CROPS FOR THE FUTURE RESEARCH CENTRE
PROGRAMME CONCEPT NOTE
BIOMASSPLUS

Expanding on the Malaysia Biomass Initiative (MBI)

Problem statements

- Over-dependence on fossil fuels from rapidly depleting resources is a global issue.
- Malaysia recently launched the MBI to support development of renewable energy from biomass sources to reduce national reliance on fossil fuel for economic growth.
- Most biomass in Malaysia is derived from agricultural wastes, over 90% of which comes from the monoculture of oil palm.
- Underutilised biomass species could provide abundant, sustainable, ecosystem resilient and cost effective sources of biomass for renewable energy in association with that from oil palm.

Objectives

- To develop new underutilised biomass species that provides complementary and sustainable sources of biomass to oil palm for renewable energy.
- To provide economically viable and resilient biomass species for energy-derived well-being and income generation of small farmers and rural communities.
- To optimise agricultural productivity per unit area of plantation by efficient use of natural resources (light, soil and land space, moisture, biodiversity) through species diversification.
- To improve the environmental resilience of the oil palm production system to meet the requirements of the Roundtable on Sustainable Palm Oil (RSPO) and similar initiatives especially in the area of biodiversity, habitat conservation and reduced pesticide use and carbon footprint.
- To provide a methodological framework for sustainable expansion and management of oil palm diversification for ecosystem and economic resilience.
- To produce value-added products from sustainable underutilised biomass species.
- To understand the barriers to adoption of new biomass species by growers (smallholders and plantations).

Outcome

Commercially viable and environmentally sustainable underutilised biomass species in association with oil palm underpinned by scientific understanding of canopy and terrestrial scale processes operating in diversified vegetation systems.

Programme concept

- Use the CFFRC Field Centre as a multiple level case-study of candidate underutilised biomass species within an existing oil palm plantation, simultaneous and subsequent to replanting of oil palm and under varying canopy combinations ranging from monoculture to complex intercrops.
- Provide a systematic, long-term (5-7 years), multidisciplinary molecular to marketing, multilevel (soil to atmosphere), and multi-location (partner sites) transition study from monoculture to potential polyculture `biomass plantations of the future.'
- Use remote sensing, mathematical biology and modelling approaches to predict optimal and ecosystem resilient management systems for biomass plantations of the future.

CROPS FOR THE FUTURE RESEARCH CENTRE
PROGRAMME CONCEPT NOTE
BIOMASSPLUS
Expanding on the Malaysia Biomass Initiative (MBI)

- Provide sustainable technologies to convert underutilised biomass species into valuable products.
- Using established survey techniques, investigate attitudes of growers to adoption of new biomass species and identify any barriers to their uptake.

Potential partners

- University of Nottingham
- Malaysian Palm Oil Board (MPOB)
- Other research institutions
- Industries
- Private plantation groups
- Rural community organisations

Programme activities

BiomassPlus links CFFRC with partners in Malaysia and beyond. Initial opportunities will focus on objective selection of candidate species, the development, experimental use and analysis of the CFFRC field site as a base for intensive study and extrapolation to other locations and environments.

Research will span agronomic, ecophysiological and environmental studies at the canopy and field scale, processing and energy values of plant products, economic and operational analysis of the chain from production to end use and the integration of selected species within the oil palm production system.

In addition, sustainable technologies to convert the identified biomass species into value-added products will be identified and developed.