BAMBOOTOPIA

PS Presentation
Yuchen Li
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Delft University of Technology
Architecture, Urbanism and Building Sciences master programme
Architecture Track
Architectural Engineering Graduation Studio
Agriculture 0.21%
Resources 2.35%
Construction 4.86%
Commerce & Tourist 41.67%
Telecom 12.47%
Service 6.64%
Others 9.25%
Industry 22.55%
New industry centers in Bandung (2013)

- Binongjati: Knitting Industry
- Cigondewah: Textile Industry
- Suci: T-shirt & Clothes Industry
- Cihampelas: Jeans Industry
- Cibaduyut: Shoes Industry
- Sukamulya: Doll Industry
- Dayeuhkolot: Textile Industry
- Rancaekek: Textile Industry
- Chimahi: Textile Industry
INDUSTRIAL POLLUTION

GREEN SPACE SHRINK

FARMER’S LIMITED PROFIT
WATER UTILIZATION & POLLUTION THREAT

- Irrigation water pollution
- Overusing groundwater
- Potential risk: groundwater pollution
SHRINKING GREEN SPACE

- Farmland gave way to high profit factories and housings
- Land-use type lead to ground subsidence
- Spatial decay
TEXTILE
HIGH PROFIT
EXPANDING

FOOD
LOW PROFIT
SHRINKING
EASY GROW BIOMASS RESOURCE
VERSATILITY OF BAMBOO

1. Filtering polluted water and soil with bio-base method
2. Making profit with productive farmland
3. Integrating with local industry and identities.
FLOW RESEARCH

MATERIAL
- Main product:
  Bamboo fiber 0.69-1.375T/Y
  Bamboo charcoal 0.55-1.375T/Y
- Byproduct:
  Bamboo shoot 10-30T/Y
  Biogas (bamboo leaves): 511.28M3/Y
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Benefit
- Bamboo plantation=1/3 rice field
- Bamboo plantation+ processing=4 times rice field (at least)
UPCYCLE

BENEFIT

INSPIRE
SITE DESIGN
- Bamboo field
- Biogas garden
- Wetland garden

PROJECT POSITION
- Long stripe
- Dividing different green spaces
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PROJECT GESTURE
- Long stripe
- Dividing different green space

FLOW MANAGEMENT
DESIGN GUESTURE

- Good receipt platform
- Mechanical workshop
- Bamboo fiber plant
PROJECT GUESTURE

- Good receipt platform
- Mechanical workshop
- Bamboo fiber plant
- Bamboo shelf / air-dry
PROJECT GUESTURE
- Good receipt platform
- Mechanical workshop
- Bamboo fiber plant
- Bamboo shelf/air-dry
- Visitor’s walkway

THE SPINE
- Shelf + Walkway + structure
- Functional core
- Aesthetic focus
V-SHAPE

- Reduce span
- Free Ground floor
- Spacious Walkway
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- Free Ground floor
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A Twist
- Tilt towards bigger span
- Winding walkway
- Shape the curvy roof
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Two ends
- Kiln and Entrance
- Separating V frame (stairs)
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**Secondary Structure**
- Structural need
- Emphasizing important side of the space
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Roof Shape
- Climate strategy
Climate Strategy

- Protect structure from rain
- Enough Shading
- Indirect Natural lighting
- Letting out redundant heat
MATERIALIZATION & CONSTRUCTION

- Natural material
- Local construction skill
- Easy construction
- Tolerance for inaccuracy

Pre-assembled joints for beam
Bamboo frames
Stone + Earth foundation
FIBER PLANT
FIBER PLANT
BIOGAS GENERATOR

- BioGas: 400 m³
- Bamboo Charcoal: 500 kg
- BioGas: 4 m³

BAMBOO PLANTATION

- Bamboo Culm: 2.5 t
- Bamboo Leaves: 6 t
- Fiber Plant: 500-1000 kg
- Oxygen (O₂): 30 t
- Fertilizer

CHARCOAL KILN

- Bamboo Charcoal: 500 kg
FACTORY

PRE-TREATMENT

FIBER PLANT

Reed

Water hyacinth

Duckweed