Adaptive Collaborative Governance Phases in Proposing Interventions to Reduce Flood Impact: The Case of LGU Bay, Philippines

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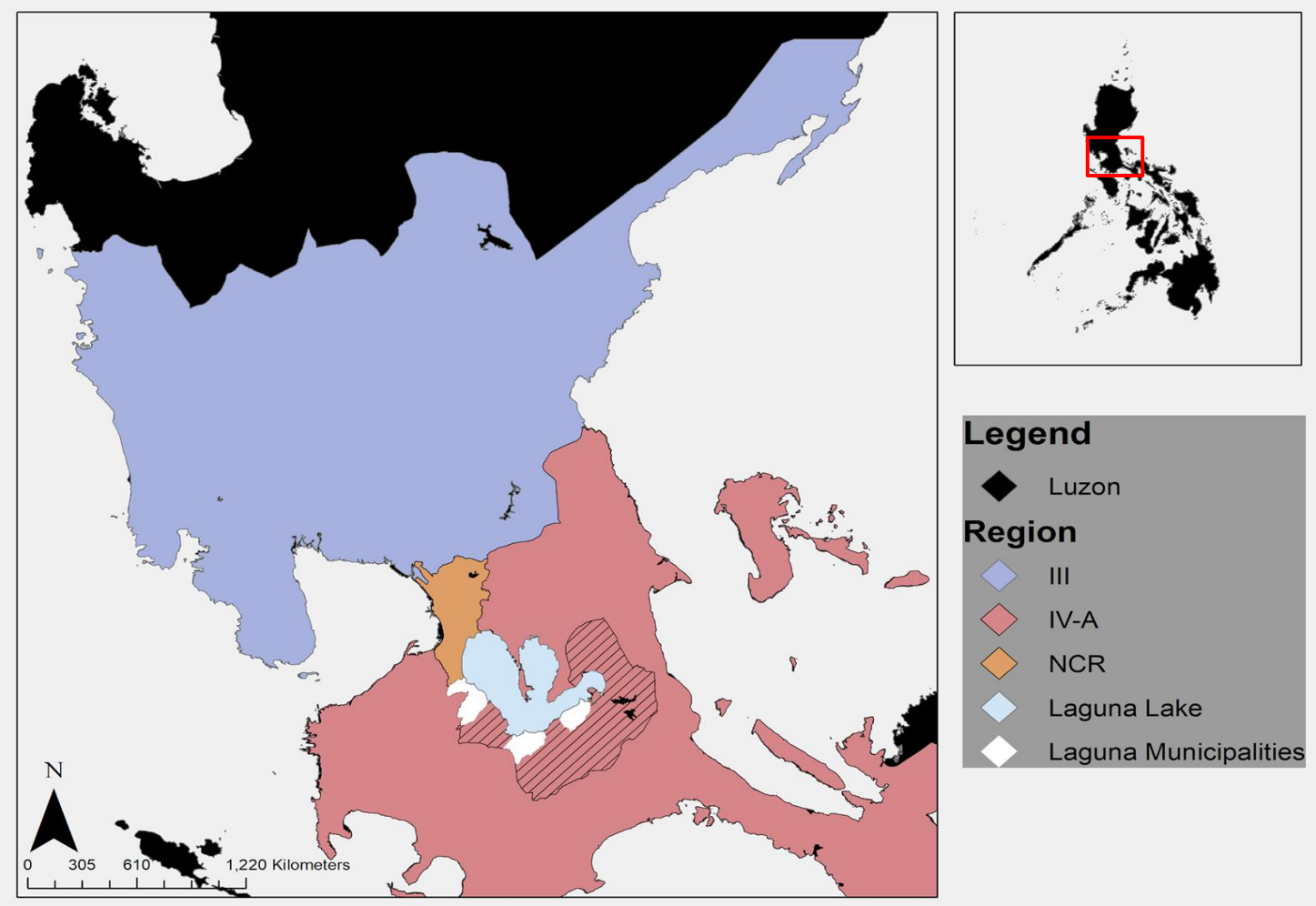
Background & Motivation

Typhoon Ulysses (Vamco)



IMPACTS AND DAMAGES

- Fatalities: 73 (CNN Report, Nov 20, 2020)
- Food and Agriculture Sector: ~12.8 Billion (DA, Philippine News Agency, November 26, 2020)
  Laguna: PhP 97,390,501
- House damages: 26,510 - totally damaged (NDRRMC, January 13, 2021)
  Laguna: 13,028 Families affected
- Infrastructure: ~12.9 Billion *including agriculture facilities (NDRRMC, January 13, 2021)

Typhoon Ulysses' damage to the agriculture sector at P12.8-B-DA

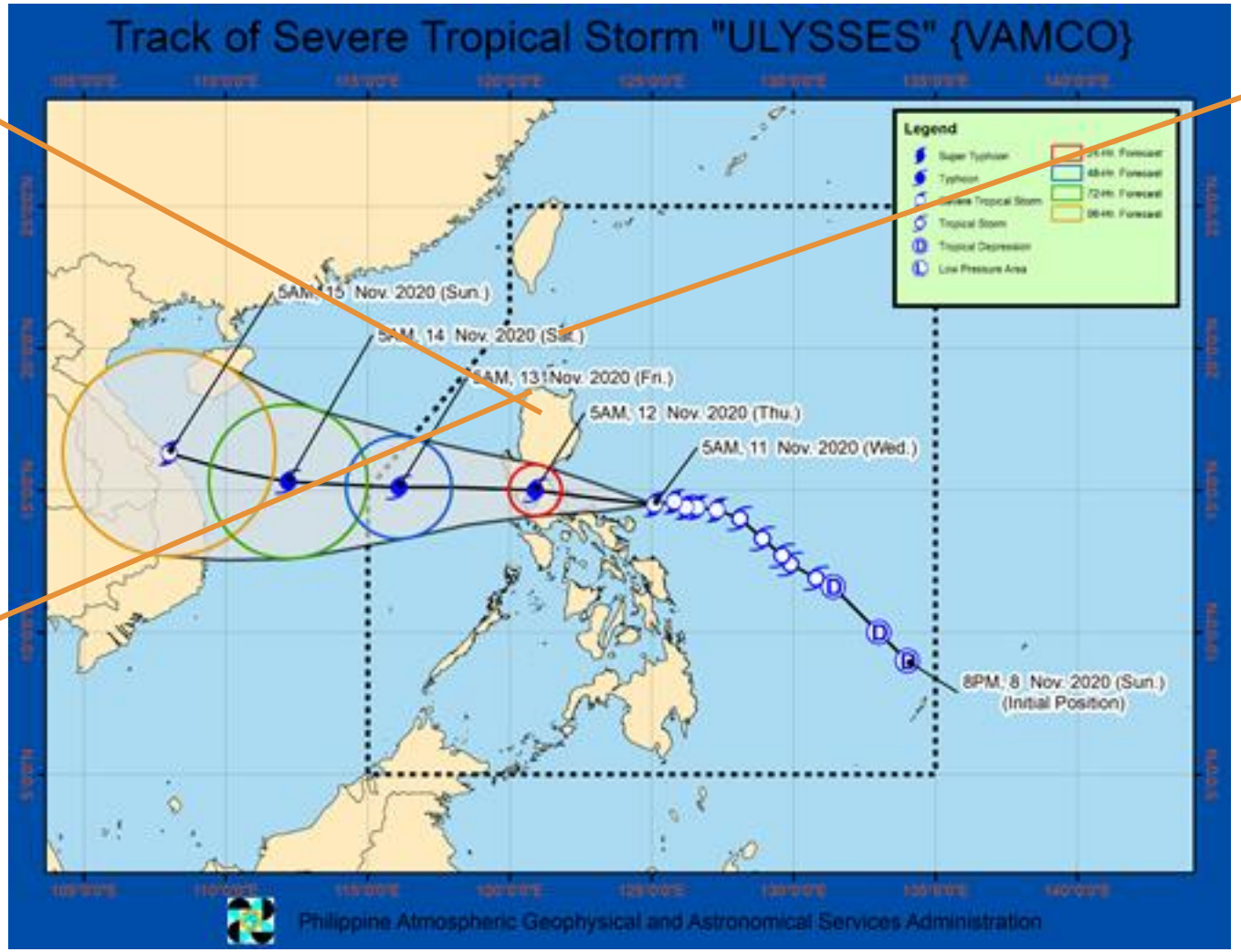
Published November 26, 2020, 5:00 PM
by Madelaine B. Miraflor

Source: Manila Bulletin

Members of the Philippine National Police-Special Action Force ferry civilians to safety on a flooded street in Nangka village, Marikina City.

'Ulysses' floods shut down Metro Manila

Source: Manila Times

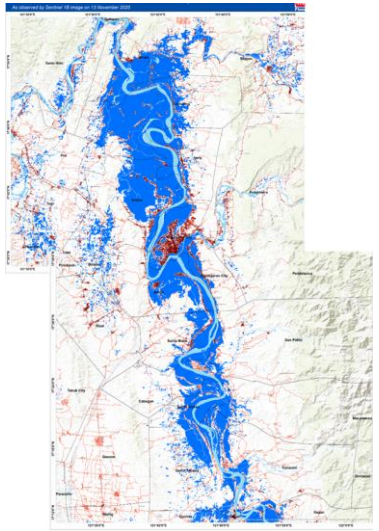


An aerial shot partially shows the magnitude of the calamity. —PHILIPPINE AIR FORCE PHOTO

What caused Cagayan Valley's worst flood in 40 years?

By: Karl R. Ocampo, Nikka G. Valenzuela - @inquirerdotnet Philippine Daily Inquirer / 05:18 AM November 15, 2020

Source: Inquirer



https://www.rotarymm.org/typhoon-ulysses-emergency-food-donation-and-its-distribution/

https://www.dswd.gov.ph/dswd-extends-more-relief-aid-to-lgus-affected-by-typhoon-ulysses/

https://www.onenews.ph/articles/coa-typhoon-ulysses-relief-rotting-expired-undistributed

Municipalities and barangays are at the forefront for every emergency relief operation.

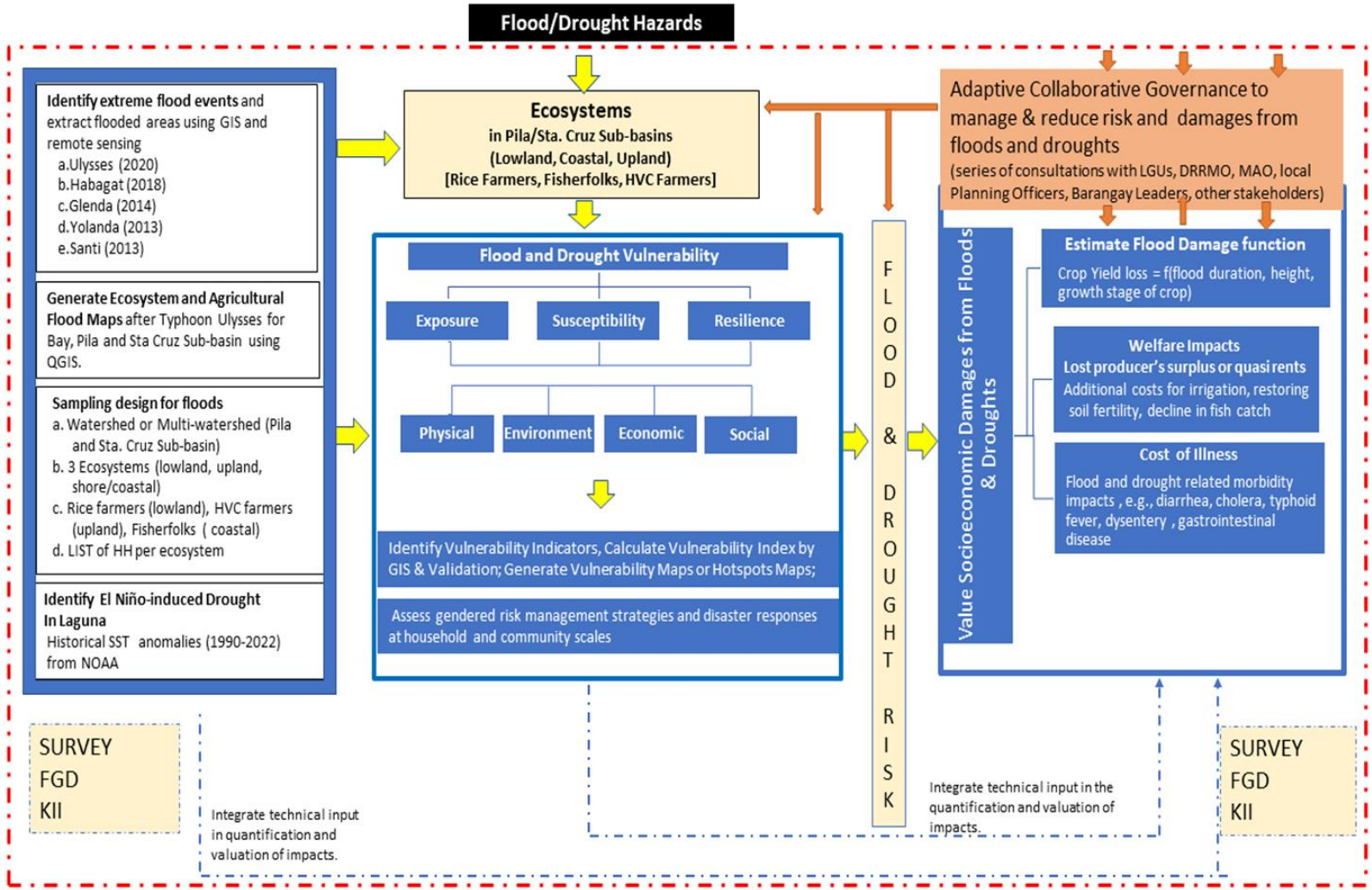
- Adaptive governance refers to “flexible and learning-based collaborations and decision-making processes involving both state and nonstate actors, often at multiple levels, with the aim to adaptively negotiate and coordinate management of social– ecological systems and ecosystem services across landscapes and seascapes” (Schulz et al. 2015 citing Folke et al. 2005, Pahl-Wostl et al. 2007 and Chaffin et al. 2014).

- used as a “theoretical alternate to the traditional forms of governance” that fail to address complexities of systems (Nikkanen et al. 2024)

- DRRM and natural hazards applications (examples of themes):

“disaster preparedness” (Nikkanen et al. 2024); resilience (Djalante 2012, Djalante et al. 2011, Munene et al. 2018) and “adaptive hazard governance” (Bixler et al. 2023)

- Success of adaptive governance implementation has been revealed in India where the number of fatalities was reduced (Walch 2018)


Flood/Drought Hazards
Identify extreme flood events and extract flooded areas using GIS and remote sensing
a.Ulysses (2020)
b.Habagat (2018)
c.Glenda (2014)
d.Yolanda (2013)
e.Santi (2013)
Generate Ecosystem and Agricultural Flood Maps after Typhoon Ulysses for Bay, Pila and Sta Cruz Sub-basin using QGIS.
Sampling design for floods
a. Watershed or Multi-watershed (Pila and Sta. Cruz Sub-basin)
b. 3 Ecosystems (lowland, upland, shore/coastal)
c. Rice farmers (lowland), HVC farmers (upland), Fisherfolks (coastal)
d. LIST of HH per ecosystem
Identify El Niño-induced Drought In Laguna
Historical SST anomalies (1990-2022) from NOAA
Ecosystems
in Pila/Sta. Cruz Sub-basins
(Lowland, Coastal, Upland)
[Rice Farmers, Fisherfolks, HVC Farmers]
Flood and Drought Vulnerability
Exposure
Susceptibility
Resilience
Physical
Environment
Economic
Social
Identify Vulnerability Indicators, Calculate Vulnerability Index by GIS & Validation; Generate Vulnerability Maps or Hotspots Maps;
Assess gendered risk management strategies and disaster responses at household and community scales
FLOOD & DROUGHT RISK
Adaptive Collaborative Governance to manage & reduce risk and damages from floods and droughts
(series of consultations with LGUs, DRRMO, MAO, local Planning Officers, Barangay Leaders, other stakeholders)
Value Socioeconomic Damages from Floods & Droughts
Estimate Flood Damage function
Crop Yield loss = f(flood duration, height, growth stage of crop)
Welfare Impacts
Lost producer's surplus or quasi rents
Additional costs for irrigation, restoring soil fertility, decline in fish catch
Cost of Illness
Flood and drought related morbidity impacts , e.g., diarrhea, cholera, typhoid fever, dysentery , gastrointestinal disease
SURVEY
FGD
KII
Integrate technical input in quantification and valuation of impacts.
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SURVEY
FGD
KII

Project title:

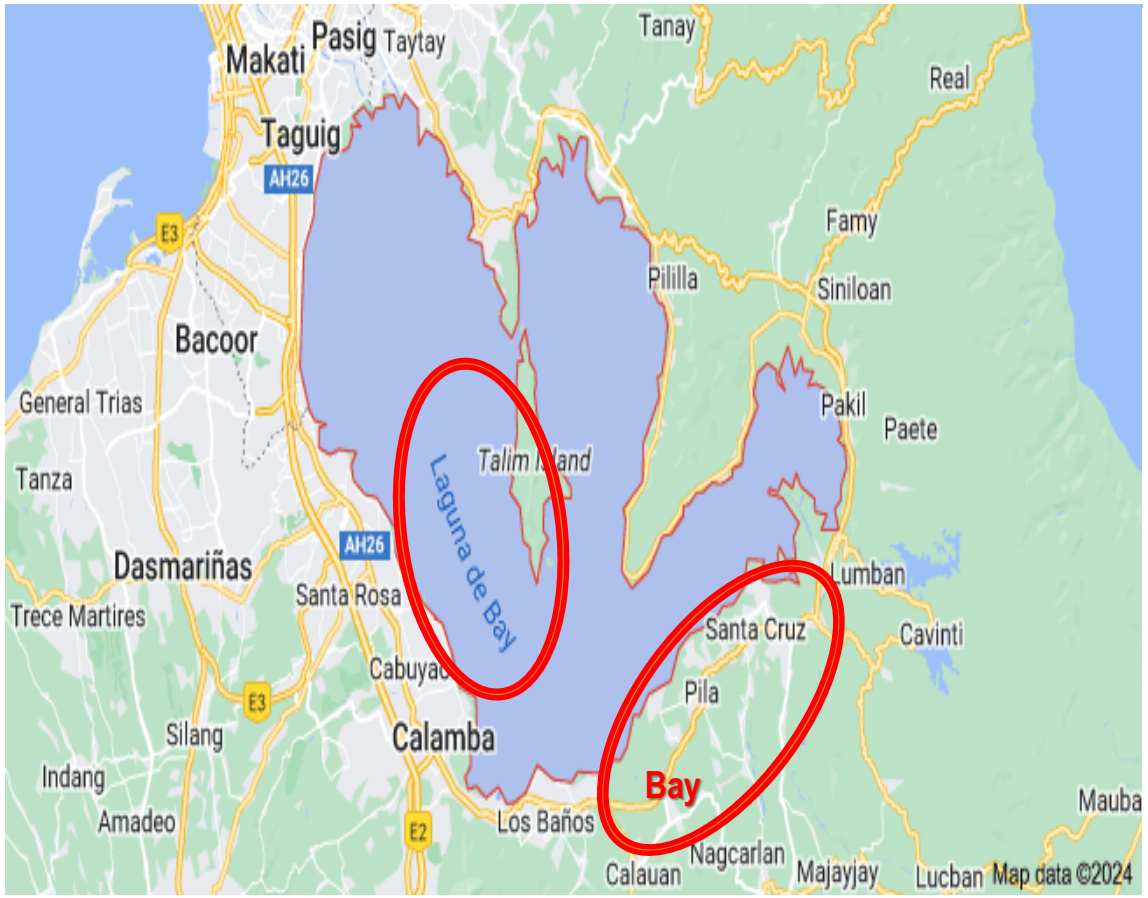
Impact of Floods and Droughts in Selected Agricultural Municipalities in Laguna

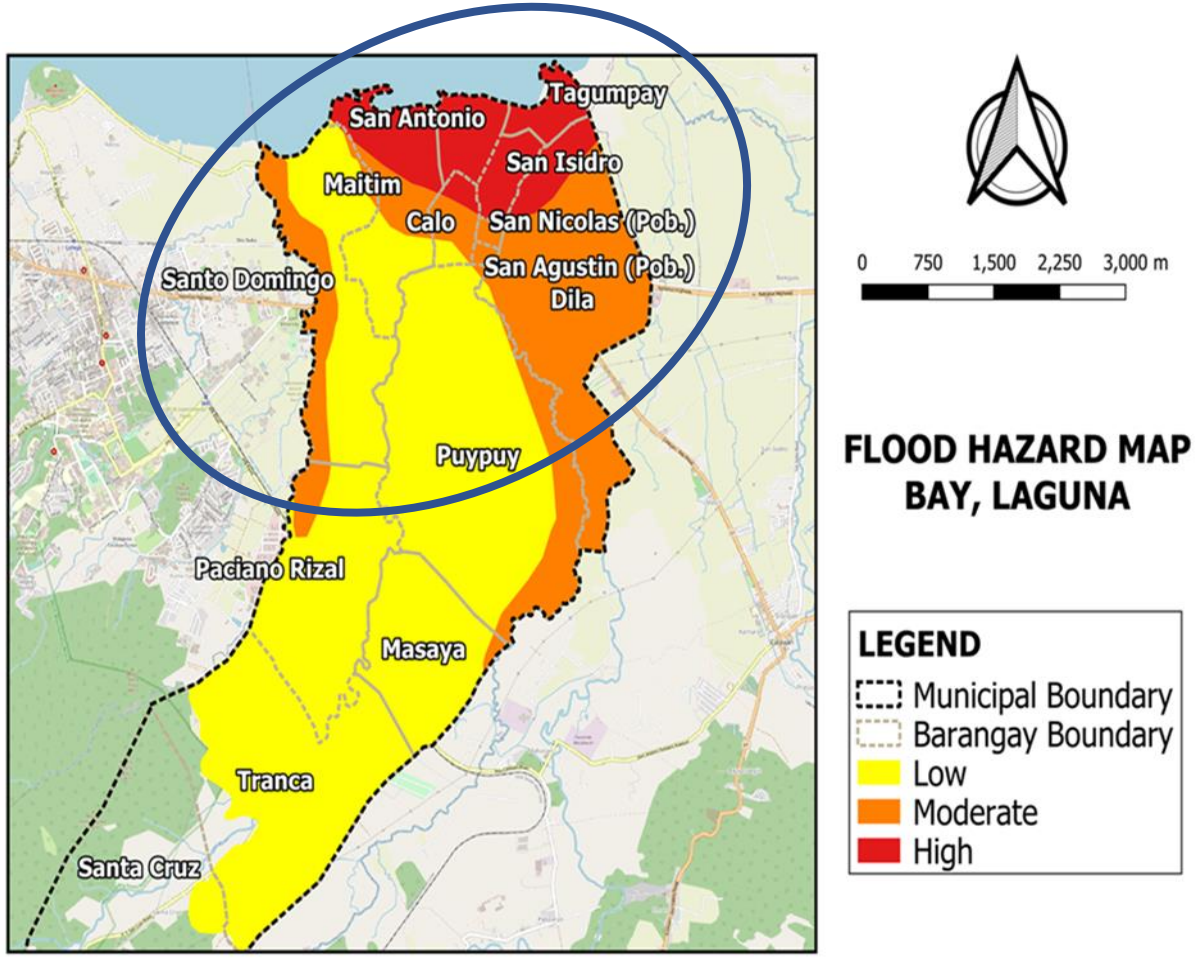
Study Objectives (governance aspect)

- To identify interventions that will reduce the impact of floods in LGU Bay
- To analyze the causes of and possible solutions to flooding (summary)
- To determine how the interventions are proposed by the barangays

Methodology

- Qualitative case study research approach
- Study site: Municipality of Bay
- Number of barangays - 15
- Number of barangays affected by typhoons - 5 + 2 (under the project)





Laguna de Bay (left photo) showing the location of LGU Bay (right photo)

Methodology

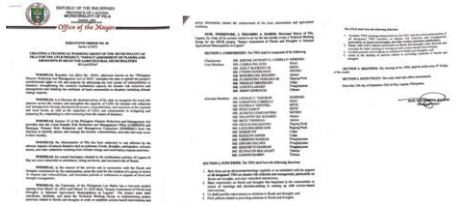
- Participants
  - 7 barangay officials (majority) from 2018 until 2023
  - either a core or alternate TWG member

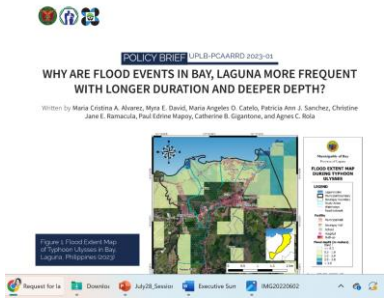
- Data sources & transcriptions
  - focus groups (2 hrs. per group meeting monthly)
  - Two consultation meetings (half day) with government agencies (March & Aug 2023)
    - Department Public Works & Highways (DPWH)
    - Natl Irrigation Authority (NIA)
    - Environment & Natural Resources
    - Los Banos Environment & Nat. Resources Office

Bay officials & project staff

Focus group at Brgy. San Isidro, 19 Aug 2022

Executive Order as TWG





Building partnerships and assessment of initial conditions

- Creation of TWGs (June 2022)
- Participatory & learning strategy – Barangays' sharing of information and experiences in addressing flood and drought concerns
- Process documentation begun (what is and has happened-→ analyze AG)
- "Conduct" & "document" observations

Planning strategic actions

- Problem & Objective Tree Analysis (Jun 2022– Jun 2023)
- Identification of possible interventions (structural & non-structural) with TWGs
- Introduced logframe approach to TWGs
- Application of participatory approach
- Consultation with experts (DPWH & NIA)

Developing flood and drought management plans

- Logframe matrix preparation of prioritized interventions
- Outputs: logframe matrix by LGU
- Emerging themes on flood & drought impact mitigation

Co-creation of policies in support of the plan

- Integration of plans in existing relevant plans
- Provincial policy forum
- Enactment of local laws to support floods and drought management

Resolution

1st- 4th month	5th -17th month	18th-20th month	21th-24th month

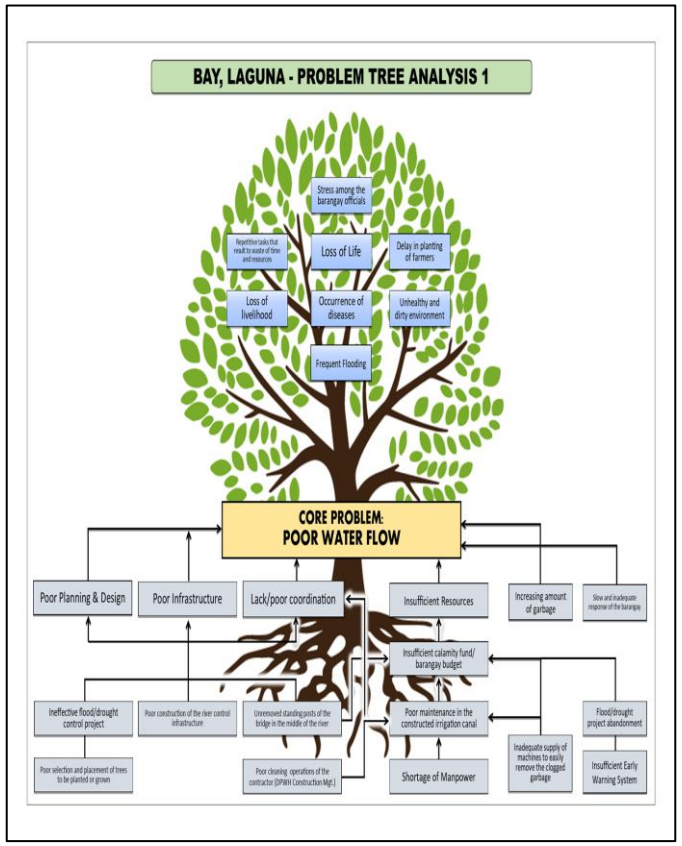
Adaptive collaborative governance phases in proposing interventions to mitigate floods & droughts impact (David et al 2022)

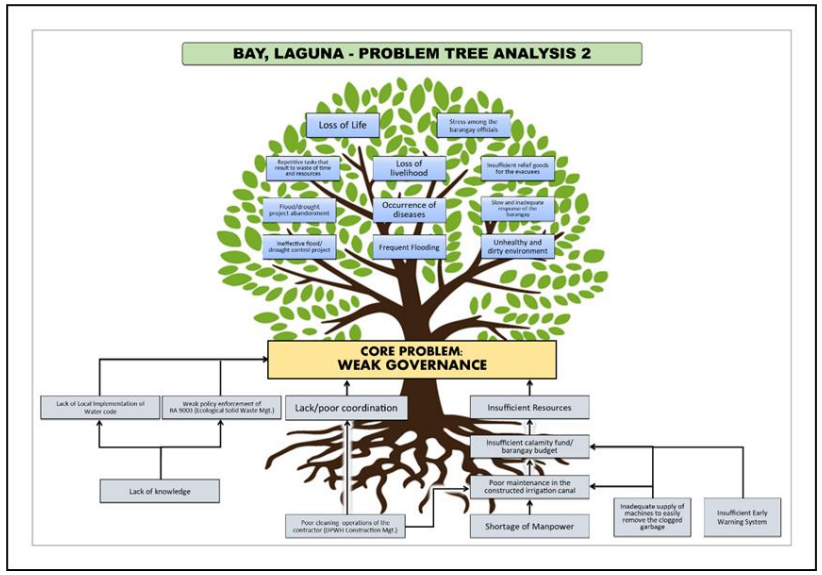
Methodology

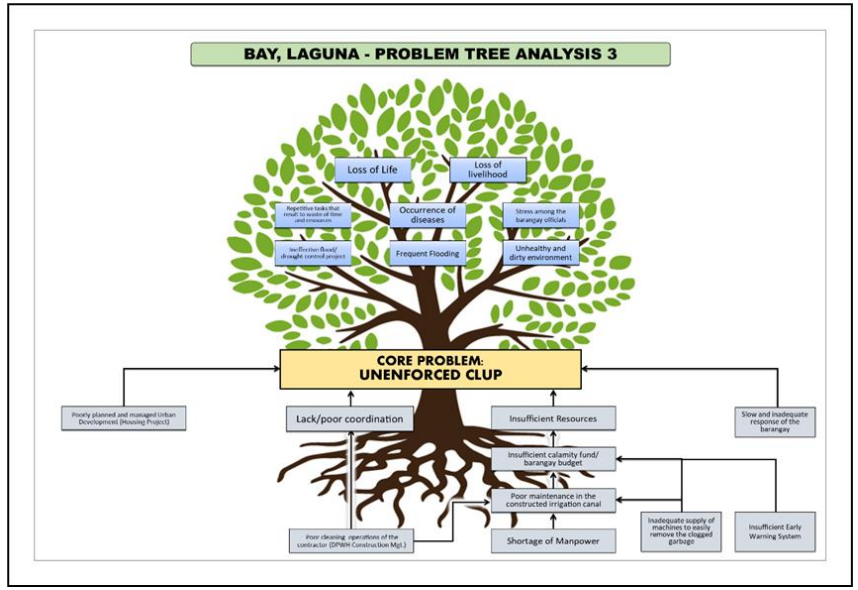
- Reflexive Thematic Analysis
- … TA is a method for developing, analyzing and interpreting patterns across a qualitative data set, which involves systematic processes of data encoding to develop themes – themes are your ultimate analytic purpose." (Braun & Clarke 2022 p.4)
- Steps- 1) Familiarizing yourself with data, 2) Generating initial code, 3) Searching for themes, 4) Reviewing themes, 5) Defining & naming themes, 6 Producing the report/manuscript
- Lead author led the analytical process, coding & theme development; use of both manual coding & NVivo 14
- Codes are assigned labels
- Themes are conceptualized.
- Immersing oneself in the data
- Research positioning & interests

  - New innovations & technologies;
  - Constructionist-experientialist
  - Inductive Q or pure qualitative
  - Latent

Causes of floodings in LGU Bay & interventions







Figures 1-3. Problem tree analysis results

Prioritized causes of floodings in LGU Bay

- Drainage cut-off due to urbanization (subdivisions) and other infrastructure
- Siltation of irrigation and drainage canals
- River overflow due to increased volume of water in rivers
- No drainage system

Validated by Department of Public Works and Highways and National Irrigation Authority

Brgy. Dila

Brgy. Puypuy

Brgy. Sto Domingo

Brgy. Maitim

❖Intervention 1-2 Build open canal & cementing of existing irrigation canal (Brgy. Dila)

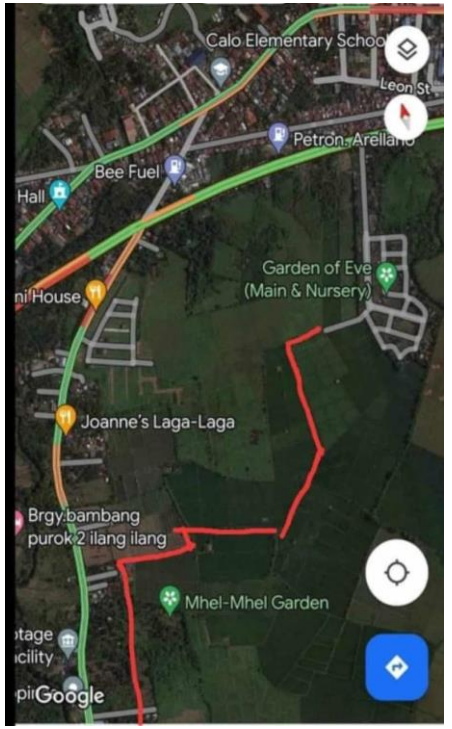
- Sitios 4 & 5 floodings due to no established drainage systems and narrowed and silted irrigation canal
- Requested National Irrigation Authority (NIA) (2021; follow-up 2022) and Department of Public Works and Highways
- No update until study ended
- Co-finance the intervention since the irrigation canal is used as a drainage canal by the residents (consultation meeting suggestion

❖Intervention 3. Improve irrigation canals (Brgy. Maitim)

- Intervention would serve farmers of Sitios 2, 4, at 5
- Through time, canals became shallow & narrow
- To act on request, NIA's advice was to file a request endorsed by the TWG or farmers' association
- Same advice was given by the Office of the Congressman

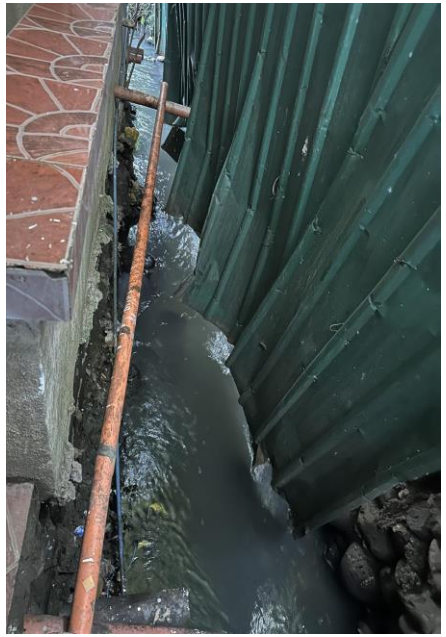
❖Intervention 4. Reconnect Lateral C going to the river at San Nicolas (Brgy. Puypuy)

- Disconnection was due to subdivision development in Puypuy.
- Irrigation canal construction was proposed too. A dialogue with the farmers' association was advised by NIA because a deed of donation for the right-of-way is needed. Also to coordinate with Municipal Agriculture Office
- Brgy Puypuy urged the evaluation of permits related to subdivision development



❖Interventions 5 & 6. Concretize & reconnect irrigation canal to existing drainage to Maitim River & establish a control gate to divert water when necessary (Brgy. Sto. Domingo)

- Drainage system of a subdivision was connected to irrigation canal; canals became narrow & shallow especially near a mall
- Advised to file a request
- NIA & DPWH working together



Control gate na konektado sa irrigation canal sa kabilang kalsada na gusting mailagay din sana sa lugar kung saan malapit ang outlet ng drainage system ng Camella.

Participants' bases for proposing interventions

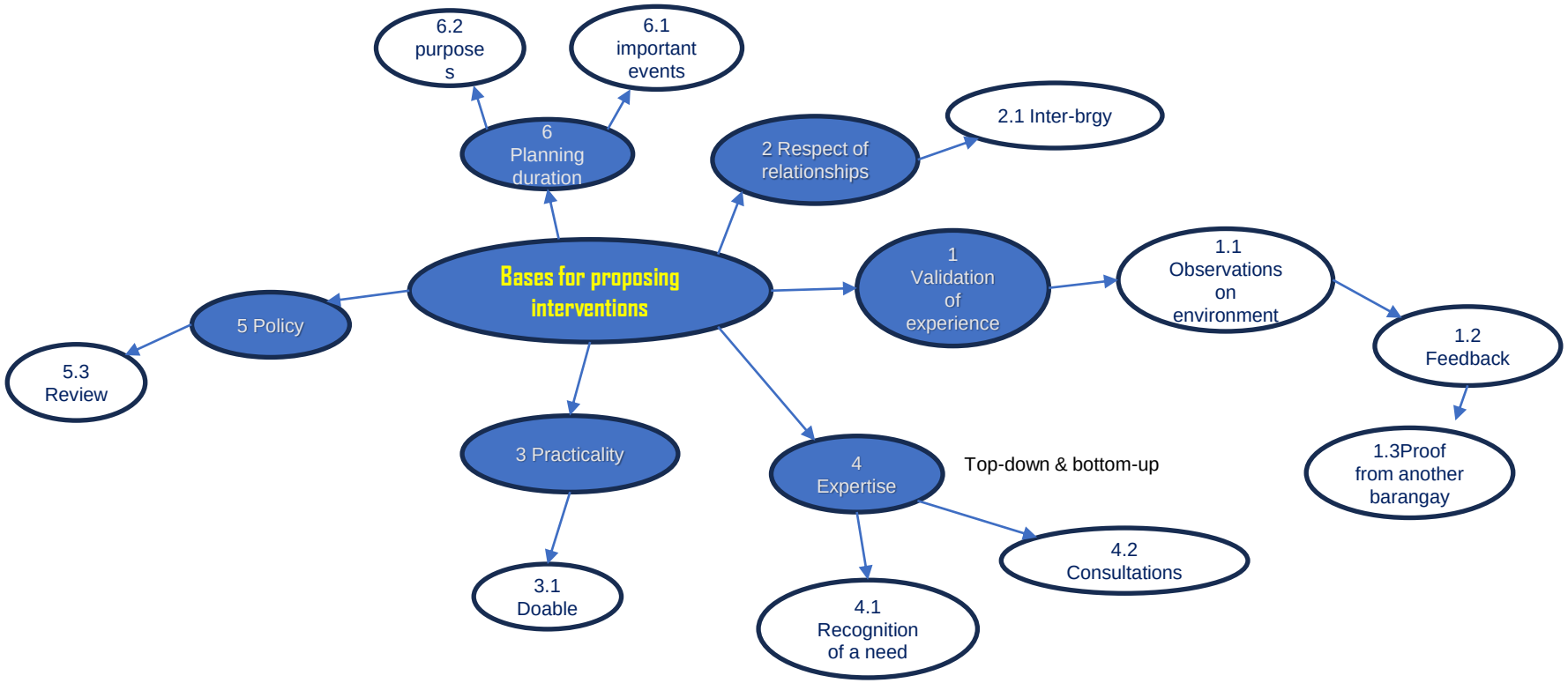


Fig. 2 Thematic map of the bases for proposing interventions

Themes on the bases for proposing interventions

1) An intervention can be validated by experience. This can be done by observing the environment, getting feedback from people, and providing proofs.

2) An intervention is based on inter-barangay relationships before they make a decision.

3) An intervention can be a practical practice and serving its purpose but a temporary protection.

4) An intervention is based on some expertise.

"Successful DRR results from the combination of top-down, institutional changes and strategies, with bottom-up, local and community-based approaches" (UNDRR).

5) An intervention should be supported with policies.

6) An intervention may need a longer period of planning to be able to make a decision.

Event – e.g. election
Purpose – for funding of plan

Sample to arriving at themes:

Theme 1: Validation of experience

- Observation of environment

Ang naging dahilan ng pagbaha sa amin… meron pa pong isang tulay na binabarahan … ng saging pati kawayan dun po sa may highway ng Calo at Maitim Brgy Maitim TWG member, 19 Aug 2022

*(*A cause of flooding in our place…there is one bridge that is loaded with bananas & bamboos at Calo-Maitim highway*)*

- Proofs from another barangay (adjacent)

… sa pagitan ng Calo at Puypoy yung dating tulay tinanggal yun, pinalaki. Ang problema po hindi inalis, yung unang …maliit na tulay yung pinaka ilalim nung pundasyon ….kaya pagka konting …ulan lang po … binaha…. Nakita nga po lahat nakabara doon saging, mga kahoy lahat, yun po kaya ano, pero kung sasabihing baha, hindi naman po nagbabaha ng ganon kung hindi lang po talaga nababarahan yung ilog. Brgy. Puypuy TWG member 22 Aug 2022

(Between barangays Calo & Puypuy, the pillars of the old smaller bridge were not removed. Hence, a little rain can cause floods…I saw load bananas, tree parts … no flooding may happen if not with those debris in the river)

- Feedback on the kind of work

… halimbawa, yun pong bumagsak po na kakagawang river control. Sa tingin ko po, although yun naman po ay maganda pero bukod dun, poor infrastructure … hindi namin maintindihan bakit poor infrastructure kasi nagawa na nila and yet, tumumba parin.

Brgy. Puypuy TWG member, 23 Sep 2022

(There's an example of a newly-built river control structure, which was thought good, but it turned out a poor infrastructure… we did not understand why it was a poor infrastructure since they built it, yet it fell (collapsed) again)

- referring to the DPWH (Department of Public Works and Highway)

Conclusion

- The study aimed to identify interventions that will mitigate the impact of floods in Bay, Laguna.
- Six interventions require structural/engineering works & related expertise (i.e., commonly on building & improvement of irrigation & drainage canals). However, some are administrative and institutional concerns
- In terms of how the barangays came up with deciding on the interventions, it shows that the officials had bases for doing so.
- It may suggest that in proposing an intervention to reduce the impact of floods, decision-makers should: a) validate experiences, b) respect how an intervention would affect inter-political boundaries, c) consider practicality but functioning, d) recognize expertise, e) review existing policies, & f) purpose e.g. funding.
- Also, as a “home-made” methodological framework, the Adaptive Collaborative Governance can be applied in exploring how collaboration works in another problematic setting. In this

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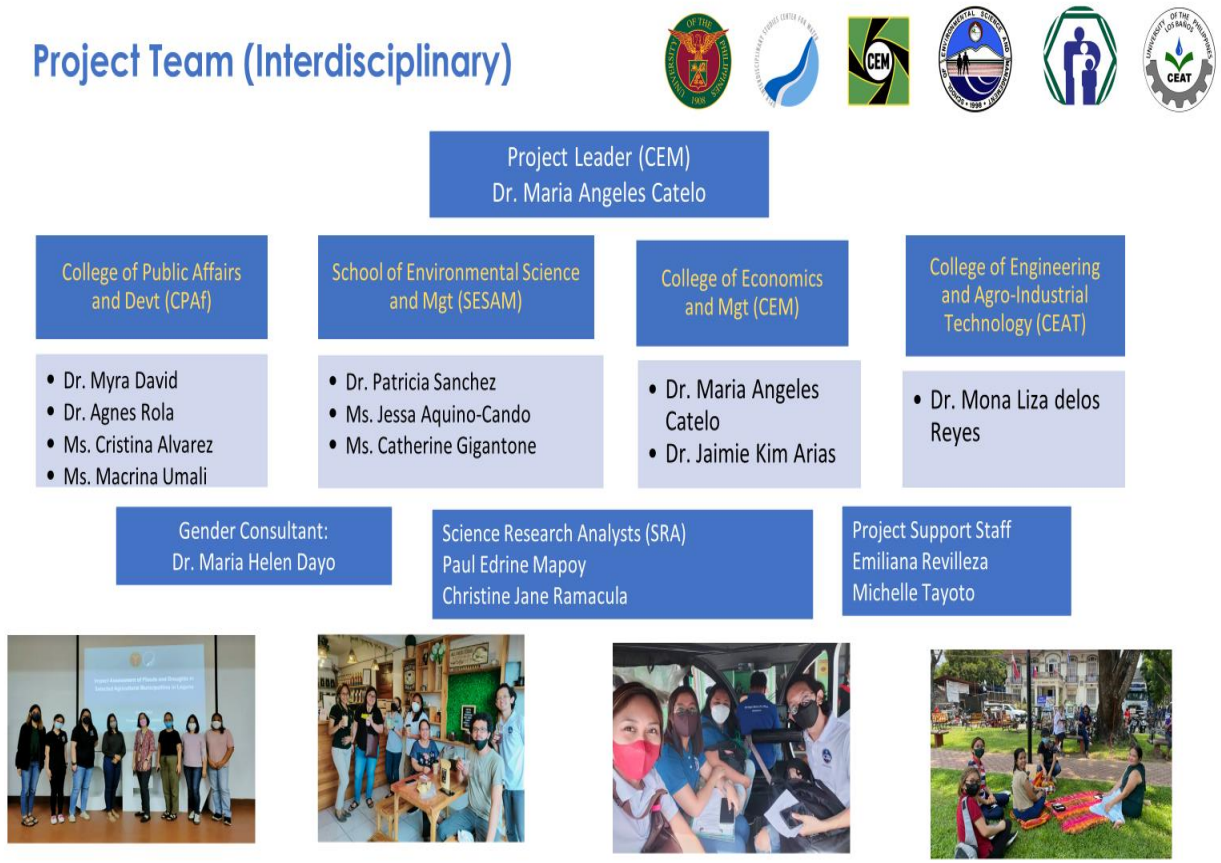
Thank you for listening!



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