

# An ISO 17025 accredited mobile laboratory for food safety testing for the agro and food sectors– Proof of Concept and prototype design

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science & innovation

Department:  
Science and Innovation  
REPUBLIC OF SOUTH AFRICA



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# Project Preparation Grant (PPG-765)

Conduct a feasibility study to assess the potential impact and economic viability of mobile ISO 17025 accredited food safety testing laboratories in the SADC region (South Africa, Namibia, Eswatini and Lesotho).

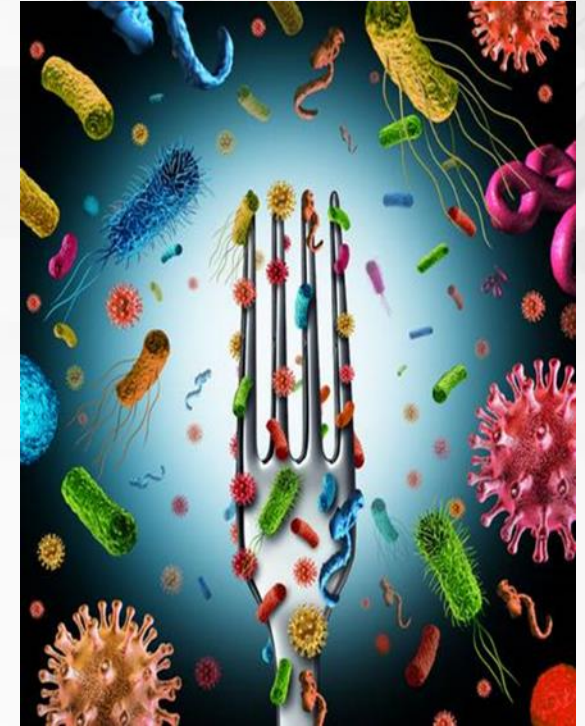


# Intro to Food Safety Group at CSIR

- The main aim of the Food Safety Group is to address the challenges associated with food safety and food safety testing in South Africa and neighboring countries through:
  - Localization of food safety testing technologies e.g. mycotoxins standards, rapid testing devices.
  - Multidisciplinary approach, leveraging expertise across the CSIR.
  - R&D through collaboration with local and international universities.
  - Providing access to affordable food safety and quality testing services adding value to SMME products, affording them opportunities: export & commercial markets.

# Context

- Laboratories for food safety testing for both commercial and SMME farmers (e.g. residue and pathogen testing) are not easily accessible.
- Increased expenses to courier samples (representative samples can be 20kg/consignment) to laboratories from pack houses, ports, central markets, airports and borders, with the added risk of sample integrity being compromised.
- Important that services delivered are relevant, cost effective and acceptable to import, export and local authorities.





# Stakeholder workshops

- Strong need for an accredited mobile food testing laboratory that can facilitate testing in remote areas.
- Mobile lab would help promote compliance of food safety regulations, thus enabling trade, job creation and economic development.



**Namibia**



**Lesotho**



**Eswatini**

# Needs identified

## Grains, nuts, fruit, vegetables, animal feed, soil and water

- Testing required for local commercial market infiltration and quality accreditation (microbial, nutritional).
- Mycotoxin testing
- Mold and Yeast levels
- Pesticide testing
- Routine NIR testing, with high turnaround time (Nutritional).
- Testing for exporting and SANAS accreditation.
- Certificates of analysis

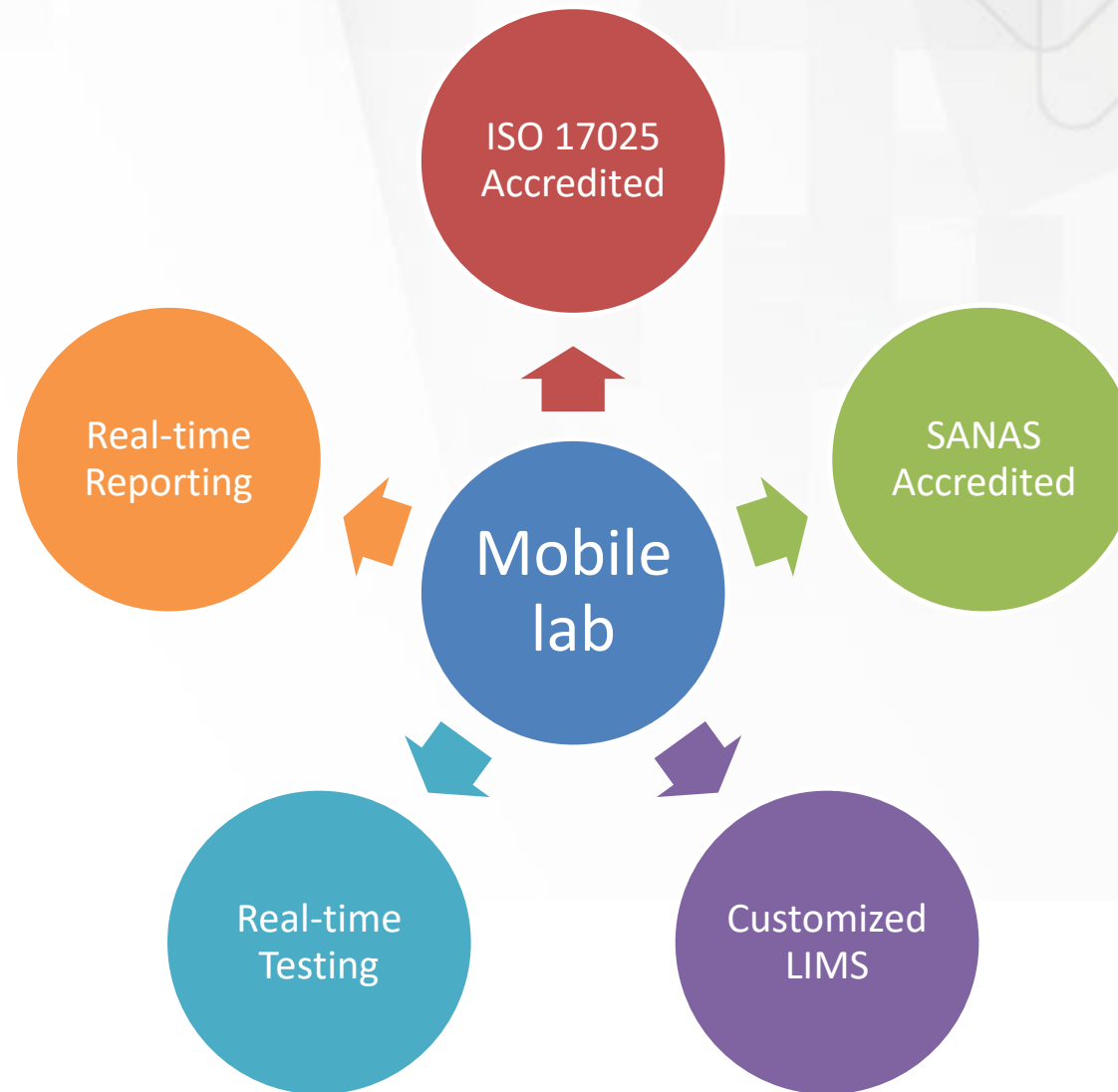


# Mobile Lab support: SADC region

❑ **Mobile laboratories: an ideal way to combat food safety issues and enable easy access to food safety testing services.**

- On-ground support: food value chain surveillance and monitoring of potential outbreaks
- Addresses challenges: food safety testing at ports of entry, remote areas
- Statutory testing to SMME products : opportunities export & commercial markets
- Provide support/extension for existing stationary lab
- Job creation opportunities: technicians, food scientists and analytical chemist

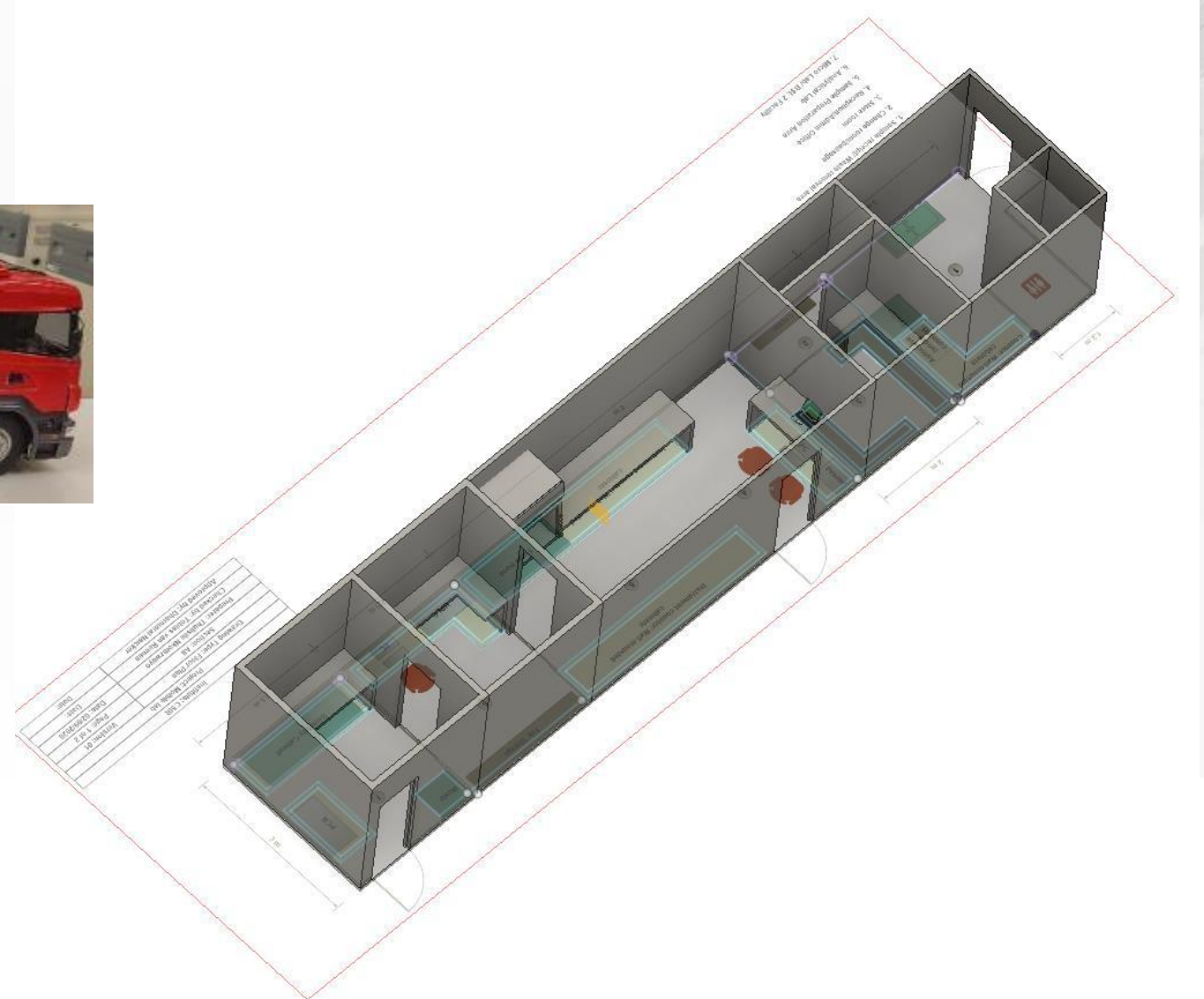
# Mobile Lab: Value Proposition





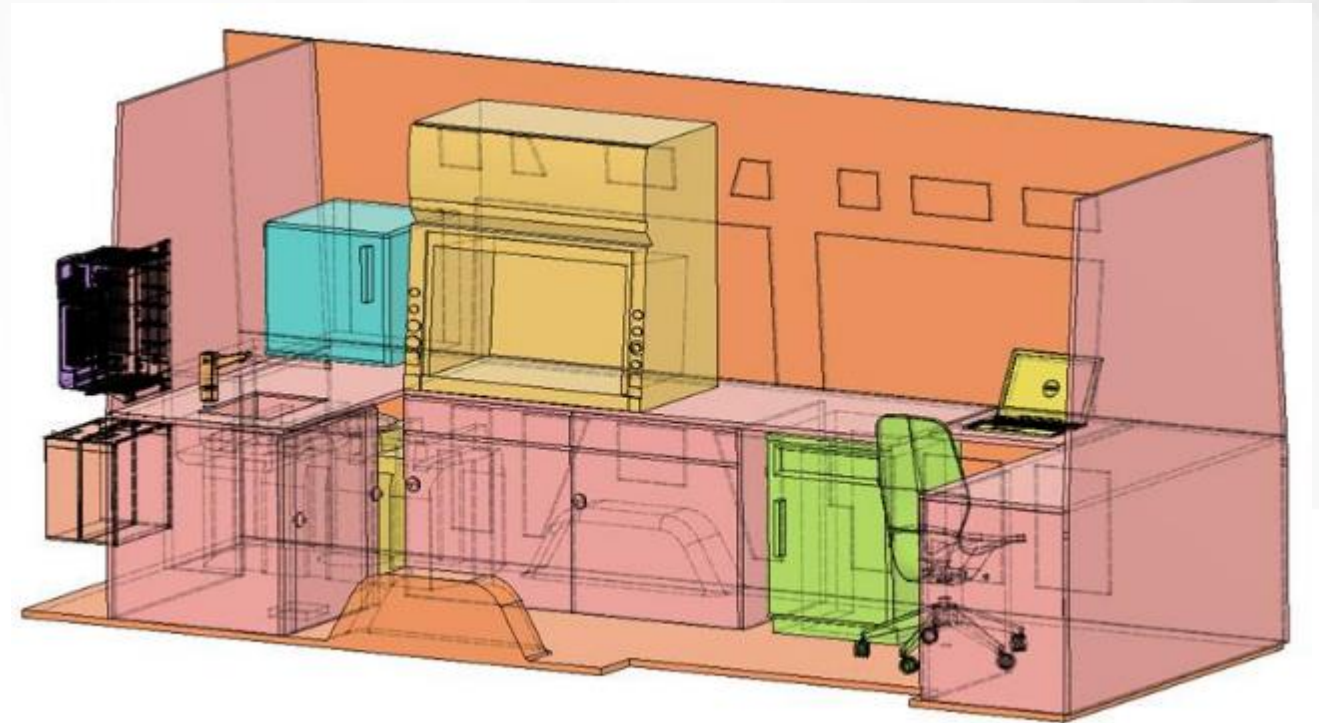
# Proposed Mobile Lab Designs

## ❑ Type 5: advanced testing



# Proposed Mobile Lab Designs

## ❑ Type 4: medium - advanced testing



# SADC Region ISO 17025 Accreditation Bodies

## South African National Accreditation System (SANAS):

- Recognized as the sole internationally recognized national accreditation body for the Republic of South Africa.
- Signatory to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangements (MRAs), the International Accreditation Forum (IAF) ect.



## Southern African Development Community Accreditation Services (SADCAS):

- multi- economy accreditation body established in terms of Article 15 B of the Technical Barriers to Trade (TBT) Annex to the SADC Protocol on Trade.
- Accreditation for: Angola; Botswana; Democratic Republic of Congo; Lesotho; Madagascar; Malawi; Mozambique; Namibia; Seychelles; Eswatini; Tanzania; Zambia; and Zimbabwe.



# Proposed testing and instruments required

- Microbial: yeast & mold, TPC, *E.coli*
- Mycotoxin testing
- MRL Pesticide testing
- Liquid chromatography
- Gas chromatography
- NIR – quality analysis
- Rapid microbial testing





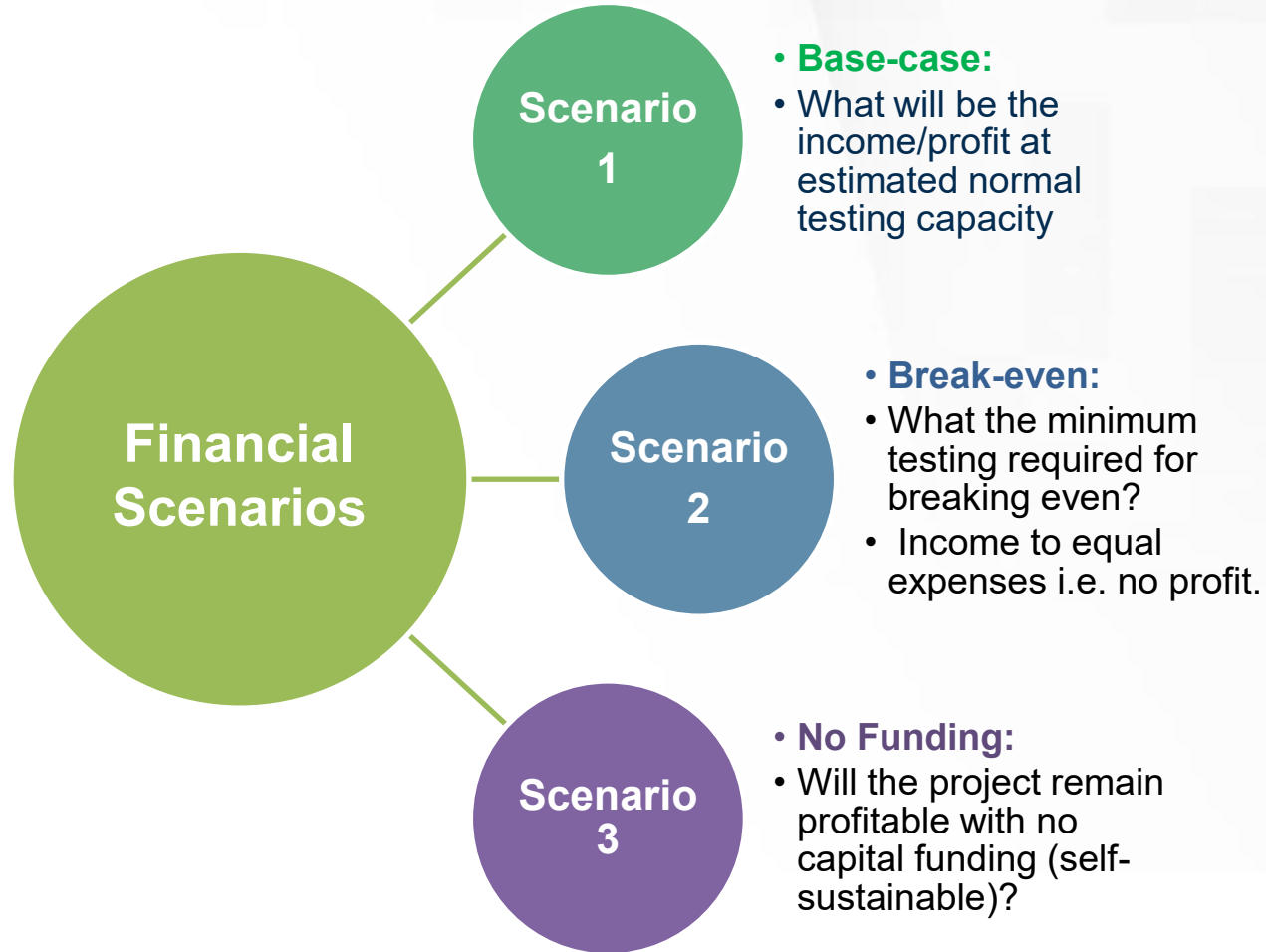
# Cost breakdown and timeline

- Start-up capital investment of approximately US\$ 707 590 (**van-type model**).
- Start-up expenses directly related to mobile lab operation include: human resource, testing, traveling, operational staff accommodation, subsistence costs, accreditation and staff training etc.
- Basis of the start-up capital is that the mobile lab will need to be fully operational for at least a year to obtain SANAS/SADCAS accreditation.

# Cost breakdown: Start-up Capital

Start-up Item	Cost (USD)
Mobile lab + modification	183 645
Instruments/equipment	188 665
Start-up expenses	182 327
Project management	105 485
Contingency	47 468
<b>Total Start-up Capital Requirements</b>	<b>\$ 707 590</b>

# Financial Feasibility Objective

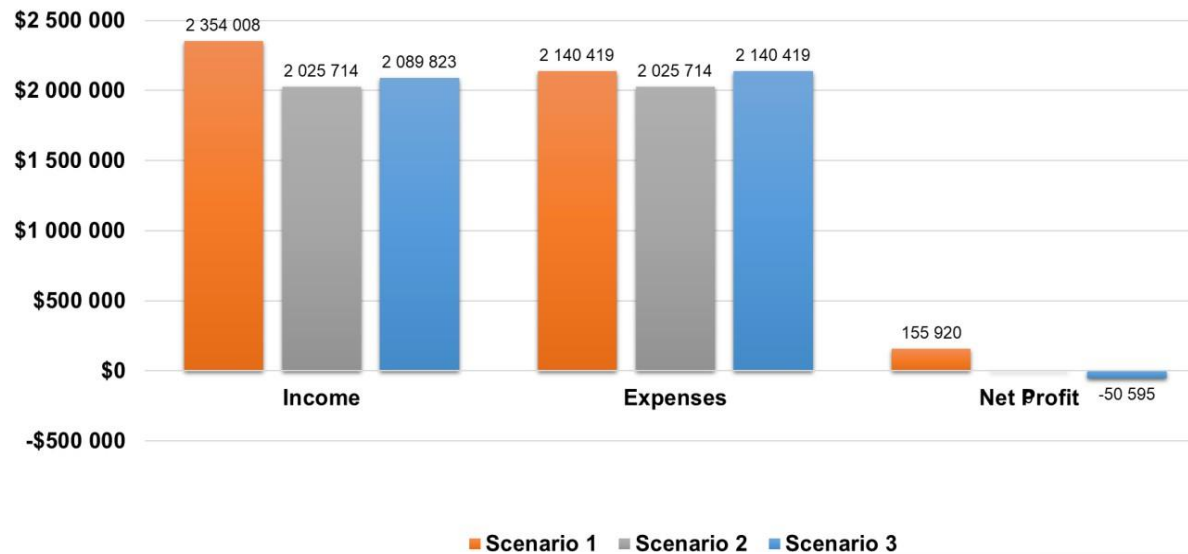


**Net Present Value (NPV):** total value of an investment opportunity/project over a time-period.

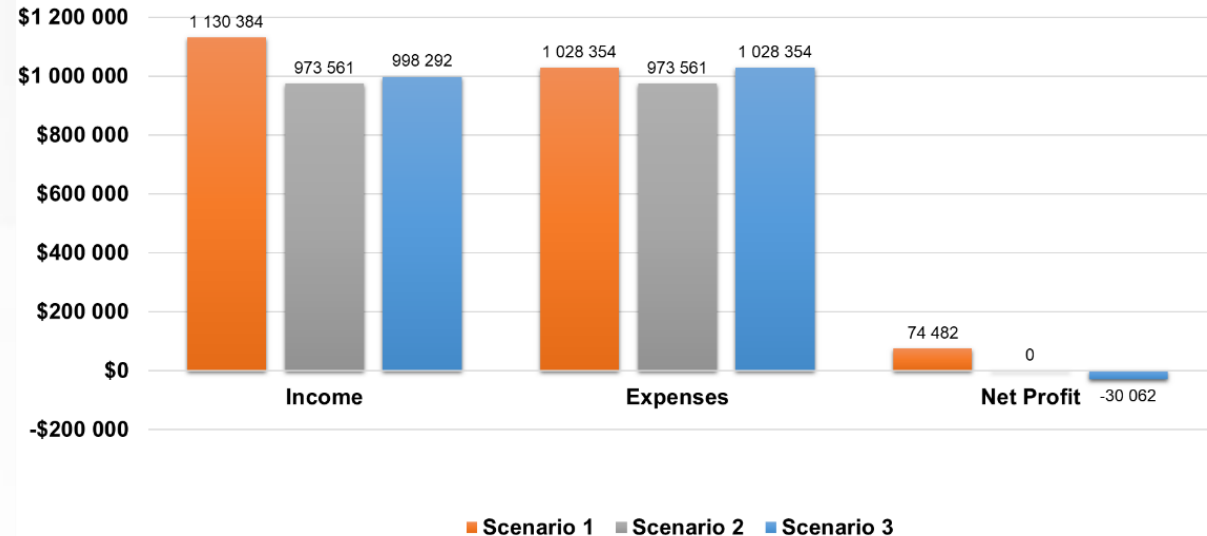
- $NPV > 0$  : Profitable
- $NPV = 0$  : No profit or loss
- $NPV < 0$  : Not profitable

# Sustainability/Return on investment

10 Year Financial Projection

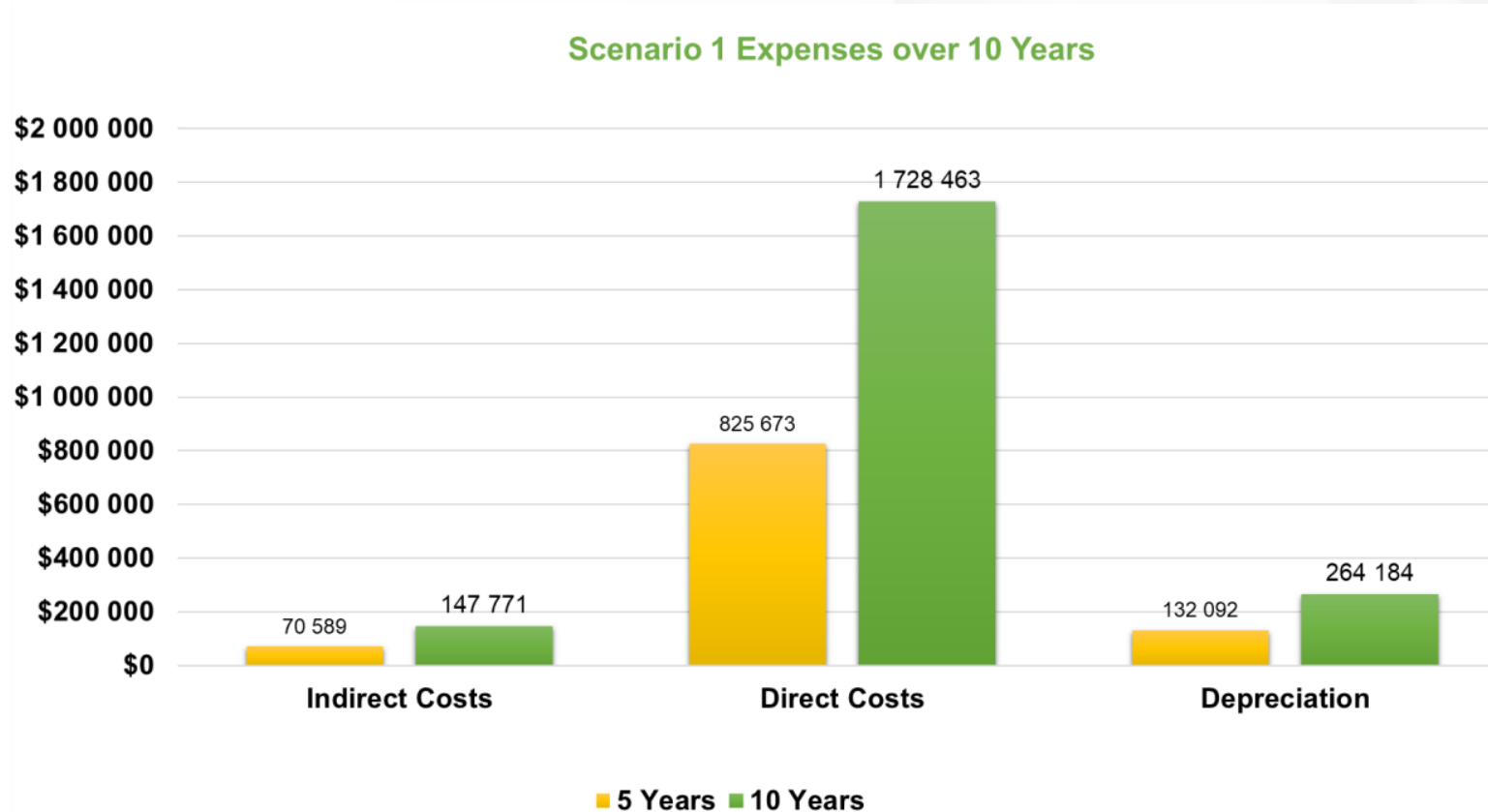


5 Year Financial Projection





# Cost breakdown: Expenses 5-10 years of operation



The cumulative running costs:

- US\$ 1 028 354 over 5 years
- US\$ 2 140 419 over 10 years

# Conclusions

- 1<sup>st</sup> ISO17025 & SANAS food safety testing mobile lab in Africa.
- Providing crucial support to the SADC food safety testing sector.
- Combating food safety challenges in ports of entry and remote areas.
- Providing affordable testing to SMME, farmers, and primary processors in the SADC region.
- The project would be profitable if the start-up capital is acquired through an external funding grant and the mobile lab operates at its maximum capacity and testing throughput.



# Partnerships



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