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Preparing for the future climate

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**Will the native fruit tree *Parkia biglobosa* remain adapted in the West African parklands? -Preparing for the future climate**

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Our presentation focuses on patterns of genetic adaptation of *Parkia biglobosa* in West Africa, and its implication for the likely impact of climate change in the region. We study *Parkia biglobosa* because it is an important traditional economic tree legume of considerable multipurpose importance. It provides fodder, human food, fuel wood, timber, green manure, medicine, shade for forage grasses and livestock, protects soil from heat, and it is important in soil nutrient cycling. The fermented seed (dawadawa or soumbala) is a popular, protein rich condiment in many West African countries. The natural distribution of *Parkia biglobosa* extends from Senegal and Guinea in West Africa eastwards to Uganda. In the western part of its range it occurs more or less throughout the area, but east of Cameroun its distribution is more scattered and restricted. *Parkia biglobosa* grows in multiple climatic zones with precipitation ranging from 700 mm to 2500 mm a year. This amplitude indicates that the species can grow under quite different environmental conditions. Still, the species is currently disappearing from the Northern range of the distribution area, at least in part because of a decrease in rainfall since the 1970'ies. Based on analysis of observations over a 15 years period of survival, growth and leaf morphology in three Burkina transplanting experiments, we provide evidence of strong genetic differentiation between *P. biglobosa* populations within West Africa. Our results from Burkina Faso point towards superior fitness of local populations, and suggest that the presence of a continuum of locally adapted populations is a part of the explanation for the species' ability to thrive under quite different climatic conditions across West Africa. Patterns of fine tuned local adaption is well known for many tree species growing under temperate and subtropical conditions, but data from parkland trees in the Sudano-Sahel region is still very limited. We emphasise that knowledge on adaptation patterns is important, because rapid climatic changes may provide severe challenges to the continued health and productivity of locally adapted tree populations. This is supported by the decrease of *Parkia* trees in the Northern part of Burkina Faso during the last three decades. With the above findings as point of departure, we outline how research, conservation and development of the genetic resources of *P. biglobosa* are combined within the SAFRUIT project (a regional EU supported research project initiated in 2006 and coordinated by the University of Copenhagen). We describe the research in Burkina Faso including mobilisation of local gene pools, initiation of robust testing schemes, and development of genetic diversified deployment strategies for future healthy and productive *Parkia biglobosa* trees.