

# Enabling Sustainable Future with Biomass Technology

Promoting organic waste valorization

Drought-resilient agriculture

Alternative energy for fossil fuel

Green industrialization

Technology transfer



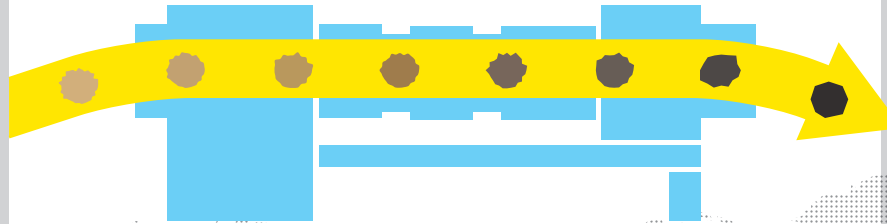
Meiwa Co., Ltd. is a technology-oriented Japanese company that develops, manufactures and sells various environmental plants and products. We aim to be a social enabler to achieve sustainable development in various countries by providing biomass processing plants and enabling local partners to use them after technology transfer.

## Unutilized Biomass

There are various types of biomass that remain unutilized. It includes sludge, human waste, chicken manure, agricultural residue and water hyacinth among others.



## Biomass to Charcoal



## Biochar

Depending on raw material, charcoal from biomass (biochar) can be used for many purposes. Typically it can be used as (1) soil conditioner for agriculture or (2) renewable fuel among other uses.



## Circulation Enabled by Meiwa's Carbonization

## Drought-Resilient Agriculture

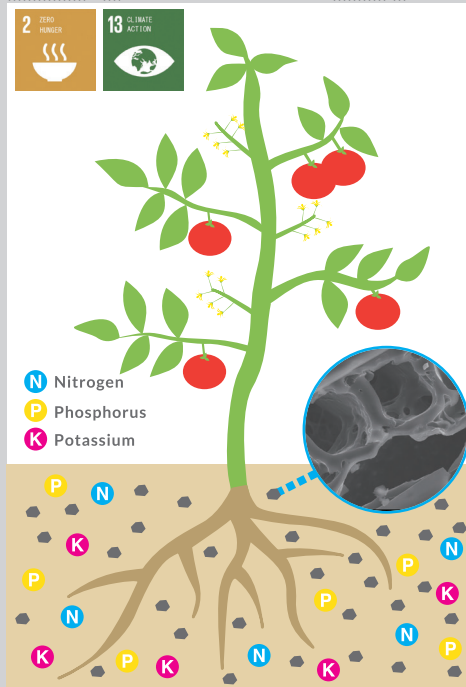
Biochar works as soil conditioner for agriculture. It retains water and nutrients while neutralizing acidic soil. Since biochar can make rainfed agriculture more resilient to irregular rainfall pattern, it can serve as one of the easiest and most powerful approaches for climate change adaptation.

### Features

- High water retention capacity for drought-resilient agriculture
- Long-lasting release of nutrients to plant
- Vitalization of soil microorganisms

### Social Impact

- Climate change adaptation
- Stabilization/Increase of food security
- Soil quality improvement



## Renewable Fuel

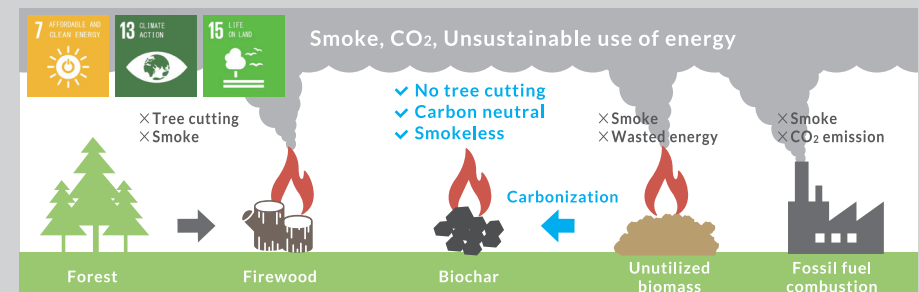
Biochar can be used as smokeless fuel instead of conventional wood charcoal or firewood, contributing to alleviation of deforestation. Also, biochar combustion is a carbon-neutral process unlike that of fossil fuel. It therefore serves as a mitigation measure for climate change.

### Features

- No extra tree cutting
- Smokeless
- Carbon neutral

### Social Impact

- Alleviation of deforestation
- Air pollution reduction
- Climate change mitigation



## Case Study 1: Non-Hazardous Municipal Sludge

**Area** Japan **Partner** Local Municipality and its Subcontractor



**1** Sludge accumulation



**2** Carbonization



**3** Biochar distribution



**4** Agricultural use of biochar

### Issue

Municipalities have been struggling with high cost of sludge disposal after treatment. Dewatered sludge used to be incinerated with a lot of fuel.

### Solution

A municipality with the population of 20,000 decided to introduce Meiwa's carbonization plant to reduce and recycle dewatered sludge at its wastewater treatment facility. After regular laboratory analysis on quality, biochar that passes a certain environmental standard proceeds for distribution. Since sludge biochar contains abundant phosphorus, the biochar is favored by local farmers who grow flowers and vegetables. The town is famous for horticulture, so the project is a big plus to the region to empower the industry while reducing organic waste.

### Project Modality

Although introduction of Meiwa's carbonization plant was an initiative of the municipality, private sector plays a key role in project sustainability. Operation of carbonization plant and biochar distribution are undertaken by a subcontracted local enterprise. The municipality set a subcontractor agreement with the local enterprise to (1) sustain the operation from sludge recycling service fee and (2) distribute the sludge biochar at an affordable price. By this, local farmers have been enjoying the benefit of sludge biochar instead of expensive chemical fertilizers.



## Case Study 2: Solution to Drought and Land Degradation

**Area** Kenya **Partner** County Government in Kenya and Japan International Cooperation Agency (JICA)



### Issue

In Kenya, like many other countries in Africa, majority of lands are classified as Arid and Semi-Arid Lands (ASAL regions) yet main industry is still rain-fed agriculture. The recent climate change makes rainfall much more unpredictable and farmers are quite anxious about their yield fluctuation. Especially for small-scale farmers, risk of drought is almost equal to the risk of losing everything. In addition, soil tends to be acidic and/or with low water and nutrient holding capacity, making the productivity stably low.

### Current Status on Project Development

Biochar has a porous structure, in which water, nutrients, soil microbes and air can be well stored. With promoted root growth, plants become more resilient under drought. Biochar's physical structure remain over long period, effectively amending the degraded soil.

Meiwa has been conducting a feasibility study (2017-2018) and a pilot project (2019-2021) in Kenya by partnering with JICA and a county government in Kenya. The aim is to equip local public and private sectors with carbonization plants so that they can locally produce and use biochar as a solution to drought and land degradation.

## Capacity Development



Meiwa aims to realize a sustainable society by transferring our biomass carbonization technology with our local partners in private, academic and public sectors. We therefore host capacity building programs for committed leaders who are eager to introduce and implement our technology in their own countries.

So far we accepted 44 postgraduate African interns from 15 countries as well as many trainees from Asia, Oceania, Europe, Middle East and Latin America (as of April 2018).

## Our Featured Products

### Bio-Toilet (under development)

#### Issue

In village where sanitation system is not adequate, lack of toilet tends to result in many social problems such as diarrhea, water and environmental pollution among others.

#### Solution

By applying its multiple biomass technologies, Meiwa developed a powerful material to compost certain types of organic waste, including human waste. After composting, it can be used as a nutrient-rich manure.

### Rice Husk Softening and Expansion Machine

#### Issue

In many rice production area, utilization of rice husk is a big challenge because its hard shell is difficult to decompose. Many people burn piles of rice husk in India, contributing to huge air pollution problem.

#### Solution

Meiwa's established technology allows hard rice husk to be softened and expanded within a short processing period. The expanded rice husk absorbs water very well and is much easier to decompose. It works as better bed material for composting than peat moss. Other use includes animal feed, bedding material for animals and mushroom cultivation.

## Technology Transferred to the World



- ★ Project in progress or completed
- Field investigation conducted
- Trainees/interns hosted at Meiwa in Japan

#### Featured Projects

- JICA-funded pilot project on carbonization technology (Kenya, 2019-2021)
- JICA-funded feasibility study on carbonization technology (Kenya, 2017-2018)
- Introduction of two carbonization plants for water weed and rice husk (India, 2017-2018)
- Joint research project with Kyushu University funded by JICA and JST (Vietnam, 2014-2020)

#### Participated Conferences

- Seventh Tokyo International Conference on Africa's Development (TICAD VII) (Japan, 2019)
- UNIDO Regional Workshop for Climate Resilient Industrial Development (Kenya, 2018)
- Japan-Africa Business Forum (Japan, 2017)
- TICAD VI Follow-up Conference (Mozambique, 2017)
- Multi-Sectoral Forum on Air Pollution Control (Mongolia, 2016)
- Sixth Tokyo International Conference on Africa's Development (TICAD VI) (Kenya, 2016)



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