



# Vermicomposting of coffee waste and its integration with aquaculture, horticulture and poultry

## Preamble

The current population growth, industrialization, urbanisation and economic growth in the region has led to the generation of large quantities of organic wastes from numerous sources. Inefficient waste management systems and the growing population further intensify the degradation of the environment on which economic development is dependent. Ethiopia and Kenya are among the top coffee exporters in Africa. Coffee industries especially those located along water catchment areas such as rivers and towns are a serious threat to the environment because of disposal of coffee pulp, husks, and effluent. The toxic impact of coffee pulp and effluent is not only on human and livestock but also harmful to the ecosystem. The treatment and conversion of coffee pulp poses a technological challenge in the region which has resulted to increased pressure from environmental authorities to manage the waste in an environmentally sustainable way.

Biological waste treatment systems such as vermitechnology which uses biological organisms offers a cost-effective solution and is an opportunity to practice green agriculture. Despite its popularity in many parts of the world, vermicomposting is rarely used as a waste management system in eastern Africa. The project will establish an enterprise that will use vermicomposting technology to treat coffee waste collected from coffee processing industries to commercially produce nutrient-rich vermicompost for horticulture and feed for poultry and fish integrated in a cyclic system.

## Technology

Based on a cyclic system, the technology uses earthworms that manage organic waste by producing nutrient-rich compost (vermicompost). Excess earthworms from the system and chicken manure from poultry provide nutritious feed for fish.

Biowaste from coffee pulp will be collected from coffee processing industries and provided to the worms which in turn disintegrate the waste while feeding it to create a suitable medium for microbial action thereby converting it to vermicompost. The effluent from the fish pond which is enriched with fish and chicken waste can supply additional nutrient to horticulture farms. Furthermore, surplus production of worms will be fed on broiler chicken. The system is based on a pilot project undertaken by a previous partnership between Debre Berhan University and Ethiopian Biotechnology Institute (EBTi).

## Local and Regional benefits

Vermicomposting offers a more affordable biofertilizer as an alternative to chemical fertilizers and affordable feed for poultry and enhances productivity, improved soil fertility, nutritional and food security. Additionally, the system provides a more cost-efficient biological way to manage organic waste generated from agricultural processing industries thus minimizing the waste burden on the environment.

## Project Partners

- Debre Berhan University, Ethiopia
- International Livestock Research Institute (ILRI), Kenya
- Selian Agricultural Research Institute (SARI), Tanzania
- Wondo Genet College of Forestry & Natural Resources, Ethiopia

## Project leader

Gezahegn Degefe - Debre Berhan University, Ethiopia

For more information about this project, please contact:

**BioInnovate Africa**

International Centre of Insect Physiology and Ecology (*icipe*)

Duduville Campus, Kasarani P.O. Box 30772-00100 Nairobi, Kenya.

Tel: +254-20-8632433

Email: [bioinnovate@icipe.org](mailto:bioinnovate@icipe.org)