# ICT FOR FOOD

## APPLICATION OF ICT FOR DISEASE PREVENTION IN RICE

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Credit: Google images

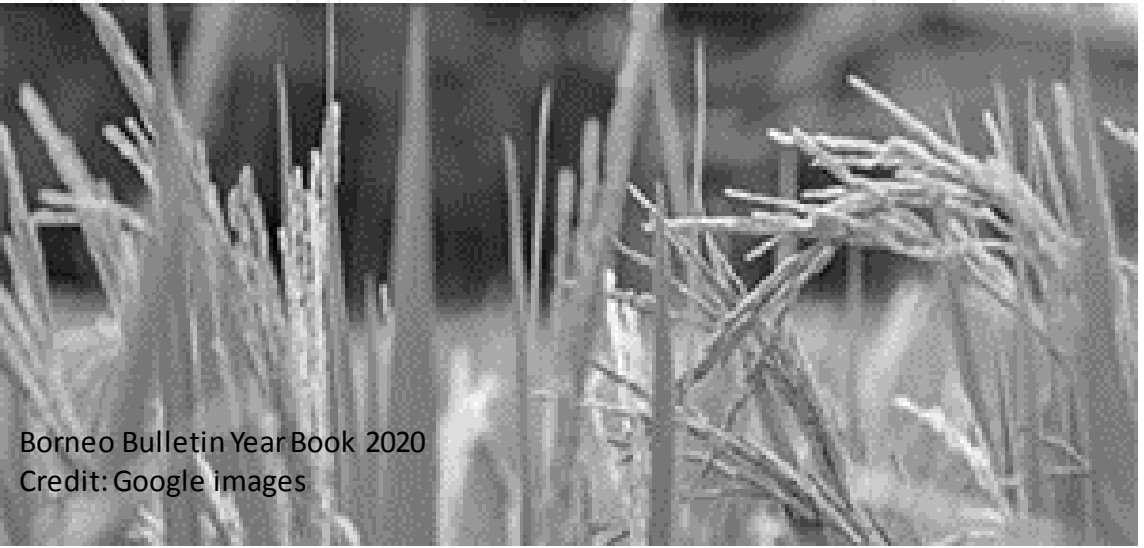
# AGENDA

PURPOSE

BACKGROUND

METHODOLOGY

CLOSING



Borneo Bulletin Year Book 2020
Credit: Google images

# PURPOSE

RATIONALE OF THIS STUDY

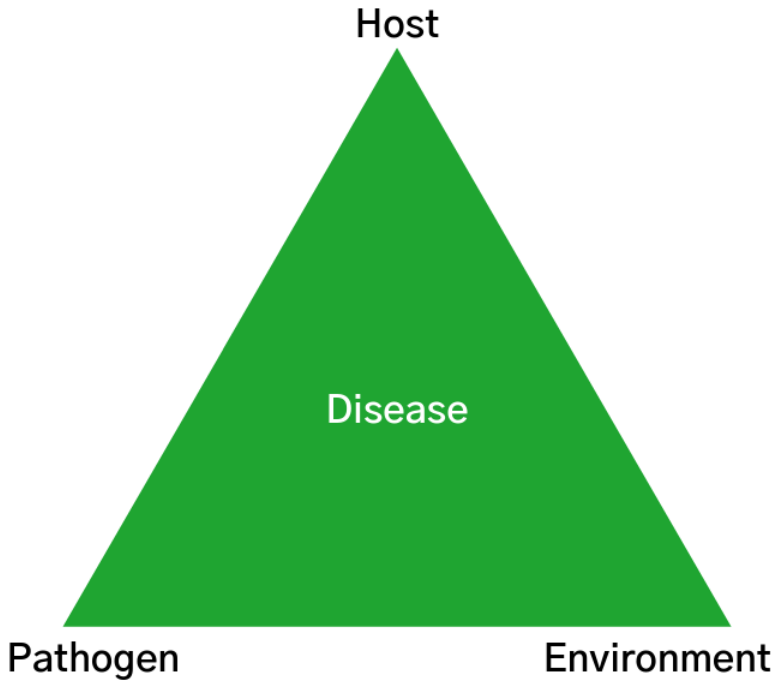
To ensure regional self-sufficiency in rice production by providing ICT solutions to crop disease (sheath blight).

Credit: agriculture.gov.bn

# BACKGROUND

DIVERSIFICATION OF ECONOMY HAS LED TO AN EMPHASIS ON REVAMPING AGRICULTURE SECTOR IN BRUNEI

# CURRENT CHALLENGE
# PLANT DISEASE TRIANGLE



Credit: agriculture.gov.bn

# METHODOLOGY

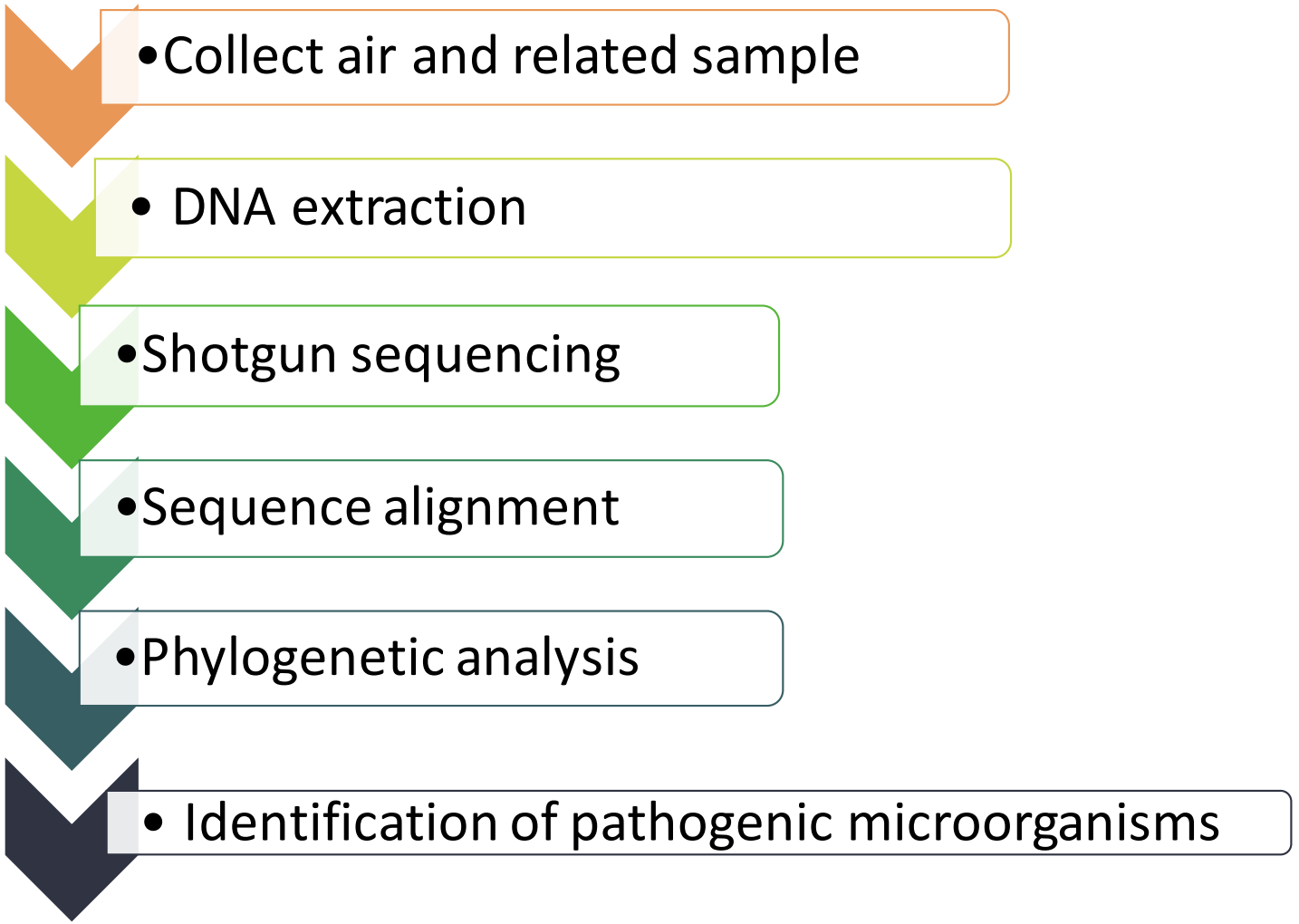
ICT FOR AGRIFOOD

# SAMPLE COLLECTION

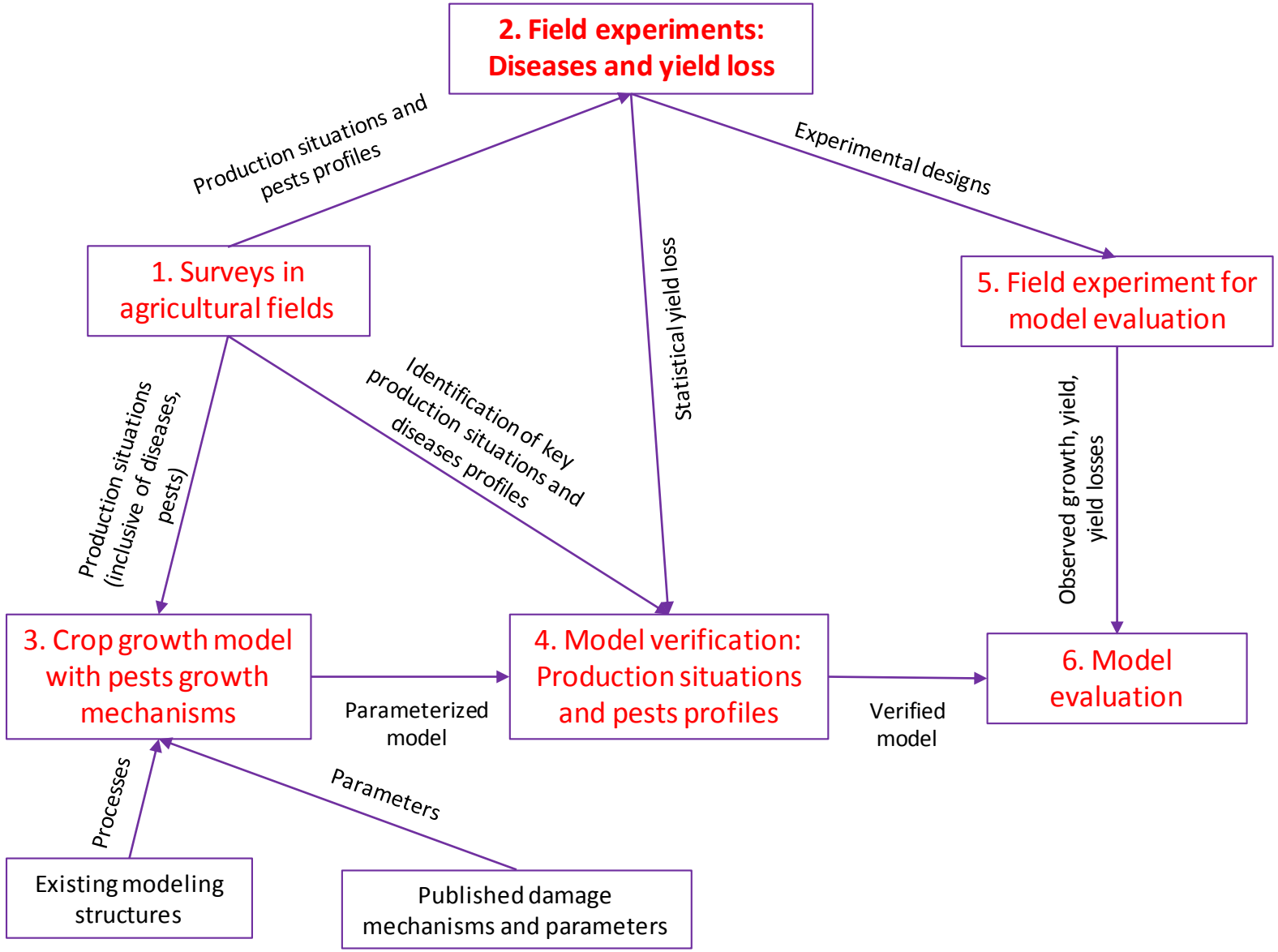
Infected plant samples (sheath blight) collected from Paddy Industry Unit and Brunei Agricultural Research Centre (BARC) paddy plots at Wasan and Kandol.

Sampling at Wasan, Brunei-Muara and Kandol area (500 hectare commercial paddy planting), Kuala Belait.

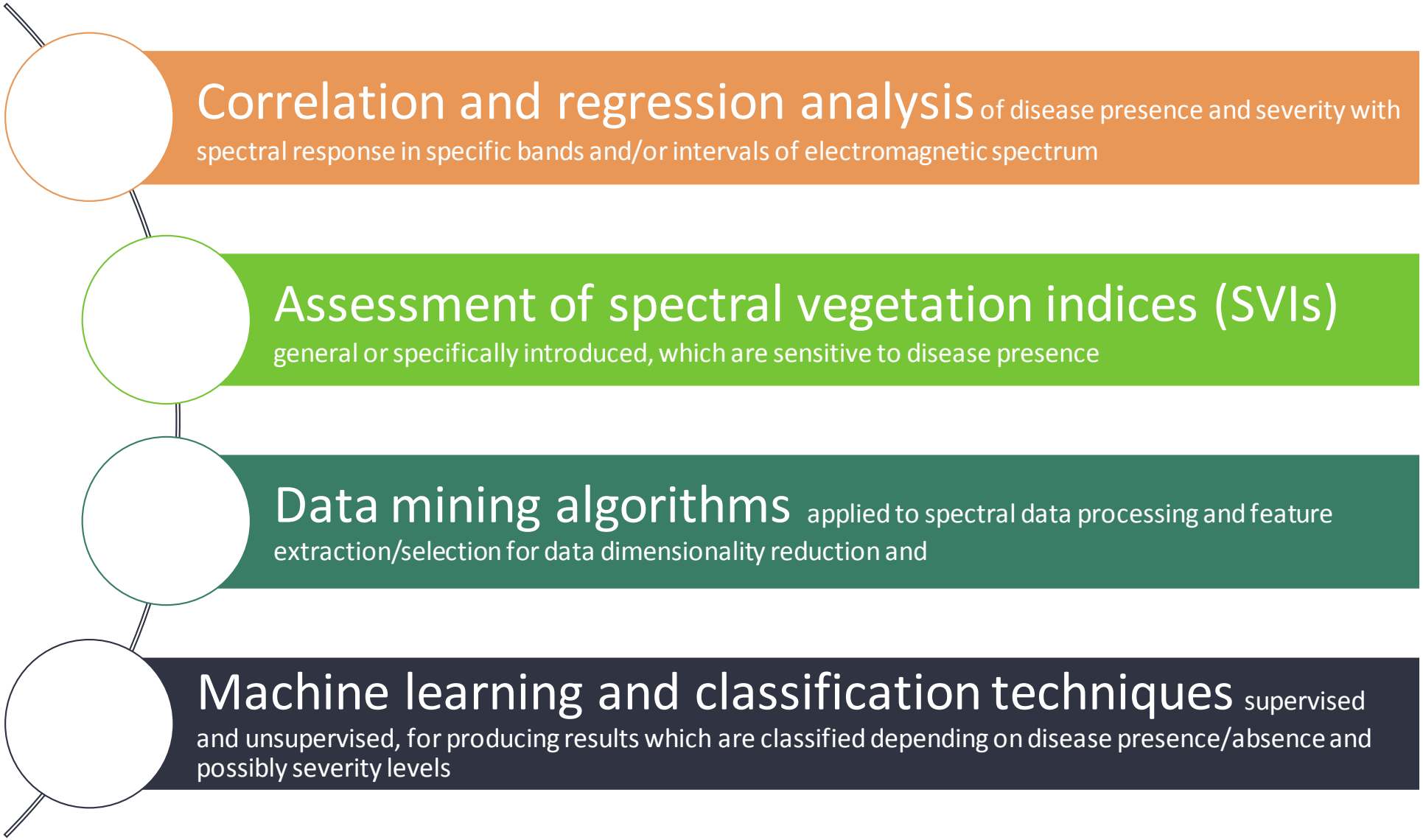
# DNA BARCODING



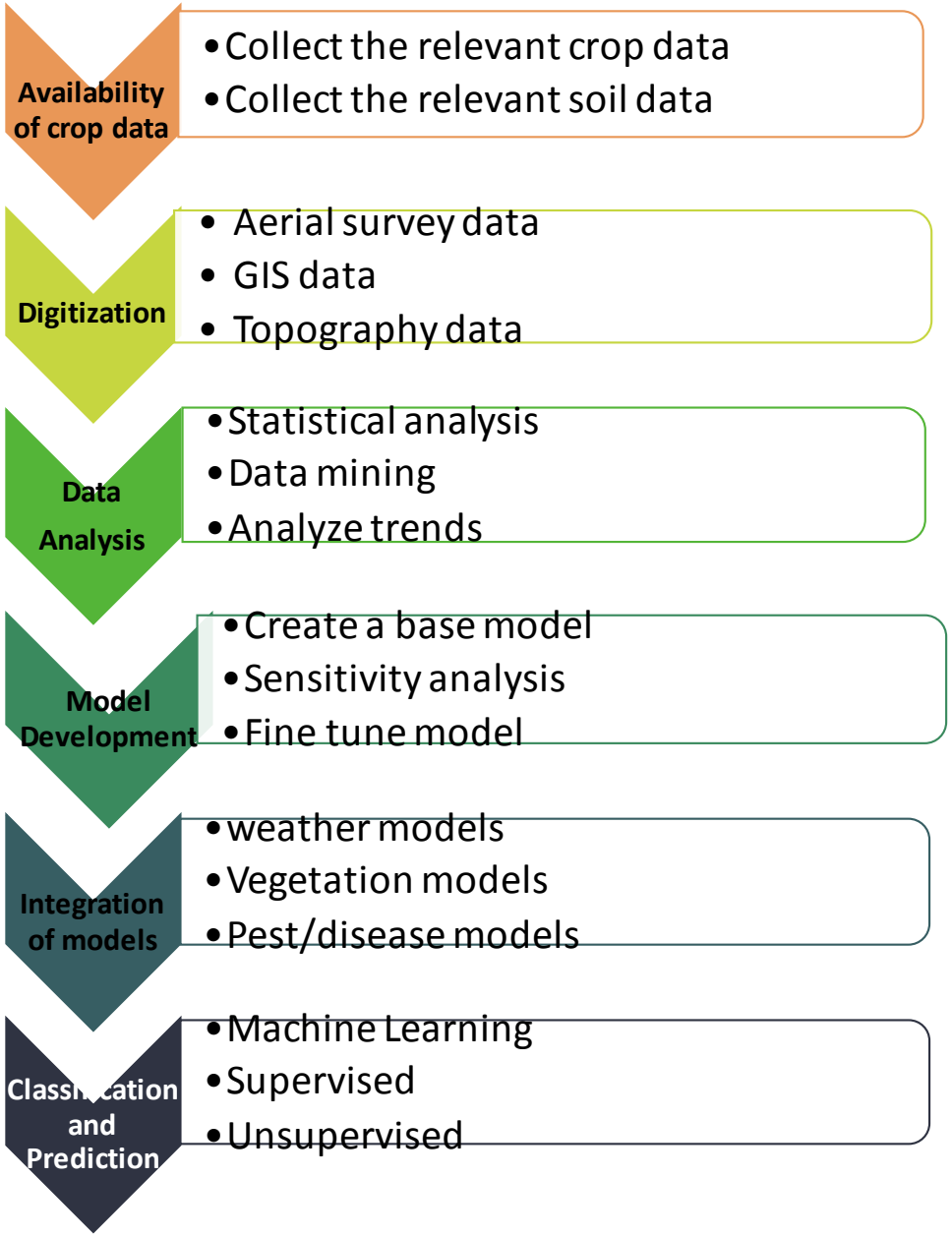
# DATA-MODEL INTEGRATION



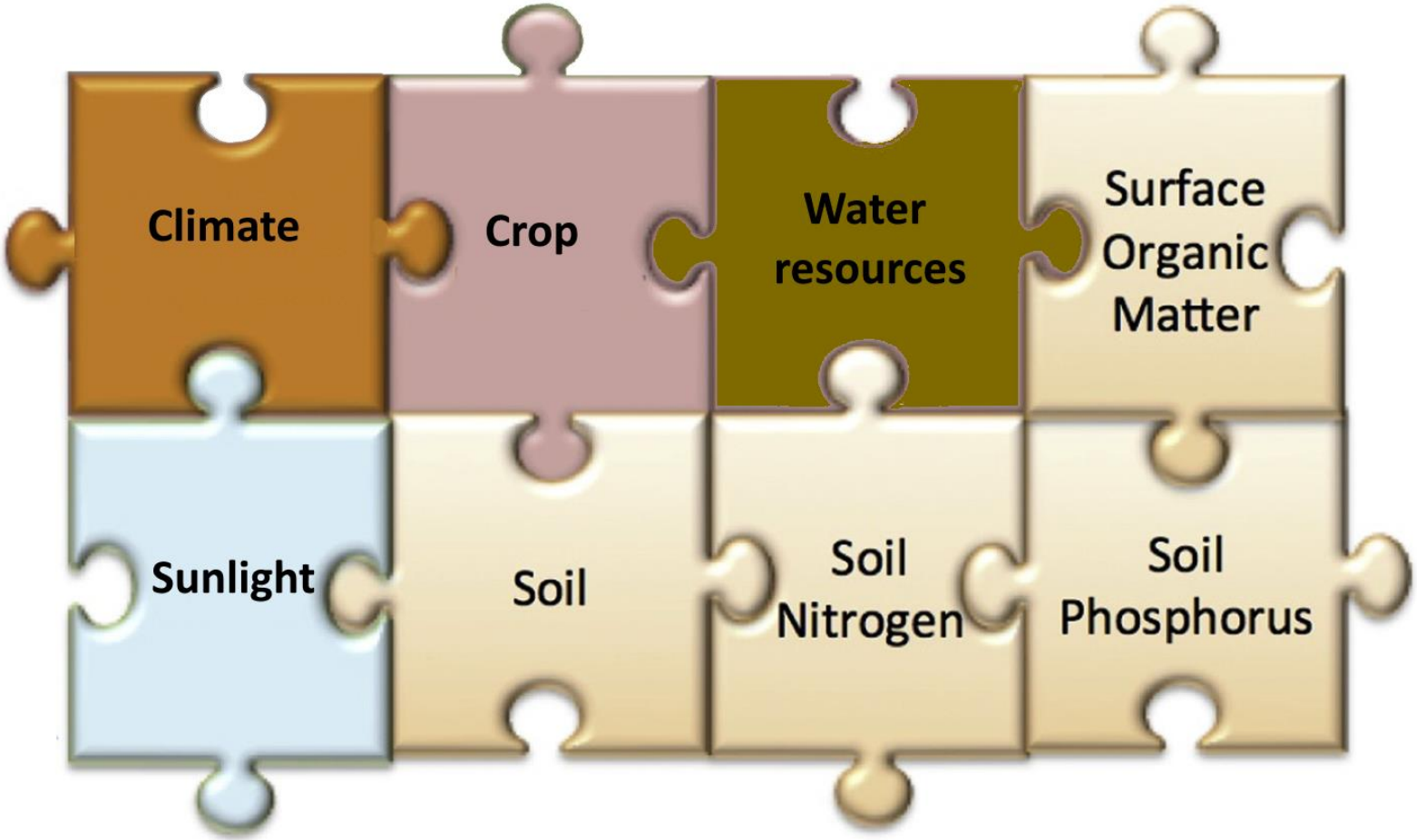
# MODELLING STAGES



# STRUCTURE FOR DATA MODEL INTEGRATION



# INTEGRATING PARAMETERS TO BETTER REPRESENT THE SYSTEM



# ROADMAP TO IMPROVE THE PREDICTION OF THE IMPACTS OF PESTS AND DISEASES IN AGRICULTURAL CROP YIELD

The action plan covers six areas:

i) Improve the quality and availability of crop data as model inputs

ii) Develop a systematic crop model

iii) Design a structure for data model integration

iv) Integrate the crop model with weather models

v) Establish diseases and pests mitigation framework

vi) Provide a robust and reliable crop model for predictable crop yield

# TEAM MEMBERS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# WHAT'S NEXT?

MATCH FUNDING

EXTERNAL COLLABORATION

# HALF-YEARLY TIMELINE

| T1 | T1 | T3 | T4 |
|---|---|---|---|
| JUL to DEC | JAN to JUN | JUL to DEC | JAN to JUN |
| SAMPLE COLLECTION<br>Collect air and other samples from agri-fields. | DNA BARCODING<br>Identify pathogens through DNA analysis. | MODELLING<br>Develop models to predict crop damage by pathogens. | SOLUTIONS<br>Offer strategies and solutions to counter causative organisms. |

# BENEFITS OF PROJECT

## AGRICULTURE

- Identification of specific rice pathogens (bacteria, fungi & spores) in Brunei
- ICT solutions to counter widely prevalent sheath blight
- Prevention of losses due to crop disease
- Self sufficiency and diversified economy

## FOOD

- Increased production of staple rice (BDR5)
- Reduce wastage of food and chemicals
- Better supply chain and storage

Credit: Google images

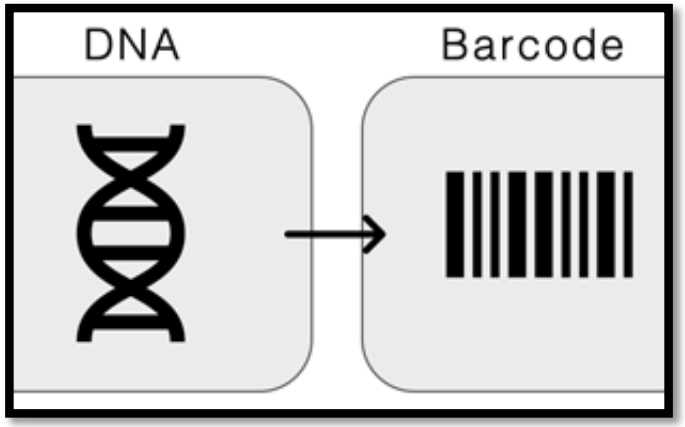
# GOALS FOR T1

## PROCURE EQUIPMENT

- Air sampler
- Consumables

## COLLECT SAMPLES FROM AGRI-FIELDS

- Air sample for spores
- Plant specimen




## DNA BARCODING THROUGH COLLABORATION

- Metagenomics
- Phylogenetic analyses

Credit: Google images

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# SUMMARY

## Diversification of economy

Thrust on agricultural sector in Brunei

## Identify causative organisms

Sheath blight a widespread concern of crop loss

## Develop models for prediction

Predict scale of crop damage though modelling

## Apply ICT for self sufficiency

Offer solutions based on prediction

# THANK YOU


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