



Forest Landscape Restoration Conference

Tree species selection: one of the components for successful FLR in Papua New Guinea

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Outline

- Status of forests in Papua New Guinea (PNG)
- History of forest landscape degradation
- Species trials to support reforestation and landscape restoration
- Reforestation in PNG
- Summary



Segei, Milne Bay Province



Amanap, West Sepik Province

Status of forests in Papua New Guinea

- Land mass area of 46.1 million ha
- Dual land tenure system
 - 3% Alienated Land Tenure
 - 97% Customary Land Tenure
- Forests covers 36.1 million ha (78.1 %) of country's land mass area and include 13 natural forest types
- 95% of forests owned or held in customary ownership
- Estimated 80-70% of population (7.2 million in 2016) live in rural areas and depend on forests
- Plantations have been established on 62,000-86,000 ha
 - poor quality
 - many burnt over the past decades
 - low management inputs



Lowland rainforests at Ramu, Madang Province



Neem establishment at RAI, Madang Province

Causes of forests landscape degradation

Between 1973 – 2002:

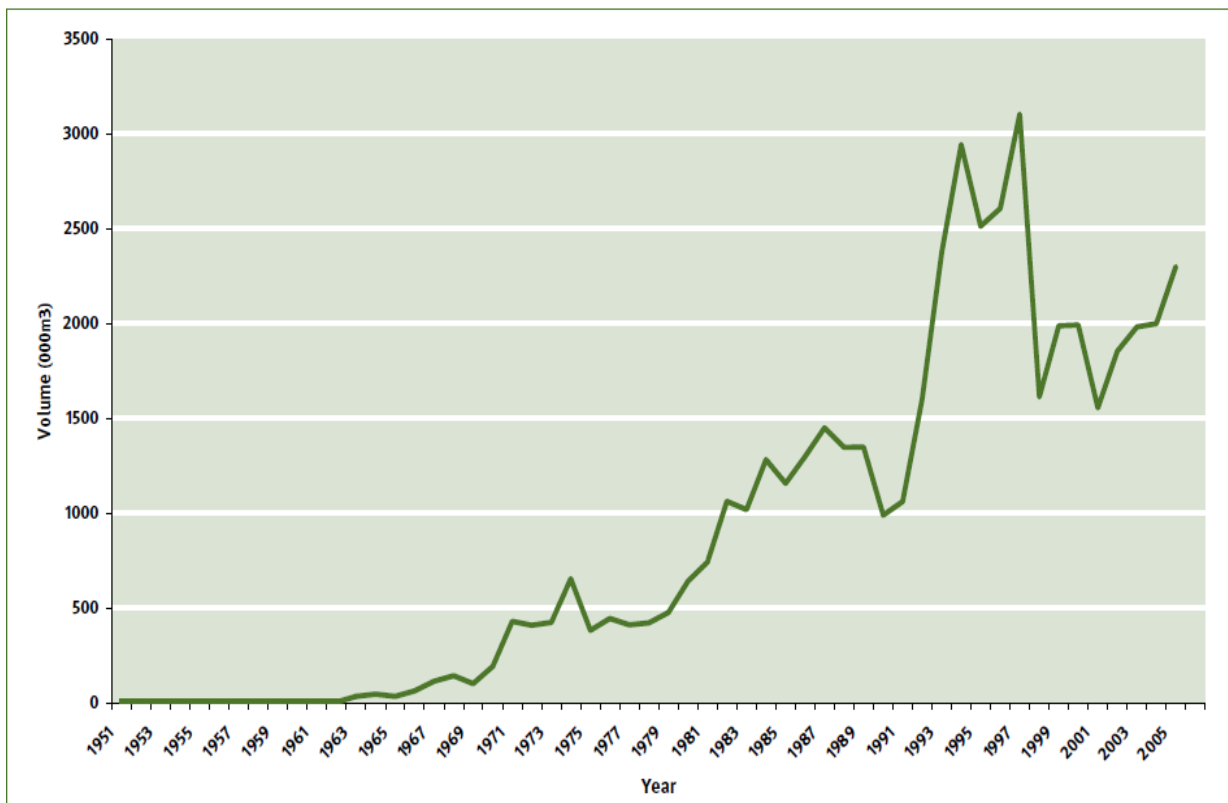
- Net 15.0 % of primary rain forest was cleared and 8.8% degraded to secondary
- Overall, 48.2% was due to logging,
 - deforestation of 886,659 ha and
 - degradation of 2,919,714 ha
- 45.6% related to subsistence agriculture,
 - Rural and semi rural subsistence
 - Exponential increase in population and subsistence related clearance
- 4.4% due to forest fires,
 - 13 % of upper montane forest was lost associated with fire and it is likely that fires lit by people, especially during El Niño years such as 1997–1998, were the major causes
- 1.2% due to Agri industries
- 0.6% due to mining.
- Forests change rate; 0.4%/yr from 1972-73 to 1.4%/yr 2001 – 2002
 - Peaked in 1997–1998 at 1.8 percent/yr
- Oil Palm plantations permanently converted logged over to agri-business lands and may be the biggest driver of deforestation after 2002

Source: Shearman et. al 2009

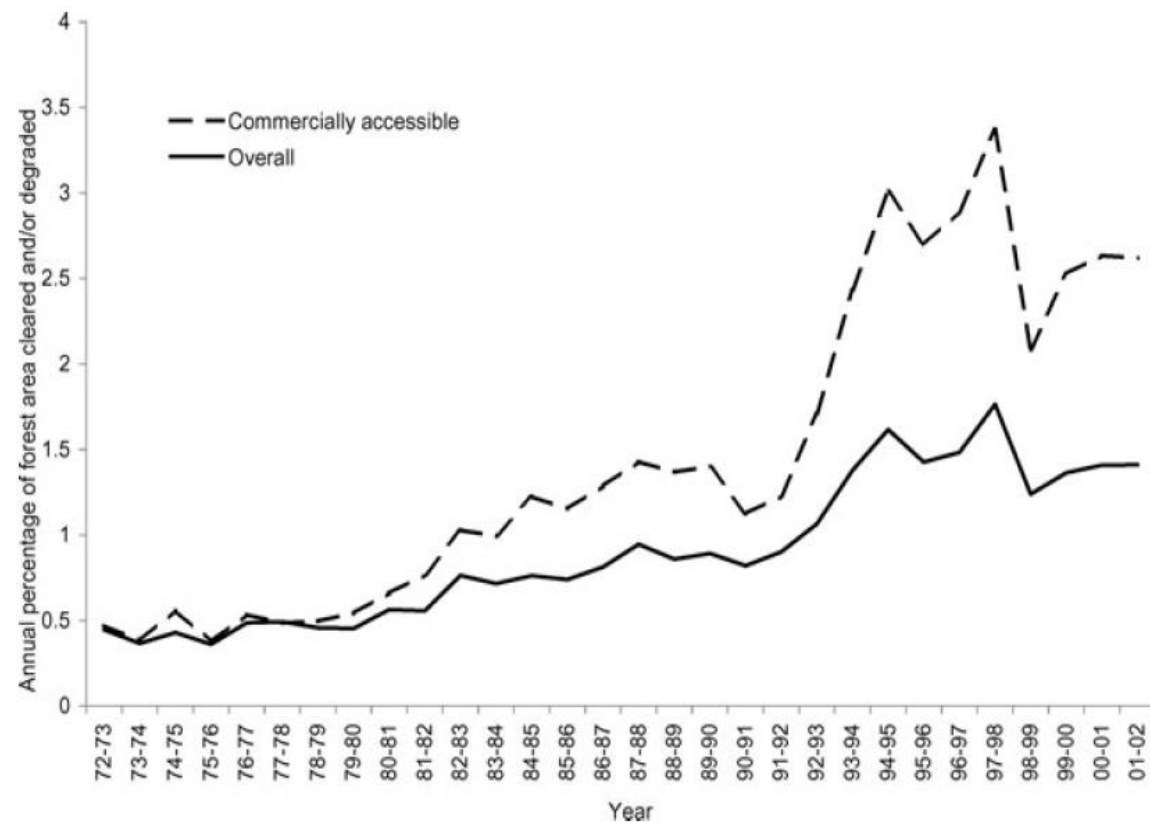


Causes of forests landscape degradation

Source: Overseas Development Institution 2007



Source: Shearman et al 2009

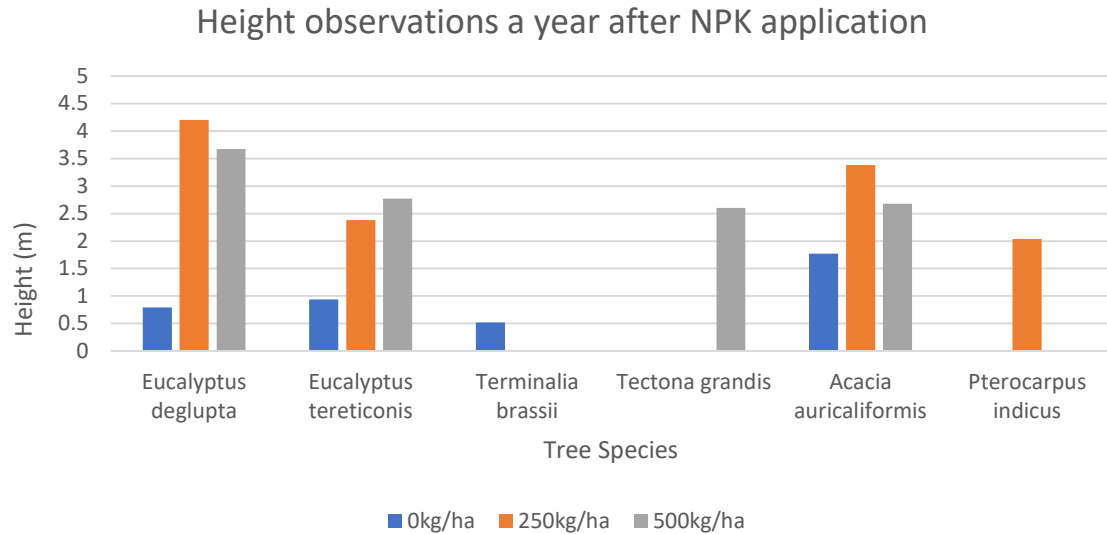


Volume export is proportional to annual % of forests cleared

Tree species trials to support reforestation and landscape restoration

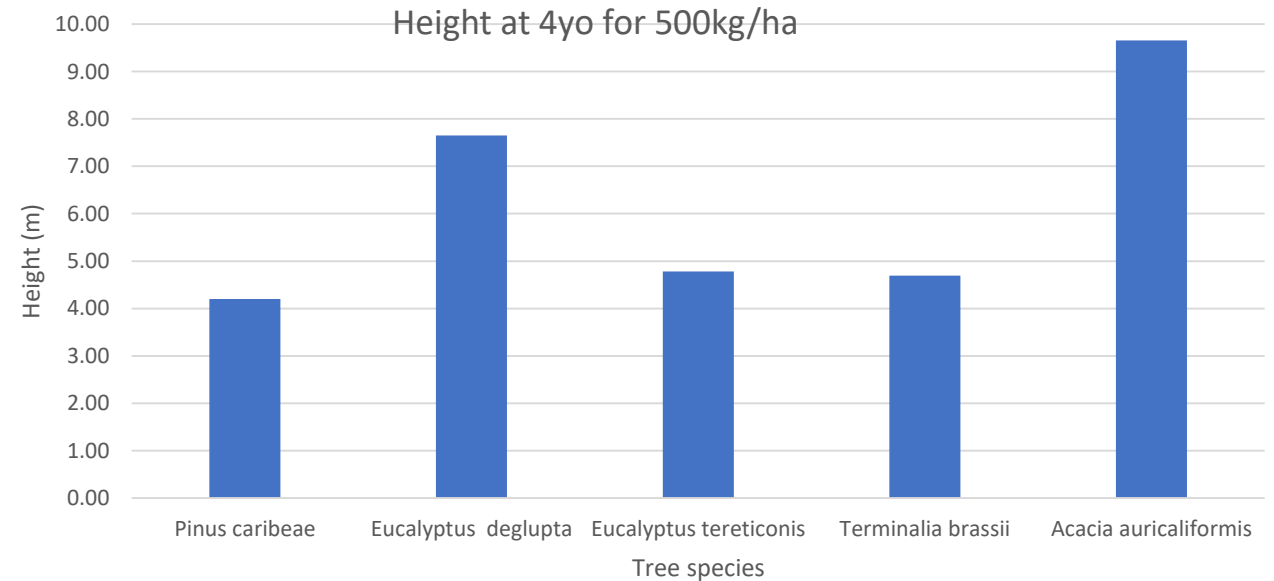
- First species trial on record was *Araucaria cunninghamii* in Bulolo and Aiyura in 1943
- Trials from 1940s to 1970s included;
 - Species trials (species to site matching)
 - Yield plots established for management purposes (Thinning and Tending)
 - Fertiliser trials
- Earlier trials scattered throughout PNG. Measured regularly/irregularly.
- Trials established from 1970s to 2010
 - provenance/progeny trials and conversion of these to SPAs, SSOs and CSO Provenance,
 - variety or hybrid trials (examination of different growth, form, resistance to diseases of difference seed sources of a single species)
- Trials after 2010
 - Clonal trials

Results from trials 1940s to 1970's (1954)



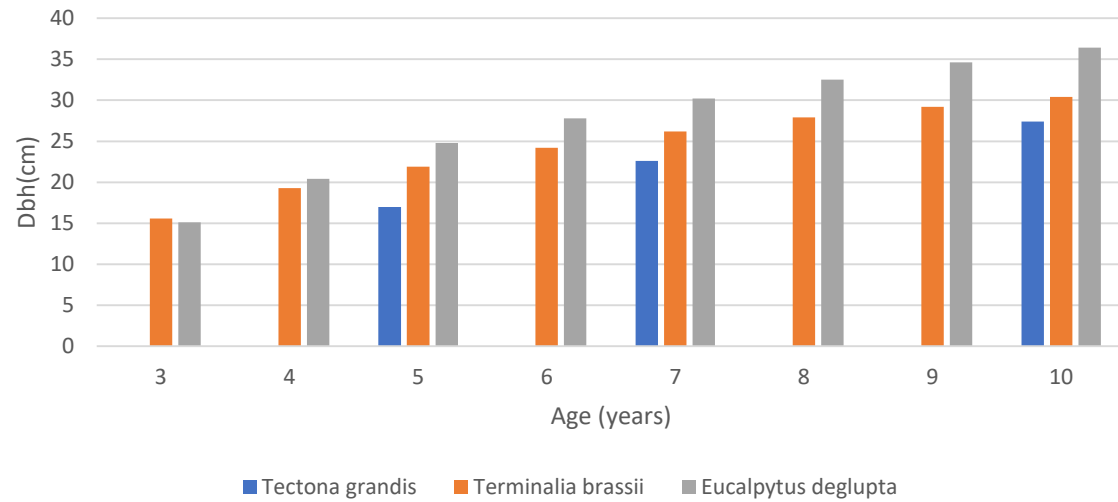
Fertilizer trial in Kunjingini, ESP

- low agricultural potential
- Infertile soils
- poorly drained
- Demands for firewood and building materials
- *Pinus caribaea*, *Pinus kesiya*, *Eucalyptus deglupta*, *Eucalyptus tereticornis*, *Terminalia brassii*, *Terminalia complanate*, *Tectona grandis*, *Acacia auriculiformis*,



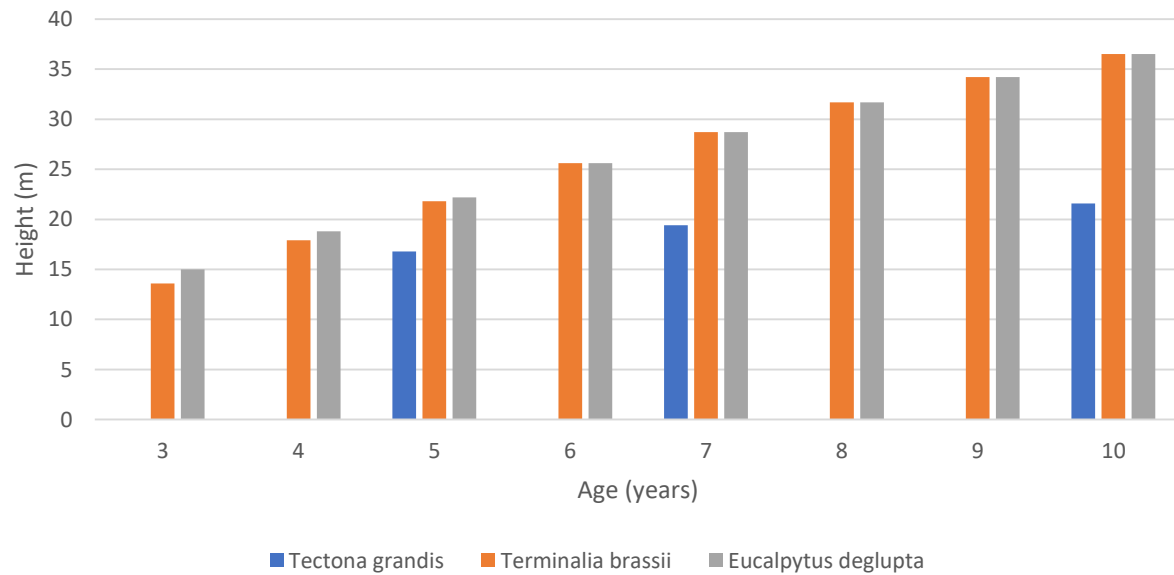
Some trial results from 1940s to 2000,

Dbh of tree spp against site in Kerevat, ENBP



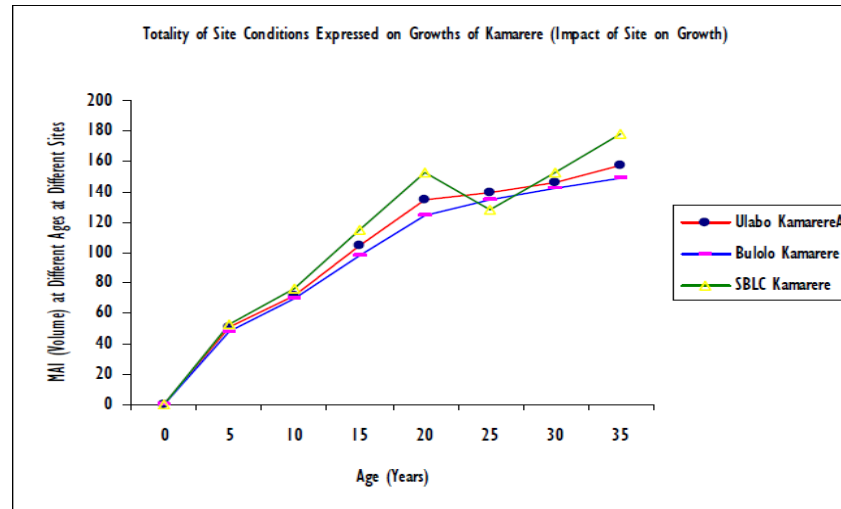
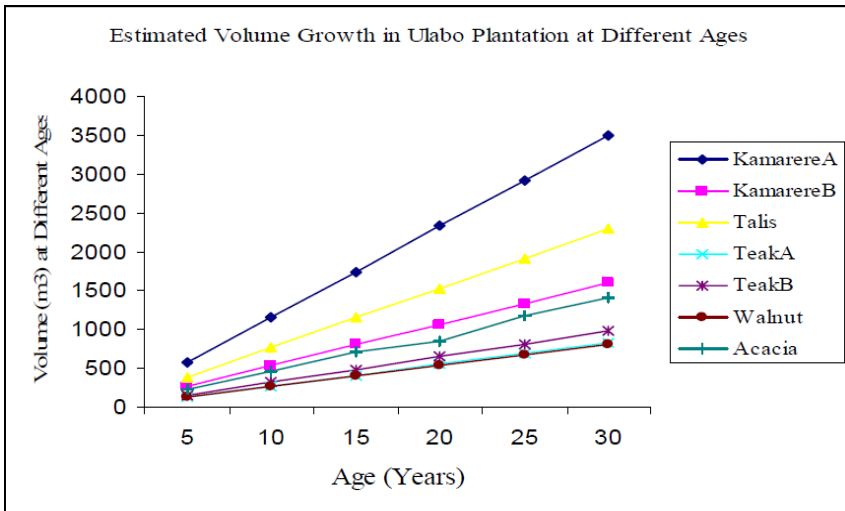
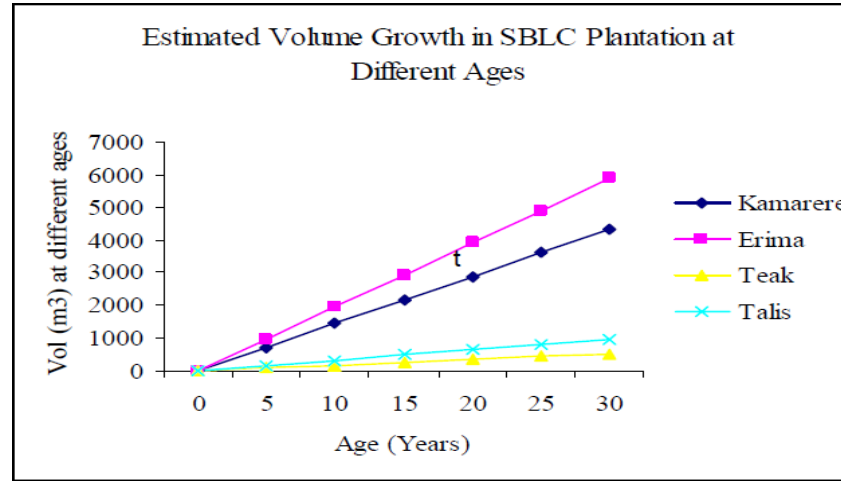
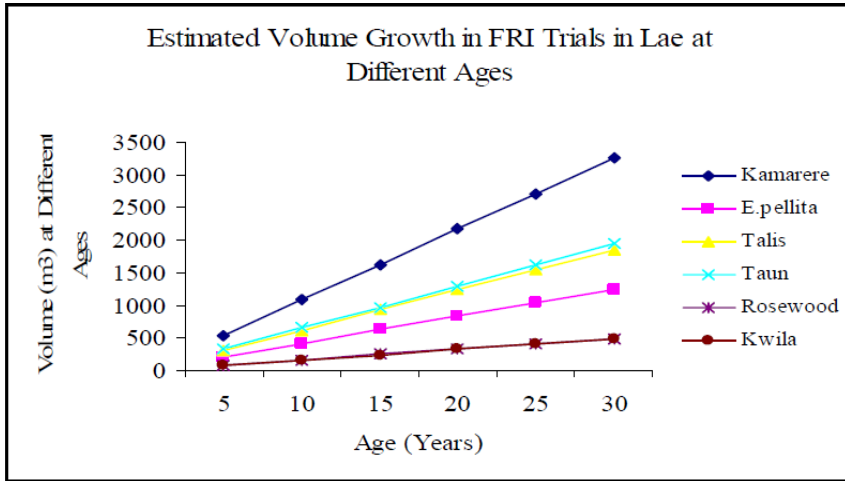
Est in 1974

Height of tree spp against site in Kerevat, ENBP



Trials after 2000

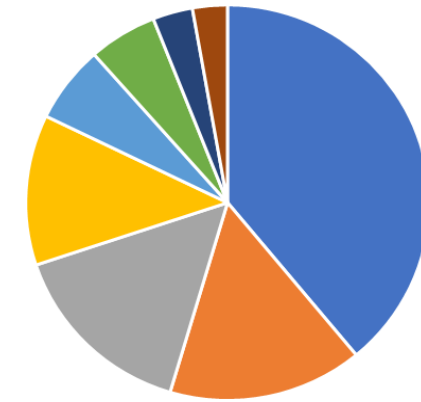
Trials established in 1985



Reforestation in PNG

Location	Species	Size (Ha)	Purpose
Bulolo/Wau	Araucaria spp	17, 000	Veneer & plywood production
Stettin Bay Lumber Co	Kamarere, Erima, Talis, Teak	10,000	Log export, sawn timber
Open Bay	Kamarere	12,000	Log Export, Sawn timber
Ulabo, Milne Bay	Kamarere and Terminalia spp	2,300	Sawn timber, log export
Whagi Swamp	Eucalyptus sp	2,000	Drain swamp, supply fuel wood to tea factories
Kuriva	Teak	2,000	Sawn timber
Kerevat	Teak	50	Sawn Timber
Lapeigu & Fayantina	Pinus	8,000	Sawn Timber, poles/posts
Total		53, 350	

Tree species distribution for private and state establishments



■ Kamarere ■ Klinkii ■ Hoop
■ Teak ■ Pinus spp ■ Other Eucalyptus spp



Reforestation in Papua New Guinea

❑ PNGFA Medium Term Development Plan

- Contribute to national economy
- Builds a sector that is sustainable and profitable

❑ Long term Plan

- PNG Vision 2050 Landscaping and Restoration of 80 000 ha of degraded sites by 2050
- PNGFA implemented “*Painum Graun Plannim Diwai*” – 1000 ha in each province
- Native species selected for planting in each province



Summary

- From 1940's to 1970's, majority of trials were on spacing, management, species screening and fertilizer trials
- From 1970's to 2000, majority of the trials were conducted on the improvement of quality and quantity germplasm, social forestry and agroforestry
- 100 species tested/trialed over the last 45 years
- Majority of these species are native with *Pinus* and *Eucalyptus spp* introduced
- Certain species are limited to geographical range and site
- Certain species perform well over a wider range of site as confirmed by provenance trials



Acknowledgements

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