About Meiwa Co., Ltd.

A technology-oriented company developing environmental plants

- **Year of Incorporation**: 1965, - **Number of staff**: About 50
- **Location**: Kanazawa City, Ishikawa Prefecture, Japan
- **Main business area**: Environment / Agriculture / Renewable energy
- **Main products**: Biomass carbonization plant / Effluent treatment facility / Methane fermentation system / Dust collector, etc.
- **Project partners**: University of Tokyo, JICA, Ministry of the Environment, etc.
- **Participated conference**: TICAD VI Follow-up conference (Mozambique), TICAD VI Japan Fair (Kenya), UNIDO Low Carbon Technology Workshop (Kenya)
Meiwa’s Technology:
Biomass Carbonization - General

Unutilized Biomass

Drought-Resilient Agriculture

Carbonization plant

Biochar

Renewable Fuel
Drought = losing everything
Challenge of Africa: Climate Change

- Gap between $T_{\text{max}}$ & $T_{\text{min}}$ widening
- Average annual temp. increasing
- Systematic decrease in annual rainfall
Challenge of Africa: Climate Change

- Land degradation (low water holding ability)
- Maize yield to reduce by up to 45% (Adhikari et al., 2015)
Meiwa’s Technology: Biochar - As powerful soil conditioner

**Biochar**
- Porous

Carbonization

**Wood vinegar**
- Organic acid

- Water retention
- Drought resilient
- Soil microbial activity
- Nutrient retention
- Nutrient (N, P, K, etc.)
- Nutrient assistance
- Repellent
- Health?
- Cattle disease control
- Livestock?
Effect of ‘Wild’ biochar in Kenya

Dwarfed

Healthier

Works for Climate-resilient agriculture
Then, how can we get biochar?
Meiwa’s Technology: Biomass Carbonization - Mechanism

Carbon box series: batch-type carbonizer

Strategically downgraded

- Simple to use
- Quick (2-3 days → 8 hours)
- Energy efficient
- Solar powered
- Smokeless
*Pre-drying required

Deployable anywhere

Dried biomass in
Fuel in
Biochar out
Unutilized biomass: **Neglected resources**

~Bagasse~
Unutilized biomass: Neglected resources

~Sludge~
Unutilized biomass: Neglected resources

~Vegetable residue~
Try & error, taking place in Kenya

Process to establish resource circulation system

Organic waste collection & screening

Pre-processing (drying, briquetting, shredding, etc.)

Carbonization (Post-processing)

Agricultural experiment with Biochar and wood vinegar
Key to success = various partners

Organic waste collection
  ↓
Raw material screening
  ↓
Pre-processing
   (e.g. Drying, shredding, briquetting)
  ↓
Carbonization

Biochar

Clean fuel
  ↓
Distributors
  ↓
End users

Agriculture
  ↓
Distributors
  ↓
End users

Wood vinegar

Livestock?
  ↓
Distributors
  ↓
End users

Repellent?
  ↓
Distributors
  ↓
End users

Analysis, R&D, test marketing etc.
to be done with partners

• What are major sources of raw material?
• Waste separation at source? Any incentive?
• Pollutants (heavy metals, plastics, etc.) to be avoided
• Simple and optimized methods/systems in Kenya?

Distributors
End users
Case study in Japan - for human sludge

Local government

Meiwa

Introducing plant
Purchasing plant
Technology transfer
Consultation on remote control, maintenance, etc.

Local private partner

Human sludge processing (incl. machine operation)

Revenue from biochar sales

Promoting biochar
(Tax revenue from flower sales)

Plant operation

Biochar distribution

Farmers

Selling biochar
Purchasing biochar
Biochar: For Climate resilient agriculture

- High water retention
- Nutrient retention and uptake
- Microbial Activation
- Own Nutrient

Biochar

- Less water
- Less top dress
- Strengthen stems, etc.
Try & error, taking place in Kenya

Process to establish resource circulation system

- Workshop with county government
- Biochar experiment with university & farmer
- Introducing technology from Japan (, etc.)