

Extension strategies for bridging gender digital divide

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ABSTRACT

Women's empowerment in India is hindered by gender disparities, particularly in rural areas where rural women are crucial contributors to sustainable development. The patriarchal society often suppresses women's voices and expressions, leading to inequality in access to resources such as land, credit, and markets. Digital empowerment is also a challenge for rural women due to a triple divide: Digital, gender, and rural. The gender digital divide highlights the inequality between men and women in accessing technologies, with 48.7% of rural men and 24.6% of rural women privileged enough to access the internet. Social, cultural, mobility, access, control, and financial constraints hinder rural women's technological empowerment. Agricultural extension and advisory services can address this by incorporating gender sensitization into their delivery services. Public, private, and civil society organizations are working to uplift and empower rural communities through innovative technical approaches to reform agriculture and rural people.

1. INTRODUCTION

The digital revolution has shifted how the agrarian community worked, accessed information, and associated with each other. Digital platforms are now full of diversity which are not confined only to transferring information about agriculture; farmers can avail of holistic knowledge about overall agricultural development [1]. This digital innovation helps to make the farmers socially, economically, culturally rich, and aware, which in return works in favor of them to come up with better decisions and stay well-informed and connected [2]. A few decades ago, newspapers, television, and magazines limited the agriculture information exchange. However, now in the new era of digitalization, the importance of technology and computer literacy has been recognized [3]. The technology incorporated with agriculture can improve production, create stronger market linkages, and bring new opportunities.

However, much of this remains unreachable. While digital innovations are reaching the farming community, considerable challenges remain [4]. The digital divide, coupled with the gender digital divide, is still significant in rural areas, preventing them from harnessing technical knowledge [2]. In the era of feminization of agriculture, women make up about 33% of cultivators and about 47% of agricultural laborers [5]. Despite their vast contribution to farming, they lag behind

male farmers in acquiring technical information. Digital platforms can open a direct window for rural women to the outside world. However, they continue to face barriers to using technology due to a lack of training, not having access to or control over it, or lack of financial strength [6]. Another reason few women farmers use digital tools is the limited awareness of the internet's potential advantages. The agricultural extension and advisory services (AEAS) somehow failed to address these challenges. Moreover, the absence of information limits women farmers' ability to participate in decision-making [7]. To survive and to grow sustainably in this fast-paced digital world, the different extension organizations need to set importance to gender disparities along with ensuring the fact that female farmers' voices should not be unheard to stop the increasing inequalities [8].

1.1. The Triple Divide

Irrespective of gender, all must have the opportunity to access, use, and control technologies, as digital innovations play a part in bringing down the daily hindrance they come across as farmers, entrepreneurs, and development representatives for their community [9].

Individuals from the agrarian fraternity, particularly women farmers in developing countries, encounter what is acknowledged as the triple divide [10]. The digital, rural, and gender divide altogether creates the triple divide.

1.1.1. Digital divide

The digital divide indicates to the difference between demographics and regions with access to advanced digital tools and others without access or restricted access [11].

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1.1.2. Rural divide

The rural divide suggests to the division between non-rural and rural areas in access to technologies [12].

1.1.3. Gender divide

The gender divide refers to the space between females and males equipped with technologies, resulting in rural females being degraded to the most disadvantaged position [13]. Only 25% of rural women in India have access to the Internet, compared to 49% of rural men. This gap is even wider among farmers, where only 17% of rural female farmers have access to the Internet, compared to 35% of rural male farmers [14].

1.2. Indian Gender Digital Divide in Numbers

- Only 25% of rural women in India have access to the Internet, compared to 49% of rural men. This gap is even wider among farmers, where only 17% of rural female farmers have access to the internet, compared to 35% of rural male farmers [15].
- Smartphone ownership: 29% of rural women own a smartphone, compared to 62% of rural men [15].
- Usage of mobile phones for financial transactions: 9% of women use mobile phones for transaction purposes compared to 16% of men in India [16].
- Digital literacy: The percentage of rural men who are digitally literate is 68.5%, while the percentage of rural women who are digitally literate is 49.6%. This means that there is a 19.9% point gap in digital literacy between rural men and women [15].

In terms of internet usage, India has the largest gender disparity in the Asia-Pacific region, with only 15% of women versus 25% of men using the internet in recent years. This gender gap amounts to 40.4% [17].

2. FOCUS OF THE STUDY

Providing technical aid information equally to both genders in rural areas has become a significant challenge in India, and the goal should be to overcome this challenge and make the farming system more technology-driven. To understand this goal, more attention must be given to those aspects influencing the provision of quality information to them, especially women farmers or entrepreneurs. The study focused on reviewing literature in the context of major constraints the farming community faces in using digital tools. The study aims to create awareness about the discrimination and difficulties farmers face in adopting technologies, and the study also proposes some extension approaches to address the challenges.

3. THE FINDINGS OF THE REVIEWS

The related literature was reviewed in the context of investigating and understanding significant challenges preventing farmers from seeking technical knowledge. The collected information was analyzed thematically, and the major themes related to prevailing gender barriers to women's use of digital tools, significant constraints faced by the genders, and some way forward approach to face the constraints. In 2021, the International Telecommunication Union revealed in their digital development facts that among the internet users by gender in selected Asian countries [Figure 1] the male users were 25% and female users were 15% [18]. In a study on the internet users of India [Figure 2] highlighted that male users were 69% and female users were 31% nationwide [19].

3.1. Existing Gender Constraints for Rural Women to Access to, Control, and Use of Technologies

Table 1 has effectively highlighted the internal challenges that women in rural areas confront, and additional significant challenges are briefly mentioned.

3.1.1. Cultural and social struggles

Socio-cultural norms are significant reasons for the existing gender digital divide in the country. There is a belief that learning technology-aided education is not productive and also not appropriate for rural women [14]. In India, around 12% of women do not have any access to the internet because of the negative social perception associated with its use, and 8% due to unsupportive family members [20]. In some places, it is unfitting for women to visit any telecenter or cybercafé themselves [21]. Women can also be restricted to be in charge of the internet because using it is discerned as displaying women to the risk of trouble through unsolicited phone calls [22].

3.1.2. Time and mobility barriers

Multiple roles and heavy domestic responsibilities performed by rural women curb the time they can devote to learning something new as a way to empower themselves. In contrast to men in society, rural women are actively tied up with heavier workloads, including productive, reproductive, and community management roles [23]. They are significantly in control of storing water, preparing food, looking after the children and older family members, and involving themselves in agricultural duties during the day [24].

Sometimes mobility becomes a major factor for them. The training centers' venue might be far from their home, making them concerned about their safety [20].

3.1.3. Finance and control

According to the Groupe Speciale Mobile Association, financial instability is the most important barrier for a woman to own and operate a mobile phone. Even if the women own a mobile phone or a digital device, they might not have control over it [2]. Another reason could be access and control over one phone by more than two people in a family. According to the report, the average monthly income of male farmers was Rs.11,600, while the average monthly income of female farmers was Rs.7200. This means that male farmers earn about 60% more than female farmers [14]. A huge wage disparity hinders female farmers from buying digital devices or paying for educational learning.

Table 1: Internal challenges to Women's digital adoption in India.

Internal challenges	Cause
Perceived lack of importance/ necessity	• Absence of digital literacy
Unfavorable opinions about digital expenses	• A belief that the internet is pricey and offers little return on investment. • A lack of awareness and anxiety about managing online spending, resulting from an inability to calculate the true cost of various online activities [27].
Fear of the "negative side" of technology, such as internet addiction, harassment, scams, or cyberbullying	• Negative perceptions of the internet (risky, a waste of time, unreliable for women, etc.) combined with ignorance of online safety precautions
Too little time to master digital technology	• Lack of motivation and family support • Triple roles of gender

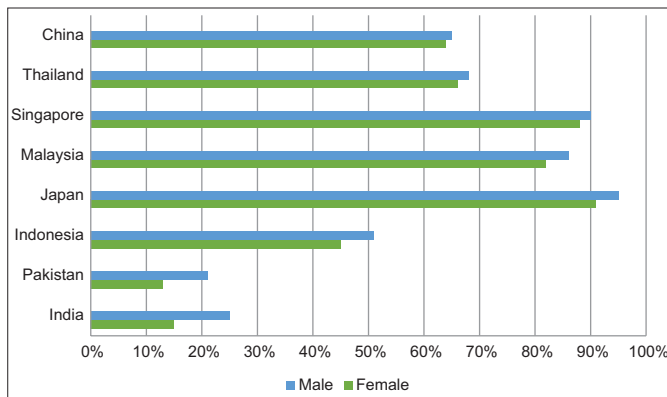


Figure 1: Individual Internet users by gender of selected Asian countries in 2021 [18].

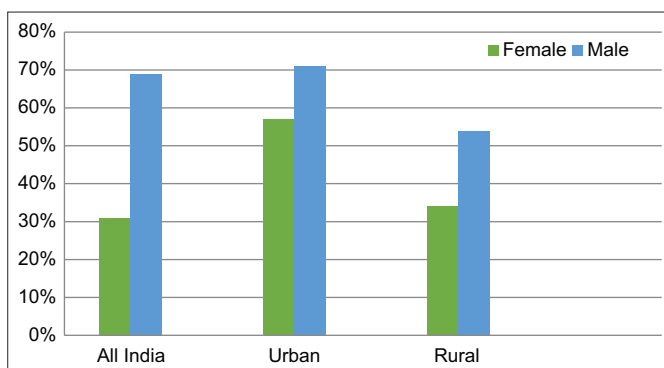


Figure 2: Internet users of India by gender in 2023 [19].

Besides, only 22% of women farmers had access to institutional credit, compared to 60% of male farmers, which makes them economically too unstable to pay other expenses on digital tools [14].

3.1.4. Literacy and education

The United Nations Educational, Scientific and Cultural Organization (UNESCO) calculated that females appear to be two-thirds of the global non-literate population. Enormous urban-rural divides within countries are often found to be existing, with maximum people living in the darkness of having poor education in rural areas. An UNESCO 2019 report suggested that in India, 81% of male farmers are literate, while only 65% of female farmers are literate. Sometimes women farmers have no formal education to know about technology. The language becomes harder for them to grasp the content or they are unaware of the real facts about technical-friendly education [25]. Lack of trust in digital devices can also play a pivotal role in their less participation in digitalized training programs [26].

3.2. Extension Approaches to Better Integrate Gender in the Use of Technologies

3.2.1. Themes: Adapt it to the needs of male and female

Males and females go in for the same value chain but in different production, processing, and marketing activities [28]. For the same reason, farmers from both genders do not always have the same information requirements; their requirement varies. For inclusion technologies, to improve the yield of farmers, it is necessary to ensure that the right content is established for them in a language that they easily grasp and will be effective for them [29]. Above all, content should be made and derived from reliable and trusted sources, considering local contexts, to make sure that equitable agricultural

knowledge can be extended [30]. It is also essential to incorporate participatory approaches by the extension organizations to initiate any technology-driven training to address their actual needs [31].

3.2.2. Capacity development

Capacity can be defined as the zeal or ability of an individual to perform a task. A major aspect is capacity building at the individual, group, and institutional levels [32]. Based on the theme of the initiative, it can be better utilized to offer learning opportunities for women and men individually and, at some point, gather both groups together so they can exchange their thoughts willingly. The approach should be learning by doing to boost their confidence [33].

At the institutional level, it is believed to be effective to make use of gender-responsive systems and structures to formulate and implement gender-responsive technology-driven projects, and institutions should include gender-aware staff, monitoring, and evaluation systems that collect what is happening on the ground level [34].

A 2016 report by Oxfam India mentioned that in collaboration with SEWABharat, they implemented a project on “Economic Empowerment of Women Farmers” to initiate a vegetable supply chain in the districts of Bihar where they provided capacity-building training programs on sustainable agriculture practices and also to women farmers to empower their economic point of views [35]. The study [Figure 3] mentions numerous additional activities aimed at tackling these relevant issues.

3.2.3. Access and involvement: Be responsible and assure the involvement of men and women at all levels

The inclusion of stakeholders at all stages of an initiative will make it more relevant, and suitable to both men’s and women’s demands. Giving everyone equal priority and hearing their perspectives, implementation, and evaluation are the first steps toward an inclusive development initiative [19]. It is crucial to frame activities considering the daily hectic work schedules of farmers from any gender, considering mobility constraints, and not overburdening them with excess work pressure [36]. To assemble large participation, exercises need to be arranged at a place that is both feasible and socially supportable for both men and women farmers.

Gaining their trust and building a good rapport with the farming community is necessary and to make it a success, local extension workers need to be hired who are well associated with the communities prior [37]. If possible, the inclusion of women extension staff or women leaders at every stage of the planning program can be a better alternative to attract more women participants [38].

3.2.4. Collaborations: Review gender issues regarding stakeholders involved in the initiative

Extension and advisory services are pluralistic in nature at present days [39]. Rather than transferring education from a single entity, various extension organizations are now working in cooperation toward sustainable development. The presence of multiple organizations or Public-Private-partnership models will help to find out the needs, and the gender gaps of these communities easily and will be able to resolve their issues, and overcome the gender digital divide in a short period [40]. With the partnership mode’s help, many people can be targeted and access to information can be increased in undiscovered areas [3]. A study was conducted by the central institute for women in agriculture on “Public-private partnership for gender mainstreaming in agriculture” where 74 women farmers were involved from Tamil Nadu, Kerala, and Assam and the study highlighted that their income level

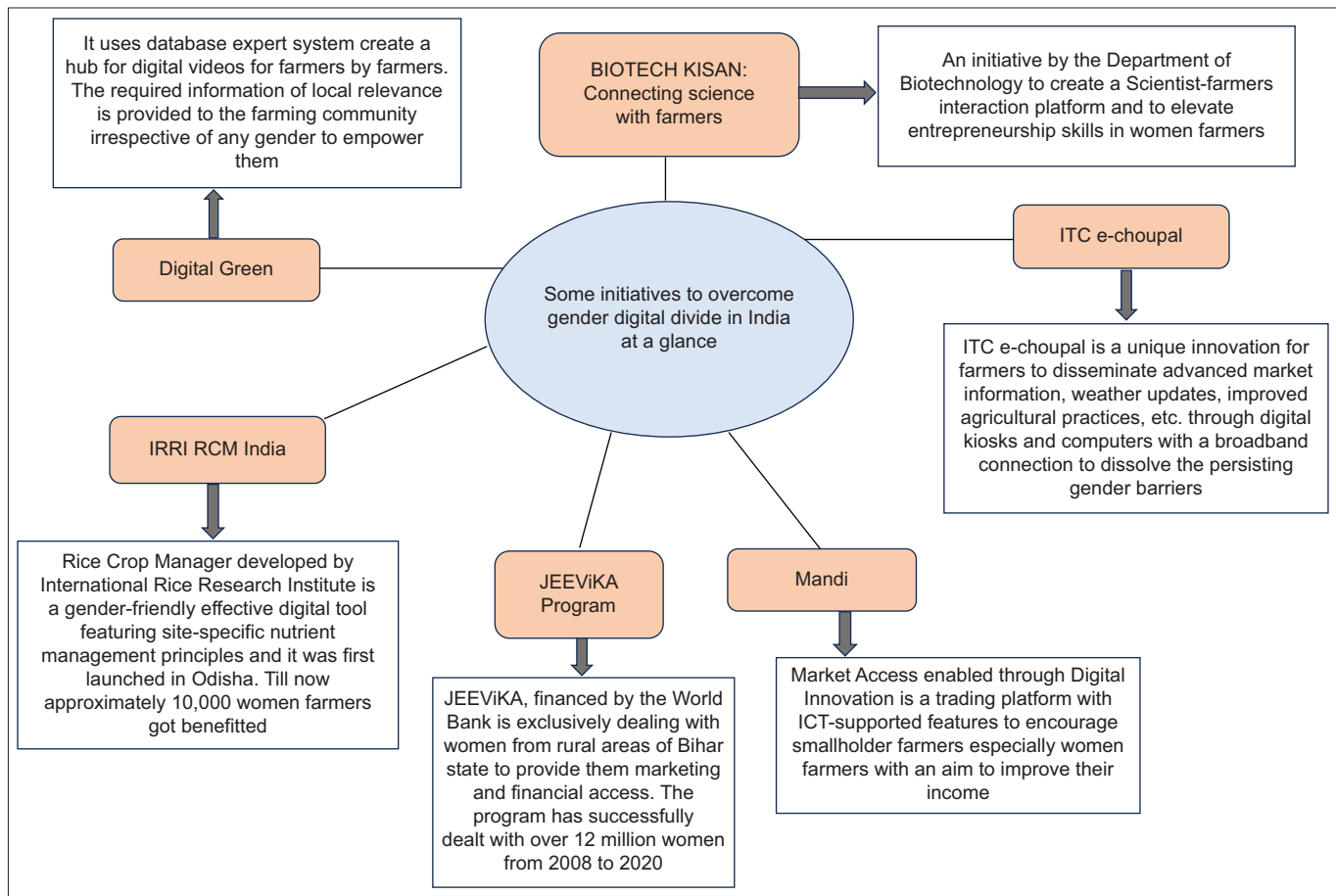


Figure 3: Different initiatives taken to address gender digital divide in India at a glance [2].

increased by 20%, additional employment generation uplifted by 10%, and also this partnership-based model enhanced their accessibility capacity to training, market, technology and many more [41].

4. CONCLUSION

The review provided insights into the farming community's obstacles while seeking effective technical education. There is a dominance of the triple divide coupled with digital, rural, and gender divide which is considerably acute for women farmers. Socio-economic, non-supportive family members, financial crisis, digital illiteracy, lack of interest to learn something new, and weak extension advisory service providers are the major constraints for the farmers, especially women farmers, to be empowered technically. AEAS being pluralistic can help overcome these challenges easily by adopting some efficient approaches and incorporating local extension staff or village agricultural workers (VAW). In our country, the importance of VAWs is required to be more encouraged as they are performing as information brokers, facilitators, and basically linking all the agricultural organizations. VAWs are responsible for motivating farmers to seek their own solutions and also to build their trust level more upon them. To reduce the problem of gender discrimination at every step, research and analysis are required to ensure that both genders get benefits from the programs and training.

5. AUTHORS' CONTRIBUTIONS

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual

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8. ETHICAL APPROVALS

This study does not involve experiments on animals or human subjects.

9. DATA AVAILABILITY

All the data is available with the authors and shall be provided upon request.

9. USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declares that they have not used artificial intelligence (AI)-tools for writing and editing of the manuscript, and no images were manipulated using AI.

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