Key Challenges for Forest Management Agencies

David Brand
Managing Director, New Forests

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Overview of New Forests

- Founded in 2005
- Managing forestry investment for institutional investment clients
- Currently managing US$1.9 billion in assets in the Asia-Pacific region
- Head office in Sydney; 38 employees in Australia, New Zealand, Singapore, and San Francisco
- Managing over 420,000 hectares of land and forestry assets across the Asia-Pacific region and United States
- New Forests has generated excellent returns to our clients over 8 years, and has aimed to operate as a leading sustainable and responsible investor in the forestry sector
Major Trends Affecting Forest Managers

1. Global timber demand growing and markets restructuring to accommodate Asian demand growth
2. Shift to plantations and the declining economic frontier of natural forests
4. Rising institutional ownership of high productivity timber plantations
5. Sustainability imperatives and the pricing of ecosystem services

Three-year old Teak Plantation – Solomon Islands
China’s domestic forest resources are insufficient to supply growing timber demand across the range of wood products. This growing timber deficit makes China a rising force in global timber markets.
Supply from Russia is Declining

Russian softwood exports have hit a wall...

Russian log exports have fallen dramatically over the past six years while lumber exports have been flat to slightly increasing.

Source: FAOstat
Canadian Supply Falling

Policy Constraints and Mountain Pine Beetle impact will lead to near-term decline in timber supply, leveling off in the medium to long term.

Impact Of Mountain Pine Beetle On B.C. Timber Supply

- current provincial AAC: 78,658,415 (excluding woodlots & CFAs)
- Total Province: 65.7M
- Interior: 57.5M
- Coast: 17.1M
- -61% Of Pine Timber In B.C. Lost

Canadian Timber Supply – 2009 & 2050 Forecast (million m3)

Source: Forest Analysis & Inventory Branch, BC Ministry of Forests, Lands and Natural Resource Operations.

Source: Mark Kennedy, CIBC. “Global Perspectives on Forest Products Trade.” Presentation to Future Forestry Finance 2012.
Natural Forest Harvest in SE Asia in Decline

Steady Decline in Natural Forest Logging in Malaysia and Indonesia

Sources: Malaysia Timber Council and personal communication with Yayasan Sabah; ITTO; Indonesian Forestry Department Annual Report, 2008.
Australian hardwood plantations are steadily replacing a declining supply from native forests.

Source: ABARES, Forest and Wood Product Statistics.
Increasing Importance of Plantations

- Global industrial roundwood demand is likely to rise from 1.5 billion m³ in 2013 to 2.5 billion m³ by 2050
- Somewhat speculative forecasts suggest biomass energy, biofuels and biomaterials demand could dwarf industrial roundwood demand over next 30 years*
- Almost all incremental supply will come from timber plantations—both productivity enhancement and plantation area will need to increase
- Investment needed could range between $100 and $500 billion to meet these levels of demand

*WWF, 2013 Living Planet Report

Institutional Capital as a Source of Finance

Institutional Investors are steadily expanding their timber plantation ownership

Area of Institutional Timberland Ownership

Area in US only

Global Area

Million Hectares

Major forestry investment regions can be classified as:

**Mature**

**Intermediate**

**Emerging**

Government policies will drive how this evolves.

*Source: HNRG and New Forests estimates, does not include Europe*
Forestry investors seek risk-adjusted returns that are based on market risk, currency, country risk, and other factors.

Investing in established plantations with established markets preferred.

As new investment opportunities in established markets decline, interest is rising in emerging markets, and new opportunities like energy crops.

### Geographic Allocation of New Commitments by Institutional Investors in Forestry

<table>
<thead>
<tr>
<th>Country</th>
<th>Investible Assets*</th>
<th>Discount Rates (real IRR, pre-fees, pre-tax)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA/Canada</td>
<td>$75-85 B</td>
<td>6-6.5%</td>
</tr>
<tr>
<td>New Zealand</td>
<td>$7-8 B</td>
<td>8-9%</td>
</tr>
<tr>
<td>Australia</td>
<td>$7 B</td>
<td>7-9%</td>
</tr>
<tr>
<td>Brazil/Uruguay/Chile</td>
<td>$45 B</td>
<td>8-12%</td>
</tr>
<tr>
<td>Asia/Africa</td>
<td>$8 B**</td>
<td>10-18%</td>
</tr>
</tbody>
</table>

**If rubber and oil palm are included this could be $150B**
Tropical Asia Forest Fund (TAFF)

- New Forests’ TAFF is an example of new emerging markets forestry fund
- Investing in Southeast Asia with priority for Indonesia, Malaysia, and Vietnam
- Attractive growing conditions, low costs, and close access to growing markets
- Investment team in financial hub of Singapore
- US$170 million fund closed in June 2013
- Combination of existing and “greenfield” plantations
- Environmental, Social & Governance (ESG) factors and environmental markets offer value-add opportunities

4-year old clonal teak in Java
Land is Finite – Productivity Gains Required

Productivity is central to meeting future needs. Forestry will follow the lead of agriculture in intensifying production.

Agricultural productivity in the US increased by 170% between 1949 and 2009, with average outputs increasing at 1.6% per year. Anecdotal evidence suggests equal or greater productivity enhancement is possible for forestry. For example, the suggestion that productivity of Brazilian eucalyptus plantations has quadrupled in 40 years and that Australian radiata pine plantations have shown 33% increases in productivity from tree breeding in the first rotation and another 10% in the second rotation.


Plantation Productivity Can Increase

- If industrial wood demand grows at an equivalent rate to global GDP can we meet much of this via productivity enhancement rather than land base expansion

- Investor strategies focus on silviculture, nutrition, risk management and genetics to increase productivity by 50-100% over the next 50 years

Example of Productivity Gains – Softwood in Australia

*Source: Timberlands Pacific Pty Ltd
Sustainability as a “Stay in Business” Issue

- Institutional Investors require sustainability policy, labour policy, corruption and bribery standards, use of certification and monitoring of performance standards.
- Major consumer groups are increasingly demanding certification or product chain of custody documentation.
- Governments are under pressure to create business environment that will encourage investment and support competitiveness of local industry.
New Forests is a signatory to the UN Principles for Responsible Investment (PRI) and commits to integrating Environment, Society, and Governance (ESG) principles into investment decision making.

ESG policies are implemented at the fund level through a Social & Environmental Management System (SEMS) with internal auditing.

The SEMS defines third-party certification and responsible management requirements relevant to the asset class and type of investment.

Sustainability reporting is integrated into funds reporting structure and New Forests publishes an annual Sustainability Report covering responsible investment activities, targets, and progress.
The Need to Price Ecosystem Services

Markets set prices for timber products, but how do we value other benefits?

- Forests provide not only timber, but a myriad of other benefits related to freshwater, carbon cycling, biodiversity conservation, human health and well being
- These ecosystem services have not been priced and therefore are used wastefully and disregarded in land conversion decisions
- Leads to plantation and agribusiness industry using more land rather than increasing productivity per hectare
- Policy in conflict with overwhelming economic fundamentals is difficult to enforce on a sustainable basis

<table>
<thead>
<tr>
<th>Region</th>
<th>Value of Natural Vegetation</th>
<th>Value of land converted to Agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaysia</td>
<td>$500 (logging concession after primary harvest)</td>
<td>$20,000 to $25,000 (oil palm)</td>
</tr>
<tr>
<td>Brazil</td>
<td>$155 (Amazon frontier land)</td>
<td>$420 (grazing)</td>
</tr>
<tr>
<td>US South</td>
<td>$2500 (mixed timberland)</td>
<td>$6250 (cropping)</td>
</tr>
<tr>
<td>Australia</td>
<td>$1900 (woodland properties)</td>
<td>$4850 (mixed cropping and grazing)</td>
</tr>
</tbody>
</table>
Environmental Markets Lessons Learned

- **Price signals work**
  - SO\(_2\) market drove changes in fuel from high to low sulphur coal
  - EU ETS drove $ billions into carbon funds and carbon companies
  - Australian water market restructured agriculture to increased efficiency and more valuable cropping
  - US Mitigation Banking is a $billion+ turnover industry

- **The finance and investment sector can facilitate change**
  - Investment funds sprang up related to the EU ETS, Australian Water market and Mitigation banking industry—creates liquidity to meet market needs
  - Markets create transparency in pricing; futures and options create stability; water rights as collateral for investment in water use efficiency

- **Stability is necessary, but fine-tuning is also necessary**
  - Meddling by Government killed the SO2 markets
  - Excessive allocations and unexpectedly huge offset supply have made the EU ETS unstable

- **It needs to cost more to remain outside rather than inside a scheme**
  - Lack of price premium has hampered most voluntary certification schemes
  - REDD has struggled to have impact because private sector is disengaged and continues to operate on a business as usual basis
Towards the Future

Can forestry represent a “natural infrastructure” asset class?

- Projections are that global industrial roundwood demand will begin to plateau around 2.3-2.5 billion m³ per annum in 2030.
- 100 to 150 million hectares of commercial plantation area (2.5-3.75% of world forest cover) could supply most of this timber, while timber production from frontier regions (Canada, Russia, tropical natural forests) will stabilize or decline. Biomass demand may double this.

- Mechanisms to price ecosystems via REDD, BioBanking, watershed protection, etc. alongside commercial timber plantations could produce the basis for the stabilization of conservation and production functions and rival timber values
- Need to align public policy, supply chain initiatives, and NGO interests
- Ultimately this must be driven by private capital and investment

*Canopy view of New Forests’ Malua Biobank in Sabah, Malaysia.*
What Might the Future Look Like?

**Present**

The existing rural landscape.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Area (ha)</th>
<th>Revenue (000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheep</td>
<td>250,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Cattle</td>
<td>200,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Wheat</td>
<td>250,000</td>
<td>118,000</td>
</tr>
<tr>
<td>Canola</td>
<td>150,000</td>
<td>112,000</td>
</tr>
<tr>
<td>Cotton</td>
<td>150,000</td>
<td>490,000</td>
</tr>
<tr>
<td>Total</td>
<td>1,000,000</td>
<td>785,000</td>
</tr>
</tbody>
</table>

**Environmental Problems**

- Dryland salinity increasing
- Rising water tables and saline discharge
- Nutrients leaching into waterways
- Low biodiversity
- Soil erosion and turbid waterways

**Future**

Planted forests in the landscape create a more diverse economy and a healthier environment.

<table>
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<tr>
<th>Land Use</th>
<th>Area (ha)</th>
<th>Revenue (000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheep</td>
<td>150,000</td>
<td>16,000</td>
</tr>
<tr>
<td>Cattle</td>
<td>120,000</td>
<td>28,000</td>
</tr>
<tr>
<td>Wheat</td>
<td>200,000</td>
<td>94,000</td>
</tr>
<tr>
<td>Canola</td>
<td>120,000</td>
<td>90,000</td>
</tr>
<tr>
<td>Cotton</td>
<td>150,000</td>
<td>490,000</td>
</tr>
<tr>
<td>Timber</td>
<td>26,000</td>
<td>12,000</td>
</tr>
<tr>
<td>Bioenergy</td>
<td>117,000</td>
<td>9,000</td>
</tr>
<tr>
<td>Charcoal</td>
<td>117,000</td>
<td>14,000</td>
</tr>
<tr>
<td>Carbon credits</td>
<td>41,000</td>
<td></td>
</tr>
<tr>
<td>Salinity credits</td>
<td>26,000</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,000,000</td>
<td>822,000</td>
</tr>
</tbody>
</table>

**Environmental Benefits**

- Dryland salinity reduced
- Lower water tables and clean discharge
- Nutrients retained on farm
- Biodiversity increased
- Soil erosion reduced
World timber demand will continue to rise, markets will evolve to encompass Asian demand growth

Supply increases will primarily come from timber plantations, rather than further expansion of the economic margin in primary forests

Increases in plantation area are more difficult to achieve than increases in productivity of existing plantation base—land competition will also rise among food, energy, and fibre crops

Institutional portfolios have gone from 5% real assets in 2000 to 15% real assets today, and likely will reach 25-30% by 2025—huge inflow of capital for real estate, infrastructure, agriculture, forestry, etc.

The great bargain or ‘end-game’ needs a financing source for conservation as well as production—this could include REDD+, biobanking, water rights, no net loss supply chains, etc.

Social and community integration via benefit sharing, consultation, and governance models, and respect for traditional and legal rights will be core to sustainable outcomes
A modern forest policy framework needs to address wood supply, forest conservation and sustainability issues

- Future wood supply growth will largely be delivered by plantations—from existing plantations managed more intensively and expansion of plantation area—expansion is a difficult policy challenge, so productivity enhancement is key.
- As timber plantations take on increasing share of wood supply, innovation is needed in financial mechanisms for forest conservation—REDD, biobanks, supply chain initiatives.
- Existing forests are still important must be managed well.
- Social outcomes need to balance multiple stakeholders and conflicting interests and rights. Innovations around consultation/governance models, sharing in economic benefits, community benefits are needed.