ANY NEW FORESTS FOR AFRICA?

Actions Required for Growth

17 March 2016
Mads Asprem
CONCLUSION
Actions required to expand forests and restore landscapes in Africa

▲ Several recent studies show the need to significantly expand the global plantation forests, including reports by Nova Institute and WWF’s Forest for a Living Planet. Land availability means that Africa has to be part of any meaningful expansion of the world’s plantation forest areas.

▲ There is huge potential to expand forest cover in Africa, and Africa has excellent people to do it.

▲ African forestation creates more positive social, environmental and economic impacts than establishing new forests anywhere else in the world. We believe the landscape model will be the only successful approach to forestation in Africa.

▲ Private companies are the locomotives in African forestation:
  ▪ accounting for all large scale forestation, while Government plantations are shrinking
  ▪ developing wood processing facilities producing environmentally friendly, high quality products and benefiting 1000s of small forest owners supplying the new factories

▲ It is the private sector that does ‘proper’ forestry in Africa. Private companies have established and own all African FSC certified plantation forest outside of South Africa.

▲ Only 100,000 ha plantations established since 2000 is a fraction of what is needed. Planting peaked in 2011 and is smaller than the loss of Government plantations during the same period.

▲ Development banks should play a positive role in funding for private forestry companies. Equity and 15-20 years debt with realistic interest must be made available if large scale planting is to take place.

▲ Donors should recognise that the private sector is the best channel for forestation and landscape restoration and shift significant grant support towards building infrastructure for private sector forestry.

▲ Carbon finance should focus on practical and implementable projects that are benefiting the environment and local people. Successful REDD+ projects (ex rainforests) must include afforestation.

▲ No. of funded planted & certified trees should be a key impact matrix for donors and lenders.
BACKGROUND
Increased demand/ supply imbalance in the global fiber and biomass markets

▲ Leading forestry consultants forecast various degrees of wood shortage going forward, concentrated on Asia and Africa

▲ WWF’s Living Forest Model (2011) developed together with IIASA argues that 241-304 m ha of new managed (plantation) forests are needed by 2050 to reach ‘Zero Net Deforestation and Forest Degradation’. WRI is working for 100 m ha new forest for Africa.

▲ Nova-Institute forecasts a need to almost double the global Planted Forest from 290 m ha in 2011 to 490 m ha by 2050 assuming ‘business as usual’. IFC says current planting levels are ¼ of the global requirement

<table>
<thead>
<tr>
<th>Demand in traditional markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>▲ Good demand in traditional markets</td>
</tr>
<tr>
<td>▲ Solid wood products grow and are gaining share in part of the building sector. Emerging market’s panel board consumption has grown strongly during the last decade, eg 8% pa in Brazil which has the fastest wood market.</td>
</tr>
<tr>
<td>▲ Tissue, carton and containerboard are growing fast, accounting for ¾ of demand from largest pulp producers.</td>
</tr>
<tr>
<td>▲ African markets, where GR sells all its products today, are among the world’s fastest growing. Most countries are net importers of most wood products.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Growth of bio-energy and chemicals</th>
</tr>
</thead>
<tbody>
<tr>
<td>▲ Growth of bio-energy and chemicals</td>
</tr>
<tr>
<td>▲ Global dissolving pulp demand has doubled during the last decade, to about 7 m tons. Wood based chemicals R&amp;D has dramatically increased, but still account for a small part of the markets for wood, and is focus area for leading forestry companies</td>
</tr>
<tr>
<td>▲ The markets for fuel-wood and charcoal continue to grow 3% pa in Africa</td>
</tr>
<tr>
<td>▲ The EU will need to import 200 m m³/yr (= 1.5x Nordic production) biomass to achieve 20% of energy from renewable sources. China’s NDRC target wood pellet is up from 2m/t in 2009 to 50m/t per year in 2020</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reduced planting</th>
</tr>
</thead>
<tbody>
<tr>
<td>▲ Reduced planting</td>
</tr>
<tr>
<td>▲ Global annual planting has fallen 50% since 2008. Australia, recently the world’s largest chip exporter and a top 3 planter in the 2000s, will see significant contraction of planted areas in the 2010s. South Africa and New Zealand are also experience shrinking plantations. New Chinese plantations are smaller and have higher costs then expected</td>
</tr>
<tr>
<td>▲ Government forests in Africa are rapidly depleting, with Tanzania harvesting predicted to collapse in 2018-20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Deforestation and insect infestation</th>
</tr>
</thead>
<tbody>
<tr>
<td>▲ Deforestation and insect infestation</td>
</tr>
<tr>
<td>▲ WWF forecasts large deforestation by 2050: 112 m ha in Africa, 82 m ha in Latin American and 38 m ha in Asia-Pacific</td>
</tr>
<tr>
<td>▲ Indonesia’s acacia is dying. Significant insect infestations in US North-West have occurred, with up to 1bn m³ of biomass infested in British Columbia by the Mountain Pine Beetle and significant declines in N.W. Russia and Siberia</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Competing land use</th>
</tr>
</thead>
<tbody>
<tr>
<td>▲ Competing land use</td>
</tr>
<tr>
<td>▲ Higher land prices due to greater land-use pressure in many regions because of rising demand and land restitution in South Africa and New Zealand</td>
</tr>
<tr>
<td>▲ Uruguay has experienced land price increases of 400-500% over the past decade. In Brazil, land prices in Parana and Santa Catarina, the two main pine states, have risen 22% and 33% per annum, respectively, since 2003</td>
</tr>
</tbody>
</table>
Tanzania, Mozambique and Angola are the three African countries in the world identified as having ‘good potential to establish new plantations’, by Poyry, a leading forestry consultancy.
Since 2000, private companies have established 100,000 ha new forests in Africa – a drop in the ocean

This private planting has primarily been done by entrepreneurial companies backed by individual private shareholders, not by investment funds and only to a small extent by institutional shareholders

The Government sector has been completely absent, except Safcol’s planting in Ifloma, Mozambique, and the net loss of Government forest plantation forest is believed to far exceed what the private sector has planted

<table>
<thead>
<tr>
<th>African Plantation companies (ex RSA) July 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planted areas in ha, excl rubber</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>1 Min of Agriculture (MoARD)</td>
</tr>
<tr>
<td>2 Kenya Forest Service</td>
</tr>
<tr>
<td>3 HCEFLCD</td>
</tr>
<tr>
<td>4 Gov’t plantations (incl. Sao Hill)</td>
</tr>
<tr>
<td>5 Comp. de Celulose e Papel de Angola</td>
</tr>
<tr>
<td>6 ZAFFICO</td>
</tr>
<tr>
<td>7 Malawi Forestry department</td>
</tr>
<tr>
<td>8 Green Resources</td>
</tr>
<tr>
<td>9 NHR Investments (Montigny)</td>
</tr>
<tr>
<td>10 Caminho de Ferro de Benguela</td>
</tr>
<tr>
<td>11 Eucalyptus Fibre Congo (MagForestry)</td>
</tr>
<tr>
<td>11 Direction Générale des Forêts</td>
</tr>
<tr>
<td>12 Rift Valley Corp (Boarders and FdN)</td>
</tr>
<tr>
<td>13 The New Forest Company</td>
</tr>
<tr>
<td>14 GEF (Shiselweni, KVTC)</td>
</tr>
<tr>
<td>15 Allied Timbers</td>
</tr>
<tr>
<td>16 Wattle Company</td>
</tr>
<tr>
<td>17 Rai Group</td>
</tr>
<tr>
<td>18 Safcol (Ifloma)</td>
</tr>
</tbody>
</table>

... Global Woods (IWC) | Uganda | Germany | Fund | 5,700 | 5,700 | 1,000 |
| Portucel | Mozambique | Lisbon | Public | 4,000 | 4,000 | 2,700 |
| Form International | Ghana, Tanz | Netherlands | Private Neth | 3,500 | 3,500 | 1,000 |
| APSD | Ghana | Ham, Germany | Private Brazil | 3,000 | 3,000 | 2,000 |
| MIRO Forestry | Ghana | London | Private UK | 2,500 | 2,500 | 1,000 |

Source: Company Data, Poyry; Some data included 2015 planting
EXPANSION OF AFRICAN FORESTRY

African wood supply: South Africa’s plantation, natural forest and little else

- We believe the productive plantation area in Africa is smaller today than 20 years ago.
- Natural forests provide the largest supply of wood in Africa, primarily used for local energy consumption. In Central and West Africa (and some from Mozambique) there are significant hardwood log and wood products export.
- However, plantations accounts for ¾ to 90% of the supply to the industrial roundwood market.
- South Africa accounts for almost half of all plantation forestry in Africa, with an annual harvest of about 20mn m3, ¼ of the level in Sweden and 1/3 of the level in Finland. There is a meaningful annual reduction in the forest area in South Africa due to attraction and pressure of competing land uses.
- In East Africa, Tanzania and Kenya have the largest plantations, according to Poyry, mostly in Government forests. However, our analysis will show that both countries face shortage of wood.
- There are meaningful forest plantations in West Africa, but much of these are rubber plantations.
- There has been virtually no new planting in Africa during the last two decades. At the same time, Government plantations have seen a rapid decline in the amount of standing forest, as the harvesting has exceeded new planting.
- GEF, the South African focused forest investment fund, is portraying the African forestry assets and opportunities in the table to the right.

**Note:** The table and diagram show the distribution of forest plantations across different countries in Africa, highlighting the significant contribution of South Africa and the challenges faced elsewhere.
Tanzania has East Africa’s largest remaining plantation forest in Mufindi, Southern Highlands.

The Government’s largest plantation, Sao Hill Forest Project will see significant decreases in AAC from 2017.

Private forests will make up much of the shortfall in Tanzania

- Private company’s are set to supply 600-800,000 m³/year from 2017, with GR being the largest supplier
- Non-industrial private forest owners already contribute about 200,000 m³/year and will double over the next decade based on Indufor’s forecast. GR believes both figures are conservative

There are similar situations in other African countries where Governments still own plantations. In Uganda, the Government forests are already finished, and others are rapidly depleting in other countries.

Source: Indufor

---

**Tanzania theoretical harvesting potential**

- **Gov plantations**
- **Natural forest**
- **Private company plantations**
- **Non-industrial private forest**

**Source:** Indufor
FSC is the world leading standard for sustainable forest management. Green Resources believes FSC is a foundation for successful greenfield forest plantation because it:

- Supports creation of high quality forest
- Monitors community relations
- Ensures high environmental standards

The private sector has established and operate all FSC plantations in Africa. More than 90% of this is done by three companies in East Africa and led by the entrepreneurial companies.

In addition to FSC, Green Resources typically has two layers of carbon certification that add rigor to the operations and secure compliance with the toughest international standards.

In total, Green Resources had more than 60 independent 3rd party assessments or audits since 2008, not including DD reports.

- More than 20 of these are publically available
- Direct costs have been USD 2m and total costs exceeded USD 5m

### GR’s FSC™ certified area by country

<table>
<thead>
<tr>
<th>Country</th>
<th>FSC Certified Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanzania</td>
<td>30,042</td>
</tr>
<tr>
<td>Uganda</td>
<td>10,334</td>
</tr>
<tr>
<td>Mozambique</td>
<td>16,666</td>
</tr>
<tr>
<td>TOTAL</td>
<td>46,085</td>
</tr>
</tbody>
</table>
In East Africa, small sawmillers utilise 1/3 of the raw material. About 40% of the harvested wood is converted at GR’s Sao Hill Industries, with a target of 2/3 by the end of 2016, with a final target of 90%.

Increased recovery represents good resource utilisation, but importantly also increases the value of the forest and stimulates further planting.

Industrial scale sawmilling is required to produce clean chips from the wood residuals, which have been delivered to East Africa’s largest pulp mill since 2015.

At the end of 2015, Green Resources will start up a USD 2m wood briquetting factory (below). All production is sold to replace fossil fuel or unsustainably managed wood. The key raw material is sawdust, the only remaining wood residual with no market at Sao Hill.

Small sawmillers will be able to deliver sawdust to the new wood briquetting factory, creating benefits for the local wood processing industry and small forest owners.
The large plantations of GR, Portucel, Rift Valley and originally UPM, are centred to Northern Mozambique, mostly in the Nacala corridor where the infrastructure has improved dramatically during the last three years.

Electricity brought 80 km to Mecuburi in 2012, the HQ town of the district with the largest land allocation to GR.

Mobile coverage and internet connection have reached most of the forest plantations by 2014.

A large upgrade of the Nacala railroad, which will enable it to transport more than 24 mn tons of goods per year. Lurio GR has secured a strategically located site at one of the few stations on the upgraded line.

A new high quality tarmac road was completed in 2014 from Nampula city westwards to Ribaue, through the areas the Lurio plantations, replacing a poor gravel road.

A large terminal, primarily for coal, for Cape sized vessels to be operational in Nacala harbour in 2015. The main container and bulk harbour is also being upgraded, where GR has been allocated a chip mill site.
All successful large scale plantations in Africa have to follow a landscape model. The diagram outlines the following initiatives:

- **Green Resources’ large scale forest plantations**
- **Support local SMEs and farmers implementing community woodlots**
- **Agriculture Development Program**
- **Sustainable firewood and charcoal production / household energy**
- **Alternative livelihoods programme – Apiculture, Non TIMber Forest Products**

These initiatives aim to:
- Reduce pressure on natural forest
- Promote conservation and REDD

**RURAL DEVELOPMENT AND POVERTY ALLEVIATION**

**DEVELOP FORESTRY, AGRICULTURE, ENERGY SUPPLIES AND ALTERNATIVE LIVELIHOODS IN THE REGION**

**CARBON FINANCE SHOULD BE AN INTEGRAL REVENUE STREAM**

▲ Creating a triple bottom line, for:
- Shareholders/
lenders
- Environment
- Livelihoods

▲ In tune with WWF’s New Generation Plantations
LANDSCAPE APPROACH WITH LARGE ENVIRONMENTAL AND SOCIAL IMPACT
Unparalleled economic and social benefits for remote rural areas

Forest establishment and maintenance are highly labour intensive. Afforestation creates employment in areas with typically no or limited alternative employment and this is the main short-term economic benefit of forest plantations. However, this goes hand in hand with community development and GR is responsible for 50-75% of the public infrastructure in the villages where it has operated the longest in Tanzania:

▲ Uchindile Forest
- 4 classrooms and office, Uchindile primary school
- 2 classrooms, Uchindile secondary school
- Dormitory for 48 girls, Uchindile secondary school
- Accommodation for eight teachers, Uchindile
- Dispensary and 2 Nurse’s houses, Kitete
- School with 2 classrooms, Kitete
- Village office and community hall, Kitete
- Community hall, Uchindile

▲ Mapanda Forest
- Teacher’s house, Mapanda primary
- 2 classrooms, Mapanda primary school
- Maternity Ward, Mapanda dispensary
- Community hall, Chogo
- Primary school, Chogo

▲ Idete Forest
- Primary and nursery school, Idete
- Community hall, Idete
- 2 classrooms, Makungu primary school
LANDSCAPE APPROACH WITH LARGE ENVIRONMENTAL AND SOCIAL IMPACT
Plantation forestry contributes to bio-diversity and conservation

▲ Green Resources is establishing new forest on grassland and degraded forest land (left picture from Tanzania).

▲ GR protects all wetlands and valuable habitats (e.g. Miombo woodland). High Conservation Value areas, wetlands, cultural sites and other valuable areas are identified by experts during the initial Environmental Impact Assessments and then managed by GR’s specialist environmental teams.

▲ 50-60% of the degraded forest OR grass land where GR is planting is typically converted to plantation forestry. When the annual fires are controlled in the remaining areas, large areas of natural forests are re-appearing in valley bottoms and other protected areas. Thus, the mosaic-based forest plantations help to contribute to re-growth of natural forests in valley bottoms and thereby increased biodiversity (right picture below).

▲ Almost 90% of East Africa’s population depend on wood based energy and providing an alternative sustainable source of wood based energy is a pre-requisite to halt deforestation, which can be done through plantation afforestation.

▲ Forestation can help fight erosion, and the presence of increased root systems limits soil erosion and water leaching. Green Resources diligently monitors hydrological resources, including water flow and quality at its operations.

▲ Most important: reforestation captures and stores carbon and is the basis for future production of renewable materials.
FORESTRY FINANCING
World’s most profitable planting in Africa, but returns too low for private capital

▲ South/ Eastern Africa might provide the world’s the lowest cost wood fibre and the highest return tree plantations, targeting to be among the world’s 10% lowest cost plantation wood suppliers.

▲ Mozambique and Tanzania are attractive locations for plantation forestry in Africa according to experts, including FAO, IWC (below), Poyry, Indufor, etc. with returns estimated at exceeding the African average.

▲ Africa is identified as the world’s highest return location for new forest plantations by RISI’s world leading Global Tree Farms Economics Review, generating unlevered cash IRR of 11% (as presented by GEF below).

▲ However, this is not sufficient return to attract private long term capital in emerging markets. Thus, long term financing at acceptable rates is required to accelerate planting activities.

▲ Development banks should offer 15 year loans, with appropriate grace periods.

▲ The Green Climate Fund, Climate Investment Fund, Global Environmental Fund, donor guarantees, etc must expand funding for the private sector and should offer longer term financing.

(1) Low Establishment Costs + (2) Solid Productivity + (3) Good Prices = High Returns

Source: RISI 2012 Global Tree Farm Economics Review; Notes: MAI defined as the commercial volume yielded from thinnings and clearfell over the rotation age, i.e. excludes volumes lost in operations, and from fire, disease, pests etc.
FORESTRY FINANCING
Grants must substitute for the tax incentives that have driven forestation in ROW

▲ Tax incentives, concurrent (not future) direct or indirect, have played a key role in providing cash support for establishing new forest plantations around the world, including **every** major Southern hemisphere forestry country.

▲ Tax incentives have not and will not play a role in establishing new plantations in sub-Saharan Africa.

▲ Small cash grants (through the EU and Norwegian funded SPGS) have worked well to establish vibrant medium sized forest plantation sector in Uganda, and small scale grants have supported the industry.

▲ However, a typical picture is the financing of Green Resources: USD 300m of private equity capital has been invested in the companies that make up the current Green Resources, compared to USD 40m of development loans principals and USD 2 m of grants (or close to USD 10m of grants if related community grants are included).

▲ **Donors should recognise the critical role of private companies in establishing new forests, landscape restoration and forestry value chains in Africa.** They should shift significantly grant support towards building infrastructure for private sector forestry. And, create a more level playing field between the private actors in Africa and the Government sector, and with forestry companies in the rest of the world.
No carbon mitigation activity creates larger economic and social benefits for the rural poor than afforestation.

Carbon finance can make a larger contribution to afforestation, than it does to other carbon mitigation projects.

However, carbon trading mechanisms and tCER and VER prices and volumes have not developed as hoped for.

Carbon finance has been complicated and expensive. The methodology and procedures must remain rigorous, but can be significantly simplified and streamlined.

Green Resources has generated carbon revenues of about USD 2 million, and just about recouped the costs of 15 years of development costs, leaving little surplus for forestation.

Carbon finance should be re-focus on practical and implementable projects that benefit the environment and normal people. Historically, the extended carbon industry’s focus has been shifting from one failed theoretical concept to another, benefiting office workers and city dwellers.

REDD+ projects outside of rainforest areas must include afforestation components in order to ensure alternative supply of wood to the people previously dependent on firewood and charcoal produced from the protected forest. REDD without afforestation will drive up energy prices and hurt the poor.

In addition to, or instead of, trading mechanisms, grants and long term financing for private carbon projects are probably the most efficient tools to mitigate climate change.
Timberland investors are interested, but African industry is too small and immature.

Private institutional timberland investors investments may be USD 120bn and has played a central role in establishing new forest in South America. Of this, only about USD 200m has been invested in Africa.

In 2007, Southern Africa (including Mozambique and Tanzania) was included in Global Forest Partners’ (the world’s largest Southern hemisphere forest investors) investment universe. Africa has received significant attention at international timberland conferences since 2011.

However, no major new private forest investor has invested in Africa since the 2008 financial crises, excluding Portucel, partly because of increased attention to immediate cash yield and return, lack of appropriate financing, sizable plantations, young companies and no ‘market for management’.

Global Environmental Fund became the first dedicated African timberland investment fund by raising capital from development banks since 2010, but they have focused on acquiring established plantations and specialised on orphan assets. Other African focused timberland funds are now being raise.

Africa needs larger plantation companies and more attractive debt and grant financing to attract timberland investors to the Continent.
CREATING VALUE IN FORESTRY
Cash return is only a part of the story – generating 1/3 of total returns

The key value and return drivers of the business are:

▲ Biological growth: represented by biological asset value, which is a DCF value of the standing forest (average 9 years life), excluding replanting and with zero end value. GR has historically used a discount rate of 11% (or a 8%+ premium over European and US forest cash yields), but many investors and lenders believe this is too low.

▲ Cash flow from operations: generated through the sales of standing timber, stumpage value of logs and sales of processed wood products. As the East African economy develops and customer base broadens, these cash flows should commend increased earnings multiples. Around the world, only 1/3 to ½ of total forest investment returns have come from the cash yield, with the rest coming from the other three value drivers. Nobody gets 10% pa cash return in forestry.

▲ Project and land value appreciation: recognised through a SOTP valuation and/or DCF end values. GR books land at cost. Experience from around the world, not the least in Uruguay (the most recent country with large plantings), suggests that as the forest industry develops, the land value increases.

▲ Discount rate compression: historically important source of return as timberland returns have approached bond returns and frontier markets have become emerging markets. Moving to a second rotation also reduces risk and discount rate (on the basis of proven yields), as does the multiple market options in East Africa compared with “single” export market exposure in some timber countries.
<table>
<thead>
<tr>
<th>Value drivers</th>
<th>3-6 yr process</th>
<th>2 yr process</th>
<th>5-16 yr cycles</th>
<th>On-going</th>
</tr>
</thead>
<tbody>
<tr>
<td>High quality land for planting</td>
<td>▲</td>
<td>▲ Effective, low cost planting</td>
<td>▲ Biological growth of forest</td>
<td>▲ Converting / operating costs</td>
</tr>
<tr>
<td>Stakeholder management</td>
<td>▲</td>
<td>▲ Access to suitable land</td>
<td>▲ Location</td>
<td>▲ Low cost investments</td>
</tr>
<tr>
<td>Location and infrastructure</td>
<td>▲</td>
<td>▲ Improved genetic material and silviculture</td>
<td>▲ Higher valued end markets</td>
<td>▲ Access to right market</td>
</tr>
<tr>
<td>Land value appreciation</td>
<td>▲</td>
<td>▲</td>
<td>▲ Cost of capital</td>
<td></td>
</tr>
<tr>
<td>GR's Competitive Advantage</td>
<td>▲ High barriers to entry</td>
<td>▲ Strong local management and organisation</td>
<td>▲ Local leadership</td>
<td>▲ High-tech sawmill and pole plants =⇒ assets for the future</td>
</tr>
<tr>
<td>20 year's experience</td>
<td>▲</td>
<td>▲ Mix of local and best international foresters</td>
<td>▲ Good community relations</td>
<td>▲ Highest yield and quality</td>
</tr>
<tr>
<td>Certification &amp; certification</td>
<td>▲</td>
<td>▲ Low-cost operations</td>
<td>▲ Integrated model, ability to create new markets</td>
<td>▲ Markets for wood residuals</td>
</tr>
<tr>
<td>Integrated model</td>
<td>▲</td>
<td>▲ The best nurseries</td>
<td></td>
<td>▲ Buy and erect 2nd hand plants</td>
</tr>
<tr>
<td>Providing forestation, employment &amp; taxes</td>
<td>▲</td>
<td>▲</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GR's Achievement</td>
<td>▲ &gt;200,000 ha land reserves</td>
<td>▲ Planted up to 7,500 ha in one year</td>
<td>▲ 43,000 ha plantations (net)</td>
<td>▲ Largest solid wood products mill in East Africa</td>
</tr>
<tr>
<td>Best locations for regional supply and export</td>
<td>▲</td>
<td>▲ Annual improvements in planting quality</td>
<td>▲ Great biomass growth</td>
<td>▲ Cash flow positive</td>
</tr>
<tr>
<td>First &amp; largest</td>
<td>▲</td>
<td></td>
<td>▲ Carbon credits</td>
<td>▲ Expanding industrial customer base</td>
</tr>
<tr>
<td>Strong local reputation</td>
<td>▲</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CREATING VALUE IN FORESTRY

Investor return requirements will fall over time

- Some established plantations may be sold to TIMOs, pension funds and other timberland investors, possibly under GR’s continued management
- Other plantations might be sold to energy and industrial companies
- Forestry investors are currently getting 2-3% cash yield in mature markets, hoping for 7-15% pa (total) return in emerging markets
- **Green Resources** acquires land, develops new plantations, processes and finds market for the wood to maximizes overall margin.

---

**Equity return requirement**

- **Private equity** total return (cash and gains): 5-20%
- **Development banks’ cash return**: 5-16%
- **Forestry and infrastructure total return**: 3-12%
- **Concessional finance cash return**: 0-5%

---

**Maturity of overall plantation profile**

- **Establishment/early development**
- **Late development/maturity**

**Institutional ownership**

- **African/EM TIMOs**
- **Industrial companies, renewable energy funds**
- **Pension funds; Global TIMOs; Infrastructure/real-asset investors**

---

**Development banks' cash return**: 5-16%

**Concessional finance cash return**: 0-5%
WHO ARE WE?
GR is a leading African sustainable Forestry & Wood Products company

Timber plantations
- Developed one of the world’s lowest cost forest plantations projects in Africa's most desirable locations with c.300,000 ha of secured land
- 43k ha net planted forest is coming to maturity with large scale harvesting and cash generation expected in next few years; also generates non-cash BAV gains

Industrial operations
- Vertical integration through industrial wood processing
- East Africa’s largest sawmill and transmission pole plant in Sao Hill, Tanzania; one of Africa’s half a dozen most modern sawmills
- Sawn timber and pole manufacturing, timber yards, pallets and briquettes manufacturing

Impact
- Leader in Forest Stewardship Council (“FSC”) certified plantation forests in Africa (ex-RSA)
- A world leader in forest-based carbon offsets
- Large positive bio-diversity, conservation, economic and social impacts

Key achievements
△ Built a world-class management team which combines senior experience, international forestry expertise, and local talent
△ Merged in 2014 with GSFF to create the largest privately-owned African forest plantation owner outside South Africa
△ GR and GSSF have between them established more new forest in Africa since 2000 than any other private or government-owned entity
△ Planted area of 43k ha accounts for 50% of all new plantings since 2000 across these 3 countries
△ GR has c. 60% of all FSC certified plantation forests in Africa (ex RSA and Swaziland)
△ Completed over 60 independent 3rd party assessments/audits since 2008
△ Raised USD 300m equity capital (in combined group) and c. USD 40m mezzanine debt from leading DFIs

Operations in 3 countries employing 2,350 people

Uganda (started 1996)
- 6.5k ha net forest
- Harvesting from 2013; reaching 40,000 m³ in FY2017
- Sawmill, Pole plant

Tanzania (started 1996)
- 17k ha net forest
- Land secured for 10k added forest
- One large nursery
- Significant harvesting from 2015, with 100,000 m³ in FY2017
- Sawmill, Pole plant, Briquettes, other processing

Mozambique (started 2004)
- 20k ha net forest
- 220k ha land secured for development
- Large-scale plantation underway
- Two large nurseries
- Large-scale harvesting to commence 2018/19
- Pole plant

Harvesting volume set to increase substantially

Total harvest volume by product
WHO ARE WE?
Advanced, highly productive nurseries

Makungu nursery, Tanzania
Clonal bed for mini cuttings, Tanzania
Sowing machine, Tanzania

Shade net and trays tables in Namaita nursery, Mozambique

Sowing machine, Namaita nursery
WHO ARE WE?
44,000 ha of fast growing pine and eucalyptus for rapidly growing markets

Pine, 8 years, Bukaleba, Uganda

Eucalyptus clones, 4 years, Bukaleba

Kachung management team, Uganda

Pine, 6 years, Kachung

Marking for thinnings
WHO ARE WE?
Africa’s technologically most advanced sawmill

Chips, sawdust and bark is produced separately at the Sao Hill sawmill, Tanzania and sold as is or processed to value added products.

Sao Hill’s new HewSaw small log sawmill, sawing logs down to 10cm top diametre and thereby increasing the harvest recovery.

100,000m³/yr sawn timber mill, possibly Africa’s technologically most advanced.
Disclaimer

This document is prepared to provide general information about forest plantations in Africa and about Green Resources AS. While Green Resources’ management believes the information presented is materially correct as at the date of this document, neither they nor Green Resources AS, its subsidiaries or its directors, officers or any other person associated with the company, or its Representatives, make any representation or warranty as to the accuracy or completeness of any of this information. Nothing set out in this document is or shall be relied upon as a promise or representation as to the past or future. The information contained herein may be subject to change without prior notice.

Green Resources AS

www.greenresources.no