

ECONOMIC OPPORTUNITIES AND EMPOWERMENT POTENTIALS IN REUSABLE MENSTRUAL PAD

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Abstract

The demand for sustainable menstrual hygiene solutions has driven attention towards reusable menstrual pads (RMPs) as a viable eco-friendly alternative to disposable products. The study aims to identify economic opportunities and empowerment potential through reusable pad entrepreneurship, particularly in marginalized communities. This cross-sectional survey was conducted in Kumbotso Local Government Area (LGA) in Kano State, Nigeria. Women and girls aged 15 - 49 years from primary health facilities, schools, community centres and households were recruited using a ballot method for simple random sampling. A final sample size of 430 participants was determined using Cochran's formula. Data were collected through an interviewer-administered, and pre-tested questionnaire and statistical analysis was conducted with IBM SPSS (version 25), using descriptive statistics. Findings indicate strong interest in RMP entrepreneurship, with 93.9% of participants expressing willingness to engage in RMP-related business. Approximately 80.3% had prior business experience, and 86.9% rated their confidence in starting an RMP business at the highest level. The primary motivations were financial profit (78.4%) and community empowerment (13.1%). However, participants identified key barriers such as insufficient capital (77.9%) and limited material access (68.1%). The preferred strategy for overcoming these challenges was financial support, highlighted by 75.6% of respondents. The findings demonstrate substantial community interest in RMP entrepreneurship, with significant empowerment potential for economic self-sufficiency among women and girls. However, challenges such as start-up capital, material access, and community acceptance must be addressed to facilitate successful RMP business venture creation and growth.

Keywords: Reusable menstrual pads, entrepreneurship, economic empowerment, marginalized communities, sustainable development

Introduction

Menstrual health management (MHM) is a critical aspect of public health that influences the physical, social, and economic well-being of women and girls worldwide (WHO, 2022). Menstruation is a natural biological process marking reproductive maturity, yet it remains widely stigmatized and insufficiently addressed, particularly in low- and middle-income countries (LMICs) (Foster & Montgomery, 2021; Nabwera et al., 2021; World Bank Group, 2023). Globally, about 500 million women and girls lack access to adequate menstrual hygiene facilities, with significant disparities between high-income and low-income regions (Hand et al., 2023; WHO, 2022). Poor menstrual health can lead to reproductive tract infections (RTIs), social isolation, and even school dropout, all of which affect the economic prospects of young women (Alam et al., 2022; Khandaker et al., 2022; Montgomery et al., 2012).

The reliance on single-use menstrual products in both developed and developing countries has significant economic and environmental implications. Disposable products are costly, with girls and women expected to spend thousands of naira on sanitary products over their lifetime (WHO & World Bank Group, 2022). This financial burden disproportionately affects those from low-income households and rural areas where access to affordable menstrual products is limited (UNICEF, 2020; Warashinta et al., 2021).

In recent years, Nigeria has faced escalating economic challenges that have significantly impacted the daily lives of its population, particularly women and girls (IAWJ, 2024). Over the past 5–10 years, high inflation rates, youth unemployment, and rising costs of living have disproportionately affected low-income households (Gado, 2025). According to the National Bureau of Statistics (2022), youth unemployment in Nigeria reached over 42%, with women and girls facing greater barriers to financial independence due to gender disparities in education and income. The cost of imported disposable sanitary products has also increased sharply, making them unaffordable for many families. These harsh economic realities have pushed adolescent girls and young women to resort to unhygienic alternatives, leading to health complications and reinforcing period poverty (UNICEF, 2020; WHO, 2022).

Reusable menstrual pad entrepreneurial development program presents a unique opportunity for women's economic empowerment. This entrepreneurial model allows local women to learn how to produce and sell reusable pads within their communities, generating income while addressing a critical MHM need (Rodriguez, 2021). Empowering women to produce and sell reusable menstrual products can foster local job creation, support financial independence, and boost the economic resilience of underserved communities. Studies on social

entrepreneurship in MHM, such as those conducted in Kenya and Uganda, revealed that income-generating MHM initiatives can improve community engagement and elevate the social status of women entrepreneurs (Benshaul-tolonen et al., 2021; Hennegan et al., 2016). Therefore, this study assesses the economic opportunities and empowerment potential inherent in reusable menstrual pad entrepreneurial development, particularly within the underserved communities.

Definition of Terms

Reusable Menstrual Pads (RMPs) are washable, cloth-based sanitary pads designed for multiple uses, offering a sustainable alternative to disposable menstrual products (WHO, 2022).

Menstrual Hygiene Management (MHM) refers to the access to clean menstrual materials, privacy to change them, and adequate facilities for disposal and hygiene, allowing women and girls to manage menstruation with dignity and safety (WHO, 2022).

Methods

Study area

This cross-sectional study was conducted in Kumbotso Local Government Area (LGA), Kano State, Nigeria. Kano is located in the northwestern part of Nigeria and is the most populous state in the country. Kumbotso LGA is one of the 44 local government areas in Kano State located between latitude $11^{\circ}53'17''\text{N}$ and longitude $8^{\circ}30'10''\text{E}$. It is predominantly

rural with a mix of semi-urban communities and covers an area of approximately 158 square kilometers. Kumbotso LGA is home to various ethnic groups, with the Hausa-Fulani being the predominant ethnicity, and Islam is the dominant religion. The area has a mix of agricultural and small-scale industrial activities, with most inhabitants engaged in farming, trading, and artisan work.

Participants

The participants were women and girls between the ages of 15 and 49 years in Kumbotso LGA. Participants were selected from primary health facilities, schools, community centers, and households, ensuring a representative sample across different socio-economic groups. The rationale for selecting this group was grounded in the specific health needs and socio-economic challenges faced by women and girls in this age range, particularly in relation to maternal and reproductive health, which were central to the study's focus. A ballot method of simple random sampling was used to select the participants.

Sample Size Determination

The sample size (N) was calculated using the Cochran formula (Cochran, 1963), which is appropriate when the total population is very large or not precisely known, as was the case for the population of women and girls aged 15–49 years across primary health facilities, schools, community centres, and households in Kumbotso LGA.:

$$N = \frac{Z^2 \times p \times q}{e^2} \quad \text{where:}$$

Z = standard deviation at 1.96, a constant (which corresponds to a 95% confidence interval).

p = 0.5 which the probability of the event occurring

q = 1-p = 0.5 which is the probability of the event not occurring

e = the desired level of precision also known as sampling error: 5% = 0.05

$$N = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2}$$

$$N = 384.16$$

A non-response rate of 10% was added to the sample size hence the final sample size was $384.16 + 38.41 = 422.6$ approximately 423 and was increased to 430, which formed the final sample size.

Sampling Technique

To ensure representativeness across different social strata, we applied a simple random sampling technique using a ballot method, selecting participants from primary health facilities, schools, community centers, and households within Kumbotso LGA. This approach minimized selection bias by giving every eligible individual within the defined strata an equal chance of being selected.

Data Collection

Data was collected from 1st May to 11th June, 2024 through an interviewer administered, pre-tested questionnaire, which was adapted from prior researches (Hennegan et al., 2020; Nabwera et al., 2021; Ramsay et al., 2023). A pilot study was conducted among 50 randomly selected students from a setting that was not part of the final study sample. The questionnaire collected information on socio-demographic characteristics such as age, marital status,

education, occupation, ethnicity and employment/business status of the respondents. The next section focused on the economic opportunities and empowerment potential of reusable menstrual pads. This included assessing participants' willingness to engage in the production or sale of reusable pads, their interest in entrepreneurship, and their perceived ability to succeed in this venture. These questions aimed to identify the potential for reusable menstrual pads to foster local businesses and improve economic independence among women in the community.

Data analysis

The data obtained were analyzed using the IBM SPSS statistic (version 25). Descriptive statistics namely frequency, percentages, mean, standard deviation, tables and pie chart were used to represent the categorical and continuous variable where it was applicable.

Ethical Consideration

Ethical approval for the study was obtained from the Health Research Ethics Committee of Kano State Ministry of Health (NHREC/17/03/2018/SHREC/2024/5074) and Health Research Ethics Committee of Bayero University Kano (NHREC/BUK-HREC/481/10/23II). Permission was obtained from the Village head and

Coordinator of Kumbotso comprehensive health centre. Confidentiality and anonymity were ensured by using identification codes instead of names for analysis purposes. A written assent and informed consent form was signed or thumb printed before any form of data collection. For girls under 18, written informed assent was obtained from their parents or guardians.

Results**Table 1: Socio-demographic characteristics of respondents (n=426)**

Characteristics	Frequency	Percentage
Age (years)		
15-24	158	37.1
25-34	156	36.6
35-44	88	20.7
45 and above	24	5.6
Ethnicity		
Hausa	323	75.8
Fulani	86	20.2
Yoruba	2	0.5
Others	15	3.5
Average monthly income		
< N20,000 (<\$12)	342	80.3
N20,000-N50,000 (\$12-\$30.3)	70	16.4
N50,000-N100,000 (\$30.3-\$60.6)	12	2.8
N100,000-N200,000 (\$60.6-\$121.2)	2	0.5
Educational Level		
Primary	68	16.0
Secondary	298	70.0
Tertiary	46	10.8
Informal Education	14	3.3
Occupation		
Unemployed	40	9.4
Business/Entrepreneurship	188	44.1
Employed	56	13.1

Characteristics	Frequency	Percentage
Self Employed	58	13.6
Student	84	19.7
Marital Status		
Married	274	64.3
Single	128	30.0
Divorced	12	2.8
Widowed	12	2.8

Table 1 presents the socio-demographic characteristics of the respondents (n=426). The age distribution indicates that most participants were between 15 and 24 years old, accounting for 37.1% of the sample, followed closely by those aged 25-34 years (36.6%). The ethnic breakdown shows that the majority of respondents were Hausa (75.8%), followed by Fulani (20.2%). Regarding income, a significant majority (80.3%) reported earning less than N20,000 (\$12) monthly, with only 16.4% earning between N20,000 (2.8%) or widowed (2.8%).

and N50,000 (\$12-\$30.3), and very few reported higher income levels.

In terms of education, 70% of respondents had attained secondary education, while 16% had only primary education. Occupation-wise, nearly half (44.1%) of the respondents were engaged in business or entrepreneurship, while 19.7% were students. The marital status distribution reveals that the majority of respondents were married (64.3%), with 30% being single, and a smaller percentage either divorced

Table 2: Community Perception and Business Potential for Reusable Menstrual Pads (RMPs)

Variables	Frequency	Percent (%)
Need for RMPs in the Community		
Yes	412	96.7
No	14	3.3
Accessibility in Local Area		
Yes	20	4.7
No	406	95.3
Amount willing to pay for 3 RMPs		
Mean ± Std. Deviation	N869.72 (\$0.53) ± N391.87 (\$0.20)	

Variables	Frequency	Percent (%)
Existing Businesses on RMPs		
Yes	34	8.0
No	392	92.0
Willingness to Start RMP Business		
Yes	400	93.9
No	26	6.1
Business Area of Interest		
Selling RMPs	226	53.1
Production of RMPs	200	46.9
Previous Business Experience		
Yes	342	80.3
No	84	19.7
Access to RMP Raw Materials		
Yes	136	31.9
No	290	68.1

Table 2 demonstrates a strong demand and positive business outlook for RMPs in the community. A vast majority (96.7%) of respondents agreed on the need for RMPs, though access was limited, with only 4.7% indicating that RMPs were available locally. On average, individuals were willing to pay approximately ₦869.72 (\$0.53) for a set of three RMPs, suggesting a moderate price point acceptable to the market.

Despite limited accessibility, there was overwhelming interest in starting RMP-related businesses, with 93.9% expressing willingness to engage in this sector. Among those interested in the business, 53.1% preferred selling RMPs, while 46.9% were

inclined towards their production. Moreover, 80.3% of respondents already had previous business experience, which could contribute to the success of RMP entrepreneurship. The majority of respondents (68.1%) indicated that they did not have access to raw materials for producing reusable menstrual pads (RMPs), while 31.9% reported having access.

However, only 8% of respondents reported the existence of RMP-related businesses in their area, highlighting a potential gap that new entrepreneurs could fill. Overall, these findings suggested a favorable environment for both the adoption and business development of RMPs within the community.



Figure 1: Confidence in Successfully Starting an RMP Business

The data revealed that a significant majority of respondents (86.9%) rated their confidence in starting a business related to reusable menstrual pads (RMPs) at the highest level (5 on a scale of 1 to 5). Only a small fraction expressed lower confidence,

with 11.3% rating their confidence at level 3, and less than 1% rating it at levels 1, 2, or 4. This indicates a strong sense of confidence among the majority of participants in their ability to start a business in this sector (Figure 1).

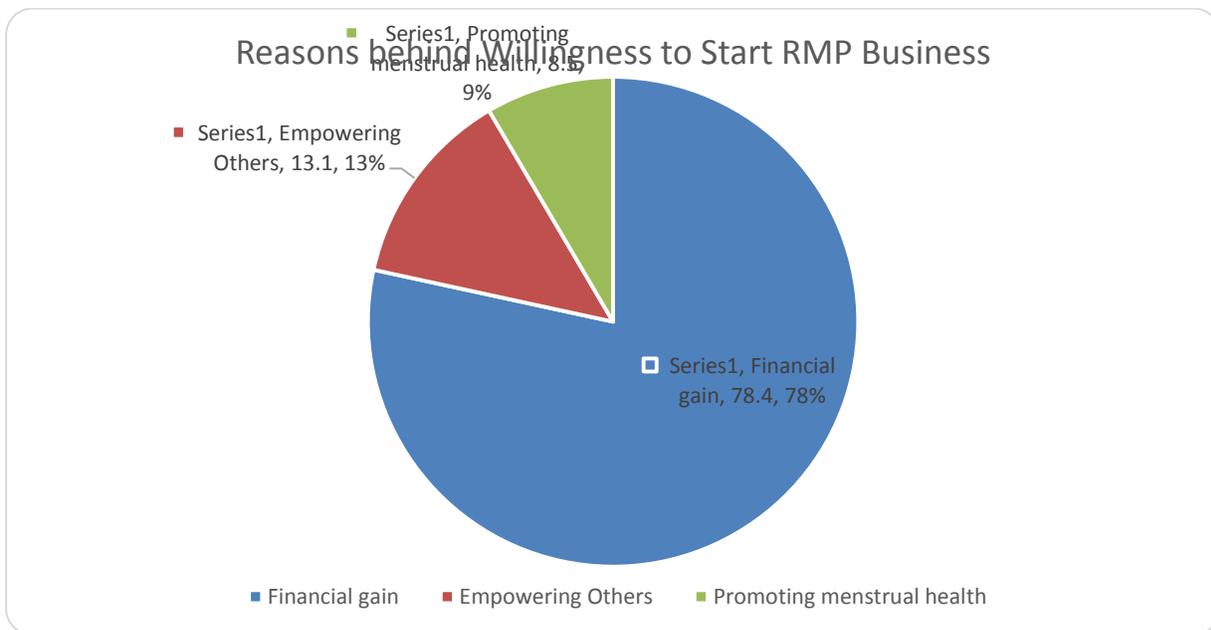


Figure 2: Motivation for Starting an RMP Business

The majority of respondents (78.4%) cited financial gain as their primary motivation for starting a reusable menstrual pad (RMP) business, indicating that most viewed it as an opportunity for economic profit. Meanwhile, 13.1% of participants expressed an interest in starting an RMP business to empower others, highlighting a

desire to support and uplift their community, potentially through job creation or access to sustainable products. A smaller portion, 8.5%, were motivated by the goal of promoting menstrual health, reflecting a focus on improving awareness and providing healthier, environmentally friendly menstrual care options (Figure 2).

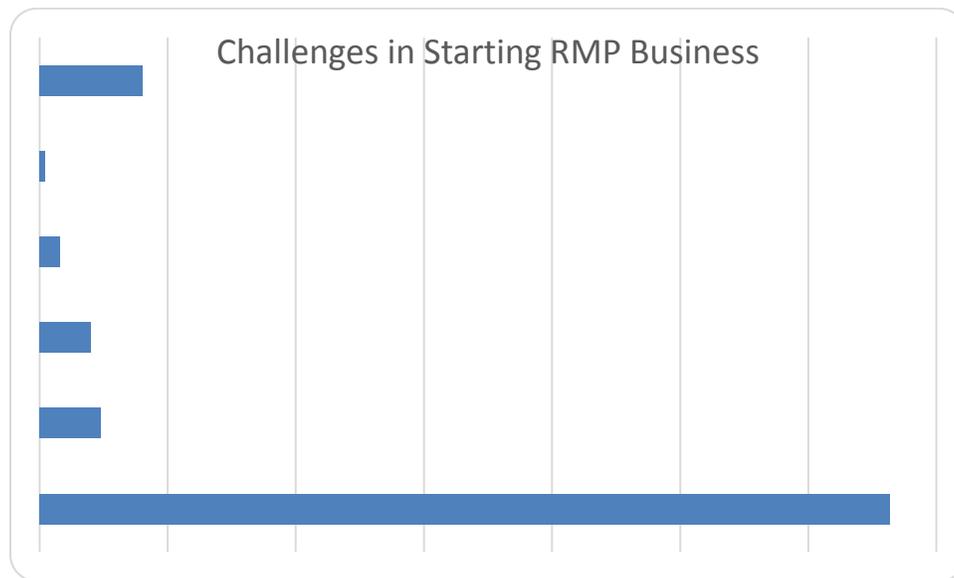


Figure 3: Key Challenges in Starting a Reusable Menstrual Pad (RMP) Business

The primary challenge identified by most respondents (77.9%) in starting an RMP business was securing the capital required for the venture, indicating that financial constraints were the biggest barrier. A smaller proportion (5.6%) pointed to community acceptance as a challenge,

while 4.7% highlighted the availability and accessibility of materials. Only 1.9% mentioned the need for skills to make the product, and an even smaller percentage (0.5%) noted advertising as a concern. Interestingly, 9.4% of respondents reported facing no challenges at all, showing a degree of optimism among some potential entrepreneurs (Figure 3).

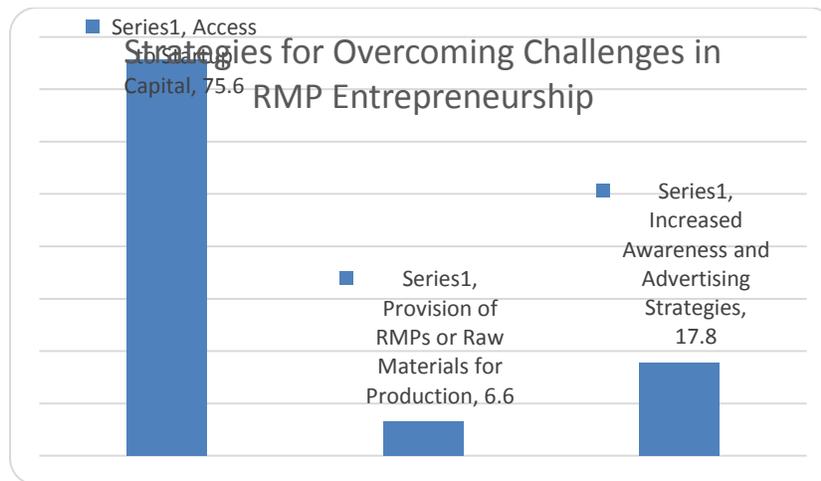


Figure 4: Strategies for Overcoming Challenges in Starting an RMP Business

To overcome challenges in starting a reusable menstrual pad (RMP) business, the majority of respondents (75.6%) identified financial support or being provided with the necessary capital as the most effective solution. Additionally, 6.6% felt that having access to RMPs or raw materials for production would help them surmount obstacles. Meanwhile, 17.8% of participants emphasized the importance of raising awareness and increasing advertising efforts to address challenges, highlighting the role of visibility and public knowledge in boosting business success (Figure 4).

Discussion of Findings

The findings of this study reveal a robust community interest in reusable menstrual pads (RMPs) as both an essential health product and a promising economic opportunity in Kumbotso, Kano, Nigeria. The majority of participants demonstrated a strong willingness to engage in RMP-related

entrepreneurship, particularly in selling and producing these products, driven largely by motivations to generate income and foster community empowerment. Respondents expressed confidence in their ability to start an RMP business and noted moderate affordability expectations, suggesting that RMPs could serve as a viable economic avenue in the area. Additionally, participants identified substantial challenges, particularly financial barriers and access to raw materials, which may impact the feasibility of widespread RMP business implementation.

Comparing these findings with studies in other low-and middle-income countries (LMICs), certain patterns and distinctions emerged. Similar researches in Ghana and Kenya, for example, have shown that when women are involved in menstrual product entrepreneurial development, their social and economic standing often improves, aligning with our study's finding that respondents are motivated by financial

independence and community impact (Anaba et al., 2022; Benschaul-Tolonen et al., 2021). Like the communities in those studies, women in Kumbotso perceive RMPs as a means to improve health access while creating a steady income stream. However, a notable difference lies in the awareness and existing market for RMPs: while some areas in East Africa have developed small-scale industries around reusable products due to strong NGO involvement, only a limited number of RMP businesses currently exist in Kumbotso, highlighting a market gap that can be tapped by local entrepreneurs.

Similar studies in other LMICs highlight cultural perceptions as a significant factor influencing RMP adoption. In contrast, this study observed high confidence among Kano participants in starting RMP businesses, suggesting that cultural barriers may be less pronounced here than anticipated. However, studies from Ethiopia and Bangladesh, for instance, report that the success of RMP entrepreneurship often depends on supportive government and community-based programs that provide resources and training to overcome logistical and financial constraints (Kumie et al., 2022; Alam et al., 2022). Such support structures are underdeveloped in Kumbotso, which may explain why securing startup capital emerged as the primary barrier for most participants in this study.

This study contributes to a growing body of research highlighting the potential for menstrual health management (MHM) to foster social and economic empowerment, particularly in underserved regions. By situating the findings within the unique socio-economic context of Kano, Nigeria, it emphasizes the potential of RMPs to provide a dual benefit: improved menstrual health management and a pathway to economic empowerment. Future initiatives might consider fostering partnerships with local financial institutions or government agencies to address financial and material barriers, promoting not only better health outcomes but also economic resilience within the community.

Economic opportunities and empowerment potential emerged as a promising aspect of RMP adoption. Several respondents showed interest in starting businesses related to the production and sale of reusable pads, particularly given the long-term financial benefits and reduced dependency on monthly purchases of disposable products. Many respondents identified the potential for RMPs to save costs, improve menstrual hygiene, and reduce waste, all of which are essential considerations in underserved communities. However, challenges such as the availability of materials, startup capital, and adequate business skills were identified as barriers to engaging in RMP-related entrepreneurship. Addressing these challenges through targeted support, such as training and microfinancing initiatives, could promote

economic empowerment, fostering local businesses and improving access to sustainable menstrual care products.

Limitations of the Study

This study had several limitations that should be acknowledged to enhance the transparency and reliability of the findings. Firstly, the study focused exclusively on the entrepreneurial potential of reusable menstrual pads (RMPs), and did not include perspectives from public health practitioners or address specific health concerns related to RMP usage. These dimensions have been addressed in our previous studies, but were beyond the scope of this paper. Secondly, data were collected through interviewer-administered questionnaires, which may have introduced social desirability bias, as respondents may have felt inclined to provide favorable answers regarding interest in RMP entrepreneurship. Additionally, the study was limited to a single local government area, which may affect the generalizability of the findings to other regions. Finally, while the sample was large and diverse across key demographics, logistical constraints limited our ability to incorporate follow-up qualitative interviews that might have enriched the entrepreneurial narratives. These limitations have been noted to guide future research directions.

Conclusion and Recommendations

This study highlights the substantial economic potential and empowerment opportunities associated with reusable menstrual pad (RMP) entrepreneurship in

Kumbotso, Kano. Findings reveal that, while financial motivation is a major driver for participants' interest in RMP businesses, there is also a strong inclination to create positive community impacts, empowering others through accessible, sustainable menstrual health products. The local community demonstrates a keen interest in eco-friendly menstrual solutions, yet entrepreneurs face significant barriers, such as limited access to raw materials and capital, that restrict business scalability and sustainability.

The study therefore recommends:

- **Increase Access to Reusable Menstrual Pads (RMPs):** Given that only 4.7% of respondents reported local accessibility, initiatives should be undertaken to improve the availability of RMPs in the community, ensuring that demand can be met effectively.
- **Support for RMP Entrepreneurs:** With 93.9% of respondents expressing willingness to start an RMP business and high confidence levels (86.9%), programs providing guidance, mentorship, and business development support should be established to translate this interest into successful ventures.
- **Financial Assistance Programs:** The primary challenge identified was access to capital (77.9%), and 75.6% of respondents indicated that financial support would help overcome this barrier. Microfinance

schemes, grants, or low-interest loans tailored to potential RMP entrepreneurs should be implemented.

- **Encourage Both Production and Sales Models:** With 53.1% interested in selling and 46.9% in producing RMPs, support programs should accommodate both approaches to maximize entrepreneurial opportunities and ensure broader community access to RMPs.

Finding

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Conflict of Interest

There is no conflict of interest in this project.

Human Ethics and Consent to Participate Declarations:

The study was conducted in accordance with ethical standards, and informed consent was obtained from all participants.

Availability of Data and Material

The datasets generated and/or analyzed during the current study are available from the corresponding author on request.

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