

# **Philippines - China Cooperation on Engineering for the Elimination of Schistosomiasis**

**Lydia R. Leonardo, DrPH  
University of the East  
University of the Philippines  
University of the East Ramon Magsaysay Graduate School**

(Asian Cooperation Fund Project)



# Construction and demonstration of water conservancy combined with schistosomiasis control system in ASEAN countries



**Changjiang River Scientific Research Institute**

**University of the Philippines**

**2023.10.12**



# 1. Background



# 2. Work Progress



# 3. Future Cooperation

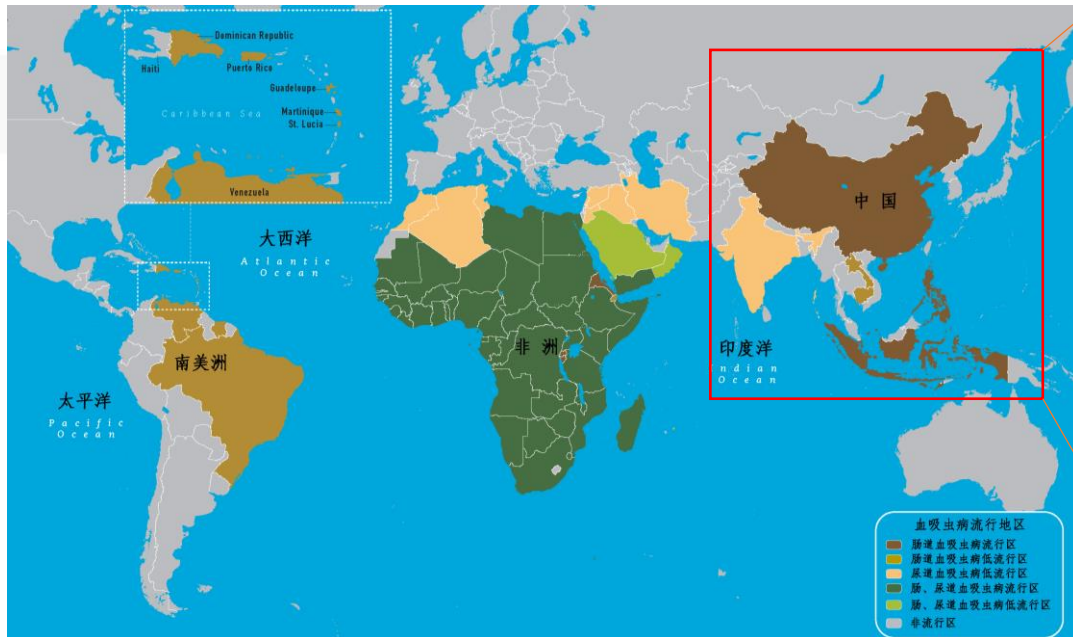
An aerial photograph of a large dam and reservoir system, featuring a central dam structure with a building on top, surrounded by water and greenery. The image is overlaid with blue geometric shapes: a large blue triangle on the left, a blue rectangle at the top, and a large blue trapezoidal shape on the right containing the text.

# 01 Background



# Background

□ Schistosomiasis, one of the six key tropical diseases identified by the WHO, is endemic in 78 countries around the world and infecting more than 140 million people. *Schistosomiasis japonica* is mainly endemic in China, Philippines and Indonesia. *Schistosomiasis mekongi* is mainly endemic in Laos and Cambodia.



Global Geographic Distribution of Schistosomiasis



Schistosomiasis in Southeast Asia

# 21



*Bacillary alder*  
*Chagas disease*  
*Dengue and chikungunya*  
*Dracunculiasis*  
*Echinococcosis*  
*Foodborne trematodiasis*  
*Human African trypanosomiasis*  
*Leishmaniasis*  
*Leprosy*  
*Lymphatic filariasis*  
*Mycetozoa, chromoblastomycosis and other deep mycoses*  
*Onchocerciasis*  
*Rabies*  
*Scabies and other ectoparasitoses*  
*Schistosomiasis*  
*Soil transmitted helminthiasis*  
*Snakebite envenoming*  
*Tacitiasis and cysticercosis*  
*Trachoma*  
*Yaws*

Ending the neglect to  
attain the Sustainable  
Development Goals  
*A road map for neglected  
tropical diseases 2021–2030*

# 30

## World Health Assembly (2012)

- Resolution WHA65.21 of May 2012 established eliminating schistosomiasis as a public health problem in 2025.

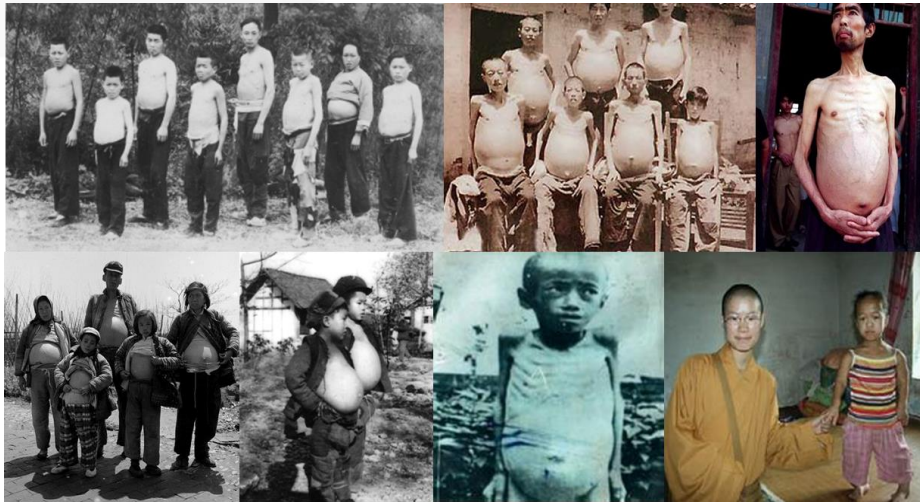
«WHO»

«A road map for neglected tropical diseases 2021-2030»

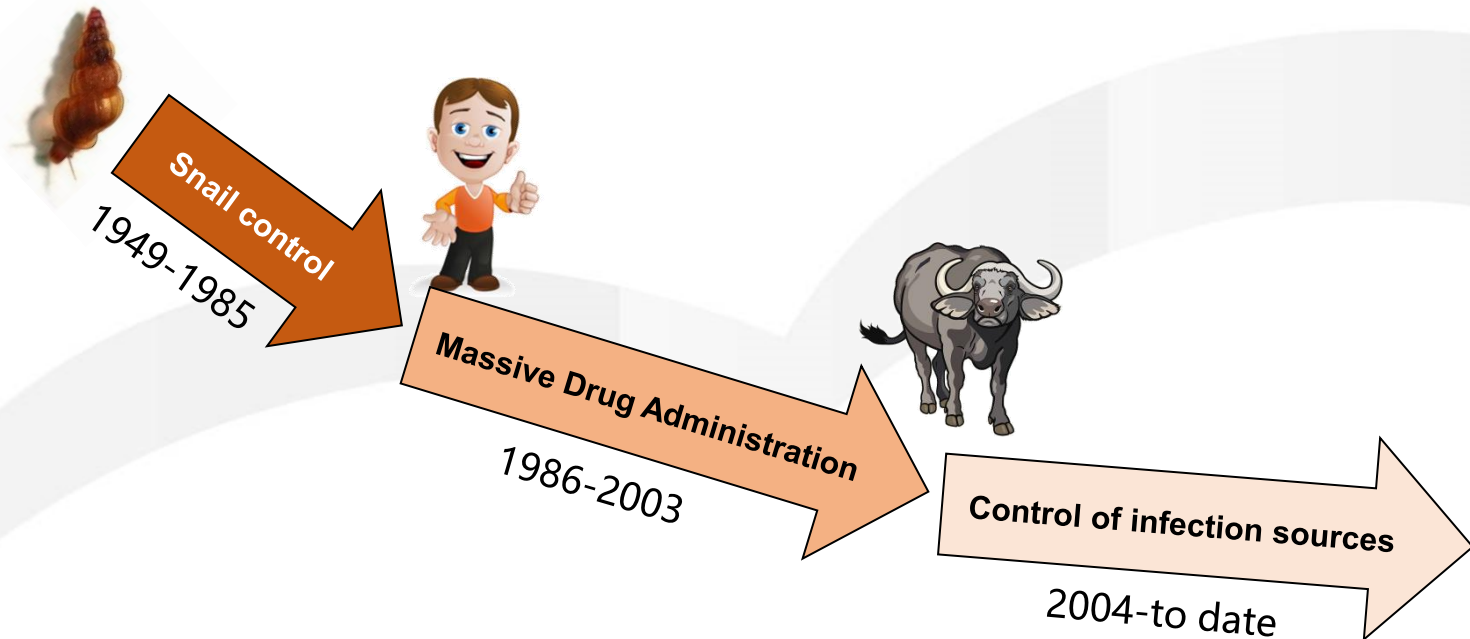
- One Health** approach and NTDs: activities and mechanisms for coordination

# Background

- ❑ In **2015**, China achieved the target of **schistosomiasis control**, and plans to achieve national **schistosomiasis elimination by 2028**.
- ❑ Public health - Agricultural engineering - Forestry engineering - water conservancy engineering



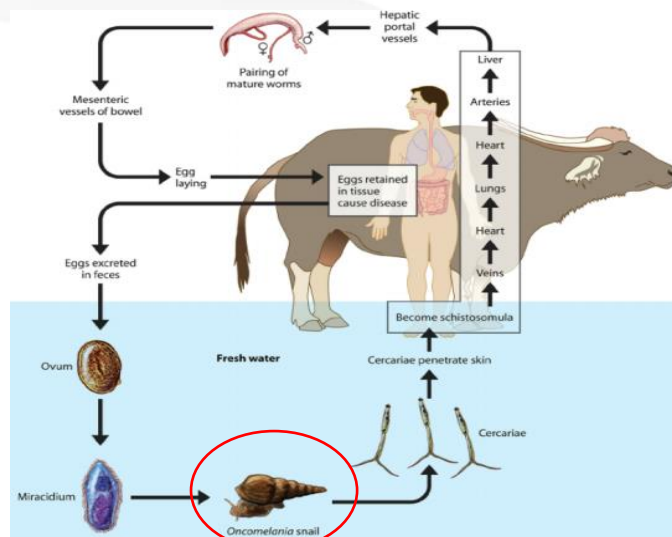
**Former Schistosomiasis Patients in China**





# Background

- ❑ **Snails** are the only intermediate host of schistosoma, and controlling snail diffusion can effectively control the spread of schistosomiasis.
- ❑ **Water conservancy combined with schistosomiasis control (WCCSC:** water conservancy projects ( dike project, river and lake regulation and canal system engineering etc.), to change the habitats of the snails or prevent the snails spreading.



**Life Cycle of *Schistosoma***



**Settling Basin for Snails**



**Canal Lining Concreted**



# Background



**Asean-China Summit**



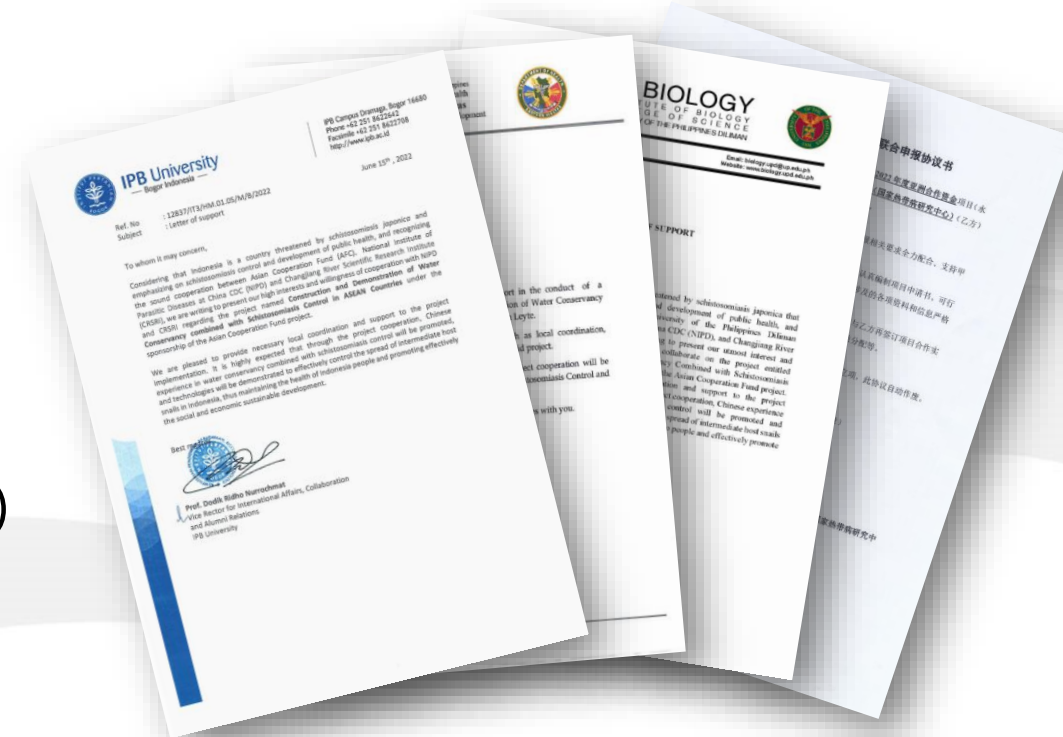
**The Global Goals for Sustainable Development**

- China is facing the challenges to solve the problems during the “final mile” stage towards schistosomiasis elimination, and contribute **Chinese experiences**, **Chinese strategy** and **Chinese wisdom** to the global schistosomiasis control programmes, so as to facilitate the transformation of the joint efforts in the Belt and Road Initiative to a high-quality development, thereby well supporting the activities on global health security.

# Background

## Construction and demonstration of water conservancy combined with schistosomiasis control system in ASEAN countries

- ❑ **China team:** Changjiang River Scientific Research Institute(CRSRI), Changjiang Hospital of Changjiang Water Resources Commission(CHCWRC), National Institute of Parasitic Diseases(NIPD)
- ❑ **Philippines team:** University of the Philippines(UP), Eastern Visayas Center for Health Development(DOH)
- ❑ **Indonesia team:** Institut Pertanian Bogor University(IPBU), Indonesia National Innovation Research Agency(INIRA)



**Letters of Support**

An aerial photograph of a large dam and reservoir. The dam is a long, straight structure with a central building. The reservoir is a large body of water behind the dam. The sky is clear and blue. There are green areas on the banks of the reservoir. The image is overlaid with blue geometric shapes: a dark blue triangle on the left, a medium blue rectangle in the center, and a bright blue rectangle on the right.

# 02 Work Progress

# Work Progress

- ❑ In March 2023, the **Indonesian team** visited Wuhan. CRSRI hosted the project exchange and WCCSC technology training meeting.
- ❑ In July 2023, **Philippines team** visited Wuhan.



**Indonesian Team Visited Wuhan**

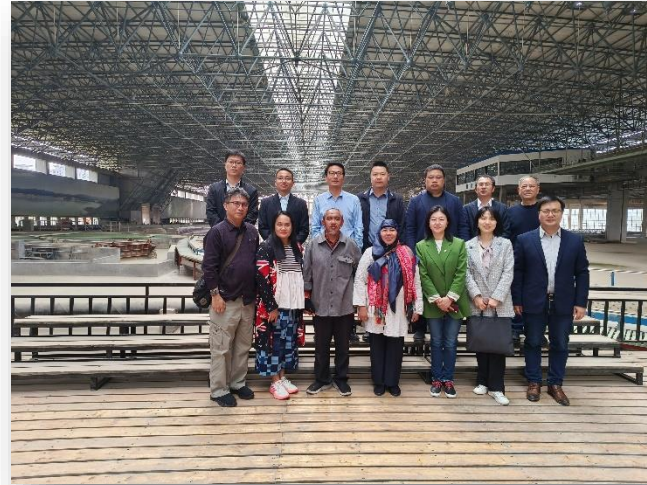


**Philippines Team Visited Wuhan**



# Work Progress

- Visited the Changjiang River Flood Protection Physical Model, *Oncomelania* and *Schistosoma* conservation base and several water conservancy combined with schistosomiasis control projects. The research work of schistosomiasis control, WCCSC technology and engineering examples in China were studied in detail.



**Visit The Changjiang River Flood Protection Physical Model**



**Visit Snails Breeding Base**



**Visit Settling Basin for Snails**



**Visit the Laboratory**



# Work Progress

- Visited University of the Philippines(UP) and gave a presentation “Water conservancy combined with schistosomiasis control: Theory and Technology”
- Visited Eastern Visayas Center for Health Development (DOH) and National Irrigation Administration 8 (NIA 8) and donated IHA kits to DOH.



**Presentation**



**Seminar with UP, DOH and NIA 8**



**Donate IHA Kits to DOH**



# Work Progress

- Accompanied by UP, NIA 8 and DOH, investigated the endemic area in Tacloban City Leyte Island. The site, type and scale of the proposed WCCSC demonstration project were initially determined.







# Restoration of Water Conservancy Infrastructures in a Schistosomiasis Endemic Province in the Philippines and its Impact on Disease Transmission and Water Use

Program: Construction and Demonstration of Water Conservancy Combined With Schistosomiasis Control System in ASEAN Countries

## Project Presentation

---

China-PH-Indonesia | 2024.05.13



# Implementing Agencies

## Philippine Team

- Institute of Biology, University of the Philippines Diliman (UPD-IB)
- Department of Health – Eastern Visayas CHD (DOH – EVCHD)
- National Irrigation Administration Region VIII (NIA Region VII)

## China Team

- Changjiang River Scientific Research Institute (CRSRI)
- National Institute of Parasitic Diseases, Chinese CDC (NIPD)

# Project Scope – Study Objectives

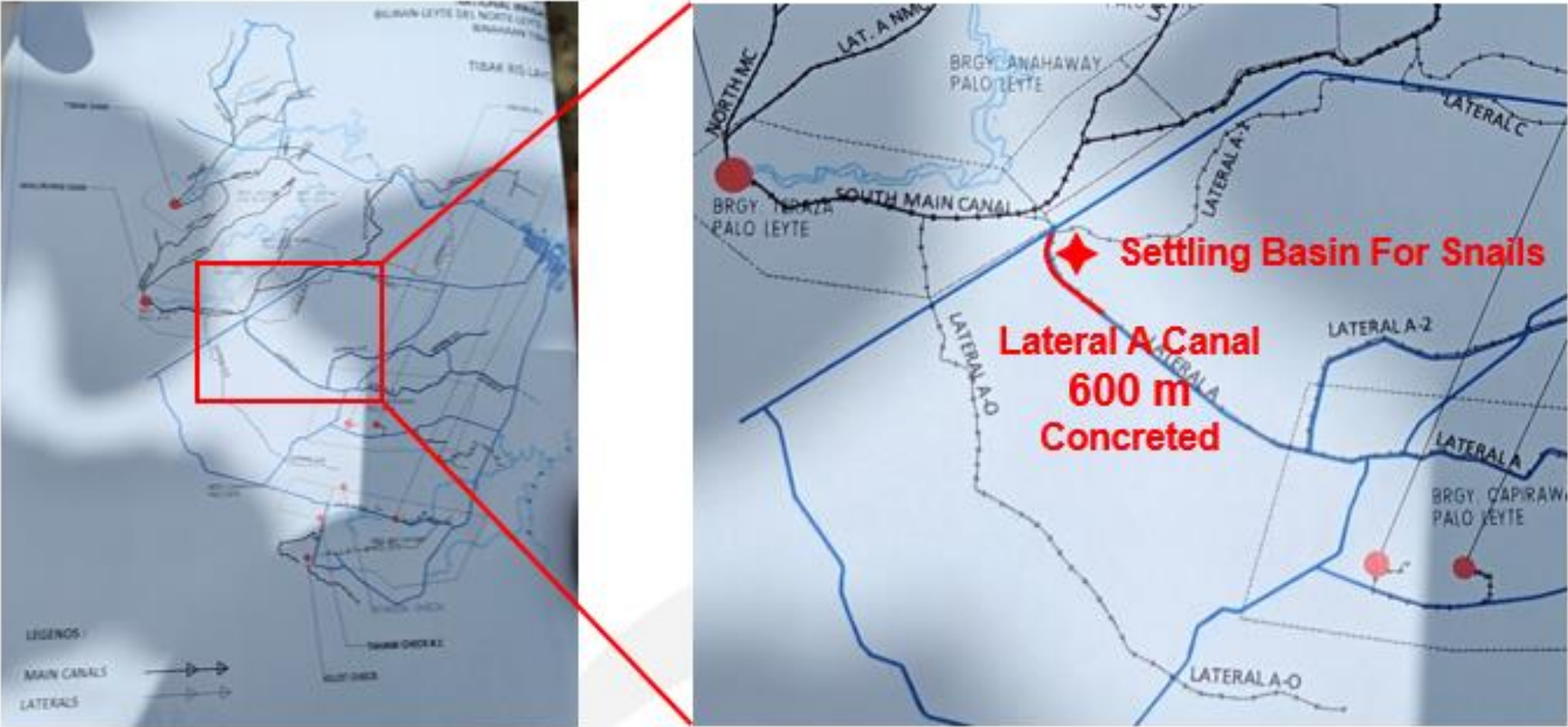
## General Objective

**Demonstrate the immediate impact of restoring a water conservancy infrastructure on schistosomiasis transmission and water use in a highly endemic province in the Philippines**

## Specific Objectives

- 1. Assess the situation of select irrigation infrastructure and their role in disease transmission**
- 2. Conduct restoration of select infrastructures following the principles of water conservancy combined with schistosomiasis control (WCCWSC)**
- 3. Evaluate the short-term impact of the construction project to snail distribution and infection rate**

# Project Scope – Location

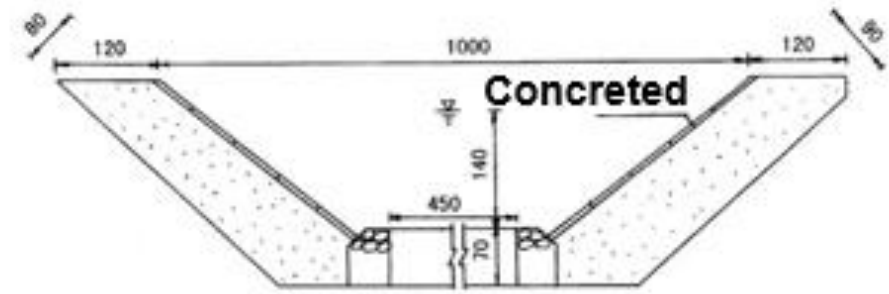


- About 5 Million PHP for 2023

# Project Scope – Pattern of WCCSC



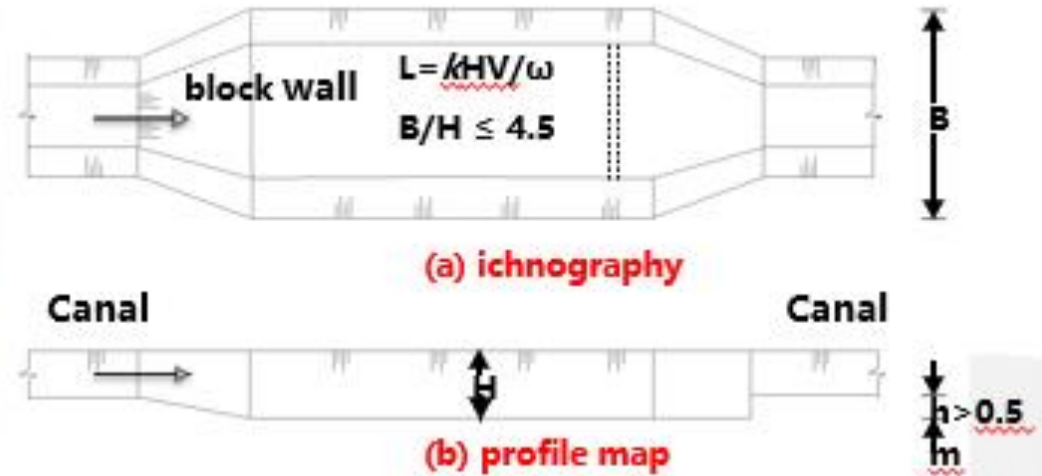
**A. Lateral A Canal  
600 m  
CONCRETED**





# Project Scope – Pattern of WCCSC

## B. A Small Settling Basin/Sedimentation Tank For Snails



# Project Scope – Pattern of WCCSC

## C. Warning Signs





# ASEAN WCCSC PH | Phase 1: Pre-construction



**Initial field visit**  
collected the data used in  
planning the design



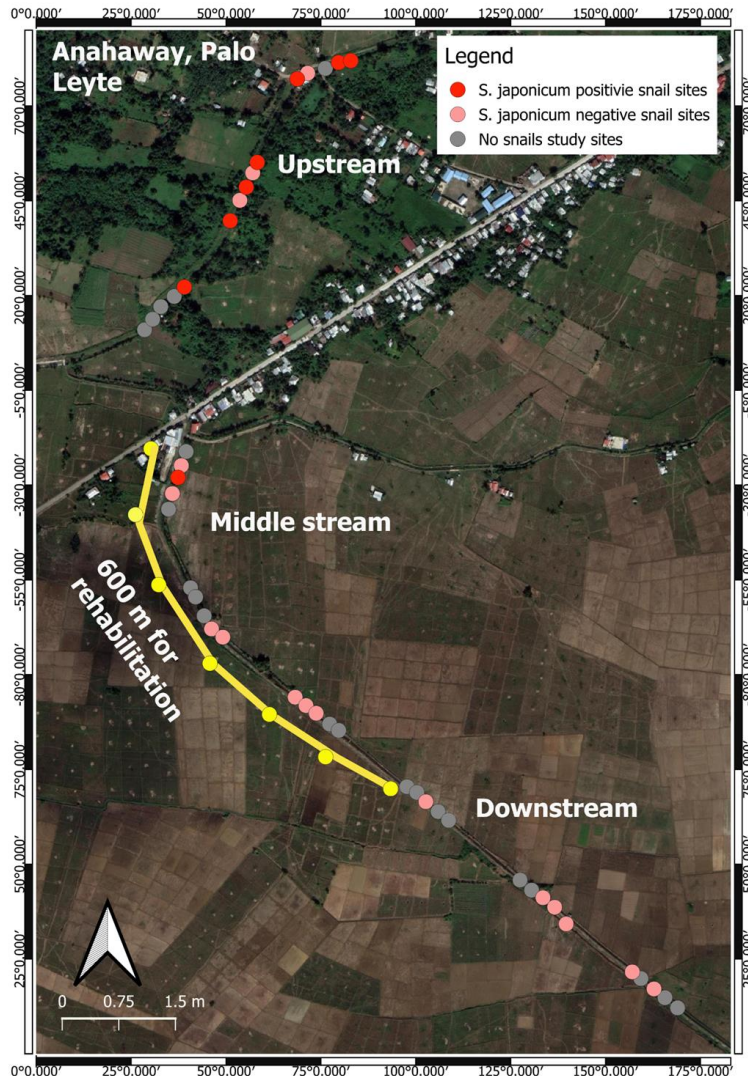
**Ground breaking ceremony**  
introduced the project to  
stakeholders and officials



**Environmental survey**  
collected baseline biotic and  
abiotic parameters



# ASEAN WCCSC PH | Phase 1: Pre-construction



## Findings from the Environmental Survey

In the 600 m irrigation canal targeted for rehabilitation:

- snail sites were recorded upstream, midstream, and downstream
- infected snails detected using microscopy and PCR were observed upstream and midstream

**Study sites: Brgy. Anahaway and Brgy. Teraza, Municipality of Palo, Leyte**



# ASEAN WCCSC PH | Phase 2: Construction



**First 50 meters of the rehabilitation project**



**Small snail basin adjacent to the target irrigation canal**



**Target irrigation canal**



# ASEAN WCCSC PH | Phase 3: Post-construction



**Commemorative marker**  
for the rehabilitation project



**Small snail basin** adjacent  
to the target irrigation canal



**Target irrigation canal**



# ASEAN WCCSC PH | Phase 3: Post-construction

## Way forward

- submit report to national and local Offices of the National Irrigation Authority (NIA)
- perform follow-up visit at least 6 months post-construction
- document procedures and protocols for similar activities in the future

An aerial photograph of a large dam and reservoir system, featuring a central dam structure with a building on top, surrounded by water and greenery. The image is overlaid with dark blue geometric shapes: a large triangle on the left and a horizontal bar on the right. The text '03 Future Cooperation' is centered in white on the blue bar.

# 03 Future Cooperation





**Thank you for your attention!**