



SHIBATA

シバタ工業株式会社

SHIBATA INDUSTRIAL CO.,LTD.

Technical Proposal for Shibata Rubber Pond "NON-EVAPO SYSTEM"

February 2024

SHIBATA INDUSTRIAL Co., Ltd.

Practice: Securing for Irrigation Water in Cambodia

- ① Using Rainwater “Rice Farming in Rainy Season”
- ② Using Floodwater “Rice Farming in Dry Season”

⇒ Important Task:
Securing Stable Irrigation Water Supply

Table 1 - Major types of paddy fields

Types of Rice Production	Size Ratio (%)	Average Yield Amount (t/ha)	Types of Irrigation
Rainfed lowland	73.1	1.6	Rain-fed (Pump for emergency use)
Irrigated -Wet season	11	3.0	Irrigated by gravity, power pump
Floating	4	1.2 (0-5)	Irrigated by flood in wet season
Irrigated -Dry season	11.9	3.0 5.0 in some area	Irrigated by power pump

Data Source: Jour. JSIDRE Sep.2000



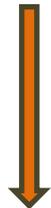
Data Source: JICA Official Website
<http://www.jica.go.jp/project/cambodia/016/index.html>

Importance of Securing Water Resources and Technical Proposal

Securing water resources

To prevent infiltration loss into the ground

To restrain evaporation loss

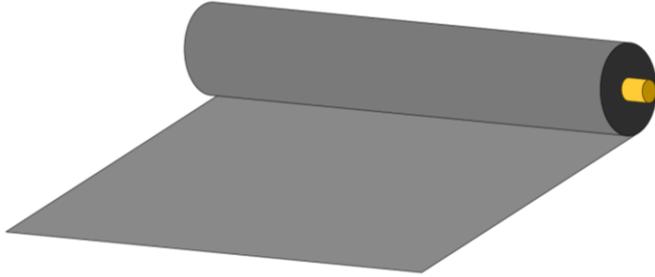


Shibata Pond "NON-EVAPO SYSTEM"

- Infiltration loss prevention with waterproof sheets.
- Evaporation loss prevention with the floating lids.



Anti-Infiltration Waterproof Sheets



Waterproof sheets specially developed by SHIBATA to infiltrate the water and to prevent evaporation, is used as these materials that have practices for roofing or landscape ponds in Japan.

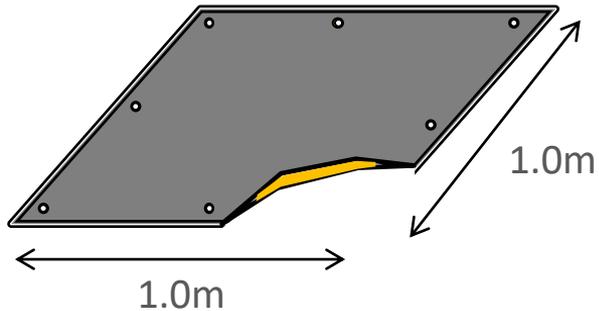


Rubber Lining Pond



Only Digging Pond

Anti-Evaporation Floating Lids



Floating Composite Material shall provide a sandwich structure with Membrane and PE Foam. Standard size Lid: 1.0m x 1.0m
✘ This standard size lid will be connected and expanded to make customized size for Reservoir respectively.



This lid will work effective for water losses by Evaporation.

Products Proven

Our collaboration study with Ryukyu Univ. have achieved well water quality and keep well transparency with Floating Lid. Uncovered tank had a sludge in the water.



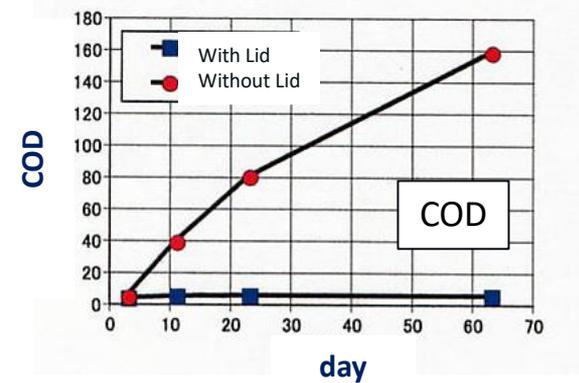
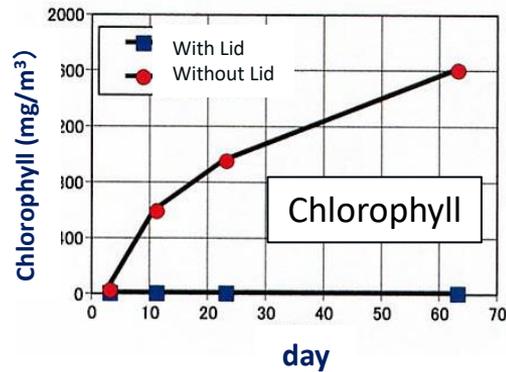
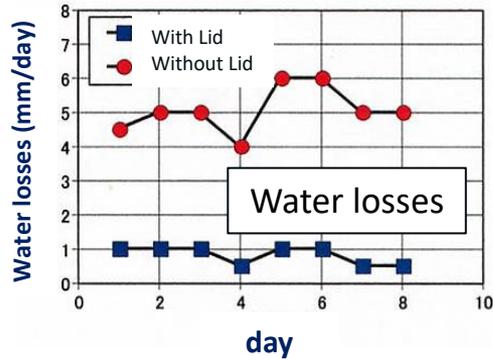
Without Lid



With Lid



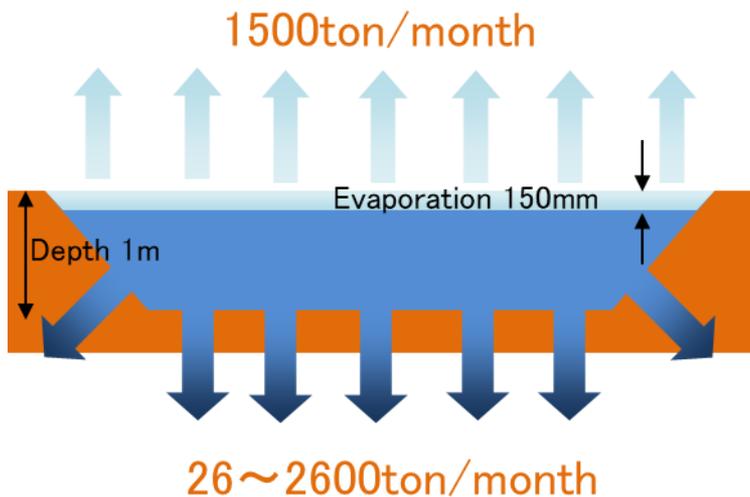
Products Proven



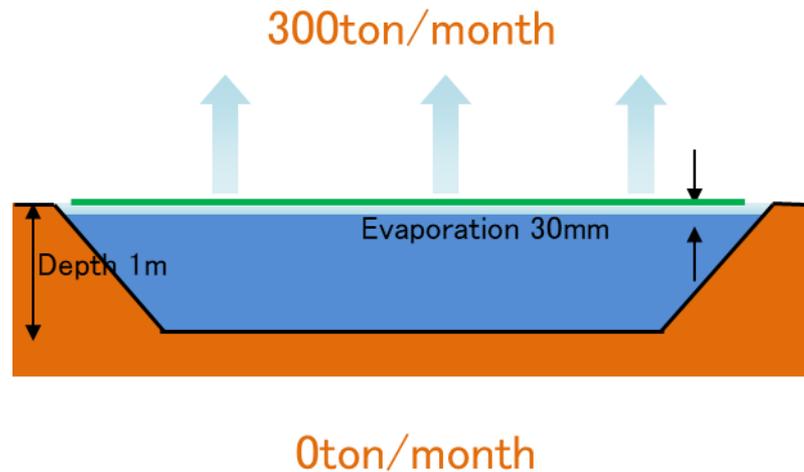
Floating lid will bring “Decrease Evaporation Loss to 1/5”, according to the verification, there were 5-6mm losses/day without lid, but only 1mm loss/day with lid.(in Okinawa island)

Floating lid prevents the generation of chlorophyll and COD, thereby protecting water quality.

Comparison of Effectiveness: 100mx100m size Pond



Without Floating Lids



With Floating Lids

Construction Procedures



1. Digging



2. Textile Spreading



3. Textile Completion



4. Waterproof Sheet Spreading



5. Waterproof Sheet Completion



6. Floating Lid Installation

Experiences

Pilot Project in-house (Completed in 2016);

In July 2016, we have installed our systems at 3 locations in Cambodia and verification tests are currently performed at these sites.



Banteay Meanchey Province



Battambang Province



Pursat Province

Experiences

JICA Project (Completed in 2018);

Feasibility Survey with the Private Sector for Utilizing Japanese Technologies in ODA Projects Kingdom of Cambodia,
Feasibility Survey for Promoting the Reservoirs for Irrigation Water



Waterproof Sheets
and Floating Lids



Waterproof Sheets
Only



Floating Lids
Only



No Installation

Royal University of Agriculture

Experiences

JICA Project (In Progress); SDGS BUSINESS VERIFICATION SURVEY WITH THE PRIVATE SECTOR FOR SECURING WATER RESOURCES FOR DRY SEASONS AND DROUGHTS IN AREAS DEPENDENT ON RAINWATER



Candidate site



Information session for residents



Takeo Province
Completed In May 2022



SHIBATA