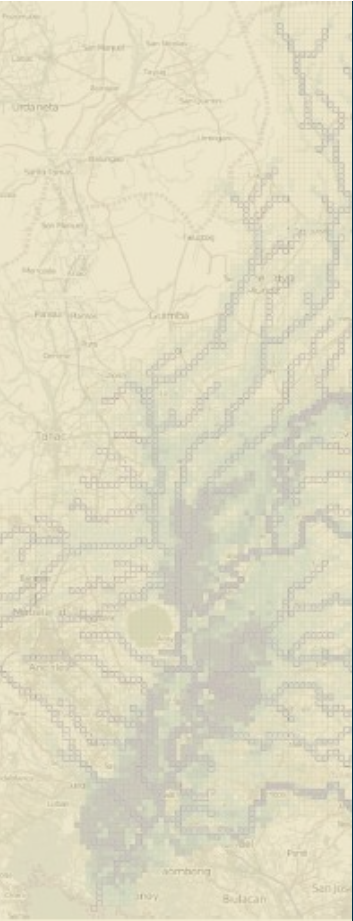




# Development of a Hybrid Water-Related Disaster Risk Assessment Technology for Sustainable Local Economic Development Policy under Climate Change in the Philippines

---

**DR. PATRICIA ANN J. SANCHEZ**

*Professor, School of Environmental Science and Management University of the Philippines Los Baños  
Philippines Project Manager, HyDEPP SATREPS*

\* A part of the Philippines country report in AWCI



# PROJECT OBJECTIVES

- To achieve the highly accurate assessment of flood and drought risks by developing and using a hybrid assessment model covering climate change, hydrological processes, agriculture (crop growth) and socio-economic activity with a DIAS-based big-data platform.
- To evaluate the benefits of pre-disaster investments by applying the hybrid assessment model to the target local municipalities and make policy proposals for the sustainable economic development of local municipalities in general.

## RESEARCH ACTIVITIES

① Data Collection Using Data Integration & Analysis System (DIAS)

② Development of a Hybrid Risk Assessment Model

③ Evaluation of Local Resilience with/without DRR Investments

④ Policy Proposal for sustainable economic development

## OVERALL GOAL

To enhance the resilience and promote the sustainable economic development of local municipalities by incorporating policy proposals in local and national climate change action plans, thereby contributing to reducing the over-centralization in the metropolitan area and facilitate balanced national land development.



## Course-1: Basic Lectures

|      |                                                                                                            |                                              |
|------|------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| BL-1 | Lecture on the HyDEPP-SATREPS Project                                                                      | <i>Prof. Patricia Ann J. Sanchez (UPLB)</i>  |
| BL-2 | Lecture on the integrated approach for climate change and flood disaster risk reduction in the Philippines | <i>Prof. Toshio Koike (ICHARM)</i>           |
| BL-3 | Lecture in the Rainfall-Runoff-Inundation model (RRI Model)                                                | <i>Assoc. Prof. Mamoru Miyamoto (ICHARM)</i> |
| BL-4 | Lecture on the use of hazard/risk information for flood disaster risk reduction in Japan                   | <i>Prof. Miho Ohara (ICHARM)</i>             |
| BL-5 | Lecture on 3D flood hazard mapping for disaster risk reduction                                             | <i>Dr. Takuya Inoue (Former, CERl, PWRI)</i> |

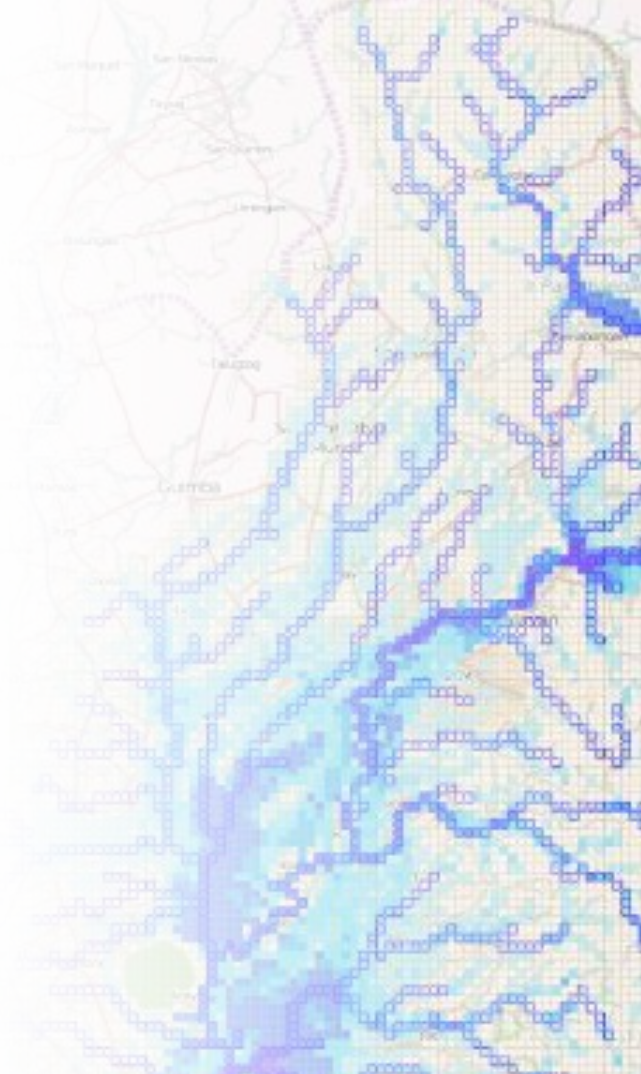
## Course-2: Flood hazard mapping and risk assessment (Tutorial)

|     |                                                                            |                                                                                            |
|-----|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| F-1 | Tutorial of flood simulation using Rainfall-Runoff-Inundation (RRI) model  | <i>Dr. Shrestha Badri Bhakta (ICHARM)</i>                                                  |
| F-2 | Tutorial of data management on DIAS (Data Integration and Analysis System) | <i>Dr. Masaki Yasukawa (University of Tokyo)</i><br><i>Dr. Katsunori Tamakawa (ICHARM)</i> |
| F-3 | Tutorial of 2D flood hazard mapping                                        | <i>Dr. Kansuke Naito (ICHARM)</i>                                                          |
| F-4 | Tutorial of 3D flood hazard mapping                                        | <i>Dr. Naoko Nagumo (ICHARM)</i>                                                           |
| F-5 | Tutorial of hazard/risk assessment for Barangay                            | <i>Prof. Miho Ohara (ICHARM)</i>                                                           |

## Course-3: Hydro-Agriculture-Economic Models (Lectures and Tutorial)

|     |                                                                  |                                                        |
|-----|------------------------------------------------------------------|--------------------------------------------------------|
| M-1 | Lecture on the Water and Energy Budget RRI model (WEB-RRI model) | <i>Prof. Abdul Wahid Mohamed RASMY (ICHARM)</i>        |
| M-2 | Lecture on the Crop Growth Simulation Model (SIMRIW)             | <i>Prof. Koki Homma (Tohoku University)</i>            |
| M-3 | Lecture on economic development scenario prediction              | <i>Assoc Prof. Muneta Yokomatsu (Kyoto University)</i> |
| M-4 | Tutorial of satellite image analysis                             | <i>Dr. Kentaro AIDA (ICHARM)</i>                       |

**e-Learning Program in summer,  
2021 and 2022**



| 2021         | UPLB | UP Diliman | UP Mindanao | Japan | Total |
|--------------|------|------------|-------------|-------|-------|
| Participants | 65   | 10         | 5           | 3     | 83    |
| Course 1     | 44   | 9          | 4           | 2     | 59    |
| Course 2     | 35   | 8          | 4           | 2     | 49    |
| Course 3     | 40   | 9          | 4           | 2     | 55    |

**(2021) 49 persons**  
completed all three courses.

**(2022) 40 persons**  
completed all three courses.

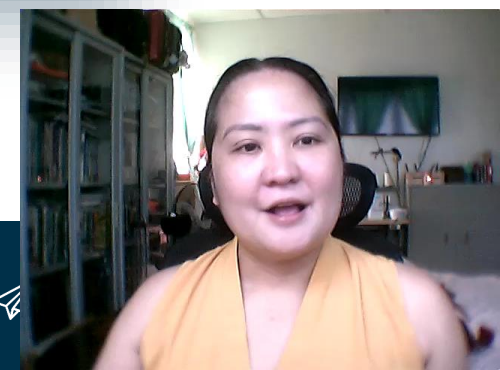


**Expanded to governmental  
cooperative organizations**  
(DOST, DPWH, LLDA, MMDA) in 2022

| 2022         | UPLB | UP Diliman | DOST<br>(+PHIVOLCS, PAGASA) | DPWH | LLDA | MMDA | Total |
|--------------|------|------------|-----------------------------|------|------|------|-------|
| Participants | 38   | 1          | 16                          | 9    | 11   | 18   | 93    |
| Course 1     | 19   | 0          | 11                          | 8    | 11   | 14   | 63    |
| Course 2     | 7    | 0          | 8                           | 6    | 8    | 12   | 41    |
| Course 3     | 15   | 0          | 10                          | 7    | 9    | 12   | 53    |

## Number of participants

who completed in **2021 and 2022**



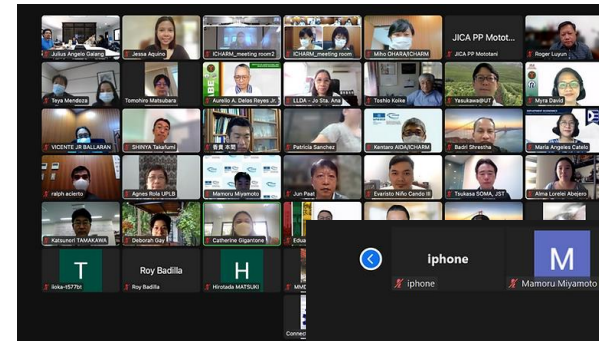




Meeting with LLDA on Data Request  
and Possible Data Sharing MOU  
June 24, 2022

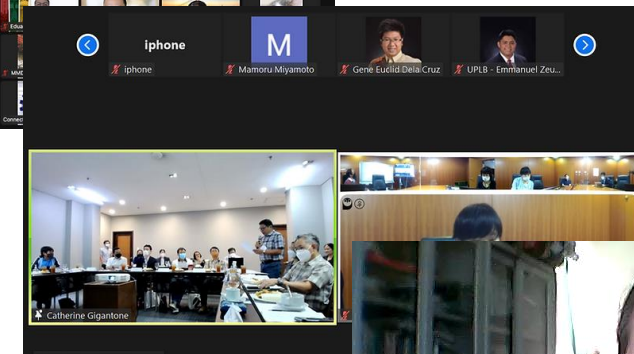


Completion of HyDEPP  
Office and Server Room  
May 31, 2022  
(Server and Other Equipment expected by  
January 2023)



2<sup>nd</sup> JCC and Consultation  
Meeting with Cooperating  
Agencies

June 10, 2022 May 27, 2022



# PROJECT OBJECTIVES

## Impact Assessment of Floods & Droughts in Selected Agricultural Municipalities in Laguna

1

Identify flood and drought events experienced in the selected municipalities and describe the roles of men, women, and the local communities in flood and drought risk management

2

Assess the knowledge and perception of communities on the existing flood and drought-related management policies/ordinances and programs

3

Assess gendered risk management strategies and disaster responses of the municipalities

4

Quantify the social and economic losses (e.g. livelihood, income, health, and critical infrastructures) of floods and droughts

5

Propose interventions based on adaptive collaborative flood and drought management

6

Co-create policies or ordinances in support of flood and drought management





# PROJECT ACTIVITIES



**Pre-inception meeting**  
conducted on April 5, 2022 to discuss the sampling design for floods and droughts and the research methods for each objective



**PCAARRD Inception Meeting**  
held via Zoom on April 18, 2022 which was attended by the project team, S&T consultants, and participants from different PCAARRD divisions



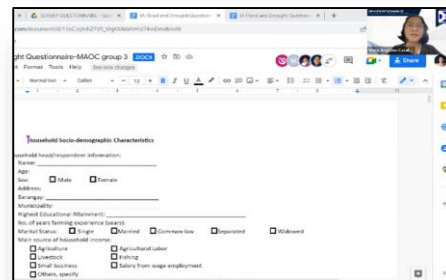
**Courtesy Call with the MDRMMOs of Bay, Pila, and Sta. Cruz**  
conducted last May 6, 2022 to briefly introduce the project and schedule the orientation



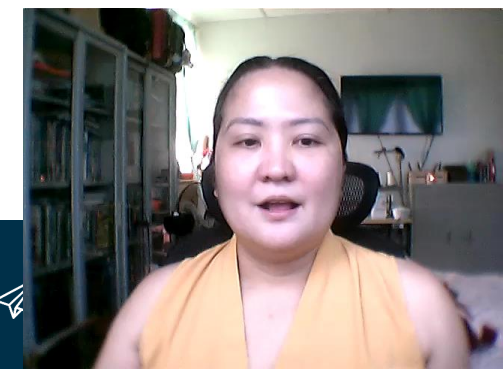
**Governance Workshop**  
held last May 13, 2022 to discuss about building partnerships through strategic planning for the municipalities of Bay, Pila, and Sta. Cruz



**Project Orientation with the LGUs of Bay, Pila, and Sta. Cruz**  
conducted last June 2 and 8, 2022 which was participated by different municipal officers and barangay leaders



**Survey Questionnaire Meeting**  
held last June 17, 2022 to discuss the draft of the survey questionnaires that will be used for the pre-testing and survey fieldwork



# PROJECT HIGHLIGHTS



**Focus Group Discussion**  
with the TWG of Bay and Sta. Cruz  
Laguna every third friday of the  
month



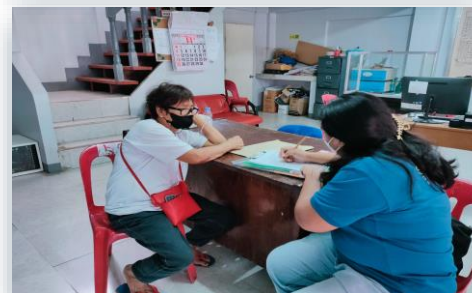
**Focus Group Discussion**  
with the TWG of Pila, Laguna every  
fourth friday of the month



1. Creation of technical working group for each Municipality.
2. Discussion and creation of Executive Order and Office Order for the members of TWG.
3. Sharing of problems and experiences about flood and droughts per Barangay.



**Pre-testing of survey  
questionnaire**  
at Brgy. Sto. Domingo, Bay, Laguna  
and Brgy. San Pablo Norte, Sta. Cruz,  
Laguna last September 15, 2022.





END OF PRESENTATION.

## Contact us

 [hydepp.satrebs.uplb@up.edu.ph](mailto:hydepp.satrebs.uplb@up.edu.ph)

 Knowledge Hub, Ornamental Crops Nursery Building,  
University of the Philippines Los Baños College, Laguna, Philippines 4031

