

Beyond the Homestead: Synergizing Gender-Sensitive Agricultural Extension with Mission Shakti 5.0 for Sustainable Rural Growth: A Comprehensive Framework for Rural Transformation in India

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Abstract

A significant paradox arises from the feminization of Indian agriculture, where women make up 42% of the agricultural labor. Although they play a crucial role in food production, they are still only marginally involved in agricultural extension activities. This study examines the potential for synergy between Mission Shakti 5.0, a flagship program of the Uttar Pradesh government focused on women's safety, dignity, and empowerment, and gender-sensitive agricultural extension systems. Using Mission Shakti's extensive grassroots infrastructure, which includes over 19,800 female police officers and 9,172 women beats, this study suggests a brand-new "Shakti-Krishi Samanvay Model." In order to create an integrated delivery system, the study uses a conceptual framework supported by the Social capital theory and the Women's empowerment framework. This system makes use of Farmer Producer Organizations (FPOs) and Self-Help Groups (SHGs) as channels for market access and technology distribution. Through dependable community safety networks, the suggested concept brings extension services to the village level, addressing structural obstacles including time poverty and mobility limitations. Increased use of climate-resilient technologies by female farmers, improved economic independence, and a narrowing of the gender productivity gap are anticipated results. The study comes to the conclusion that overcoming the digital gap and attaining sustained rural growth in agrarian India require coordinating safety networks with agricultural knowledge systems.

Keywords: Mission Shakti 5.0, Gender-Sensitive Extension, Feminization of Agriculture, Rural Development, Women Empowerment, SHGs.

1. Introduction

Indian agriculture is undergoing a profound structural transformation, increasingly characterized by the phenomenon commonly described as the "*feminization of agriculture*". As male workers migrate to urban centers in search of non-farm employment, women are progressively assuming primary responsibility for agricultural production. According to the Periodic Labour Force Survey (PLFS), women account for approximately 42% of the agricultural workforce, and nearly 80% of economically active women in rural India are engaged in the agriculture sector (Government of India, 2024). Despite their substantial and growing presence in farming systems-undertaking labor-intensive activities such as sowing, weeding, harvesting, post-harvest operations, and livestock management- women remain largely invisible within agricultural policy frameworks and extension systems.

Women are frequently classified as "farm wives" or "helpers" rather than recognized as farmers in their own right. This misclassification has far-reaching consequences, systematically excluding them from institutional access to land titles, formal credit, agricultural inputs, markets, and, critically agricultural extension and advisory services. Such structural invisibility perpetuates gender-based disparities in access to information and resources, reinforcing unequal power relations within rural agrarian economies. The gender gap in agricultural extension services is particularly pronounced. Conventional extension systems in India

have historically been male-centric, relying predominantly on male extension agents who target male heads of households under the assumption that agricultural knowledge will naturally “trickle down” to women. Empirical evidence, however, consistently demonstrates the inadequacy of this approach. Women farmers often face socio-cultural constraints related to mobility, time poverty, literacy, and norms governing interaction with male officials, which limit their access to extension services. As a result, women experience significant information asymmetries that hinder their adoption of improved agronomic practices, climate-smart technologies, mechanization, and high-yielding inputs. These constraints contribute to a persistent productivity gap, with female-managed farms producing an estimated 20–30% less than male-managed farms, despite comparable resource potential (FAO, 2011; Raghunathan *et al.*, 2019).

Within this context, *Mission Shakti* has emerged as a flagship initiative of the Government of India, with strong implementation support from state governments such as Uttar Pradesh, aimed at advancing women’s safety, security, and empowerment. Over successive phases, Mission Shakti has evolved from a focus on protection and welfare toward a more comprehensive empowerment framework. Mission Shakti 5.0 represents a mature phase of this evolution, emphasizing holistic empowerment that includes economic self-reliance, livelihood enhancement, and institutional leadership. The program has successfully mobilized millions of women into Self-Help Groups (SHGs) and established an extensive network of frontline women functionaries at the grassroots level. Despite this expansive institutional reach, the potential of Mission Shakti to function as a transformative platform for delivering agricultural extension and advisory services remains largely underexplored. This study argues for a strategic synergy between gender-sensitive agricultural extension approaches and the institutional architecture of Mission Shakti 5.0. The logic of such convergence is compelling: Mission Shakti offers strong social mobilization, collective action, and trust-based networks- the institutional “software”- while agricultural extension systems provide technical knowledge, innovation dissemination, and productivity-enhancing tools- the operational “hardware.” Integrating these two domains can simultaneously address persistent challenges of low agricultural productivity and entrenched gender inequality in rural India.

Accordingly, the objectives of this research are fourfold: (1) to analyze the current status of gender inclusiveness within Indian agricultural extension systems; (2) to assess the components of Mission Shakti 5.0 that are directly relevant to rural livelihoods and agricultural development; (3) to document and synthesize successful case studies of gender-sensitive extension interventions; and (4) to propose a theoretically grounded and operationally feasible model for integrating gender-responsive extension services with Mission Shakti 5.0 to promote sustainable and inclusive rural growth.

2. Literature Review

2.1 Gender Dynamics in Indian Agriculture

The scholarly discourse on gender in Indian agriculture has evolved from the earlier “*women in development*” paradigm toward a more nuanced “*gender and development*” framework, which emphasizes the role of power relations, institutional structures, and access to resources in shaping agricultural outcomes. Seminal work by Agarwal (1994) underscores the centrality of land ownership to women’s empowerment, arguing that secure land rights enhance women’s bargaining power, access to institutional credit, and eligibility for government support programs. In the absence of formal land titles, women farmers are systematically excluded from extension services, input subsidies, and risk mitigation mechanisms, perpetuating cycles of low investment and low productivity.

The increasing feminization of agriculture, widely documented in recent literature, has further complicated gender relations within agrarian systems. Pattnaik *et al.* (2018) caution that this trend often represents a “*feminization of agrarian distress*,” wherein women assume responsibility for increasingly unviable farms characterized by declining profitability, limited access to technology, and heightened exposure to climatic and market risks. Rather than signaling empowerment, feminization in this context reflects the structural withdrawal of men from agriculture without a commensurate transfer of resources, rights, or institutional support to women.

2.2 Women Farmers' Contributions and Invisibility

Women play a critical role across all stages of agricultural production, contributing an estimated 60–80% of labor in food production, including sowing, transplanting, weeding, harvesting, post-harvest processing, and livestock management. Despite this extensive involvement, women's agricultural labor remains largely unrecognized and unmonetized. This "invisibility" is deeply rooted in narrow definitions of productive work and entrenched socio-cultural norms that frame women's farm labor as an extension of domestic responsibilities rather than as economic activity.

Empirical evidence from the International Food Policy Research Institute (IFPRI) demonstrates that when women have control over income and productive resources, positive outcomes are observed in household food security, dietary diversity, and child nutrition. However, women often lack decision-making authority over key agricultural choices such as crop selection, input use, and market participation (Raghunathan *et al.*, 2019). This disconnect between labor contribution and decision-making power limits the transformative potential of women's participation in agriculture and reinforces gendered inequalities within farming households.

2.3 Agricultural Extension Systems in India

India's public agricultural extension system, largely implemented through institutions such as the Agricultural Technology Management Agency (ATMA) and Krishi Vigyan Kendras (KVKs), continues to face significant challenges in effectively reaching women farmers. Ragasa (2014) highlights critical structural constraints, including an unfavorable extension worker-farmer ratio of approximately 1:1100 and the severe underrepresentation of women within the extension workforce, with female extension agents constituting less than 15% of total staff.

These institutional limitations are compounded by socio-cultural barriers. Prevailing gender norms often restrict interactions between male extension agents and women farmers, particularly in conservative rural settings, thereby reinforcing information asymmetries (Benson & Jafry, 2013). Consequently, women farmers remain disproportionately excluded from training programs, demonstrations, and advisory services, limiting their awareness and adoption of improved technologies, climate-resilient practices, and market-oriented production strategies.

2.4 Gender-Sensitive Extension Approaches

The literature increasingly emphasizes that gender-sensitive agricultural extension extends beyond the mere inclusion of women in training activities. Instead, it requires a fundamental reconfiguration of extension design and delivery mechanisms to address women's specific constraints, priorities, and lived realities. Effective approaches include the formation of women-only learning groups, the engagement of female extension paraprofessionals, participatory and experiential learning methods, and the scheduling of extension activities at times and locations that accommodate women's domestic and care responsibilities.

Scholars argue that conventional demand-driven extension models often fail to serve women effectively, as social norms and power asymmetries may limit their ability to articulate demands or engage with formal institutions. In this context, Sulaiman and Hall (2012) advocate for a supply-side gender responsiveness approach, wherein extension systems proactively identify and address gender-specific needs rather than relying solely on expressed demand. Such models are particularly relevant in settings where women's voices are systematically marginalized.

2.5 Self-Help Groups and Women's Empowerment

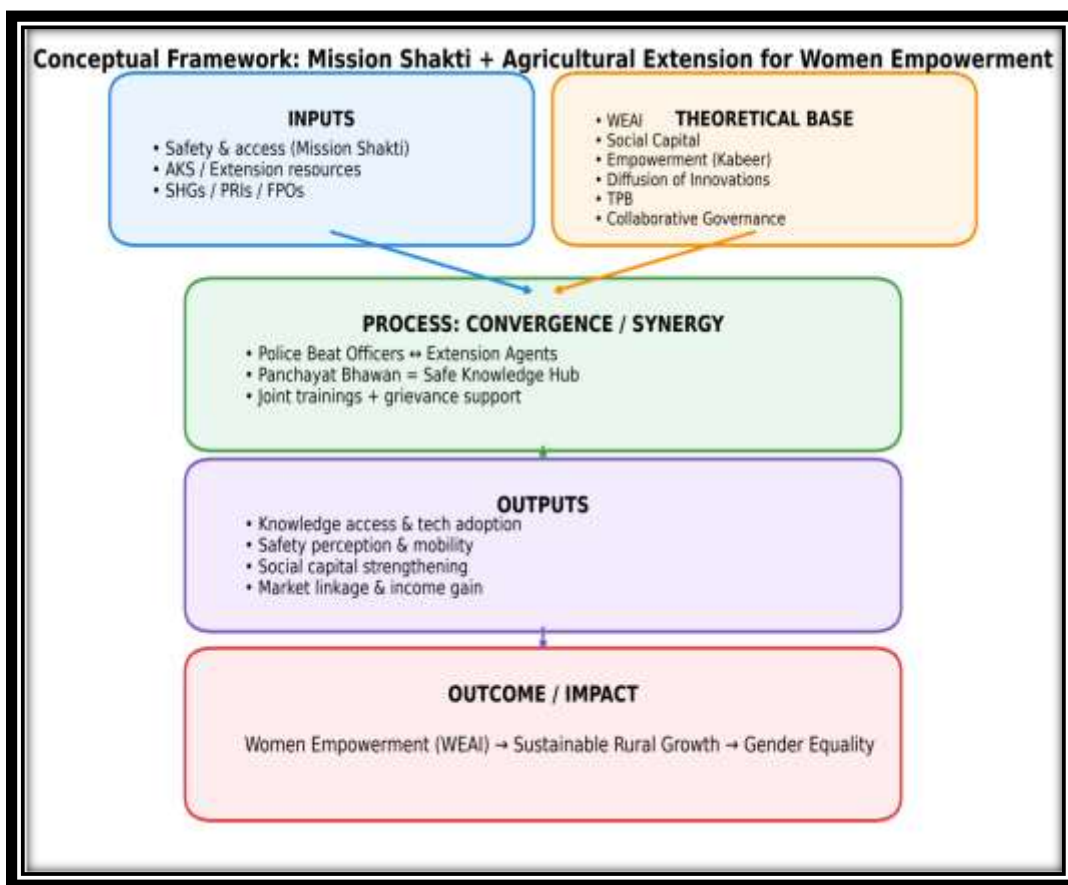
Self-Help Groups (SHGs) have emerged as a cornerstone of women's empowerment in rural India. Initially promoted by the National Bank for Agriculture and Rural Development (NABARD) and subsequently scaled up under the National Rural Livelihoods Mission (NRLM), SHGs have played a pivotal role in building social capital, enhancing financial inclusion, and fostering collective agency among rural women.

Empirical studies indicate that SHG participation is associated with improved access to credit, increased savings, enhanced confidence, and greater political and social participation.

Despite these gains, the literature points to a persistent gap between financial inclusion and sustainable livelihood enhancement, particularly in agriculture. While SHGs have been effective in facilitating savings and credit, their integration with agricultural extension, value chains, and market-oriented production remains limited (Madheswaran, 2001). Bridging this gap is critical for translating collective mobilization into tangible productivity gains and long-term economic empowerment for women farmers.

3. Conceptual framework

In order to understand how safety-focused governance initiatives and agricultural extension systems could collaborate to enhance women's empowerment in agriculture, this study employs a complex conceptual framework.



The framework incorporates the Women's Empowerment in Agriculture Index (WEAI) as the main lens through which outcomes are measured. Social capital theory is used to describe how networks, trust, norms, and group participation help women participate in livelihood and extension operations. WEAI conceptualizes empowerment through the agency, inclusion, and decision-making ability of women in several agricultural domains, including leadership, time use, production decisions, and resource access (Alkire *et al.*, 2013). Simultaneously, the social capital theory highlights that social connections and institutional ties that promote collaboration, information sharing, and group action greatly influence development outcomes (Coleman, 1988; Putnam, 2000). Consequently, the paradigm makes the assumption that empowerment in agriculture is a result of both institutional access and relational structures at the community level in addition to being individual-level phenomena.

The Agricultural Knowledge System (AKS) and the Mission Shakti infrastructure are two important enabling systems that are part of the conceptual framework at the input level. Mission Shakti offers

governance frameworks and safety measures that lessen women's susceptibility, enhance public access, and foster faith in institutional assistance. In order to decide women's mobility and engagement in extension activities, market visits, and public decision-making, safety measures are viewed as fundamental enabling factors. This is consistent with ecological systems theory, which contends that interacting systems- from institutional and policy surroundings to family and community contexts- shape human development and engagement (Bronfenbrenner, 1979).

Women are more likely to participate in livelihood projects and attend trainings when there are safe communal areas, gender-responsive services, and village-level enforcement systems in place, free from social or physical restrictions. In parallel, AKS stands for the people and technical resources that provide agricultural knowledge and innovation through training modules, extension agents, consulting services, demonstrations, and institutional connections for markets, inputs, and credit. The paradigm makes the assumption that AKS improves women's ability to farm and make decisions, both of which directly lead to empowerment.

The framework also acknowledges local committees, FPOs, PRIs, SHGs, and other community organizations as important enabling structures that facilitate women's interaction with outside organizations. In this situation, social capital plays a crucial role in determining whether or not women can access and make use of the services that are offered. According to Coleman (1988), social capital adds value by facilitating people's access to networks for cooperation, support, and information. Putnam (2000) emphasizes that civic involvement and trust improve how well institutions and communities work. These networks provide as avenues for women to acquire self-assurance, exchange experiences, engage in collective bargaining, and create credibility for their presence in traditionally male-dominated fields in rural development contexts. Therefore, the framework makes the assumption that having robust community networks improves women's capacity to transform resources into results that lead to empowerment.

The framework's primary mechanism is the convergence (synergy) between agricultural extension programs and safety infrastructure. Panchayat bhawans are used as safe knowledge centers, and police beat officers and extension workers work together to operationalize the process. Collaborative governance theory provides theoretical justification for this convergence, contending that coordinated service delivery and structured, consensus-oriented decision-making by diverse stakeholders are more effective ways to manage complex public issues (Ansell & Gash, 2008). According to this approach, the panchayat bhawan turns into a multifunctional convergence platform where women can attend trainings, get advisory support, engage with service providers, attend group meetings, and file grievances pertaining to social or safety limitations. By making sure that women view public institutions as supportive and responsive rather than aloof or unreachable, this strategy also increases institutional trust.

In order to explain women's involvement in agricultural training, market connections, and public governance spaces, the conceptual framework also integrates behavioral mechanisms through the Theory of Planned Behavior (TPB). According to TPB, perceived behavioral control (confidence, access, mobility, and safety), subjective norms (family and community acceptability), and attitudes (perceived benefits of participation) all have an impact on participation (Ajzen, 1991). If social disapproval, fear of harassment, or transportation limitations continues, women may not actively participate in rural settings even when resources are provided. While extension exposure improves attitudes by proving livelihood benefits, Mission Shakti efforts increase perceived behavioral control by lowering fear and improving safety perception.

Participation in SHGs and PRIs simultaneously enhances norms by establishing collective legitimacy for women's participation. As a result, the framework makes the assumption that convergence interventions affect women's intention and motivation to engage in addition to institutional access. The framework produces quantifiable results through these convergent processes, such as improved safety perception, expanded access to knowledge, and fortified market ties. Improved access to and use of agricultural information, technologies, and services is referred to as knowledge access. This product is closely related to the Diffusion of Innovations theory, which describes how awareness, perceived relative advantage, need compatibility, trialability, and observability all play a role in the adoption of new agricultural technologies and practices (Rogers, 2003).

Women are more exposed to innovation when Panchayat Bhawans serve as learning centers and extension agents are available, which speeds up its diffusion and acceptance. Women's access to markets and institutions is increased by increased safety perception and mobility, which fortifies market ties through group selling, pricing awareness, entrepreneurship, and negotiating skills. Lastly, the framework connects

these outputs to long-term results or impacts, which are conceived as gender equality, sustainable rural growth, and women's empowerment. WEAI categories such as autonomy across time, leadership in groups, decision-making authority in production, and control over resources and income are used to interpret empowerment (Alkire *et al.*, 2013). Women's agency rises and disempowerment falls as they acquire both capability (knowledge and resources) and enabling context (safe spaces and institutional trust). By increasing household welfare, diversifying livelihood strategies, and boosting productivity, this empowerment supports sustained rural growth. These changes eventually promote gender equality by normalizing women's leadership, economic visibility, and public involvement in village organizations and agricultural markets.

4. Gender-Sensitive Extension Approaches

To effectively reach women farmers, agricultural extension systems must move beyond gender-blind, technology-centric models of knowledge transfer and adopt approaches that explicitly recognize women's roles, constraints, and capacities. Gender-sensitive extension seeks not only to include women as beneficiaries but also to redesign extension processes in ways that overcome entrenched socio-cultural, institutional, and informational barriers. A growing body of evidence highlights several approaches that have demonstrated effectiveness in enhancing women's access to agricultural knowledge and innovation.

4.1 Participatory Rural Appraisal (PRA)

Women's knowledge, limitations, and priorities have been made visible in extension planning through the use of Participatory Rural Appraisal (PRA) techniques modified for gender analysis. Extension staff can systematically examine gendered work divides, time poverty, and unequal access to resources using tools including daily activity clocks, seasonal calendars, mobility maps, and access-and-control profiles. PRA transforms extension from a top-down transfer approach to a co-creation process by actively incorporating women in generating potential solutions and diagnosing farming problems.

The proposed technologies and practices are better matched with women's resource endowments, labor availability, and risk perceptions thanks to this participatory involvement. Additionally, PRA procedures can boost women's self-esteem and collective voice, empowering them to express issues that are frequently disregarded in traditional extension interactions that are controlled by male farmers.

4.2 Farmer Field Schools (FFS)

Women farmers who may have little formal schooling but have a wealth of indigenous and practical knowledge are especially well-suited to the Farmer Field School (FFS) model, which stresses experiential and discovery-based learning. FFS is more accessible to participants with lower literacy levels since it encourages learning through experimentation, observation, and group discussion rather than written materials. In situations where social conventions limit women's participation in mixed-gender settings, women-only FFS has been found to be particularly successful. These areas promote peer learning, lessen social inhibition, and develop female farmers' leadership. Women who participate in frequent group meetings throughout the full cropping season develop not only technical skills but also analytical abilities and confidence in their ability to make decisions about crop management, pest control, and input utilization.

4.3 Digital and ICT-Based Extension

Women's limited mobility, time constraints, and limited involvement with formal institutions can all be addressed with the help of information and communication technologies (ICTs). Women farmers can receive fast, location-specific, and customized agricultural information directly through mobile-based advisory services, helplines, and decision-support tools. Efforts to customize advice information to specific farm situations are exemplified by applications like Farm Precise.

However, the ongoing digital divide- which is typified by rural women's lower smartphone ownership, low digital literacy, and limited internet access- remains a serious problem. Gender-responsive ICT methods are focusing more on voice-based advisories, Interactive Voice Response Systems (IVRS), and mediated access

through networks of self-help groups or community resource persons (CRPs) in order to close this gap. By combining social facilitation with technological efficiency, these hybrid approaches guarantee that digital expansion stays inclusive rather than exclusive.

4.4 Video-Mediated Extension

One effective strategy for increasing women's involvement in agricultural innovation is video-mediated extension. Models like the ones developed by Digital Green make use of movies made by the community that showcase local farmers using better methods in settings they are acquainted with and in their native tongues. This strategy makes new technology seem more realistic and credible by drastically lowering the "social distance" between innovators and adopters.

Observing peers from their local communities successfully adopt new methods increases self-efficacy, drive, and trust for female farmers. Research indicates that when combined with facilitated group discussions, video-mediated extension frequently leads to higher adoption rates than traditional demonstration techniques. Because video production is a collaborative process, women are positioned not only as learners but also as producers and distributors of knowledge.

5. Case Studies

5.1 PRADAN: Gender-Transformative Extension in Jharkhand and Odisha

In some of India's most socio-economically disadvantaged areas, especially in Jharkhand and Odisha, Professional Assistance for Development Action (PRADAN) has become a prominent practitioner of gender-transformative agricultural extension. The foundation of PRADAN's strategy is the collective mobilization of women through Self-Help Groups (SHGs) in conjunction with methodical capacity building in enhanced and sustainable agriculture techniques, such as improved seed management, soil health practices, and the System of Rice Intensification (SRI). PRADAN's concept stands apart from traditional gender-inclusive approaches because it explicitly addresses gender norms and power dynamics inside households.

In addition to providing women with technical training, PRADAN organizes organized discussions with men about labor sharing, decision-making authority, and the economic worth of women's contributions to agriculture. Because of this dual approach, women are now more widely acknowledged in the community as "Kisan" (farmers) rather than as auxiliary workers. The productivity improvements that can come from gender-transformative extension models are highlighted by empirical evaluations of PRADAN's initiatives, which show significant increases in agricultural yields, enhanced food security, and greater household incomes.

5.2 SEWA: RSV Mobile Application in Gujarat

The Self-Employed Women's Association (SEWA) is a powerful illustration of how gender-responsive design may effectively harness digital innovation to empower women farmers. To assist its vast network of rural women producers in Gujarat, SEWA created the Rudi Sandesha Vyavhar (RSV) mobile application. By directly connecting smallholder women farmers with bulk purchasers, the app improves price realization by avoiding traditional middlemen.

The RSV program offers real-time market price information and basic technical advises related to crop production and post-harvest processing, in addition to facilitating market linkages. Its user-centric design, which includes local language interfaces, simple navigation, and less reliance on text, is responsible for its success. SEWA's experience shows that technology can be a potent enabler of market integration, income enhancement, and collective bargaining leverage for women farmers when digital solutions are customized to women's literacy levels, linguistic preferences, and economic realities.

5.3 Mahila Kisan Sashaktikaran Pariyojana (MKSP)

The Mahila Kisan Sashaktikaran Pariyojana (MKSP), which is a part of the National Rural Livelihoods Mission (NRLM), implemented as the largest government-led program specifically aimed at enhancing the responsibilities of women farmers in agriculture. Through group efforts and community-led extension,

MKSP seeks to increase women's productive potential, lessen drudgery, and advance sustainable farming methods.

The creation of a cadre of Community Resource Persons (CRPs), sometimes referred to as Krishi Sakhis, is a key innovation under MKSP. These women are chosen from the local communities and undergo systematic training in extension facilitation, nutrition-sensitive agriculture, agronomy, and natural resource management. Krishi Sakhis serve as peer educators, bridging the gap between women farmers and official extension systems by providing culturally relevant, context-specific consulting services. According to independent assessments, MKSP interventions have improved household nutrition outcomes and dietary diversity, boosted women's confidence in interacting with formal institutions and markets, and promoted the adoption of sustainable and climate-resilient farming techniques. The program demonstrates how decentralized, women-led extension systems can improve agricultural and empowerment outcomes on a large scale.

6. *Mission Shakti 5.0 Framework*

With exceptional visibility and operational depth in Uttar Pradesh, Mission Shakti 5.0 is the most recent and advanced phase of the Government of India's flagship women's empowerment campaign.

Phase 5.0 represents a major strategic change from the previous stages of Mission Shakti, which were mostly focused on guaranteeing women's protection and security through programs like Pink Booths, Women Help Desks, and gender-sensitive policing. It goes beyond protection-centric strategies to long-term livelihood stability and agency, acknowledging economic self-reliance as a fundamental prerequisite for sustained empowerment.

This development is a reflection of a broader policy understanding that economic independence, institutional access, and social recognition are closely linked to women's safety, dignity, and empowerment. Mission Shakti 5.0 takes a more comprehensive and development-focused strategy by integrating livelihood promotion into a safety-and-rights framework.

6.1 *Core Components of Mission Shakti 5.0*

6.1.1 *Safety and Security*

Through improved emergency response systems, including as helplines like 112 and 1090, and a greater deployment of female police officers, such as Beat Constables and female help desk officials, Mission Shakti 5.0 continues to fortify its safety architecture.

Building confidence between women and law enforcement agencies is the goal of these initiatives, especially in rural and semi-urban areas where reporting obstacles are still significant. The ongoing focus on safety creates the favorable conditions required for women to participate in public life and the economy.

6.1.2 *Economic Empowerment*

Phase 5.0 is distinguished by its clear emphasis on women's economic empowerment. Through skill development programs, access to institutional finance, assistance for entrepreneurship, and market connections, the mission places a high priority on connecting women- particularly members of Self-Help Groups (SHGs) - to income-generating activities.

This component is directly related to national livelihood missions and recognizes SHGs as vital platforms for risk-sharing, financial inclusion, and cooperative entrepreneurship. By emphasizing income production, Mission Shakti 5.0 seeks to transform women from passive beneficiaries into active economic participants.

6.1.3 *Institutional Convergence*

Interdepartmental convergence is a key component of Mission Shakti 5.0's strategy for efficient service delivery. To guarantee that women receive integrated and seamless support, the framework requires collaboration amongst important departments, such as police, rural development, agriculture, panchayati raj institutions, health, and education. This convergence strategy is particularly crucial for rural women, whose needs span multiple sectors and cannot be adequately addressed by fragmented solutions.

6.2 *Relevance for Agricultural Livelihoods*

Mission Shakti 5.0 has established one of the biggest women-centered institutional ecosystems in the nation, with a grassroots network that includes over 44,000 female police officers and millions of women mobilized through SHGs and community institutions. Given that farming continues to be the principal source of

employment for the majority of rural women, the mission's strategic shift toward economic empowerment offers a crucial chance to combine agricultural and related activities.

Agricultural extension and livelihood services have not yet been methodically included into the Mission Shakti framework, despite this connection. Phase 5.0's convergence mandate provides a policy window for incorporating value-chain involvement, climate-resilient farming methods, and gender-sensitive agricultural extension into the mission's economic empowerment goal. Using agricultural extension methods in conjunction with Mission Shakti's social infrastructure might greatly improve outreach, relevance, and impact for female farmers.

6.3 Analytical Implications

A change from a protection-focused campaign to a framework for developmental empowerment with significant potential for livelihood integration is represented by Mission Shakti 5.0. It is positioned as a feasible platform for implementing gender-responsive agricultural extension and rural development interventions at scale due to its focus on convergence, grassroots presence, and women-led institutions. It takes intentional policy alignment and operational coordination between agricultural institutions and women-centric programs to fully realize this promise.

7. Synergistic Integration Model

This paper's main argument is that gender-sensitive agricultural extension services should be strategically integrated within Mission Shakti 5.0's institutional framework. This integration is based on the understanding that agricultural productivity and women's empowerment are goals that reinforce one another and that intentional institutional design, as opposed to parallel programming, can operationalize their convergence.

7.1 Theoretical Framework: The Convergence Matrix

The Convergence Matrix, which conceptualizes the meeting point of the technical capital ingrained in the agricultural extension system and the social capital produced by Mission Shakti, serves as the foundation for the suggested model. Based on ideas of institutional embeddedness and collective action, the framework makes the case that technology adoption works best when it is distributed via reliable social networks.

Social Capital or Mission Shakti:

- Women's dense networks of trust
- Self-Help Groups (SHGs) as collective organizations
- Female frontline functionaries, including beat constables and SHG leaders
- In-depth community mobilization and credibility

Agricultural Extension System (Technical Capital):

- Scientists and subject-matter specialists in many fields from Krishi Vigyan Kendras (KVKs)
- Coordination and execution of the program via Agricultural Technology Management Agencies (ATMAs)
- Input supply chains (seeds, fertilizers, tools)
- Market intelligence, price information, and climate advisories

According to the Convergence Matrix access, relevance, and adoption hurdles are greatly diminished when technical expertise is integrated into reputable women-led organizations. The concept stresses institutional layering, whereby extension services are provided through already-existing Mission Shakti platforms, as opposed to developing new delivery structures.

7.2 Modes of Integration

7.2.1 SHGs as Extension Nodes

Self-Help Organizations organized under the Mission For the purpose of agricultural extension, Shakti might be officially designated as Farmer Interest Groups (FIGs). SHGs are perfect venues for sharing information since they already have regular meetings, internal leadership structures, and peer accountability standards. It would guarantee high participation, lower transaction costs, and encourage peer-to-peer

learning to schedule extended sessions during regular SHG meetings. Additionally, this strategy gives women's status as producers and key agricultural decision-makers legitimacy.

7.2.2 *Krishi Sakhis as Mission Shakti Livelihood Agents*

The Mission Shakti framework can incorporate the Krishi Sakhi model- community-based women agricultural extension workers- institutionally. Krishi Sakhis can act as frontline agents for agricultural inclusion, just like Bank Sakhis do for financial inclusion. These women, who are drawn from SHGs and have received training in agronomy, climate-resilient practices, and extension facilitation, can help close the gap between women farmers and official extension organizations. Sustainability would be guaranteed and women-led service delivery would be strengthened with partial funding through Mission Shakti's livelihood and empowerment components.

7.2.3 *Safety in the Fields*

The gender-specific dangers associated with agricultural livelihoods can be addressed by extending Mission Shakti's mission on women's safety. When traveling to far-off fields, irrigation sites, procurement centers, or markets, women frequently experience harassment or insecurity- risks that directly limit their ability to participate in the economy. Safe mobility can be improved by deploying Pink Patrols or women-led safety teams in rural areas during the busiest agricultural seasons, such planting and harvesting. This integration emphasizes the notion that safety is a necessary condition for productive engagement rather than something apart from livelihoods.

7.2.4 *Digital Convergence*

The integration model's fourth pillar is digital convergence. The digital platforms that Mission Shakti employees already utilize can incorporate agricultural advising modules that cover crop techniques, input usage, weather alerts, and market prices. On the other hand, agricultural extension apps can be used to spread information about women's rights, safety services, and empowerment programs. In addition to improving service visibility and reducing information fragmentation, a uniform digital interface will guarantee that women receive timely, context-specific advisories about empowerment and agriculture.

7.3 *Analytical Significance*

The Synergistic Integration Model suggests a structural convergence of institutions, going beyond additive approaches to gender inclusion. The methodology provides a scalable and economical way to overcome ongoing gender disparities in agricultural extension by coordinating social mobilization with technical know-how. Crucially, it reframes Mission Shakti as a revolutionary rural development platform that can promote inclusive agricultural prosperity rather than only as a safety or welfare effort.

8. Barriers and Challenges

Despite the Mission Shakti 5.0 framework's strong conceptual justification and institutional capacity for including gender-sensitive agricultural extension, a number of interconnected obstacles still prevent its successful implementation. These issues include structural, socio-cultural, institutional, and economic in nature, which emphasizes the necessity of a multifaceted approach.

8.1 Structural Barriers

The biggest structural obstacle still facing Indian women farmers is the lack of stable land ownership. Women are rarely acknowledged as farmers in official records without proper land titles, which prevent them from being eligible for government programs, institutional loans, crop insurance, and extension services. Women's bargaining power is weakened by this lack of legal recognition, which also restricts their ability to invest in technology that increases productivity. Mission Shakti's legal knowledge and assistance systems present a significant yet neglected opportunity in this regard. One of the main reasons why women are excluded from agricultural institutions might be addressed by strategically promoting joint land titling, inheritance rights, and paperwork support through legal cells and women's help desks within the mission.

8.2 Socio-Cultural Barriers

Women's movement, public involvement, and interactions with male extension agents or market actors are still restricted by deeply ingrained patriarchal standards. Women's access to information and services is

severely restricted in many rural settings since their participation in training programs, farmer meetings, or marketplaces is mediated by social acceptance.

Another and frequently disregarded limitation is time poverty. The "triple burden" of reproductive labor (home and care work), productive labor (agricultural and related activities), and community responsibility falls disproportionately on women. This reduces the amount of free time available for taking part in extension or training initiatives. Even well-meaning programs run the danger of poor participation and impact unless extension delivery is intentionally planned to fit women's schedules and obligations.

8.3 Institutional Barriers

One of the main obstacles to convergence in the agricultural extension system is institutional inertia. In terms of staffing and organizational culture, extension services are still predominantly male, which may limit their awareness of the needs and interests of women. Furthermore, despite governmental calls for convergence, bureaucratic silos can lead to opposition to interdepartmental cooperation.

Instead of viewing Mission Shakti as a platform with significant livelihood and development possibilities, agriculture departments and extension staff can still view it exclusively as a social welfare or enforcement program. This limited view undermines the operationalization of integrated service delivery by weakening ownership and limiting proactive involvement from agricultural institutions.

8.4 Economic Barriers

Adoption is sometimes hampered by financial limitations, even when women farmers have access to agricultural knowledge. Women's capacity to buy high-quality seeds, fertilizer, tools, or equipment that extension agents recommend is hampered by a lack of collateral, inconsistent revenue flows, and limited access to inexpensive loans. As a result, knowledge by itself cannot be used.

This limitation emphasizes how crucial it is to connect financial inclusion methods with extension services. In the absence of complementing loans, input support, or risk-mitigation tools, gender-sensitive extension initiatives run the danger of making women farmers feel more frustrated rather than empowered.

8.5 Synthesis of Challenges

When considered collectively, these obstacles show that gender differences in agricultural extension arise from the interplay of legal, social, institutional, and economic variables rather than from a single limitation. More than little changes are needed to address these issues; a systemic convergence strategy that addresses recognition, access, capacity, and agency all at once is required.

9. Policy Recommendations

This section presents practical policy proposals to institutionalize gender-sensitive agricultural extension using the Mission Shakti 5.0 framework, based on case studies, empirical data, and the suggested Synergistic Integration Model. Scalability, accountability, and convergence are highlighted in these recommendations.

9.1 Institutionalizing Convergence

By issuing a Government Order (GO) requiring the inclusion of agricultural livelihood plans in the yearly action plans of Mission Shakti 5.0, state governments can formally institutionalize convergence between women's empowerment activities and agricultural development. To manage planning, execution, and oversight at the district level, joint task forces made up of the District Magistrate (DM), Superintendent of Police (SP), and District Agriculture Officer should be established. High-level coordination like this would guarantee departmental ownership and lessen the siloed operation that presently jeopardizes integrated service delivery.

9.2 Gender Budgeting in Agriculture

Agricultural policy needs to incorporate gender-responsive budgeting. All major agricultural programs, including the Rashtriya Krishi Vikas Yojana (RKVY) and the Mission for Integrated Development of Horticulture (MIDH), should rigidly set aside at least 30% of their entire budget for beneficiaries who are women. Transparent tracking systems, gender-disaggregated reporting, and outcome indicators should be used in conjunction with this allocation to make sure that designated funds are not merely nominal allocations but rather result in real advantages for women farmers.

9.3 Expanding and Professionalizing the Krishi Sakhi Cadre

For outreach to be sustained, women-led para-extension systems must be expanded. The training, deployment, and expansion of Krishi Sakhis as front-line extension providers should be a clear priority for the National Mission on Natural Farming (2025).

Standardized training, frequent refresher courses, sufficient compensation, and official recognition within the agricultural extension architecture should be provided to these cadres. It would improve service quality and strengthen women's leadership in agricultural knowledge systems if Krishi Sakhis were positioned as professional para-extension workers.

9.4 Strengthening Legal Literacy on Land Rights

Mission Shakti's legal awareness camps should be deliberately used to teach women about joint land titling, inheritance rules, and the legal relevance of land ownership in order to remove the fundamental obstacle of land insecurity. To update land records with women's names, especially in joint and inherited holdings, cooperation with tax departments is crucial. Women would be much more eligible for extension assistance, institutional loans, and agricultural schemes if they were legally recognized as landowners.

9.5 Strategic Positioning for IYWF 2026

With the United Nations has designated 2026 as the International Year of the Woman Farmer, India has a good chance to establish Mission Shakti 5.0 as a model for integrated women's empowerment that is a global best practice. India's leadership in the global discourse on gender and development can be strengthened by demonstrating the convergence of livelihoods, safety, and gender-sensitive agricultural extension under a unified institutional framework. Impact and exposure would be further increased by strategic documentation, international knowledge exchange, and pilot projects in line with IYWF 2026.

9.6 Concluding Policy Insight

When taken as a whole, these suggestions highlight the fact that standalone efforts are insufficient to promote gender inclusion in agriculture. Rather, it calls for global policy coherence, women-led service delivery, institutional convergence, committed funding, and legal empowerment. A practical and scalable route to inclusive and sustainable rural development is provided by operationalizing these approaches through Mission Shakti 5.0.

10. Future Directions

In order to guarantee long-term sustainability, resilience, and transformative impact, future research and policy implementation must build upon the integrated approach presented in this study. Future initiatives should concentrate on increasing women's involvement throughout the value chain, strengthening gender responsiveness in agricultural innovation, and producing solid data on empowerment results.

10.1 Advancing Gender-Responsive Climate-Smart Agriculture

Due to their greater reliance on climate-sensitive livelihoods, restricted access to resources and low capacity for adaptation, women farmers are disproportionately at risk from climate change. Gender-responsive Climate-Smart Agriculture (CSA) must therefore be given top priority in future extension initiatives, with a

focus on robust crop varieties, diverse farming methods, water-efficient technology, and low-cost adaptation techniques.

Women should be actively involved in the selection, testing, and distribution of CSA technologies in addition to being recipients of them thanks to gender-sensitive extension services. By integrating CSA modules into extension platforms connected to Mission Shakti, women's adaptability can be improved and household and community resilience strengthened.

10.2 Promoting Women-Led Agri-Entrepreneurship and Value Addition

Future initiatives should promote women's upward mobility within agricultural value chains through value addition, food processing, and agri-entrepreneurship in addition to primary production. Women can increase their profit margins and lessen their susceptibility to price swings by receiving training in post-harvest management, packaging, branding, and quality standards.

Economic stability and income diversification can be further improved by connecting women-owned businesses and self-help groups to digital markets, export-oriented value chains, and institutional procurement systems. These tactics are in line with Mission Shakti 5.0's focus on entrepreneurship and economic independence.

10.3 Strengthening Evidence through Longitudinal Research

Longitudinal and mixed-methods studies are desperately needed to evaluate the long-term effects of incorporating agricultural extension within the Mission Shakti framework. Future research should monitor how household income, agricultural production, asset ownership, labor allocation, decision-making authority, and intra-household gender relations evolve over time.

To ascertain whether convergence models result in revolutionary empowerment or only incremental benefits, it will be crucial to assess both economic and social consequences. Thorough impact evaluations will also offer vital input for improving program design and expanding successful models.

10.4 Innovation, Learning, and Policy Feedback

Lastly, by creating feedback loops between research, practice, and policy, future initiatives should prioritize adaptive learning and innovation. According to the Mission Shakti–Agriculture convergence paradigm, pilots can be used as living labs to test new digital tools, institutional setups, and extension techniques. Maintaining momentum and guiding evidence-based decisions will require systematic recordkeeping and knowledge exchange on a national and worldwide level.

11. Conclusion

Mission Shakti 5.0 and gender-sensitive agricultural extension work together strategically to advance inclusive and sustainable rural development in India in a way that is revolutionary. The state can achieve significant improvements in productivity, resilience, and social well-being by repositioning women as key economic players in agricultural systems rather than just as recipients of safety and welfare initiatives.

Moving "Beyond the Homestead" requires a fundamental rethinking of women's responsibilities in agriculture, one that acknowledges their agency and contributions along the whole agrarian value chain, from value addition, marketing, and entrepreneurship to production and natural resource management. This change is made possible by including agricultural extension within the Mission Shakti framework, which combines technical know-how with reputable social institutions to overcome long-standing obstacles to acceptance, recognition, and access.

India's commitment to gender equality, climate resilience, and sustainable rural livelihoods can be powerfully demonstrated by the successful convergence of women's empowerment programs and agricultural extension services as the country gets closer to the International Year of the Woman Farmer in 2026. The conversation shifts from symbolic inclusion to structural change as a result of such integration.

Ultimately, the shift from "women in agriculture" to "empowered women farmers" is an economic necessity rather than just a social justice or equitable issue. Achieving the national objectives of food security, poverty alleviation, and sustainable growth requires investing in women's agricultural capacities through

institutional convergence and gender-responsive extension. Empowering women farmers is essential to the future of Indian agriculture, as this paper's research demonstrates.

12. References

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