BRUNEI 2021
MID-YEAR CONFERENCE AND EXHIBITION
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جابتن ڤرتانين دان اکري ماکنن
AGRICULTURE AND AGRIFOOD DEPARTMENT
MINISTRY OF PRIMARY RESOURCES AND TOURISM | BRUNEI DARUSSALAM

KEMUDA Institute

AGRICULTURAL SECTOR: CHALLENGES & WAY FORWARD

Usage Of Technology In Increasing Farm Production And Productivity

MINISTRY OF PRIMARY RESOURCES AND TOURISM
MINISTRY OF RELIGIOUS AFFAIRS
MINISTRY OF DEVELOPMENT
MINISTRY OF TRANSPORT AND INFOCOMMUNICATIONS
MINISTRY OF ENERGY
MINISTRY OF FOREIGN AFFAIRS
MINISTRY OF HOME AFFAIRS
RTB
Borneo Bulletin
Media Permata
DST
CITYNEON

UTB's Vision: A Global University Impacting Society

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Assistant Professor,
Deputy Director for the Centre for Innovative Engineering
Head of Digital & Creativity Thrust Leader,
Project Coordinator School of Computing and Informatics,
ASEAN Science & Technology Fellows of the 2019/2020

EVOLUTION OF PADDY PROJECT TOWARDS RESEARCH DEVELOPMENT & DEPLOYMENT

ASEAN IVO KICKOFF JAPAN 2018

HARI BELIA AITI 2018

KOSEKA & MPP 2019

UTB IN-HOUSE 2020

IBTE AGRO 2020

2021

2018 **IMANG DAM**

2019 **ASTF DAA: SOIL**

2019 **ASTF DAA: PADDY**

2019 **IVO NECTEC THAILAND**

2020 **KANDOL**

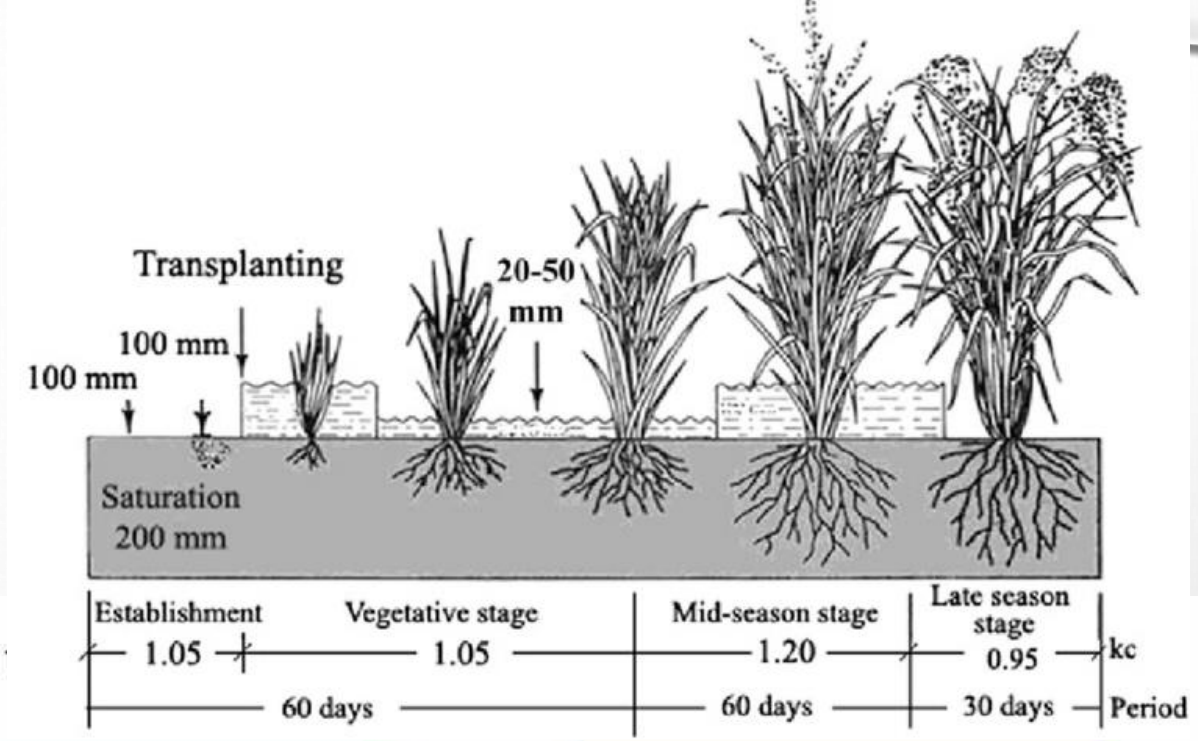
2020 **UBD & DAA**

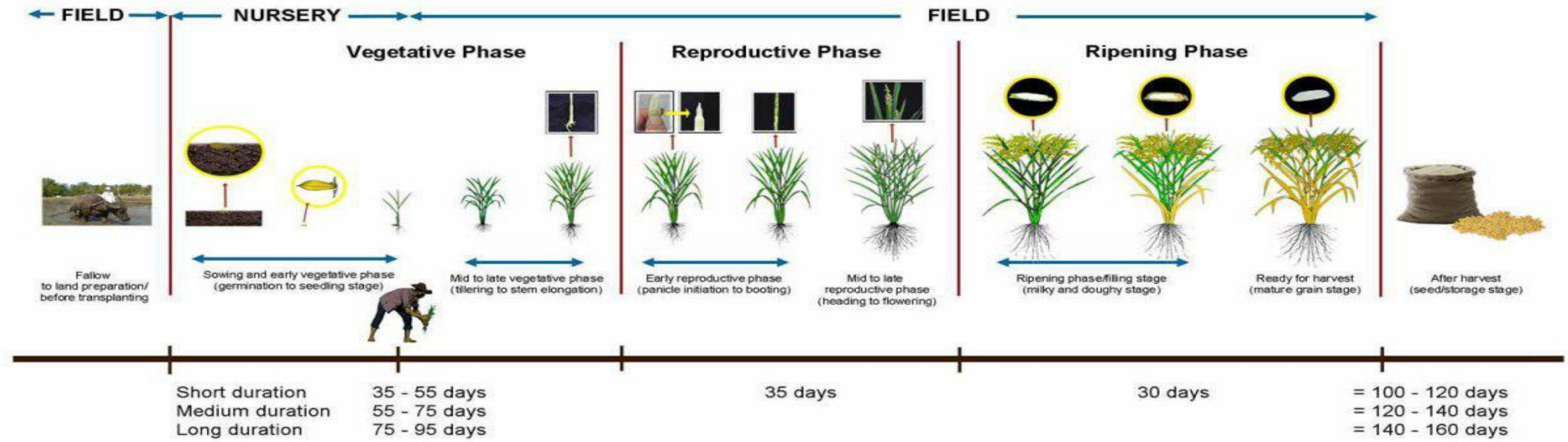
WASAN

AGENDA

- **ADOPTION OF TECHNOLOGY**
  - **UTB'S TECHNOLOGICAL PROJECTS – RESEARCH TO PROTOTYPING**
    - ASEAN IVO 2018 SWS PROJECT – RESEARCH TO DEVELOPMENT
    - IBTE WASAN – RESEARCH TO DEPLOYMENT
    - [illegible] WATERGATE – RESEARCH TO PROTOTYPE
- RECOMMENDATION & SUGGESTION TO ADDRESS IRRIGATION ISSUES

DIFFERENT STAGES OF IRRIGATION (IRRI)



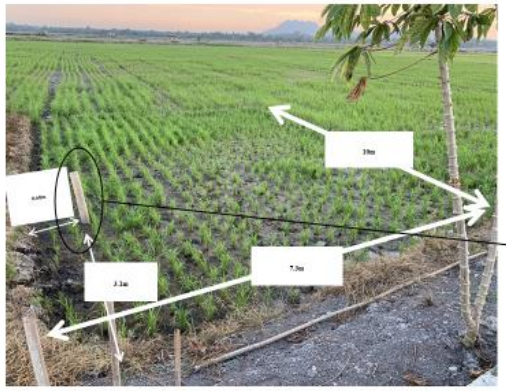


ADOPTING ALTERNATE WETTING AND DRYING STRATEGY (IRRI)

- EARLIER VERSION OF AWD IS SIMPLY A PVC PIPE WITH SEVERAL HOLES ON IT AND A MEASURING TAPE.
- AFTER YEARS GOES BY, WATER LEVEL SENSOR ARE BEING INTRODUCE TO THE PIPE TO MEASURE AND TAKE THE WATER LEVEL READING. NO MORE MEASURING TAPE INVOLVED.
- THEN, MOISTURE SENSOR ARE BEING ADDED TO KNOW WHETHER THE SOIL IS WET OR DRY.
- MONITOR WATER REQUIREMENT FOR EACH STAGE

AWD & AUTOMATED WATER GATE – PROTOTYPE DESIGN

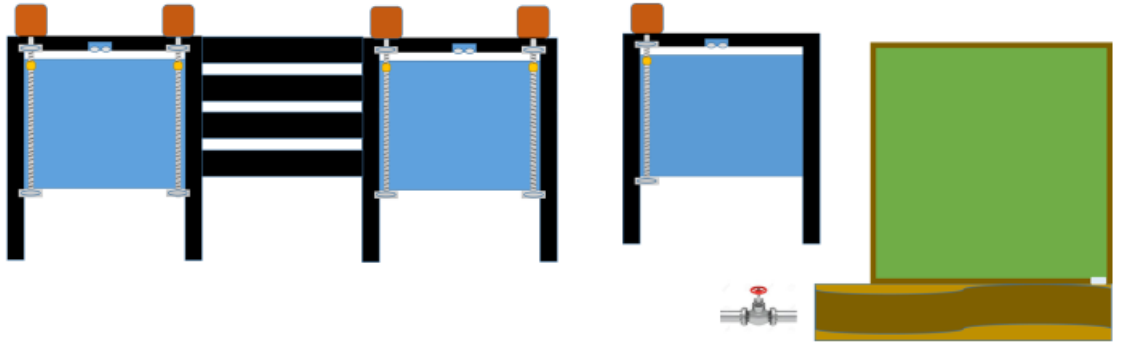
Bamboo Testing @Bunga Cawan (Limau Manis)



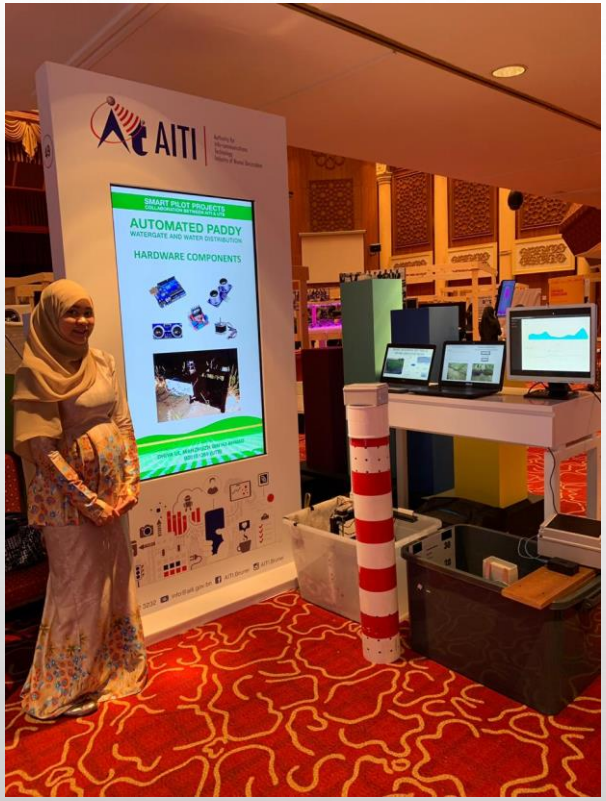
	Date	Depth (cm)
1	3rd February	20
2	17th February	20.3
3	3rd March	20.8
4	17th March	21.3
5	31st March	21.8
6	7th April	22

Total : 9 weeks

New Watergate design – UTB SCI's Design



HARI BELIA 2019 PRESENTATION



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  - UTB'S TECHNOLOGICAL PROJECTS – RESEARCH TO PROTOTYPING
  - **ASEAN IVO 2018 SWS PROJECT – RESEARCH TO DEVELOPMENT**
  - UTB WASAN – RESEARCH TO DEPLOYMENT
  - UTB WATER GATE – RESEARCH TO PROTOTYPE
- RECOMMENDATION & SUGGESTION TO ADDRESS IRRIGATION ISSUES

ASEAN IVO 2018
Smart Watering System For Paddy

AIM

TO INTRODUCE THE USE OF TECHNOLOGY TO IMPROVE YIELD AND ADDRESS IRRIGATION ISSUES FOR PADDY PLANTATION IN BRUNEI DARUSSALAM

OBJECTIVES

- TO IMPROVE THE CONDITIONS OF THE SOIL, WITH THE CORRECT WATER DISTRIBUTION THROUGH THE APPLICATION OF AWD
- TO REDUCE HUMAN INTERVENTION
- TO IMPROVE WATER IRRIGATION
- TO IMPROVE AND INCREASE YIELD
- BY PROVIDING RECOMMENDATION ON THE BEST WAY FORWARD

THROUGH ASEAN IVO 2018 PROJECT
SMART WATERING SYSTEM WITH PADDY PLANTATION

- USER REQUIREMENT AND SITE VISITS HAS BEEN DONE.
- PROGRESS HAVE BEEN REPORTED
- THE REQUIREMENTS ARE AS FOLLOWS:
  - TWO WEATHER STATIONS – ONE INSTALLED AT THE OFFICE ANOTHER AT THE DAM
  - TWO SENSOR NODES EQUIPPED WITH FOUR SENSORS: WATER LEVEL, SOIL MOISTURE, SOIL TEMPERATURE AND PH SENSORS
  - ADOPT TECHNOLOGICAL AWD
  - TWO VALUES TO CONTROL THE WATER IN THE CANAL.
    - WATER LEVEL
    - PH VALUES

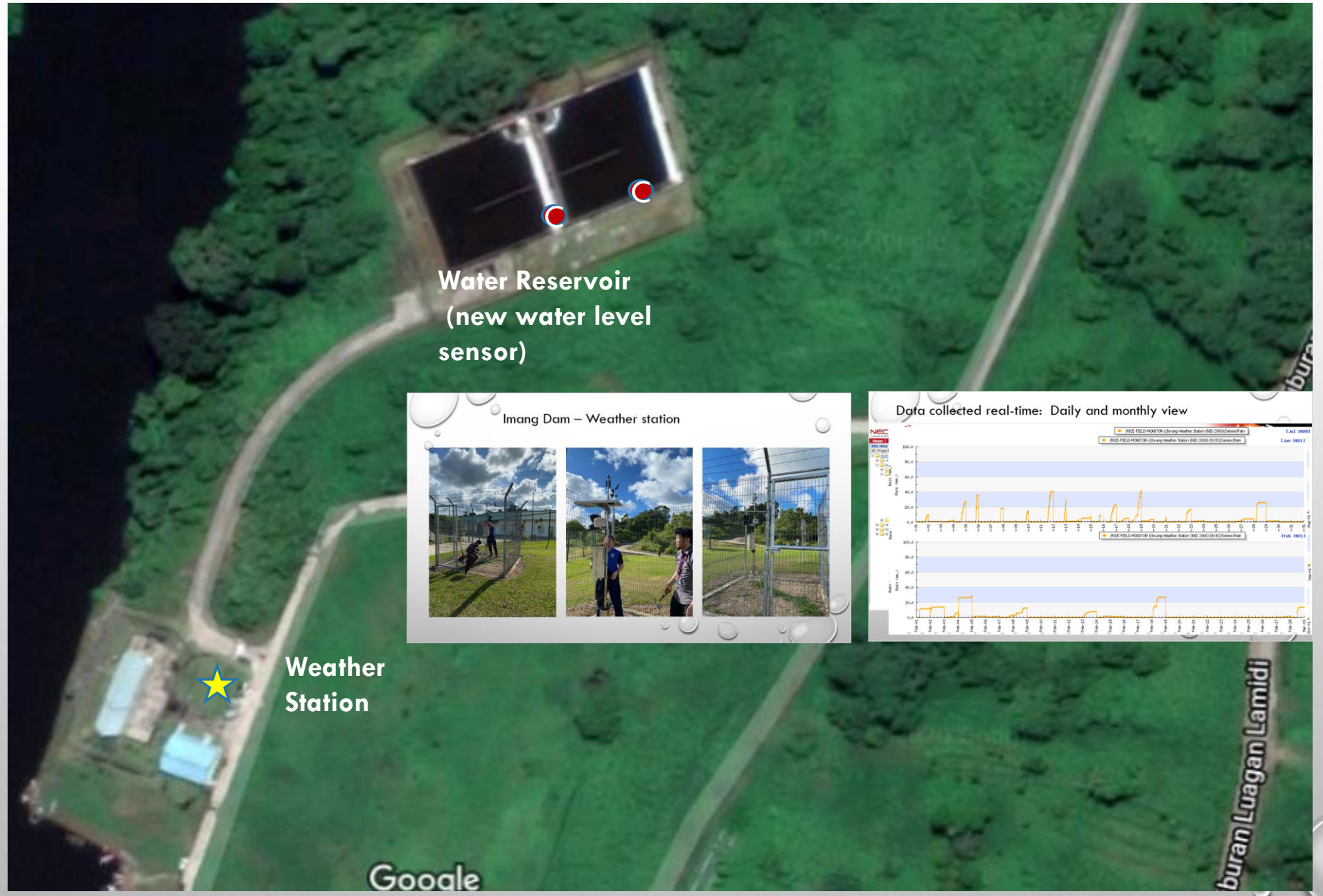
ASEAN IVO PROJECT – ADOPTION OF TECHNOLOGY

Weather Station's Sensor	Sensor Type	Measurement Range	Measurement Unit	Resolution	Accuracy
Temperature & Humidity & Pressure Sensor 	Temperature,	0 – 100	Celsius	0.01	±0.2
	Humidity,	0 – 100,	%RH	0.01	±2
	Pressure	400	kPa	-	±1.5
Pyranometer 	Light intensity	0 - 2000	W/m2	-	±6%
Rainfall sensor 	Rain gauge	-	mm	0.2 mm	-
Wind sensor 	Wind speed	1-322	km/h	1	±3
	Wind direction	0-360	degree	1	±7

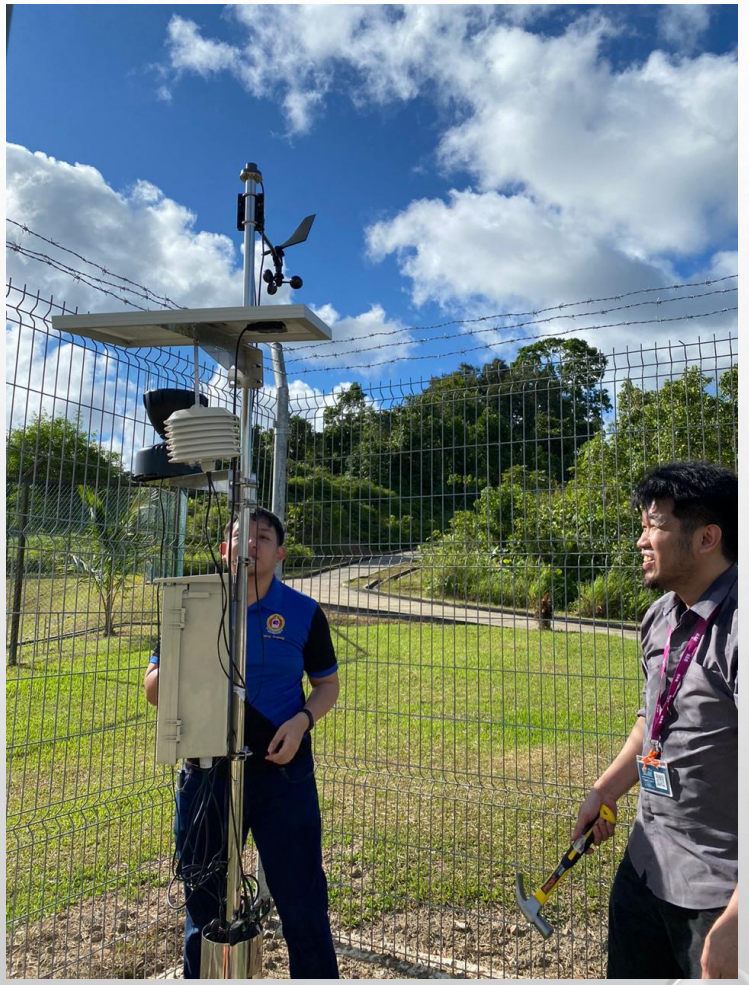
2 Weather Stations

1. Imang Dam
2. Paddy Office at Wasan

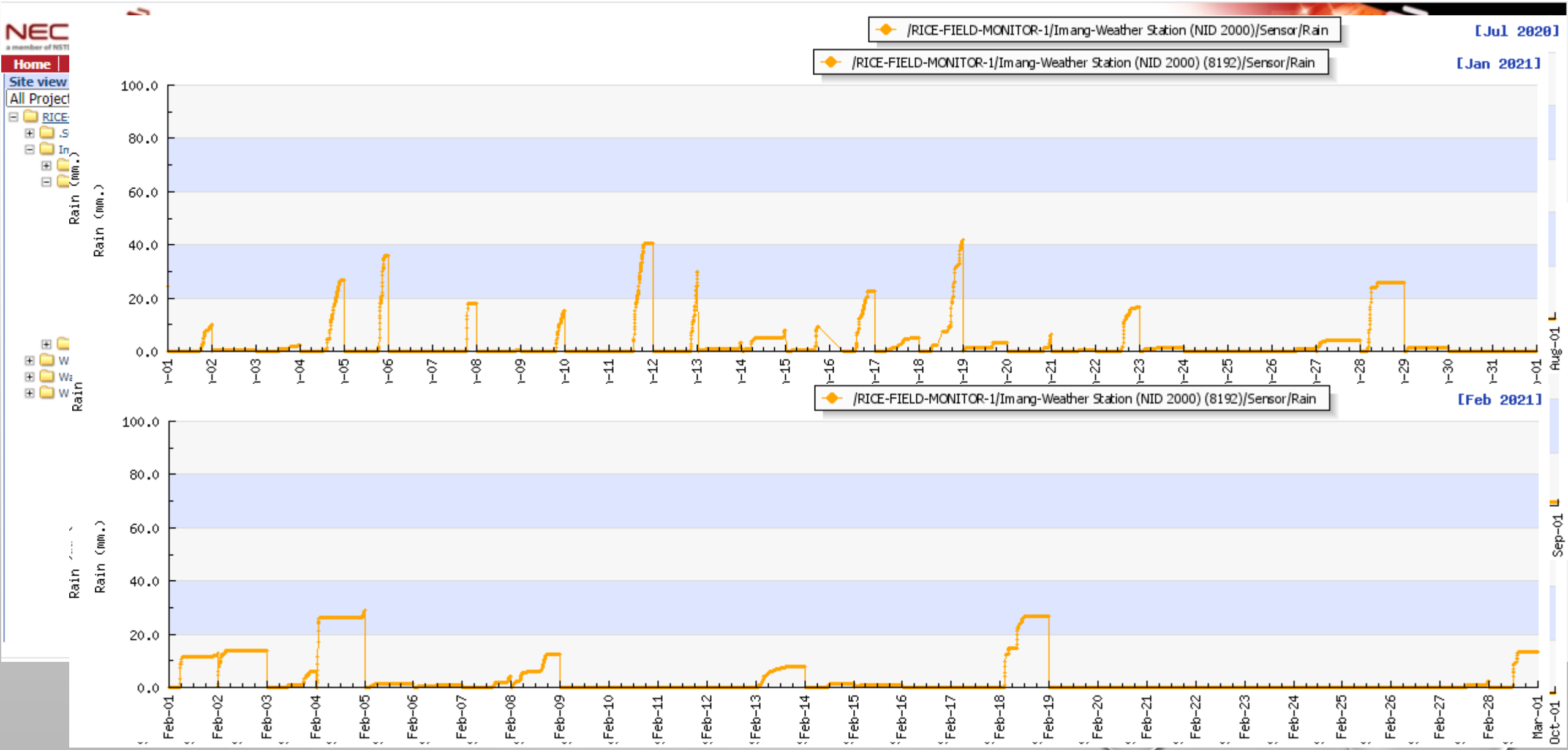
IMANG DAM


Water Reservoir
(new water level sensor)
Imang Dam – Weather station
Data collected real-time: Daily and monthly view
Weather Station
Google

Imang Dam – Weather station



Data collected real-time: Daily and monthly view



ASEAN IVO PROJECT – ADOPTION OF TECHNOLOGY

Sensor	Sensor Type	Measurement Range	Measurement Unit	Resolution	Accuracy
	water level	30cm-5m	cm	1mm	±0.5%
	soil moisture	0-100	%	0.001 m^3/m^3	±0.03 m^3/m^3
	soil temperature	0-100	Celsius	-	±0.7
	pH Sensor	1-13	pH	-	0.1

Sensor nodes

Total cost:

599,200 baht

(exclude shipping)

USD19,211

B$26,130

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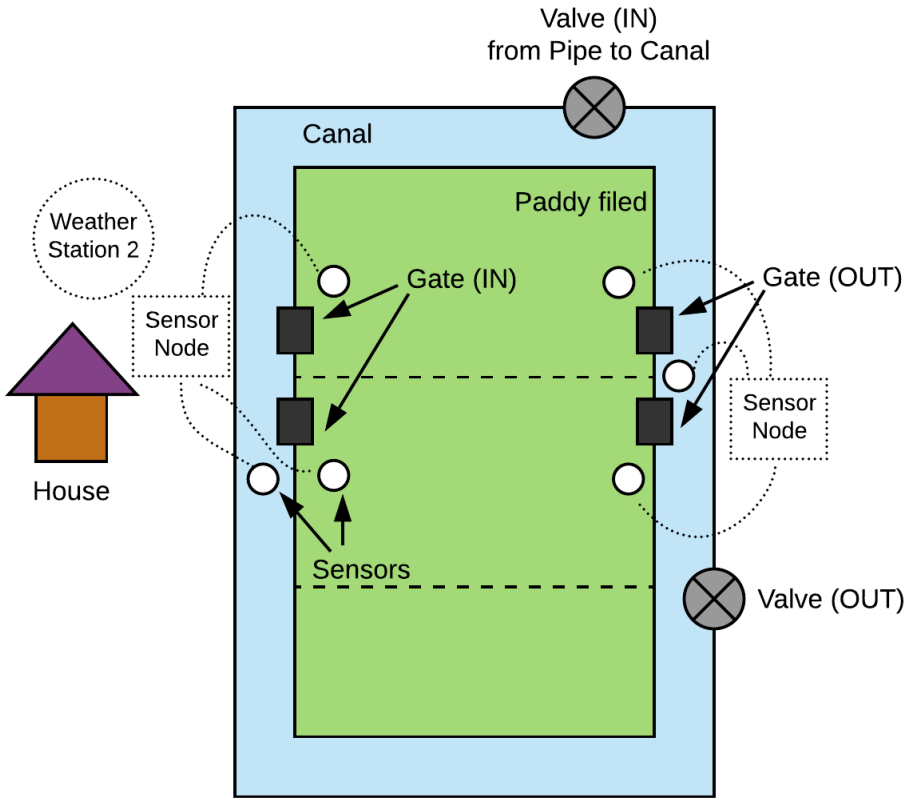
  - **IBTE WASAN – RESEARCH TO DEPLOYMENT**
  - UTB WATERGATE – RESEARCH TO PROTOTYPE
- RECOMMENDATION & SUGGESTION: TO ADDRESS IRRIGATION ISSUES

Planting Season	Months
1st Season	May – August
2nd Season	November – February

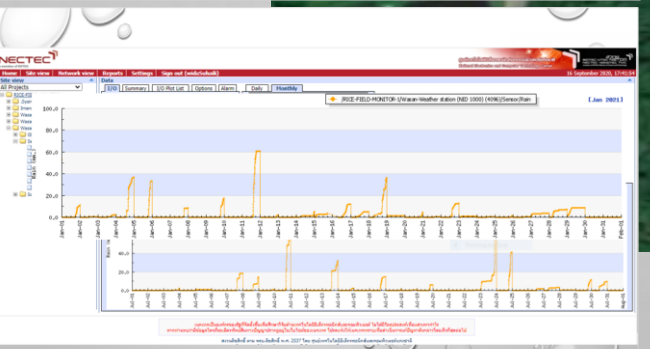
LESSON LEARNED



Irrigation for Paddy Plantation

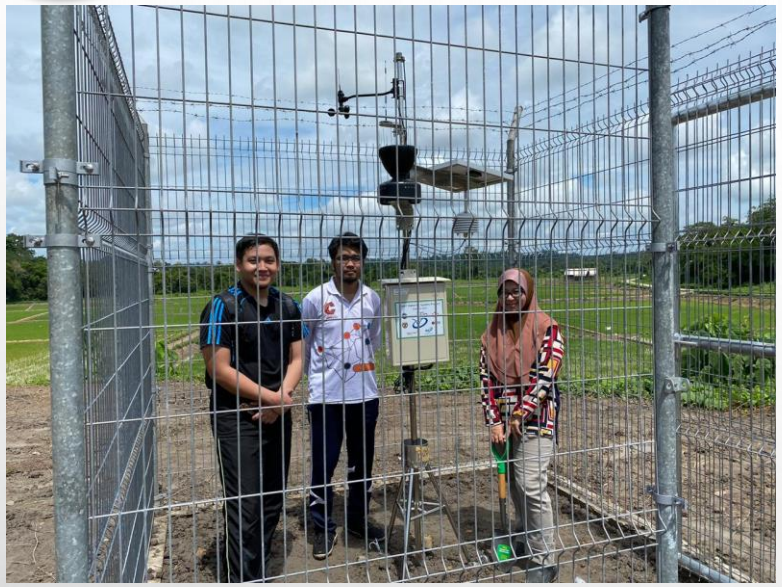
IBTE WASAN


FIRST TRIAL 2020 (JULY – SEPT SEASON)




Water
Reservoir 3
IBTE Agro-Technology
Campus
Water
Reservoir 2
Weather
Station
Sensor Nodes Stations
Google

FIRST TRIAL 2020 (JULY – SEPT SEASON)



NECTEC
a member of NSTDA

ศูนย์เทคโนโลยีอิเล็กทรอนิกส์และคอมพิวเตอร์แห่งชาติ
National Electronics and Computer Technology Center

Home | Site view | Network view | Reports | Settings | Sign out (widaSuhaili) 16 September 2020, 17:41:54

Site view

All Projects

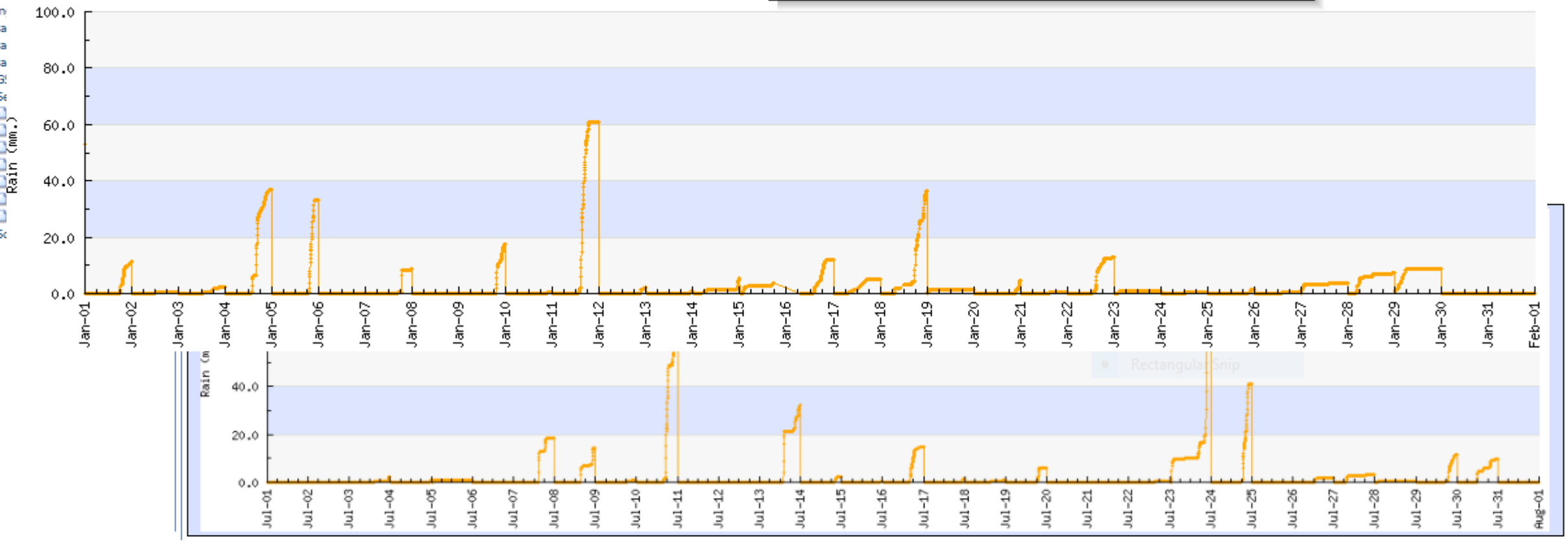
- RICE-FIE
  - .Sysir
  - Iman
  - Wasa
  - Wasa
  - Wasa
    - G
    - Se
      - Rain (mm.)
    - Sc

Data

I/O | Summary | I/O Plot List | Options | Alarm | Daily | Monthly

/RICE-FIELD-MONITOR-1/Wasan-Weather station (NID 1000) (4096)/Sensor/Rain

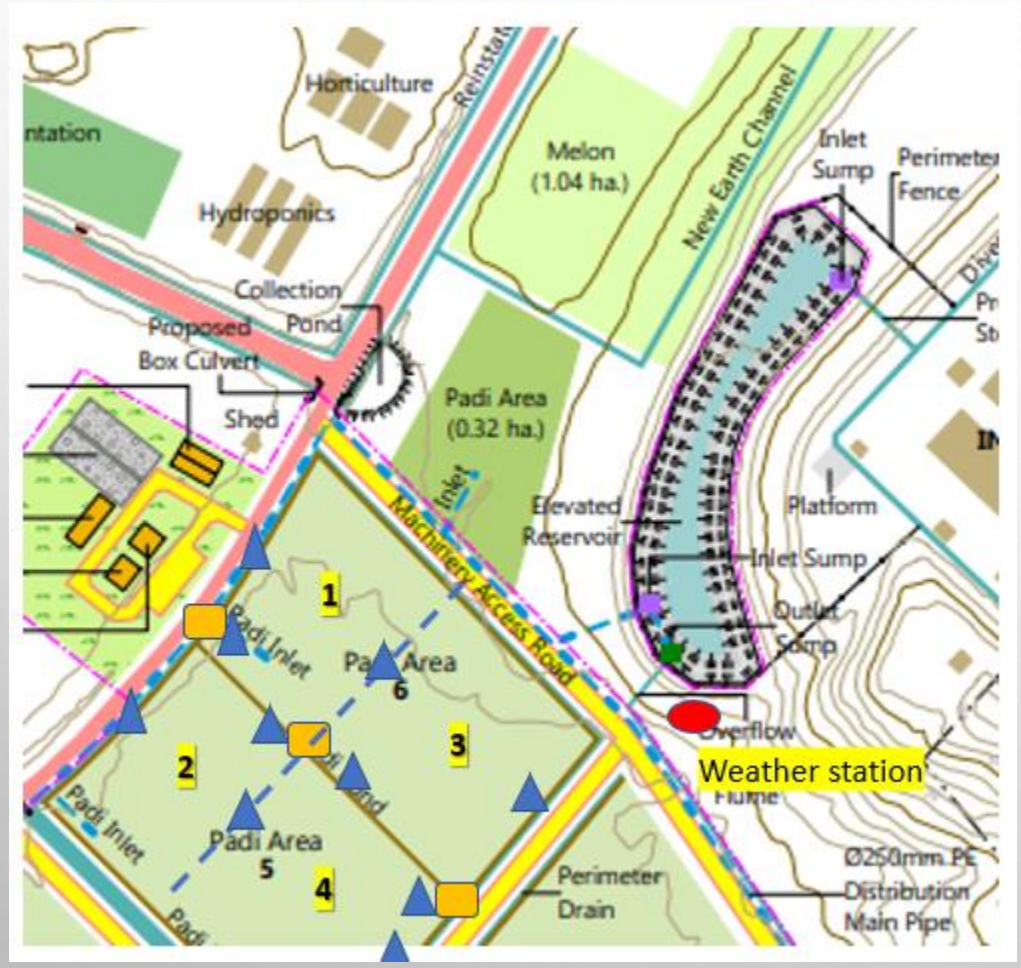
[Jan 2021]

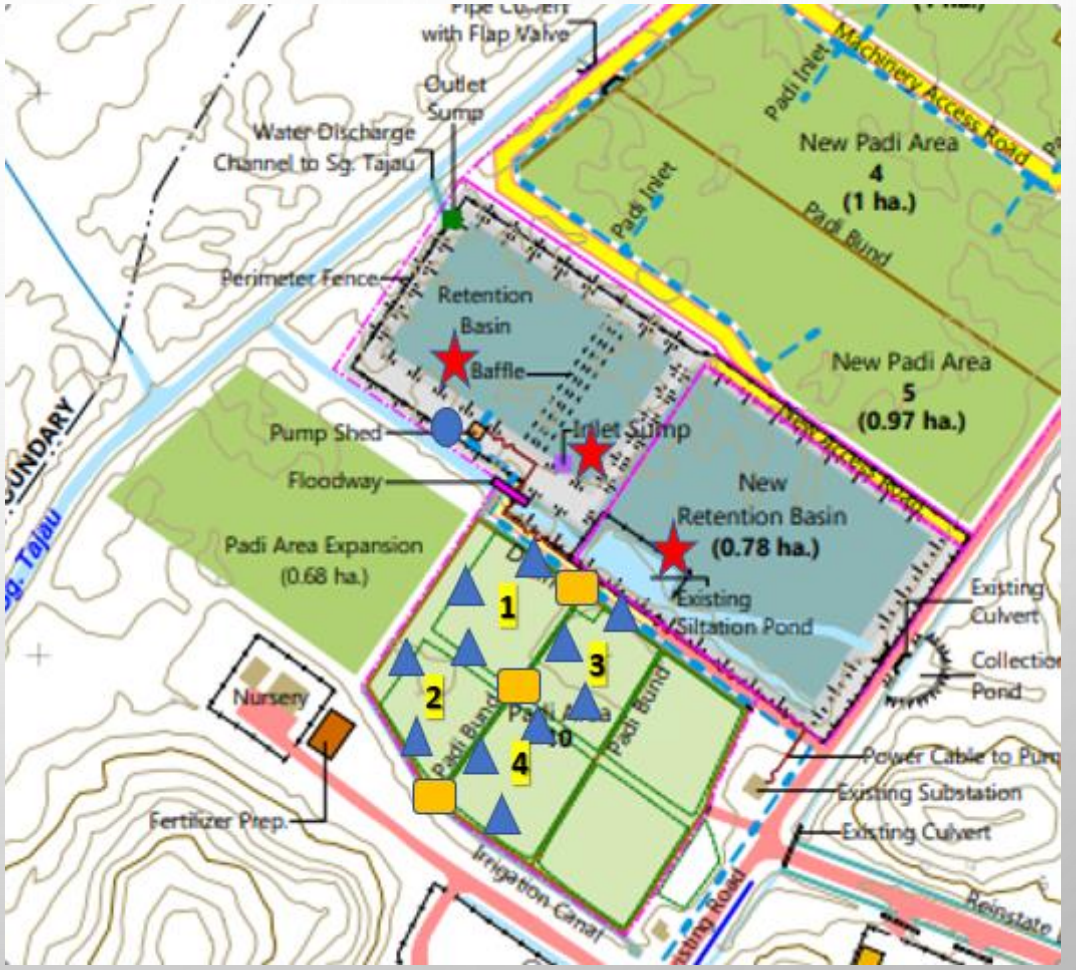


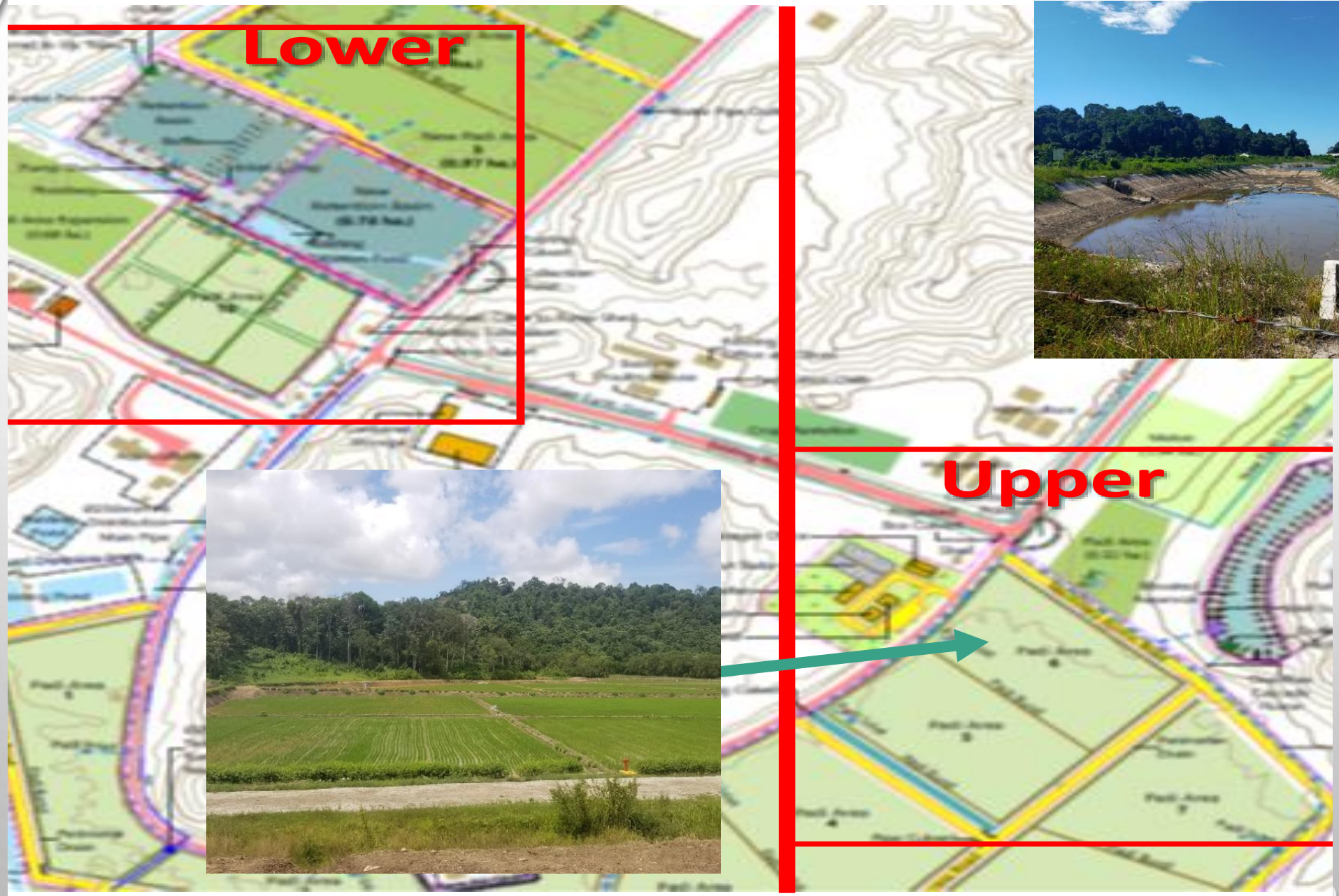
LESSON LEARNED FROM FIRST TRIAL

- SOLUTION NEED TO BE CUSTOMIZED TO FIT THE PURPOSE
- NEED TO BE FLEXIBLE AND REDESIGN TO FIT THE REQUIREMENT
- READY WITH PLAN A AND PLAN B.

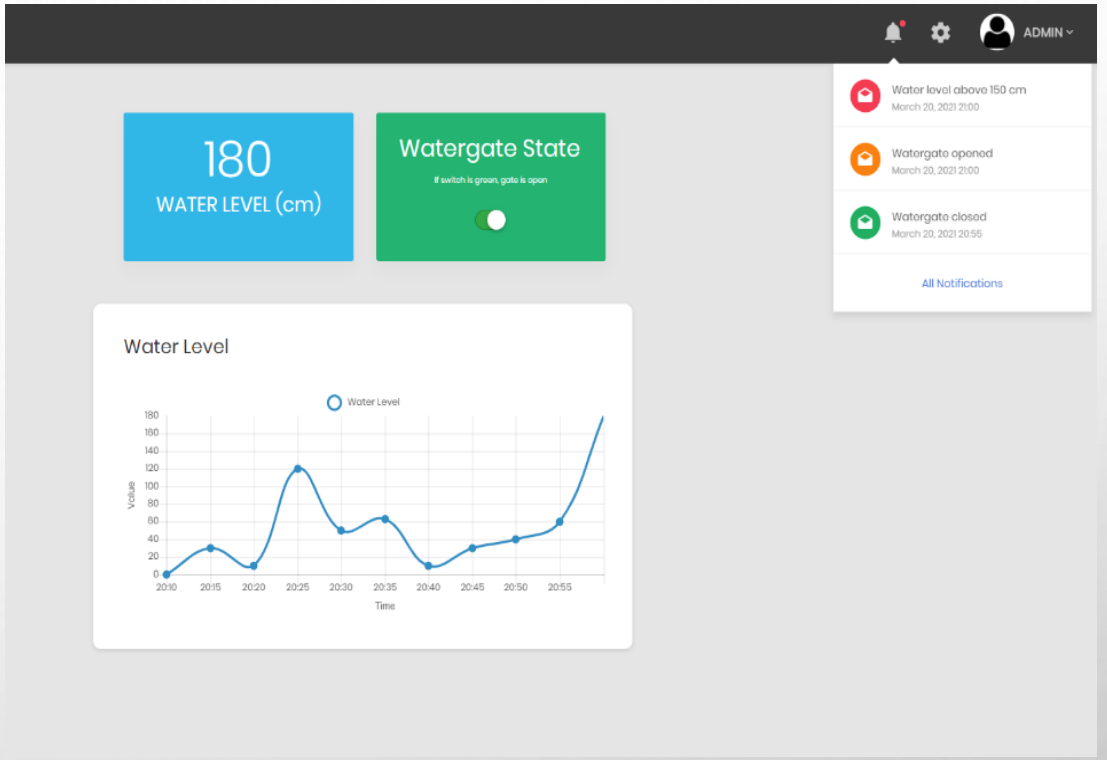
IBTE AGRO - WASAN





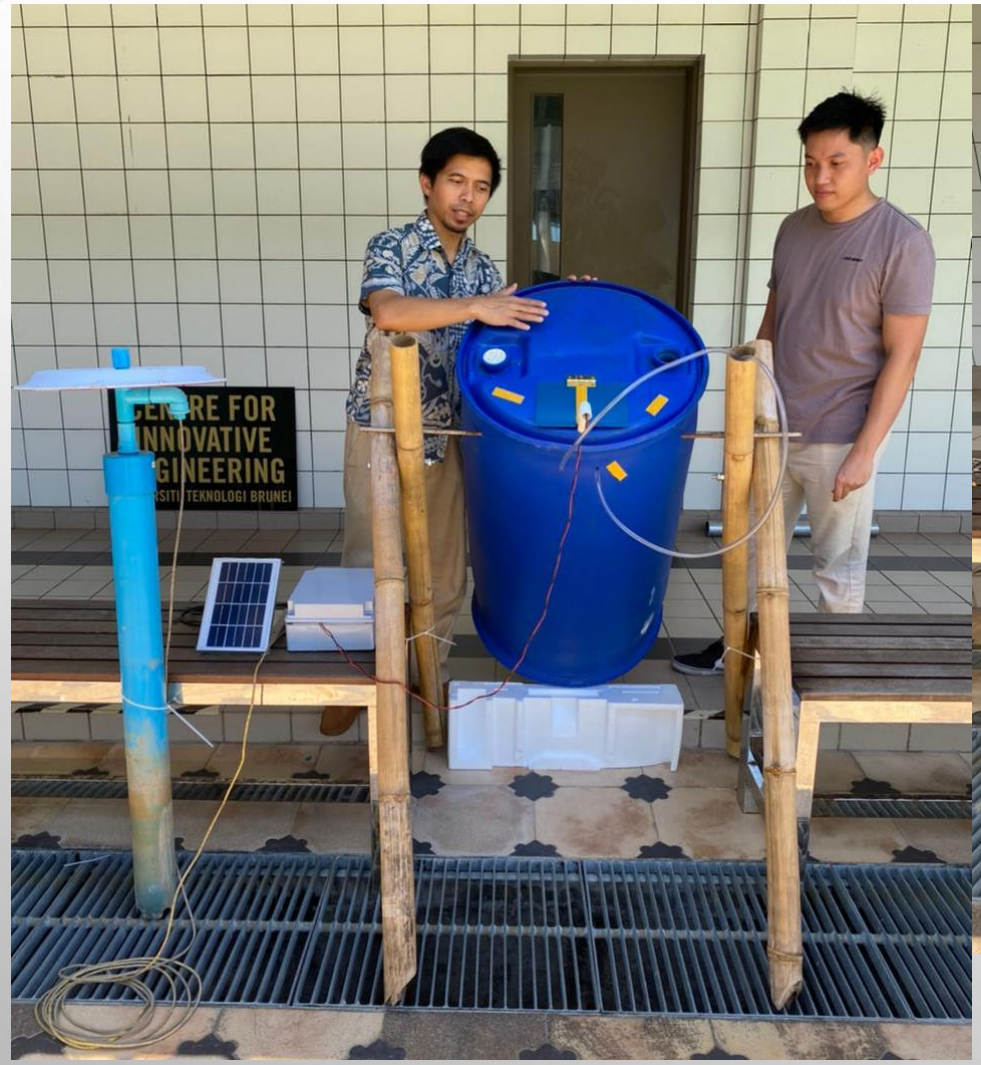

Lower
Upper

RESERVOIR WATER LEVEL DETECTOR



- **The components used are placed in a junction box for protection from environmental damages.**

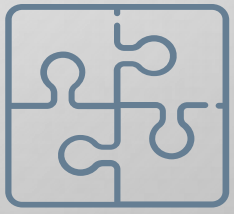
WATER GATE



RECOMMENDATION TO ADDRESS IRRIGATION ISSUES

1. PADDY LEVELLING AND PREPARATION
   - (WHICH FOCUS ON THE PHYSICAL PROPERTIES)
2. PROPER AND EFFICIENT IRRIGATION SYSTEM,

3. SOIL ANALYSIS, CONDITIONING AND PREPARATION
   - (FOCUS ON THE CHEMISTRY AND ORGANIC MATTER),
4. NATURAL ELEMENT (WEATHER & CLIMATE),
5. PEST CONTROL (MECHANICAL, CHEMICAL AND NATURAL)
6. CULTIVATION DENSITY AND RICE VARIETY.



ACKNOWLEDGEMENT

USAID FROM THE AMERICAN PEOPLE

ASEAN FOUNDATION

MINISTRY OF PRIMARY RESOURCES AND TOURISM
BRUNEI DARUSSALAM

UNIVERSITI TEKNOLOGI BRUNEI

ASEAN IVO

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KEMUDA Institute

WORK TOGETHER FOR THE COMMON GOAL

"Alone I go fast,

together 'we' go far"

THANK YOU

Any Questions

Wida.suhaili@utb.edu.bn

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