Gliricidia-based doubled up legume for improving crops production and agro-ecosystem resilience in Kongwa and Kiteto districts

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Key messages

- Extensive grazing and the use of crop residues for cooking energy are major drivers of land degradation in semiarid sites.
- Agroforestry technologies such as Gliricidia-based doubled up legume provide an opportunity to integrate crops production with fodder and energy supply to sustain production and build resilience.
- Tree-based doubled legume has comparative advantages in KK sites due to scarcity of firewood and high quality fodder.
- A network of champion farmers involved in testing and validating benefits of the tree-based doubled up legume can support scaling out this technology.

Objectives and approach

Purpose: To assess performance of a tree-based doubled up system for sustainable intensification and building resilience of dryland smallholder farming systems.

Approach: Field experiments were carried out in mother sites to assess ecological and economic benefits of (Fig 1 a & b). Baby plot demonstrations were established for validation and scaling purposes (Fig. 1c).

Key results

- Gliricidia-based doubled up legume improved maize yield by 33% in indicating positive effects of trees and pigeonpea.
- Maize yields in baby plots was also improved above farmer practice (1-1.5 t/ha) depending on site potential (Fig. 2).
- Firewood and fodder are bonus products of tree-crop production system with the advantage of reducing land degradation (Fig 3).
- Land equivalent ratio (LER) indicated yield advantage of intercropping maize with pigenpea alone (1.76) or in combination with Gliricidia (2.25).

Significance and scaling potential

- Over 50 farmers were involved in developing the tree-based doubled up legume in KK. Multiple benefits of this system noted here provide incentive for out scaling to more farmers in phase II.
- Over 120 farmers were trained to use Gliricidia and Melia spp as complementary fodder for livestock and poultry leaf meal (Fig 4).

Partners

Fig 1: Ox-ploughing **(a)** maize sowing in Manyusi doubled up legume mother site **(b)** and pruning for green manure supply and maize harvesting **(c)** in Gliricidia-pigeonpea baby plot at Laikala. **Photo credit A.A. Kimaro**

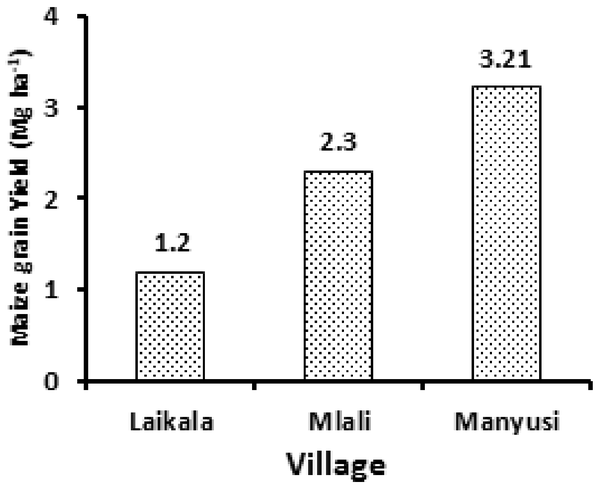

Fig. 2: Maize grain yields in baby plots of Gliricidia-based doubled up in Laikala, Mlali and Manyusi villages (n = 8) .

Fig. 3: Gliricidia harvested for firewood supply at Moleti, reducing labour and women's productive time spent in firewood collection. Tree planted in 2013.

Fig. 4: (a) Gliricidia fodder bank in Manyusi – planted 2016 **(b)** demonstration on the use of Gliricidia for poultry feeds at Mlali.

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