

Impact of JEEViKA on Women's Livelihood- A Comparative Study on Before and After JEEViKA Participation in the Micro Enterprises in Bihar

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Abstract - Government of Bihar takes various initiatives for women empowerment and upliftment. This study examines one such program known as JEEViKA to analyse its impact on women's livelihoods and micro-enterprise development in Patna District, Bihar. Using primary data from 197 women SHG members across Patna Sadar and Phulwarisharif blocks, the research employs descriptive statistics, Wilcoxon Signed Rank Test, Spearman correlation, and logistic regression to assess economic, social, and entrepreneurial outcomes. Findings reveal significant improvements in income generation, savings behaviour, access to credit, and financial autonomy. Women's participation in household decision-making, confidence, and social engagement increased remarkably. While more than half of women established micro-enterprises, challenges remain rooted in capital access, skill development, and market linkages. Recommendations include targeted skill upgradation, enterprise financing, market linkage development, digital literacy training, and longitudinal monitoring. The study highlights JEEViKA's effectiveness in promoting women's empowerment and livelihood security, while identifying structural constraints for sustainable enterprise scaling.

Keywords: JEEViKA, Women Empowerment, Micro-enterprises, Rural Livelihoods, Self-Help Groups (SHGs), Financial Inclusion, Bihar, Rural Women Empowerment, Rural Entrepreneurship, Savings, Credits, Decision- Making Power, Socio-Economics Transformation.

INTRODUCTION

JEEViKA, formally known as the Bihar Rural Livelihoods Project (BRLP), is a flagship initiative of the Government of Bihar, implemented by the Bihar Rural Livelihoods Promotion Society (BRLPS) with extensive financial backing from the World Bank. Launched in 2006 across six pilot districts and successfully scaled to all 38 districts by 2022, the program utilizes the Self-Help Group (SHG) model to facilitate the social and economic empowerment of rural women. The success of JEEViKA is rooted in a robust, multi-tiered governance structure designed to ensure strategic alignment and localized delivery. At the State level, the General Body and Executive Committee provide policy direction, led by a CEO-cum-State Mission Director who manages high-level coordination between the state government and international stakeholders. The District and Block levels focus on operational oversight, with District Project Managers (DPMs) and Block Project Managers (BPMs) supervising performance and implementation quality. On the front lines, at the Village and Hamlet level, Community Mobilizers (CMs) and Community Coordinators (CCs) engage directly with the populace. These grassroots workers are essential for mobilizing women into SHGs, providing technical training in financial literacy, and leading social campaigns on health, nutrition, and legal rights. In alignment with the Micro, Small and Medium Enterprises Development (MSMED) Act of 2006, JEEViKA focuses on the promotion of micro-enterprises as a vehicle for job creation and poverty reduction. For a developing region like Bihar, fostering SME (Small and Medium Enterprise) financing is vital. By providing rural women and youth with the capital and skills to innovate and expand, the program generates a powerful multiplier effect that stimulates inclusive growth and enables families to reinvest in their own communities. Academically, "Women's Livelihood" is defined as the complex set of activities and resources through which women secure their basic needs and sustain well-being. This concept acknowledges that women's economic strategies are fundamentally shaped by gender-specific social and institutional constraints. In context to the study conducted by different researcher and scholar in the field of microfinance to measure the impact of Jeevika, study conducted on the role of microfinance as a transformative tool for gender equality in Bihar conclude that, with the help of Jeevika under the initiative of microfinance, the women get economically empowered. The status of women belongs to SHGs get changed after joining SHGs under Jeevika

initiative and led to improvement in decision-making in family and society which also led to their social empowerment in the society at large [1]. Study conducted in the District of Jehanabad on effectiveness of self-help group in multidimensional development of women shows that with the involvement of women under the SHGs multidimensional improvement in the lives of women which include enhanced access to livelihood opportunities, increased employment and development of entrepreneurship skill take place. Along with this, the decision-making capability of women get also increases which overall led to the empowerment at social, economic, political and nutritional dimension [2]. Another study conducted on women's rural livelihood programme and mental health with reference to Jeevika in Bihar conclude that the women who belong to Jeevika through its SHGs programme have a good mental health as compare to those who are not a part of Jeevika programme. This analysis shows that due to the financial inclusion and increase in socio-economic status the empowerment of women can take place which led to good women's mental health [3]. Another study conducted on socio-economic upliftment of women under Jeevika conducted study on 120 respondents using personal interview using pre structured interview schedule conclude that after joining microfinance institution through Jeevika in Bihar, there is a significant increase on the socio-economic empowerment [4]. Study conducted to understand the role of Jeevika in economic empowerment of women with reference to Madhubani District of Bihar conclude that with the engagement of women through Jeevika the economic empowerment of women takes place [5]. Study conducted on Jeevika women and rural Bihar show that, SHGs participation contributes economic empowerment of women in Bihar in such a way that after participation in SHGs, women experience an increase in the income opportunity, saving behaviour and financial inclusion. With this study it is also observe that the women's self-confidence, mobility and participation on community-level decision-making also get increases [6]. Study to measure the role of SHGs under Jeevika in Livelihood promotion concludes that Jeevika emerged as a transformative model for the rural development. Through this model the income generation activity of an individual get increases which mainly ensure long term food and income stability [7]. Study on women's empowerment in rural Bihar highlights that microfinance significantly create a positive impact on the empowerment of women across economic, social and psychological dimension. The psychological dimension manifested through increase self-confidence, collective identity. With the participation of women under SHGs, it enhances their income generation activity, promote financial inclusion and strengthen women's involvement in household and community decision-making [8]. Another study on impact of Jeevika on socio-economic empowerment of rural women in Bihar conclude with the statement that Jeevika project had a positive impact on the socio-economic empowerment of women in Bihar. It significantly increases in the level of empowerment of rural women and also boost their personal and social development through income generation by providing equal opportunity [9]. In this context, initiatives such as JEEVIKA attempt to address these barriers by providing institutional support, financial access, and collective platforms for women's participation. The impact of JEEViKA on women's livelihoods is multi-faceted, ranging from financial autonomy to improved public health outcomes. By providing access to low-interest credit and formal banking linkages, the program helps women bypass exploitative informal moneylenders and establish independent income sources. This financial independence is frequently a precursor to broader empowerment, granting women the agency to make healthier lifestyle choices and access government social security schemes. Furthermore, by integrating market linkages, the program ensures fair pricing for rural products, thereby reducing the influence of middlemen and contributing to the long-term sustainability of income-generating activities. Building on this evidence, the present study seeks to apply a quantifiable, data-driven approach to examine the relationship among the various impacts of the program which includes economic independence, decision making, business development and self-empowerment. Researchers though studied the impact of it but didn't study the relation and intensity of these aspects in relation to one another. By assessing measurable outcomes in income stability and credit access, this research aims to provide empirical evidence regarding JEEViKA's role in transforming the socio-economic status of rural women in Bihar. The study becomes necessary in order to evaluate the objective fulfilment of JEEViKA with its quantifiable impact on woman's life, personality and business. This in return will help to assess the effectiveness of the program and suggest possible solutions to hidden inefficiencies of the program.

METHODOLOGY:

The research mainly examines the impact of JEEViKA led micro-enterprises on women's livelihood by comparing their life before and after joining JEEViKA. The research was focused on quantifying the impact to understand the strength of the program. It also aimed to analyse the pain points of the initiative to find out targeted solutions to improve its effectiveness. The study aims to examine the changes in women's income levels before and after participation in JEEViKA supported micro-enterprises. It assesses the impact of JEEViKA on women's savings and access to financial resources. It analyses changes in women's decision-making power within household and business activities after joining JEEViKA. It studies the effect of JEEViKA on women's social empowerment, including mobility, group participation, and networking. It evaluates the sustainability and growth of women-led micro enterprises before and after participation in JEEViKA. In order to verify these objectives, we considered five hypothesis

that is women's income levels significantly improve after participation in JEEViKA-supported micro-enterprises compared to before participation. Women associated with JEEViKA show higher savings and better access to credit facilities than before. Participation in JEEViKA increases women's involvement in household and business decision-making processes. Women engaged in JEEViKA experience higher levels of social empowerment (mobility, confidence, networking) than before participation. Micro-enterprises run by JEEViKA participants demonstrate greater sustainability and growth compared to their pre-participation stage. The target population consists of women entrepreneurs and members of Self-Help Groups (SHGs) under JEEViKA. The research design selected for the study was the descriptive and exploratory design, which encompasses Survey Method. It relies on primary as well secondary data sources. The questionnaire consisted of 16- closed-ended questions with Likert scale value assigned to options according to its relevance where the 'strongly agree' hold maximum value 5. Convenience and snowball sampling techniques were used to select respondents. Patna Sadar, and Phulwarisharif were the main areas of data collection in Patna, Bihar. Secondary data sources such as Bihar government annual report on JEEViKA, academic literature, research studies, and peer-reviewed journals were also used to collect existing data to support the research study. The pattern size of this study was 250-300 response out of which response of 197 participants provided complete data. However, 50 participants shared incomplete and rest 53 participants refused to give. The gathered data was then utilized for descriptive and statistical analysis. The methods used are descriptive statistics, binary logistic regression, Wilcoxon Signed Rank Test (Before – After Comparison), Spearman Rank Correlation and Coefficient, and chi-square test.

ANALYSIS AND RESULTS

In this study, we found out that 51% of the women had no income before joining JEEViKA and 39.6% of the women had income levels less than Rs. 8000. This indicates that many women were economically dependent and had low earning capacity. Furthermore, 39.6% women agreed that they had no savings before JEEViKA with 7.1% women being neutral. This shows that women had weak or inconsistent saving habits, highlighting their initial financial vulnerability. Later joining JEEViKA, 90.4% women agreed that they were now able to save. This indirectly underlines the increase earnings of women which results in increase in savings. It also shows that women developed regular saving habits, indicating that JEEViKA had been highly effective in promoting financial discipline and building saving culture among its members. This can further be restated using descriptive statistics where- Mean = 3.08, Median = 4, SD = 1.57 for savings before joining JEEViKA, indicating mixed experiences. However, after joining JEEViKA, Mean = 4.59, Median = 5, and SD = 0.76. The high mean and median indicate that most women now save regularly, reflecting improved financial discipline. 95.5% women agreed that they had easier access to loans and credit facilities after joining JEEViKA. This indicates that JEEViKA had been highly successful in connecting women to formal and semi formal credit channels, reducing their dependence on informal or exploitative sources. Moreover, 95.9% agree that JEEViKA has reduced their dependence on moneylenders leading to greater financial security and reduced vulnerability to debt traps. This can further be restated with descriptive statistics results where Mean is 4.77, Median is 5, and SD is 0.64. The majority of respondents strongly agree that JEEViKA has improved their access to credit. This shows effective financial inclusion and reduced dependence on informal lenders. 38.8% women disagreed with 16.8% being neutral that before joining they were actively involved in household, financial, or business decisions. This shows that decision making power was either low or inconsistent prior to their association with JEEViKA. However, after joining JEEViKA, 83.2% women agreed with 15.8% women being neutral that their participation has increased in decision making. This suggests that JEEViKA has significantly enhanced women's voice and influence in both household and entrepreneurial decisions. 88.8% women agreed that they now participate in decision making related to purchase of assets, 84.2% make decisions related to business activities and 99% about savings and investment decisions and 100% agree to making household expenditure decisions with 99% women agree to be involved in decision making related to her children's education. This indicates a major shift from earlier limited decision-making power to broad, multi-dimensional involvement in almost all critical household and business. Furthermore, Wilcoxon signed rank test, a non-parametric statistical method, was used to compare two related samples – 'decision-making scores before joining Jeevika and after joining Jeevika were paired for the same respondents', such as measurements taken from the same individuals at two different time points. Then the boxplot is used as a visual representation of this test to show changes in the distribution, median, and spread of decision-making scores over time. The purpose of applying the Wilcoxon Signed Rank Test was to assess whether participation in Jeevika has led to a significant change in women's decision-making ability. Compare pre-intervention and post-intervention outcomes. Evaluate the impact of Jeevika on women's empowerment in household and business decisions. The boxplot indicates a clear upward shift in decision- making scores after joining Jeevika. The median decision-making score after Jeevika is high, clustered around 4–5, indicating strong participation. The interquartile range is relatively narrow at the higher end, showing consistency among respondents. Only a few lower outliers are present, suggesting that most women experienced improvement. Compared to pre-Jeevika levels, post-Jeevika scores reflect greater involvement in decision-making. The findings demonstrate that women's

participation in decision-making has improved significantly after joining Jeevika. The concentration of higher scores suggests that Jeevika has played an important role in enhancing women's confidence, autonomy, and bargaining power within households and economic activities. This improvement reflects Jeevika's effectiveness as an empowerment-oriented intervention, enabling women to transition from passive roles to more active decision-makers. The limited presence of low scores indicates that while the impact is largely positive, a small group of women may still face social or structural constraints.

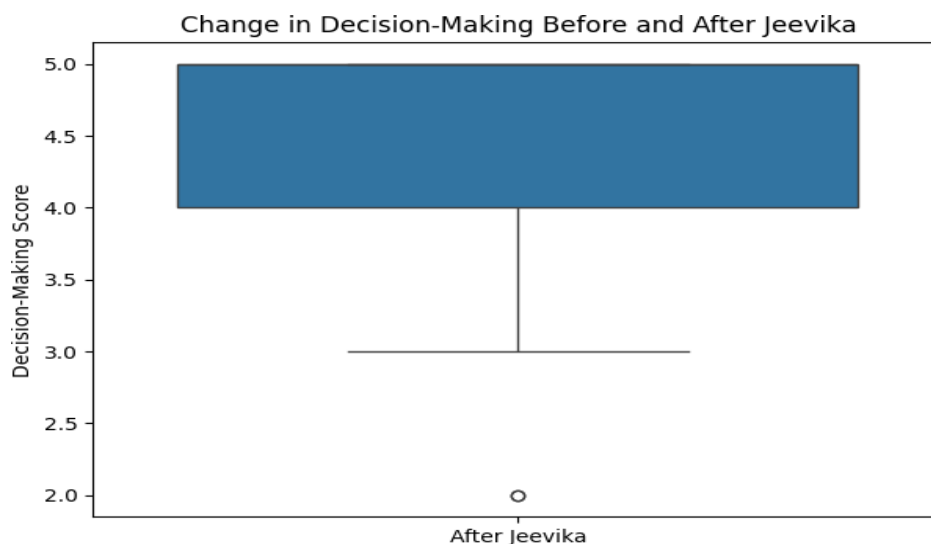


Figure 1: Boxplot Analysis of Decision Making Before and After Joining JEEViKA

This can further be reemphasized by the data where 93.9% women agreed with 5.6% being neutral that JEEViKA makes them feel empowered and confident to speak up for their rights. It indicates that JEEViKA had a positive effect on women's self-belief, voice, and the ability to assert their rights within family and community spaces. 97.4% women after joining JEEViKA participate in community groups, networking or collecting activities. This resulted in increasing women social engagement, collective involvement, and integration into community-based platforms. This can be restated using descriptive statistics where Mean is 4.78, Median is 5, and SD = 0.56. This is one of the highest rated outcomes. Women feel highly empowered and confident to assert their rights after joining JEEViKA. This led to active participation in community groups strengthening social capital. 61.7 % women agreed that have some sort of business or started a business joining JEEViKA engaging in income-generating activities. In which 35.53% women were tailoring, 22.31% were cattle rearing, and 20.66% engaged in running shop. Smaller proportion are involved in vegetable vending (3.31%), parlours (3.31%), farming (2.47%), office work (2.47%) and a variety of other activities such as laundry, catering, garbage collection, press work, labour, poultry farming, spice selling, and egg selling (each below 2%). These patterns suggest that JEEViKA has been effective in helping women move from no income to running micro-enterprise, most remain concentrated in traditional, low-income, informal and primary sector activities that require limited formal education and are vulnerable to low demand, limited market access, and capital requirements. This reemphasizes education level of women in Bihar which may be one of the causes for women engagement in these activities since female literacy is just over 50% in Bihar as per 2011 census. Moreover, women in rural areas have literacy rate of 29.6% in comparison to urban literacy rate of female that is 62.6%. 82.6% women agreed that their enterprise adopted more sustainable or improved business practices after joining JEEViKA as they experienced better business management, use of improved practices and greater sustainability in their micro-enterprises. For example, some bought more cattle like goat and cow, some bought tailoring machine and some invested in farming etc. More than 90% women agreed that they received skills or financial literacy training, financial assistance or loans and mentorship and guidance from joining JEEViKA. This reemphasizes internal lending functioning effectively. However, only 25% women agreed that they received market linkages or sales opportunities. 12.2% agreed to received raw material supply. This suggest while training and credit are widespread, forward and backward market integration remains limited. Despite these benefits, 66.8% women agreed that the biggest challenge in running their enterprise in lack of capital and 18.9% agreed for lack of training or skills. Women still feel undercapitalised and unable to adequately invest in or expand their businesses. Moreover, though women are trained but their learning is limited to non-technical and low skill activities. 11.2% women found limited market access problem and 2.6 % faced issue of lack of demand for their products. This points out to weak linkages with larger or profitable markets. Very few women cited time burden due to household and business with less than 0.5% women and none reported family restrictions explicitly as main challenge. Few even quoted that they got permission from household to work because of all female engagement in the group. This highlights the gender disparity and patriarchy existing in society limiting female engagement in society. 93.4% women agreed that

after JEEViKA, they manage their bank account and finances. And 89.3% women agreed that JEEViKA had improved their financial literacy and awareness about savings, loans and investments with 10.2% being normal. This indicates that they gained substantial knowledge and understanding of financial concepts through JEEViKA, which helps them make more informed decisions about savings, borrowing and investing. They often go to bank to submit team savings. However, some also quoted that in banks they still require help of bank employees to fill out the forms due to low education. JEEViKA has given them confidence to visit banks and understand process of depositing money or lending but still lack ability to read forms themselves.

	2. Did you have savings before joining Jeevika? (क्या जीविका से जुड़ने से पहले आपकी बचत थी?) _num	3. Do you have savings now after joining Jeevika? (जीविका से जुड़ने के बाद क्या अब आपकी बचत है?) _num	4. Do you have easier access to loans/credit facilities after joining Jeevika? (जीविका से जुड़ने के बाद क्या आपको ऋण/कर्ज सुविधाओं तक आसान पहुंच मिलती है?) _num	5. Before joining Jeevika, I was actively involved in household, financial, or business decisions. (जीविका से जुड़ने से पहले मैं घरेलू, वित्तीय या व्यापार संबंधी निर्णयों में सक्रिय रूप से शामिल थी।) _num	6. After joining Jeevika, my participation in decision-making within the family and business has increased. (जीविका से जुड़ने के बाद परिवार और व्यवसाय में निर्णय लेने में मेरी भागीदारी बढ़ी है।) _num	7. Do you feel more empowered and confident to speak up for your rights after joining Jeevika? (क्या जीविका से जुड़ने के बाद आप अपने अधिकारों के लिए आवाज उठाने में अधिक सशक्त और आत्मविश्वासी महसूस करती हैं?) _num	8. Do you now participate in community groups, networking, or collective activities? (क्या आप अब सामुदायिक समूहों, नेटवर्किंग या सामूहिक गतिविधियों में भाग लेती हैं?) _num	9. Has your enterprise adopted more sustainable or improved business practices after joining Jeevika? (क्या जीविका से जुड़ने के बाद आपके उद्यम ने अधिक टिकाऊ या बेहतर व्यावसायिक प्रथाएं अपनाई हैं?) _num	11. After joining Jeevika, you manage your bank account and finances. (जीविका से जुड़ने के बाद आप अपना बैंक खाता और वित्तीय लेन-देन स्वयं संभालती हैं।) _num	12. Jeevika has improved my financial literacy and awareness about savings, loans, and investments. (जीविका ने मेरी वित्तीय साक्षरता और बचत, ऋण तथा निवेश से संबंधित जागरूकता में सुधार किया है।) _num
count	197.000000	197.000000	197.000000	196.000000	196.000000	196.000000	196.000000	196.000000	196.000000	196.000000
mean	3.076142	4.58832	4.771574	3.591837	4.469388	4.780612	4.704082	4.408163	4.647959	4.642857
std	1.567947	0.761629	0.641748	1.315289	0.793617	0.561894	0.585451	0.880987	0.682038	0.683130
min	1.000000	2.000000	1.000000	1.000000	2.000000	2.000000	2.000000	1.000000	2.000000	2.000000
25%	1.000000	4.000000	5.000000	3.000000	4.000000	5.000000	4.750000	4.000000	4.000000	5.000000
50%	4.000000	5.000000	5.000000	4.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000
75%	4.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000
max	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000

Figure 2: Descriptive Analysis of Likert Scale Response

Thus, with the descriptive analysis of Likert-scale response of Figure 1, we can conclude that across all post JEEViKA indicators mean values exceed 4.4. Median response is consistently 5. Standard deviations are low. This indicates strong positive impact of Jeevika. Consistent empowerment across respondents and improvement in financial, social, and decision-making capacities. In short, JEEViKA has played a significant role in enhancing women's socio-economic empowerment in a consistent and meaningful manner. Furthermore, we used binary logistic regression (Figure 2) to examine the relationship between a binary dependent variable and one or more independent variables. In this study, binary dependent variable is coded as women who owns or has started business (assigned value 1) and women who does not own business (assigned value 0). The independent variables included in the model are: financial literacy after joining JEEViKA, level of empowerment, and participation in decision-making after joining JEEViKA. The model estimates how these factors influence the probability that a woman becomes a business owner. The purpose of using binary logistic regression is to identify key determinants of women's entrepreneurship, assess the impact of JEEViKA-related outcomes on business ownership, and understand which factors increase or decrease the likelihood of women starting or owning enterprises. Empowerment as a Predictor: The regression results show that empowerment has a positive coefficient, indicating a strong positive relationship with women's business ownership. Women who report higher levels of empowerment after joining JEEViKA are more likely to own or start a business. This can be further interpreted as empowerment enhances women's confidence, autonomy, and decision-making capacity, which are critical for entrepreneurial activities. This suggests that JEEViKA's role in strengthening women's self-belief and agency plays a central role in promoting entrepreneurship.

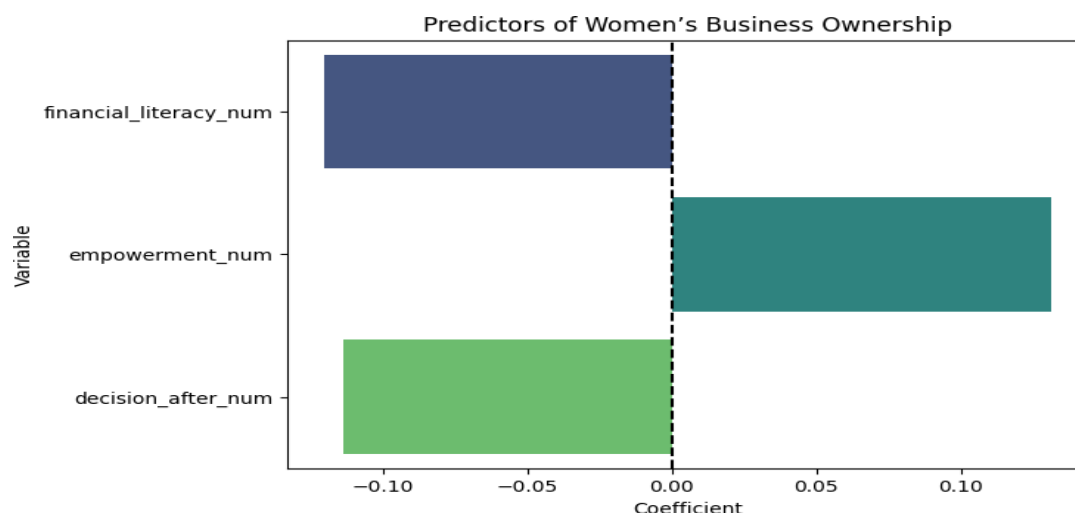


Figure 3: Binary Logistic Regression

Financial Literacy as a Predictor: Financial literacy shows a negative coefficient in the model indicating financial literacy alone does not significantly increase the probability of women becoming business owners. While financial literacy improves knowledge about savings, loans, and investments, it may not directly translate into business ownership unless combined with access to capital, markets, and social support. This indicates that knowledge without empowerment or resources may have limited entrepreneurial impact.

Decision-Making Participation as a Predictor: Participation in decision-making after joining Jeevika also shows a negative coefficient. Increased participation in household or business decision-making does not independently predict business ownership. This suggests that decision-making power within households may improve women's status but may not be sufficient for enterprise creation. Structural barriers such as capital constraints, market access, and other burdens may limit the translation of decision-making authority into entrepreneurial action.

The logistic regression analysis highlights that empowerment is the most influential factor in predicting women's business ownership. Financial literacy and decision-making participation, though important, appear to function as supportive or indirect factors rather than direct drivers. This finding underscores the idea that entrepreneurship among women is not driven by skills or knowledge alone, but by a broader process of social and psychological empowerment. This partial role of financial and decision-making factors reinforces the importance of adopting a holistic empowerment-based approach in women-centric livelihood and entrepreneurship programs.

Then, Spearman Rank Correlation Analysis, was visualized using a correlation heatmap. Spearman correlation is a non-parametric method used to measure the strength and direction of monotonic relationships between variables without assuming normal distribution in Figure 4. The purpose of this method was to examine the interrelationships among key empowerment indicators. Understand whether financial literacy, empowerment, and decision-making move together. Explore whether these empowerment dimensions are associated with business ownership. From the figure 4, it is known that financial literacy and empowerment show a moderate positive correlation ($r = 0.35$). Financial literacy and post-Jeevika decision-making are also moderately positively correlated ($r = 0.37$). Empowerment and decision-making demonstrate a positive relationship ($r = 0.33$). Business ownership shows very weak or near-zero correlation with financial literacy ($r = -0.02$), empowerment ($r = 0.01$) and decision-making ($r = -0.05$). The results indicate that financial literacy, empowerment, and decision-making are closely interconnected. Women with higher financial literacy tend to report greater empowerment and increased participation in household and business decisions after joining JEEViKA.

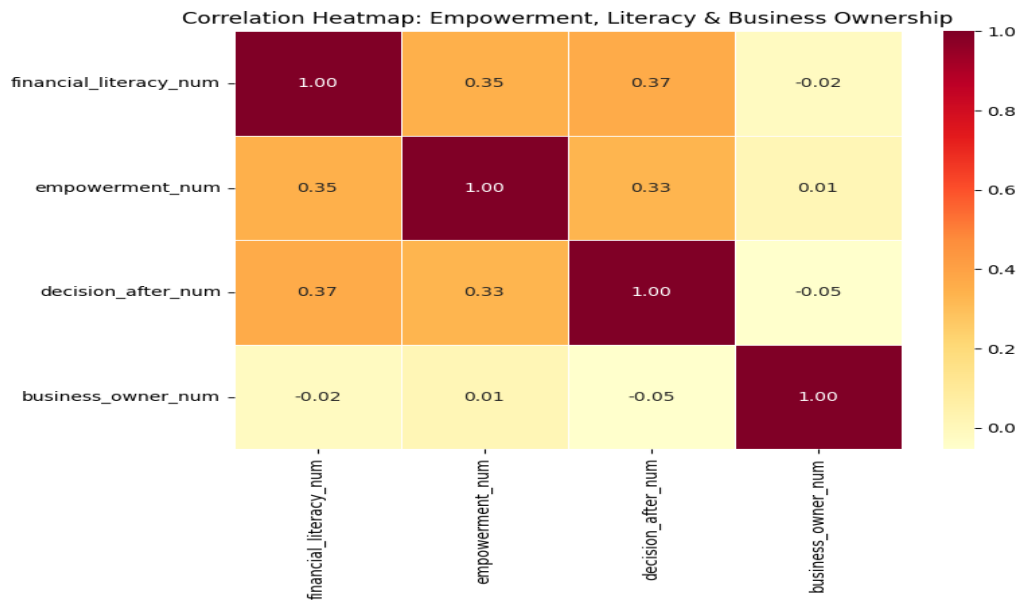


Figure 4: Spearman Rank Correlation Analysis using Heat Map

However, business ownership does not show a strong direct correlation with these empowerment indicators. This suggests that while empowerment improves women's agency and confidence, entrepreneurship may depend on additional external factors such as access to capital, market opportunities, or family support. Thus, empowerment appears to be a necessary but not sufficient condition for business ownership. The correlation analysis highlights JEEViKA's success in strengthening women's financial literacy, empowerment, and decision-making capacity, which reinforce each other. However, translating empowerment into entrepreneurship requires structural and economic support beyond personal capability building. While the correlation analysis (Figure 4) shows that business ownership has a weak direct association with empowerment, financial literacy, and decision-making, the logistic regression results reveal a more nuanced relationship. The regression model (Figure 3) indicates that empowerment significantly increases the likelihood of women engaging in entrepreneurial activities when other factors are controlled. This apparent difference suggests that the relationship between empowerment and business ownership is not directly linear but conditional. Empowerment alone may not guarantee entrepreneurship, but it becomes a crucial enabling factor when combined with supportive conditions such as access to resources, capital, and opportunities. Therefore, empowerment should be understood as a latent driver that influences entrepreneurship indirectly, rather than as a variable that shows strong independent correlation. Chi-square test was used to examine whether there is a statistically significant association between women's business ownership status and their access to loan or credit facilities after joining Jeevika. The two hypotheses for the test are: H0: There is no association between women's business ownership status and access to loans or credit facilities after joining Jeevika. H1: There is a significant association between business ownership and access to loans after joining Jeevika.

Do you have business or did you start a business	Response
yes	121
no	75

```
contingency = pd.crosstab(  
    df["do_you_have_business_or_did_you_start_a_business"],  
    df["4_do_you_have_easier_access_to_loanscredit_facilities_after_joining_jeevika_____"]  
)  
  
chi2, p, dof, expected = stats.chi2_contingency(contingency)  
  
print("Chi-square:", chi2)  
print("p-value:", p)  
  
... Chi-square: 7.284980008187016  
p-value: 0.12157314960745687
```

Figure 5: Chi Square Test to Study Relationship Between Owning Business and Access to Loans/Credits

Results show that Chi-square value is 7.28, p-value is 0.12, and level of significance is 0.05. The p-value (0.12) is greater than the standard significance level of 0.05. Therefore, the null hypothesis cannot be rejected. The results indicate that there is no statistically significant association between business ownership and easier access to loans or credit facilities among the respondents. This suggests that although JEEViKA provides financial inclusion mechanisms, loan access does not differ significantly between women who own businesses and those who do not. In other words, both business-owning and non-business women appear to have similar levels of access to credit, implying that JEEViKA's financial services may be broad-based and inclusive, rather than targeted only toward entrepreneurs. Thus, there is no statistically significant association between women's business ownership status and their access to loans or credit facilities after joining Jeevika which can be proven with JEEViKA credit facility available for all its members. However, external loans may be specific to women owning business. The absence of disparity suggests that Jeevika's financial services are equitable and inclusive, ensuring that credit access is not restricted only to entrepreneurs but is available to all participating women. This reflects the program's success in promoting broad-based financial inclusion, rather than selective business owners. The results indicate that credit access alone may not be sufficient to drive enterprise creation or expansion. While women may have access to loans, additional constraints—such as lack of market linkages, limited business skills, risk aversion, or household responsibilities—may prevent credit from translating into entrepreneurial outcomes. Therefore, the findings highlight the need for targeted credit products, along with complementary support such as entrepreneurship training, mentoring, and market access, to enable women to effectively use financial resources for business growth.

CONCLUSION

This study demonstrates that JEEViKA has profoundly transformed rural women's socio-economic conditions in Bihar, fostering financial inclusion, decision-making autonomy, and empowerment. Pre-intervention, participants faced economic dependence (51% with no income), limited savings (39.6% with no savings), and minimal decision-making roles (38.8% disagreed with prior involvement). Post-JEEViKA, stark improvements emerged: 90.4% now save regularly (mean = 4.59, SD = 0.76), 95.5% report easier credit access, and 83.2% participate more in decisions, with near-universal involvement in household expenditures (100%) and children's education (99%). Statistical analyses reinforce these shifts as the Wilcoxon signed-rank test and boxplot reveal a significant upward trajectory in decision-making scores, while high Likert-scale means (>4.4) and low standard deviations across indicators signal consistent empowerment. Entrepreneurship outcomes are promising yet constrained as 61.7% started businesses, primarily in low-skill sectors like tailoring (35.53%) and cattle rearing (22.31%), bolstered by training (90%+) and sustainable practices (82.6%). Binary logistic regression identifies empowerment as the strongest predictor of business ownership (positive coefficient), with financial literacy and decision-making playing supportive roles. Spearman correlations ($r \approx 0.33$ – 0.37) confirm interconnections among these factors, though business ownership shows weak direct links, underscoring empowerment's latent, conditional influence. Notably, chi-square tests ($p = 0.12$) reveal no significant association between credit access and ownership, highlighting JEEViKA's equitable financial inclusion but also persistent barriers like capital shortages (66.8%) and weak market linkages (only 25% access). While JEEViKA excels in building agency, confidence (93.9% feel empowered), and social capital (97.4% in community groups), challenges persist in scaling enterprises beyond informal activities, partly tied to Bihar's low female literacy (more than 50% 29.6% rural). In Bihar's rural context, JEEViKA stands out as a highly successful, scalable model of women-led development, mobilizing millions into self-help groups. These findings affirm its role as a catalyst for reshaping patriarchal norms through psychological empowerment and financial inclusion. However, enhancements are essential for targeted entrepreneurship training, market integration, financial literacy for leaders and members, and gender-sensitive credit products. Women Leaders (Community Leaders in JEEViKA), who require only high school education, report inconsistent training,

underscoring education gaps and the need for updated programs on technology, finances, and business knowledge. Dedicated enterprise financing at the Cluster Level Federation (CLF) level, incubation for high-potential ventures, structured digital linkages, and performance monitoring would elevate it from survival-focused to growth-oriented. Future programs should adopt holistic approaches, integrating psychological empowerment with structural supports to bridge the inclusion-to-sustainability gap. For future research, experimental designs such as randomized controlled trials with educational training for control groups could more rigorously isolate JEEViKA's impacts and inform policy. In conclusion, JEEViKA has laid a strong foundation for women's empowerment and economic participation in Bihar. With these strategic evolutions, it holds immense potential to transform empowered women into sustainable entrepreneurs, fostering inclusive growth, poverty reduction, and a resilient rural economy.

Abbreviations

SHG: Self Help Groups, DPM: District Project Managers, BRLP: Bihar Rural Livelihoods Project, BRLPS: Bihar Rural Livelihoods Promotion Society, BPM: Block Project Managers, CM: Community Mobilizers, CC: Community Coordinators, and MSMED: Micro, Small and Medium Enterprises Development

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Author Contributions

The manuscript has accurate citations for all sources. All facets of this study, including literature reviews, secondary source data gathering, primary data collection, analysis, conclusion, and manuscript writing, were entirely the author's responsibility.

Conflict of Interest

Regarding this study, the author discloses no conflicts of interest.

Ethics Approval

This study is primarily based on primary data collection following the CITI guidelines for data collection. Secondary data sources like available reports, official government documents and academic publications have been utilised for study and analysis.

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