Abstract

Climate change and increasing climate variability present new challenges affecting human society in the 21st century. In an unfortunate twist of fate, the poorest countries whose economies and livelihoods largely rely on natural resources in sub-Saharan Africa (SSA) are amongst the most vulnerable. The impact of climate change and climate variability on crop growth and yields is largely determined by their impact on soil health and the capacity of crop varieties to adapt to the changing climate and weather patterns. Success stories of improved land productivity and climate resilience as a function of integrated soil fertility management (ISFM) interventions are widespread in subSaharan Africa. In a trial carried out across four districts in western Kenya, improved cereal-legume intercrop technologies increased maize yield by between 2.8 and 3.3 t/ha (≈ 300%). Further, across varying agroecosystems in 5 sub-Saharan African countries (Kenya, Uganda, Rwanda, Tanzania, Ghana), P fertilization + innoculation increased soybean crop yields by more than 200% in each country. Similarly, maize yield increases of up to 300% were observed in the drought stricken Sadore and Dasso regions in Niger upon use of appropriate fertilizers. The carbon input to the soil from these systems exceeded 2 t/ha implying that these systems are capable of mitigating climate change through carbon sequestration. The observed improved yields were linked to the capacity of ISFM to improve soil fertility, enhance soil organic matter, boost the soil water holding capacity and water use efficiency. The soil organic matter is crucial in soil nutrient processing and soil water retention. A number of challenges, related to inputs, information and markets constrain wide scale use of ISFM in SSA. Bringing these ISFM benefits to scale require agricultural policy reforms on access to appropriate fertilizer and seed inputs, agricultural advisory services and access to output markets.