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Unpacking Social Capital as A Determinant of Sustainable Agriculture Adoption: A Literature Review

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Abstract

This paper presents a literature review examining the role of social capital in adopting sustainable agriculture, given the growing importance of sustainable agriculture for addressing climate change, food security, and resource scarcity. The review focuses on exploring the construct of social capital and its key dimensions and reviewing the impact of these dimensions on adoption. A Web of Science (WOS) database search identified 17 eligible articles for inclusion following a screening process. The review highlights that various social capital dimensions emerged from previous studies. However, these dimensions can be grouped into three primary constructs of social capital; social network, social norm and social trust. This paper also discussed how these three constructs could lead to better adoption of sustainable agriculture. The findings of this paper provide an understanding of social capital's role in promoting sustainable agricultural practices. By unpacking the construct of social capital and examining its dimensions and influence on adoption behaviours or outcomes, this paper contributes to a better understanding of the factors that influence farmers' decision-making processes and highlights social capital's importance in achieving sustainable agricultural development. Ultimately, this review can promote sustainable agriculture and enhance the sustainability and resilience of global food production systems.

Keywords: Sustainable Agriculture, Social Capital, Social Network, Social Norms, Social Trust

Introduction

Given the growing concerns about climate change, food security, and resource scarcity, sustainable agriculture has emerged as a critical solution to the agricultural sector's various environmental, social, and economic challenges (Ren et al., 2022). Sustainable agriculture can reduce the carbon footprint on the environment, increase the efficiency of resource use and long-term productivity, and, more importantly, increase the resilience of the agricultural system (Bourne et al., 2021; Kansanga et al., 2020). Despite the benefits of sustainable

agriculture, farmers' adoption of such practices and technologies is slow and uneven across different regions and contexts (Luu, 2020a).

Studies show that several factors have been identified as determinants influencing farmers' decision-making regarding sustainable agriculture. These factors include individual characteristics and economic, institutional, and technological factors (Luu, 2020a; Steffens et al., 2020; Luu, 2020). In addition, in recent years, there has been growing interest in understanding the role of social capital in using sustainable agricultural practices. Since social capital provides a deeper understanding of the social mechanisms that influence farmers' decision-making regarding sustainable agriculture practices, social capital is increasingly recognised as an essential factor influencing sustainable agriculture use (Zheng et al., 2022).

Social capital refers to resources embedded in social networks and relationships that can be mobilised to achieve specific goals (Jamil & Rasheed, 2023). It has influenced farmers' decision-making process, shaping the flow of information, access to resources, and cooperation among farmers (Zheng et al., 2022). However, social capital's complex and multi-dimensional nature makes it challenging to assess its impact on adopting sustainable agricultural practices. Therefore, the main aim of this paper is to conduct a literature review to examine previous social capital and sustainable agriculture adoption studies focusing on these objectives.

- 1) To explore the construct of social capital and identify its key dimensions relevant to adopting sustainable agricultural practices.
- 2) To review the impact of social capital construct on adopting sustainable agriculture.

Exploring how social capital impacts sustainable agriculture adoption among farmers in a community holds the potential for numerous benefits. Not only does it contribute to practical knowledge by shedding light on the social dynamics and relationships that influence sustainable agricultural practices, but it also addresses a significant knowledge and literature gap in the field.

Literature Review

Social Capital

Social capital is a concept that refers to resources embedded in social networks and relationships that can be mobilised to achieve specific goals (Mwanri et al., 2023). French sociologist Pierre Bourdieu first introduced the concept of social capital in the 1980s. However, it gained more attention after the study of American political science by Robert Putnam and sociologist James S. Coleman in the 1990s. Putnam's work on social capital argues that variations in the level of civic engagement and social capital can explain differences in the effectiveness of local governments in different regions of Italy. He defined social capital as "characteristics of social organisation, such as networks, norms, and social trust, that facilitate coordination and cooperation for mutual benefit" (Putnam, 1993, p. 167). Putnam argues that social capital can significantly impact various social and economic outcomes, including economic growth, political participation and social cohesion. He also supports the importance of civic engagement and the creation of social networks to develop social capital.

In contrast, Coleman's work on social capital focuses on its role in shaping educational outcomes. In his "Social Capital in the Creation of Human Capital" (1988), Coleman argues that social capital is essential in producing human capital for economic growth and development. Coleman defines social capital as "various entities with two elements in common: they all consist of some aspect of the social structure, and they facilitate the actions of certain actors - whether people or corporate actors - within the structure" (Coleman, 1988, p. S98). Coleman emphasises the importance of social capital in providing access to resources, including information, knowledge, and social support. He states that social capital can be generated through social networks, norms, and beliefs and can significantly impact educational outcomes, including academic achievement and school performance.

Sustainable Agriculture

The Food and Agriculture Organization of the United Nations (FAO) defines sustainable agriculture as "the basic management and conservation of natural resources and the orientation of technological and institutional change toward the achievement of the benefits and satisfactions demanded by people for present and future generations" (FAO, 2018). This definition emphasises the importance of meeting today's society's needs without compromising future generations' needs. Sustainable agriculture encompasses various practices to promote long-term ecological balance, economic viability, and social well-being (Zeweld et al., 2017). Sustainable agriculture is essential for several reasons. First, given the pressure to reduce agriculture's environmental impact, sustainable agriculture helps reduce greenhouse gas emissions and mitigate climate change (Olawuyi, 2019; Teklewold et al., 2013). The agriculture sector is a significant contributor to global greenhouse gas emissions and is responsible for about 10-12% of global greenhouse gas emissions (Panchasara et al., 2021).

Third, sustainable agriculture can increase the economic viability of the farming community, which on average is a low-income group, especially in developing countries such as Malaysia, by reducing dependence on expensive inputs such as synthetic fertilisers and pesticides (Teodoro et al., 2022). Furthermore, sustainable agricultural practices can also increase yields and reduce production costs, thereby increasing the profitability of agricultural operations (Yang et al., 2022). Finally, sustainable agriculture can improve food security and nutrition by producing healthy, diverse, locally-grown food (Sridhar et al., 2023). These sustainable agricultural practices can help increase the availability and accessibility of nutritious food, especially in rural areas where food insecurity is a significant challenge (Raza et al., 2023).

Three sustainable agricultures that have received significant attention in recent years are conservation agriculture, agroforestry, and precision agriculture. Conservation agriculture involves reduced tillage, cover planting, and crop rotation that can improve soil health, reduce erosion, and increase crop yields (Olawuyi, 2019). This approach has successfully improved soil structure and quality, resulting in higher yields and lower environmental impacts while ensuring long-term sustainability (Bourne et al., 2021; Teshome et al., 2016). Conversely, agroforestry integrates trees into agricultural landscapes to provide several benefits, including soil conservation and carbon sequestration (Kansanga et al., 2020). This approach is taken to improve soil fertility, biodiversity, and air pollution control and to generate additional revenue through the sale of timber and non-timber forest products (FAO, 2018). Finally, precision agriculture uses advanced technologies, such as GPS, sensors, and drones, to

optimise crop production and reduce waste (Zheng et al., 2022). This approach has led to more effective use of inputs, saving time and producing better quality output (Wachenheim et al., 2021).

Methodology

This review aimed to identify and synthesise empirical evidence on the role of social capital in adopting sustainable agricultural practices. A search was conducted using the Web of Science (WOS) database due to its reputation compared to other databases. The initial search used keywords related to social capital and the adoption of sustainable agriculture, as presented in Table 1, resulting in the identification of 34 articles.

Table 1

Search String Keywords

Database	Search String
Web of Science (WOS)	TS=("Social Capital*") AND TS=(Adopt*) AND TS=("Sustainable Agri*")

The next step involved screening the articles to ensure they met this review's inclusion and exclusion criteria. The criteria included document type, source type, and language, as explained in Table 2. Based on this process, four articles were excluded, leaving 30 for the next review stage.

Table 2

Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Document Type	Article	Conference proceedings, chapters in a book, book series, books etc.
Source type	Journal	Journals (review), book series, books, chapters in a book, conference proceeding
Language	English	Non-English

In the final stage, the authors reviewed and assessed the abstracts of the 30 articles to determine their relevance to the research questions and objectives. This resulted in identifying 17 eligible articles for inclusion in the review, as 13 did not meet the criteria. These excluded articles either did not discuss empirical data adoption of sustainable agriculture or did not examine the influence of social capital. The flow of the process is presented in Figure 1.

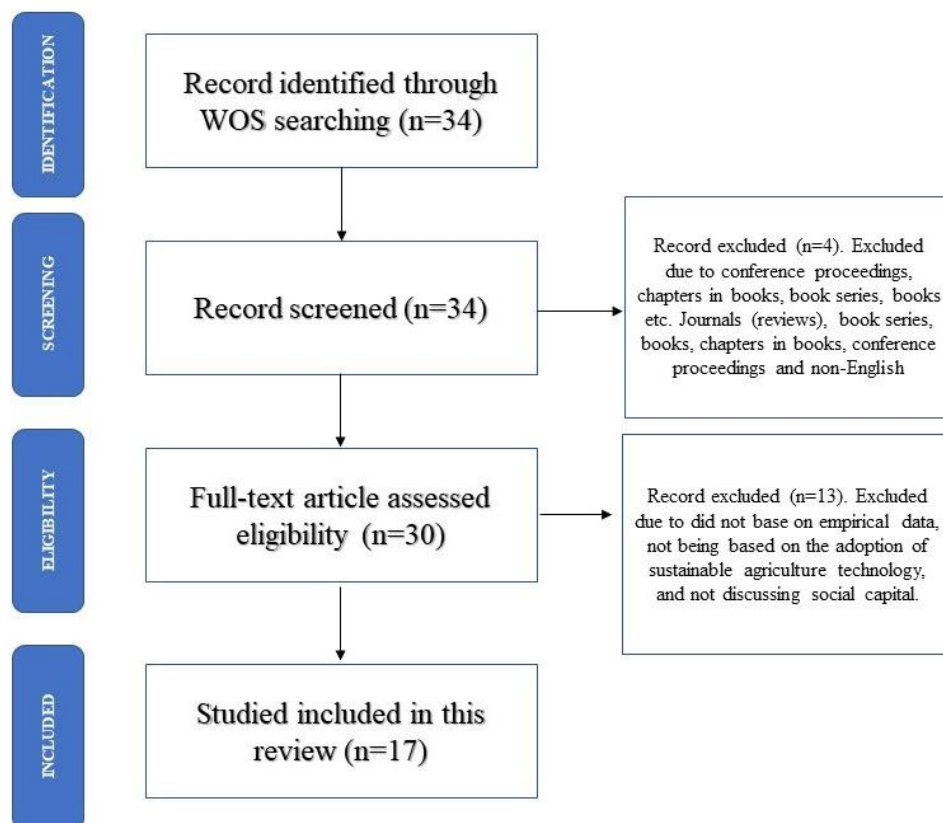


Figure 1 Flow Diagram

Findings

Dimensions of Social Capital

The findings of this literature review reveal that various dimensions emerged in the study of social capital and the adoption of sustainable agriculture, as shown in Figure 2. The first dimension that gained the most significant attention in previous research is membership in a farmer association. This refers to the formal affiliation of farmers with a group or organisation that aims to promote their interests and improve their livelihoods (Teklewold et al., 2013; Luu, 2020a). Membership in a farmer association can also provide opportunities for networking, social support, and cooperation among members (Zeweld et al., 2017). By joining a farmer association, farmers can increase their social capital and access to resources, facilitating the adoption of sustainable agricultural practices and improving their overall well-being (Zossou et al., 2016; Luu, 2020a).

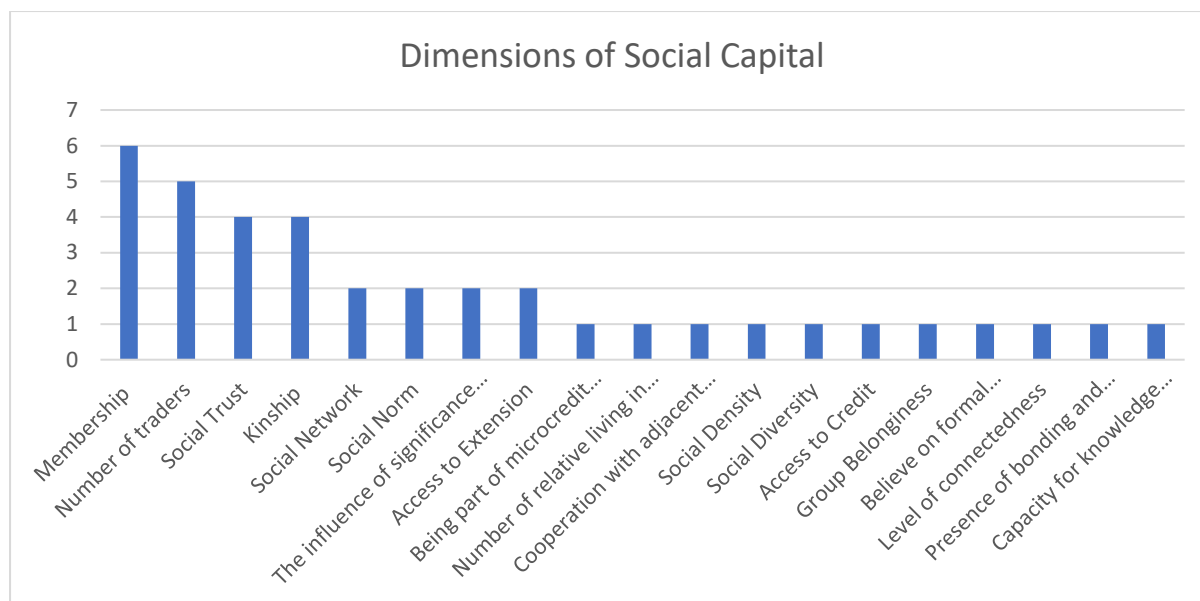


Figure 2 Dimensions of Social Capital

Another critical dimension is the number of traders that farmers know inside and outside the village. Knowing more traders within the village can be beneficial for several reasons. First, it can increase the availability of market information, such as prices and demand, which can help farmers make informed decisions about crop selection, the timing of planting and harvesting, and pricing strategies (Luu, 2020a; Luu, 2020b). Second, it can facilitate the exchange of goods and services within the community, such as sharing agricultural equipment, labour, or other resources (Beyene et al., 2015; Teklewold et al., 2013). Finally, knowing a more significant number of traders within the village can increase social support and cooperation among farmers, leading to more effective collective action and increased bargaining power (Luu, 2020a; Luu, 2020b).

Social trust and kinship are critical dimensions of social capital studied in adopting sustainable agriculture practices. Social trust refers to individuals' trust and confidence in their social networks, institutions, and communities (Ren et al., 2022). Higher levels of social trust can facilitate cooperation, coordination, and collective action among individuals and groups, contributing to the successful adoption of sustainable agricultural practices (Zheng et al., 2022). Kinship, otherwise, refers to the ties of family relationships and can also play a significant role in adopting sustainable agriculture practices (Teklewold et al., 2013). Kinship ties can provide access to social support, resources, and information that can facilitate the adoption of sustainable agricultural practices (Ren et al., 2022; Zheng et al., 2022). In addition, kinship ties can contribute to communities' social cohesion and solidarity, increasing the likelihood of collective action and the successful adoption of sustainable agriculture practices (Kassie et al., 2013).

Construct of Social Capital and Potential Impacts on Adoption

From the previous finding, we can conclude that the determinants of social capital are complex, and there is no consensus on the specific dimensions of social capital. Different studies have identified different factors that influence social capital. Therefore, there is a need to re-construct the dimensions of social capital based on empirical evidence relevant to

sustainable agriculture. One approach to re-constructing the dimensions of social capital is to group them into primary constructs based on their similarities and relationships. Re-constructing the dimensions of social capital can provide a more nuanced and comprehensive understanding of the factors influencing the adoption of sustainable agriculture practices. By identifying and grouping the dimensions into primary constructs, we can better understand social capital's complex and multifaceted nature. All determinants found in this study can be grouped back into Coleman's definition of Social Capital; Social networks, social norms and trust (Coleman, 1988), as presented in Table 3. However, some dimensions overlap and are believed to have been constructed based on the general idea of social capital referring to a social network, social norms and social trust.

Table 3

Main Construct of Social Capital

Construct	Definition	Determinants
Social Networks	Resources embedded in social networks and relationships can be mobilised to achieve specific goals.	Number of traders, cooperation with the adjacent farm, kinship
Social Norms	Shared values, beliefs, and behaviours shape individual behaviour within a group.	Group belongingness, Presence of bonding and bridging ties, Belief in formal organisations influencing behaviour
Social Trust	Willingness to rely on and cooperate with others based on shared values, norms, and beliefs.	Social trust
Combination of Social Networks, Social Norms and Social Trust	Membership, Being part of a microcredit group, Access to Credit, Access to Extension, Group Belonginess, the influence of Significance Reference Group, and Capacity for knowledge transfer and access.	

Discussion and Recommendation

From this review, social capital within a community can increase the adoption of sustainable agriculture by providing farmers with access to information, resources, and a supportive social context for adopting sustainable agriculture practices. A few limited characteristics of farmers, such as location, income, and age, lead to limited access to information and resources (Zheng et al., 2022; Zeweld et al., 2018). By leveraging the social network, farmers gain access to more quality resources, leading to more information and resources that can increase the likelihood of adoption (Ren et al., 2022). For example, farmer groups or associations can provide a platform for farmers to share knowledge, experience, and best practices related to sustainable agriculture practices. These groups can also provide access to credit and financing, as they can provide collateral for loans and facilitate sharing of risk and

resources (Luu, 2020a; Luu, 2020b). Social networks can also connect farmers with other actors in the agricultural value chain, such as buyers willing to pay a premium for sustainably produced crops (Kansanga et al., 2019).

Social norms, otherwise defined previously as shared values, beliefs, and behaviours that shape individual behaviour within a group, may also act as essential factors in influencing the adoption of sustainable agriculture. Traditional farming practices that farmers used previously that are deeply rooted in cultural beliefs may be resistant to change, making it challenging to promote the adoption of sustainable agriculture practices. However, interventions that promote social norms and values that support sustainable agriculture practices can create a sense of ownership and participation, increasing the likelihood of adoption (Kansanga et al., 2019). Moreover, social norms can also shape communication and knowledge sharing within a community (Gao et al., 2019). If social norms encourage open communication and collaboration, farmers may be more willing to learn from one another and share their experiences in adopting sustainable agriculture practices (Olawuyi, 2019). In contrast, if social norms discourage open communication and collaboration, farmers may be less likely to share their experiences or seek advice from others, leading to slower adoption of sustainable agriculture practices.

Finally, social trust within a community can facilitate cooperation and collective action, which can be critical for adopting sustainable agriculture practices. Social trust can help build relationships and networks of trust between individuals and groups, leading to the development of social capital over time (Zheng et al., 2022; Ren et al., 2022). Trust can enable farmers to share resources and knowledge and to collectively advocate for policies and programs that support sustainable agriculture practices (Olayuwi, 2019). Besides that, social trust can also facilitate sharing of risk and resources, increasing access to credit and financing (Luu, 2020b). The development of social trust can also lead to the formation of formal and informal institutions that support sustainable agriculture practices, such as farmer associations or community-based organisations (Gao et al., 2019).

Future research on social capital and sustainable agriculture should focus on social norms, trust, and networks at the cluster level, particularly in developing countries where smallholder farmers often dominate agriculture (Galvez-Nogales, 2010). In these contexts, it is essential to understand how social norms, trust, and networks operate within and between clusters and how they shape the adoption of sustainable agriculture practices (Sharma, 2020). Moreover, future research could investigate the interactions between different communities and how they influence the adoption of sustainable agriculture practices. For example, understanding how farmers in different communities interact and collaborate can provide insights into how to promote sustainable agriculture practices across wider geographical regions.

Conclusion

This literature review will provide an understanding of social capital's role in promoting sustainable agricultural practices. By unpacking the construct of social capital and examining its dimensions and influence on adoption behaviours or outcomes, this paper contributes to a better understanding of the factors that influence farmers' decision-making processes and highlights social capital's importance in achieving sustainable agricultural development.

Ultimately, this review can promote sustainable agriculture and enhance the sustainability and resilience of global food production systems.

The practical implications of this literature review are significant, as it highlights the importance of social capital in promoting the adoption of sustainable agricultural practices. By identifying the specific dimensions of social capital most relevant to sustainable agriculture, this review provides insights that can inform the design and implementation of policies and programs to promote sustainable agriculture. For example, interventions that aim to improve social networks or promote social norms and values that support sustainable agriculture practices can be more effective in promoting adoption than interventions that do not consider the social context in which farmers operate. Furthermore, this review emphasises the importance of understanding the social dynamics of agricultural communities, such as how farmers interact and form relationships with one another. Policymakers and researchers can better understand how social relationships and networks can be leveraged to promote sustainable agriculture by focusing on social capital. This knowledge can inform the design of interventions to improve social capital and promote sustainable agricultural practices, such as farmer groups or community-based organisations.

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