# Harvesting Hope

## Revolutionizing Farming Practices for Sustainable Crop Yield Growth

A Data Science Project by Aymen Mohamed

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# INTRODUCTION

**The world is going hungry...**

43

countries have alarming or serious levels of hunger

18

countries with moderate, serious, or alarming hunger levels have higher 2023 GHI scores than 2015

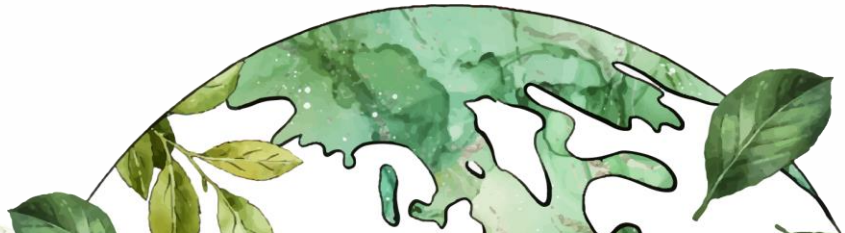
58

countries will fail to reach a low level of hunger by 2030

# 01

# PROBLEM

How can we use machine-learning to effectively implement precision agriculture to cater to impoverished countries?



# PRECISION AGRICULTURE

the science of improving crop yields and assisting management decisions using high technology sensor and analysis tools.

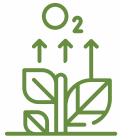
# PROBLEM: “GRAND SCHEME”

There are a plethora of reasons that can cause humanitarian crises:

- War
- Political Corruption
- Poor Infrastructure
- Change in Environment
- Misinformation in Agric.

For this project we will focus on the last two.

# WHY ARE THESE IMPORTANT?




## AGRICULTURAL MISINFO.

Are they using their land to the fullest? Are they planting suitable crops? Are they using healthy land? Are they cultivating healthy vegetation?

## ENVIRONMENTAL CHANGES

Are they accounting for seasonality? Change in soil composition? Global warming? Changes in arable land quantity?

# WHAT WE ARE MEASURING?

## CROP YIELD

Does employing precision agriculture affect total crops produced?

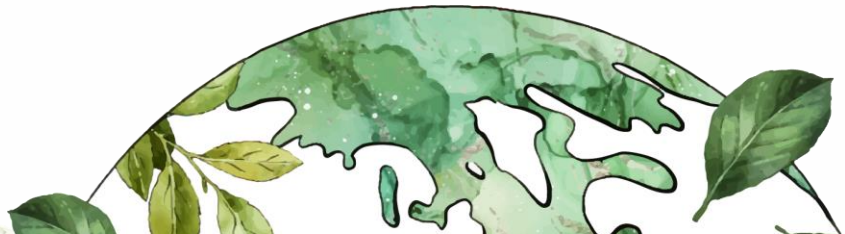
## GHI METRIC

Will the new amount of crops translate to less instances of hunger? How much?

02

# OBJECTIVE

Train model to predict crop yield under the most efficient parameters and see if it effects the ‘Global Hunger Index’ positively.



# WHAT IS WRONG?

## LAND USAGE

Suitable land?

## CLIMATE

Environmental factors?

## FARMING

Proper technique?

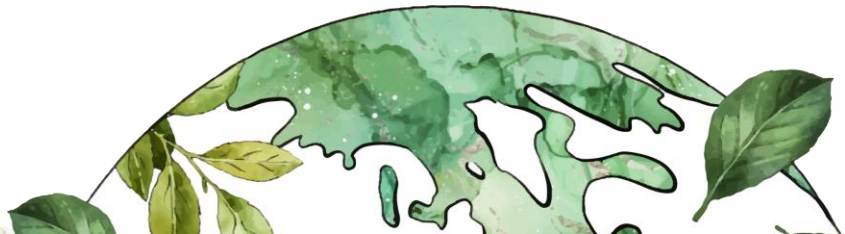
## CROP SELECTION

Is the crop suited for your situation?

# 03

# DATA

List of all relevant data intended to be used.



# DATA: DATASETS

## AGRICULTURAL LAND %

SOURCE: Worldbank

## GHI

SOURCE: Global Hunger Index

## VHI

SOURCE: FAO

## VCI

SOURCE: FAO

## GHS

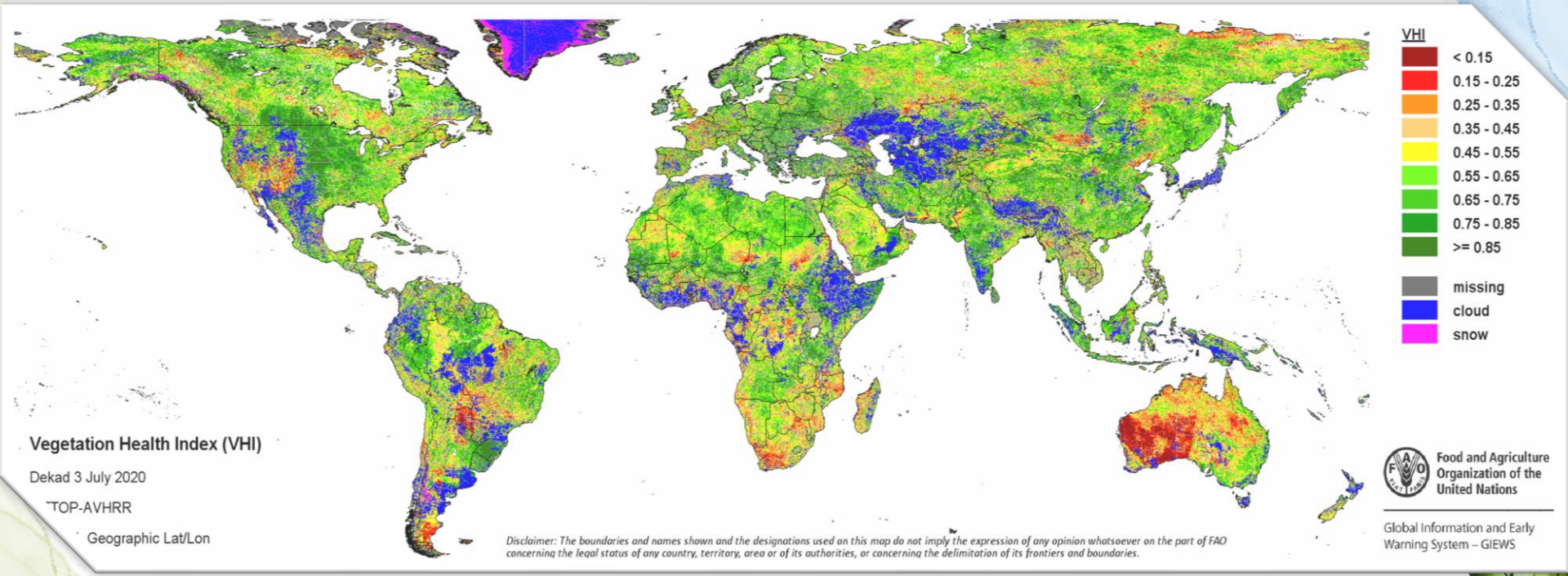
SOURCE: European Commission

## CROP GROWTH

SOURCE: Kaggle (for now)

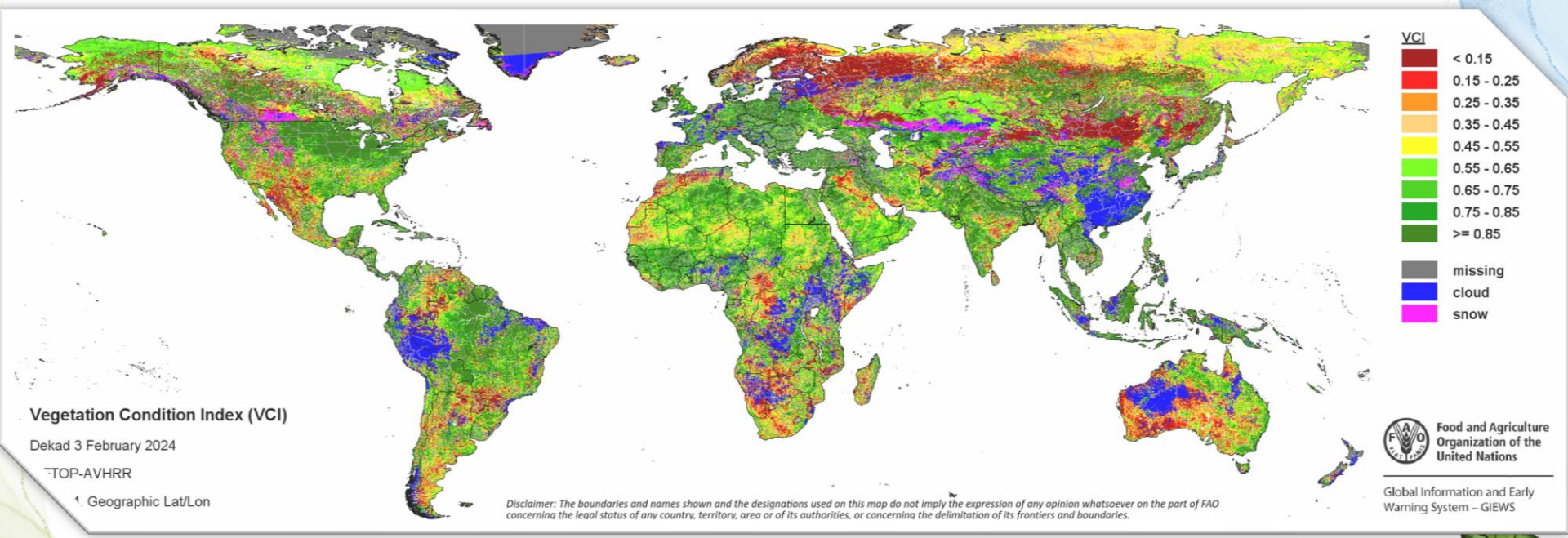
# GHI: GLOBAL HUNGER INDEX

# VHI – VEGETATION HEALTH INDEX




https://asis.apps.fao.org/pages/non-seasonal-indicators

# VCI – VEGETATION CONDITION INDEX



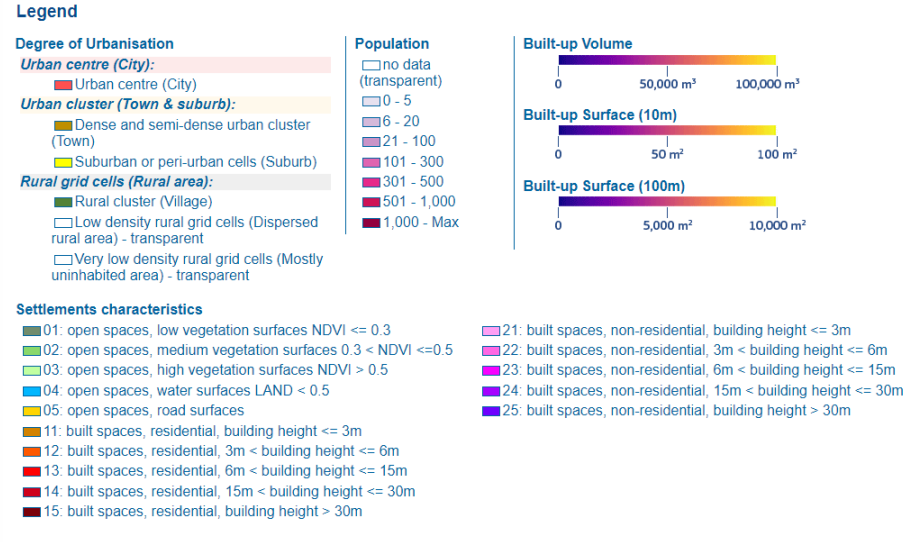

https://asis.apps.fao.org/pages/non-seasonal-indicators

# GHS – GLOBAL HUMAN SETTLEMENT

Comprehensive map visualization that includes:

- Populated areas
- Land Breakdowns
- Urban centers

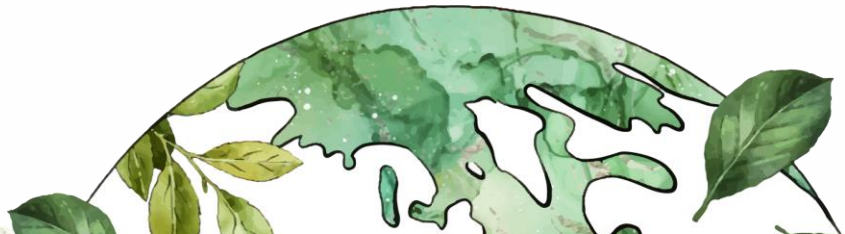
- Breakdown =>



# 04

# ACTIONS

Next steps...



# ACTION PLAN:

01

## DATA ENGINEERING

Complete data collection and concatenation process

02

## LOAD DATA

Clean data and perform regressions to establish baseline,

03

## ADVANCED MODELING

Incorporate ML concepts to prove/disprove hypothesis

# ACTION PLAN:

04

## TROUBLESHOOT

Confirm accuracy and project feasability

05

## VISUALIZE

Create visualizations and begin sprucing up presentation

06

## FINAL CHECKS

Make sure findings are presentable and complete

# Conclusion

**THANK YOU!!!**

**ANY QUESTIONS?**

“If you can’t feed a hundred people, feed just one.”

—MOTHER TERESA