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Organic Farming and Women Empowerment in Karnali Province, Nepal

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Abstract

This study examines the factors influencing women's empowerment in organic farming in Karnali Province, Nepal, focusing on education, market access, institutional policies, technology, infrastructure and socio-cultural dynamics. A quantitative approach was employed, utilizing standardized Likert scale questionnaires to collect data from 200 women actively engaged in organic farming. Smart PLS path analysis and reliability tests were applied to assess variable relationships. The target population comprised women organic farmers in Karnali Province. A sample of 200 participants was selected through purposive sampling, ensuring representation of diverse backgrounds and farming experiences. Education and training significantly enhanced women's skills and confidence in organic farming, Access to resources was critical for empowerment, Supportive policies and gender-sensitive institutions promoted women's participation, Socio-cultural barriers like gender norms, hindered empowerment but could be addressed through targeted interventions and Infrastructure, technology and market access improved productivity and economic growth. The study highlights the need for holistic strategies i.e. policy reforms, training programs and cultural shifts to empower women in organic farming, fostering sustainable agricultural development. Further studies could explore

longitudinal impacts of interventions, regional comparisons or qualitative insights into women's lived experiences in organic farming.

Keywords: Gender equality, organic farming, rural agriculture, social-cultural barriers, sustainable development, women's empowerment

Introduction

Approximately 75 percent of people in underdeveloped countries depend on agriculture as their main source of income. It is the world's largest food supply. Reliability is a fundamental aspect of human progress, especially in Nepal, where it provides employment for more than 65.70 percent of the population and accounts for almost 37.00 percent of the country's GDP (Khanna, 2016). The world's food production systems have undergone significant changes as a result of the green revolution that has emerged in recent decades. In both established and emerging economies, this age has seen greater food output and productivity along with higher revenue creation from agricultural operations and a variety of employment opportunities (Joshi, 2011).

In Nepal, where organic farming is the norm, organic agriculture is widespread. In the past, farmers who were resource-poor and subsistence farmers used an integrated farming system that included cattle and crops. Though the government began formally promoting organic agriculture in the 10th Five-Year Plan (Tamang et al., 2023), commercial organic agriculture in Nepal actually began in the early 1990s (Singh &Maharjan, 2017). While most of the land in high hills and rural areas is free of agrochemicals, just around 11, 951 ha, or 0.30 percent of all cultivated land area in Nepal, are legally certified for organic farming (Baral et.al., 2020).

In 2018, the Government of Karnali Province (GoKP) launched the 'Policy and Development Program' with the vision of transforming the Province into a fully Organic region. This initiative includes supporting the Organic Agriculture Bill, delegating responsibilities to local governments for producing organic inputs, enhancing capacity-building and ensuring quality control. Public-private partnerships and mechanization efforts are being leveraged to establish Organic fertilizer plants and pesticide production units. Key strategies under this program include the "One local level, one model organic farm" initiative and promotional slogans such as "Increased organic agriculture, prosperous Karnali". To encourage adoption, the government subsidizes up to 70.00 percent of organic farming costs and provides incentives to exemplary farmers. Institutional support is being

strengthened through collaboration between the Agriculture Knowledge Centre, District Agriculture Development Offices (DADOs) and the provincial government.

In 2007, Jumla was designated as Nepal's first "Organic district," and the district's farmers were prohibited from using agrochemicals for agricultural production (Lewison, 2019). This was done in an effort to increase farmer profitability by marketing organically certified apples, beans, potatoes, millet, Jumli rice, buckwheat, barley, and other crops. However, as of right now, only apples are certified and sold as organic products for a variety of administrative and legal reasons (Atreya and Kafle, 2016).

Women's empowerment is a complex and multifaceted phenomenon, often considered latent due to its intricate internal dynamics and indirect manifestations. It encompasses enhancing women's agency, autonomy and decision-making capabilities. In rural settings, empowerment unfolds progressively, enabling women to gain authority and apply it constructively in household and agricultural decisions. Factors such as land ownership, employment status and socio-cultural norms significantly influence women's empowerment in agriculture (Cornwall, 2016).

Women's empowerment is greatly impacted by their participation in organic farming since they handle animals and participate in a variety of agricultural operations that require a multifaceted role. Increased accountability leads to gains in self-worth, ability to make decisions, and general empowerment (Bodapati & Chander, 2011). Notably, organic farming increases women's access to information and decision-making power, especially when it comes to health-related issues (International Federation of Organic Agriculture Movements, 2007). Women who work in agriculture also have greater mobility, self-awareness, and decision-making ability. There is evidence that women are leading more homes than ever before, that they are actively participating in public debate and taking on a multitude of responsibilities in the home and on the farm, and that their empowerment has improved noticeably from earlier times.

The objectives of the study are as follows:

To analyze the influence of human and social capital especially education, training and socio-cultural factors on the empowerment of women in organic farming.

To evaluate the role of structural and institutional support including access to resources, supportive policies, infrastructure and technological innovations in empowering women in organic farming.

To assess the impact of economic integration through market access and opportunities on the empowerment of women in organic farming.

Hypothesis

H_1: There is a significant relationship between access to resources and empowerment of women in organic farming.

H2: There is a significant relationship between education and training and the empowerment of women in organic farming.

H3: There is a significant relationship between supportive institutions and policies and the empowerment of women in organic farming.

H4: There is a significant relationship between social and cultural factors and the empowerment of women in organic farming.

H5: There is a significant relationship between market access and opportunities and empowerment of women in organic farming.

H6: There is a significant relationship between technological innovations and the empowerment of women in organic farming.

H7: There is a significant relationship between infrastructure development and the empowerment of women in organic farming.

Review of Literature

Kurniasari et.al, (2024) have examined the socio-economic conditions and identified appropriate and successful solutions for women farming groups in Kedurus, Surabaya city. The study's primary goal is to provide an explanation of the socioeconomic circumstances that affect the women farmers in Kedurus. Secondly, examine and explain how empowerment tactics fit the requirements, traits, and capacities of Kedurus's women farmers' groups. This study employs a census approach in which every participant is the focus of the investigation. SWOT analysis is used in this study to explain how empowerment techniques fit the needs, traits, and capacities of women.

Kumar, Nagal, Kar and Lal (2024) have focused on supporting traditional farming paradigms, particularly organic and natural farming systems, and have outlined a number of programs targeted at improving the production of premium food grains. A recent investigation was conducted to evaluate the effectiveness of a training program aimed at women farmers under the direction of the Livelihood Enhancement through Development of Women Project (LEDP), which is financed by NABARD. This discrepancy highlights how much the training program contributed to women farmers' increased knowledge base. As a result, the results support the introduction of focused, region-specific training program designed to support skill development, especially for female farmers, and thereby promote the broader use of organic farming methods.

Kapoor (2023) examines the challenges climate change poses to rain-fed agriculture in India, including low incomes, stagnant technology and a growing reliance on female labor. The study analyzes India's National Mission on Sustainable Agriculture as a climate adaptation strategy promoting organic farming. While beneficial for local ecology and soil health, Kapoor argues that this transition introduces gendered equity concerns. Through a mixed methods approach, the research evaluates gender disparities in land ownership, workload, decision making autonomy and access to credit, critically assessing the inclusivity of India's shift toward organic agricultural practices.

Thakur (2023) identifies rural women as essential contributors to agricultural growth. Despite their vital role, they frequently experience marginalization due to factors including low investment, limited decision-making power and restricted access to technology and opportunities. Persistent gender disparities in the sector are exacerbated by socio-cultural norms, digital divides and financial constraints. While agricultural technology holds potential to enhance productivity, market access and employment, its adoption by women remains limited. Addressing these barriers requires gender sensitive strategies for technology adoption to foster equitable and sustainable agricultural development.

Bano, Waqar and Ali (2023) studied the women's collective farming was encouraged by an initiative in Gilgit-Baltistan, Pakistan's Upper Indus Basin to overcome issues in agriculture brought on by climate change. The Hunza district was the implementation site for this project, which concentrated on better farming techniques and cutting-edge water resource management technologies. The

situation and agency of women as collective farmers were investigated in this study using a gender analysis framework. Research reveals that women farmers are more vulnerable to the effects of climate change, yet collective farming gives them the chance to question social norms, lighten their workloads, make use of the right tools, and exchange experiences. According to the study, enlarging these activities to the policy level can improve the agency overall, reduce drudgery, increase women's choice, and increase their participation in decision-making.

Singh, Tiwari, and Saroj (2023) analyzed the rural women's contributions to the development of organic and sustainable farming from a variety of offline and online sources. In modern times, native agriculture is one of the world's most important renewable wealth sources, and organic farming is becoming more and more popular. The development of the rural economy depends heavily on rural Indian women, who play a variety of roles including wage earners, entrepreneurs, and farmers. In addition, they are in charge of providing care and food security for their families. Women contribute to agricultural productivity by working along the entire value chain, from pre-harvest production to post-harvest marketing and processing. Organic farming arose in reaction to changing farming practices and is still evolving today with the help of modern organizations. It uses natural fertilizers and embraces practices like composting, green manuring, and biological pest management. Sustainable and organic farming preserves indigenous knowledge and increases output while providing a forum for women's empowerment.

Nath and Athinuwat (2021) have studied in the districts of Sankamphaeng, Mae On, Mae Taeng, DoiSaket, and San Sai in Chiang Mai province to determine the factors that contribute to women's empowerment in organic farming. Education, enhanced agricultural expertise and marketing ability, changes in cultural perspectives, and participation in economic activities were important elements that led to women's empowerment. The study emphasizes how crucial it is to take these aspects into account when developing policies and programs in order to improve women's empowerment in organic farming.

Senjawati and Pratiwi (2020) have studied about sustainable way to improve plant development while lowering expenses and minimizing environmental effects is to replace inorganic fertilizers with locally produced organic fertilizers. Farmers, especially women, learn about producing fertilizer at a reasonable cost by participating in educational programs that emphasize Micro Organisms Local

(MOL) cultivation and the transformation of organic waste into liquid organic fertilizer. A reduced need on chemical inputs and increased agricultural output result from this community-based approach's promotion of resource utilization. An assessment of this program shows how well it works to solve farmers' problems and make the most of available resources in the area to maximize crop productivity.

Lucero, Gelido and Abalos (2020) examined how respondents regarded the current state, future potential and issues with organic agricultural methods. The descriptive-evaluative research methodology was used in the study to collect all pertinent data and information on the state, opportunities, and issues related to agricultural systems as experienced by women who practice organic farming. Results indicate that the areas of adoption rate and organic training post availability are only moderately implemented in terms of the state of organic farming systems. The respondents found that the prospects for organic farming in terms of environmental preservation were the most acceptable, while the prospects in terms of economic contribution were the least acceptable.

Kalyan and Murugan (2017) highlighted women's empowerment and participation among marginalized Tamil Nadu, India, organic farmers. Due to deeply ingrained patriarchal institutions and caste-based discrimination, these women—who are predominantly from lower castes—face marginalization. Policies promoting globalization make their marginalization worse. Through fieldwork, this study sheds light on the often underappreciated contribution made by female organic farmers to the development of sustainable socio-economic relationships. In particular, collective millet farming contributes to the economic and social independence of these women and so supports women's empowerment. In addition, it includes women's participation in the legal system, land ownership, and the function of community organizations in promoting governance and self-sustainability in rural agricultural economies.

Setboonsarng and Gregorio (2017) have highlighted the contribution that organic agriculture will make to these nations' achievement of their development goals by the end of 2015, especially the Millennium Development Goals.Organic agriculture's positive effects on human health, livelihoods, and environmental integrity are made possible by its unique standards and market-driven certification processes, which guarantee that organic farmers, receive premium compensation. As a result, increased demand for organic products and increased consumer knowledge of its

benefits are visible in both established and emerging economies. Most importantly, organic farming promotes gender equality by creating meaningful jobs with varied responsibilities, offering low-cost economic opportunities, supporting health by avoiding synthetic chemicals, preserving traditional seeds and farming methods to support biodiversity and indigenous knowledge, and guaranteeing fair labor standards with equal pay and benefits. For farmers in marginalized smallholder communities—women in particular—this statement is very important.

Altenbuchner, Vogel and Larcher (2017) examined the impacts of organic farming activities on women's empowerment in Odisha, India. While there are advantages to organic farming, such as better health and food security for women, there are drawbacks as well, like an increased workload. Moreover, conventional gender roles continue to exist, which results in women's exclusion from agricultural training programs and business decisions within organic efforts. This keeps long-standing gender disparities in place. In order to fully realize the promise of organic farming in India for gender equality and women's empowerment, efforts to demolish existing social structures and provide technical training are necessary for women to be included in higher administrative roles.

Pandey and Jha (2016) have investigated the food sovereignty, empowerment, and engagement of marginalized female farmers in Tamil Nadu, India. Globalization policies intensify caste-based discrimination and entrenched patriarchal institutions that marginalize these farmers, who are mostly from lower castes. This study, which makes use of a fieldwork technique, highlights the underappreciated contribution made by female farmers to the development of sustainable socio-economic relationships with local agricultural land, which is essential to their social and economic independence, especially in achieving food sovereignty. In the face of state and private encroachment on agricultural property, it emphasizes the development of collective and organic farming practices, with a special concentration on millets, as a way to establish inherent food sovereignty. The study also looks at topics including land ownership, women's legal problems, and the role that community organizations play in empowering women.

Shahid and Hossain (2014) investigated the intersections between gender and biodiversity conservation. The deep understanding of seeds that women have gained via ongoing observation and selection for traits like size, grain structure, and pest resistance highlights the critical role that women play in preserving the variety

and quality of seeds. Additionally, women's contributions to genetic resources—the basis of agricultural production—are acknowledged in this work, despite their frequent underappreciation. However, modern issues like the growth of intellectual property rights and the monetization of seeds endanger indigenous knowledge systems and customary seed-saving methods. Notwithstanding these obstacles, women's contributions to seed conservation and agricultural sustainability must be acknowledged and valued. The discourse highlights the essential premise of women's empowerment, which has ramifications for expanding food production and distribution, improving nutrition, and raising living conditions in rural areas. The goal of the local Kiosks communities is to promote a fair and harmonious society based on the values of sharing and happiness by incorporating women into all aspects of agricultural and organic farming.

Conceptual Framework

Access to Resources: In the Karnali Province of Nepal, women's empowerment in organic farming is significantly influenced by their access to resources. This includes different resources like capital, land, seeds, technology, and knowledge. The availability of these resources to women has a direct impact on their involvement, output, and ability to make decisions in the agricultural industry. Improvements in livelihoods, sustainable agricultural practices, and socioeconomic development can result from providing equitable access to resources for women in Karnali Province, where gender discrepancies in resource access still exist.

Education and Training: For women to be more empowered in organic farming, especially in areas like Nepal's Karnali Province, education and training are essential. With regard to the unique requirements and difficulties faced by women in agriculture, the main goal of this effort is to offer extensive education and training programs. Women's awareness of organic farming methods, sustainable agricultural approaches, and market potential will be improved by the workshops, seminars, and educational materials included in the education component. Practical skills in crop rotation, pest control, soil management, and organic certification procedures are imparted through hands-on training programs.

Supportive Institutions and Policies: Institutions and policies that are supportive could have a big impact on "Empowering Women in Organic Farming in Karnali Province, Nepal". These include policies that encourage gender parity in agriculture, such training programs or subsidies for female farmers. Policies that grant

women access to resources such as finance facilities, land ownership rights, and technical support might also encourage them to take a more active role in organic farming. Local cooperatives and non-governmental organizations (NGOs) that provide networking opportunities, mentorship, and advocacy for women's rights in agriculture can also be considered supportive organizations. Overall, women's leadership and participation in organic farming can be increased by supportive institutional environments and policies, which will benefit Karnali Province's sustainable development.

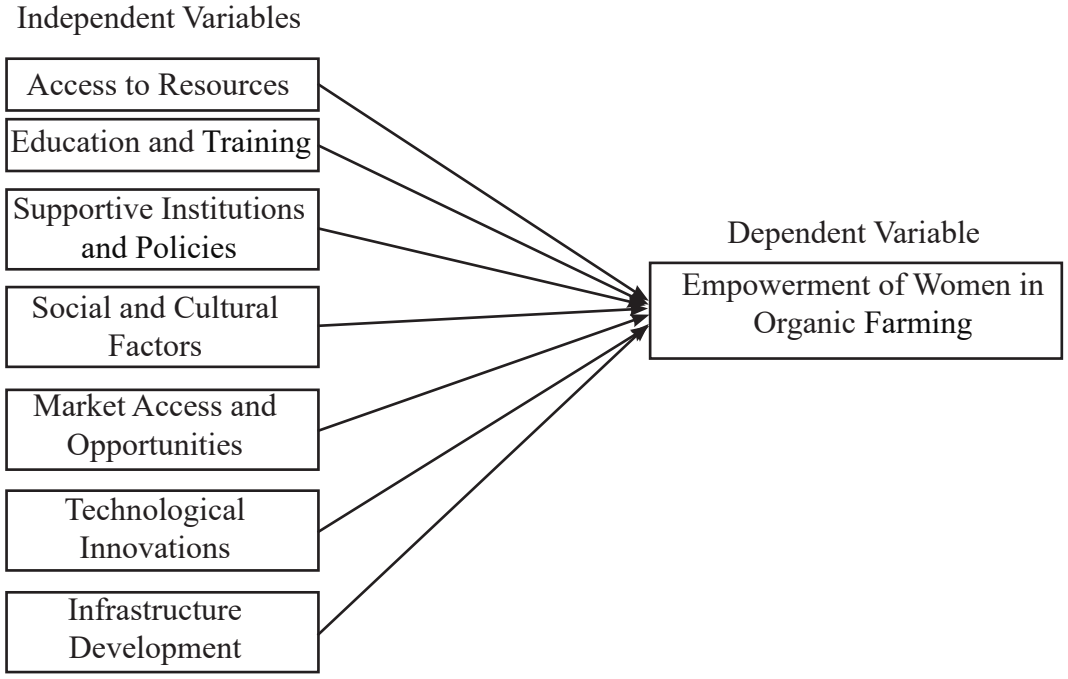
Social and Cultural Factors: Women's empowerment in organic farming in Nepal's Karnali Province is greatly influenced by social and cultural issues. Gender roles have long been profoundly embedded in Nepalese society, with men performing agricultural work and women being assigned to household duties. Furthermore, women's roles and duties in farming are shaped by cultural traditions and beliefs. Cultural activities have the potential to cultivate an atmosphere in which women are acknowledged as equal participants in agriculture by dispelling prejudices and advocating gender equality. While protecting the region's cultural legacy, embracing indigenous knowledge and practices can help increase women's involvement in organic farming. In general, women in Karnali Province's organic farming sector must be empowered by tackling social and cultural issues.

Market Access and Opportunities:"Market access and opportunities" refers to how much a person or group can engage in the exchange of goods and services for a price inside a market. This includes a wide range of elements, including financial resources, market research, logistical systems, and legal frameworks. In the Province of Karnali, the emphasis is on the ability of women who cultivate organic produce to find markets for selling their goods and the consequent opportunities for economic growth. This involves taking market dynamics, information sharing, logistical viability, financial accessibility, and regulatory constraints into account. Women's empowerment in this field requires a sophisticated understanding and focused interventions that address these complex factors.

Technological Innovations: By providing tools and techniques to increase output, decrease labor, and improve efficiency, technological advancements in organic farming can empower women in Nepal's Karnali Province. These include technological advancements that empower women to break down old barriers and actively engage in sustainable agriculture, such as solar-powered tools, crop monitoring applications, drip irrigation systems, and organic fertilizers.

Infrastructure Development: The term "infrastructure development" describes the many additions, upgrades, or developments made to the structural and institutional frameworks that sustain the agricultural industry. Developing roads, irrigation systems, storage facilities, market access, and adopting technologies specifically designed to improve organic agricultural techniques are a few examples of the kinds of projects such as this. With the goal of advancing gender equality and women's leadership and participation in organic farming, the infrastructure development will give women in the area greater access to opportunities, resources, and support systems within the organic farming industry.

Empowerment of Women: In Organic Farming: The term "Empowerment of Women in Organic Farming" describes how much of organic farming is carried out by women. Their participation in organic farming efforts has improved their socioeconomic situation overall and given them access to resources and decision-making authority. It describes advantages and progress attained by female farmers concerning their self-governance, involvement, and input to the organic farming industry, finally culminating in their empowerment within their households and communities.



Methodology

The study employed a quantitative research design to examine the empowering women in organic farming in Karnali Province, Nepal. Samples of 200 participants were selected through a convenience sampling technique because of its practicality and accessibility, as it allows for the selection of participants based on ease of availability rather than a random or systematic method and time and resources are also limited. The sample included women who have actively engaged in organic farming in Karnali Province, Nepal. Structured Likert scale questionnaires were developed to collect quantitative data. The data were collected in the month of April, 2024. Descriptive statistical analysis was conducted to summarize the demographic characteristics of the participants and Statistical software (e.g., SPSS, Excel, and Smart PLS) was utilized to perform the data analysis.

Results and Discussion

On the basis of the points such as demographic profiles, reliability test and smart PLS, this section is discussed.

Table 1

Demography Profile

		No. of respondents	Percentage (%)
Age	Below 25	20	10.00
	26-35	60	30.00
	36-45	80	40.00
	Above 45	40	20.00
Marital Status	Married	150	75.00
	Single	50	25.00
Experience	0-3 year	80	40.00
	More than 3 year	120	60.00
Qualification	Primaryor below	60	30.00
	Secondary	100	50.00
	Graduation and above	40	20.00
Ethnicity/Caste	Brahmin/Chhetri	100	50.00
	Janajati	40	20.00
	Dalit and Others	60	30.00
Income level	Less than 10,000	30	15.00
	10,000-20,000	80	40.00
	20,001-40,000	50	25.00
	Above 40,000	40	20.00

Source: Field Survey, 2024

Table 1 provide the information on the age, marital status, experience, qualification, ethnicity/caste and income level of the participants. The majority of respondents were in the 36-45 age range, accounting for 40.00 percent of the total. The next largest group was 26-35 years range, comprising 30.00 percent of the respondents. Similarly, 75.00 percent of the respondents were married, while the remaining 25.00 percent were single. The largest group of respondents, at 50.00 percent had a secondary level qualification. The next significant group, at 30.00 percent had a primary or below qualification. Brahamins/Chhetris were the majority, comprising 50.00 percent of the respondents. Dalit and others accounted for 30.00 percent, while the Janajati were 20.00 percent. The highest number of respondents fell within the income range of 10,000-20,000, accounting for 40.00 percent. The next largest group had an income range is 20,001- 40,000, representing 25.00 percent of the respondents.

Reliability Test

The Cronbach alpha reliability coefficient was used to evaluate the research instrument's dependability. A reliable coefficient of 0.6 and above is acceptable and high while a reliable coefficient of below 0.6 shows questionable and poor reliability (Dikko, 2016).

Table 2

Reliability Test

Code	N	Cronbach's Alpha	Remarks
AR	5	0.655	Acceptable
ET	5	0.723	Good
SP	5	0.781	Good
SC	5	0.622	Acceptable
MO	5	0.883	Excellent
TI	5	0.701	Good
ID	5	0.804	Excellent
EW	5	0.689	Good

As shown in the table no. 2, the cronbach's Alpha of the variables is higher than 0.6 thus we can say that there is high level of internal consistency among the variables.

Smart PLS

Smart PLS (Partial Least Squares) is a software package commonly used for structural equation modeling (SEM) analysis. Hypothesis testing is a fundamental aspect of SEM, and Smart PLS provides capabilities to test hypotheses using the partial least squares algorithm (Wang et.al., 2023). In Smart PLS, hypothesis testing typically involves assessing the significance of path coefficients, which represent the relationships between variables in the model. Here, the study is conducted on empowering women in organic farming. For, this purpose Smart PLSis used which is mentioned as follows.

Table 3

Path analysis

Path	P value
AR-> EW	*** (0.000)
ET-> EW	***
SP->EW	***
SC ->EW	***
MO->EW	***
TI->EW	***
ID->EW	***

Note: (***) denotes p-value significant at 0.01 level of significance (AR= Access to resources, ET= Education and training, SP= Supportive institutions and policies, SC= Social and cultural factors, MO= Market access and opportunities, TI= Technological innovations, ID= Infrastructure development and EW=Empowering women in organic farming)

According to the above figure and table, the path analysis table no.3 presented p-value of Access to resources, Education and training, Supportive institutions and policies, Social and cultural factors, Market access and opportunities, Technological innovations less than 0.01, which indicates that there is significant effect of above mentioned variables in empowering women in organic farming at 1.00 percent level of significance.

The findings provide robust empirical validation for the proposed conceptual framework, confirming the significant relationships between multiple factors and women's empowerment in organic farming in Karnali Province. High Cronbach's

Alpha values across constructs affirm the reliability and internal consistency of the measurement instrument. Regarding human and social capital, path analysis reveals statistically significant effects of education and training (ET) and social and cultural factors (SC) on empowerment. Education enhances technical knowledge and autonomy, though the lower reliability score for SC reflects the persistent complexity of patriarchal norms, suggesting a need for interventions that extend beyond policy alone. Concerning structural and institutional support, significant path coefficients for access to resources (AR), supportive institutions and policies (SP), technological innovations (TI) and infrastructure development (ID) underscore the importance of an enabling environment. These results align with existing literature emphasizing that gender sensitive support such as equitable access to training and decision-making is critical to avoid reinforcing traditional gender roles. Finally, in assessing economic integration, market access and opportunities (MO) demonstrate high reliability and a significant effect on empowerment. This highlights economic agency as a central driver, where access to premium markets directly enhances income, autonomy and influence within household and community contexts. The results showed that the empowerment of women in organic farming in Karnali Province was significantly influenced by a number of factors, including market access and opportunities, education and training, supportive institutions and policies, technological advancements, infrastructure development, social and cultural factors, and access to resources.

Conclusion

The study concludes by highlighting the critical significance that a number of variables have in advancing women's empowerment in organic farming in Nepal's Karnali Province. Firstly, regarding the influence of human and social capital, the analysis concludes that while both are significant drivers of women's empowerment in organic farming, their impacts are distinct. Education and training emerged as a robust, positive predictor, directly enhancing technical knowledge and decision-making autonomy. In contrast, the influence of social and cultural factors was more complex and attenuated, indicating that persistent patriarchal norms act as a significant, though not absolute, barrier. This finding suggests that empowerment initiatives must extend beyond knowledge transfer to address deeper socio-cultural constraints. Secondly, pertaining to structural and institutional support, the study conclusively determines that an enabling environment is indispensable. The significant positive influence of access to resources, supportive policies,

technological innovations and infrastructure development underscores that empowerment is contingent upon a tangible institutional framework that facilitates participation. Finally, concerning economic integration, the analysis identifies market access as the paramount factor. This variable demonstrated that the highest predictive strength, leading to the conclusion that economic agency achieved through direct market linkages, fair prices and income generation is the primary mechanism through which empowerment is actualized within households and communities. In summary, women's empowerment in this context is a multifaceted process, simultaneously dependent on human capital development, structural support and economic integration. Overall, the study's findings highlight the significance of taking a comprehensive strategy to address the various requirements and difficulties that women in organic farming encounter. Through a holistic approach to addressing these concerns, policymakers, practitioners, and stakeholders may cultivate an atmosphere that enables women to fully engage in and reap the benefits of organic farming projects, ultimately supporting the sustainable development of Karnali Province, Nepal.

Implications and Recommendations

Policymakers, practitioners, and other stakeholders who support women's empowerment in organic farming in Nepal's Karnali Province will find great significance in the study's conclusions. Initially, the acknowledgement of the complex aspects of women's empowerment in this field emphasizes the need for a comprehensive strategy that takes into account a range of interrelated elements. In organic farming, women's empowerment is significantly influenced by their access to resources. Thus, funding for laws and initiatives that improve women's access to capital, land, seeds, and technology has to be given top priority. In order to advance inclusivity and solve current gender inequities, it is also critical to make steps to ensure equitable distribution of resources, with a focus on marginalized populations.

To improve the knowledge, abilities, and self-assurance of female farmers in organic farming techniques, education and training programs that are specifically designed to address their needs and concerns are essential. Putting money into educational programs that train people on the job and raise awareness of sustainable farming methods can make a big difference in women's empowerment in the industry. Establishing supportive institutional frameworks and rules is essential to fostering an atmosphere that encourages women to take on leadership roles and participate in organic farming. Therefore, legislators ought to pass and implement legislation

that advances gender parity, gives women access to opportunities and resources, and cultivates an environment that is favorable to female farmers. Effective implementation and oversight of these policies requires cooperative efforts from government agencies, non-governmental organizations, and community-based organizations.

In order to advance gender equality and women's empowerment in organic farming, it is essential to address social and cultural hurdles. To make the agricultural industry a more welcoming and encouraging place for women, efforts must be made to dispel prejudices, discriminatory practices, and conventional gender norms. Women's integration and involvement in organic agricultural operations can be facilitated by embracing indigenous knowledge and cultural practices and supporting gender-sensitive techniques. To further support female farmers' economic empowerment and sustainability in organic farming, it is imperative to improve market access and opportunities for them. Women can participate in value chains and increase their income-generating potential through initiatives that improve market infrastructure, provide market knowledge, and facilitate access to financial services.

Additionally, the advancement of infrastructure and technology advancements play a crucial role in facilitating the empowerment of women in organic farming. Agricultural businesses can experience increased output, decreased labor costs, and improved efficiency with the implementation of suitable technology, such as irrigation systems and solar-powered tools. The construction of roads, storage facilities, and market connections, among other necessary infrastructure, can also improve women's access to markets and support networks, which will help to empower them in the industry.

In summary, it will take a coordinated effort to address the intricate interactions between social, economic, cultural, and institutional variables in order to promote women's empowerment in organic farming. Policymakers, practitioners, and stakeholders can foster an environment that empowers women to actively participate in and benefit from organic farming initiatives by adopting a holistic approach and implementing targeted interventions. This will help Karnali Province, Nepal, develop sustainably.

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