

Technology Fact Sheet for Adaptation

D. Conservation farming with *faidherbia albida* (Musangu tree) ⁱ

D.1 Introduction

Conservation farming in general refers to practices that in combination conserve soil, moisture, and fertilizer, seeds, energy and time.¹ It has a number of basic features which include: no burning of crop residues, correctly spaced planting basins established before the rains, early planting of all crops, early weeding and rotation with a minimum of 30% legumes in the system. There are many ways to practice conservation farming. The technology proposed here is conservation farming with agro-forestry, specifically the planting of *faidherbia albida* (Musangu tree) in the fields where crops are cultivated.

D.2 Technology characteristics

Faidherbia is an excellent agro forestry tree that contributes to soil fertility. Organic matter, nitrogen and other nutrients are added to the soil as a result of the falling leaves and seed pods. These leaves and seed pods are used as protein-rich livestock fodder, the tree bark as a medicine and the wood for construction. Unlike other trees, *Faidherbia albida* produces leaves in dry season and defoliates in the rains and this reduces competition for sunshine with the cultivated crop. The root systems and higher levels of organic matter in the soil increases water retention and assists to stabilize the soil against landslides and soil erosion.

D.3 Country specific applicability and potential

The *faidherbia albida* tree can grow in most parts of the country but requires many years to fully achieve their benefits on crop production. Therefore, the trees are found on very few farms in Zambia and would require significant sensitization and investment in promotion.

D.4 Status of technology in country

Conservation farming is well known and practiced by a number of small and medium scale farmers in Zambia. The main promoters have been the Conservation Farming Unit (CFU), the Ministry of Agriculture and Livestock Development (MALD), the Golden Valley Agricultural Research Trust (GART) and the Zambia Agricultural Research Institute (ZARI). Conservation farming is commonly practiced in Agro-Ecological Regions I and II.

In Central and Eastern province, some farmers are integrating conservation farming with agro-forestry. In this regard, tree species like *Faidherbia albida* (musangu), *Tephrosia vogelii* (ububa) and *Sesbania sesban* are used to promote soil fertility. *Sesbania sesban* was promoted in Eastern province by the International Center for Research in Agro forestry (ICRAF). Conservation with agro-forestry is not as wide spread mainly because benefits of agro-forestry only begin to show after years.

¹Conservation Farming Unit (CFU): Conservation Farming and Conservation Agriculture Handbook for HOE Farmers in Agro-Ecological Regions I & IIa - Flat Culture 2007 Edition

D.5 Benefits to economic/social and environmental development

In Zambia, recent observations by Conservation Farming Unit (CFU) in the 2008 growing season found that that unfertilized maize yields in the vicinity of *Faidherbia* trees averaged 4.1 tonnes per ha, compared with 1.3 tonnes in areas beyond the tree canopy. In addition, GART conducted studies on the *effects of crop rotation on the maize grain yield under and away from the canopy of young Faidherbia albida tree* from 2006/7 to 2009/10 farming seasons. The results indicated that significant higher yields were achieved under the canopy than away from the canopy. For instance, the yield of maize under the canopy was 2065 Kg/ha and away from the canopy was 1852 Kg/ha during the 2006/7 farming season.

D.6 Climate change adaptation benefits

There are many environmental benefits of conservation farming of the preservation of soil fertility is the most obvious. Besides this, conservation farming helps minimizing of soil erosion, growth of micro-organisms and reduction of the use of herbicides and fertilizers.

D.7 Financial Requirements and Costs

The unit cost of *Faidherbia albida* seedlings is ZMK 5000 (\$0.93). A total of 100 trees are required for 1 hectare piece of land. Therefore, a total of **ZMK 5,000,000 (\$943)** would be an investment cost in Zambia for seedling production².

ⁱ This fact sheet has been extracted from TNA Report – Technology Needs Assessment for Climate Change Adaptation – Zambia. You can access the complete report from the TNA project website <http://tech-action.org/>

² Conservation Farming Unit (CFU), Lusaka, 2012.