "Good Farmer" for the whole sample in response to the existence of a "Good Farmer" within the community (sample sizes: 703 'Yes, a GF exists in my community', 66 'No, a GF does not exist in my community'). Source: Authors' elaboration

are not involved in farming as their main income (those who have other jobs or 'hobbyst' farmers). The highest heterogeneity emerges between subgroups when subdividing the sample by gender (Fig. 14); the female subgroup uses a greater amount of words associated with community and mutual support ("*ajuda*","*comunidade*"), whereas the male subgroup expresses more words linked to agricultural production ("*produção*", "*produtos*", "*cultivo*"). This shows that female farmers have a greater propensity for a communitarian vision than male farmers in defining a GF.

An interesting result emerged from the analysis of splitting the sample by income level (Fig. 15). Farmers with higher disposable income have more definitions which include the word "*comunidade*" (community in English), whereas farmers with a relitively lower income have more definitions which include meanings linked to others and help ("*outros*", "*ajuda*"). This interesting heterogeneity in the defintion of the GF concept underlines how, the two groups' interpretations share a vision of communitarianism and reciprocity. Moreover, farmers with a higher level of disposable income consider openness to the community as a value for defining a GF and, while
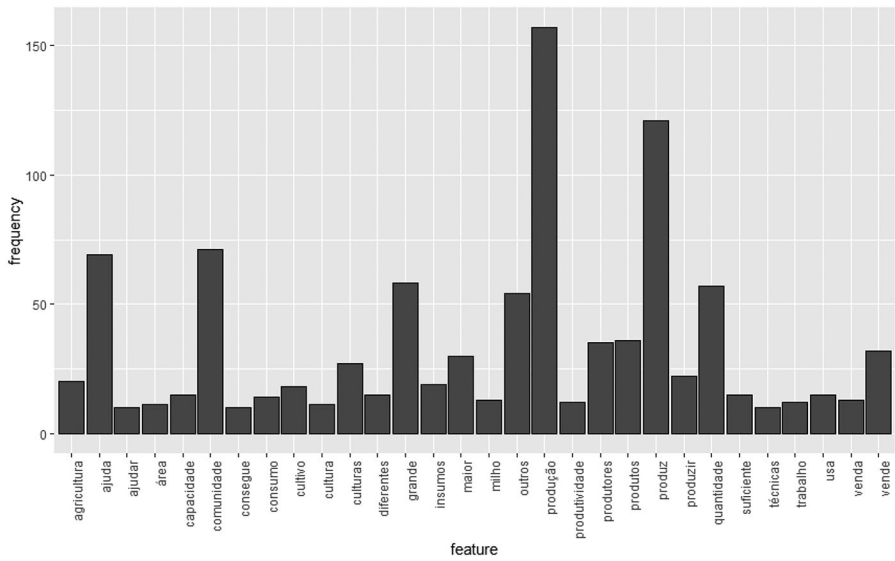
Fig. 8 Main words used in the definition of "Good Farmer" by the group (on the existence of a good farmer within the community). Source: Authors' elaboration
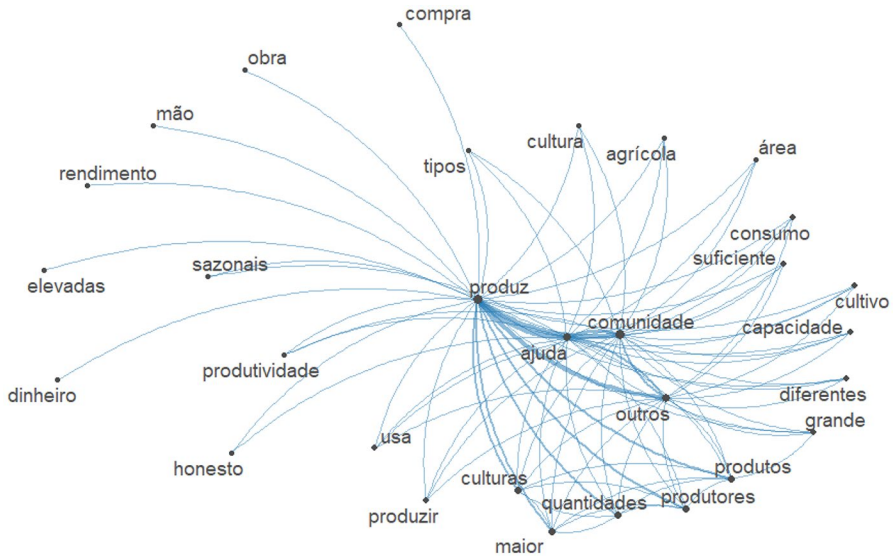

Fig. 9 Co-occurrence of words network. Source: Authors' elaboration

farmers with lower disposable income are more focused on helping and altruism. This may indicate that the rural communities in the study area have deeply rooted social relations and social norms founded on a communitarian vision that permeate the social strata.

This observation is partially reconfirmed when the sample is split by farmers owning land and landless farmers (Fig. 18). In this case, the former include, in their GF definition, terms such as productivity and capacity ("*produtividade*", "*capacidade*") as well as community ("*comunidade*"). Landless farmers include more words related to employement ("*mao de obra*") and honesty ("*honesto*"). This result can again be linked to a shared vision of mutual connectedness within rural society, where those who are well endowed (those who own land) are inclined to help others, while those who are less endowed (the landless peasants) rely on other members of the community.

Slight differences emerge also in the subdivision of farmers who live removed from roads and markets and those who are notfar away, where the former show more community-related definitions than the latter, who are more focused on agricultural production (Fig. 17). The reason could be that farmers with a limited production factor endowment – in this case, geographic location, which could significantly reduce their comparative advantage with other farmers – may consider help from other community members as an important value in defining a GF.

Similar differences emerged between farmers who are able to read and those who are unable, highlighting again that members with better conditions (able to read) define a GF using community-related words, whereas members in worse conditions (unable to read) define good farmers by emphasizing that they help others ("*outros*", "*ajuda*") (Fig. 22).

Splitting the sample by religious faith (Christian vs. non-Christian) also resulted in heterogeneous definitions (Fig. 23). The word cloud indicates that the Christian subgroup uses more community-related words to define a GF's characteristics than the non-Christian subgroup, which seems to be more focused on production definitions. Finally, differences in GF definitions are also present in the two provinces analysed (Fig. 21). Farmers in Manica used more community-related words to define the values of a GF, while farmers in Nampula used more production-related words.

4.3 Content analysis

After extrapolating from the text analysis, a classical content analysis on the GF definitions was performed. Considering the results, what respondents usually define as features of a GF relate to *production output*, as stated by Binoca: "*Ter uma produção acima das expectativas*" ("To have yields that exceed expectations") or "*Porquê tem uma produção acima da média*" ("To have above average production"); to *techniques*, as stated by Alista: *"Uso de tracção animal para boa produtividade*" ("Using animal traction for producing goods"), by Carlos: "*Diversifica a sua produção em todas as campanhas agrícolas*" ("Product diversification covering the agricultural seasons"), and by Eunice: "*Controlar as pragas na sua produção*" ("Crop pest control"); and to the *knowledge of agricultural practices*, for example, as stated by Carlos: "*Tem conhecimentos sólidos sobre agricultura*"("Possessing extensive agricultural knowledge") or by Jamaldine: "*Ter conhecimento sobre as normas de produção*"("Being proficient in production standards").

Often, the respondents' definition of a GF strictly links production aspects to providing mutual support. In fact, many definitions include both features. In some cases

the link between production and *helping* is in a *broad sense*, as reflected by Orlando: "*Ajuda a comunidade com a sua produção para alimentação quando for a necessitar*" ("Help the community with your food production when necessary") and by Gilson: "*Assistência social no fornecimento de uma parte da produção a sociedade*" ("Providing social solidarity by supplying the community with a share of your production"), or by providing *specific help* for some farming activities "*Ajuda outros produtores nos insumos e na prestação de serviços*" ("Helping other producers with inputs and services").

Another important aspect is the *knowledge transmission*, as noted by Octavio: "*Ensina novas técnicas de produção*" ("Teaching new production techniques"), by Carlos: "*Consegue ajudar a comunidade em termos de disponibilizar informação sobre a prática agrícola*" ("Helping the community by providing information on agricultural practices"), by Binoca: "*Porque ele ajuda outros agricultores que também querem produzir atraves novas formas que o governo recomenda*" ("Because he/she helps other farmers who also want to produce using the new methods recommended by the government") and by Gilson: "*Ajuda outros produtores na contribuição de ideias de produção*" ("Helping other producers to contribute with production ideas").

Commitment to the community is another important aspect of the ideal definition of a GF. He/She should be benevolent and generous toward the community ("*É caridoso com a comunidade", "Intervém com acções doativas na comunidade*") ("He/She is generous toward the community", "He/She participates in charitable activities in the community"). In terms of employment, the GF should help the needy members by offering them work opportunities ("*Da emprego a comunidade trabalhando na machamba dele*", "*Tem ajudado a comunidade com trabalho*", "*Da emprego sazonais a comunidade*") ("He/She provides work for the community by letting them work on his/her farm", "He/she helps the community by providing work", "He/she provides seasonal employment to the community"). The GF should also sell products at affordable prices to other members of the community ("*Ele produz e vende a preços acessiveis na comunidade*") ("He/She produces and then sells at affordable prices to the community").

The role of the GF in the helping - knowledge transmission nexus is also evident in relation to the community and its individual members, the GF according to Carlos : "*Fornece informação fidedigna a comunidade local*" ("Provides reliable information to the local community"); according to Gilson: "*Orientar os outros produtores nas práticas de produção*" ("Guides other producers in production practices"); and "*Ensina as técnicas de produção aos outros*" ("Teaches production techniques to others").

Additional definitions of a GF are linked to his/her moral character -*honesty and altruism*("*É honesto*", "*Não é egoista*") ("He/She is honest", "He/She is not selfish"), which again reproduces a symbolic vision of devotion and humanity toward others strictly related to helping individual community members and assisting with the needs of community overall as highlighted above.*Reputation*, inside and outside the community, is another important quality of a GF ("*Reconhecimento em todo distrito*", "*É muito conhecido", "Porque o governo lhes conhecem*") ("He/She is known in the whole district"; "He/She is very well known"; "The governing authori-

ties know him/her"). Being the reference person for the community is also important ("*É a referência da comunidade*") ("He/She is the community's point of reference").

5 Discussion and concluding remarks

From the above analysis, it is evident that a structural difference exists between the conceptions and definitions of a GF in Western countries and in rural Africa. The Western conception tends to have a more individualistic slant and places considerable emphasis on productive and visual symbols, as suggested by Burton (2004). The SLR performed in this paper confirms the symbols and shared ideas linked to a non-communitarian (in a strict sense) "way of doing" things in line with the neoclassical interpretation of intrinsic and extrinsic motivations of Brekke et al. (2003) and Bénabou and Tirole (2003) in driving farmers' decisions in a collective context. The latter, however, champion a more pro-social vision and place greater emphasis on helping other community members and actively engaging with community needs. These aspects have also been highlighted in our case study showing that community participation, mutual support and social networks are important when capital, finance and productive means become scarce.

Our research on the African conception of a GF reveals that it goes beyond production aspects. It emphasizes interactions and connections with the community and its members, where the GF offers reciprocal support and reliable assistance within the community.

Our analysis found no structural differences between subgroups, suggesting a lack of significant heterogeneity within the investigated community. We investigated how socio-economic and cultural aspects influence symbolic capital production in a rural community through a Bordieuan lens. The analysis sheds light on how these factors contribute to the construction of social capital through shared ideas, norms and practices. When we expanded our analysis to include diverse dimensions (i.e. religion, income level, language, literacy and location), we discovered a key pattern. Solidarity, community, and mutual support emerged as important elements in defining the characteristics of a GF, alongside productive features. This pattern held true also when examining subgroups within the community even though some minor diversities emerged. Notably, female farmers placed a greater emphasis on the community and the mutual support aspects of a GF compared to male farmers, who tended to prioritize productive factors. The analysis of subgroups revealed another interesting finding. Farmers with greater resources (i.e. more disposable income, land ownership, proximity to key locations, literacy) tended to define a GF using community-related terms, while farmers who had fewer resources tended to define the values of a GF with terms associated with offering help to others and emphasizing altruism. Despite variations between more and least endowed subgroups, our findings suggest a strong sense of community throughout the study area. Rural communities have a strong communitarian outlook, and social norms are prevalent throughout all social strata. Members are closely bound by the expectation of mutual support, shaping the way in which the GF is perceived by the community. Thus, community members share the idea that providing mutual support is an important characteristic of a GF

on both the 'supply' side (more endowed) and the 'demand'side (less endowed). This finding in our view reinforces our interpretation of a structural difference in agricultural practices and symbolism between farmers in the North and in the Global South.

Therefore, social norms and symbolism in rural Mozambique are not linked to individualistic perceptions but rather to a community vision, confirming the theory of "African Communalism" of Ikuenobe (2018). According to Ikuenobe', "African communalism" does not necessarily imply conflict between individuals and the community. In fact, they can be mutually supportive. Within this framework, community members are expected to contribute to the collective good, also for their own well-being, thus creating "*a sense of cooperation, interdependence and collective responsibility*" (Ikuenobe, 2018 p.597). The interdependence of the individual and the community's well-being is the ultimate goal of the community members' actions, namely improving personal well-being, which can best be achieved by living harmoniously and in solidarity with fellow community members (Ikuenobe, 2018; Venter, 2004).

In African culture, collective identity and community solidarity are extremely important. An individual is an integral part of society and individuals only exist as a group; however, individuality is not negated. This is well explained in the concept of *Ubuntu* 'I am, because we are, and since we are, therefore I am' (Nwagbara, 2012; Venter, 2004). These features are crucial when considering the cultural aspects affecting economic activities, production practices and the everyday choices by African farmers running their farms (Darley & Blankson, 2020). Since cultural aspects are remarkably different for Western and African countries, they must be reflected in the development programs.

An important aspect that emerged from the analysis of the case study is that the concept of 'helping' by a GF is strictly linked to knowledge transmission. Knowledge sharing relates to agricultural practices and techniques as a driver of peer-to-peer innovation among farmers. This finding reinforces the existing understanding, from other development studies, (Bandiera & Rasul, 2006; Crudeli et al., 2022), that social aspects play an important role in pre-capitalistic rural societies. Their importance must be considered for new technology transmission and innovation policies in rural African areas, since social aspects (i.e. social capital and symbolic capital) and the emphasis on solidarity and community, which are stronger than in Western countries, should be taken into account for increasing the effectiveness of those policies.

Peer effects and social networks have been widely studied as important drivers of innovation diffusion (Xiong et al., 2016). In agriculture, they are seen as crucial for boosting diffusion. This is true also for Western countries (Sutherland & Marchand, 2021) where social connections are less strong than in developing countries. In developing countries, social networks and peer effects have been identified as crucial factors for incentivizing innovation adoption at community level (Bandiera & Rasul, 2006; Fafchamps et al., 2021; Faysse et al., 2012). This has been also documented by the implementation of development programs that specifically focus on peer-to-peer effects such as 'Farmer Field Schools' to increase productivity and adopting new techniques and technologies through observational and experiential learning (Waddington et al., 2014). Another example of peer-to-peer learning is the 'Campesino a Campesino' program developed in Latin America by La Via Campesina. This

Farmer-to-Farmer program focuses on spreading sustainable agriculture practices as an alternative to the standard extension services (Rosset et al., 2011).

Social capital and symbolic capital, through peer effects and social norms, should be considered for the implementation of agricultural development programs. In fact, considering the GF as a context specific cultural product of symbolic interactionism may help endogenous innovation and diffusion adoption by boosting bottom-up processes that may be more effective in many rural areas in African countries. Since it is possible to change a shared concept of a GF given appropriate time, incentives in rural areas of Africa can be provided (through appropriate policies and external nudges) to influence symbolism, codes and social rules, to shift from a shared vision of "doing things" to new practices that include the needs of macro-rural development (i.e. in Bordieuan terms: the shifts of fields, habitus and practices to create new symbolic capital). In fact, new social rules that substitute past habitus may be linked to the adoption of innovation boosting technological diffusion within rural communities, thus freeing rural areas from poverty traps and technological lock-ins with important external effects on the socio-economic conditions for the whole of African society.

Agricultural development is crucial for many African countries to cope with numerous societal and environmental challenges. Considering the close nexus between agricultural activities and the fragility of many African ecosystems, developing the African agricultural sector must include all social, economic, cultural and environmental features so that each rural area can support an 'endogenous transition' which incorporates its socio-economic and cultural peculiarities. This approach supports local and higher-scale innovation adoptions that enhance agricultural development while minimizing ecological impact. In this paper we have not focused on sustainable agricultural practices (e.g., agroecology or organic farming), but how social capital, symbolism and practice can influence innovation adoption Our results can be applied to all types of agricultural innovation, whether we consider them sustainable or not, but further studies should focus specifically on sustainability.

Moreover, according to the innovation diffusion theory of Rogers (1971), the identification of community members as GFs can lead to important implications in terms of technological change and innovation diffusion within rural communities. Indeed, those who are identified as GFs can become promoters of innovation, through the transmission of (technological and technical) knowledge, which has been identified as one of the most important features of a GF.

Farmer-to-farmer extension services are important strategies in developing countries to cope with the decline of investments in government extension services (Fisher et al., 2017). Selected individuals, called 'model' or 'lead' farmers, provide extension functions to their peers by cooperating with private or public agencies for extension programs (Khaila et al., 2015). Model/lead farmers can act as powerful catalysts in promoting innovation at the community level since they act as multidimensional vectors of knowledge transfer by showcasing daily practical applications of innovation, disseminating information to fellow community members, and teaching by example (Bhandari et al., 2022).

Promoters, according to Taylor and Bhasme (2018), are a central node of the social network for knowledge transmission within the community and assume a broader

socio-cultural role as part of the extension network. Lead/model farmers assume functions with important political-economic and socio-cultural dimensions which are much more than the mere dissemination of technical knowledge. Their extremely complex social role can involve the transformation of extant social dynamics (e.g., hierarchies and power relations) within the community (Taylor & Bhasme, 2018).

Thus, development programs and innovation diffusion programs may leverage the concept of accepted and recognized GFs and leaders by the community, giving them the role of "innovators" with the goal of promoting innovation. Symbolic interactionism between "innovators" and fellow community members can strengthen the dissemination process and minimize clashing with existing symbolic capital and socio-cultural dynamics, ultimately increasing the success rate of innovation diffusion.

Rural development programs should pay more attention to social complexities by using a holistic approach and an adaptive method to enable the integral development of many rural areas in Africa (Lambe et al., 2020).

It has been shown that social values and identity (both personal and communitarian) are fundamental for boosting the diffusion innovations (unlike the green revolution of the '60s) which can be tailored to local culture and needs through a bottom-up and inclusive framework (Jones & Tvedten, 2019). The interpretation of local culture, as embodied in the GF concept, can be an interesting point of view to understand farmers, rural communities and their ways of interpreting technological/technical change. Implementing this approach can provide policy makers, researchers, farmers' unions, development institutions and NGOs with a deeper understanding of 'how farmer communities in Africa' perceive innovation and change in their productive patterns. This understanding can facilitate the diffusion agricultural innovations, ultimately supporting a bottom-up process of development (Ellis & Biggs, 2001; Power et al., 2002).

Our research offers a broad analysis of the GF concept in rural Africa. We leverage a unique 2019 dataset of 769 open-ended survey responses on the characteristics of a GF in Mozambique. We then compare the key themes identified through text and content analysis with the main findings from a SLR of the main current literature on the topic. To our knowledge, this is the first study that provides an interpretation of symbols, habitus and shared ideas to interpret what being a GF means in the African context. Our analysis shows there is a structural difference between the Western and African interpretations of a GF. In Africa, the dimension of solidarity – focusing on helping others and participating in community's needs – is quite prominent. We believe that this work can assist in designing tailored development policies which consider local needs, endogenous collective beliefs and local culture to achieve effective agrarian changes in the in the developing world.

Declarations

Conflict of interest The Authors declare that they have no conflicts of interest in this research work.

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