SONIC SAFE

Submitted by

Annet Janishma Lewis - 24250112

Frenita Fernandes - 24250129

Preemal Castelino – 24250171

ST ALOYSIUS (DEEMED TO BE UNIVERSITY)

Institute of Management and IT-AIMIT

ST ALOYSIUS (DEEMED TO BE UNIVERSITY)

Institute of Management and IT-AIMIT Mangaluru

KARNATAKA

2025

ST ALOYSIUS (DEEMED TO BE UNIVERSITY) Mangaluru

Institute of Management and IT-AIMIT

KARNATAKA

CERTIFICATE

This is to certify that the BCP project titled

SONIC SAFE

Submitted by

Annet Janishma Lewis - 24250112

Frenita Fernandes - 24250129

Preemal Castelino – 24250171

ST ALOYSIUS (DEEMED TO BE UNIVERSITY)

Institute of Management and IT-AIMIT

Mangaluru

During the year

2025

Examiners :

1._____

2._____

CERTIFICATE OF AUTHENTICATED WORK

This is to certify that the BCP project report entitled **SONIC SAFE** submitted to St Aloysius Institute of Management and Information Technology (AIMIT), St Aloysius (Deemed to be University), Mangaluru is an original work carried out by Annet Janishma Lewis – 24250112, Frenita Fernandes – 24250129, Preemal Castelino – 24250171.

The matter embodied in this project is authentic and is genuine work done by us and has not been submitted to any other University / Institute for the fulfilment of the requirement of any course of study.

Signature of the Students:

Date : 23/05/2025

Annet Janishma Lewis - 24250112

Frenita Fernandes - 24250129

Preemal Castelino – 24250171

INDEX

ABSTRACT

Sonic Safe is an advanced, solar and USB-powered ultrasonic animal repellent device with built-in motion sensors, engineered to protect outdoor spaces by gently irritating and deterring stray animals and birds without causing them distress. Utilizing high-frequency ultrasonic sound waves up to 20KHz. It effectively repels common intruders such as monkeys, dogs, wild boars, and birds etc. Designed with versatility in mind, the device is ideal not only for farmers safeguarding their crops but also for gardeners aiming to preserve their plants and landscapes, homeowners protecting their yards, factory and warehouse owners preventing property damage, and restaurants or hotels with outdoor areas looking to maintain clean, animal-free dining environments for their guests. Its durable, weather-resistant construction and adaptable mounting system ensure reliable performance across diverse environments. Sonic Safe promotes eco-friendly, non-invasive animal control, helping users minimize crop damage, maintain clean and appealing spaces, and support sustainable living through a smart, affordable solution.

VISION

“To be a pioneer in sustainable, humane technology that safeguards outdoor spaces from animal and bird intrusions.”

MISSION

To deliver a simple, humane, and eco-friendly solution for protecting outdoor spaces from animal intrusion through our innovative ultrasonic device **Sonic Safe**, helping people safeguard their crops and gardens without harming wildlife.

CORE VALUES

Eco-Friendly

Protects plants without harming animals or the environment.

Non-Lethal

Repels animals without causing injury or death.

Sustainable Farming Support

Helps farmers and gardeners grow crops safely and naturally.

User-Friendly

Easy to install and operate, even in rural areas.

Cost-Effective

Reduces crop loss with minimal investment.

Innovation for Coexistence

Promotes peaceful human-wildlife interaction.

LEAN CANVAS

<table>
<tr>
<td rowspan="2">PROBLEM

• Animal intrusion into farms and properties
• Crop and property damage
• Lack of humane and legal deterrents
• Noise and disturbance from traditional repellents
• High cost & maintenance

EXISTING ALTERNETIVES

• Electric fencing
• Scarecrow
• Poisoning
• Chemical Sprays
• Labour and fencing</td>
<td>SOLUTION

• Emit ultrasonic sound waves (covers range up to 20KHz)
• wide-area coverage (coverage: 30cents/device)
• chemical-free, non-lethal solution
• solar power with optional USB charging</td>
<td rowspan="2">UNIQUE VALUE PROPOSITION

Humane, solar-powered ultrasonic device with motion sensor tech to protect outdoor spaces.

HIGH-VALUE CONCEPT (X-Y Analogy)

Like a digital fence using motion detection and sound - no walls, no harm.</td>
<td rowspan="2">UNFAIR ADVANTAGE

India-focused design, local partnerships, culturally aware messaging, and extra-value services for retention.

CHANNELS

• Agri-shops
• Online Marketplaces
• FPOs and cooperatives
• Agricultural Exhibitions & Trade fairs
• social media for wide, local reach.</td>
<td rowspan="2">CUSTOMER SEGMENTS

• Farmers & Agricultural Landowners
• Nurseries & Horticulturists
• Homeowners & Garden Enthusiasts
• Hospitality Businesses & Resorts
• Industrial & Commercial Property Owners
• Government & Municipal Parks

EARLY ADOPTERS
• Farmers & Agricultural Landowners
• Commercial / Tech-savvy farmers
• Nurseries & Horticulturists
• Garden Enthusiasts</td>
</tr>
<tr>
<td>KEY METRICS

• Units sold
• region coverage
• Satisfaction
• Cost Per Acquisition
• crop protection impact</td>
</tr>
<tr>
<td colspan="2">COST STRUCTURE

• Machine components
• Assembly & labour cost
• Marketing & logistics
• Rural demo/training setup</td>
<td colspan="3">REVENUE STREAMS

Earnings from device sales, Bulk orders, Accessory upgrades, Maintenance Kit, Warranty Extension & AMC, Referral discounts</td>
</tr>
</table>

COMPANY DESCRIPTION

Business Name: Sonic Safe

Logo: 

Business Type: Private Startup

Business Structure: Partnership or Private Limited Company (recommended for growth, liability protection, and technology investment)

Stage: Early-stage, pre-revenue startup

Founded: 2025

COMPANY OVERVIEW

Sonic Safe is a purpose-driven Agri-tech startup offering eco-friendly, ultrasonic animal and bird repellent solutions for farms, gardens, warehouses, and outdoor businesses. Our flagship product uses high-frequency sound waves and motion detection to safely repel intruding animals such as monkeys, dogs, wild boars, and birds—without trapping them.

Built for sustainability, affordability, and ease of use, the device is solar and USB powered, weather-resistant, and requires minimal maintenance. Sonic Safe empowers farmers, gardeners, residential communities, and commercial spaces to protect their environments without harming wildlife.

We aim to bridge the gap between smart technology and traditional outdoor protection, especially in semi-urban and rural India where animal intrusion is a persistent challenge.

Long-term Vision: To become the most trusted name in humane animal control, scaling across India with localized support, community partnerships, and sustainable technology adoption.

PRODUCT OR SERVICE

The company offers a physical product called Sonic Safe, a solar and USB-powered ultrasonic animal repellent device with motion sensors, designed to protect open areas from animals and birds using sound technology. Both the product and its variants are sold directly through agents or retail shops with 2-year warranty to consumers such as farmers, gardeners, and property owners for humane and eco-friendly animal control.

PRODUCT FEATURES

Solar Powered
Operates using solar energy, eliminating the need for external power sources and reducing electricity costs.

USB Support
Allows charging or connectivity through USB, offering versatility in power options.

Ultrasonic Sound Emission (up to 20 kHz)
Emits high-frequency sound waves to repel pests or animals without disturbing humans.

Adjustable Volume
Lets users control the sound intensity based on need and environment.

Weather Resistant
Built to withstand rain, sunlight, and other outdoor conditions for long-term use.

Better Range Coverage Area (30 cents)
Effectively covers up to 30 cents of land, ensuring wide protection.

Portable Design
Lightweight and easy to move or install anywhere.

Environment Friendly
Uses clean energy and avoids harmful chemicals or noise pollution.

Affordable Cost
Budget-friendly pricing makes it accessible for a wide range of users

BUSINESS MODEL

Sonic Safe uses a Direct-to-Customer and Partner-Based Sales Model.

1. The device reaches customers through:

Direct Sales at local exhibitions, agri-fairs and gardening outlets.

Commission-Based Agents, such as local shopkeepers or field reps, who promote and sell the product within their community.

This model ensures personalized service, lower distribution costs, and stronger customer relationships.

2. Target Customers:

Farmers (small to medium scale)

Gardeners and nursery owners

Homeowners with gardens or backyard areas

Factory and warehouse owners

Restaurants and hotels with outdoor dining

3. Product Offering:

Sonic Safe Device: A solar + USB-powered ultrasonic animal repellent with motion sensor technology

Variants:

Single-unit pack (for small areas)

Triple-unit combo pack (for large area coverage)

Optional Add-ons: Mounting accessories.

4. Pricing:

Single Unit: ₹2,800

Combo Pack (3 Units): ₹7,560 with 10% discount

5. Promotion:

Local advertisements via agri-shops and farmer co-operatives

Participation in village-level agri-events and expos

Social media reels and demo videos in regional languages

Retail tie-ups with fertilizer shops and gardening stores

6. Sales Force:

A trained field sales team or commissioned agents in rural/agri areas

Collaboration with agricultural extension workers or NGOs

Retailers or local shopkeepers can be sales partners

These representatives provide DEMOS, explain benefits, and handle customer queries

7. Commission and Revenue Model:

Sales partners or agents earn commission per unit sold (e.g., ₹150–₹250)

8. Training and Support:

Sales reps are provided with a simple training manual and demo kit

Customers get a user manual and basic troubleshooting guide

MARKET ANALYSIS

Industry Insights

India faces significant challenges due to stray animals and crop-damaging wildlife, especially in semi-urban and rural areas. According to recent estimates:

- Crop loss due to wild animals (monkeys, wild boars, etc.) is a persistent issue, costing farmers crores of rupees annually.
- Urban areas also struggle with stray dog and monkey interference in residential and commercial properties.

With increasing awareness around humane animal control, and the government's push for clean and sustainable technologies, devices like Sonic Safe are well-positioned.

Target Market Segments

Segment	Need	Opportunity
Farmers and Agricultural Landowners	Prevent crop damage from monkeys, wild boars, birds, and other pests.	Rising awareness of organic farming and non-chemical methods; large land coverage creates demand for cost-effective solutions.
Nurseries & Horticulture	Protect high-value plants from birds and small animals in open setups	Highlight chemical-free protection and solar operation to appeal to eco-conscious plant businesses
Homeowners and Garden Enthusiasts	Protect home gardens and landscapes from stray dogs, cats, and birds.	Urban gardening and backyard farming are on the rise; animal intrusion is a major deterrent for home growers.

Hospitality and Resorts	Maintain clean, animal-free outdoor environments without using harsh measures.	Growing eco-tourism and wellness retreats demand eco-friendly facilities; customer experience is paramount.
Industrial and Commercial Properties	Prevent health hazards and property damage caused by animals (e.g., stray dogs, monkeys).	Warehouses, food storage units, and outdoor manufacturing areas need low-cost deterrents.
Government and Municipal Parks	Deter animals from public spaces while ensuring humane treatment.	Public pushback against inhumane animal control methods; policy preference for green technologies.

Competitive Landscape

Competitor	**Strength**	**Weakness**
Scarecrow-based Products (traditional, sensor-based dummies)	Low-cost Widely used in rural areas Easy to set up	Limited effectiveness Animals get used to them Not suitable for urban or professional setups
Electric Fencing	Effective physical barrier Can protect large areas	High setup and maintenance costs Safety hazard for humans and animals Requires electricity
Chemical Repellents / Sprays (chili spray, commercial pest deterrents)	Readily available Fast action	Harmful to plants, soil, and animals Needs regular reapplication Not eco-friendly
Ultrasonic Devices (Generic/Imported) (no-name or Alibaba-sourced products)	Affordable Some offer solar support	Unreliable quality Limited service/support in India Weak weatherproofing and durability
Bird Spikes and Nets	Physical deterrent Long-lasting in controlled areas	Not effective for all animals (monkeys, boars) Visually intrusive

		Not suitable for dynamic or large spaces
Security Personnel / Manual Guarding	Human judgment Deterrence through presence	Expensive over time Not scalable Ineffective for night-time or large properties

Sonic Safe Edge

Strengths

- Solar + USB powered
- Motion Sensor
- Weather-resistant, portable, and durable
- Humane and eco-friendly
- Adjustable volume and wide area coverage (30 cents/unit)
- Multi-animal deterrence (within the range of 20KHz)

Market Demand Snapshot

1. More Animal Problems Than Ever

- Crop losses from wild animals (monkeys, boars, birds) account for 15–20% of total farm losses in some regions.
- Urban areas are increasingly reporting stray dog and monkey problems in residential and public spaces.
- There's rising concern over animal-related disruptions in hospitality, industrial zones, and religious/public sites.

2. People Want Safe and Eco-Friendly Solutions

- Many don't want to harm animals, so they're looking for non-lethal options.

- There’s growing interest in solar-powered and chemical-free products.
- Sonic Safe is perfect because it uses sound only and doesn’t harm animals or nature.

3. Solar and Smart Devices Are Becoming Popular

- People prefer solar gadgets that work without electricity.
- Smart, low-maintenance tools are in demand, especially in rural and remote areas.

ORGANISIZATION AND MANAGEMENT PLAN

1. Project Overview

Objective: Develop a device to detect and repel animals from farms, gardens, or public areas using sound, light, or other methods.
Target Users: Farmers, gardeners, factories, warehouses etc .
Key Features: Sensor-based detection, automatic activation, weather-proof design, low power consumption.

2. Team Structure & Roles

Role	Responsibility
Project Manager	Planning, coordination, timeline management
Electronics Engineer	Circuit design, component selection, hardware integration
Embedded Programmer	Programming microcontroller, sensor logic, output control
Mechanical Designer	Design and build casing, ensure outdoor durability
Tester	Perform testing, gather field results, report improvements

3. Project Scope

- Detect animals using sensors.
- Repel using ultrasonic waves.
- Operate on battery or solar power.
- Suitable for different weather conditions.

4. Work Breakdown and Timeline

Week	Task	Team Member(s)
Week 1	Requirement analysis, research, planning	All
	Component procurement, initial circuit design	Electronics Engineer
	Coding and testing detection logic	Embedded Programmer

Week 2	Repellent mechanism integration	Programmer, Engineer
Week 3	Casing design and full assembly	Mechanical Designer
	Field testing and bug fixes	Tester
Week 4	Final optimization, documentation, demo prep	All

5. Resource Management

- Human: 3 members with clear tasks.
- Technical: Arduino, PIR/Ultrasonic sensors, battery/solar panel.
- Financial: Budget for hardware, tools, and field testing. Monitored by the Project Manager.

6. Risk & Mitigation

Risk	Mitigation Strategy
Sensor errors	Use reliable modules and calibrate regularly
Weather impact	Use waterproof casing and insulated wiring
Power failure	Add solar panels and rechargeable batteries
Ineffective repellence	Combine sound, light, and possibly spray methods

7. Communication Plan

- Weekly team meetings: Task updates, progress tracking.
- Daily chats: Quick questions, coordination.
- Final presentation: To mentors/stakeholders.

8. Documentation

- Circuit diagram
- Component list
- Testing report
- User manual

OPERATIONAL PLAN

1. Production Process

Design Phase

Finalize circuit design, code, and enclosure design.

Procurement Phase

Purchase sensors, microcontroller, power units, and casing materials.

Assembly Phase

Assemble components on PCB or breadboard, mount inside enclosure.

Testing Phase

Perform bench testing and field testing under real conditions.

Deployment Phase

Install devices at farms/gardens, monitor performance.

2. Daily Operations

Monitor devices for power and sensor performance.

Collect data on animal activity and device effectiveness.

Perform regular maintenance (battery replacement, cleaning sensors).

Update firmware if improvements are developed.

3. Quality Control

Check components before assembly.

Test every device with standard animal detection scenarios.

Inspect casing for weatherproofing.

Log issues and fix them before deployment.

4. Maintenance

Schedule monthly inspection visits.

Replace batteries or recharge solar panels as needed.

Calibrate sensors periodically.

Fix or replace damaged parts quickly.

5. Safety and Environmental Considerations

Use non-harmful repelling methods (no toxins).

Ensure device does not disturb non-target species.

Use eco-friendly materials where possible.

6. Logistics

Manage inventory of parts and devices.

Plan transportation for deployment and maintenance teams.

Keep records of device locations and status.

FINANCIAL SUMMARY

Cost (in Bulk – 100 Units)

Component	Total cost (INR)
Ultrasonic Sound Module	17,000
PIR Motion Sensor	11,000
Micro controller	28,000
Solar Panel + Rechargeable Battery	50,000
Waterproof Casing	22,000
Wires, connectors and other materials	15,000
Outer Body	12,000
Total Hardware	1,55,000

Assembly and Labour costs

Task	Estimated Total (INR)
Soldering & PCB Assembly	12,000
Device Fitting & testing	10,000
Packaging & Labelling	8,000
Subtotal	30,000

Marketing and Logistics

Item	Estimated cost (INR)
Branding	4,000
Local Demos	4,000
Transport & Delivery	5,000
Subtotal	13,000

Total Cost for 100 Units

Category	Amount (INR)
Hardware	1,55,000

Assembly & Labour	30,000
Marketing & Logistics	13,000
Total Cost	1,98,000

Revenue & Profit

Selling Price per unit	INR 2,800
Total Revenue	2,800*100 = 2,80,000
Profit	2,80,000-1,98,000=82,000
Profit Per Unit	INR 820

Income Statement (for 100 Units)

Item	Amount (INR)
Revenue	2,80,000
Cost of Goods Sold (COGS)	1,98,000
Gross Profit	82,000
Profit per unit	820

Package Order (3 in 1 package)

Cost Price	1,980*3=5940
Selling Price	2,800*3 =8,400
10% Deduction	840
Payable Total cost	7,560
Profit	1,620

3-in-1 Package Summary

Item	Amount (INR)
Cost Price (3 units)	5,940
Selling Price	8,400
10% Deduction	840

Net Payable	7,560
Profit (per package)	1,620

Cash Flow Summary (for 100 Units)

Activity	Inflow/Outflow	Amount (INR)
Initial Hardware Purchase	Outflow	1,55,000
Assembly & Labour Payments	Outflow	30,000
Marketing & Logistics	Outflow	13,000
Total Outflows		1,98,000
Sales Revenue	Inflow	2,80,000
Net Cash Inflow		82,000

Balance Sheet Snapshot (Post-Sales)

Assets

Asset	Amount (INR)
Cash (Profit earned)	82,000

Liabilities

Liability	Amount (INR)
None	0

Equity

Equity	Amount (INR)
Owner's Equity (Profit)	82,000

Profit Milestone Analysis

Units Sold	Revenue (INR)	Cost (INR)	Profit (INR)
100 Units	2,80,000	1,98,000	82,000
200 Units	5,60,000	3,96,000	1,64,000
500 Units	14,00,000	9,90,000	4,10,000

Long-Term Income Opportunities

Service	Estimated Charge per Unit (INR)	Potential Profit per 100 Units (INR)
Chargeable Battery Replacement Service	500	25,000
Upgrade Module Sales	1000	40,000
Maintenance Kit	700	28,000
Warranty Extension / AMC	600	20,000
Referral Discount Impact	-200	-10,000
Total Estimated Long-Term Profit (per 100 units)		1,03,000

CONCLUSION

In an era where environmental sustainability and humane practices are becoming increasingly important, the Sonic Safe emerges as a timely and innovative solution to a persistent problem—protecting outdoor spaces from the damage caused by stray animals and birds. Traditional methods of deterring animals often involve harmful traps, toxic substances, or labour-intensive barriers, which not only pose ethical concerns but also affect the surrounding environment and non-target species. Our device presents a clean alternative by leveraging ultrasonic technology to gently repel unwanted animals and birds without causing them harm or distress.

With its dual power system solar and USB the Sonic Crop Guard is both energy-efficient and versatile, ensuring reliable performance even in remote agricultural settings. Its durable, weather-resistant construction and easy installation process make it accessible for a wide range of users including farmers, gardeners, homeowners, and commercial property owners. By offering a smart, low-maintenance, and cost-effective solution, the device helps users reduce crop losses, protect property, and maintain cleaner, safer, and more enjoyable outdoor spaces.

Beyond its technical strengths, the Sonic Crop Guard represents a broader vision: to support sustainable living and eco-conscious practices by empowering individuals and communities to coexist peacefully with nature. As climate change, urban expansion, and biodiversity loss continue to reshape rural and urban landscapes, such humane technologies will play a vital role in future land and resource management strategies.

In conclusion, the Sonic Crop Guard is more than just a product it’s a practical step toward smarter farming, responsible land use, and a more sustainable future. With continued focus on innovation and user needs, it has the potential to transform how we protect our spaces from animal and bird intrusions, ensuring a balance between productivity and environmental care.