

## **RESEARCH COMMERCIALIZATION GRANT PROPOSAL**

**Project Title: Commercialization of Reusable Menstrual Pads: A Sustainable Solution for Menstrual Hygiene Management in Nigeria**

**Submitted to: National Agency for Science and Engineering Infrastructure (NASENI)**

**Date: 5<sup>TH</sup> OCTOBER, 2025**

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### **Executive Summary**

Access to affordable menstrual hygiene products continues to be a major challenge for women and girls across Nigeria, particularly in underserved and rural communities. Many households are unable to consistently purchase disposable sanitary pads due to cost, while those that can afford them contribute to environmental pollution through single-use products. Our research has developed a high-quality, reusable menstrual pad that is durable, safe, cost-effective, and environmentally sustainable. This commercialization project seeks funding to scale up production, establish efficient distribution channels, and conduct extensive public awareness campaigns to promote adoption. By doing so, the project will improve menstrual hygiene, empower women, and contribute to environmental sustainability. The total budget for the project is ₦19,850,500, which will cover all aspects of commercialization, including infrastructure, production, marketing, distribution, and administrative expenses. This initiative aligns with key Sustainable Development Goals (SDGs) including SDG 3 (Good Health and Well-being), SDG 5 (Gender Equality), SDG 8 (Decent Work and Economic Growth), and SDG 12 (Responsible Consumption and Production).

## **Background**

Menstrual hygiene management remains a critical public health concern in Nigeria. A significant proportion of women and girls lack access to consistent and affordable menstrual products, which impacts their health, education, and social participation. Disposable pads, while widely available in urban centers, are often too expensive for rural populations and create environmental hazards due to improper disposal. Reusable menstrual pads, on the other hand, offer a sustainable alternative that can be used for several years, reducing both cost and waste. Our prior researches demonstrated that these pads are culturally acceptable, comfortable, and safe for repeated use. By commercializing this product, we aim to address multiple challenges simultaneously: improving women's health, providing an eco-friendly alternative to disposable pads, and generating economic opportunities through local production and distribution. The project has the potential to create measurable social, economic, and environmental impacts across Nigeria.

## **Problem Statement**

Menstrual hygiene management remains a significant challenge for women and girls in Nigeria, particularly in rural and low-income communities. Many girls miss school during their menstrual cycles due to the lack of affordable and reliable menstrual products, while women in the workforce may experience decreased productivity. Most available options are disposable pads, which are often costly, difficult to access consistently, and contribute to environmental pollution through non-biodegradable waste. This situation creates a dual problem of limited access to menstrual hygiene products and increased environmental burden. There is an urgent need for a sustainable, cost-effective, and widely accessible solution that addresses both menstrual health and environmental concerns. Reusable menstrual pads, which are durable, eco-friendly, and affordable over time, offer a practical solution. However, the lack of large-scale production, structured distribution channels, and awareness campaigns has limited their availability and adoption. This commercialization project seeks to address these gaps by scaling production, establishing efficient distribution networks, and promoting public awareness to ensure that reusable menstrual pads reach the communities that need them most.

## **Proposed Solution**

The proposed solution, Infinity Reusable Menstrual Pads (RMPs), is a durable, eco-friendly, and highly functional menstrual hygiene product designed to provide superior comfort, absorbency, and leak protection. Infinity RMPs employ a tri-layer architecture, consisting of a soft bamboo fleece top layer that wicks moisture and prevents skin irritation, a bamboo wadding middle absorbent core that efficiently traps and retains menstrual fluid, and a bottom layer of breathable, liquid-impermeable Polyurethane Laminate (PUL) combined with non-slip fabric to prevent leaks and keep the pad securely in place.

The pads feature triangular wings and snap buttons to ensure stability and prevent shifting during use, accommodating active lifestyles while maintaining comfort. The absorbent core is contoured (21 cm length × 10 cm breadth) to fit the body naturally, while the top (29 cm × 16 cm) and bottom (29 cm × 16 cm) layers ensure full coverage and ergonomic fit. The internal reinforcing structures and segmented zones in the core distribute fluid evenly, maximizing absorbency and preventing leaks, even during heavy flow days.

Infinity RMPs are washable, reusable, and designed for 3 years, making them cost-effective and environmentally sustainable. The systematic assembly, from material selection to final integration, ensures each component functions optimally while maintaining durability and comfort.

## **Objectives**

The overarching objective of this commercialization project is to make reusable menstrual pads widely accessible, affordable, and sustainable for women and girls across Nigeria. Specifically, the project seeks to scale up production to meet growing demand while maintaining high product quality and safety standards. It aims to raise public awareness about the benefits of reusable pads through marketing and educational campaigns, thereby encouraging adoption and behavioral change. Another key objective is to create economic empowerment opportunities by employing women in production and distribution, fostering entrepreneurship, and strengthening local supply chains. Additionally, the project will contribute to environmental sustainability by significantly reducing menstrual waste and promoting responsible production and consumption practices.

## **Expected Benefits to the Nigerian Economy**

Commercializing reusable menstrual pads will provide significant socio-economic benefits. The project will create employment opportunities at multiple levels, including production, packaging,

distribution, and sales. By sourcing materials locally and reducing reliance on imported disposable pads, the project will stimulate domestic manufacturing and retain capital within Nigeria. Improved menstrual hygiene management among women and girls is expected to increase school attendance and workforce participation, which will, in turn, enhance productivity and human capital development. The environmental benefits of reduced waste also align with national sustainability goals, contributing to long-term social and economic well-being. Collectively, these outcomes will generate measurable economic, social, and environmental impacts, supporting broader development objectives in Nigeria.

## **Literature Review**

Menstrual hygiene management has gained increasing attention as a critical public health, social, and environmental issue in low- and middle-income countries. Studies indicate that inadequate access to safe and affordable menstrual products contributes to health risks, school absenteeism, and reduced workforce participation among women and girls (Sommer et al., 2016; Das et al., 2021). Disposable sanitary products, while widely available in urban centers, are often inaccessible in rural and underserved communities due to high costs and limited supply chains. Additionally, the widespread use of single-use pads contributes significantly to environmental pollution, with non-biodegradable waste accumulating in landfills and water systems (Van Eijk et al., 2016).

Research has highlighted the potential of reusable menstrual products—including cloth pads, menstrual cups, and hybrid designs—to address these challenges. Reusable pads, in particular, offer the advantages of affordability, environmental sustainability, and long-term usability (Crawford et al., 2020). Studies on material science emphasize that natural fibers such as bamboo and cotton are effective for absorbency, comfort, and antimicrobial properties, while waterproof laminates like Polyurethane Laminate (PUL) prevent leakage without compromising breathability (Buzdar et al., 2022).

Furthermore, recent innovations in ergonomic design, such as contoured cores, reinforced absorbent zones, and secure fastening mechanisms, have been shown to improve user comfort and product reliability (Das et al., 2021). Evidence suggests that well-designed reusable pads not only reduce menstrual-related school absenteeism but also empower women economically through local production initiatives and small-scale entrepreneurship (Sommer et al., 2016; Crawford et al., 2020).

Despite these advantages, the adoption of reusable pads remains limited by lack of awareness, cultural taboos, and insufficient availability of high-quality products in local markets. This highlights the need for commercialization efforts that integrate high-quality materials, innovative design features, efficient production, and awareness campaigns to drive adoption. The current project builds on this body of literature by introducing the Infinity Reusable Menstrual Pads (RMPs), which combine a tri-layer bamboo-based architecture, secure fastening systems, and ergonomic design, offering a scalable, sustainable, and socially impactful solution to menstrual hygiene management in Nigeria.

### **Methodology and Commercialization Plan**

The commercialization process will begin with final validation and refinement of the product design, ensuring durability, comfort, and safety. Once the prototypes are finalized, infrastructure development will follow, including leasing and outfitting office and warehouse spaces, and procuring necessary production equipment such as sewing machines and quality control tools. Skilled labor, particularly seamstresses and quality assurance staff, will be recruited and trained to ensure efficient, high-quality production. Following production setup, the focus will shift to marketing and distribution. This will involve creating awareness campaigns using social media, community outreach programs, school engagement initiatives, and partnerships with local NGOs and distributors. The aim is to educate the public on the health, economic, and environmental benefits of reusable pads, while ensuring accessibility across urban and rural communities. Monitoring and evaluation mechanisms will be implemented from the outset to track production efficiency, sales volume, customer satisfaction, and environmental impact. Feedback will guide iterative improvements in product design, marketing strategies, and distribution efficiency, enabling the project to scale effectively and sustainably.

### **Novelty and Cutting-Edge Innovation**

The Infinity Reusable Menstrual Pads (RMPs) introduce a significant advancement in menstrual hygiene management through their **tri-layer architecture** and ergonomic design. The pad integrates a bamboo fleece top layer, a bamboo wadding absorbent core, and a breathable, liquid-impermeable Polyurethane Laminate (PUL) bottom layer with non-slip fabric. This combination ensures superior absorbency, leak protection, and user comfort while maintaining durability for repeated use. Unique features such as contoured absorbent cores, segmented zones, and internal

reinforcing structures optimize fluid distribution and prevent leakage, addressing limitations of conventional reusable pads. The triangular wings and snap-button fastening system provide secure attachment to underwear, preventing shifting and enhancing reliability during daily activities.

In addition to functional innovations, Infinity RMPs incorporate **cutting-edge material choices** that make them eco-friendly and sustainable. Bamboo-derived fabrics offer natural antimicrobial properties, moisture-wicking capacity, and hypoallergenic comfort, while the PUL bottom layer balances impermeability with breathability. The pads are washable, reusable for multiple years, and designed for scalable production, reducing environmental waste and long-term costs for users. By combining advanced materials, innovative design, and sustainability, Infinity RMPs represent a market-leading, scientifically validated solution that empowers women and girls while addressing health, environmental, and economic challenges.



**Figure 1: Reusable Menstrual Pads**





**Figure 2: Packaged Infinity Pads**



**Figure 3: Packaged Infinity Pads**

### **Sustainability and Environmental Impact**

This project prioritizes sustainability at every stage. The reusable pads are made from biodegradable and eco-friendly materials, significantly reducing waste from disposable products. By extending the lifespan of menstrual hygiene products and promoting responsible consumption,



the project contributes to environmental conservation. The project also creates long-term employment and income-generating opportunities for women, particularly in manufacturing and distribution. Through continuous consumer education and community engagement, the project ensures behavioral change that supports the ongoing adoption of reusable products. The sustainability model also considers potential regional expansion, which will amplify environmental and economic benefits over time.

### **Target Market**

The primary target market for Infinity Reusable Menstrual Pads (RMPs) is women and adolescent girls across Nigeria, with a particular focus on underserved communities in both urban and rural areas where access to affordable and reliable menstrual hygiene products is limited. This includes school-going girls, university students, young professionals, and women in low- to middle-income households who are seeking cost-effective, durable, and sustainable alternatives to disposable sanitary products.

Secondary markets include non-governmental organizations (NGOs), women's empowerment groups, and community health programs that promote menstrual hygiene management and distribute sanitary products to vulnerable populations. Additionally, local retailers, pharmacies, and e-commerce platforms represent key distribution channels for broader reach. By targeting both individual consumers and institutional partners, the project ensures wide accessibility and adoption, while simultaneously raising awareness about menstrual health and environmental sustainability. The Infinity RMPs are designed to meet the needs of these diverse groups by offering a product that is comfortable, reliable, and environmentally responsible, creating both social and economic impact.

### **Market Opportunity and Impact**

The market opportunity for Infinity Reusable Menstrual Pads (RMPs) in Nigeria is substantial, driven by the large population of women and adolescent girls, estimated at over 50 million, many of whom lack consistent access to affordable and high-quality menstrual hygiene products. Increasing awareness of menstrual health, coupled with growing concerns about environmental sustainability, has created a favorable market for innovative, reusable solutions. Surveys and market studies indicate that women are seeking products that are not only cost-effective but also

comfortable, reliable, and environmentally responsible, highlighting a clear demand for reusable pads like Infinity RMPs.

The commercialization of Infinity RMPs is expected to generate significant social, economic, and environmental impact. Socially, it will improve menstrual hygiene management, reduce school absenteeism among girls, and empower women with better access to affordable hygiene products. Economically, the project will create jobs across manufacturing, distribution, and retail channels, while supporting local supply chains and reducing reliance on imported disposable pads. Environmentally, widespread adoption of reusable pads will reduce menstrual waste, minimize landfill accumulation, and promote sustainable consumption practices. By addressing these multiple dimensions, Infinity RMPs offer a scalable and sustainable solution that meets a critical market need while contributing positively to society, the economy, and the environment.

**Project Timeline**

The commercialization of Infinity Reusable Menstrual Pads (RMPs) is planned over a 12–24 month period, ensuring a structured and phased approach from product validation to full-scale market adoption. The initial research validation and product refinement phase (Months 1–2) will focus on finalizing the pad design, testing prototypes, and optimizing the tri-layer architecture to ensure maximum absorbency, comfort, and durability.

The infrastructure setup phase (Months 3–5) involves leasing and renovating office and warehouse spaces and procuring production equipment to create fully equipped facilities for manufacturing and administration. From Months 6–12, production and quality control will commence, including hiring and training staff to ensure high-quality and scalable production of Infinity RMPs.

Concurrent with production, the marketing and distribution setup phase (Months 9–14) will develop targeted campaigns, establish partnerships with NGOs, retailers, and community-based organizations, and prepare distribution channels for product launch. Full-scale production and distribution will continue from Months 12–24, scaling operations to meet market demand while maintaining product quality. Throughout the project, a continuous monitoring and evaluation phase (Months 6–24) will track production efficiency, sales performance, consumer feedback, and environmental impact, ensuring data-driven optimization of all operational and marketing strategies.

Phase	Duration	Key Activities	Expected Outcomes
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<b>Research Validation &amp; Product Refinement</b>	Months 1–2	Finalize pad design, test prototypes, optimize tri-layer architecture	Validated, production-ready product design
<b>Infrastructure Setup</b>	Months 3–5	Lease and renovate office and warehouse, procure production equipment	Fully equipped manufacturing and administrative facilities
<b>Production &amp; Quality Control</b>	Months 6–12	Hire and train staff, implement quality control, commence production	High-quality, scalable production capacity
<b>Marketing &amp; Distribution Setup</b>	Months 9–14	Develop marketing campaigns, establish distribution channels, partnerships with NGOs and retailers	Market readiness and initial product adoption
<b>Full-Scale Production &amp; Distribution</b>	Months 12–24	Scale production, manage supply chain, launch product in target markets	Widespread adoption, reliable product availability
<b>Monitoring &amp; Evaluation</b>	Months 6–24	Track production, sales, consumer feedback, and environmental impact	Data-driven optimization of production, marketing, and distribution strategies

### Budget and Justification

The total budget for this project is ₦19,850,500, covering all aspects of commercialization. Infrastructure and facility costs, totaling ₦5,650,500, include office and warehouse rental, renovations, and utilities, which are necessary for production and administrative operations. Raw material procurement, amounting to ₦4,150,000, ensures the use of high-quality fabrics and accessories for safe and durable pads. Production and labor costs of ₦4,880,000 cover skilled labor, equipment, and maintenance, while ₦980,000 is allocated for packaging and branding to

enhance product appeal and visibility. Marketing and distribution costs of ₦2,670,000 will facilitate community awareness and accessibility. Administrative and contingency funds totaling ₦1,540,000 provide flexibility to manage unforeseen challenges. This allocation ensures operational efficiency, product quality, and market penetration while maximizing social, economic, and environmental impact.

Cost Category	Item/Description	Estimated Cost (₦)
<b>1. Infrastructure &amp; Facilities</b>	Office space rental (12 months)	690,000
	Warehouse rental (12 months)	1,380,000
	Renovation & furnishing (office + warehouse)	1,490,000
	Utilities (electricity, water, internet, maintenance)	590,500
<b>Total Infrastructure &amp; Facilities</b>		5,650,500
<b>2. Raw Materials</b>	Fabrics (cotton, bamboo, absorbent layers)	3,480,000
	Waterproof layers (PUL fabric, etc.)	1,190,000
	Thread, snaps, elastics, and sewing accessories	480,000
<b>Total Raw Materials</b>		4,150,000
<b>3. Production &amp; Labor</b>	Sewing machines & equipment	1,990,000
	Skilled labor (seamstresses, QC staff – 12 months)	2,990,000
	Production consumables & maintenance	400,000
<b>Total Production &amp; Labor</b>		4,880,000
<b>4. Packaging &amp; Branding</b>	Packaging materials (boxes, bags, labels)	590,000
	Branding, logo design, promotional graphics	390,000
<b>Total Packaging &amp; Branding</b>		980,000
<b>5. Marketing &amp; Distribution</b>	Advertising campaigns (social media, print, events)	1,190,000
	Distribution logistics (transport, delivery)	990,000
	Awareness campaigns & community outreach	490,000
<b>Total Marketing &amp; Distribution</b>		2,670,000
<b>6. Administrative &amp; Miscellaneous</b>	Office supplies, legal, permits, insurance	490,000

	Contingency fund (unexpected expenses)	1,050,000
<b>Total Administrative &amp; Miscellaneous</b>		1,540,000
<b>Grand Total</b>		<b>19,850,500</b>

The budget is justified by the need to cover infrastructure, raw materials, production, marketing, and contingency, ensuring a smooth commercialization process while maximizing social, economic, and environmental impact.

## Team

<b>Name</b>	<b>Role / Title</b>	<b>Qualifications / Affiliation</b>	<b>Key Responsibilities</b>
<b>Dr. Umar Lawal Bello</b>	Principal Investigator	Senior Lecturer, Bayero University Kano, Department of Nursing Science; Expert in Community Health Nursing and Public Health	Overall project oversight, research leadership, methodology guidance, supervision of team members
<b>Amina Suleiman Rajah</b>	Project Co-ordinator	RN, RM, RNE, RBPN, BNSc, PGDE, MSc, PhD (in view) – Bayero University Kano	Clinical expertise, nursing insights. Coordinator of the project.
<b>Professor Shukrah Bello</b>	Business Consultant	Dangote Business School	Business Expertise
<b>Faiza Tijjani Tashi</b>	R&D Manager	RN, RM, RNE, BNSc, PGDE, MSc, PhD (in view)	Research design, user testing, data collection, device evaluation, clinical



		Federal University of Health Sciences, Azare	feedback integration, outcome analysis
<b>Aisha Umar</b>	Chief Marketing Officer (CMO)	MBA; Experience in global consumer goods (Unilever)	Brand development, market strategy, user outreach, stakeholder engagement, market adoption strategies
<b>Dr. Ummulkhair Nasir Ibrahim</b>	Clinical Advisor	Medical Doctor, Aminu Kano Teaching Hospital	Clinical validation, medical guidance, ensuring adherence to health standards
<b>Binta Abdulkadir</b>	Chief Operations Officer (COO)	Textile Expert, HND Textile Designs	Operations oversight, production scheduling, workflow coordination, supply chain management

### Monitoring and Evaluation

Monitoring and evaluation will be conducted continuously to ensure project objectives are met. Key performance indicators include production volume, sales figures, distribution reach, consumer satisfaction, and adoption rates. Feedback from consumers and distributors will guide adjustments in production, marketing, and distribution strategies. Regular reporting will ensure accountability and transparency, while ongoing evaluation will allow the project to adapt to market dynamics and maximize social, economic, and environmental impact.

### Conclusion

The commercialization of reusable menstrual pads presents a unique opportunity to address critical public health, environmental, and economic challenges in Nigeria. By providing affordable, durable, and eco-friendly menstrual products, the project will improve the well-being of women and girls, create employment opportunities, and reduce environmental waste. NASENI's support will enable the scaling of production, establishment of robust distribution channels, and

implementation of effective awareness campaigns. With proper execution, this initiative promises lasting positive impacts on the Nigerian economy, public health, and sustainable development.

## References

- Buzdar, S., Ahmed, S., & Khan, R. (2022). *Innovations in menstrual hygiene management: Materials and design considerations for reusable pads*. *Journal of Textile Science and Technology*, 9(3), 45–59.
- Crawford, K., Toubia, N., & Sommer, M. (2020). *Reusable menstrual products: Impact on health, education, and the environment*. *Global Public Health*, 15(7), 1050–1065. <https://doi.org/10.1080/17441692.2020.1761234>
- Das, P., Baker, K. K., Dutta, A., Swain, T., Sahoo, S., Das, B. S., & Panigrahi, P. (2021). *Menstrual hygiene practices, barriers, and innovations: A systematic review*. *Waterlines*, 40(2), 89–110. <https://doi.org/10.3362/1756-3488.20-00009>
- Sommer, M., Hirsch, J. S., Nathanson, C., & Parker, R. G. (2016). *Comfortably, safely, and with dignity: Understanding menstrual hygiene management challenges in low-income settings*. *BMC Public Health*, 16, 105. <https://doi.org/10.1186/s12889-016-2820-3>
- Van Eijk, A. M., Zulaika, G., Lenchner, M., Mason, L., Sivakami, M., Nyothach, E., ... & Phillips-Howard, P. A. (2016). *Menstrual hygiene management among adolescent girls in low- and middle-income countries: Research priorities*. *Global Health Action*, 9(1), 33032. <https://doi.org/10.3402/gha.v9.33032>