



Women Empowerment in Agriculture and Its Link to Food Security: Mapping Knowledge Gaps for Future Research

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Abstract

In developing country like Pakistan, women are playing an important role in the field of agriculture. However, Women's empowerment and its effects on household food security is always neglected, contrary to the evidence that equality in gender immediately affects access to nutritious food. This review critically analyzed the empirical research, which is conducted for analyzing the link between women empowerment in agriculture and household food security. In this paper, it is explored that how different dimensions of women's empowerment in agriculture influence the household food security and stability. This paper evaluated that how women empowerment link with food security at household level, and how different barriers intersect this significant link. The Gaps found in Literature regarding the use of standardized tools that overlook the intra-household and cultural dynamics. The indices, such as Women Empowerment in Agriculture (WEAI) and Food Consumption Score (FCS), improved the measurement of women's empowerment and food outcomes, but they are still limited to the realities about context-specific and nuanced challenges faced by the rural women. Institutional hurdles, including unequal land distribution, division of gendered labor, restricted access to the market and problems about mobilization, continued to mitigate the women's ability to improve household nutrition. Gender-sensitive techniques and context-specific approaches are needed to understand how women's empowerment in agriculture influences household food security.

Keywords: Women's empowerment, agricultural productivity, food security, gender equality, rural development, policy interventions

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Introduction

Pakistan contributes around 23.33% to the national GDP in the context of agriculture in Pakistan and employs 37.4% of the total labor force (Government of Pakistan, 2023). Women are playing an important role; however, their labor and hard work is always underestimated. In Pakistan, especially, in the rural areas of Punjab Province, 45% of women of Punjab province, are working in the agriculture sector and are directly involved in the sowing, harvesting, and threshing, as well as in the livestock management along with post-harvest activities (Pakistan Bureau of Statistics [PBS], 2022; Fatima *et al.*, 2025). Instead of their pivotal roles, women are facing inequalities, especially in land ownership, finance and extension services, as well as input in the agricultural resources and participation in the decision-making (Acosta *et al.*, 2025; Irshad *et al.*, 2024).

Besides their high involvement women are still undervalued and significantly restricted by land ownership, minimum participation in agriculture decision-making. Linking women empowerment and food security is very crucial to maintain the household food security. This research indicates that when women have right to have greater autonomy on livestock assets, selection of seed, kitchen gardening, and food purchases mitigate the seasonal food crisis and make higher intake of nutritious food. By strengthening women empowerment in land rights, access towards market, participation in decision making and access to credit, these are the important pathways to improve household food security to achieve sustainable rural development (Khan *et al.*, 2021; Naz *et al.*, 2021).

Women exclusion from decision-making power increased the gender differences and decreased the trust, which led to a reduction in food security and poverty. A vast body of literature has raised the link between women's empowerment in agriculture and improvements in nutrition and food security at the household level (Rashid and Gani, 2025; Afzal *et al.*, 2024). Women who are empowered tend to invest more in the quality of food and the well-being of the family and children. Achieving the sustainable development goals, needs to improve overall household well-being and food security (Fahad *et al.*, 2024). Pakistan considered the agricultural heartland of Pakistan, especially Punjab, which has been divided into fourteen major cropping zones, which include wheat-rice, mixed cropping, and cotton zones. These zones are not only having diversity in the agriculture sector but also having different socio-cultural differences that set the different roles of women according to the crops cultivated in that region. It is very critical to understand the different roles of women according to their different socio-cultural and agro-diversity to develop the interventions aiming at food security (Smolenaars *et al.*, 2024).

To analyze, the effects of gender empowerment in the agriculture sector and outcomes for food security, there are two tools that emerged as frameworks in the previous studies: Women Empowerment in Agriculture (WEAI) and Food Consumption Score (FCS). The WEAI, which introduced by IFPRI and USAID, analyzes the control of women on agricultural production, decision-making power, and different roles of leading as well as time use (Fischer *et al.*, 2025). On the other hand, the Food Consumption Score (FCS), which introduced by the World Food Program, analyzes the quantity, food diversity, and frequency as indicators of household food security. Combining both indices to analyze, it allowed the persistence of the gender-sensitive evaluation and analysis in the agriculture sector (Bezabih *et al.*, 2025). Including Pakistan, in past applications of WEAI and FCS in South Asia provided strong evidence that by increasing women Empowerment increased the availability of quality food and better nutrition at the household level (Almonti *et al.*, 2025; Barak and Melgar-Quinonez 2024). According to Nadeem *et al.* (2025) in the South Punjab those households where women

have decision-making power, they have improvements in FCS outcomes especially in those districts where women are more empowered in all domains, found food security there. Bhattacharya (2024) studied that decision-making power among the female farmers has positive outcomes of different food groups, including diversity like fruits, vegetables, and pulses. These findings showed that women who are involved in decision-making power more actively participate in the consumption of food groups and dietary diversity. Such approaches help maintain gender-sensitive policies for food security and development.

With a growing body of knowledge and research gaps, aggregating data, especially from different cropping zones of Punjab, despite it, women are still under-valued by different cultural norms and values, which affects their empowerment. While use of different indexes, WEAI and FCS have increased the policy interventions, their assimilation and monitoring of government systems in agriculture extension systems are still limited (Ahmad *et al.*, 2023). The basic aim of this paper is to fulfill the gaps compiling study from different literature related to 2020 to 2025, especially focusing on three cropping zones of Punjab. Through a gendered analytical point, this paper analyzed critically that how WEAI and FCS have been used to interpret the relationship between women empowerment and household food security. This review aims to provide evidence-based policy implications aligning with SDG 2 (zero hunger) and SDG 5 (gender equality), it will be inclusive for agricultural development as well as for food security outcomes.

Methodology of the Review

In previous months, September and October 2025, a structured review conducted using different databases, like Google Scholar and the HEC digital library. Keywords that are included are Women's empowerment, agricultural productivity, food security, gender equality, rural development, policy interventions. Focused criteria are on peer-reviewed articles and reports from 2020 to 2025 related to South Asia. Different studies that use the WEAI and FCS indices explore the link with food security. Articles related to the study reviewed, which met the criteria; the focus is on analytical findings, methodologies, and policy implications.

Thematic Critical Analysis

Women's Role in Agriculture: Unrecognized Contribution

Across developing countries, women always considered central to agricultural production, besides largely their hard work they their efforts are still unrecognized and invisible in formal statistics, in Punjab women are paying most of the time in the agriculture tasks like weeding, harvesting, seed cleaning and post-harvest activities. From food preparation to live stock care they are fully engaged in household tasks, which are essential for household food security. Besides their extensive involvement women, work always considered a "Household Help" rather than to consider it an economic labor, which resulted in, limited access to agricultural resources. This is not just perpetuate the gender inequality but also effect the household food security as well as agricultural output. By valuing women's hard work formally essential for the purpose of achieving development goals and sustainable food security system (Rouf *et al.*, 2025; Khalil and Warner, 2025)

Women are playing their role in agricultural tasks, which include weeding, sowing, and care of livestock, as well as food processing in rural Punjab; still, their role considered informal and unpaid. Gender inequalities like land ownership, where less than 10% of women own land, and the patriarchal system limiting the capacity of decision-making, such disempowerment not only decrease the women's economic stability but also affect the household nutrition outcomes. When women are empowered, they tend to prioritize food diversity (Ahmad, 2024; Bano, 2025).

Linking Women Empowerment In Agriculture And Household Food Security

Women empowerment in agriculture and input in farming decision have positive and significant effect on household food security. By considering the two input farming decisions two indicators used that who are taking the decision in farming and how much women are contributing (Gumucio *et al.*, 2021; Kaluwa *et al.*, 2022). Women empowerment in agriculture closely linked with the household food security because women can play a greater role in the farming decisions, use of the resources as well as the crop choices, which directly linked with the household food diversity. Women can participate in the decisions of what type of crops have to grow and how income could be spent. Women always tend to spent on food crops and nutritional enhancing practices, which make more, strengthen household food diversity. Evidence showed that in those households where women are more strengthen in decision-making and control over income experienced high level of food security. It is demonstrating that women empowerment in agriculture is essential way to achieve the sustainable household food security (Lecoutere and Wuyts, 2021; Arshad, 2022).

Intersecting Barriers

Women empowerment in agriculture is deeply linked with the structure of socio-economic which include cast, education, religion and class. These intersecting domains are constraining to translate empowerment initiatives into the tangible outcomes. In rural areas women who belong to cast considered low in their culture, they are significantly facing the issues about access to essential resources such as income, training and services of extension even they are living in the same geographic and policy environment where the higher cast people are residing. This shows that social hierarchies always influence the institutional outreach in subtle but with critical point of view (Aslam *et al.*, 2025)

Khalid *et al.* (2025) analyzed that the role of gendered cultural norms, especially in female speculation (purdah), highlighting the women's condition about empowerment. In almost all the regions of Punjab purdah is severely restrict the mobility of women that they do not have access towards local markets for agricultural inputs and participation in decision about harvesting activities. These obstacles directly affecting the women active participation in agriculture and household food security. Due to these limitations, they could not adequately be addressed within the contemporary empirical frameworks and remained under-theorized in Women Empowerment in Agriculture Index. The qualitative indices failed to capture that how to layer the social ties and identities like being a low income, un-educated or lower cast women that limits the effectiveness of interventions of women empowerment.

Gaps in Literature and Future Research Needs

Besides growing improvement in academic record on gender and food security, there are still prominent gaps, which limits the impacts and scope of research.

Geographic Blind Spots

Most of the studies on women empowerment in agriculture are conducted in the northern and central Punjab, whereas the under developed districts in south Punjab are overlooked. The southern regions considered the poorest regions, where poverty rate is too high, limited institutional support, rigid social norms like hard rules of patriarchal system which limits the women empowerment that they do not having access towards a single domain. These regions constrains and difficulties need a mechanism to capture the real form of problems (Rizvi *et al.*, 2025). Women empowerment and its impacts on food security and nutrition are the dynamic process, which change over-time, mostly studies in south Punjab are the cross-sectional which offered a limited view and analysis. Longitudinal studies needed to understand how women

empowerment face socio-economic and climate transition barriers and policy interventions (Iqbal and Fatima, 2022).

Methodological Critique and Gaps

Mostly studies analyzing the relationship between women empowerment in agriculture and food security relying on pre-dominant cross-sectional designs and standardized tools like WEAI and FCS. While these indexes provide the macro-level metrics which often overlooked the complexity and depth of lived experiences of women in rural areas, including socio-cultural and emotional dimensions such as autonomy, household negotiations and agency which always remained overlooked. The limited qualitative inquiry limits the understanding that how empowerment interpreted and constrained in daily life. Furthermore, sometimes the past findings conflicting the contemporary outcomes (Akhtar et al., 2025)

Use Of Standardized Tools To Analyze The Women Empowerment In Agriculture And Household Food Security.

The International food policy Research Institute (IFPRI) developed the surveyed based tool Women Empowerment in Agriculture Index (WEIA), an aggregate index which comprising the five major domains (5DE) including (1) production (2) resources (3) income (4) leadership and (5) time (Alkire et al., 2013; Malapit et al., 2017). Application of WEAI applied in various studies to analyze the women's agency including five domains production, resources, income, leadership and time. According to (Lountain et al. 2024). However, it is criticized that WEAI lacking of sensitivity about intra-household dynamics as well as context-specific cultural limitations. For example, patterns of male migration and joint family system influence the empowerment, which is not directly capture by indicators of WEAI (Grataula et al., 2025).

Widely used index the Food Consumption Score developed by the World Food Programme (WFP) to analyze the dietary diversity, frequency of food and importance related to nutrition of different food groups which they intake over a 7-day recall period. It is a composition to measure the quality and quantity of consumed food as well as the overall status of food of the household (Nusher et al., 2024). Arora et al. (2024), highlighted that greater involvement of women in food related issues and decisions especially in purchasing of food and preparation of meal exhibit the positive relation of high FCS outcomes. This shows that women empowerment in agriculture improve the household food security and nutrition. Besides the extensively use of FCS it also have a notable limitations, it is not able to analyze the dynamics of intra-household about food distribution therefore it is difficult to understand the disparities about gender-based in intake of nutrition level. Even in food secure household women taking fewer or less nutrition than male due to socio-cultural norms which is not reflected by this FCS index. Moreover, the standardized food group classifications, this tool do not fully account of regionally and culturally food items which are significant, leads towards underestimate of food diversity that what type of different types of food according to different cultures they intake. While the FCS index considered a valuable tool for the assessment broad scale food security, and it also be complemented within the qualitative methods or any more indicators to get a more detailed gender-sensitive understandings about consumption patterns and food access (Lesueur, 2025; Pienaaah, 2025).

Both standardized indices globally recognized like Women Empowerment in Agriculture (WEAI) and Food Consumption Score (FCS) but it lacks to capture the cultural sensitivity and contextual flexibility. For example, WEAI fail to analyze the communal or informal forms of empowerment especially in the South Asia, while FCS often fail to capture the cultural food items that vary culture to culture which leads to low assessment of dietary diversity. To customize the indices according to the local community is necessary for more

persistent and accurate analysis and for the purpose of policy implications (WFP, 2022; Bahera *et al.*, 2024).

Lack of Mixed-Methods Research

Abbas *et al.* (2025) analyzed that without the help of institutional mechanism including extension services, access to market and legal look-after, empowerment may not get the better nutritional benefits. These obstacles underscore the need for the purpose of integrated research approaches, which include quantitative index within the participatory qualitative tool, focus group discussion, history of life and as well as the empowerment narratives. The mix methods strategies provide more extensively and context-sensitive lens to analyze the complex and multi-layered pathways in-between women empowerment and food security. Minimal utilization of mix method study within the quantitative study, which includes the ethnography participatory techniques, focused group discussion, life histories, which helps to study more deeply and understand the real facts. The qualitative methods are the more valuable to analyze that how women perceive and experience empowerment within their local community and domestic sphere (Majeed *et al.*, 2025).

Policy-Practice Disconnect

Very few studies analyzed the impact of government-led programs like Benazir income Support Program (BISP), Kissan Package and different Government extension services on women empowerment and household food security outcomes. Extension services programs, which help to the female farmers in agriculture practices. It is very crucial to analyze the impacts of all these programs whether there are affecting household food security. Without gender-sensitive approaches and local mechanism, these programs failed to analyze the sustainable empowerment outcomes (Touseef *et al.*, 2024). Therefore, a very critical and deeper policy designs, gender inclusivity and community participation needed to ensure the agricultural programs to get the tangible outcomes in women's empowerment in agriculture and household food security (Nusher *et al.*, 2024; Kirkwood *et al.*, 2024).

Conclusion

Empowering women in the field of agriculture arises as a moral duty and a strategic approach to increase and achieve household food security for extensive sustainable development goals. Both indices, such as Women Empowerment in Agriculture (WEAI) and Food Consumption Score (FCS), improved the measurement of women's empowerment and food outcomes, but they are still limited to the realities about context-specific and nuanced challenges faced by the rural women. Institutional hurdles, including unequal land distribution, division of gendered labor, restricted access to the market and problems about mobilization, continued to mitigate the women's ability to improve household nutrition. To address these obstacles and challenges women empowerment metrics should be more intensive and standardized including participatory and mixed method techniques that analyze the local perspectives and cultural dynamics. These adaptive methodologies and techniques enable the researchers and policy makers to draw evidence-based gender-responsive agricultural policies reflecting truly lives experiences of women. In the same ways, by strengthening women's access to resources, power of decision-making and structural support system is necessary to gain Sustainable Development Goals (SDGs) 2 (zero hunger) and 5 (gender equality). Through context-specific and inclusive empowerment, strategies women's role in agriculture will fully recognized, as a foundation of household food security and development of rural communities.

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