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Evaluation of climate and soil properties in parts of Dodoma district, Tanzania in
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Information on climate and soil in Dodoma district, Tanzania is coordinated and interpreted in terms of potential for afforestation and village afforestation. Dodoma district covers about 16,600km², and is dominated by pre-Cambrian metamorphic rocks with extensive granite intrusions. Altitude and slope are generally less than 1,320m and 10percent respectively. The climate is semi-arid. Hence annual rainfall is slightly over 500mm, with a five to six months dry season. Climatic analysis concentrated on rainfall from 16 stations. Ten day intervals were used as a basis for evaluating short term moisture availability fluctuations. Analysis concentrated on rainy days, the distribution of rain, its probability of occurrence both in the rainy season and after planting trees in the field. Aerial photographs and geological and topographical map were used in locating soil sampling sites on six traverses in a sampling area of 124km². Soils were sampled at 37 places. Rainfall is the main limiting factor to tree growth. There is an average of two to three rain days per 10day period during the rainy season but variability is high and rainfall unreliable for individual decades. The PH, electrical conductivity and available water values generally show increases down the slope, demonstrating a need to consider alkalinity and salinity tolerance, and general water requirements when species are to be chosen for afforestation in the area. Fairly homogeneous afforestation units (i.e. forestry land use classification units) were recognized by reference to aerial photographs, geological and topographical maps, soil analysis and rainfall data. Water balance calculations indicated that though most of the forestry land use categories often may not reach field capacity there is a significant relationship between total monthly rainfall and run-off ($r=0.93$). The need for soil water conservation is emphasized. From planting experience to date *Azadirachta indica*, *Cassia siamea*, *Casuarina equisetifolia*, *Ducalyptus camaldulensis*, *E.citriodora*, *E.tereticornis* variety Zanzibar "C" *Chelone arborea*, *Grevillea robusta* and *syzygium cumini*, appear promising trees to grow in the area. It is concluded that successful village afforestation programs would diversify the district's economy because some species (e.g. *Acacia albida*) have agro-forestry potential while others (e.g. *Melia azedarach*) are suitable for paper production or (e.g. *Prosopis chilensis*) may promote beekeeping.

It is suggested that integrated planning should be used to cope with the direct and indirect effects of the afforestation programs.