

Wood energy provides 70% of Kenya's national energy need and is expected to continue as the country's main source of energy for the foreseeable future. However, despite the importance of wood energy in the economic development, woodfuel data are scarce and characterized by high degree of uncertainty that makes it difficult to undertake relevant wood energy planning and policy formulation. This study was carried out in the Kiambu, Thika and Maragwa districts of Central Kenya. It aimed at developing micro-level wood energy plan that would act as a case study for future decentralized wood energy plans in Kenya. The study objectives were to analyze the potential of wood energy planning factors in the study area; to determine the supply networks and consumption of woodfuel and analyze utilization technologies used in reducing the amount of woodfuel consumed; to develop a decentralized wood energy plan and its implementation strategies aimed at meeting the demand and supply of woodfuel in the study area and finally to analyze the economic importance derived from the use of wood energy. Primary data was collected from households, vendors, producers, transporters of fuel wood and service/production institutions comprising factories/industries, schools, restaurants, hospitals and prisons using structured questionnaires. Secondary data was collected from existing information on wood energy and related areas from various institutions. Data was analyzed using the Statistical Package for Social Sciences (SPSS) where descriptive statistics, chi-square, correlations, Kruskal-Wallis test and ANOVA were used. The supply and consumption data were projected from base year 2006 to 2018 (Planning period). Sustainable supply was matched with demand over the planning period. Scenarios were developed with implementation strategies aimed at bridging the deficit gap. The study established a deficit between supply and demand balance of -41.7%, -45.6% and -50.1% of woodfuel in 2006 for Kiambu, Thika and Maragwa districts respectively. Four scenarios were created with their implementation strategies which included allocation of 16%, 19% and 21% of gazetted plantation forest in respective districts to fuel wood production, increase of improved stove technology, increase of on-farm tree planting area and use of a combination of alternative energy sources. The combination of all these strategies gave a projected surplus of woodfuel in all the districts by 2018. Consequently, the income from the projected woodfuel consumption for Kiambu, Thika and Maragwa was about Ksh 371,848,400, Ksh 534,536,800 and Ksh 337,862,000, respectively in 2006 which was expected to increase to Ksh 490,925,400, Ksh 615,616,400 and Ksh 410,959,400, in that order by 2018. In conclusion the study found out that more than 70% of woodfuel was sourced from farmlands and the household area under tree was significantly correlated to household land size. On average, about 72% of the households had less than 0.2 ha of their land under trees and *Grevillea robusta* and *Eucalyptus* spp) were the most preferred species. Inadequate land was found to be the major constraint to tree planting. On average, about 66% of the households used 3 stone stoves while only an average of 24% had adopted improved stoves. The study recommends implementation of the suggested supply and demand strategies to reduce the huge deficit between supply and demand. Other recommendations include; integrating woodfuel production with farming systems, improving wood energy production and utilization technologies and improving wood energy data base for planning purposes.