Problem Chosen	2025 MCM/ICM Summary Sheet	Team Control Number
E		**2511940**

Our Article

Summary

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2 Assumptions and Notations

2.1 Assumptions and Explanations

- **Accurate Data Assumption**: The model assumes that the data used are accurate.

  Explanation: The data used in the model are sourced from official databases, and we believe the data to be accurate and reliable.

- **Geographic Applicability Assumption**: The model assumes that the applicable region is Southeast Asia.

  Explanation: The climate of Southeast Asia is simple, with only two seasons—rainy and dry. Additionally, as is shown in Figure 3,the temperature variation within a year is minimal,which leads to trivial effect on the ecosystem.Consequently,temperature can be considered as a constant.

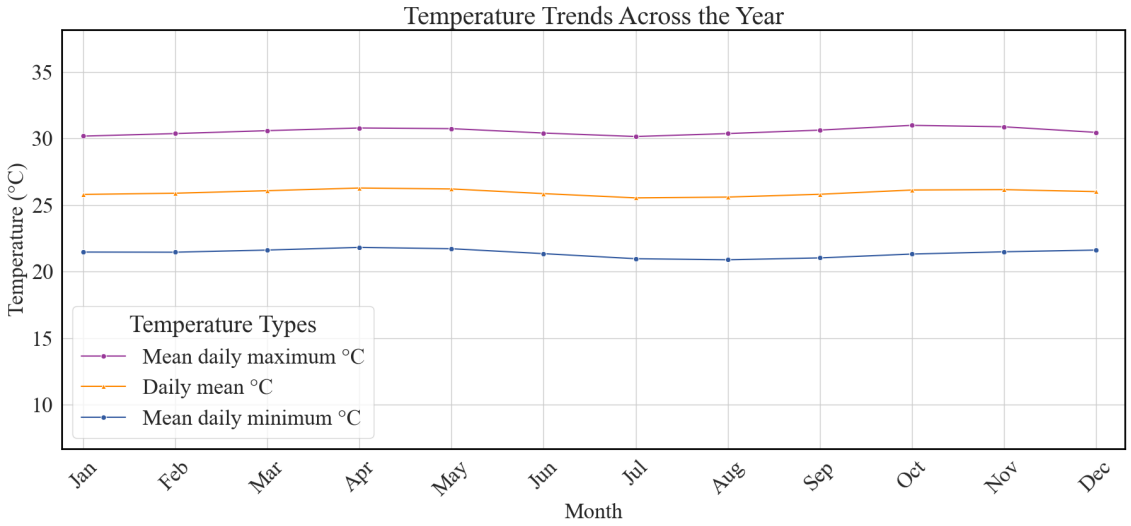

Figure 3: Mean Temperature from 1991 to 2020 in Southeast Asia

- **Planting Pattern Assumption**: The model assumes that two crops of rice are planted each year in the farmland.

  Explanation: This aligns with the planting patterns commonly observed in Southeast Asia, and the simplicity of crop types makes the model easier to establish.

- **Stable Lighting Conditions Assumption**: The model assumes that the region under study experiences stable lighting conditions throughout the four seasons.

  Explanation: Since the model focuses on tropical regions, the variation in daylight duration across different months within a year is minimal, thus the lighting conditions are treated as constant in the model.

- **Stable Growth Environment Assumption**: The model assumes that no natural disasters, which could significantly impact the agricultural ecosystem, will occur during the time frame considered.

  Explanation: Natural disasters are considered low-probability events in agricultural activities. To ensure the generalizability of the model, natural disasters should not be considered.

Symbols	Description
$\mathbf{X}$	Vector $[N_w, N_c, N_p, N_b, N_B, C_{hc}, C_{pc}]^T$,etc.
w	Subscription for weeds
c	Subscription for crops
p	Subscription for pest
bir	Subscription for birds
bat	Subscription for bats
hc	Subscription for herbicide
pc	Subscription for pesticide
C_i	Concentration of certain chemical
N_i	Numbers of certain species
α	abc

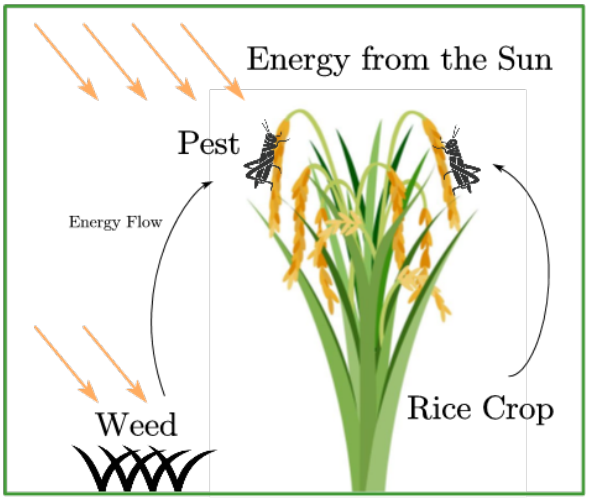

Figure 4: Energy Flow

2.2 Notations

3 Models

4 Application of the Models

5 Sensitivity Analysis

6 Evaluation of the Model

6.1 Strengths

6.2 Weaknesses

7 Conclusion

References

[1] John Doe. An example article. *Journal of Examples*, 1:1–10, 2020.

[2] Rosenow D.T. et al. Drought tolerant sorghum and cotton germplasm. *Agricultural Water Management*, 7(1):207–222, 1983.