The study focused on gaining an understanding of current farmers' practices and perceptions of locally evolving agroforestry trends and practices involving *Grevillea robusta* and *Melia volkensi* and their social and environmental relevance in dryland areas, in the eastern province of Kenya (Mbeere District). Pruning of tree roots as a technique for managing competition between trees and associated maize *(Zea mays L.)* crops for below-ground resources (water and nutrients) at the farm level was examined by comparing water use and nutrient accumulation by the trees and crop performance in root-pruned and unpruned hedgerow systems with equivalent sole crop control treatments during the 2000 short rainy season and 2002/03 long and short rainy seasons. Landsat satellite images for the years 1988 and 2000 were used to assess the impact of such agroforestry practices on vegetation cover at the landscape scale. The results show that subjective opinions provided by previous farming experience, association with other farmers, and the ease of propagating and establishing trees were the most important factors in promoting the adoption of *Grevillea robusta* by farmers. Conversely, the difficulty of establishing *Melia volkensii* was a major factor limiting its adoption. Root pruning of trees reduced the growth of *Grevillea*, and trunk basal diameter, diameter at breast height, canopy width and tree height were all lower in root-pruned than in unpruned trees ($p<0.001$). Maize grain yields were reduced relative to sole crops in systems containing unpruned trees, but were increased by root-pruning ($p<0.004$). Although root pruning generally reduced transpiration, factors such as soil characteristics and tree species were important. Exclusion of tree roots from the cropping area did not improve short-term supplies of soil organic N and P to meet crop requirements, as no significant differences in %N or extractable P concentrations were found between rootpruned and unpruned treatments for any of the species examined. However, soil moisture content adjacent to root-pruned trees was greater than in the equivalent unpruned treatment for all species ($p<0.001$). Trend analyses performed using data series generated from the years 1988 and 2000 Landsat images using the Normalised Vegetation Difference Index (NDVI) showed that notable changes in vegetation cover occurred during this period. Further analysis revealed an association between the observed NDVI trends, rainfall distribution and land use/land cover type within the study area. It was concluded that tree species with limited perceived and practical value are of little interest to resource-limited farmers, irrespective of the extent of their complimentarity with understorey crops or environmental value. Root pruning of trees improves access to available soil water for associated crops by enforcing niche differentiation, but may also reduce tree growth rate. Moreover, cumulative removal of nutrients such as nitrogen and phosphorus from the system over a period of years cannot be avoided or ameliorated by root pruning. The current agroforestry-based human-induced type of land cover may be associated with increased biomass of vegetation compared to unmanaged natural land cover types within the study area.