NARBO
Network of Asian River Basin Organizations

Perum Jasa Tirta II

A SUSTAINABLE SOLUTION FOR WATER QUALITY CONTROL:

"TACKLING WATER HYACINTH INVASIONS - A HOLISTIC APPROACH TO SAFEGUARDING WATER QUALITY IN CITARUM'S CASCADE RESERVOIRS IN INDONESIA"

INBO WORLD GENERAL ASSEMBLY PROGRAM
Bordeaux, France
October 8th, 2024

Dr. Imam Santoso
President of NARBO and CEO of Indonesia Water Company Jasa Tirta II

NETWORK OF ASIAN RIVER BASIN ORGANIZATION (NARBO)

The 1st NARBO General Meeting, 2004

The 7th NARBO General Meeting, 2024

MoU signing between INBO and NARBO

NARBO, established in 2004, aims to help **achieve IWRM in river basins throughout Asia**. NARBO's objective is to strengthen the capacity and effectiveness of RBOs in promoting IWRM and improving water governance, through **training and the exchange of information and experiences among RBOs and their water sector agencies and knowledge partner organizations in Asia and to advise on the establishment of RBOs in Asia**. The NARBO members have reached **94 members from around 18 countries in Asia**.

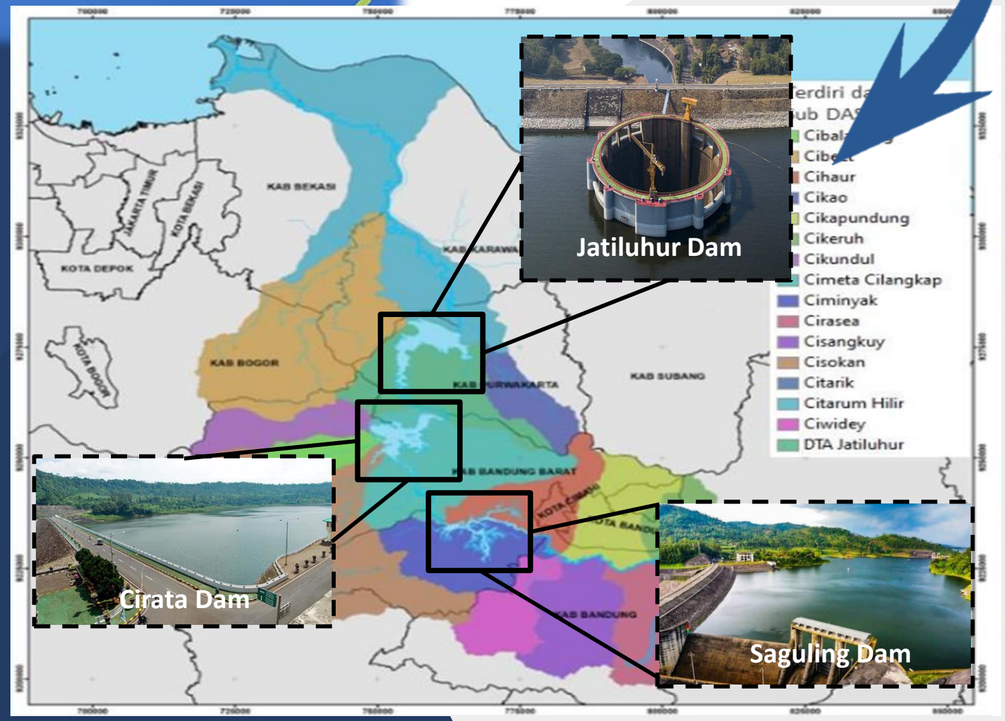
MEMBERSHIP OF NARBO

- River Basin Organizations
- National and federal/ provincial/local governmental organizations
- Regional knowledge partner organizations
- Inter-regional knowledge partner organizations
- Bilateral and multilateral development cooperation agencies
- Water related organizations

INDONESIA CITARUM RIVER BASIN

Profile Citarum River Basin

- 11.323 km^2 (32% of West Java total area)
- ±18 million of population
- Length 297 km
- More than 4.500 Industries



CITARUM RIVER BASIN IN WEST JAVA PROVINCE

Water Management

Water Supply 47 m^3/sec
Drinking Water Municipals and Industries of 1,100 million m^3/year for Capital City Jakarta & West Java

Food Security
Through irrigation water for an area of ± 230,000 ha.

Energy Security 3,350 MW
Through the provision of ± 5 billion kWh/year raw water for hydropower in Dams of Saguling, Cirata and Jatiluhur

Flood Control 26,500 Ha
In North of West Java areas
Through the water level control in 3 Dams (Saguling, Cirata & Jatiluhur)

Citarum Cascade Dam

Saguling Dam
managed by National Electric Company (PLN)

Volume
518 Million m^3

Turbines Capacity
700 MW

Hydropower Plant
± 2,5 Billion kWh/year

Cirata Dam
managed by National Electric Company (PLN)

Volume
1,7 Billion m^3

Turbines Capacity
1.000 MW

Hydropower Plant
± 1,5 Billion kWh/year

Jatiluhur Dam
managed by Indonesia Water Company Jasa Tirta II

Volume
2.4 Billion m^3

Irrigation
± 230,000 ha
(total area)

Water Supply for Irrigation
5.2 Billion m^3/year

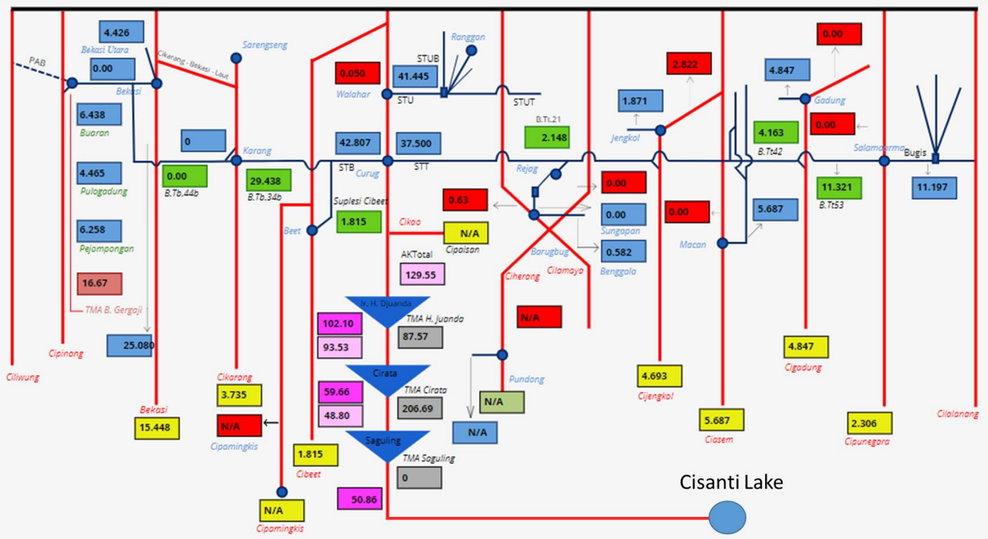
Raw Water Supply for Domestic and Municipal
814.8 Million m^3/year

Raw Water Supply for Industry
285.9 Million m^3/year

Hydropower Plant
± 1 Billion kWh/year

Location

JATILUHUR IRRIGATION SYSTEM



Jatiluhur Irrigation Scheme

In Citarum River Basin, there are 3 cascaded dams (Saguling, Cirata, and Jatiluhur) which play a crucial role in water supply for irrigation, DMI, and electricity. ***The water supply for irrigation system will pass through three cascaded dams and regulated at Jatiluhur Dam.***

Water Resources Facilities and Infrastructures managed by Jasa Tirta II			
Weir	72 infrastructures	**Pond, reservoir, and lakes**	105 infrastructures
Main Canal	191 km	**Secondary Channel**	1,784 km
Water Infrastructures in Main Canal	549 infrastructures	**Water Infrastructures in Secondary Channel**	2,680 infrastructures
Water gates in Main Canal	460 gates	**Water gates in Secondary Channel**	2,513 gates

Irrigation
± 230,000 ha
(total area)

Jatiluhur Dam has responsibilities to fulfill the water demands of Jatiluhur Irrigation Area for FREE

If it is assumed that the average rice production is 5.5 tons/ha for 2 harvests per year, then it has resulted rice production of 2.53 million tons/year, or an equivalent value of **€ 1,14 trillion/year** (BPS, December 2023).

CONDITION OF WATER HYACINTH IN SAGULING, CIRATA, AND JATILUHUR RESERVOIR

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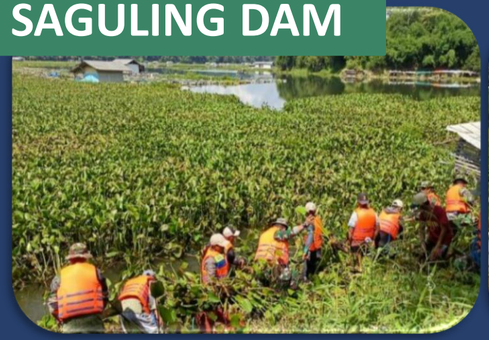
JATILUHUR DAM



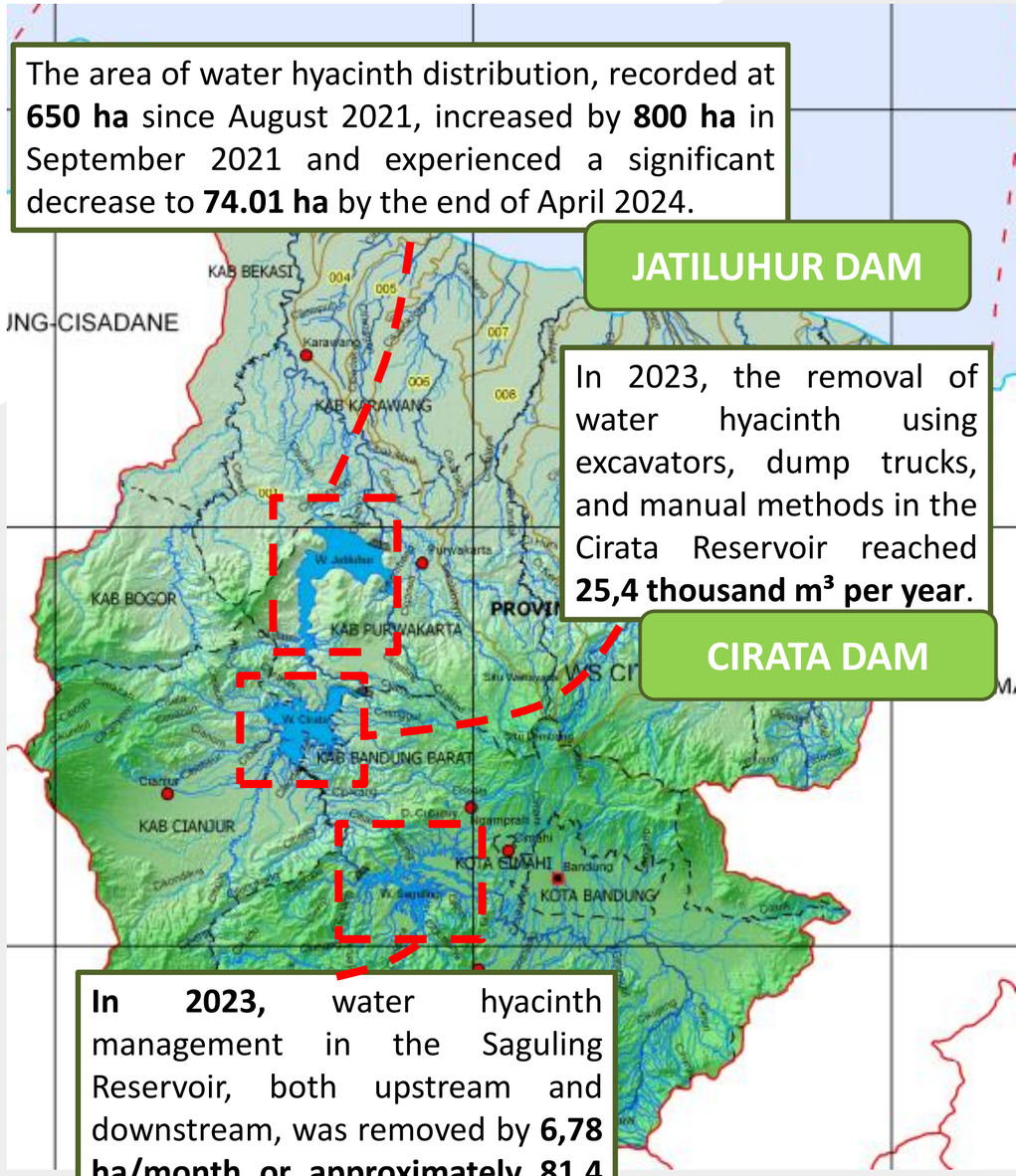
CIRATA DAM



SAGULING DAM



The area of water hyacinth distribution, recorded at **650 ha** since August 2021, increased by **800 ha** in September 2021 and experienced a significant decrease to **74.01 ha** by the end of April 2024.



JATILUHUR DAM

In 2023, the removal of water hyacinth using excavators, dump trucks, and manual methods in the Cirata Reservoir reached **25,4 thousand m³ per year**.

CIRATA DAM

In 2023, water hyacinth management in the Saguling Reservoir, both upstream and downstream, was removed by **6,78 ha/month or approximately 81,4 ha/year.**

SAGULING DAM

CITARUM PENTAHELIX APPROACHES

In Addressing Water Hyacinth Problems

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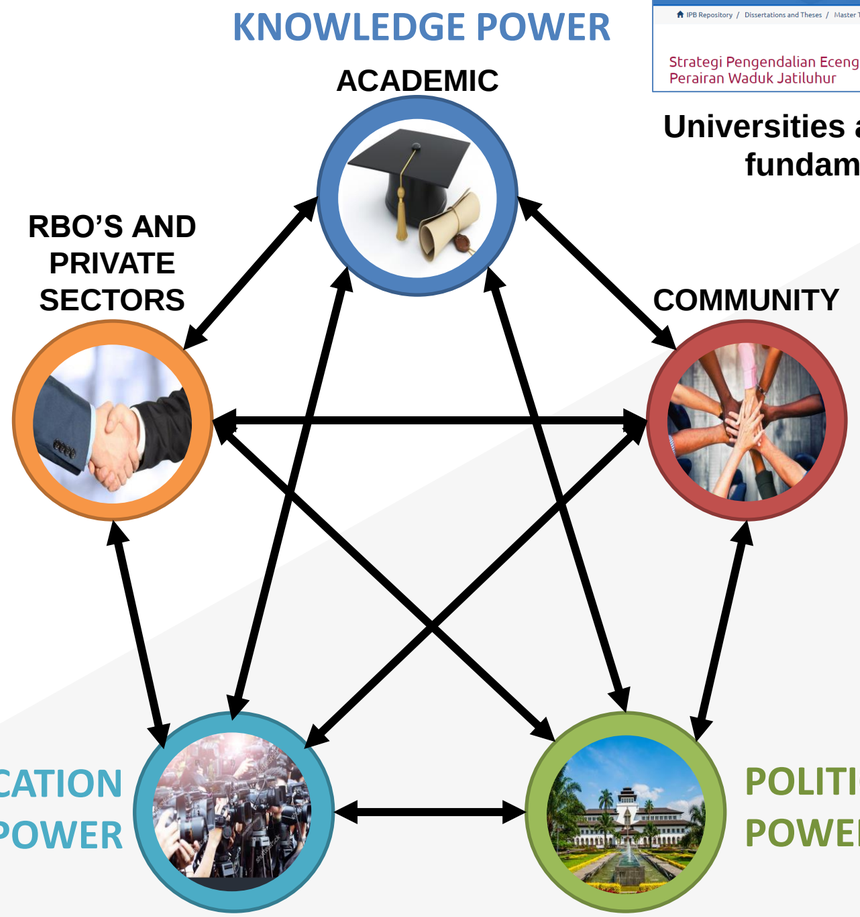
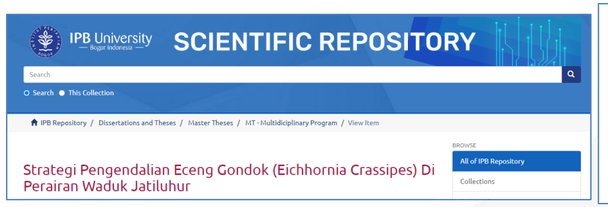
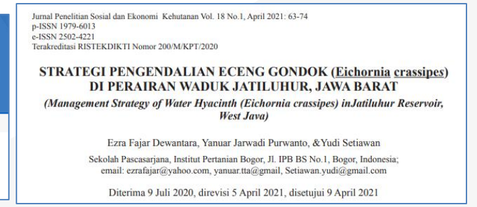
CENTER OF EXCELLENCE

The Center of Excellence for Innovative Products emphasizes that businesses should not focus solely on profit but also on supporting and uplifting the economy of disadvantaged communities. The CSR SOE Forum (Corporate Social Responsibility State-Owned Enterprises Forum) serves as a platform for these efforts.

Media serves as an important means of conveying information to the public regarding the water quality conditions in the Citarum cascade dams





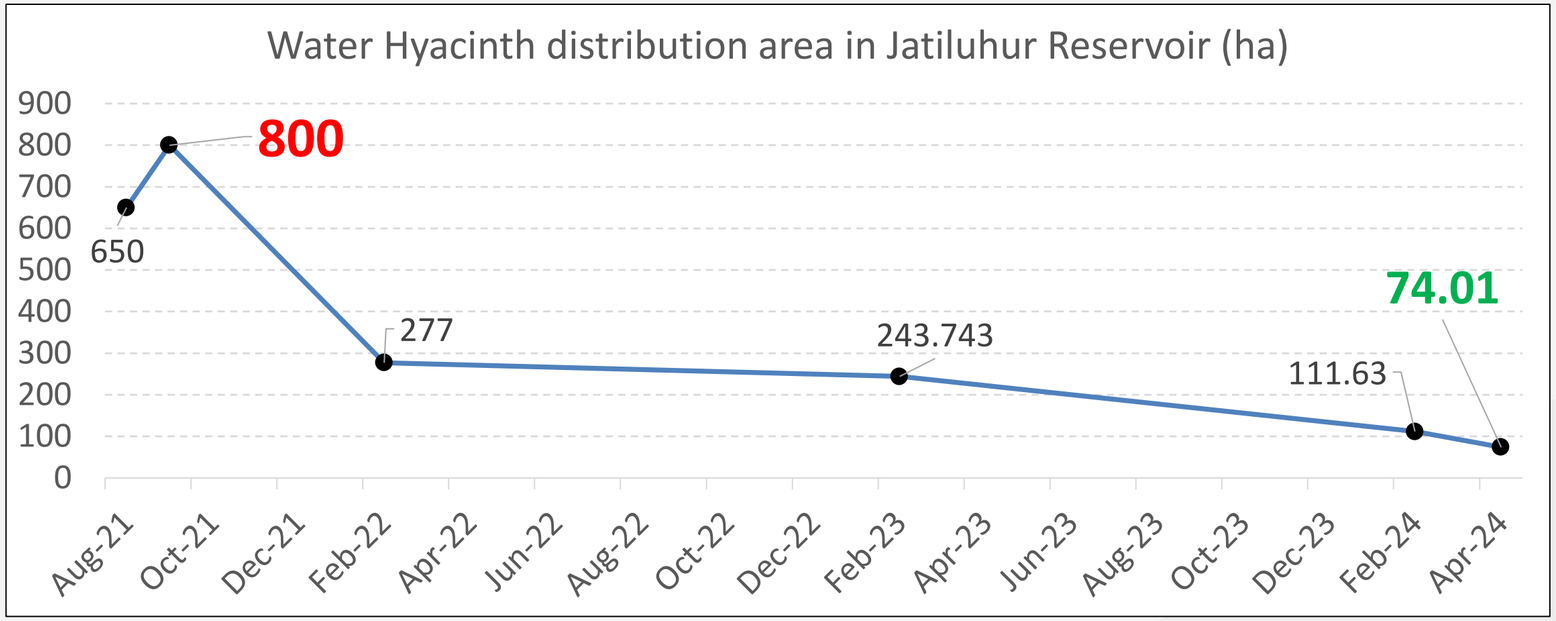


Universities and research institutions as centers for research and fundamental project ideas to support the resolution of water hyacinth problems in the Citarum River.

Attracting communities and creative community associations to socialize the Citarum Handling Program and Disaster Mitigation to the wider community

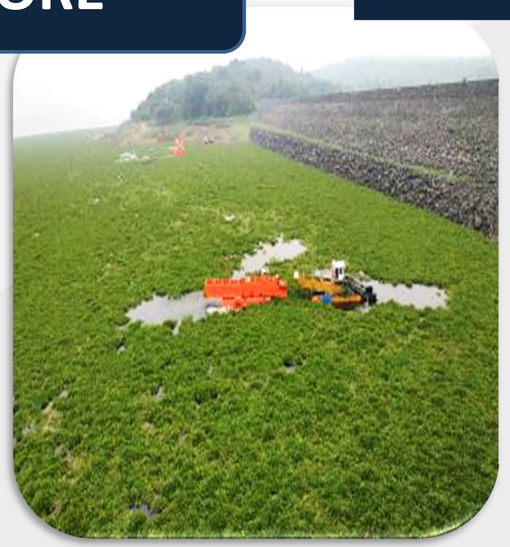
Regulation of the President of The Republic of Indonesia Number 15/2018 on the Acceleration Of Pollution And Damage Control In The Citarum River Basin

THE CONDITION OF JATILUHUR DAM



The growth of water hyacinth, particularly in the Jatiluhur Reservoir, has **decreased** from **September 2021 (800 ha) to May 2024 (74 ha)**. This reduction is supported by water hyacinth removal activities from 2022 to 2024, with a total volume of **1.62 million m³, equivalent to 800,74 ha.**

BEFORE



AFTER

WATER HYACINTH MANAGEMENT

Community-Based Water Hyacinth Processing Around Jatiluhur Reservoir

Collaborating with local boat owners and other state-owned enterprises in initiatives to provide training on **processing techniques and initial support for processing facilities** to help communities turn **water hyacinth into handicrafts and fertilizers.**

COMMUNITY BASED WATER HYACINTH PROCESS

1. Processing Water Hyacinth into Active Humus and Enzymatic Products

1. Collecting water hyacinth to the dumping area

2. Transferring water hyacinth to the shelter

3. Sorting and shredding water hyacinth with a shredding machine

4. Fermenting in a biofloc pond for 21 days and producing enzymatic water hyacinth for 3 months

5. Packaging active humus and enzymatic products

2. Processing Water Hyacinth into Handicrafts

1. Sorting water hyacinth, stems, and roots

2. Drying water hyacinth for 7 - 10 days

3. Weaving water hyacinth into handicrafts

4. Various Handicrafts

THE IMPACT OF WATER HYACINTH MANAGEMENT

Reservoir Sustainability

1. **Reducing the potential risk of failure** of the Hydroelectric Power Plant (turbine generator).
2. Reducing water hyacinth **will prolonged the life service of the reservoir and maintain the sustainability of the biological diversity and reservoir environment**
3. **Enhancing the tourism sector** by improving the reservoir's environmental quality and aesthetics, while also **optimizing water transportation** for tourism in the reservoir area

Water Quality

1. Minimizing the **risk of reduced water storage capacity and water quality in reservoirs**
2. Improving **irrigation supply** and **reducing blockages in irrigation channels**
3. **Expanding sunlight exposure** on the reservoir's water surface to prevent disruption of the aquatic ecosystem.




Communities

1. **Enhancing active community participation around the reservoir.**
2. Additional income from the sale of processed water hyacinths products such as **Handicrafts, Enzymatic products and Active humus as nearly total € 17.500 per year**
3. Facilitating **community access** for daily activities and **improving the flow of waterway transportation.**


CONCLUSIONS

01. Irrigation for National Food Resilience

Through comprehensive efforts in tackling water hyacinth, **water quality in the reservoir will be maintained**, ensuring the supply of **irrigation water and raw water not disrupted**, thus supporting **national food security and sustainability**

03. Water Hyacinth Management Integration with Citarum Pentahelix

- The water hyacinth management integrates well with Citarum Pentahelix approach, which involves the collaboration of government, media, corporations, academia, and the community
- This holistic approaches capitalizes on collective efforts to manage water resources, reduce pollution, and promote sustainable agricultural practices

02. Water Hyacinth Management in the Implementation of IWRM

Water hyacinth management plays a crucial role in the implementation of Integrated Water Resources Management (IWRM), **aligning with NARBO's goal** of promoting sustainable water quality and agricultural productivity in Asia. By integrating continuous innovation in water and agricultural management, water hyacinth control not only mitigates environmental impacts but also enhances reservoir efficiency, reduces water quality degradation, and supports agricultural activities.

“Water is essential for sustaining life, ensuring shared prosperity, and sustainable development among all nations”

"L'eau est essentielle au maintien de la vie, garantissant une prospérité partagée et un développement durable entre toutes les nations"

THANK YOU
MERCI BEAUCOUP