

Delivering climbing and drought tolerant bush beans in different soil health conditions in Dedza and Ntcheu districts of Malawi

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Challenges & Study objective

- ✓ Use of low yielding local varieties of beans, due to poor access to adapted improved varieties
- ✓ Low yields due to poor crop management practices worsened by declining soil N, B and SOC
- ✓ High rainfall variability, requiring informed choices and diversity of varieties
- ✓ In adequate postharvest handling skills in community seed producers

Main study objective: Increasing smallholder bean productivity through delivery of bush and climbing bean varieties and soil health management options under different cropping systems.

Introduced technologies

- i. Drought tolerant bush bean varieties and climbing bean varieties
- ii. Best fit agricultural practices in bean-maize cropping systems i.e. sole cropping, intercropping with maize and staking options.
- iii. Different soil fertility improvement options i.e. use of manure, use of inorganic fertilizer and use of a combination of inorganic fertilizer and manure

Evidence

- Use of fertiliser (23Kg N ha⁻¹ and 21 P₂O₅ Kg ha⁻¹) under bean pure stand can increase yield by 47% as compared to a bean pure stand with no fertilizer applied .
- Under favorable rainfall conditions, climbing beans yield (2558Kg/ha) 59% higher than bush beans (1500Kg/ha).
- During a drought season, bush beans perform 2 fold higher (1200Kg/ha) than climbing beans (627Kg/ha) (Figure 1).

Approaches of taking the technologies to scale

- Mother-baby trial approach for learning and adoption: 239 host farmers exposed to 42 mother trials and 197 corresponding baby trials in pure bean stands and maize-bean intercrops.
- Best fit combination selected through participatory technology selection during field days
- Integrated community based and formal seed systems for wider impact: in 2017/18 , 18 farmers were engaged seed multiplication for drought tolerant, marketable and high iron bean varieties on 0.2-0.4ha farms (Figure 3).
- Capacity development through lead farmer training in variety identification, post-harvest handling of seed for better quality in community seed schemes
- Participatory action research to check seed viability under two storage methods for 3 -12 months.



Figure 1: Caption on “magic beans”. <http://ciat.cgiar.org/magic-beans-beat-malawis-worst-drought-in-30-years/>



Figure 2: Climbing bean staking options and soil fertility options

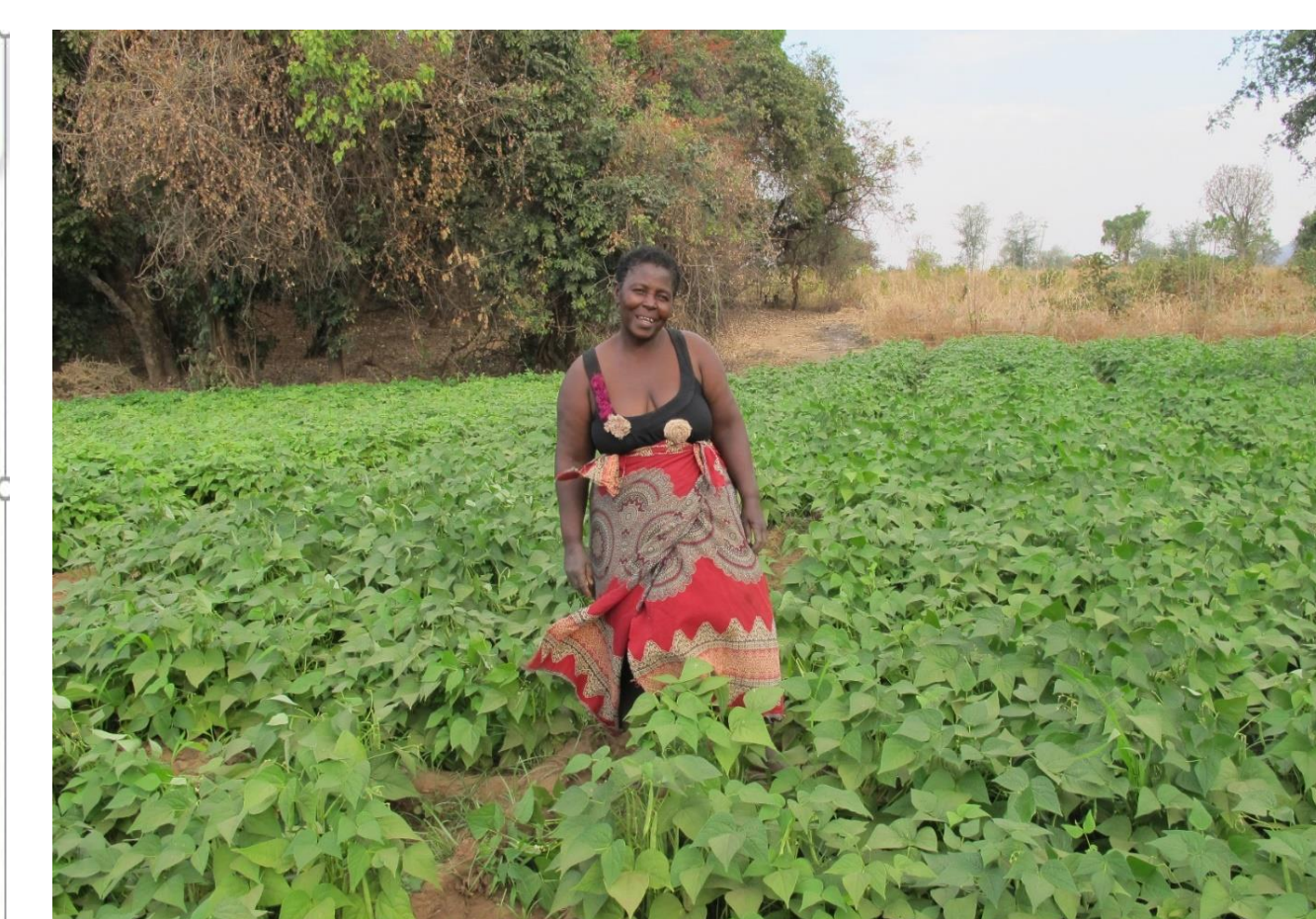


Figure 3: Community seed multiplication in Golomoti EPA

Proposals for the future

- Conduct further research on nutrient cycling and socioeconomic benefits of livestock manure integration.
- Collaboration across projects such as MSIDP in the target areas to increase access to bush bean varieties.
- Widen dissemination of drought tolerant bean varieties among farmers through mainstream formal delivery system and localized community seed schemes
- Diversify farmers options to include high yielding marketable bean varieties with high iron content and tolerance to drought for nutrition, income and resilience to climate change

Partners

