

### Sustainable Micro-Finance and Rural Development Green Investing

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**Abstract:** The research examines the dual nature of microfinance as a development intervention, highlighting both its potential benefits and drawbacks for low-income groups. The findings emphasize the need for responsible lending practices, regulatory monitoring, and a nuanced understanding of microfinance's impact to maximize its benefits while addressing its inherent challenges. Microfinance can have significant effects on gender inequality, health outcomes, economic empowerment, financial inclusion, and climate change adaptation. While microfinance can help empower women and underrepresented groups, it may also further entrench gender inequality if not implemented with a focus on equity and inclusion. Integrating health-related elements into microfinance programs can lead to holistic development outcomes. Microfinance can be an important tool for improving financial inclusion and economic empowerment, but challenges around sustainability and legal restrictions remain. Incorporating climate change adaptation strategies into microfinance programs can help vulnerable communities build resilience. Addressing the financial needs of the informal sector through tailored microfinance programs is crucial for enhancing financial inclusion and economic empowerment. Strengthening microfinance institutions' crisis readiness and response capabilities is essential for supporting borrowers during emergencies. Integrating financial literacy education into microfinance programs can enable borrowers to manage loans and achieve better financial outcomes. Overall, the research highlights the need for a balanced and responsible approach to microfinance, one that maximizes its benefits while addressing its inherent challenges and adapting to a rapidly changing environment.

### 1. INTRODUCTION

In the worldwide movement to reduce poverty, empower women, and advance sustainable development, microfinance has become a game-changing instrument. Its creative strategy for delivering financial services to marginalized groups, especially in developing countries, has drawn notice for its capacity to promote socioeconomic advancement. The ability of microfinance to lessen gender inequality is one of its main promises, especially in rural areas. Microfinance institutions (MFIs) have become essential facilitators of female empowerment in nations such as Bangladesh, where traditional financial systems frequently marginalize women. According to research, having access to microfinance can greatly raise women's socioeconomic standing by giving them the money they need to launch small enterprises, make educational investments, and enhance their families' health and nutrition. According to empirical evidence, women who take part in microfinance initiatives frequently have more influence over decisions made in their homes and communities. Greater educational possibilities and better health outcomes for kids are only two examples of the wider social advantages that result from this empowerment. Additionally, the connection between gender dynamics and microfinance highlights how financial services have the ability to question established social norms and advance gender parity. New studies have started looking into the connections between microfinance and health, with an emphasis on how the availability of financial services can affect people's health-related behaviors and general well-being. By making it possible for people to pay for healthcare, engage in health education, and adopt healthier lives, financial inclusion is said to improve health outcomes. According to studies, because microfinance clients have more financial security, they are more willing to invest in their health and seek medical attention when necessary. This link between microfinance and health highlights the complex effects of financial inclusion, which go beyond purely financial gains to include more significant advancements in social health. Microfinance has been popular in Sub-Saharan Africa as a way to promote financial inclusion and economic empowerment. Through the provision of small loans to micro and small firms that propel regional economic growth, MFIs serve a crucial role in filling the financial vacuum frequently left by traditional banks. Researchers can assess how well microfinance supports financial inclusion and economic growth by examining empirical data and case studies. It has been demonstrated that microfinance programs encourage local economies and entrepreneurship, which helps to create jobs and revenue. These programs' capacity to strengthen underprivileged communities demonstrates their

promise as tools. Microfinance is becoming more widely acknowledged for its role in adaptation and resilience building as climate change presents significant problems, especially for vulnerable populations in developing nations. According to research, microfinance can help low-income communities embrace sustainable practices and technology that increase their ability to withstand the effects of climate change. Scholars investigate how microfinance programs can make it easier for communities to acquire resources that help them adapt to climate change by looking at case studies and empirical data. Microfinance initiatives centered on green technologies, like solar energy or sustainable agriculture, for example, might enable people and companies to adopt eco-friendly practices while also tackling financial difficulties. Even though it makes up a sizable component of many developing countries, the informal sector frequently does not have access to official financial services. Understanding how microfinance may address the unique needs of entrepreneurs and informal workers requires an understanding of the interaction between microfinance and the informal sector. MFIs are able to develop customized solutions that tackle the particular difficulties encountered by these groups by incorporating the informal sector within the microfinance framework. According to research, microfinance can be extremely important in helping informal workers become more financially included by giving them access to credit and savings options that improve their financial security. Researchers can find opportunities and difficulties in integrating the informal economy into the microfinance ecosystem by looking at case studies and empirical data. Microfinance institutions (MFIs) and their customers have been significantly impacted by the COVID-19 pandemic, which has exposed weaknesses and put the industry's resilience to the test. Many MFIs encountered difficulties with loan repayments, operational viability, and preserving client connections as economic uncertainty increased. Research on the pandemic's effects on the microfinance sector emphasizes the flexible tactics used by MFIs to assist their customers throughout this emergency. To assist clients in navigating financial issues, innovative alternatives have been implemented, such as digital lending platforms and flexible repayment options. Researchers can assess the microfinance industry's resilience and ability to handle unusual circumstances by examining these case studies. Integrating sustainability into microfinance processes is becoming more and more crucial as the severity of climate change increases. Particularly in low-income areas dealing with serious environmental issues, green microfinance becomes an essential instrument for encouraging ecologically conscious corporate activities. According to research, traditional microfinance-which is just concerned with reducing povertycan be improved by taking environmental factors into account, producing better results. Researchers can find successful instances and pinpoint issues that require attention by looking at how green microfinance aids in the growth of sustainable firms. The sustainability and effectiveness of the microfinance sector depend on an understanding of the opportunities and difficulties it faces. Microfinance is a potent dual force that works to reduce poverty and advance sustainable development. Microfinance exhibits its potential as a comprehensive development tool by tackling gender gaps, promoting economic growth, improving health outcomes, and strengthening resilience to climate change. Adopting sustainability, inclusion, and financial literacy will be essential to optimizing the sector's influence as it develops further. Microfinance may continue to empower underserved communities and help create a more sustainable and equitable future by conducting research and developing new ideas.

### 2. REVIEW OF LITERATURE

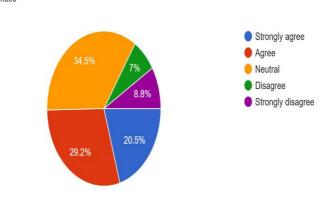
Sustainable green microfinance combines the goals of traditional microfinance—namely, reducing poverty—with an emphasis on environmental sustainability. Research highlights how important it is for advancing sustainable development, especially in underdeveloped nations like Bangladesh where it makes eco-friendly practices and renewable energy technologies more accessible (Rouf, 2012; Uddin et al., 2021). Green microfinance tackles social issues including poverty and community empowerment in addition to supporting environmentally sustainable projects by providing the required money. Despite its potential, there are a number of obstacles facing green microfinance. The absence of specialist financial instruments for green investments, low financial literacy, and borrowers' ignorance of sustainable practices are major obstacles (Nugroho et al., 2017; Parveen, 2020). Furthermore, risk aversion is frequently displayed by microfinance institutions (MFIs) because of the perceived risks when evaluating loans for green projects (Reed, 2020). The landscape is further complicated by regulatory obstacles, which prevent green initiatives from growing. Research emphasizes how crucial it is to incorporate local governance and expertise into microfinance plans. In addition to ensuring that financial products are pertinent and available to rural populations, applying local knowledge helps improve community trust (Atahau et al., 2021). Better results and longer-term viability for microfinance initiatives can result from this communitydriven strategy. Additionally, in the larger financial sector, there is a growing movement toward sustainable investment. But investors frequently struggle to strike a balance between short-term financial rewards and long-term sustainability goals (Aggarwal & Elembilassery, 2021). This emphasizes the necessity of creative investment plans that support sustainability objectives, especially in developing nations. To increase the efficacy of green microfinance, education and capacity building are essential. Enhancing borrowers' financial literacy can increase repayment rates and support MFI sustainability (Rahman, 2019). Furthermore, in order to properly comprehend and apply green finance choices enhancing the impact of green microfinance projects requires innovative methods, such as cooperative efforts across diverse stakeholders, including financial institutions, non-profits, and governmental entities. These partnerships and the creation of specialized financial products can promote knowledge sharing and capacity building, which will ultimately increase access to green finance. Numerous academics have focused on the development of microfinance, emphasizing its vital role in reducing poverty and promoting economic empowerment. Key findings from numerous studies that sustainability According to Lidgerwood (2013) in The New Microfinance Handbook, microfinance has evolved from a tool for reducing poverty to an essential part of financial systems in developing countries. She supports an all-encompassing strategy in microfinance institutions (MFIs) that acknowledges the complexity of financial markets and the range of client needs. Effective microfinance is portrayed as a comprehensive service package that includes savings, insurance, and remittance services in addition to loans. Ledgerwood emphasizes the value of financial institutions working together to improve access for underserved groups and advance financial inclusion. The effects of group-based credit programs in Bangladesh are examined by Pitt and Khandker (1998), who offer a theoretical framework linking increased household welfare with microcredit availability. According to their research, microcredit can encourage entrepreneurship by allowing low-income households to make investments in ventures that generate revenue. Using social collateral lowers the chance of default and encourages on-time loan repayments by leveraging group dynamics. Significant benefits are found by the authors, such as higher household income and spending, which boost local economies and help non-borrowing households. Harper (2002) explores the achievements of Self-Help Groups (SHGs) in India, highlighting their contribution to women's economic and social empowerment. SHGs increase women's financial independence and decision-making authority in homes and communities by giving them access to savings and loans. Harper emphasizes the model's viability by pointing out that member accountability builds social capital, lowers default rates, and encourages financial restraint. Notwithstanding its achievements, the report highlights issues including the uneven caliber of SHGs and the requirement for members to have better financial literacy, especially when it comes to reaching the most impoverished. Seelos and Mair (2005) highlight social entrepreneurship as a way to connect market solutions with development concerns. They provide examples of how social entrepreneurs develop scalable business models that provide access to basic services like banking, healthcare, and education through case studies. The writers stress how important it is to comprehend local settings and make use of the resources at hand in order to promote systemic change. They conclude that inclusive business models can effectively tackle poverty after discussing the difficulties faced by social entrepreneurs, such as the need for patient capital and the difficulties in assessing social impact. McIntosh and Wydick (2005) examine the effects of competition in the microfinance industry, pointing up both advantages and disadvantages. Increased access to financial products, reduced interest rates, and improved service quality can result from competition among MFIs. The authors caution that too much competition could lead to market saturation and unmanageable borrower debt, which would cause MFIs to lose sight of their initial social goals in favor of financial viability. According to their empirical research from Uganda, competition has lowered interest rates, but it has also led to smaller average loan amounts, which has clients worried about being overly indebted. Ghosh and Van Tassel (2008) examine how MFIs handle the conflicting demands of upholding their social goals and preserving financial viability in their model. They highlight how MFIs frequently turn their attention to richer clients who pose lesser risks and larger loan amounts, citing commercialization and shifting donor expectations as significant factors to mission drift. The authors make the case for tactics that balance financial performance and social impact in order to continue serving the most underprivileged clients. Chliova et al. (2015) provide a nuanced perspective on the impact of microcredit on reducing poverty through a meta-analysis. Negligible effects on reducing poverty are seen in some research, while others show improvements in the economic circumstances of borrowers. The authors stress the importance of contextual elements including the state of the local economy and the financial knowledge of borrowers. Since microcredit is insufficient for widespread poverty alleviation, they support a comprehensive strategy that incorporates microcredit with complementing interventions like financial education and skills training. Bastelaer (2000) emphasizes how crucial social capital is to improving low-income people's access to credit. According to the study, robust community networks can make borrowing easier by lowering transaction costs and enhancing borrower-lender trust. But Bastelaer also points to possible drawbacks, like exclusionary policies that might prevent outsiders or untrustworthy people from entering. In order to improve financial inclusion and economic progress, his research supports the development of social capital as a supplement to traditional microfinance techniques. Berge et al. (2011) investigate how financial resources and training programs that improve entrepreneurial abilities can work in tandem. Their research shows that although having access to microcredit has a beneficial effect on business investments and income, the effect is much increased when paired with focused training. The authors draw the conclusion that encouraging sustainable microenterprise development requires addressing both human and financial capital restrictions, emphasizing the necessity of integrated interventions. Even though green microfinance has a lot of potential to empower communities and advance sustainable development, removing current obstacles and improving governance frameworks are essential to achieving its full potential. In order to ensure long-term economic, social, and environmental advantages, future research should concentrate on creative approaches and cooperative models that may successfully incorporate sustainability into microfinance operations.

### 3. DATA ANALYSIS

#### We have found out that cultural attitudes in rural areas hinder the adoption of green investing

According to the study, cultural attitudes in rural areas are cited by over half of the respondents as a major obstacle to green investing. Adopting innovative, sustainable investment strategies may be viewed with skepticism in rural areas, which frequently have firmly ingrained conventional traditions. This view may be influenced by the fact that green investing frequently necessitates behavioral changes, such as embracing organic farming, renewable energy sources, or environmentally friendly financial products. It's possible that many rural residents are unaware of the long-term advantages of these investments or think they're expensive and dangerous. Adoption may also be further slowed by lesser levels of financial literacy and exposure to green financial efforts in these regions. Out Of the 171 responses, 29.2%

#### agreed and 20.5% strongly agreed, for a 49.7% overall agreement rate.



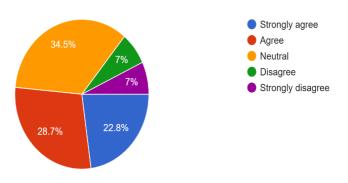
Cultural attitudes in rural areas hinder the adoption of green investing. 171 responses



Adoption may also be further slowed by lesser levels of financial literacy and exposure to green financial efforts in these regions. The significant degree of agreement indicates that focused awareness campaigns are necessary for legislators, financial institutions, and environmental groups to get beyond these cultural hurdles. Incentives, success examples from comparable areas, and educational initiatives could all aid in shifting attitudes and highlighting the advantages of green investments. All things considered, the 49.7% agreement shows that cultural obstacles in rural areas are strongly acknowledged. Addressing local issues, offering financial incentives, and improving awareness of the advantages of green investing are essential to easing the shift to sustainable investment methods.

#### For the success of green investment in rural areas government subsidies are essential.

This high degree of agreement emphasizes how important government funding is for encouraging sustainable projects in rural areas. Small-scale investors and rural business owners might not have easy access to the substantial initial capital needed for green ventures. By lowering financial risk and encouraging companies to implement eco-friendly practices, subsidies aid in closing this gap. This response also suggests that a large number of respondents are aware of the difficulties rural towns encounter in obtaining long-term support. Due to smaller profit margins or higher perceived risks, private investors could be hesitant to fund green projects in rural areas in the absence of government participation. A total of 51.5% of the 171 respondents supported the role of government subsidies in green initiatives, with 22.8% strongly agreeing and 28.7% agreeing.



Government subsidies are essential for the success of green investment in rural areas. 171 responses

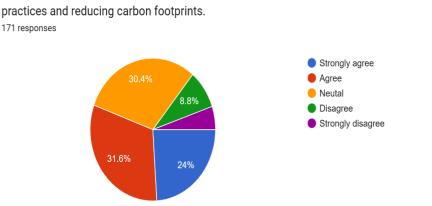
### FIGURE 2.

Therefore, subsidies are an essential tool for promoting the use of renewable energy, environmentally friendly farming methods, and the construction of sustainable infrastructure. Additionally, a greater awareness of the long-term financial and ecological advantages of green investment is shown in the strong support for subsidies. Governments may counteract climate change, promote environmental sustainability, and stimulate economic growth in rural areas by offering financial incentives. According to the majority perspective, officials ought to give green project grants and subsidies top priority

when formulating plans for rural development. To sum up, the substantial consensus among participants highlights the importance of government assistance in promoting a sustainable future for rural economies. Many green projects could find it difficult to gain traction without these financial incentives, which would impede the advancement of both environmental and economic sustainability.

# Green banking promotes environmental sustainability by encouraging eco-friendly financial practices and Reducing carbon footprints.

More than half of the respondents acknowledge the significance of green banking in promoting environmental sustainability, as seen by this high degree of agreement. Green banking is the provision of financial services and products that promote eco-friendly projects like low-carbon technologies, sustainable agriculture, and renewable energy projects. Green banking assists individuals and companies in making the shift to a more sustainable economy by promoting environmentally friendly financial choices. According to the comments, individuals think that financial institutions are crucial in lowering carbon footprints since they encourage environmentally damaging activities, finance green projects, and support sustainable investments. Out Of the 171 respondents, 24% strongly agreed and 31.6% agreed, meaning that 55.6% of them had a favorable opinion of the contribution of green banking to sustainability.



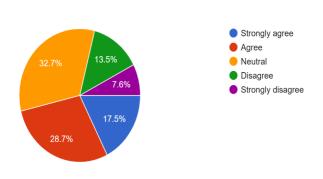
Green banking contributes to environmental sustainability by promoting eco-friendly financial



These days, a lot of financial institutions provide low-interest funding for environmentally friendly projects, sustainability-linked loans, and green bonds. The survey's high degree of agreement shows that people are becoming more conscious of and supportive of these financial activities. The findings also show how banks are increasingly expected to match their policies with environmental objectives. Customers may be persuaded to choose financial institutions that place a high priority on environmental responsibility, and governments and regulators can utilize these findings to develop incentives for banks to embrace sustainable lending practices. All things considered, the 55.6% agreement shows that the public strongly recognizes the contribution of green banking to sustainability. It emphasizes how important it is for financial institutions to increase their green activities, inform clients about sustainable financial practices, and take proactive steps to lower carbon footprints.

# We discovered that how Green investing initiatives are most effective when tailored to the specific cultural and economic needs of rural populations.

This suggests that some respondents really feel that green initiatives are more effective when they are tailored to the cultural and economic settings of rural areas. In the meantime, 28.7% of replies fall into the red-highlighted "Agree" category. This implies that a sizable portion of respondents agree with the concept, albeit to a somewhat lesser extent. These two categories together account for 46.2% of all responses, indicating that over half of participants concur that prioritizing rural needs maximizes According to the research, there is a significant tendency to acknowledge the significance of cultural and economic factors in rural areas when putting green initiatives into practice. Responses from 171 participants about how successful green investing programs are when they give rural communities' cultural and economic demands first priority are displayed in the pie chart. The categories "Strongly Agree" and "Agree," which show favorable support for this strategy, are the focus of the analysis.17.5% of comments fall into the "Strongly Agree" category, which is shown by the blue symbol.



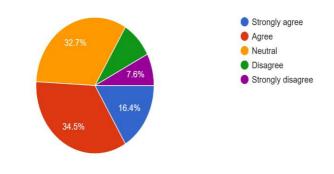
Green investing initiatives are most effective when they prioritize the specific cultural and economic needs of rural populations.



The fact that 46.2% of respondents supported this strategy suggests that it is regarded as essential to the accomplishment of sustainability projects. This proportion shows a significant degree of agreement among respondents, even while it does not represent an overwhelming majority. According to this report, investors and politicians ought to think about incorporating rural-specific tactics into green investment plans. The high degree of agreement among respondents suggests that in order to optimize the impact of sustainable investments, tailored solutions that take into account local economic realities and values are required.

## Loan recipients should be required to engage in environmentally sustainable activities to promote long-term ecological and economic stability.

The blue-colored "Strongly Agree" group represents 16.4% of the replies. This suggests that some respondents are adamant that loan beneficiaries ought to be required to engage in ecologically friendly activities. Furthermore, 34.5% of the replies fall into the "Agree" category, which is indicated in red. This implies that a sizable portion of respondents agree with the concept, albeit not as strongly as those who checked the "Strongly Agree" box. More than half of the participants support the implementation of such a mandate, as evidenced by the 50.9% of responses that fall into these two groups combined. Responses from 171 participants about the need for loan beneficiaries to participate in ecologically sustainable activities are displayed in the pie chart. The "Strongly Agree" and "Agree" categories, which show favorable support for this condition, are the focus of the analysis.



Loan recipients should be required to engage in environmentally sustainable activities. 171 responses

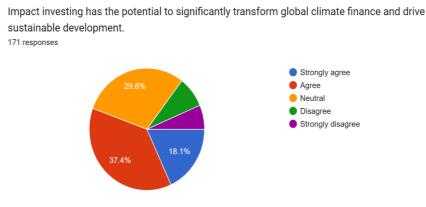


According to the research, there is a substantial preference for including sustainability clauses in loan contracts. The fact that more than half of the respondents agreed with the concept shows that people are becoming more conscious of the potential of financial incentives to encourage environmental responsibility. This implies that in order to promote environmentally friendly corporate practices and investments, financial institutions and politicians ought to think about implementing sustainability. The high degree of agreement suggests that if such a condition were put into place, it may be positively welcomed because many people feel that it is crucial to match financial support with environmental sustainability. However, the fact that 15.2% disagreed to some degree and 32.7% of respondents were neutral also raises the possibility that more conversations or implementation flexibility may be required. However, the general pattern indicates that policies that tie financial aid to sustainable activities are well received, highlighting the importance of

responsible financing programs in environmental preservation measures.

# The study shows that how the Impact investing has the potential to significantly transform global climate finance and serve as a catalyst for sustainable development.

This implies that a sizable percentage of respondents are adamant that impact investment can be extremely important for improving climate financing and sustainability. Furthermore, 37.4% of the responses fall into the "Agree" category, which is highlighted in red. This suggests that a sizable portion of participants agree with this idea, albeit with somewhat less fervor than those in the "Strongly Agree" category. These two categories together account for 55.5% of all responses, indicating that over 50% of participants understand how impact investment can lead to significant changes in sustainable development and climate finance. This shows that impact investing is widely recognized as a crucial instrument for tackling both economic and environmental issues. Responses from 171 participants about impact investing's ability to revolutionize global climate financing and promote sustainable development are displayed in the pie chart. The "Strongly Agree" and "Agree" categories, which show favorable support for this statement, are the main focus of the analysis. The blue-colored "Strongly Agree" group represents 18.1% of the replies.





According to the data, impact investing is regarded as a practical strategy for raising funds for sustainability objectives. Financial institutions, legislators, and investors may find considerable support for methods that combine sustainability and financial gains, as the majority of respondents share this viewpoint. The great degree of agreement shows how important it is to match investments with long-term social and environmental gains. There may still be doubts or reservations about the efficacy or application of impact investment, though, given that 29.8% of respondents were neutral and a smaller percentage disagreed. However, the general pattern indicates that these investments are seen favorably and have the potential to significantly influence how climate financing and sustainable development are developed in the future.

### 4. CHALLENGES

Limited access to finance restricts rural communities from engaging in green investments due to the absence of traditional financial institutions, high transaction costs, and insufficient collateral for loans. Lack of awareness and financial literacy prevents rural entrepreneurs from accessing and understanding green finance options, limiting their ability to invest in sustainable initiatives. High perceived risks associated with green projects, including long payback periods, climate uncertainties, and lack of credit history, discourage lenders from providing financial support. Insufficient policy and regulatory support, including weak government policies, lack of incentives, and bureaucratic hurdles, hinders the growth of green microfinance initiatives. Limited institutional capacity within microfinance institutions results in a lack of expertise in assessing green projects, creating a need for specialized training and improved financial models. Lack of market linkages makes it difficult for farmers and rural entrepreneurs to find buyers for green products, as demand for sustainable agricultural and energy goods remains unstable.

### 5. SUGGESTIONS/ FINDINGS

Expanding financial access by strengthening rural financial networks, promoting digital banking services, and designing microfinance products tailored for sustainable initiatives. Building awareness and capacity through educational programs on green investment and supporting community-led financial groups that promote sustainable practices. Minimizing investment risks by introducing insurance schemes for climate-related financial losses and utilizing blended finance approaches to reduce financial uncertainty. Strengthening policies and regulations by introducing tax incentives for green microfinance and establishing clear frameworks to measure the impact of sustainable investments. Encouraging

partnerships by enhancing collaboration between microfinance institutions, NGOs, green investors, local governments, and international funding organizations. Using technology for financial inclusion by expanding mobile money and digital lending platforms, as well as leveraging AI and data analytics for improved credit assessment and risk management.

### 6. CONCLUSION

Microfinance has proven to be a powerful instrument for economic and social transformation, particularly in low-income and rural areas. By providing access to credit and financial services to those who are excluded from traditional banking, microfinance enables individuals to invest in businesses, education, and essential needs, ultimately improving their livelihoods. One of its most notable impacts has been in promoting gender equality, as financial inclusion empowers women with greater economic independence and social influence. Additionally, microfinance plays a vital role in fostering entrepreneurship, stimulating local economies, and creating job opportunities in underserved regions. In addition to its economic contributions, microfinance has a broader influence on social development, particularly in health and environmental sustainability. By linking financial services with healthcare programs, microfinance institutions can enhance public health outcomes by enabling individuals to afford medical treatments and preventive care. The rise of green microfinance further extends its impact, as it supports sustainable investments in areas such as renewable energy, eco-friendly farming, and climate adaptation. These initiatives not only contribute to environmental protection but also help communities build resilience against climate-related risks, ensuring long-term economic and ecological stability. However, the microfinance sector faces several challenges that must be addressed for it to remain an effective tool for development. High borrowing costs, inadequate financial literacy, and potential risks of over-indebtedness can undermine its benefits if not properly managed. Regulatory constraints and institutional limitations further pose obstacles to its scalability and efficiency. To mitigate these challenges, it is crucial to implement responsible financial policies, strengthen borrower education programs, and establish oversight mechanisms that ensure ethical lending practices. As microfinance continues to evolve, leveraging technology and innovation will be essential for expanding its reach and improving its efficiency. Digital banking solutions, mobile lending platforms, and alternative credit assessment models can help microfinance institutions serve a wider population while reducing costs and improving accessibility. Additionally, collaboration among governments, private sector players, and non-profit organizations will be key in fostering a regulatory environment that promotes inclusive and sustainable financial growth. By embracing innovation, sustainability, and inclusivity, microfinance can continue to drive positive change, empowering disadvantaged communities and contributing to a more equitable and resilient global economy.

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