1) Introduction

Agriculture growth driven by intensification (fertilizer, high yielding seeds and plant protection chemicals), led to simplification of agro ecosystem wrt species and genetic diversity.

Declining land size, investment in irrigated agriculture for livelihood has lead to wider scale adoption of monocropping or narrow rotations in drylands with limited external inputs. So dryland soils are degraded with low soil organic carbon (SOC) and ‘natural fertility’.

Legume-based cropping systems (rotation and intercropping) combined with appropriate soil nutrient management strategies enhance SOC and ‘natural fertility’.

In short-run, farmer adopting a legume-based rotation must forgo returns from relatively high remunerative cereal crop for less remunerative legume crop. Any recommended crop diversification strategy must inform farmer on this trade-off in short-run and appropriate input management strategies in cropping system for sustainable long-run benefit.

Sustainable intensification (SI) of dryland cropping systems is defined as efficient allocation of external inputs (non-renewable resources) and temporal choice (long-run) of crops over finite period for given output, factor prices and crop yield level.

4) Analytical frame work

5) Key Results and Analysis

Maize, finger millet and groundnut are major crop in the region that are grown individually as monocrop or two crop rotation (finger millet and groundnut) or three crop rotation (finger millet, maize and groundnut).

Maize monocrop is most remunerative while groundnut monocrop is the least remunerative cropping system.

Maize monocrop is most remunerative while groundnut monocrop is the least remunerative cropping system.

Maize, groundnut and finger millet rotation can be rewarding at economic at 2.5 % monocrop yield penalty or more than 9.5 % monocrop yield penalty and rotation reward can make millet-groundnut rotation remunerative.

Groundnut and finger millet rotation can be rewarding at economic at 2.5 % monocrop yield penalty and rotation reward can make millet-groundnut rotation remunerative.

6) Conclusion

The information on required monocrop yield penalty or rotation reward for economic adoption of rotation under static model can be utilized to screen results agronomical experiments to identify suitable cropping system for SI.

The long term yield response to cropping system can be incorporated to allocate crops over time to improve productive capacity of soil.

Support tactical decision choice of crop, input intensity and management practices.