

Project presentation

# Global Crop Analysis: Unveiling Insights for Sustainable Agriculture and Food Security

Yatharth Aggarwal (E23MCAG0051)

Ritik Roshan (E23MCAG0012)

Shashwat Sharma (E23MCAG0085)

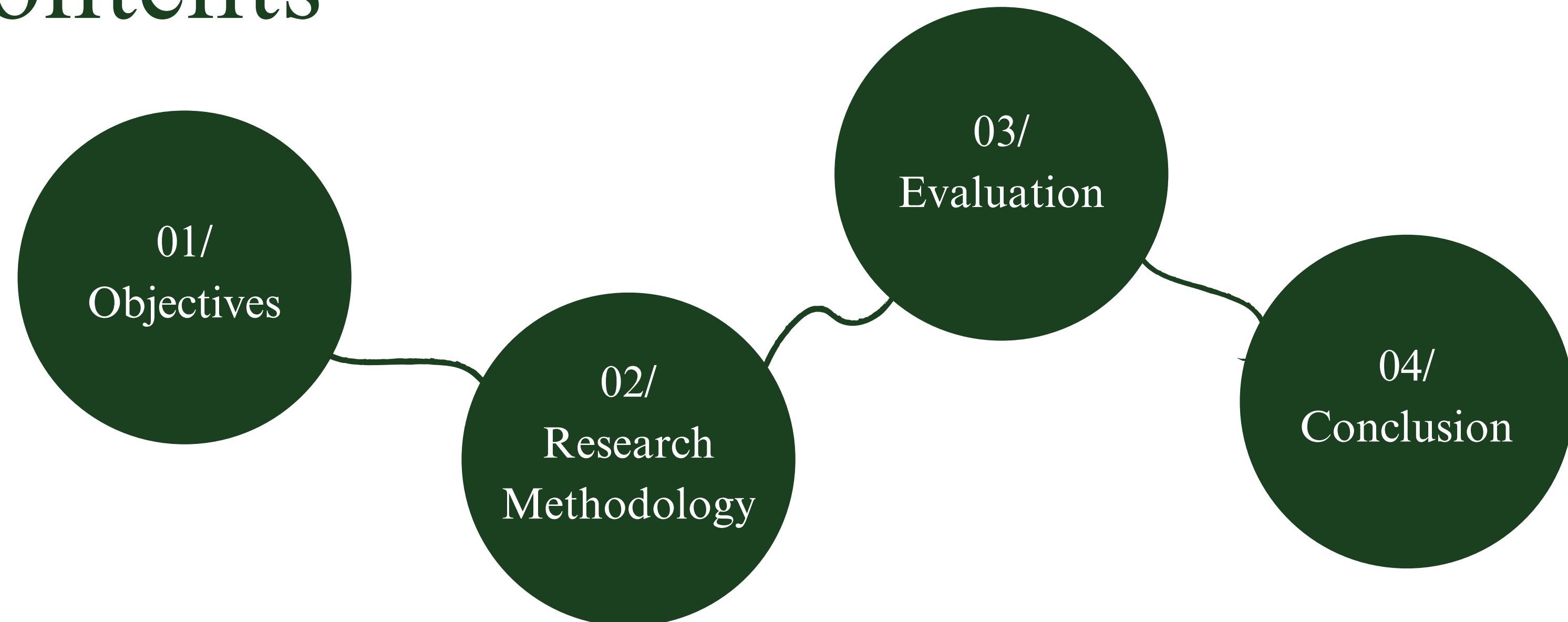




# Introduction

Amidst a surging global population and escalating climate challenges, ensuring food security and promoting sustainable farming practices is imperative. With more people in the world and climate issues on the rise, making sure we have enough food and using sustainable farming practices is really important. This study looks at a lot of information about crops all around the world. It wants to understand how different things affect how well crops grow everywhere. It's not just about knowing the names of the crops; it also looks at how heavy they are and how much water they need. By learning about these things, the study wants to give ideas on how farmers can do better, handle changes in the weather, and make sure we have enough food for everyone. This study uses data and science about farming to help make decisions that can change how we grow food worldwide.

# Contents



# 01/ Objectives

- ↳ Identify Major Crops Globally
- ↳ Assign Scientific Nomenclature and Symbols
- ↳ Analyze Moisture Levels and Impact on Productivity
- ↳ Categorize Crops Based on Characteristics
- ↳ Assign Weightage to Crop Categories
- ↳ Study Effects of Dryness on Crop Yield
- ↳ Explore Factors Influencing Agriculture Productivity
- ↳ Integrate Analyzed Data for Meaningful Insights
- ↳ Provide Actionable Recommendations
- ↳ Contribute to Global Food Security
- ↳ Promote the Synergy of Data-Driven Analysis and Agricultural Science



02/

# Research Methodology

To undertake a comprehensive analysis of global crops data and address the multifaceted dimensions outlined in the problem statement, a structured and systematic methodology is crucial. The proposed methodology encompasses the following key steps:

↪ Data Collection : Compiling diverse global crops dataset, use reputable sources for depth.

- ↪ Data Cleaning and Preprocessing : Clean and preprocess data for consistency, accuracy, and standardized units.
- ↪ Moisture and Dryness Analysis : Apply statistical and geospatial analysis to study global moisture distribution and dryness impact
- ↪ Crop categorization and Weightage Assessment : Apply clustering algorithm to categorize crops; assess economic and nutritional weightage
- ↪ Integrated Analysis : Integrate moisture, and categorization analyses for comprehensive insights into agriculture





## 02/(i) Data Collection, Cleaning and Data Preprocessing :

We collected diverse global crops data, cleaned for accuracy, and standardized units for consistent analysis.

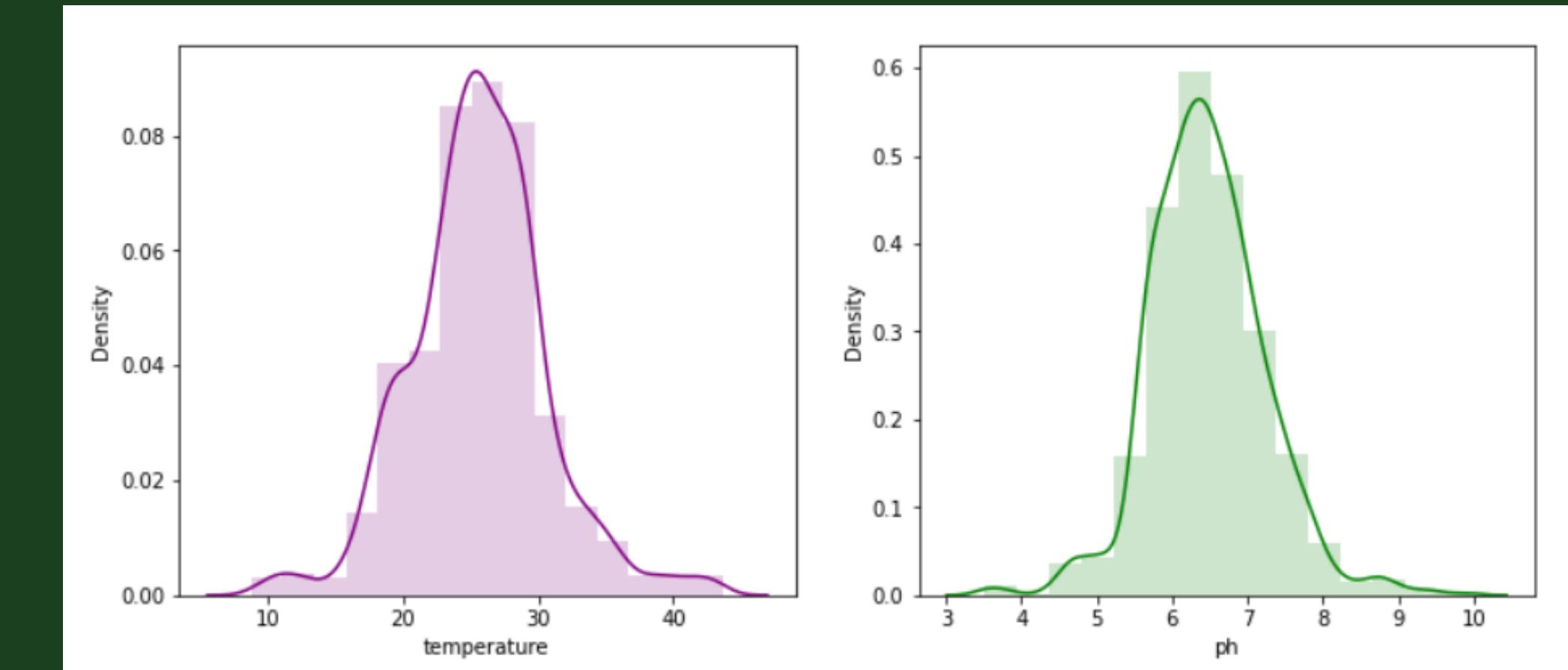
	N	P	K	temperature	humidity	ph	rainfall	label
0	90	42	43	20.879744	82.002744	6.502985	202.935536	rice
1	85	58	41	21.770462	80.319644	7.038096	226.655537	rice
2	60	55	44	23.004459	82.320763	7.840207	263.964248	rice
3	74	35	40	26.491096	80.158363	6.980401	242.864034	rice
4	78	42	42	20.130175	81.604873	7.628473	262.717340	rice

	N	P	K	temperature	humidity	ph	rainfall
count	2200.000000	2200.000000	2200.000000	2200.000000	2200.000000	2200.000000	2200.000000
mean	50.551818	53.362727	48.149091	25.616244	71.481779	6.469480	103.463655
std	36.917334	32.985883	50.647931	5.063749	22.263812	0.773938	54.958389
min	0.000000	5.000000	5.000000	8.825675	14.258040	3.504752	20.211267
25%	21.000000	28.000000	20.000000	22.769375	60.261953	5.971693	64.551686
50%	37.000000	51.000000	32.000000	25.598693	80.473146	6.425045	94.867624
75%	84.250000	68.000000	49.000000	28.561654	89.948771	6.923643	124.267508
max	140.000000	145.000000	205.000000	43.675493	99.981876	9.935091	298.560117



## 02/(ii) ph level, Temperature and Density Analysis :

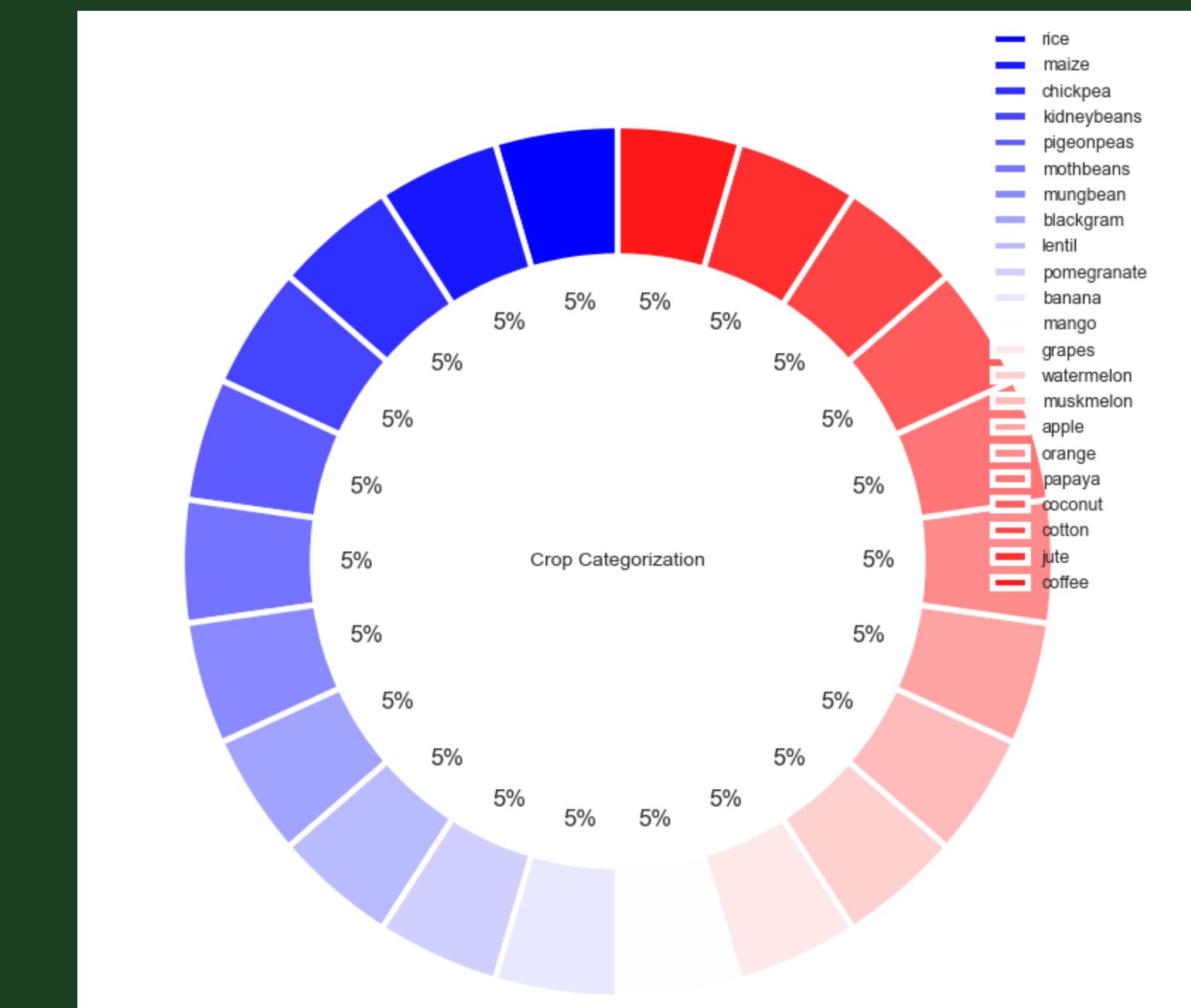
Identified crops using taxonomic analysis. Studied Density and temperature impact for global agriculture insights.





## 02/(iii) Crop categorization and Weightage Assessment :

Categorized crops based on shared characteristics and assessed their economic and nutritional weightage in diverse contexts

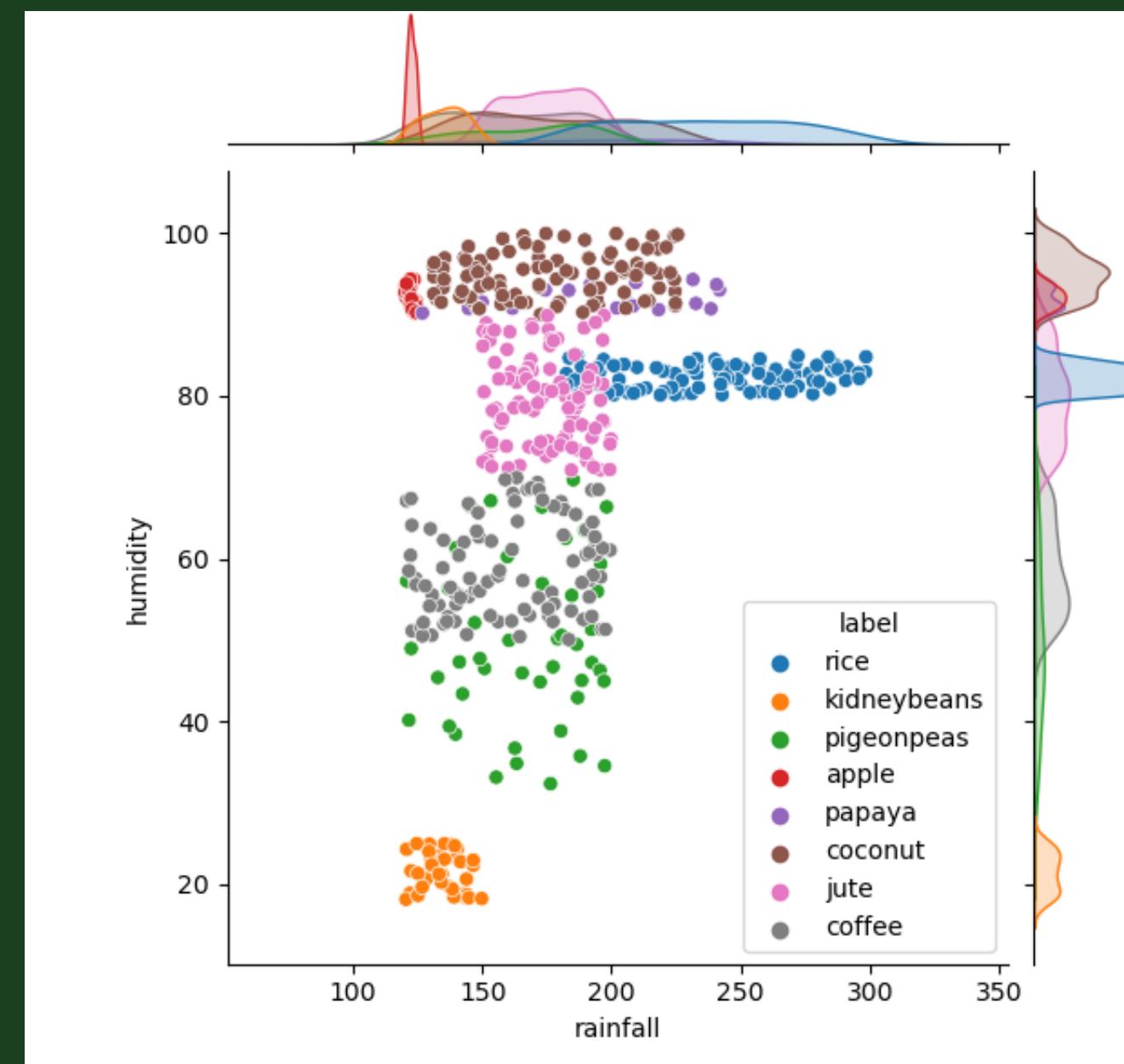




## 02/(iv)

# Integrated Analysis :

Integrated humidity and rainfall analyses for comprehensive insights into global agriculture productivity factors



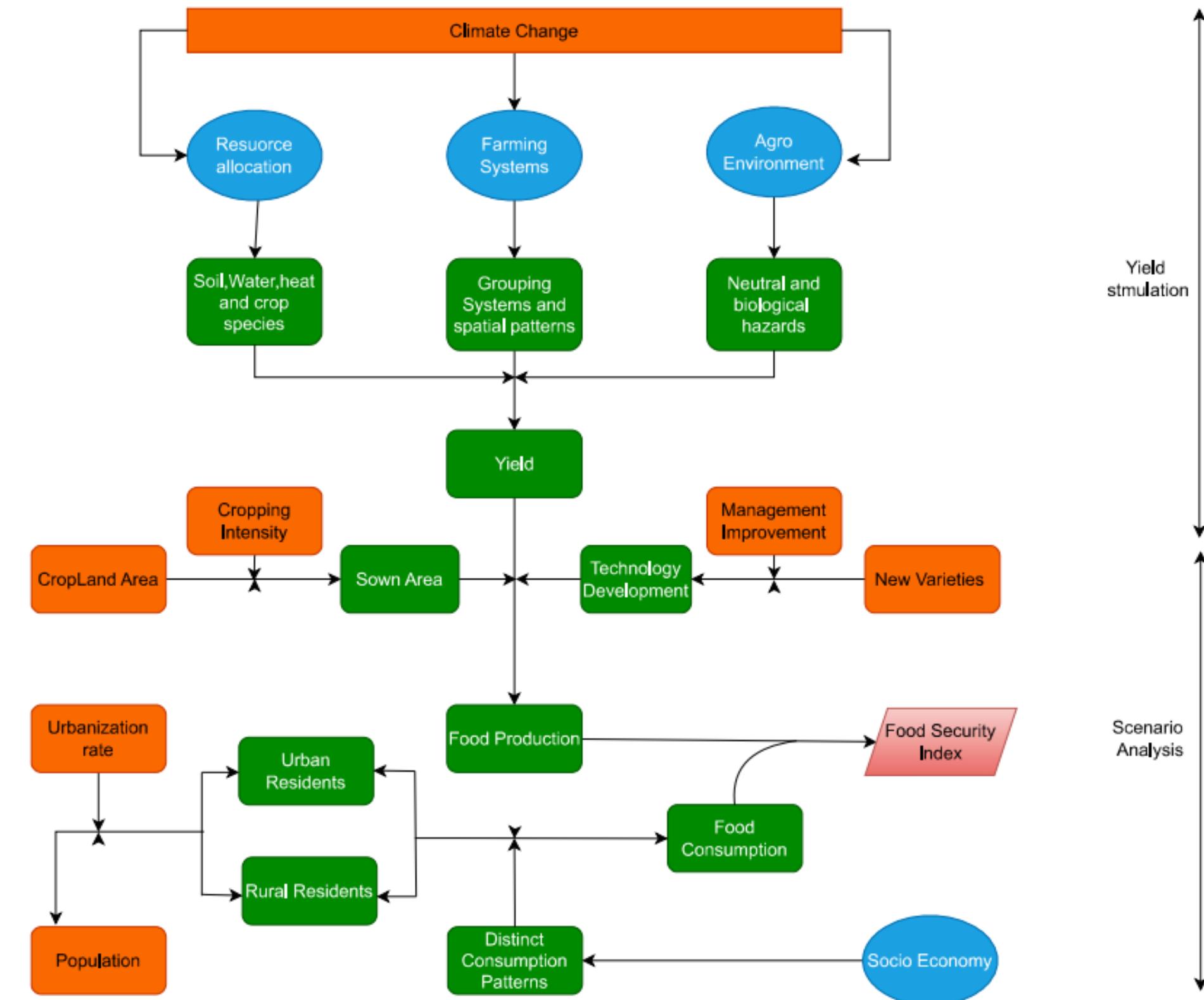
# 03/

## Evaluation

In the evaluation the main issues and concerns that need to be considered to address the complexity of agricultural sustainability assessment. These issues and concerns can be categorized in seven broad groups:

- (1) integration of climate changes;
- (2) maintaining resources, farming and agro environment;
- (3) ensuring system performance;
- (4) involving stakeholders;
- (5) maintaining food production views;
- (6) integration of food security; and
- (7) practicing distinct consumption patterns

The flowchart begins with climate change which improves in yields simulation categorized in three groups as resource, farming & agro environment. The process goes for scenario analysis for informative visualization of food production which gives the conclusion of the effective communication of food security



## 04/ Result & Conclusion

To sum up, our study on global crops shows important information for making farming better and ensuring there's enough food. We found out details about different crops, how they grow, and what factors affect them. This helps farmers make smarter decisions for sustainable farming. By understanding which crops are more important and how they're affected by things like weather and soil, we can work towards a future where farming is not just productive but also good for the environment and makes sure everyone has enough to eat.





# Thank You