Women's Leadership Models in Sustainable Agricultural Value Chains: A Systematic Literature Review

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Abstract
This study aims to identify various models of women's leadership that play a role in strengthening sustainable agricultural value chains and analyze their contributions to gender empowerment and inclusive development in the agricultural sector. The method used was a Systematic Literature Review (SLR) with the PICOC (Population, Intervention, Comparison, Outcome, Context) approach and the PRISMA 2020 guidelines to ensure a systematic and transparent literature selection and analysis process. Data sources were obtained from Scopus, ScienceDirect, DOAJ, and Google Scholar databases for the period 2015-2025. Bibliometric analysis using VOSviewer was used to map the interrelationships between concepts and research trends related to leadership in women in agricultural value chains. The study results indicate three main leadership models–transformational, participatory, and community-based–that significantly promote value chain efficiency, social innovation, and environmental sustainability. A limitation of this study is its reliance on secondary literature sources without empirical verification in the field. The findings of this study contribute to the development of gender-based leadership theory, formulation of sustainable agricultural policies, and strengthening of women's capacity in rural development and agribusiness.
Keywords: *women's leadership, agricultural value chain, sustainable agriculture*

1. Introduction

The role of women in agricultural systems at the global and local levels is crucial for achieving food security and sustainable development. Research shows that women contribute significantly to food production, with some studies indicating that they are involved in up to 70% of agricultural work in some regions (Kumar and Sharma, 2022). These women's contributions include local knowledge, natural resource management, and community education and awareness (Onoh et al., 2023). However, despite their crucial role, women often face significant barriers, such as limited access to resources and gender discrimination, which can hinder their full creativity in agricultural systems (Dabkienė, 2025); (Ramani et al., 2021).

The challenge of gender inequality in decision-making in the agricultural sector is real and encompasses a wide range of social and economic variables. Many women are excluded from important decision-making processes, both within the family and community context, due to gender stereotypes and institutional barriers (Dabkienė, 2025); (Ramani et al., 2021). The absence of women's representation in decision-making impacts their ability to contribute maximally to innovation and the adoption of agricultural technology. This has direct implications for the effectiveness of agricultural production and the sustainability of farming families (Aryal et al., 2020). Research shows that when women are included in decision-making, they can introduce more inclusive and sustainable agricultural practices that can improve global food security (Aryal et al., 2023); (Aryal et al., 2020)..

The relevance of women's leadership in strengthening sustainable agricultural value chains is increasingly being highlighted, as this leadership can bring new and innovative perspectives needed to address global challenges such as climate change and social injustice. Women in leadership positions can facilitate the presence of more gender-diverse teams, which, in turn, can improve value chain performance and create a more equitable distribution of resources (B. & Ikuejewa, 2025). In this context, there is an urgent need to identify effective leadership models that can promote inclusive and sustainable development in agricultural systems (Fani et al., 2021); (Muleya & Mothoagae, 2025). Conducting a Systematic Literature Review (SLR) can be an important tool for mapping

conceptualizations, models, and empirical contributions related to women's leadership and gender inclusion in agriculture, as well as reflecting on existing research tracks, helping to identify gaps in future research (Hui, 2024). This study aims to identify various models of women's leadership that play a role in strengthening sustainable agricultural value chains and analyze their contributions to gender empowerment and inclusive development in the agricultural sector.

2. Methodology

2.1 Research Design

This study uses the Systematic Literature Review (SLR) method to review and analyze relevant literature on the role of women in agriculture, particularly in the context of leadership and food security. This research design refers to PRISMA 2020, which provides a methodological framework for transparency and reproducibility in the literature collection and analysis process (Georgopoulos et al., 2023); (Vincent, 2022). The article selection process was conducted meticulously, following systematic steps for identifying, screening, and selecting articles that met the research criteria (Vincent, 2022). We also applied the PICOC (Population, Intervention, Comparison, Outcome, Context) framework to determine the inclusion and exclusion criteria, ensuring that only articles that met these aspects were included in the analysis (Kusuma & Yoto, 2024).

Research Questions (RQs)

Research Questions (RQs) were developed to ensure that the systematic literature review (SLR) remained focused and relevant to the research objectives. The research questions were formulated using the PICOC framework: Population, Intervention, Comparison, Outcomes, and Context. This approach systematically guided the study selection, data collection, and analysis. Table 1 presents the PICOC structure of the research question regarding women's Leadership Models in Sustainable Agricultural Value Chains. This systematic literature review aims to identify women's leadership models that play a role in strengthen sustainable agricultural value chains.

Table 1. Summary of PICOC Women's Leadership Models in Sustainable Agricultural Value Chains

PICOC	Description	Keywords
Population	Target group studied: women involved in the agricultural sector and value chain.	Women, female farmers, rural women, women in agriculture, women's groups, and women's cooperatives.
Intervention	Women's leadership models applied to agricultural activities and value chains.	Women's leadership, leadership models, leadership styles, transformational leadership, participatory leadership, and community-based leadership.
Comparison	Comparison with conditions without female or conventional leadership. Optional in SLR.	Traditional leadership, male leadership, no leadership model, and conventional leadership.
Outcome	Impact of women's leadership models on value chain sustainability.	Sustainable agriculture, value chain efficiency, gender empowerment, economic sustainability, social sustainability, and environmental sustainability.
Context	The context of the agricultural sector and sustainable agricultural value chains.	Agricultural value chain, agrifood value chain, sustainable agriculture, rural development, and inclusive agribusiness.

Source : Processed data, 2025

The research questions (RQs) developed in this study are shown in the following table table:

Table 2. Research Questions (RQs)

RQ1	What are the most frequently identified models of women's leadership in research on sustainable agricultural value chains?
RQ2	How do these leadership models contribute to improving the sustainability of agricultural value chains from economic, social, and environmental perspectives?
RQ3	What are the supporting and inhibiting factors of women's leadership in agricultural value chains?
RQ4	What are the research trends and conceptual linkages emerging in recent studies related to female leadership in sustainable agricultural value chains?

Source: Processed data, 2025

2.2 Data Sources

The data sources for this study included several leading databases, namely, Scopus, ScienceDirect, DOAJ, and Google Scholar. This database selection aimed to ensure the diversity and quality of the articles obtained, as well as their relevance to the research topic. The publication period of the articles analyzed was limited to 2020–2025, with the aim of ensuring that the information obtained was up-to-date and reflected the latest advances in research on women in the agricultural sector and their leadership (Tatasari & Fatchurrohman, 2025); (Putri, 2025). The data collected from these sources were then evaluated and synthesized to answer the research questions and achieve the desired objectives.

2.3 Inclusion and Exclusion Criteria

The inclusion criteria for this study were articles discussing women's leadership in the agricultural sector, with a focus on value chains and sustainability. Only articles written in English or Indonesian will be considered, covering various publication types such as journal articles, conference papers, and scientific research reports (Ramani et al., 2021) (Prithika et al., 2024). Exclusion criteria were established to exclude articles that were non-scientific or not peer-reviewed, as well as articles focusing on leadership outside the agricultural sector. Furthermore, articles that did not provide data or analysis relevant to the focus of this study were excluded (Kawarazuka & Bui, 2021).

2.4 Data Collection Procedure

The data collection procedure began with identifying relevant keywords, namely "women's leadership," "agricultural value chain," "sustainable agriculture," and "gender empowerment." The next step was to screen the titles and abstracts of the articles to ensure that they met the inclusion criteria (Ramani et al., 2021); (Malhotra et al., 2024). After the initial search, only eligible articles will proceed to the full-paper selection stage according to the procedures established in PRISMA. Data will then be extracted, including information on the types of leadership models practised by women, their contributions, the methodology used in the research, and the geographic context of each selected article (Tombe & Smuts, 2023); (Prithika et al., 2024).

2.5 Data Analysis

Data analysis was conducted using a thematic analysis approach to identify various leadership models emerging in the literature and their contribution to sustainability in agriculture. In addition to thematic analysis, narrative analysis was used to understand the contribution of women's leadership to sustainability practices in the agricultural sector (Fontoura & Coelho, 2020). To deepen understanding and visualize the relationships between emerging concepts, a bibliometric analysis was conducted using VOSviewer, which allows the mapping of trends and relationships between various themes and related variables in the analyzed literature (Rayhan et al., 2024).

3. Results and Discussion

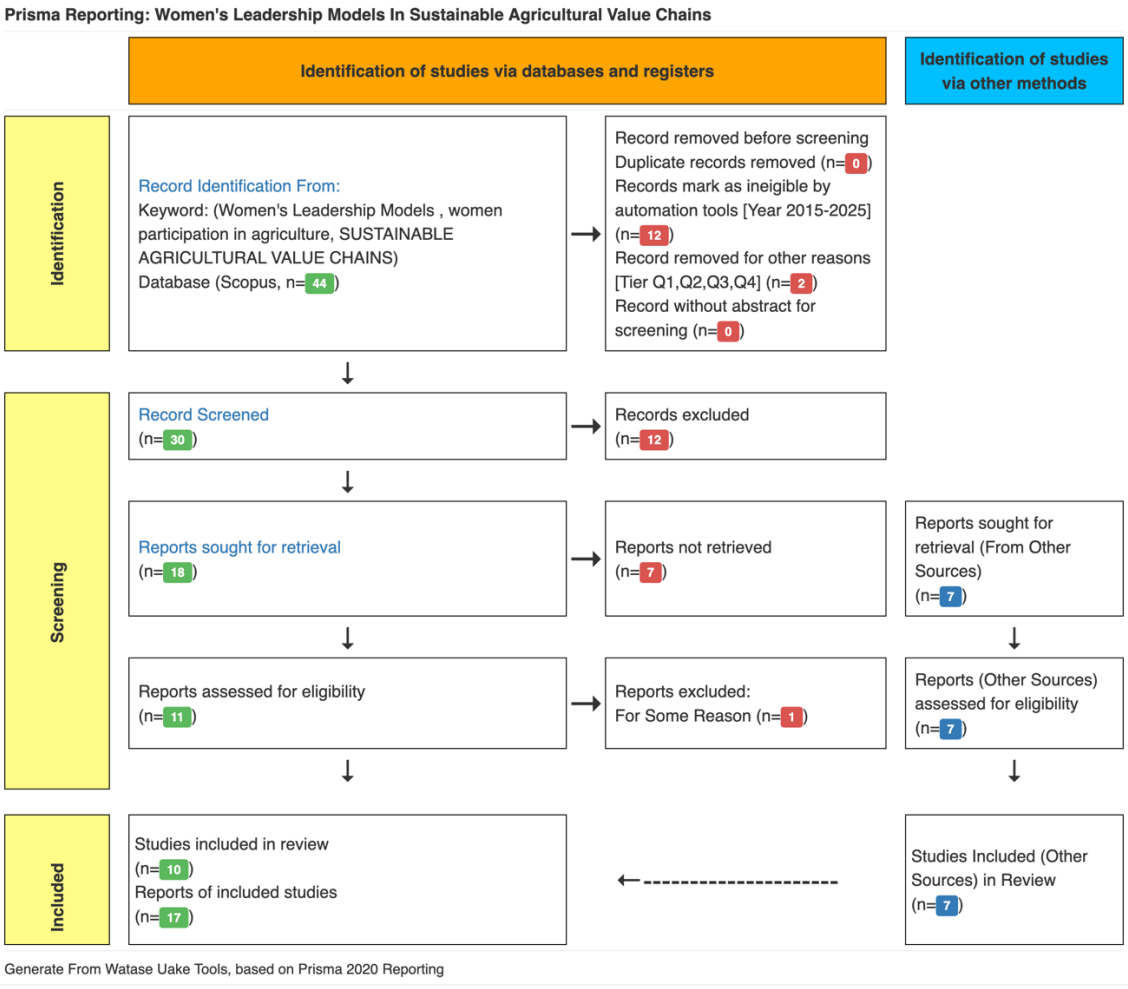

Figure 1. PRISMA Systematic Literature Review

Data was collected using relevant databases, namely Scopus, using keywords such as "Women's Leadership Models," "Women's Participation in Agriculture," and "Sustainable Agricultural Value Chains." The initial screening process yielded 44 relevant records from Scopus Q1, Q2, Q3, and Q4 journals. Of these, 12 records were removed prior to screening, including duplicates and ineligible records based on publication years 2015-2025 and automated tools. After the identification process, 30 records were screened to assess compliance with the inclusion and exclusion criteria of the present study. Of the 30 screened records, 18 were retrieved. However, seven reports were not found or could not be retrieved. After further evaluation, 11 reports were assessed for eligibility, and one report was deemed ineligible for review. Ultimately, 10 studies were included in the review and were further analyzed. Seven reports were identified from other sources, resulting in a total of 17 reports being included. This process follows the PRISMA guidelines, which aim to ensure that all search and selection steps are conducted with transparency and thoroughness.

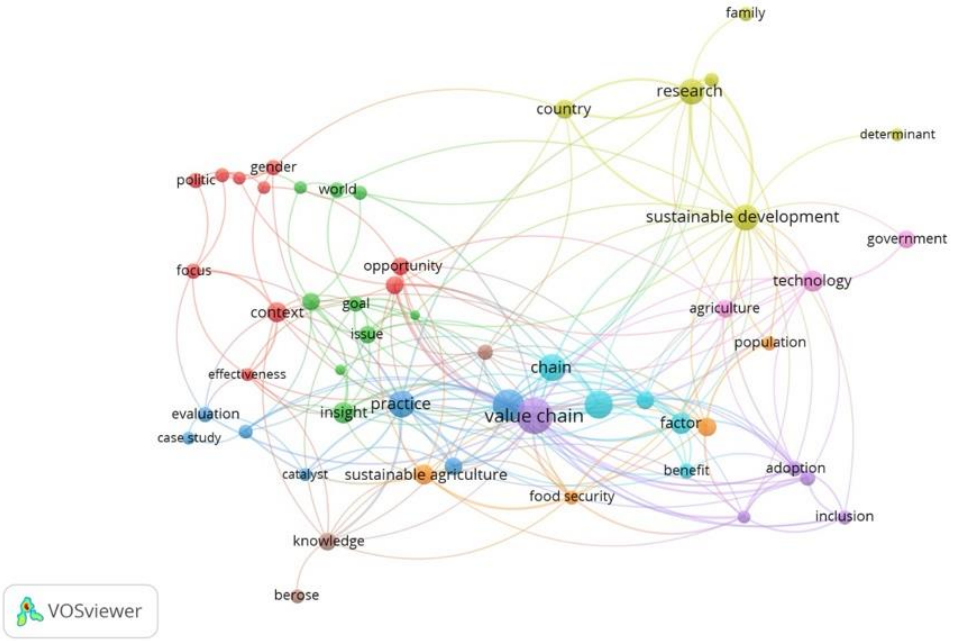

Figure 2. Key Relationships Through VOS Viewer

VOSviewer was used to map and visualize the structure of knowledge within a research field through bibliometric analysis. This tool helps identify key themes, relationships among concepts, and research clusters, and facilitates the detection of research trends and gaps. Therefore, VOSviewer is highly useful for supporting systematic literature reviews and strengthening novelty analyses in an objective and data-driven manner. The keyword map shows that the value chain is at the center of studies related to agricultural sustainability, food security, gender, and communities. This confirms that women's leadership is a crucial factor throughout the agricultural value chain. The linkages with inclusion, policy, and technology reinforce the relevance of the title, which states that women's leadership models play a role in strategies to support sustainable agricultural value chain.

The novelty of this VOSviewer map rests on the conclusion that women's leadership is integrated throughout the sustainable agricultural value chain, not just in the production aspect of it. The map demonstrates women's roles as key actors connecting innovation, technology adoption, social inclusion, and aspirations. Furthermore, the linkages with food security and sustainable development confirm that female leadership contributes to broader strategic impacts, offering a new integrative framework for studying female leadership in the agricultural sector. This visualization from VOSviewer shows the relationships between various concepts frequently mentioned in the literature on sustainable agricultural value chains and women's leadership. In this map, several key concepts, such as the value chain, are centered as a focal point, indicating their importance in the overall discussion of the topic.

Concepts related to sustainable development, agriculture, and technology are clearly connected to other concepts, such as government and population, demonstrating the significant role of policy and technological innovation in creating sustainability in the agricultural sector. Furthermore, clusters representing social aspects such as gender, family, and inclusion were interconnected, with gender at the center. This demonstrates the importance of a gender perspective in developing sustainable agricultural policies and practice. Concepts such as opportunity, goal, and issue are represented in the red cluster, highlighting the importance of external factors and challenges that must be addressed to achieve sustainability goals in the agricultural value chain. Overall, this map reflects how women's leadership and gender participation play a crucial role in advancing sustainable agricultural value chains, with many interconnected factors, including policies, technology, and economic sustainability. These concepts are interconnected in efforts to create a more inclusive and sustainable agricultural system.

Table 3. Search Results for Articles

No	Author/Year	Methodology	Variables	Findings
1	Abdul et al. (2022)	Sample: 330 households (166 women FBO members, 164 non-members, 205 adult men); Analysis: GLMM	Strengthening groups, partnerships, product quality improvement	The intervention has a small impact on women's economic empowerment, increasing participation and leadership, but is limited by gender norms. The group-based approach was the most effective.
2	Malhotra et al. (2024)	Mixed-Methods Systematic Review & Meta-Analysis (118 studies)	Strengthening group coordination, partnerships, product quality improvement	It has a small impact on economic and women's empowerment, increasing participation and leadership. Cultural and gender norms limit their effectiveness.
3	Acevedo-Ortiz et al. (2024)	Mixed-methods in 30 households (Oaxaca)	Food security, economic stability, gender role in decision-making	Seventy% of households showed improvement in food security, and 76.67% succeeded in harvesting and selling surplus. Women's participation in agricultural decisions has increased.
4	Quisumbing et al. (2021)	Household surveys in 4 countries (Bangladesh, Philippines, Benin, Malawi); Regression	Participation in value chains, education, wealth, training, extension services	Education and training increase women's empowerment, but entrepreneurship and wealth do not always have positive effects. Participation in trade is more empowering for women.
5	Rhiannon Pyburn et al. (2023)	Literature Review	Gender involvement, returns, power relations, gender transformation	Gender inequality is evident in value chains, with a focus on how women participate. Limited quantitative data and evidence of the effectiveness of companies in reducing gender inequality are still scarce.
6	Malapit et al. (2020)	Sequential Mixed Methods (1,264 households, 4 value chains)	Type of value chain, position, extension access, economic demographics	The intervention slightly improved women's empowerment. Cultural and gender norms limit economic outcomes, despite increasing women's participation and leadership.
7	Brückner & Sardadvar (2023)	Conceptual Perspective	Feminist & gender analysis of value chains	Commercialization increases women's burdens, and market reforms weaken producers' food sovereignty. An inclusive gender analysis is needed to recognize women's work.
8	Malhotra et al. (2024)	Mixed-methods systematic review & meta-analysis	Coordination, certification, women's groups	Value chain interventions have a small impact, with the main benefits coming from skill improvement and access to inputs; however, cultural norms reduce their effectiveness.
9	Devaux et al. (2017)	Literature Review	Value chain approach, innovation, evaluation,	Inclusive VCD provides opportunities for small farmers but does not automatically solve poverty. Success comes

			multistakeholder, smallholder capacity	from agricultural innovation, institutional support, and a gender-based approach to agricultural development.
10	Mupangi Sithole et al. (2023)	Mixed-methods (interviews & secondary data)	Drought-resistant seeds, fertilizers, compost, production practices	Kabako varieties double the yield. Training programs improve the adoption of environmentally friendly practices; however, challenges such as input access and limited female involvement persist.
11	Aishat Abdu et al. (2022)	Cross-sectional study, baseline data	FBO membership, empowerment, food security, GPI	FBO membership increases women's empowerment and gender parity but poses higher risks of food insecurity. FBO are effective in providing nutrition education and gender-sensitive strategies.
12	Gayle Mitchell and Robin C. D. Currey (2020)	Systematic literature review	Women's participation, gender gaps, STEM outreach, gender representation	Women's participation is high in K–12 and college but does not continue into careers. STEM outreach is effective in increasing long-term female participation in agriculture.
13	Atif Bilal et al. (2021)	Quantitative – cross-sectional survey	Women's Transformational Leadership, trust, connectivity, innovative behavior	W-TL increases employees' innovative behavior through trust and connectivity, which mediates the relationship both directly and indirectly.
14	Jennifer Jihye Chun (2016)	Qualitative case study	Political agency, movement leadership, immigrant women's empowerment	CTOS builds political agency and movement leadership, increasing self-confidence and organizational skills among immigrant women.
15	Shiva D. Yagobian et al. (2025)	Review article (SEM)	Women's leadership development in radiology	Gender barriers at various levels have been identified, and multilevel interventions are needed to close the gap in radiology.
16	Christiana Papadakou & Robert J. Sternberg (2025)	Review article (WICS)	Wisdom, intelligence, creativity, women's leadership characteristics	Women's leadership is more transformational and based on wisdom, emotional intelligence, and creativity, although they still face misogynistic challenges.
17	Seyyedeh Rozita Ebrahimi et al. (2025)	Systematic Literature Review (SLR)	Biomass logistics operations, optimization models	MILP is the dominant optimization model in this study. Multi-biomass integration can reduce transport costs and stabilize supply; however, the models used are still fragmented.

Source: Processed data, 2025

RQ1: What are the most frequently identified models of women's leadership in research on sustainable agricultural value chains?
The most frequently identified model of women's leadership in research on sustainable agricultural value chains is transformational. Studies such as those by Bilal et al. (2021) and (Papadakou et al. (2025) show that female leaders tend to use a leadership style that is empathetic, collaborative, and focused on public welfare. Furthermore, Malhotra et al. (2024) identified a group-based model as a frequently used approach to increase women's participation in key decisions in agricultural value chains. Women's leadership also incorporates the values of wisdom, creativity, and emotional intelligence, which have been shown to be effective in improving social dynamics within groups and communities.

RQ2: How do these leadership models contribute to improving the sustainability of agricultural value chains from economic, social, and environmental perspectives?
Women's leadership models contribute significantly to the sustainability of agricultural value chains in three main aspects: economic, social, and environmental. (1) Economic aspect: Transformational leadership models increase women's economic participation in production and marketing decisions. (Malhotra et al., 2024) found that women-led group-based interventions can improve economic outcomes, although their impact is sometimes limited to a few areas. (2) Social aspects: Women's leadership often focuses on social welfare and strengthening social capacity within groups. Acevedo-Ortiz et al. (2024) found that women-led programs can improve food security and more inclusive decision-making. Women play a significant role in social decision-making, which leads to improved community well-being. (3) Environmental aspects: Environmentally friendly practices, such as composting and intercropping, are more widely adopted under female leadership. Sithole et al. (2023) identified that women-led training programs increase the adoption of environmentally friendly practices and long-term agricultural sustainability.

RQ3: What are the supporting and inhibiting factors for women's leadership in agricultural value chains?
Various studies analyzing gender dynamics in the agricultural sector have identified supporting and inhibiting factors for women's leadership in agricultural value chains, including: (1) Supporting factors: Women's leadership is strongly supported through mentoring, role models, and group-based approaches. (Mitchell & Currey, 2020) showed that mentoring and STEM outreach programs effectively increase women's participation in the agricultural sector. (2) Inhibiting factors: The biggest barriers to women's leadership in this sector are gender norms that limit women's roles and limited access to economic resources such as capital and training. Malapit et al. (2020) and Sardadvar and Pérez-akaki (2023) note that gender stereotypes and inequalities in market access often prevent women from advancing into leadership positions.

RQ4: What research trends and conceptual linkages have emerged in recent studies related to women's leadership in sustainable agricultural value chains?
Recent research trends indicate an increasing emphasis on women's participation and active involvement throughout the agricultural value chain. Research by Pyburn et al. (2023) and Malapit et al. (2020) indicates that women's involvement in decision-making processes, as well as recognition of their roles in natural resource management and agricultural production management, is increasingly emphasized. In this context, empowerment is often associated with group-based models and holistic approaches that consider gender inequality and limited access to resources and training. Another trend is the integration of gender into agricultural policies, where more inclusive policies, as identified by Devaux et al. (2025), are increasingly prioritized to ensure that women have better access to training, agricultural technology, and markets.

Overall, recent trends reflect a more inclusive and gender-sensitive approach that not only encourages women's participation in agricultural value chains but also creates more equitable economic and social sustainability. The results of this study indicate that the three most dominant models of women's leadership in the sustainable agricultural value chain are transformational, participatory, and community-based leadership. Each of these models plays a crucial role in strengthening value chain efficiency, social innovation, and environmental sustainability in the agricultural sector.

Women's Leadership Models

Transformational leadership focuses on empathy, collaboration, and well-being in agricultural resource management, which are crucial for creating social and economic sustainability in agricultural communities. Women leaders in this model often focus on empowering their group members, increasing women's active participation and involvement in decision-making, particularly in sectors related to natural resource management and agricultural production. Participatory leadership, which is more inclusive, allows group members, especially women, to have a greater voice in agricultural management and in decision-making. This model encourages the creation of space for open discussion and active participation, which increases value chain efficiency by enabling more collective and democratic decisions. Community-based leadership strengthens local capacity and community-based development, focusing on collaboration among community members. Women leaders in this model are more involved in building social solidarity and increasing the capacity of community members to innovate in agricultural management, as well as creating a more socially and environmentally sustainable environment.

Sustainable Agricultural Value Chains

In the context of sustainable agricultural value chains, these three leadership models contribute to strengthening value chain sustainability from various aspects: (1) Economic: By increasing value chain efficiency, women leaders help strengthen equitable distribution systems, improve access to markets, and support the creation of added value for agricultural products. This aligns with the goal of boosting the rural economy and improving food security in communities. (2) Social: Participatory and community-based leadership enables women to play a greater role in decision-making and increases gender equality in access to resources and training in the agricultural sector. This strengthens women's capacity for rural development and increases equality among farmers. (3) Environmental: All three models of women's leadership promote environmentally friendly practices in agricultural value chains, such as the use of environmentally friendly technologies, better management of natural resources, and the implementation of sustainable agriculture that supports ecosystem sustainability.

Women's Leadership Models in Sustainable Agricultural Value Chains

The link between female leadership and sustainable agricultural value chains is further clarified in this study. Women's leadership in this sector focuses on developing women's capacity to manage and lead sustainable agricultural initiatives in the region. Furthermore, sustainable agricultural policies driven by women's leadership models can improve market access, strengthen funding, and increase women's participation in key decision-making processes.

However, this study's limitations lie in its reliance on secondary literature sources, without empirical verification in the field, which could provide more in-depth and contextual data on the implementation of women's leadership models in real-world practice. Therefore, while these findings contribute to the development of gender-based leadership theory, policy formulation in sustainable agriculture, and strengthening women's capacity, further research using primary data and field studies is urgently needed to deepen the understanding and implementation of women's leadership models in this sector. Thus, this study provides a strong foundation for the continued development of policies and practices that support women's leadership in the sustainable agricultural sector and strengthen women's roles in rural economic development and agribusiness.

5. Conclusion

5.1. Conclusion

This study successfully explains the impact of women's leadership models on sustainable agricultural value chains using three main models: transformational, participatory, and community-based. These models improve value chain efficiency, social innovation and environmental sustainability. This study also contributes to the development of gender-based leadership theory, sustainable agricultural policy, and women's empowerment in agribusiness and rural development fields.

5.2. Limitations

This study was limited to the use of secondary literature sources without empirical verification from field studies. This limits the understanding of the implementation of leadership models in the real world. This study also does not address the cultural, geographic, and economic variations that influence women's leadership in the agricultural sector.

5.3. Recommendations

Future research should conduct empirical field studies to verify the findings, expand the geographic scope to cover different contexts, and explore other leadership models. Policymakers should also consider gender-sensitive agricultural policies that support women's involvement and conduct longitudinal studies to assess the long-term impact of women's leadership in sustainable agriculture.

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