



Minimum Viable Product Documentation
MVP-Snail Farming
Living Lab ADC



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1. Overview

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Location: Aglobe Development Center

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1.1. Abstract

The simplified snail farming model focuses on rearing *Achatina fulica* and *Archachatina marginata*, leveraging low-cost materials like repurposed tires for housing. It aims to provide a sustainable, nutritious protein source while tackling food insecurity and youth unemployment in West Africa. Snails require minimal space, water, and feed, making farming environmentally friendly. The initiative addresses key barriers like lack of knowledge, disease management, and predator control through hands-on training and locally adaptable methods. The MVP demonstrates that with basic resources and guidance, small-scale farmers can produce and sustain profitable snail farms, contributing to nutrition and income generation.

1.2. Photos



Figure 1: Design of a snail farm

1.3. Motivation and challenges addressed

The snail farming MVP addresses several interconnected problems in urban areas of Nigeria such as:

Food Insecurity: In West Africa, many communities struggle with food insecurity due to limited access to affordable and nutritious protein sources. Snail meat is highly valued for its rich nutritional profile. It is high in protein, iron, and essential amino acids making it an excellent option for improving diets and combating malnutrition. However, snail availability is typically seasonal; snails are most commonly

found during the wet or rainy season and become scarce during the dry season, creating fluctuations in supply and access.

The MVP addresses this issue by introducing a simplified and controlled method of snail farming that allows year-round production. By using basic, affordable materials and techniques that can be easily adopted by local farmers, the MVP enables communities to rear snails sustainably in both wet and dry seasons. This steady supply helps reduce reliance on wild harvesting, lowers market prices over time, and ensures that nutritious snail meat is consistently available, especially in vulnerable rural and peri-urban areas. Ultimately, this contributes to improved food security, dietary diversity, and overall public health.

Youth Unemployment: In many Nigeria, young people face high unemployment rates due to limited access to formal jobs, vocational training, and startup capital. This lack of opportunity contributes to poverty, rural-urban migration, and social instability. Traditional forms of employment are either saturated or require significant education or investment, which many young people cannot afford. The snail farming MVP offers a low-barrier entry point into agriculture, tailored specifically to overcome these challenges. It requires minimal land, low startup costs, and uses locally available and repurposed materials such as old car tires and Styrofoam for snail housing and hatchery. These characteristics make it highly accessible for youth, even those with limited resources. Additionally, the MVP does not require extensive knowledge, thus, enabling young people to quickly acquire the skills needed to manage and scale snail farming operations. With a relatively quick production cycle (especially for *Achatina fulica*, which matures in six months), young agripreneurs can start earning income in a short time, improving their livelihoods and self-reliance. This MVP turns a traditionally overlooked practice into a structured, income-generating venture, the MVP not only addresses unemployment but also empowers youth with entrepreneurship skills, promotes agricultural innovation, and contributes to community development.

Lack of Technical Know-how: One of the major barriers to successful snail farming in Nigeria is the limited technical knowledge among prospective farmers. A substantial number of these farmers are unfamiliar with essential aspects such as snail species selection, breeding cycles, feeding practices, pest control, and habitat management. As a result, even those who are interested in farming snails often struggle to maintain healthy stock, leading to poor yields, losses, and eventual abandonment of the practice. The snail farming MVP directly addresses this knowledge gap by offering simplified, easy-to-follow, and replicable methods that farmer and agripreneur, regardless of prior experience, can adopt. It breaks down the entire farming process into manageable steps for species selection, cost minimization, safe habitation, hatchery, feeding, environmental conditions and disease management. These steps aid hands-on training and demonstrations, enabling learners to gain experience through direct practice. This approach builds confidence, reduces the risk of trial-and-error losses, and encourages more people, especially youth and women, to engage in snail farming.

High Farming Costs: Traditional livestock farming, such as raising poultry, goats, or cattle, requires a high upfront investment. Costs typically include land acquisition, construction of specialized animal housing, veterinary services, commercial feed, irrigation or water systems, and labor. These expenses create significant financial barriers, particularly for first-time entrepreneurs, youth, and low-income individuals seeking to enter the agricultural sector. Even in the case of traditional snail farming, the projected startup cost for a 100-snail-capacity farm in 2023 was approximately ₦460,000, including

₦400,000 in fixed capital (refrigerator ₦100,000, generator ₦120,000, pens/cages ₦100,000, and other essentials ₦140,000), along with ₦60,000 in supplementary investment. The first-year working capital was ₦546,840, covering expenses such as feeding (₦240,000), fueling (₦226,800), electricity (₦24,000), transportation (₦30,000), and tax (₦26,040). Such financial demands make traditional snail farming inaccessible to many youths and vulnerable groups living in urban and peri-urban areas. The proposed MVP offers a low-cost, scalable solution by using affordable, locally sourced materials, like repurposed car tires and Styrofoam, for snail housing. This reduces startup costs and makes snail farming a more inclusive and practical livelihood option for underserved populations.

Environmental Impact: The snail farming MVP aligns with sustainable and environmentally friendly agricultural practices. Unlike traditional livestock farming, which often requires large tracts of land, high volumes of water, and substantial feed inputs, snail farming is naturally low-impact. The MVP is designed to maximize efficiency while minimizing ecological footprint. It requires only a small amount of land, making it ideal for urban or peri-urban spaces where land is scarce and expensive. Snails are housed in compact units i.e. repurposed car tires and Styrofoam boxes and promoting waste recycling. Snails also consume a variety of food scraps, including fruit peels and leafy vegetables, enabling farmers to repurpose kitchen and market waste as nutritious feed. This practice not only lowers feed costs but also contributes to organic waste upcycling. Water usage is minimal, limited to misting for humidity and occasional cleaning. Additionally, snail farming produces very little waste compared to conventional livestock, which generate significant manure and require complex waste management systems. Thus, the MVP encourages a circular, low-carbon farming model that supports biodiversity, reduces pollution, and aligns with global environmental sustainability goals making it a smart choice for both economic empowerment and ecological preservation.

1.4. Feedback process

From March to September 2024, the interaction between the Living Lab (LL) and the innovation actor exploring the adoption of the simplified snail farming model as an MVP was marked by consistent, structured capacity-building activities. These engagements aimed to strengthen both the technical understanding and hands-on skills of the innovation actor, enabling them to implement, manage, and adapt the snail farming system effectively within their local context. The capacity-building process included a series of participatory training sessions, design co-creation workshops, and iterative feedback loops. These sessions explored the core components of the simplified snail farming model namely, the use of loamy soil, repurposed car tires, Styrofoam, and mesh netting attached to a circular iron frame. Special attention was given to understanding how each material functions within the system to provide a suitable environment for snail growth, reproduction, and protection. Participants were introduced to the basic biological needs and behavior of snails, including moisture and temperature regulation, feeding routines, reproductive cycles, and predator management. Practical demonstrations covered soil preparation, habitat construction, feeding techniques using household organic waste, and daily maintenance tasks such as moisture monitoring and cleaning. Emphasis was placed on ensuring sustainable practices and minimal input costs, aligning with the MVP's goal of affordability and replicability in resource-constrained urban and peri-urban settings. In addition to technical skills, the sessions promoted collaborative learning through open discussions, peer feedback, and knowledge exchange between LL managers and the innovation actor. Local experiential knowledge was integrated into the process, reinforcing the adaptability of the model to local conditions such as climate variability, space limitations, and waste reuse opportunities. This

interactive and co-creative approach helped build trust and boosted the confidence of the innovation actor in the feasibility of the snail farming model. By the end of the training cycle, the innovation actor demonstrated a clear understanding of how to set up, operate, and scale the model, as well as how to troubleshoot common issues such as snail escapes, low hatch rates, or pest intrusion. Thus, the sustained capacity-building efforts provided a solid foundation for informed decision-making, local innovation, and long-term ownership of the simplified snail farming MVP by the adopting actor.

2. Implementation

2.1. MVP Design

The simplified model for snail farming, or heliciculture, outlined in this report is built upon a foundation of affordability, accessibility, and practicality—especially tailored for urban and peri-urban environments where space and resources are often limited. The key components of this innovative snail farming system include four essential materials: sharp and loamy soil, repurposed car tires, Styrofoam sheets, and mesh netting attached to a circular iron frame.

(i) Sharp and Loamy Soil: The choice of soil is critical in heliciculture. Sharp, loamy soil was selected due to its optimal texture and composition, which supports snail mobility, egg-laying, and burrowing. Loamy soil, rich in organic matter and well-draining, also helps maintain the right level of moisture necessary for snail growth and reproduction. Its availability in most regions further enhances its suitability for low-cost snail farming.

(ii) Repurposed Car Tires: Used car tires serve as compact, durable enclosures that define the snail habitat. This design choice reflects a conscious effort to repurpose waste materials, minimizing environmental impact while reducing startup costs. Tires are readily available in urban and peri-urban settings and offer a contained, stackable option for managing multiple snail colonies within a limited space.

(iii) Styrofoam Sheets and Box: Styrofoam is employed as a moisture-retaining cover within the enclosure as well as a hatchery for snail eggs. Given snails' sensitivity to environmental changes, especially dryness, Styrofoam helps create a controlled microclimate by preserving humidity and providing shelter. Despite environmental concerns around Styrofoam use, its reusability and insulating properties make it a functional component in this small-scale model.

(iv) Mesh Netting and Circular Iron Frame: A breathable but secure environment is essential to prevent escape and protect the snails from predators. This is achieved by fastening mesh netting around a circular iron frame, which also allows for air circulation and visibility. The iron frame adds stability and durability to the system, ensuring longevity and structural integrity.

The overall design philosophy emphasizes the use of locally available, low-cost, and often discarded materials. This approach directly addresses the challenges of resource scarcity common in urban and peri-urban areas, making snail farming more accessible and scalable for low-income households, youth entrepreneurs, and small-scale farmers seeking to enhance food security and generate alternative income.

2.2. Operations

This model for snail farming is designed to be easy to set up, manage, and operate using locally available resources and minimal technical expertise.

(i) Site Preparation and Setup:

The first step in operating the system involves selecting a suitable location that is shaded, protected from direct sunlight and heavy rainfall, and away from predators such as rodents and birds. Once the site is identified, the foundation is prepared using sharp, loamy soil, which is first sieved and disinfected through cooking on a stove. This loosens the soil and facilitates snail burrowing and egg-laying. Spread the pathogen-free soil in the enclosure i.e. the hollow of a repurposed car tire.

(ii) Construction of the Enclosure

Each snail habitat is formed by stacking painted used car tires. The paint is done to reduce heat absorption inside the tire. A circular iron frame is constructed around the setup, onto which mesh netting is fastened. This enclosure prevents snail escape, allows for air circulation, and protects against pests and predators. For hatchery, Styrofoam is used as moisture-retaining housing, helping to keep the internal environment humid and suitable for snail survival.

(iii) Stocking and Feeding

Juvenile or mature snails, *Achatina fulica* and *Archachatina marginata*, are introduced into the system at a stocking density appropriate for the tire's size. The snails can be found and collected during the wet season. The snails are fed daily with (kitchen) vegetable waste, fruit peels, leafy greens, and calcium-rich supplements such as ground eggshells or limestone to support shell development. Feeding is usually done in the evening when snails are most active.

(iv) Maintenance and Monitoring

Regular watering is essential to maintain soil moisture, especially during dry periods. Farmers monitor the system daily for signs of overfeeding, dehydration, or pest intrusion. The mesh cover is inspected to ensure it remains intact and secure. Occasional soil replacement and cleaning of the enclosure help maintain hygiene and prevent disease.

(v) Harvesting and Reproduction

Snails are harvested based on size and market demand, usually after 5 to 7 months. A portion of the mature snails is left for reproduction to sustain the cycle. Eggs are collected from the soil and incubated within the same tire system or separate nursery tires.

2.3. Bill of Materials & required Tools

Table 1. Bill of materials

Item	Quantity*	Unit cost	Total cost
Sharp and Loamy Soil	25 kg	₦200 (EUR 0.13)	₦5,000 (EUR 3.1)
Repurposed Car Tires	3	₦500 (EUR 0.31)	₦1,500 (EUR 0.9)
Styrofoam Sheets	1	₦2,000 (EUR 1.2)	₦2,000 (EUR 1.2)
Styrofoam Box	1	₦20,000 (EUR 13)	₦20,000 (EUR 13)
Mesh Netting and Circular Iron Frame	1	₦1,000 (EUR 0.62)	₦1,000 (EUR 0.62)
Paint (Bright color)	1	₦5,000 (EUR 3.1)	₦5,000 (EUR 3.1)
Total			₦34,500 (EUR 21.5)

Table 2. Tools required

Item	Quantity	Unit cost	Total cost
Pot	1	-	-
Brush	1	₦1,000 (EUR 0.62)	₦1,000 (EUR 0.62)
Kerosene/Gas	2L/2kg	₦1,000 (EUR 0.62)	₦2,000 (EUR 1.2)
Sieve	1	₦2,000 (EUR 1.2)	₦2,000 (EUR 1.2)

3. Economics

3.1. Business model

The core business idea behind the simplified snail farming model as an MVP is to establish a low-cost, scalable, and sustainable agribusiness venture that leverages locally available materials to produce edible snails for food and income generation. This model is designed to address key challenges faced by aspiring urban and peri-urban farmers, particularly youth and women, who often have limited access to land, capital, and technical knowledge. At its foundation, the business uses a simple but effective production system made from repurposed car tires, loamy soil, Styrofoam, mesh netting, and an iron frame. These materials are affordable, widely available, and easy to assemble, enabling quick setup and expansion without the need for expensive infrastructure or specialized tools. This simplicity reduces entry barriers and makes snail farming accessible to low-income entrepreneurs. The business operates by rearing *Achatina fulica* and *Archachatina marginata*, which are in increasing demand due to their nutritional value, low fat content, and use in both local cuisine and traditional medicine. The snails are fed organic kitchen waste such as vegetable peels, fruit scraps, and leafy greens, making the model not only cost-effective but also environmentally sustainable through waste recycling. Revenue is generated by selling mature snails directly to local markets, restaurants, and individual consumers. Additional income streams can be developed by selling snail eggs or juveniles to new farmers and by offering training or demonstration services for those interested in replicating the model. With proper care, each tire unit can yield several cycles of harvest annually, ensuring a steady income flow. A major strength of the MVP is its adaptability. It can be operated in small backyards, balconies, or rooftops, and can scale incrementally as profits are reinvested. The model is also resilient to climate change, requiring minimal water, and can be managed part-time, making it ideal as a supplementary income source or as a step toward full-time agribusiness. Ultimately, the business idea positions snail farming not just as a livelihood option but as an entry point for youth- and women-led innovation in urban

agriculture. It provides practical experience, builds entrepreneurial skills, and fosters circular economy principles through low-waste, nature-positive food production.

4. Iterative Optimization

4.1. SWOT analysis

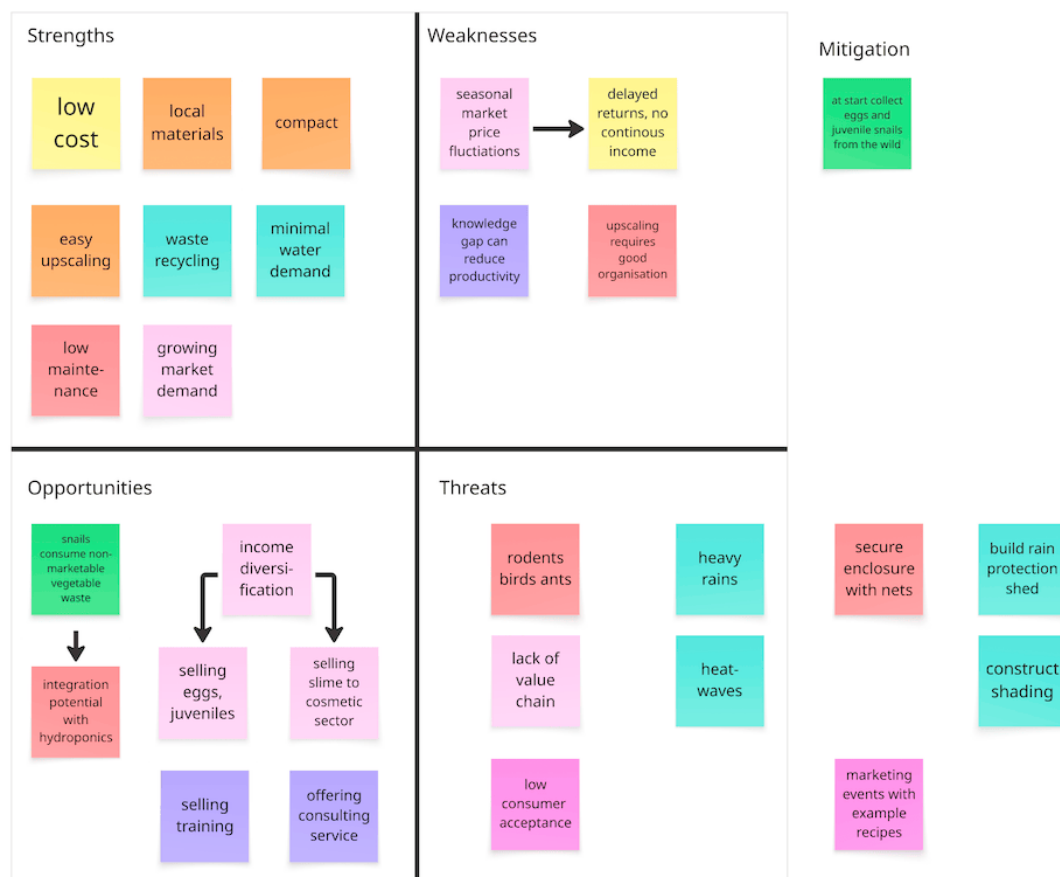


Figure 2: SWOT – AGLOBE LL – Snail farming

Strengths: The simplified snail farming model is built on a strong foundation of low-cost, locally available materials, such as used car tires, loamy soil, mesh netting, and Styrofoam. This makes the setup affordable and easily replicable for low-income individuals, particularly youth and women in urban and peri-urban areas. The system is compact, allowing for vertical or modular expansion even in space-constrained environments like backyards or rooftops. Operationally, the model is environmentally friendly. It promotes organic waste recycling through snail feeding practices and requires minimal water, making it climate-resilient. Snails themselves are hardy, low-maintenance livestock that require little input compared to poultry or fish. Moreover, market demand for snails is growing due to their high protein, low fat, and medicinal properties. They are popular in local diets and have potential in the cosmetics and pharmaceutical industries. The business also allows for income diversification through sales of live snails, eggs, and training services.

Weaknesses: Despite its strengths, the simplified snail farming model has limitations. Snail growth is relatively slow, typically requiring 6 months before harvest, which may delay returns for first-time farmers. Additionally, there is a knowledge gap among new entrants regarding snail biology, optimal feeding, and disease prevention, which can affect productivity. The model also faces limitations in scalability if not well planned. While tires are easy to find, expanding beyond a small household unit

requires organization, labor, and space that may be challenging to secure in dense urban settings. Record-keeping, quality control, and biosecurity may also be difficult without additional training or support.

Opportunities: There is significant potential to scale the model through youth employment schemes, women's empowerment programs, and climate-smart agriculture funding. Partnerships with NGOs, government agencies, and agri-tech incubators can enhance visibility and support. Market opportunities also include value addition (e.g., smoked or packaged snails), online sales, and export, particularly as global interest in alternative protein sources increases. Additionally, the model can be integrated into school gardens, urban food hubs, and circular economy initiatives. Snail farming is also well-positioned to benefit from growing consumer awareness around sustainability, healthy eating, and regenerative agriculture.

Threats: External threats include environmental hazards like heavy rains, heatwaves, or prolonged droughts that could disrupt snail health if the system is not adequately protected. Predation by rodents, birds, or ants is another risk, especially if the mesh enclosure is compromised. Market risks also exist—such as price fluctuations, lack of established value chains, and consumer unfamiliarity in some areas. Policy gaps or lack of recognition of snail farming as a formal agricultural activity may limit access to subsidies or technical support. In some cases, informal land tenure may threaten long-term investment, particularly in peri-urban zones undergoing rapid development.

4.2. Optimization

The usage of Styrofoam raises environmental concerns as this material does not decompose when it degrades beyond usability. To mitigate this, compostable materials like jute sacks or boxes from Banana or Plantain leaves can be explored.

There is little that can be done to counter the slow growth and the delayed returns when starting a snail farming operation. Collecting larger juveniles or mature snails during the wet season and rearing them into the dry season to achieve higher prices can be a viable strategy.

When upscaling, building snail housing out of bricks or concrete walls offers the opportunity to improve ventilation and climate control for the snails. The organizational burden of upscaling could potentially be mitigated with an app.

4.3. Threat mitigation

Environmental factors like predators, heavy rain, heat waves and drought can be countered with diligent operation and a sound construction of the snail pens. In case of a heatwave or drought that jeopardize the life of the snails, a premature harvest and emergency marketing could be an option to minimize losses.

A lack of consumer awareness and the lack of a value chain can be countered by a marketing campaign where samples of delicious dishes with snail meat are offered to potential customers. This can work in particular with local restaurants and gastronomy, aiming for long-term customers.