

The Tree Biotechnology Project – Kenya (TBPk)

Title April 2002	Tree Biotechnology Project Kenya, A Biotechnology Transfer Project between South Africa and Kenya
Project leaders	Mr. Benson Kanyi, Manager TBPk, Mr. Joseph Kibe, Chairman Tree Project Board Kenya Gatsby Trust (KGT) - Kenya Mr. Errol Duncan - Mondi Forest, South Africa Mr. Laurence Cockcroft - Consultant, Gatsby Charity Foundation (GCF) - UK
Tech Donors	Mondi Forest Limited - South Africa Department of Biology - University of Natal-Durban Campus, South Africa
Collaborators	Forest Department, Ministry of Environment and Natural Resources – Kenya Forestry Research Institute (KEFRI) - Kenya Dept. Biology - University of Natal – South Africa Mondi Forest Limited - South Africa Kenya Gatsby Trust
Facilitator	International Service for the Acquisition of Agri-biotech Applications (ISAAA) – <i>AfriCenter</i> , Nairobi, Kenya.
Donor	Gatsby Charitable Foundation (GCF)-UK, through Kenya Gatsby Charitable Trust – Kenya
The Needs	In Kenya and many other African countries, the rural communities that form over 80% of the population depend almost entirely on firewood for cooking energy. In Kenya alone, it was estimated that by the year 2000, 65% of this rural fuel wood demand was unmet. The major bottleneck to impact afforestation and reforestation in Kenya is the unavailability of desirable tree seedlings during the planting season. This project has introduced at Forest Department head office at Karura Forest facilities for large-scale rapid macro propagation biotechnology techniques for the clonal multiplication of selected popular tree species in Kenya in order to address this bottleneck.
Objectives	To improve the living standards of rural families in Kenya, particularly of the resource poor segment of the population, by enhancing forestry production through the integration of improved and proven tissue culture and other forestry biotechnologies into traditional propagation systems. The project will positively impact the overall quality of the environmentally, socially and economically.
Planned activities	1997 Establishment of field trials 1998 Data collection and evaluation 1999 Construction of clonal nursery facility at Karura Forest 2000 Clonal propagation of three tree species, <i>Eucalyptus</i> , <i>Grevillea</i> , and <i>acacia spp.</i> Mondi Forest has donated ten introduced <i>Eucalyptus</i> clones of “GC” which are now being commercially deployed in Kenya. These clones are improved for good performance in marginal areas, fast growth, and high calorific value suitable for fuel wood and construction. <i>Acacia melanoxylon</i> (Australian blackwood) is a proven hardwood alternative for the carving industry that should reduced demand for Khaya and Ebony 2001 Field testing of new clones from Mondi Forests of South Africa 2003. Clonal propagation of other local popular tree species such as <i>Mellia volkenssi</i> and <i>Prunus</i> . <i>Mellia volkenssi</i> is very popular tree species in marginal areas and is used for fuel wood (firewood)

	<p>and charcoal), construction, fencing and medicinal applications. <i>Prunus</i> is a popular local species which has application fuel wood (firewood and charcoal), construction, fencing and medicinal applications.</p> <p>2004. Research and development of the tunnel techniques in clonal propagation at the Karura nursery.</p> <p>2005 Optimization of the tunnel technique for community based clonal propagation.</p> <p>2006 Trials of the tunnel techniques in regional center to capture agro-climatic variations.</p>
Anticipated Impact	This project will contribute to a significant increase in afforestation and reforestation. It will also increase commercial forestry while delivering a model project for private/public South/South technology transfer. It shares technologies and capacity building experiences with Uganda and Tanzania within the East African context. The established facility will also enhance applied upstream research and screen for locally produced germplasm; while integrating traditional propagation methods with new improved biotechnologies.
Status of Technology	Successfully commercialized. The technologies being transferred to Kenya originated from ??England and have been used in Brazil, but they have also successfully been established and utilized in South Africa—especially <i>Eucalyptus</i> —for several years.
IPR	The transfer of proprietary improved <i>Eucalyptus</i> germplasm from Mondi Forests, South Africa, to Forest Department, Kenya, has been done under a research agreement. Utilization of this superior germplasm for commercial forestry will require some negotiations and IPR considerations.
Biosafety	None because it is non-transgenic technology
Environment Impact	The reforestation and afforestation achieved through this project will be a major positive environmental impact, especially to the rural communities that depend on firewood energy to cook their foods. A lot of deforestation and loss of top soil due to soil erosion have occurred because of a lack of seedlings to plant to replace the trees cut for firewood.
Other Issues	Quarantine phytosanitary requirements and import permit was required for this germplasm transfer, especially as the materials were potted in an artificial media mixture.
Duration	Phase I- 4 years 1996-1999 - technology transfer, field testing and applications Phase II – 3 years 2000 - 2003 - commercial feasibility; Phase III – 3 years 2004-2006 – clonal commercial deployments and distribution streams establishment
Progress to-date	<ul style="list-style-type: none"> • There has been successful nursery establishment with local seed germplasm of <i>Eucalyptus</i>, <i>Grevillea</i> and <i>Acacia</i> as well <i>Eucalyptus</i> clonal nursery with transferred clonal germplasm from Mondi Forest, South Africa for field trials, clonal hedges, clonal nurseries, macro-cutting system development for production of clonal planting materials. • Field trials for comparison, testing and demonstration of performance of both local and introduced clonal <i>Eucalyptus</i> germplasm from South Africa, are being conducted in seven selected suitable ecological forest zones in Kenya. • The clonal nursery establishment complete and operational. Production of clonal planting material was 100,000 in year 2001. These materials increase to 250,000 plantlets in 2002, 550,000 in 2003, 1,000,000 in 2004,

1,500,000 in 2005 and 2,500,000 this year.

**Specific
Challenges**

- Bureaucratic system caused lengthy delays of over six months loss of time and finances due to lack of project implementations that was initially not anticipated. The drought and pest incidences present major challenges in both adoption and diffusion processes.

Future challenges include:

- Once the technology has been demonstrated to be effective, similar production system will be established to widen biodiversity in species such as *Grevillea*, *Mellia*, *Prunus* and *Acacia*.
 - Establishing an effective and efficient tree seedling distribution and marketing system to reach all the needy rural farming communities in Kenya.
 - Demonstrating the commercial feasibility of the technology and privatization of the project through market driven strategies to ensure sustainability of benefit streams after expiry of the grants.
 - Technologies transfer to Tanzania through adoption and diffusion, which at the moment is at nascent stage.
-