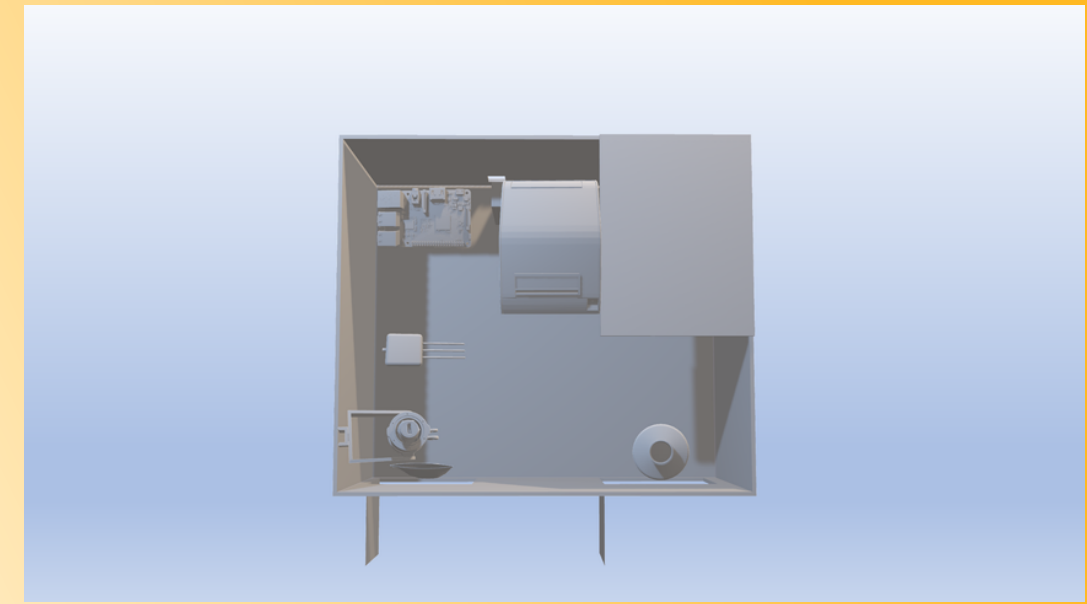




PROJECT माटोLAB

Portable Soil Lab

Team - Momentum



Team Members

- Suyog Gaire
- Sumit Kumar Sah
- Sarwesh Parajuli
- Nobel Paudel

➤ Problem Statement

Most Nepalese farmers go without knowing anything about the soil, making farming extremely inefficient.

The main problem is lack of access to facilities for soil testing, and even when available, the results are indecipherable to an average farmer.



S.N.E.C

SOIL

NUTRIENTS:

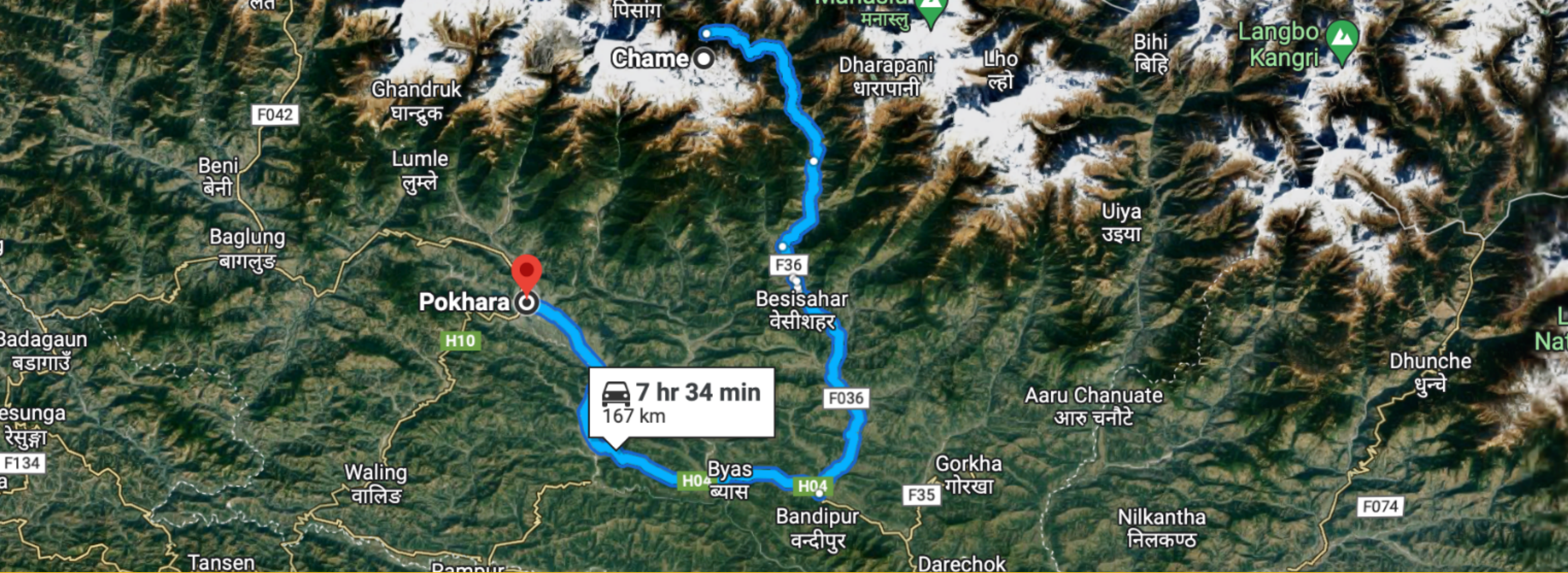
EFFECTS &

CONSEQUENCES



- ☠ Majority of Nepalese soil lack in nutrients**
- ☠ Nitrogen Deficiency causes wilted plants and slowed growth**
- ☠ Excess of Phosphorus -> Low pH -> Ideal condition for parasites like Fusarium wilt**
- ☠ Potassium is essential for hormonal condition in plants**

NPK imbalance is the main reason for inefficient crop yield



Soil testing facilities
for farmers
are non-existent or out of reach.
We aim to make this accessible to everyone.

Existing Technology



Atomic Absorption Spectrometry +Flame Photometry

Cost: NPR 70 lakh+



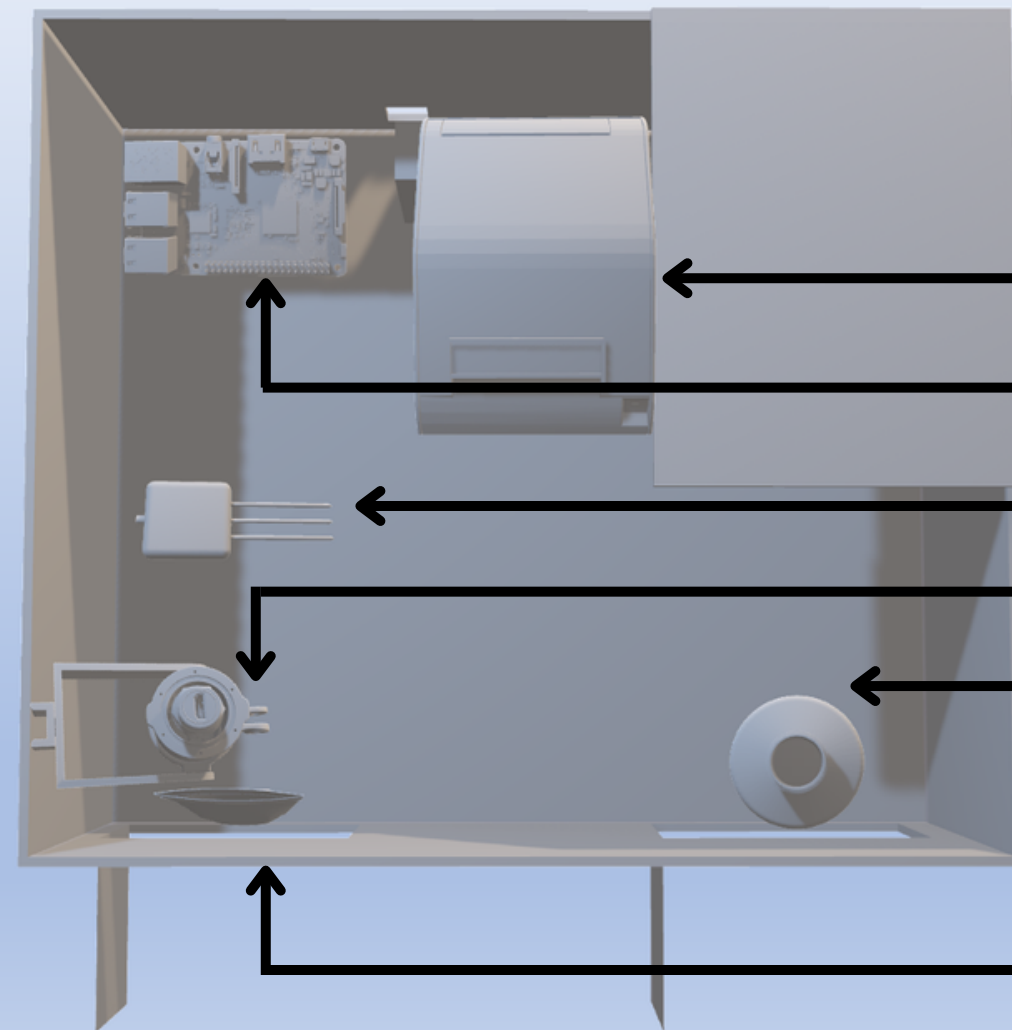
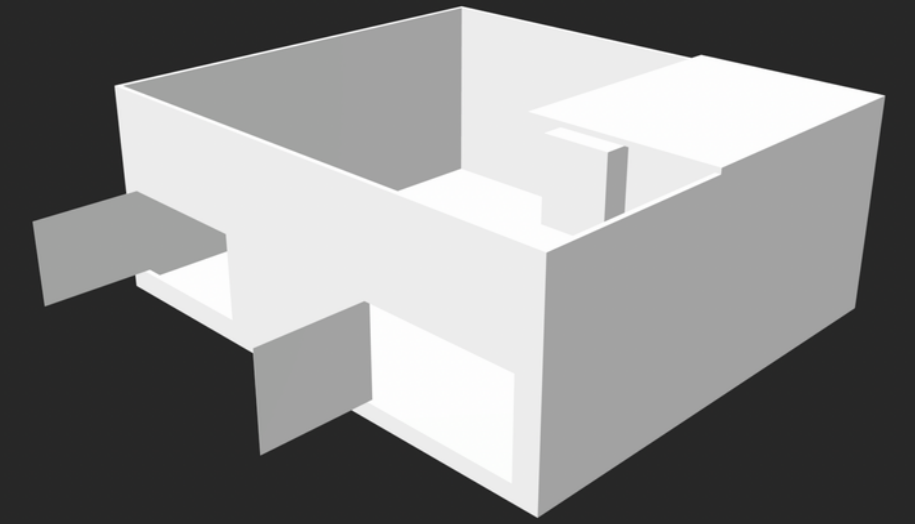
Soil Kit

Cost: NPR 15 thousand+

**Our technology of hyperspectral imaging sensor-guided rapid soil test is on par with
AAS+Flame Photometry**

Reference: <https://soil.narc.gov.np./soil/soilmap/>

Prototype Design



PSU

Thermal Printer

Raspberry Pi

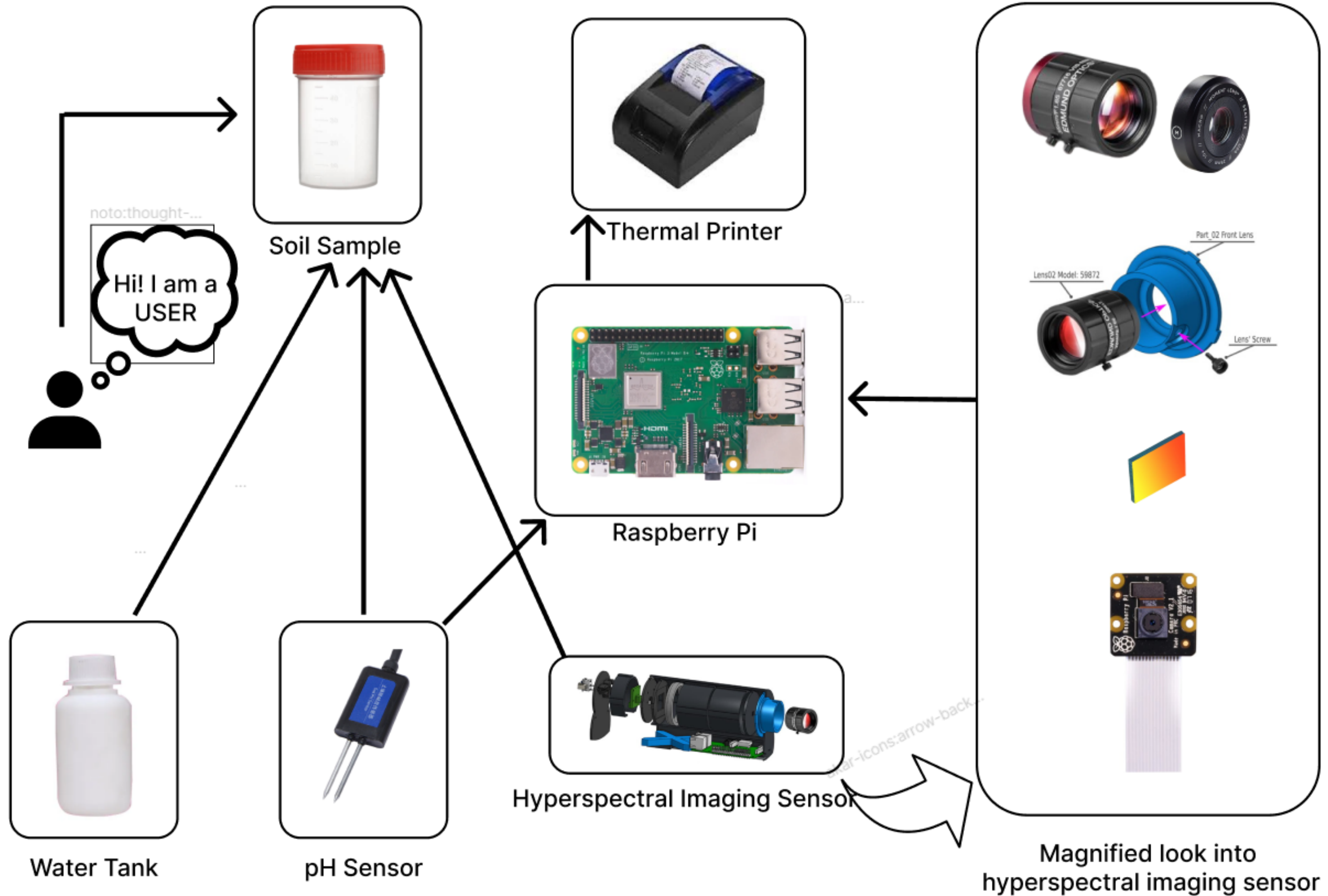
pH Sensor

Hyperspectral Imaging Sensor

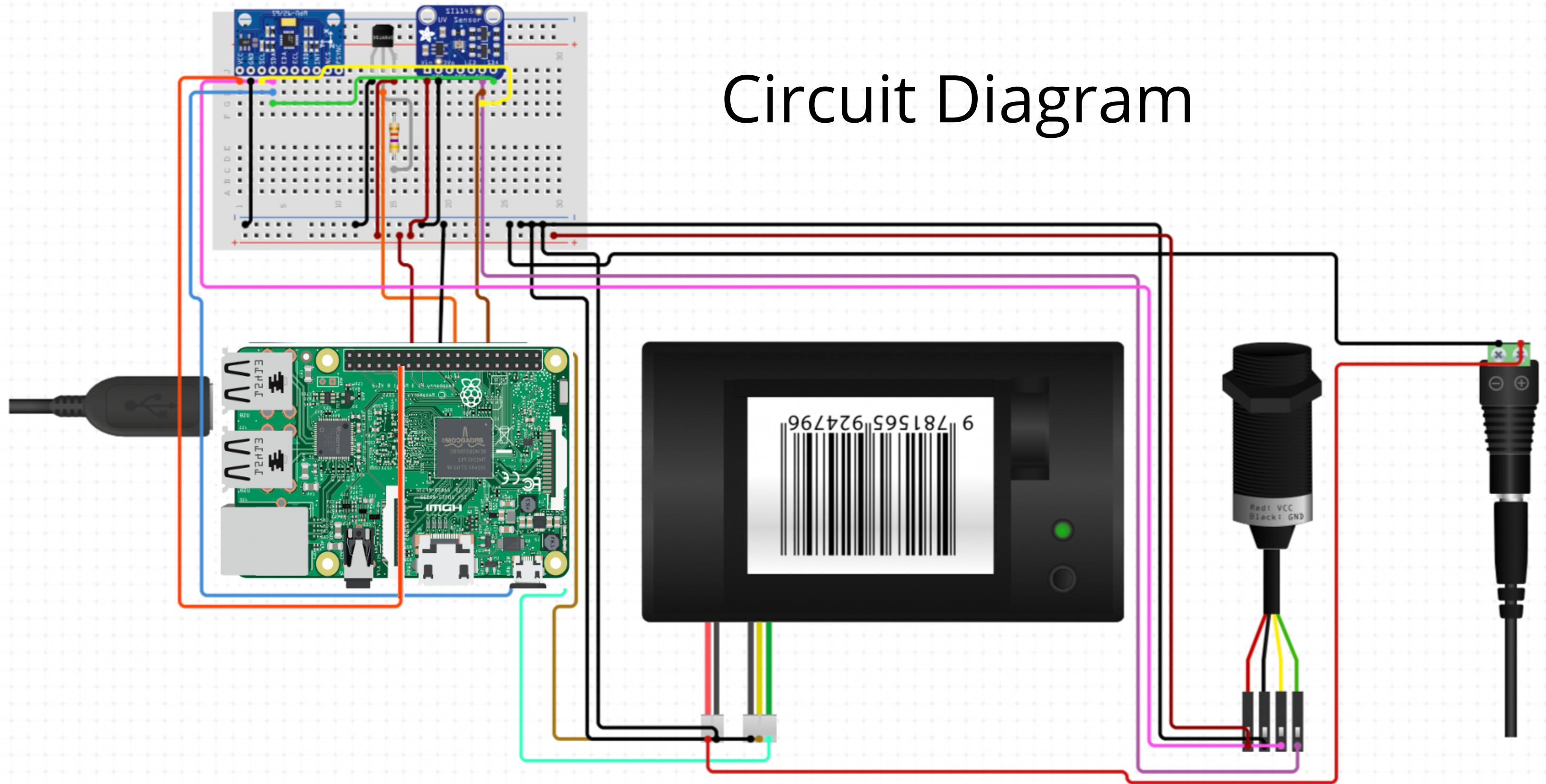
Water reservoir

Sample slot

Architecture diagram



Circuit Diagram



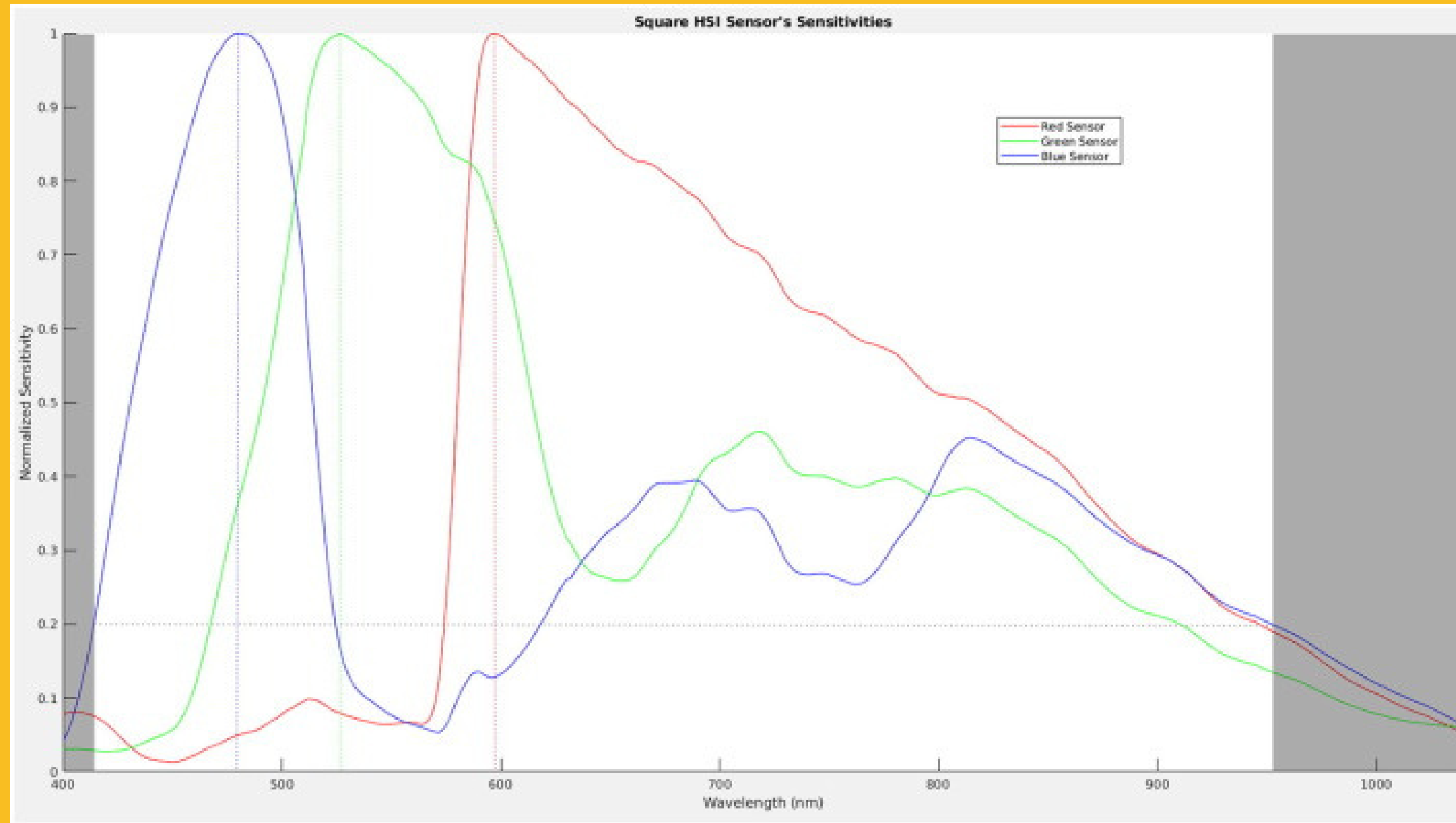


This is a novel technology, only limited to sophisticated laboratories before



**400nm-1052nm range w/ 35mm lens
Vis-NIR**

1% of commercial cost



Target Customers



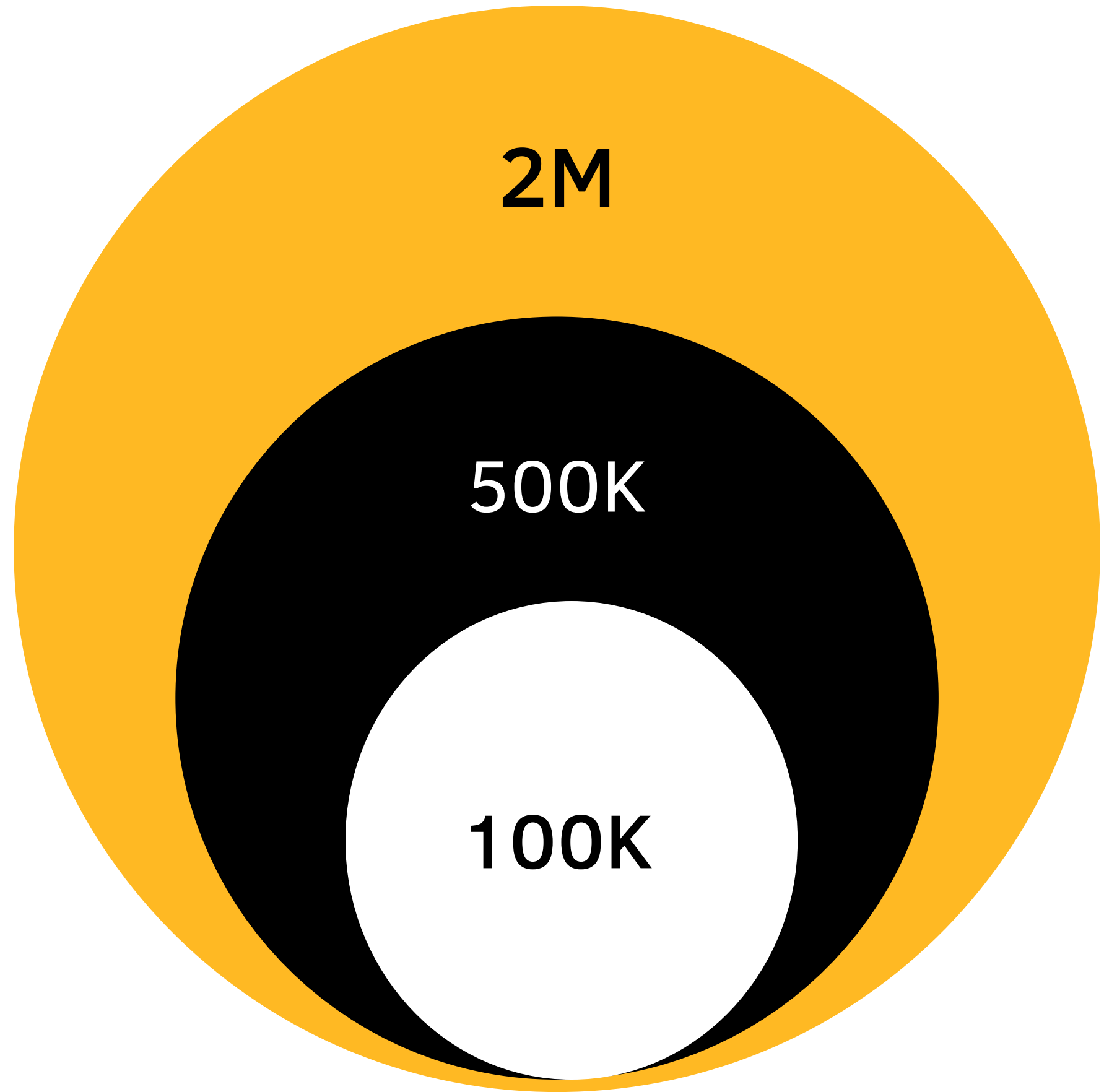
RURAL MUNICIPALITIES
IT'S OUR BIGGEST TARGET .






**FARMERS IN DEVELOPING
COUNTRIES**
THE ISSUE OF SOIL QUALITY IS
PREVALENT.

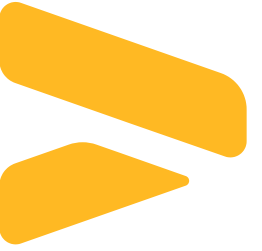


Size of the Market



-  **Total Available Market (TAM):**
2 MILLION
-  **Serviceable Available Market (SAM):**
500 THOUSAND
-  **Serviceable Obtainable Market (SOM)**
100 THOUSAND

PRICING PLANS



**PLAN
OPTIONS**

**RURAL
AREAS**

**FOREIGN
COUNTRIES**

LAB USE

300\$

\$500


**Installation
+Shipping**

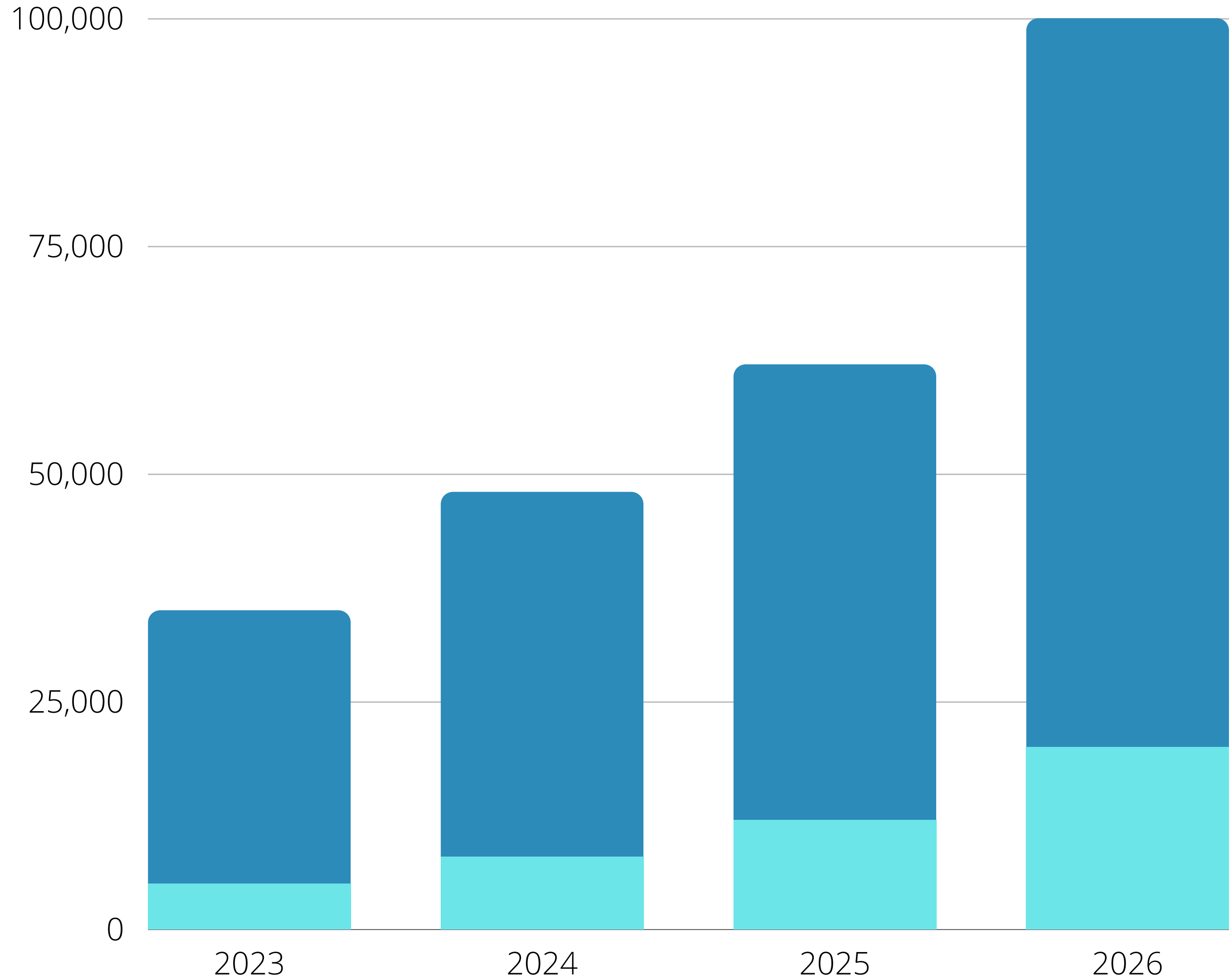
FREE

100\$

EXPENSES

 - Miscellaneous

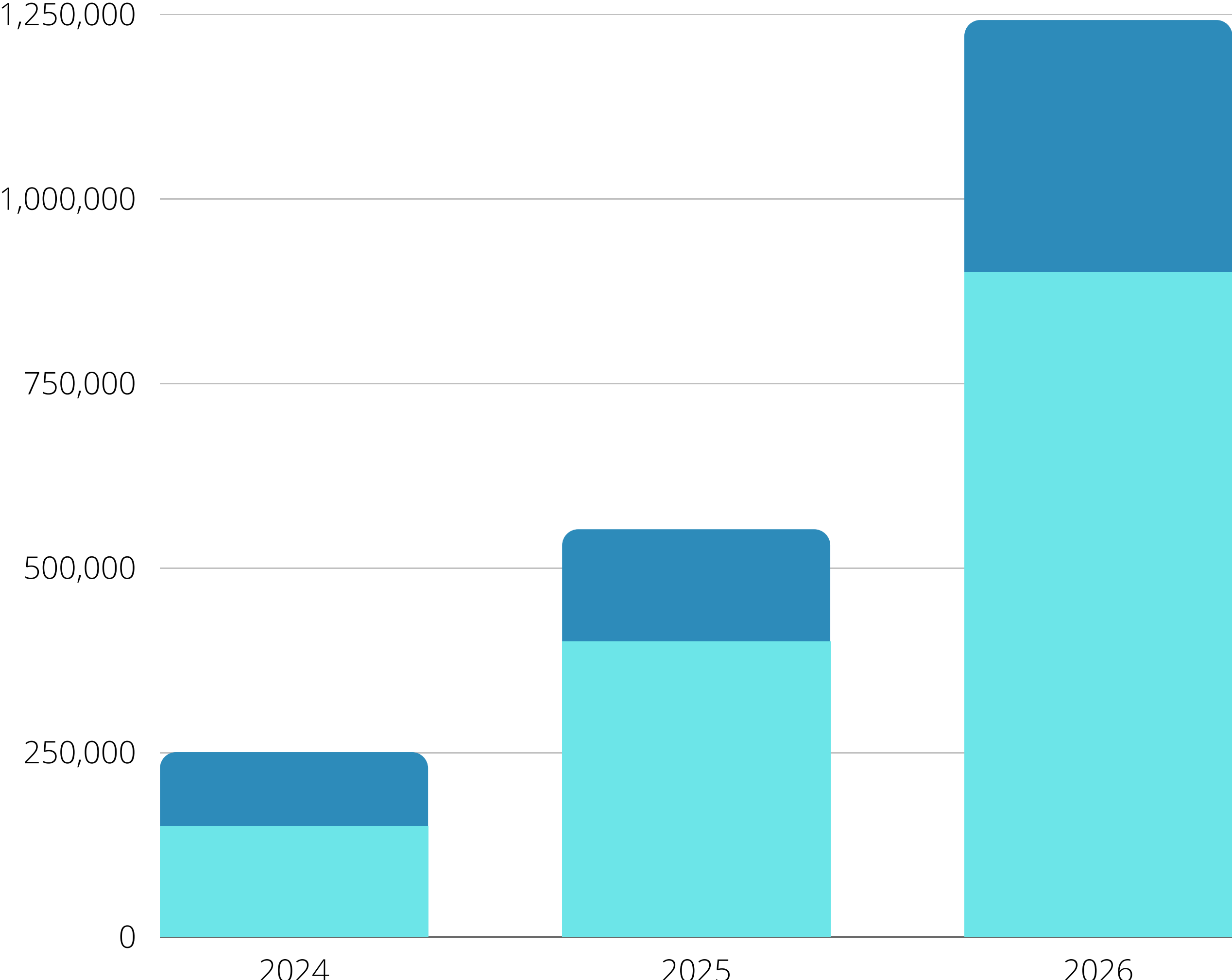
 - Lab
manufacture



EARNINGS

Foreign Income

Domestic Income



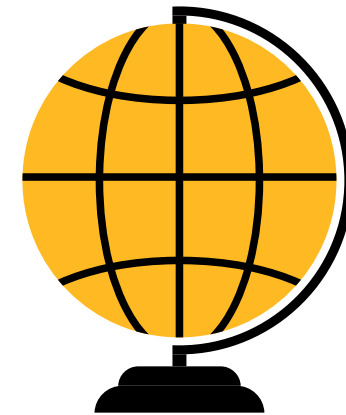
OUR SOLUTIONS



**PROVIDE ACCESS TO
FARMERS**



**PREDICT SOIL
COMPOSITION**



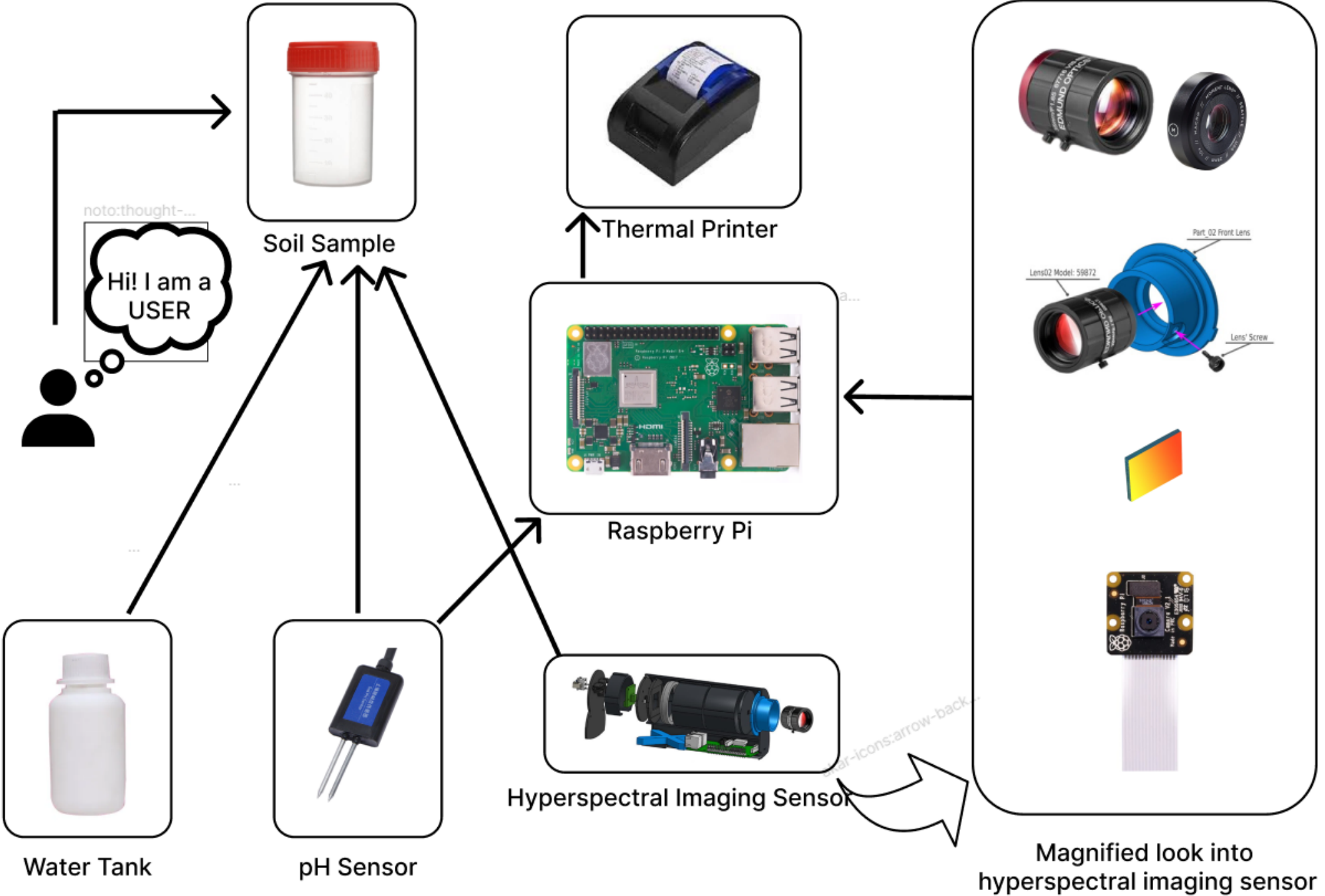
**SUGGEST AFFORDABLE
REMEDY**



TEAM COLLABORATION



Architecture Diagram



Prototype Design

