Volume: 8 Issues: 47 Special Issue [April, 2023] pp. 372 - 384
International Journal of Accounting, Finance and Business (IJAFB)
eISSN: 0128-1844
Journal website: www.ijafb.com
DOI: 10.55573/IJAFB.084731

THE ROLE OF SUPPORT NETWORKS IN THE ADOPTION OF SUSTAINABLE AGRICULTURE: A LITERATURE REVIEW

Mohd Firdaus Ruslan[1,2*]
Haliyana Khalid[3,4]

[1]Azman Hashim International Business School (AHIBS), Universiti Teknologi Malaysia (UTM), Kuala Lumpur (E-mail: mohd-87@graduate.utm.my)
[2] Faculty of Business and Management, Universiti Teknologi MARA (UiTM), Kedah Branch
[3] Azman Hashim International Business School (AHIBS), Universiti Teknologi Malaysia (UTM), Kuala Lumpur (E-mail: haliyana@ibs.utm.my)
[4] College of Business Administration, University of Business and Technology, Jeddah, Saudi Arabia
* Corresponding author: mohd-87@graduate.utm.my

Article history
Received date : 18-3-2023
Revised date : 19-3-2023
Accepted date : 2-5-2023
Published date : 15-5-2023

To cite this document:
Ruslan, M. F., & Khalid, H. (2023). The role of support networks in the adoption of sustainable agriculture: A literature review. *International Journal of Accounting, Finance and Business (IJAFB)*, 8(47), 372 - 384.

Abstract: *This paper reviews the limited knowledge and information regarding sustainable agriculture among farmers and the potential role of social networks in addressing this issue. Promoting sustainable agriculture is challenging, and farmers may lack the necessary knowledge and resources to adopt sustainable practices. To address this, enhancing social networks can be a crucial strategy to improve access to information and knowledge related to sustainable agriculture. The review draws on 25 articles published in the Web of Science (WOS) database between 2014 and 2023, where the result indicates a growing interest in this area with increasing number of publications. The review suggests that social networks can be categorised as either formal or informal, each playing a distinct role in supporting sustainable agriculture. Formal social networks such as extension agent services and farmers' associations can provide farmers with valuable information and resources, helping bridge the gap between knowledge and practice. In particular, informal social networks such as farmer-to-farmer and neighbour support networks can play a vital role in facilitating knowledge sharing and adopting sustainable practices. These networks are built on trust and mutual respect and can provide farmers with practical advice and guidance on improving their farming practices. Additionally, the paper recommends improving extension agent services and strengthening farmers' associations to enhance the adoption of sustainable agricultural practices. In conclusion, enhancing social networks can be a critical strategy in promoting sustainable agriculture, particularly in rural areas where farmers may lack access to information and resources. By strengthening informal and formal social networks, farmers can gain the knowledge, skills, and resources they need to adopt sustainable practices, ultimately leading to a more sustainable agricultural sector.*

Keywords: *Social Networks; Sustainable Agriculture; Adoption*

Volume: 8 Issues: 47 Special Issue [April, 2023] pp. 372 - 384
International Journal of Accounting, Finance and Business (IJAFB)
eISSN: 0128-1844
Journal website: www.ijafb.com
DOI: 10.55573/IJAFB.084731

Introduction

Food security and safety issues, together with environmental issues, make sustainable agriculture one of the best methods that can be applied by farmers today. This sustainable farming method is found to prioritise environmental sustainability while at the same time focusing on economic viability. Sustainable agriculture has also been found to protect the welfare of farmers and rural communities by ensuring appropriate practices and supporting the local economy (Waaswa & Satognon, 2020). It consists of techniques that promote soil health, save water, and reduce pollution that can increase agricultural yields and improve the quality of the product while not affecting the environment for future generations (Yang et al., 2022; Teodoro et al., 2022)

Sustainable agriculture practices have evolved rapidly in recent years. For example, precision agriculture uses technologies such as drones and sensors to collect real-time data on soil moisture, temperature and nutrient levels that can help farmers optimize water and fertilizer use while reducing waste (Wachenheim et al., 2021; Blasch et al., 2022). Another example is the use of biotechnology to produce crops with increased resistance to pests and diseases, which can reduce the need for chemical pesticides (Yang et al., 2022). In addition, conservation agriculture practices, such as minimum tillage and cover cropping, are becoming more common. They promote soil health and biodiversity while reducing soil erosion and increasing water retention (Teodoro et al., 2022).

Although sustainable agriculture has many benefits, some studies have found that its adoption in most countries especially developing ones are still low (Luu, 2020a; Luu, 2020b). One of the recognised challenges is the limited information and knowledge farmers have regarding sustainable agriculture, especially farmers living in rural areas, which causes most farmers to not adopt this technology (Thi et al., 2021). As a result, the good impact of sustainable agriculture cannot be appropriately enjoyed. Social networks can play an essential role in addressing these challenges because good social networks provide access to information, resources and support, which can facilitate the adoption of sustainable practices (Levy & Lubell, 2018). Ren et al. (2022) found that farmers' probability of adopting sustainable agriculture increases with information obtained through social networks. Furthermore, farmers can expand the channel through a good social network to obtain information about sustainable agriculture.

Therefore, understanding the role of social networks in sustainable agricultural practices is essential in increasing the adoption rate of this technology. This paper provides an overview of existing research on social networks and the use of sustainable agriculture. The main aims of this paper are:

1) Analyse research trends regarding social networks and sustainable agriculture
2) Identify types of sustainable practices based on the review
3) Understand the types of social networks that previous studies have studied

In this way, this paper aims to contribute to the growing literature on agricultural management and social networks and suggest how sustainable agriculture can be increased through social networks.

Volume: 8 Issues: 47 Special Issue [April, 2023] pp. 372 - 384
International Journal of Accounting, Finance and Business (IJAFB)
eISSN: 0128-1844
Journal website: www.ijafb.com
DOI: 10.55573/IJAFB.084731

Literature Review

Sustainable Agriculture

The term sustainable agriculture began in the 1980s as a response to the adverse effects of conventional agricultural practices on the environment and society (Harwood, 2020). Sustainable agriculture, at its core, refers to methods of producing food that is economically viable and socially and environmentally fair (FAO, 2018). The Food and Agriculture Organization of the United Nations (FAO) has provided the most commonly used definition of sustainable agriculture. FAO defines sustainable agriculture as farming methods that meet current needs while not compromising the ability of future generations to meet their own needs (FAO, 2018). This definition emphasises the importance of equity between generations and strives to meet the needs of the present and future generations' needs in a balanced way.

The International Assessment of Agricultural Knowledge, Science, and Technology for Development (IAASTD) has also provided a widely accepted definition of sustainable agriculture. According to the IAASTD, sustainable agriculture is a system of agricultural production that seeks to meet the present needs while enhancing the ability of future generations to meet their own needs by optimising the use of natural and human resources (IAASTD, 2008). This definition stresses the significance of environmental and social sustainability in agriculture and highlights the need to efficiently utilise natural and human resources.

Benefits of Sustainable Agriculture

Studies have shown that sustainable agriculture has several advantages over conventional farming methods, including economic, environmental and social benefits. This benefits the farmer and the end consumer, i.e. society as a whole (Sridhar et al., 2023). One of the essential benefits of sustainable agriculture is conserving natural resources and the environment. Sustainable agricultural practices such as conservation agriculture, agroforestry and integrated pest management reduce soil erosion, conserve air and increase biodiversity (FAO, 2018; Faroque et al., 2011). This leads to better soil health, improved air quality and reduced greenhouse gas emissions. By reducing the environmental impact of agriculture, sustainable agricultural practices contribute to agriculture's long-term development go).

Sustainable agriculture provides not only environmental advantages but also bolsters economic stability for farmers. Adopting eco-friendly farming techniques, such as crop rotation and integrated pest management, can decrease expenses related to chemical fertilisers and pesticides (Levy & Lubell, 2018). Furthermore, sustainable practices enhance soil health, improving crop yields and resilience against extreme weather events (FAO, 2011). As consumer demand for sustainably grown products continues to rise, farmers can capitalise on this trend by catering to these niche markets, thus diversifying their income sources and ensuring the longevity of their businesses (Ingram et al., 2015). Overall, sustainable agriculture fosters economic prosperity for farmers and strengthens the foundation of rural communities.

Sustainable agriculture also plays a crucial role in delivering social benefits. By adopting sustainable farming methods, the health and well-being of farmers and rural communities can be significantly improved. For instance, incorporating agroforestry practices, such as planting fruit and nut trees, offers rural populations additional income and nutritional sources (Levy & Lubell, 2018). Moreover, by minimising chemical inputs, sustainable agriculture enhances farmers' and consumers' health and safety (Faroque et al., 2011). Furthermore, sustainable agriculture is instrumental in addressing food security and alleviating poverty. Practices that

Volume: 8 Issues: 47 Special Issue [April, 2023] pp. 372 - 384
International Journal of Accounting, Finance and Business (IJAFB)
eISSN: 0128-1844
Journal website: www.ijafb.com
DOI: 10.55573/IJAFB.084731

boost soil fertility, minimise post-harvest losses,s and promote biodiversity can lead to increased action and accessibility (Ulian et al., 2020).

Social Networks

Social networks are vital to social organisation, influencing human behaviour, beliefs, and attitudes. A social network consists of a collection of social connections among individuals. Each inked to others through various relationships such as friendships, family ties, and professional associations (Heaney & Israel, 2008). These networks can significantly impact numerous aspects of human life, including health behaviours, political engagement, and economic outcomes (Wills & Ainette, 2012). A primary function of social networks is the provision of social support. This support encompasses the emotional, informational, and practical assistance that social network members offer one another (Heaney & Israel, 2008). Such support is crucial in fostering health and well-being, aiding individuals to cope with stress and adversity (Heaney & Israel, 2008; Wills & Ainette, 2012).

Social networks also present opportunities to develop social capital. Social capital encompasses the resources accessible to individuals and groups through their social connections, including information, beliefs, and social norms (Mishra, 2020). This form of capital fosters cooperation, collaboration, and collective action, ultimately contributing to economic and social advancement. Another crucial function of social networks is social influence. This concept refers to how individuals are affected by the attitudes, beliefs, and behaviours of others within their social network (Hollenbeck & Jamieson, 2015). Depending on the norms and values of the social network, social influence can have either positive or negative effects on a individual's behaviour (Mishra, 2020).

Social Networks and Sustainable Agriculture

One of the ways that social networks can influence the adoption of sustainable agriculture is by facilitating knowledge exchange and providing access to information to farmers (Abid et al., 2017). Farmers usually who live in rural areas have limited information and knowledge about technology including sustainable practices, make it they less adopt. Therefore, through social networks such as friendship. Family ties, membership in association, farmer can gain more input, knowledge and information about sustainable agriculture, thus can increase the adoption (Bagagiolo et al., 2022).

Furthermore, social networks can create a sense of community among farmers, providing a supportive environment for learning and skill development (Chaudhuri et al., 2021). Farmers can share their successes and challenges with their peers, which can lead to a better understanding of sustainable agriculture practices and their implementation (Khataza et al. 2018). This sense of community can also create peer pressure, encouraging farmers to learn and adopt sustainable agriculture practices to keep up with their peers (Le et al., 2020).

Methodology

A literature search was conducted using the Web of Science (WOS) database. This database was chosen due to its reputation as the best database for social sciences research and its high quality compared to other databases. A combination of keywords and phrases related to social networks and the use of sustainable agriculture were used to identify relevant articles, including “social network*,” “adopt*,” and “sustainable agri*,” as shown in Table 1.

Volume: 8 Issues: 47 Special Issue [April, 2023] pp. 372 - 384
International Journal of Accounting, Finance and Business (IJAFB)
eISSN: 0128-1844
Journal website: www.ijafb.com
DOI: 10.55573/IJAFB.084731

Table 1: The Search String

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

From the initial search, 46 articles were found using the search string. The screening process involved a multi-level screening against the inclusion and exclusion criteria, as shown in Table 2. The criteria included articles from 2014-2023 to ensure that only articles published within the last 10 years were included, and only journal articles in English were considered. This resulted in 38 articles that met the inclusion criteria.

Table 2: Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Publication Timeline	2014-2023	2013 and before
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 next stage (eligibility), critical screening of the abstract of 38 articles selected in the previous stage was done. This stage finally identified 25 eligible articles for this review.

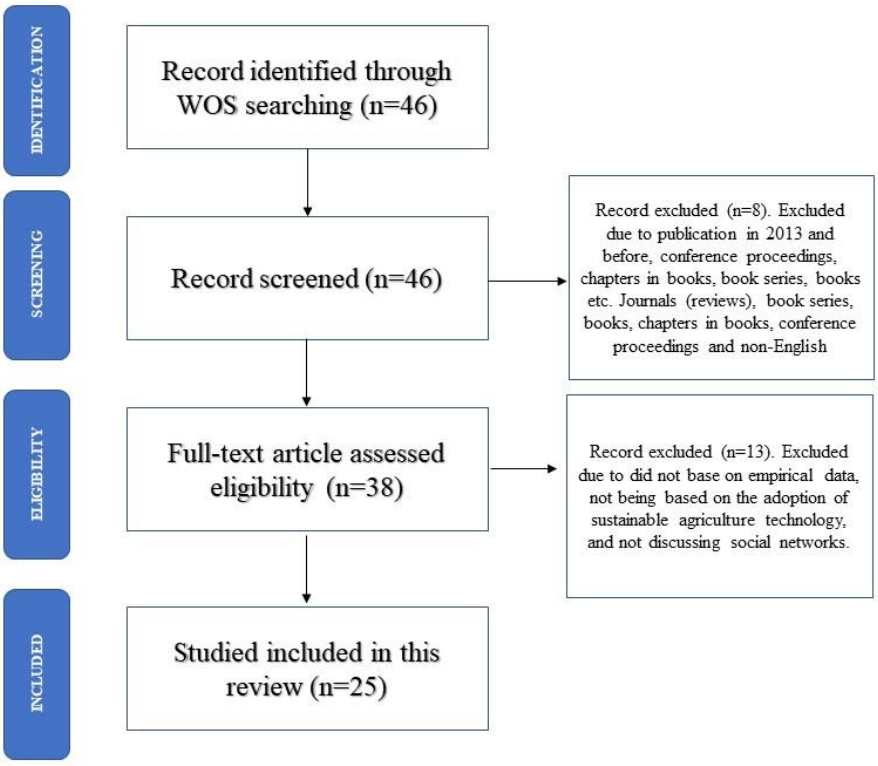

Figure 1: Flow Diagram

Volume: 8 Issues: 47 Special Issue [April, 2023] pp. 372 - 384
International Journal of Accounting, Finance and Business (IJAFB)
eISSN: 0128-1844
Journal website: www.ijafb.com
DOI: 10.55573/IJAFB.084731

Findings

Publication Trend

Based on the 25 articles found eligible for this review, the number of publications has increased over the last ten years. Furthermore, a significant increase can be seen after 2021, when seven publications have been issued looking at social networks and sustainable agriculture in 2022. Based on country, China shows the publication of the most articles in this field (n=5) during 2014-2023, followed by Vietnam (n=4). There is also a publication that compares two countries (Kenya and Ghana) and a publication that looks at the region of South Asia, categorised into other groups in Figure 3 below.

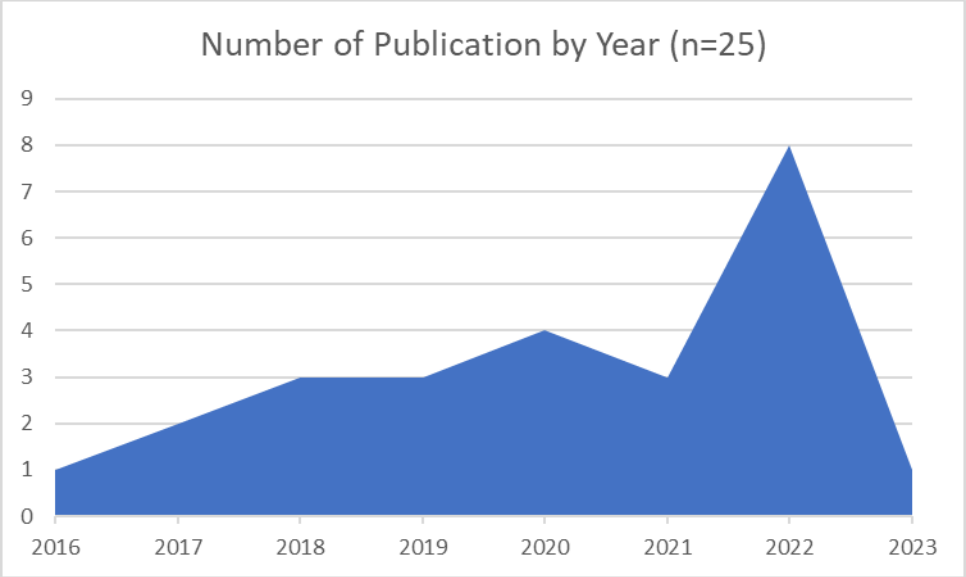

Figure 2: Number of Publication by Year

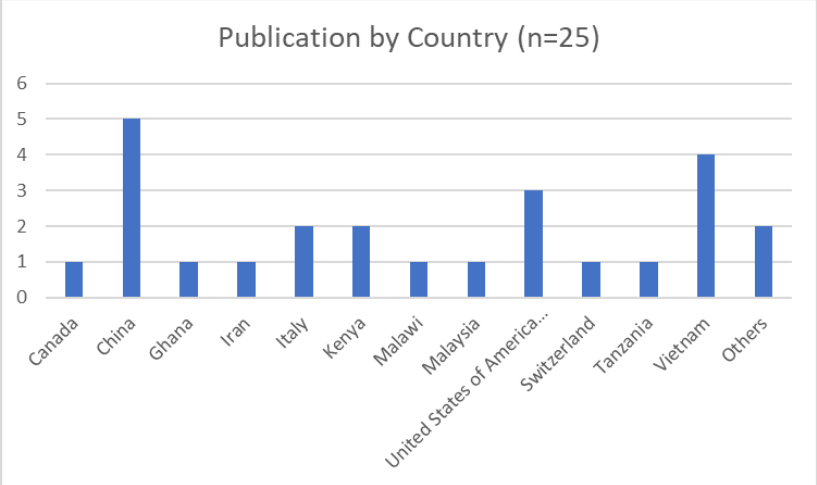

Figure 3: Publication by Country

Volume: 8 Issues: 47 Special Issue [April, 2023] pp. 372 - 384
International Journal of Accounting, Finance and Business (IJAFB)
eISSN: 0128-1844
Journal website: www.ijafb.com
DOI: 10.55573/IJAFB.084731

Sustainable Technologies

Based on the review, the technology that has been the focus of previous studies can be divided into five main technology groups, namely soil and fertility management, sustainable agriculture practices (general), water management and conservation, crop and plant management, waste management and pollution control and precision agriculture. The technology group, the main objective of the technology and the articles that study the technology are in Table 3 below.

Table 3: Categories of Sustainable Practices

Group of Technology	Objectives of the Technology	Article
Soil and Fertility Management	Maintain or improve soil health, fertility, and productivity; promote sustainable soil management practices.	Manson et al. (2016), Adolwa et al. (2017), Thi et al. (2021), Yang et al. (2022), Teodoro et al. (2022)
Sustainable Agriculture Practices	Enhance agricultural sustainability, focusing on environmental protection, economic viability, and social responsibility.	Sheng Tey et al. (2018), Zeng et al. (2019), Luu (2020a), Luu (2020b), Marfo et al. (2021)
Water Management and Conservation	Conserve water resources, improve water-use efficiency, and address water-related challenges in agriculture.	Khataza et al. (2018), D'Souza and Mishra (2018), Ataei et al. (2019), Jha et al. (2019), Bourne et al. (2021), DeDecker et al. (2022)
Crop and Plant Management	Optimise management, cultivation, and production of various crops and plants; increase yield and quality.	Levy and Lubell (2018), Le et al. (2020), Ren et al. (2022), Wang et al. (2023).
Waste Management and Pollution Control	Reduce waste generation, manage waste disposal, and minimise pollution in agricultural and related activities.	Bagagiolo et al. (2022), Cishahayo et al. (2022)
Technology Adoption and Precision Agriculture	Utilise advanced technologies and data-driven decision-making to increase efficiency, accuracy, and overall performance in agriculture.	Wachenheim et al. (2021), Blasch et al. (2022), Zheng et al. (2022)

Volume: 8 Issues: 47 Special Issue [April, 2023] pp. 372 - 384
International Journal of Accounting, Finance and Business (IJAFB)
eISSN: 0128-1844
Journal website: www.ijafb.com
DOI: 10.55573/IJAFB.084731

Types of Social Networks

This study shows that various actors within a farmer's social network significantly influence adopting sustainable agriculture practices. These networks can be categorised into two groups: formal social networks and informal social networks. Formal networks typically possess a more structured and hierarchical organisation with well-defined roles, responsibilities, and communication channels. Examples of formal networks include professional organisations, companies, and government institutions. In contrast, informal social networks are more fluid and adaptable, with relationships developing based on personal connections, shared interests, or common experiences (Allen et al., 2007).

Extension service agents are among the most prominent social networks that impact the adoption of sustainable agriculture. These agents are professionals within extension service programs, providing support, education, and technical assistance to farmers and rural communities (Thi et al., 2021). They serve as the primary link between research institutions, agricultural experts, and the farming community, facilitating the transfer of knowledge, skills, and technologies from research to practice Sheng (Tey et al., 2018; Thi et al., 2021). Additionally, farmer association membership is critical in influencing sustainable agriculture adoption (Khataza et al., 2018). Studies have shown that participating in farmer associations increases the likelihood of farmers adopting sustainable agriculture practices (Marfo et al., 2021; Luu, 2020a; Luu, 2020b).

Informal support networks also play a crucial role in influencing sustainable agriculture adoption. Farmer-to-farmer or peer social networks are critical in this regard. Farmers are more likely to trust information and advice from their peers since they share similar experiences, challenges, and contexts (Wang et al., 2023). This trust can enhance the perceived credibility of information, encouraging farmers to adopt new practices (Le et al., 2020; Ren et al., 2022). Furthermore, neighbours have been identified as another informal solid social network in promoting the adoption of sustainable agriculture. Neighbours often maintain long-standing social ties and relationships based on trust, which can improve the credibility of shared information. Trust is a crucial factor in influencing the adoption of new practices, as people tend to consider advice from those they trust (DeDecker et al., 2022).

Discussion and Recommendation

Formal support networks, such as extension service agents and farmer associations, play a crucial role in promoting the adoption of sustainable agriculture practices. Extension service agents are professionals who provide technical assistance and information to farmers to improve their productivity, profitability, and sustainability (Thi et al., 2021; Tey et al., 2018) . They serve as a primary link between farmers and the broader agricultural community, providing information on new technologies, market opportunities, and government policies that can impact the adoption of sustainable agriculture practices (Tey et al., 2018; Thi et al., 2021). Extension agents can also facilitate the sharing of knowledge and best practices among farmers, thereby promoting the adoption of sustainable agriculture practices (Khataza et al., 2018; Marfo et al., 2021). Similarly, farmer associations can provide a platform for farmers to share knowledge, experience, and best practices related to sustainable agriculture practices. These associations can also provide access to credit and financing, as they can provide collateral for loans and facilitate the sharing of risk and resources (Luu, 2020a; Luu, 2020b).

Compliment with the formal support network, informal support networks, such as farmer-to-farmer networks and neighbours, also play a critical role in promoting the adoption of

Volume: 8 Issues: 47 Special Issue [April, 2023] pp. 372 - 384
International Journal of Accounting, Finance and Business (IJAFB)
eISSN: 0128-1844
Journal website: www.ijafb.com
DOI: 10.55573/IJAFB.084731

sustainable agricultural practices. These networks are typically based on trust and shared experience, and they can facilitate the sharing of knowledge, resources, and best practices related to sustainable agriculture (DeDecker et al., 2022). For example, experienced farmers can share their knowledge and experience with new farmers who are just starting to adopt sustainable agriculture practices. In addition, neighbours who are adopting sustainable agriculture practices can serve as role models for other farmers in the community, demonstrating that these practices can be successful and profitable (Wang et al., 2023). Moreover, informal networks can also provide emotional and social support, which can be critical in promoting the adoption of sustainable agriculture practices. Farmers who are part of informal networks may feel a sense of community and belonging, which can help to overcome the sense of isolation that some farmers may feel when adopting new practices (Le et al., 2020; Ren et al., 2022).

Given the importance of these various actors, a strategy to enhance the adoption of sustainable agriculture involves fostering the development of farmer-to-farmer networks. These networks comprise farmers who collaborate to exchange knowledge and experiences while supporting each other in adopting sustainable practices (Omulo & Kumeh, 2020). Extension services, farmer organisations, or other community-based organisations can facilitate these networks. By uniting farmers, such networks can cultivate a sense of community and collaborative learning, which can promote sustainable practices (Fisher et al., 2018; Ren et al., 2022). In addition to fostering farmer-to-farmer networks, improving extension program services and enhancing farmer associations is essential (Wang et al., 2021). Extension services can be strengthened by providing continuous training to extension agents, ensuring they are well-equipped with the latest knowledge and skills in sustainable agriculture practices (Ataei et al., 2019). This will enable them to provide more practical guidance and support to farmers. Furthermore, utilising digital technologies, such as mobile applications and online platforms, can extend the reach of extension services, allowing them to cater to a broader audience and provide timely, relevant information (Luu, 2020a; Luu, 2020b; Ren et al., 2022).

Enhancing farmer associations can be accomplished by increasing their capacity to provide resources, training, and support to their members (Bourne et al., 2020). This may involve securing funding, improving governance structures, and building partnerships with relevant stakeholders, such as research institutions and government agencies (Zeng et al., 2019). By doing so, farmer associations can offer more targeted and effective programs to promote sustainable agriculture practices among their members. Additionally, facilitating collaboration and communication between farmer associations can encourage the sharing of best practices and innovative ideas, leading to a more robust and dynamic agricultural sector (Teodoro et al., 2022; Le et al., 2020)

Recognising the importance of various actors in promoting sustainable agriculture, future research should consider several recommendations further to enhance our understanding and adoption of these practices. Investigating underexplored technologies such as agroecology can contribute to a more comprehensive understanding of potential benefits and challenges associated with their adoption and help extension services and farmer associations better tailor their support and training programs. Moreover, examining the role of informal social networks more closely can lead to developing targeted interventions that leverage these networks to facilitate the diffusion of sustainable agriculture practices. Delving deeper into the dynamics of informal networks, such as peer-to-peer relationships and neighbour interactions, can provide valuable insights into their influence on adopting sustainable practices.

Volume: 8 Issues: 47 Special Issue [April, 2023] pp. 372 - 384
International Journal of Accounting, Finance and Business (IJAFB)
eISSN: 0128-1844
Journal website: www.ijafb.com
DOI: 10.55573/IJAFB.084731

This paper has significant practical implications for multiple stakeholders, including policymakers, practitioners, and farmers. For policymakers and practitioners, the understanding of the role of social capital in promoting sustainable agriculture practices can help design and implement more effective policies, programs, and strategies to support sustainable agriculture. Such measures may include the development of formal and informal support networks, the promotion of social norms and values that support sustainable agriculture, and the creation of platforms for knowledge sharing and collaboration. Farmers, on the other hand, can leverage the insights gained from this research to make informed decisions that will improve their access to resources, knowledge, and markets. Ultimately, the adoption of sustainable agriculture practices can contribute to enhancing food security, strengthening resilience to climate change, and preserving natural resources for future generations.

Conclusion

In conclusion, support networks play a crucial role in promoting the adoption of sustainable agriculture practices. Formal networks such as extension services and farmer associations, as well as informal networks such as farmer-to-farmer networks and neighbours, provide a range of benefits that encourage farmers to adopt sustainable practices. Efforts to strengthen and expand these networks can enhance the adoption of sustainable agriculture practices and contribute to building a more resilient agricultural sector. By fostering the development of farmer-to-farmer networks, improving extension program services, and enhancing farmer associations, we can create a more supportive environment for the adoption of sustainable agriculture practices.

References

Abid, M., Ngaruiya, G., Scheffran, J., & Zulfiqar, F. (2017). The role of social networks in agricultural adaptation to climate change: Implications for sustainable agriculture in Pakistan. *Climate*, *5*(4), 85.

Adekunle, A. A., & Fatunbi, A. O. (2012). Approaches for setting-up multi-stakeholder platforms for agricultural research and development. *World Applied Sciences Journal*, *16*(7), 981-988.

Adolwa, I. S., Schwarze, S., Bellwood-Howard, I., Schareika, N., & Buerkert, A. (2017). A comparative analysis of agricultural knowledge and innovation systems in Kenya and Ghana: sustainable agricultural intensification in the rural–urban interface. *Agriculture and human values*, *34*, 453-472.

Allen, J., James, A. D., & Gamlen, P. (2007). Formal versus informal knowledge networks in R&D: a case study using social network analysis. *R&d Management*, *37*(3), 179-196.

Ataei, P., Sadighi, H., Chizari, M., & Abbasi, E. (2019). Analysis of Farmers' Social Interactions to Apply Principles of Conservation Agriculture in Iran: Application of Social Network Analysis. *Journal of Agricultural Science and Technology*, *21*(7), 1657-1671.

Bagagiolo, G., Vigoroso, L., Pampuro, N., & Cavallo, E. (2022). The role of social interaction and personal characteristics in affecting the adoption of compost from organic fraction of municipal solid waste in Italy. *Agronomy*, *12*(2), 445.

Blasch, J., van der Kroon, B., van Beukering, P., Munster, R., Fabiani, S., Nino, P., & Vanino, S. (2022). Farmer preferences for adopting precision farming technologies: a case study from Italy. *European Review of Agricultural Economics*, *49*(1), 33-81.

Bourne, M., de Bruyn, L. L., & Prior, J. (2021). Participatory versus traditional agricultural advisory models for training farmers in conservation agriculture: a comparative analysis from Kenya. *The Journal of Agricultural Education and Extension*, *27*(2), 153-174.

Volume: 8 Issues: 47 Special Issue [April, 2023] pp. 372 - 384
International Journal of Accounting, Finance and Business (IJAFB)
eISSN: 0128-1844
Journal website: www.ijafb.com
DOI: 10.55573/IJAFB.084731

Chaudhuri, S., Roy, M., McDonald, L. M., & Emendack, Y. (2021). Reflections on farmers' social networks: a means for sustainable agricultural development? *Environment, Development and Sustainability*, *23*, 2973-3008.

Cishahayo, L., Yang, Q., Zhu, Y., & Wang, F. (2022). Learning behavior, environmental awareness, and agricultural waste management of banana farmers in China. *Social Behavior and Personality: an international journal*, *50*(5), 1-11.

D'Souza, A., & Mishra, A. K. (2018). Adoption and abandonment of partial conservation technologies in developing economies: The case of South Asia. *Land use policy*, *70*, 212-223.

DeDecker, J., Malone, T., Snapp, S., Thelen, M., Anderson, E., Tollini, C., & Davis, A. (2022). The relationship between farmer demographics, social identity and tillage behavior: evidence from Michigan soybean producers. *Journal of Rural Studies*, *89*, 378-386.

Do, H., Luedeling, E., & Whitney, C. (2020). Decision analysis of agroforestry options reveals adoption risks for resource-poor farmers. *Agronomy for Sustainable development*, *40*, 1-12.

FAO 2018 The 10 elements of agroecology: Guiding the transition to sustainable food and agricultural systems FAO Rome http://www.fao.org/3/a-i6030e.pdf

Faroque, M. A. A., Kashem, M. A., & Bilkis, S. E. (2011). Sustainable agriculture: a challenge in Bangladesh. *International Journal of Agricultural Research, Innovation and Technology*, *1*(1-2), 1-8.

Fisher, M., Holden, S. T., Thierfelder, C., & Katengeza, S. P. (2018). Awareness and adoption of conservation agriculture in Malawi: what difference can farmer-to-farmer extension make? *International Journal of Agricultural Sustainability*, *16*(3), 310-325.

Furman, C., Roncoli, C., Nelson, D. R., & Hoogenboom, G. (2014). Growing food, growing a movement: climate adaptation and civic agriculture in the southeastern United States. *Agriculture and Human Values*, *31*, 69-82.

Harwood, R. R. (2020). A history of sustainable agriculture. In *Sustainable agricultural systems* (pp. 3-19). CRC Press.

Heaney, C. A., & Israel, B. A. (2008). Social networks and social support. *Health behaviour and health education: Theory, research, and practice*, *4*, 189-210.

Hollenbeck, J. R., & Jamieson, B. B. (2015). Human capital, social capital, and social network analysis: Implications for strategic human resource management. *Academy of management perspectives*, *29*(3), 370-385.

Ingram, J., Maye, D., Kirwan, J., Curry, N., & Kubinakova, K. (2015). Interactions between niche and regime: an analysis of learning and innovation networks for sustainable agriculture across Europe. *The Journal of Agricultural Education and Extension*, *21*(1), 55-71.

International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD). (2009). Agriculture at a crossroads: International Assessment of Agricultural Knowledge, Science and Technology for Development.

Jha, S., Kaechele, H., & Sieber, S. (2019). Factors influencing the adoption of water conservation technologies by smallholder farmer households in Tanzania. *Water*, *11*(12), 2640.

Kassie, M., Jaleta, M., Shiferaw, B., Mmbando, F., & Mekuria, M. (2013). Adoption of interrelated sustainable agricultural practices in smallholder systems: Evidence from rural Tanzania. *Technological forecasting and social change*, *80*(3), 525-540.

Khataza, R. R., Doole, G. J., Kragt, M. E., & Hailu, A. (2018). Information acquisition, learning and the adoption of conservation agriculture in Malawi: A discrete-time duration analysis. *Technological Forecasting and Social Change*, *132*, 299-307.

Volume: 8 Issues: 47 Special Issue [April, 2023] pp. 372 - 384
International Journal of Accounting, Finance and Business (IJAFB)
eISSN: 0128-1844
Journal website: www.ijafb.com
DOI: 10.55573/IJAFB.084731

Konefal, J., Hatanaka, M., & Constance, D. H. (2019). Multi-stakeholder initiatives and the divergent construction and implementation of sustainable agriculture in the USA. *Renewable Agriculture and Food Systems*, *34*(4), 293-303.

Le, T. Q. A., Shimamura, Y., & Yamada, H. (2020). Information acquisition and the adoption of a new rice variety towards the development of sustainable agriculture in rural villages in Central Vietnam. *World Development Perspectives*, *20*, 100262.

Levy, M. A., & Lubell, M. N. (2018). Innovation, cooperation, and the structure of three regional sustainable agriculture networks in California. *Regional environmental change*, *18*, 1235-1246.

Li, B., Zhuo, N., Ji, C., & Zhu, Q. (2022). Influence of Smartphone-Based Digital Extension Service on Farmers' Sustainable Agricultural Technology Adoption in China. *International Journal of Environmental Research and Public Health*, *19*(15), 9639.

Luu, D. T. (2020b). Origins of farmers' adoption of multiple climate-smart agriculture management practices in the Vietnamese Mekong Delta. *Makara Human Behavior Studies in Asia*, *24*(2), 141-153.

Luu, T. D. (2020a). Factors influencing farmers' adoption of climate-smart agriculture in rice production in vietnam's mekong delta. *Asian Journal of Agriculture and Development*, *17*(1362-2020-1103), 110-124.

MacCarthy, D. S., Vlek, P. L., Bationo, A., Tabo, R., & Fosu, M. (2010). Modelling nutrient and water productivity of sorghum in smallholder farming systems in a semi-arid region of Ghana. *Field Crops Research*, *118*(3), 251-258.

Manson, S. M., Jordan, N. R., Nelson, K. C., & Brummel, R. F. (2016). Modeling the effect of social networks on adoption of multifunctional agriculture. *Environmental modelling & software*, *75*, 388-401.

Marfo, E., Danso-Abbeam, G., Donkoh, S. A., Dikro, M. A., Ehiakpor, D. S., & Ofori, D. (2021). The complementarity and substitutability of sustainable agricultural practices among maize farm households under AFRINT regions in Ghana: Do the socioeconomic determinants confirm these?. *Cogent Food & Agriculture*, *7*(1), 1969736.

Mishra, S. (2020). Social networks, social capital, social support and academic success in higher education: A systematic review with a special focus on 'underrepresented students. *Educational Research Review*, *29*, 100307.

Ofori, M., & El-Gayar, O. (2021). Drivers and challenges of precision agriculture: a social media perspective. *Precision Agriculture*, *22*, 1019-1044.

Omulo, G., & Kumeh, E. M. (2020). Farmer-to-farmer digital network as a strategy to strengthen agricultural performance in Kenya: A research note on 'Wefarm'platform. *Technological Forecasting and Social Change*, *158*, 120120.

Piñeiro, V., Arias, J., Dürr, J., Elverdin, P., Ibáñez, A. M., Kinengyere, A., ... & Torero, M. (2020). A scoping review on incentives for adoption of sustainable agricultural practices and their outcomes. *Nature Sustainability*, *3*(10), 809-820.

Ren, Z., Fu, Z., & Zhong, K. (2022). The influence of social capital on farmers' green control technology adoption behavior. *Frontiers in Psychology*, *13*, 1001442-1001442.

Sheng Tey, Y., Brindal, M., Li, E., Gill, G., Bruwer, J., Abdullah, A. M., ... & Darham, S. (2018). Factors affecting the selection of information sources of sustainable agricultural practices by Malaysian vegetable farmers. *Journal of Agricultural & Food Information*, *19*(2), 162-175.

Siedenburg, J., Martin, A., & McGuire, S. (2012). The power of "farmer-friendly" financial incentives to deliver climate-smart agriculture: a critical data gap. *Journal of Integrative Environmental Sciences*, *9*(4), 201-217.

Volume: 8 Issues: 47 Special Issue [April, 2023] pp. 372 - 384
International Journal of Accounting, Finance and Business (IJAFB)
eISSN: 0128-1844
Journal website: www.ijafb.com
DOI: 10.55573/IJAFB.084731

Sridhar, A., Balakrishnan, A., Jacob, M. M., Sillanpää, M., & Dayanandan, N. (2023). Global impact of COVID-19 on agriculture: role of sustainable agriculture and digital farming. *Environmental Science and Pollution Research*, *30*(15), 42509-42525.

Teodoro, J. D., Baird, J., & Otung, I. (2022). Longitudinal Network Analysis on a Farmers' Community of Practice and Their Changes in Agricultural Systems Management. *Society & Natural Resources*, 1-18.

Thi, Q. A. L., Shimamura, Y., & Yamada, H. (2021). Information Acquisition and Conservation Farming Practices for Sustainable Agriculture in Rural Vietnam. *Asian Journal of Agriculture and Development*, *18*(1362-2021-1178), 32-48.

Ulian, T., Diazgranados, M., Pironon, S., Padulosi, S., Liu, U., Davies, L., ... & Mattana, E. (2020). Unlocking plant resources to support food security and promote sustainable agriculture. *Plants, People, Planet*, *2*(5), 421-445.

Waaswa, A., & Satognon, F. (2020). Development and the environment: Overview of the development planning process in the agricultural sector, in Uganda. *Journal of Sustainable Development*, *13*(6), 1.

Wachenheim, C., Fan, L., & Zheng, S. (2021). Adoption of unmanned aerial vehicles for pesticide application: Role of social network, resource endowment, and perceptions. *Technology in Society*, *64*, 101470.

Wang, Y., Möhring, N., & Finger, R. (2023). When my neighbors matter: Spillover effects in the adoption of large-scale pesticide-free wheat production. *Agricultural Economics*.

Wills, T. A., & Ainette, M. C. (2012). Social networks and social support.

Yang, C., Zeng, H., & Zhang, Y. (2022). Are Socialized Services of Agricultural Green Production Conducive to the Reduction in Fertilizer Input? Empirical Evidence from Rural China. *International Journal of Environmental Research and Public Health*, *19*(22), 14856.

Zeng, Y., Zhang, J., He, K., & Cheng, L. (2019). Who cares what parents think or do? Observational learning and experience-based learning through communication in rice farmers' willingness to adopt sustainable agricultural technologies in Hubei Province, China. *Environmental Science and Pollution Research*, *26*, 12522-12536.

Zheng, H., Ma, J., Yao, Z., & Hu, F. (2022). How Does Social Embeddedness Affect Farmers' Adoption Behavior of Low-Carbon Agricultural Technology? Evidence from Jiangsu Province, China. *Frontiers in Environmental Science*, 567.