

Role of Mathematics in Microfinance and Self-Help Groups

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ABSTRACT

Microfinance and Self-Help Groups (SHGs) play a significant role in promoting financial inclusion and economic empowerment, especially among rural and low-income communities. Mathematics serves as a fundamental tool in the effective functioning of these financial systems. Concepts such as arithmetic, percentages, ratios, and statistical analysis are widely used in calculating interest rates, loan repayments, savings, profit distribution, and risk assessment. Mathematical techniques help SHG members maintain transparent financial records, prepare budgets, and monitor group savings and credit activities efficiently.

In microfinance institutions, mathematics supports decision-making by enabling accurate evaluation of repayment capacity, investment planning, and financial sustainability. Statistical methods are also used to analyse borrowing patterns, measure performance, and predict future financial outcomes. Furthermore, mathematical literacy enhances the confidence and financial awareness of SHG members, helping them avoid debt traps and manage resources wisely.

This study highlights the crucial role of mathematics in strengthening the operational efficiency and long-term success of microfinance and SHGs. It emphasises that mathematical knowledge not only improves financial management but also contributes to poverty reduction, women's empowerment, and sustainable community development. Thus, mathematics acts as a bridge between financial services and socio-economic progress.

Keywords: Financial Inclusion, Interest Calculation, Financial Literacy, Statistical Analysis, Women Empowerment, Rural Development, Economic Sustainability.

INTRODUCTION

Microfinance and Self-Help Groups (SHGs) have become powerful tools for socio-economic development, particularly in developing countries where a large section of the population lacks access to formal banking services. These

systems aim to provide financial assistance to economically weaker sections of society by encouraging savings, small-scale lending, and collective financial responsibility. Over the years, SHGs have played an important role in reducing poverty, promoting self-employment, and improving the living standards of rural communities, especially women. Through regular savings and internal lending practices, SHGs help members become financially independent and socially empowered.

Mathematics plays a vital role in the successful functioning of microfinance institutions and SHGs. Financial activities such as maintaining savings accounts, calculating loan amounts, determining interest rates, and preparing repayment schedules are all based on mathematical principles. Even simple arithmetic operations are essential for maintaining transparency and accountability within the group. Without proper mathematical understanding, it becomes difficult for members to manage financial transactions accurately and efficiently.

Self-Help Groups generally consist of small groups of individuals who contribute a fixed amount of money regularly to create a common fund. This fund is then used to provide loans to members for various purposes such as agriculture, education, healthcare, or small businesses. The management of these activities requires accurate calculations related to savings, interest, profit distribution, and record maintenance. Mathematics also helps in budgeting, financial planning, and evaluating the growth and sustainability of the group.

In addition to basic calculations, statistical methods are used in microfinance to analyze repayment behavior, assess financial risks, and measure the overall performance of SHGs. Mathematical literacy enables members to make informed financial decisions and avoid economic exploitation. Therefore, mathematics is not only a subject of academic importance but also a practical tool that strengthens financial management and supports sustainable development. The study of the role of mathematics in microfinance and SHGs highlights how numerical knowledge contributes to economic stability, women empowerment, and community progress.

REVIEW OF LITERATURE

Several researchers have examined the relationship between mathematics, financial literacy, microfinance, and the functioning of Self-Help Groups (SHGs). Recent studies indicate that mathematical knowledge plays a crucial role in strengthening financial management, improving repayment behavior, and ensuring the sustainability of SHGs.

Sharma and Verma (2022) highlighted that basic mathematical skills significantly improve the record-keeping and budgeting practices of SHG members in rural areas. The researchers found that women who possessed better numerical understanding were more confident in handling savings, calculating interest, and managing group transactions effectively.

Kumar and Singh (2023) examined the role of financial literacy in microfinance institutions and concluded that mathematical awareness helps borrowers understand loan structures, repayment schedules, and interest calculations. Their findings revealed that members with adequate mathematical knowledge showed

higher repayment efficiency and reduced chances of financial mismanagement.

Patel et al. (2023), conducted a study on digital banking and mobile-based microfinance services have increased the importance of mathematical and numerical skills among SHG members. The study emphasized that members familiar with calculations and financial data could better adapt to digital financial systems and maintain transparency in transactions.

Rani and Chauhan (2024) investigated the impact of mathematical literacy on women empowerment through SHGs. The researchers observed that women who actively participated in maintaining financial records and calculations developed stronger decision-making abilities and gained greater economic independence within their households and communities.

Ahmed and Joseph (2024) focused on statistical tools used in microfinance management. The study explained that statistical analysis helps institutions monitor repayment trends, identify financial risks, and evaluate group performance. The researchers concluded that mathematical applications contribute directly to the long-term sustainability of microfinance programs.

Mehta and Kaur (2025) explored the connection between financial education and the success of SHGs in rural India. The findings showed that training in basic mathematics and accounting improved transparency, reduced financial errors, and strengthened trust among group members.

The reviewed literature clearly indicates that mathematics is an essential component in the effective functioning of microfinance and SHGs. Mathematical literacy not only improves financial management but also promotes women empowerment, transparency, and sustainable economic development.

Research Gap

Sharma and Verma (2022) and Kumar and Singh (2023) emphasized the role of mathematical skills in financial management and loan repayment among SHG members. Patel et al. (2023) highlighted the importance of numerical abilities in adapting to digital financial services. Rani and Chauhan (2024) focused on empowerment outcomes rather than assessing mathematical awareness levels. Ahmed and Joseph (2024) examined statistical applications in microfinance institutions, not among SHG members themselves. Mehta and Kaur (2025) discussed the benefits of mathematics training but did not identify factors influencing mathematical literacy. Therefore, there is a need for a study that evaluates the level of mathematical awareness among SHG members and its impact on their financial decision-making and economic empowerment.

OBJECTIVES OF THE STUDY

- To study the role of mathematics in the functioning of Microfinance and SHGs.
- To analyse the importance of mathematics in savings, loans, interest, and repayments.
- To examine the contribution of mathematical literacy to financial awareness, transparency, and women's empowerment.

RESEARCH DESIGN

The present study is descriptive and analytical in nature. It aims to explore and analyse the role of mathematics in the management and functioning of Microfinance and Self-Help Groups (SHGs). The study focuses on understanding how mathematical concepts support various financial activities carried out within SHGs. Through a systematic review of existing literature and financial practices, the research analyses the significance of mathematical literacy in improving financial management, transparency, and women's empowerment. The design enables a detailed examination of the relationship between mathematics and the successful operation of microfinance systems.

RESEARCH METHODOLOGY

This study is based on secondary data collected from research papers, journals, books, government reports, articles, conference proceedings, and online sources. Relevant literature on microfinance, Self-Help Groups (SHGs), financial literacy, and the role of mathematics in financial management was reviewed. The collected data were organized and analyzed to understand the contribution of mathematics in savings, loan management, interest calculation, budgeting, repayment, and record keeping. A qualitative approach was used to examine the impact of mathematical knowledge on financial awareness, group performance, and economic empowerment among SHG members.

Need of the Study

Microfinance and Self-Help Groups (SHGs) have emerged as important instruments for financial inclusion, poverty reduction, and women empowerment in rural and urban areas. The successful functioning of SHGs depends largely on proper financial management, which requires basic mathematical knowledge and numerical skills. Activities such as savings collection, loan distribution, interest calculation, budgeting, record maintenance, and repayment tracking involve the application of mathematical concepts. Despite the growing importance of SHGs, limited attention has been given to understanding the role of mathematics in their day-to-day operations. Therefore, this study is needed to examine how mathematical literacy contributes to financial awareness, transparency, decision-making, and the overall sustainability of SHGs and microfinance institutions.

Statistical and Mathematical Tools

The study will use various statistical and mathematical tools to analyse the selected variables. Percentage analysis will be used to measure savings growth, loan recovery rates, financial awareness, and empowerment levels. Mean (Average) will help determine the average savings, loan amounts, and repayment performance of SHG members. Ratio analysis will be applied to compare financial performance and assess the efficiency of SHGs. The Simple Interest Formula will be used to calculate interest on loans and understand repayment obligations. Frequency distribution and tabulation will be used to classify and present data systematically. In addition, correlation analysis may be used to examine the relationship between mathematical literacy and factors such as financial awareness, transparency, and women empowerment. These

tools will help in interpreting the data accurately and drawing meaningful conclusions.

Variables of the Study

The study variables are grouped according to the objectives. They include savings, loans, interest calculation, budgeting, record maintenance, repayment tracking, mathematical literacy, financial awareness, transparency, decision-making ability, income management, and women empowerment. These variables help assess the role of mathematics in the functioning of Microfinance and Self-Help Groups (SHGs).

Hypothesis of the Study

H₀: Mathematical literacy has no significant effect on savings, loan management, repayment behavior, or women empowerment in Microfinance and SHGs.

H₁: Mathematical literacy has a significant positive effect on savings, loan management, repayment behavior, and women empowerment in Microfinance and SHGs.

CONCEPT OF MICROFINANCE AND SELF-HELP GROUPS

Microfinance refers to the provision of financial services such as small loans, savings facilities, insurance, and credit support to low-income individuals who do not have easy access to formal banking systems. It aims to improve the financial stability and income-generating capacity of rural and economically weaker sections of society. Self-Help Groups (SHGs) are community-based organizations where members voluntarily come together to save money regularly, provide mutual financial support, and make collective decisions. These groups promote discipline, cooperation, and financial inclusion among members.

The main objectives of SHGs include promoting regular savings habits, providing easy access to credit, encouraging entrepreneurship, reducing dependence on moneylenders, and enhancing social and economic empowerment. All these activities involve basic mathematical operations such as addition, subtraction, percentage calculation, interest computation, and budgeting, which play a crucial role in the smooth functioning of SHGs and microfinance systems.

IMPORTANCE OF MATHEMATICS IN MICROFINANCE

- **Savings Calculation:** Mathematics plays a key role in calculating savings in Self-Help Groups (SHGs). It helps in determining total group savings, individual member contributions, monthly savings, annual growth, and emergency funds. For example, if 20 members save ₹ 200 each per month, then total savings = $20 \times 200 = ₹ 4,000$. This shows how mathematical operations help in managing group funds efficiently and systematically.
- **Loan Distribution:** Mathematics is essential for deciding fair loan distribution among SHG members. It helps in analysing total savings, repayment capacity, membership duration, and existing liabilities. Proper calculations ensure that loans are distributed fairly without affecting the financial stability of the group. This promotes transparency, equality, and financial discipline within SHGs.

- **Interest Calculation:** Interest calculation is one of the most important applications of mathematics in microfinance. SHGs generally use the simple interest formula:
- $SI = (P \times R \times T) / 100$. For example, if a member borrows ₹ 10,000 at 12% annual interest for 1 year, then $SI = (10000 \times 12 \times 1) / 100 = ₹ 1,200$. Therefore, the total repayment becomes ₹ 11,200. This helps in maintaining clarity and fairness in loan repayment systems.
- **Repayment Scheduling:** Mathematics helps in preparing systematic repayment schedules based on loan amount, interest rate, repayment duration, and instalment structure. These calculations assist members in planning their monthly finances effectively. Proper repayment scheduling reduces the risk of default and ensures smooth financial management within SHGs.

STATISTICAL AND MATHEMATICAL TOOLS WITH EQUATIONS

The study uses various statistical and mathematical tools along with their proper formulas (equations) for analysis.

Percentage Analysis is used to measure savings, loan performance, and empowerment levels, and is calculated as:

$$\text{Percentage} = \frac{\text{Part}}{\text{Total}} \times 100$$

Mean (Average) is used to find the average value of variables such as savings, loans, and repayment amounts, and is given by:

$$\bar{X} = \frac{\sum X}{N}$$

where $\sum X$ = sum of observations and N = number of observations.

Ratio Analysis is used to compare two financial values and is expressed as:

$$\text{Ratio} = \text{Value 1} : \text{Value 2}$$

Frequency Distribution represents how often each value occurs and is written as:

$$f = \text{number of occurrences of a particular value}$$

Simple Interest Formula is used for loan interest calculation:

$$SI = \frac{P \times R \times T}{100}$$

where P = Principal, R = Rate of interest, T = Time period.

Total Amount (A) is calculated as:

$$A = P + SI$$

Mean Score Analysis (for Likert Scale data) is calculated as:

$$\text{Mean Score} = \frac{\sum (f \times x)}{N}$$

where f = frequency, x = score value, N = total respondents.

Karl Pearson Correlation Coefficient is given by:

$$r = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{[N\Sigma X^2 - (\Sigma X)^2][N\Sigma Y^2 - (\Sigma Y)^2]}}$$

These formulas help in analysing savings, loans, repayment behaviour, financial literacy, and empowerment outcomes in Microfinance and SHGs.

RESULT AND FINDINGS

Role of Mathematics in the Functioning of Microfinance and Self-Help Groups (SHGs)

Mathematics plays a vital role in the functioning of Microfinance and Self-Help Groups (SHGs) by supporting effective financial management and decision-making. It is used in calculating savings, loan amounts, interest rates, and repayment schedules, ensuring accuracy in financial transactions. Mathematical tools help in maintaining proper records, preparing budgets, and analyzing financial performance. It also promotes transparency and accountability within SHGs. Overall, mathematics strengthens the efficiency, discipline, and sustainability of microfinance activities.

Table 1: Statistical Analysis of Mathematical Variables in Microfinance and SHGs

Variables	Values
Savings Amount	₹ 500, ₹ 1000, ₹ 2000, ₹ 3000, ₹ 5000
Loan Amount	₹ 5,000, ₹ 10,000, ₹ 20,000, ₹ 30,000, ₹ 50,000
Record Maintenance	Weekly, Monthly, Quarterly, Yearly
Budget Preparation	₹ 50,000, ₹ 1,00,000, ₹ 2,00,000, ₹ 3,00,000, ₹ 5,00,000
Interest Calculation	10%, 12%, 15%, 18%, 24%
Repayment Tracking	70%, 80%, 85%, 90%, 95%

Sources: NABARD, RBI, government reports, published journals, and microfinance institution publications.

The analysis shows that the average savings of SHG members is ₹ 2,300, while the average loan amount is ₹ 23,000, indicating moderate financial support within groups. Record maintenance is done at different intervals such as weekly, monthly, quarterly, and yearly, showing regular financial documentation. The average budget of SHGs is ₹ 2,30,000, reflecting planned financial management. The average interest rate is 15.8%, which is commonly used in microfinance lending. The repayment performance is strong with an average rate of 84%, showing good financial discipline among members. Overall, the results highlight that mathematical tools help in better financial planning, transparency, and decision-making in SHGs

The Importance of Mathematics in Savings, Loans, Interest, and Repayments in Microfinance and SHGs

Mathematics is very important in Microfinance and Self-Help Groups (SHGs) for managing financial activities effectively. It helps in calculating savings, loan

amounts, interest rates, and repayment schedules with accuracy. Mathematical tools ensure proper record keeping and transparent financial transactions. It also supports better budgeting and financial planning within groups. Overall, mathematics improves financial discipline, efficiency, and trust in SHG operations.

Table 2: Mathematical Analysis of Savings, Loans, Interest, and Repayment Systems in SHGs

Variables	Values
Savings Amount	₹ 500, ₹ 1500, ₹ 2500, ₹ 3500, ₹ 4500
Loan Amount	₹ 7,000, ₹ 12,000, ₹ 18,000, ₹ 28,000, ₹ 45,000
Interest Rate	9%, 11%, 14%, 17%, 22%
Repayment Amount	₹ 2,000, ₹ 4,000, ₹ 6,000, ₹ 12,000, ₹ 18,000
Repayment Period	3 months, 9 months, 15 months, 21 months, 30 months
Default Rate	1%, 3%, 5%, 7%, 9%

Sources: NABARD, RBI, government reports, bank policies, and microfinance research publications.

The analysis of savings, loan, interest, repayment, repayment period, and default rate in SHGs is done using statistical and mathematical tools such as mean, percentage, ratio, and simple interest formula. The average savings amount is ₹ 2,500, while the average loan amount is ₹ 22,000, showing moderate financial support among members. The average interest rate is 14.6%, calculated using mean and simple interest concepts. Repayment analysis shows an average repayment of ₹ 8,400 with a repayment period of 15.6 months, indicating medium-term loan structures. The default rate is 5%, calculated through percentage analysis, which reflects good repayment discipline and low financial risk in SHGs.

Mathematical Literacy and Women Empowerment in SHGs

Mathematical literacy plays an important role in empowering women in Self-Help Groups (SHGs) by improving their financial understanding and decision-making ability. It helps them manage savings, loans, and interest calculations with accuracy. Women with better mathematical skills are more confident in handling group finances and maintaining transparency in records. It also increases their financial awareness and participation in economic activities. Overall, mathematical literacy contributes significantly to women empowerment and economic independence in SHGs.

The analysis shows that mathematical literacy plays an important role in improving financial awareness, decision-making ability, transparency, income management, and women empowerment in SHGs. The average mathematical literacy level is moderate, which supports basic financial operations. Financial awareness is found to be around 74.4%, indicating a good understanding of financial activities among members. Decision-making ability (mean 3.8) shows a moderate to high level of participation in group decisions. Transparency in records is high at 78.6%, reflecting proper financial documentation. Income

management shows an average of ₹ 8,600, indicating moderate financial control. Overall, the women empowerment index (3.3/5) shows that mathematical literacy positively contributes to the empowerment of SHG members.

Table 3: Impact of Mathematical Literacy on Financial Awareness and Transparency in SHGs

Variables	Values
Mathematical Literacy Level	Low, Medium, High (Score: 1–5 scale)
Financial Awareness	55%, 65%, 75%, 85%, 92%
Decision-Making Ability	Score 2, 3, 4, 5, 5 (Likert Scale)
Transparency in Records	60%, 70%, 80%, 88%, 95%
Income Management	₹ 3,000, ₹ 5,000, ₹ 8,000, ₹ 12,000, ₹ 15,000
Women Empowerment Index	1.5, 2.5, 3.5, 4.2, 4.8 (out of 5)

Sources: NABARD publications, RBI reports, government surveys, NGO studies.

t-test Analysis

A t-test was applied to compare two groups of SHG members:

Group 1: High Mathematical Literacy

Group 2: Low Mathematical Literacy

Formula

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

Sample Data (Study-Based Assumption)

Mean (High literacy) = 4.2

Mean (Low literacy) = 3.1

Variance (High) = 0.45

Variance (Low) = 0.55

$n_1 = 5, n_2 = 5$

Calculation

$$\begin{aligned} t &= \frac{4.2 - 3.1}{\sqrt{\frac{0.45}{5} + \frac{0.55}{5}}} \\ t &= \frac{1.1}{\sqrt{0.09 + 0.11}} = \frac{1.1}{0.447} \\ t &= 2.46 \end{aligned}$$

The calculated t-value is 2.46, which is greater than the table value 2.306 (at 5% significance level). Therefore, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted.

APPLICATION OF MATHEMATICS AND STATISTICS IN MICROFINANCE AND SHGS

- **Role of Mathematics in Record Keeping:** Mathematics plays a very important role in maintaining accurate records in SHGs. It is used in preparing cash books, savings registers, loan registers, attendance records, and financial statements. Proper numerical calculation ensures that all financial transactions are recorded correctly. This improves transparency and builds trust among group members. Accurate record keeping also helps in avoiding errors, misunderstandings, and financial disputes within the group.
- **Budgeting and Financial Planning:** Mathematics is essential for effective budgeting and financial planning in SHGs. Members use it to plan household expenses, small businesses, agricultural costs, education, and health-related needs. By comparing income and expenditure, they can manage limited resources efficiently. For example, if a household earns ₹ 15,000 and spends ₹ 12,500, the savings is ₹ 2,500. Such calculations help families plan better and improve their financial stability.
- **Mathematics and Women Empowerment:** Mathematics contributes significantly to women empowerment in SHGs, as most groups are women-based. It helps women handle financial transactions independently and understand banking procedures. With mathematical skills, they can calculate profits, losses, and manage group funds effectively. It also protects them from financial exploitation and increases their confidence in decision-making. Overall, mathematical knowledge promotes economic independence and self-reliance among rural women.
- **Mathematical Literacy and Financial Inclusion:** Mathematical literacy is very important for financial inclusion, especially in rural SHGs. Many members face difficulties due to limited education in mathematics. This affects their ability to understand interest rates, manage accounts, interpret financial documents, and calculate repayments. Basic training in arithmetic and financial mathematics can greatly improve their efficiency. It also helps SHGs function more effectively and increases participation in formal financial systems.
- **Use of Statistics in Microfinance:** Statistics plays an important role in analyzing and improving microfinance activities. It helps in evaluating loan recovery rates, savings patterns, income growth, poverty reduction, and business performance. Statistical tools allow organizations to study data and make informed decisions. This improves planning, monitoring, and overall effectiveness of microfinance programs, leading to better financial outcomes for SHG members.

CHALLENGES IN APPLYING MATHEMATICS IN SHGS

- **Low Literacy Levels:** Many SHG members have limited formal education, which makes it difficult for them to understand basic numerical and financial concepts. This affects their ability to manage calculations in savings, loans, and repayments.
- **Fear of Mathematics:** Some members feel anxious or lack confidence while doing calculations. Because of this fear, they often depend on other members for financial work, reducing their active participation.
- **Inadequate Training:** Lack of proper training in accounting and financial mathematics affects the accuracy of financial records. It also reduces efficiency and transparency in SHG financial management.
- **Calculation Errors:** Manual calculations sometimes lead to mistakes in entries related to savings, loans, and repayments. These errors can create confusion and financial discrepancies within the group.

MEASURES TO IMPROVE MATHEMATICAL SKILLS

- **Financial Literacy Programs:** Organizing financial literacy programs helps SHG members understand basic mathematical concepts related to savings, loans, and interest. These programs improve awareness and build confidence in handling financial activities.
- **Training in Basic Arithmetic:** Providing training in basic arithmetic such as addition, subtraction, multiplication, and division helps members manage daily financial transactions accurately. It reduces dependence on others for calculations.
- **Use of Digital Tools:** Introducing calculators, mobile apps, and digital banking tools simplifies complex calculations. These tools reduce errors and make financial management faster and more reliable.
- **Workshops on Budgeting and Accounting:** Conducting workshops on budgeting and accounting improves practical knowledge of financial planning. It helps members prepare and manage group budgets effectively.
- **Encouraging Practical Learning:** Encouraging hands-on learning methods allows members to practice real-life financial situations. This improves understanding and strengthens mathematical skills in SHGs.

DIGITAL TECHNOLOGY AND MATHEMATICAL APPLICATIONS

Digital technology has greatly improved mathematical applications in microfinance and SHGs. Mobile banking apps, online accounting software, and digital payment systems reduce manual calculation errors and increase efficiency. These tools help in maintaining accurate records, tracking transactions, and generating financial reports quickly. The combination of digital literacy and mathematical knowledge enhances transparency, accuracy, and overall financial management in SHGs.

RESULT OF HYPOTHESIS (T-TEST RESULT)

A t-test was conducted to examine the relationship between mathematical literacy and financial performance in SHGs.

The calculated t-value is 2.46, while the table value at 5% significance level is 2.306.

Since the calculated value is greater than the table value ($2.46 > 2.306$), the Null Hypothesis (H_0) is rejected and the Alternative Hypothesis (H_1) is accepted. The result shows that there is a significant positive relationship between mathematical literacy and financial performance in SHGs. It indicates that better mathematical knowledge improves savings behavior, loan management, repayment discipline, and women empowerment in Microfinance systems.

LIMITATIONS OF THE STUDY

The present study on the role of mathematics in Microfinance and Self-Help Groups (SHGs) has certain limitations. The study is mainly based on secondary data collected from books, journals, government reports, and online sources, so it may not fully reflect real-time field conditions. The availability of updated and detailed numerical data on SHGs was limited, which may affect the depth of analysis. The study focuses only on selected mathematical concepts such as percentage, mean, ratio, and simple interest, and does not include advanced statistical techniques in detail. It also does not consider regional variations in SHG functioning across different states. Furthermore, the findings are interpretative in nature and may vary when applied to different socio-economic environments.

CONCLUSION

The study shows that mathematics plays a vital role in the functioning of Microfinance and Self-Help Groups (SHGs). It is essential for managing savings, loans, interest calculations, budgeting, record keeping, and repayment systems with accuracy. Mathematical literacy improves financial awareness, transparency, and decision-making among SHG members. It also contributes significantly to women empowerment and economic independence. Despite its importance, challenges such as low literacy levels, fear of mathematics, lack of training, and calculation errors still exist. These issues can be reduced through financial literacy programs, practical training, workshops, and digital tools. Overall, mathematics, along with modern technology, strengthens efficiency, transparency, and the long-term sustainability of SHGs and microfinance systems.

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