Engineering-Oriented Plantation and Mechanical Harvesting of Aquatic Plants in Water Body Restoration Engineering

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Content

1. Water body restoring engineering and Plantation of related aquatic plants

2. Mechanical harvesting of aquatic plants in water body restoring engineering
1. Water body restoring engineering and plantation of related aquatic plants

1) Waterbody contamination and Ecological restoration

● Waterbody contamination

Lakes and reservoirs contamination

75% of China’s rivers and lakers are facing heavy metal contamination and eutrophication (Phosphorus and nitrogen).
Main contamination resources

- Domestic sewage
- Industrial waste water
- Aquaculture wastewater
- Pesticides spraying plane
- Usage of fertilizer
Ecological restoration for waterbodies

There are many ways to improve and restore water bodies, of which, artificial wetland is an effective way to improve large water bodies. Which combine microbes with aquatic plants to purify water, and it is suitable for treatment of industrial waste water, domestic sewage etc.

Artificial Floating Islands in shaoxing and ningbo, zhejiang province, China
2) Engineering-oriented plantation of related aquatic plants

These pictures are from a cooperation project of Zhejiang University and Qingshan Lake Sewage Treatment Plant, Linan City, Zhejiang Province.

An artificial wetland was designed to purify tail water from the sewage treatment plant. Some plants are planted outdoors, and other plants were planted in greenhouses.

1.2m deep pools in houses

Orderly planting is very important for mechanical harvesting, especially for those planted in greenhouses.
2. Mechanical harvesting of aquatic plants in water body restoring engineering

1) Ordinary harvesting method for aquatic plants

Most harvesting machines using a boat as the harvesting platform, and cutting collecting devices are fixed on the boat.

Here are some harvestors produced by some companies in China or some other countries.
Specially designed for floating plants, such as blue algae, water hyacinth, and floating rubbish etc.

Produced by Hua Kai Science & Technology Cor, Ltd, Hanzhou, China
Emersed plants harvestor

Designed for rooted emersed plants, such as reed

Produced by Aquatic Technology Center, New York, USA
Aquatic Plants Harvesting System

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A product of Freshwater Environment Management Company, Australia
2) Harvesting machinery for aquatic plants

- Adverse conditions for mechanical harvesting in greenhouses:
  - Narrow space
  - A pool in each greenhouse
  - Transfer between adjacent two houses

Above boats are not suitable for greenhouses harvesting!
Guided harvesting machinery for greenhouses

Layout of railway in greenhouses

Overview of railway in greenhouses from above
Structures and principle for guided harvestor in greenhouses
Grass in

Grass out

working state
The right wing of the guided harvester:

- Hydraulic Motor
- Conveying belt
- Conveying wheel
- Cutting device
- Grass in
- Clapping spring

Diagram showing the right wing of a guided harvester including its components and actions.
The left wing of the guided harvestor Grass in

The left wing of the guided harvestor
Moving cutter

Fixed cutter

Right-hand Cutting Device Assembly
THANK YOU!