George Arapata Kuru

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Professional forester, biometrician, traceability expert and IT System Designer with over 20 years' experience within Indonesia.

New Zealand citizen, Jakarta domiciled

B.For.Sc. (Hons), University of Canterbury, New Zealand 1987
M.For.Sc., University of Canterbury, New Zealand 1988

www.ata-marie.com

Present position	**President Director, Ata Marie Group Ltd**
Years within the firm	11 years
Membership of professional bodies	Member, New Zealand Institute of Forestry Member and Secretary, Indonesian Forest Industry Club
Specific expertise focuses on	• Carbon forestry, carbon accounting and forest management systems, system design and development for plantations and natural forest. • Forest biometrician - specializing in resource assessment, forest-inventory, growth and yield modelling, wood supply forecasting. information technology and supply chain management for the forestry and agricultural sectors • Systems design and development - for plantations and natural forests, harvesting, supply chain management and natural resource inventory in plantations and natural forests. • Forest carbon advisor - Climate change and forest carbon modelling assessments under Clean Development Mechanism (CDM), Reduced Impact Logging (RIL), Voluntary Carbon Standard (VCS), forest related climate change and climate change mitigation, and the carbon compliance markets under the IPCC regulations. • Traceability expert
Country works in	Pacific: New Zealand, Australia, Solomon Islands, Tonga, Niue, Fiji Africa: Ghana, Cameroon, Ethiopia, Central African Republic, Republic of Congo, Kenya, Rwanda, Liberia Asia: Indonesia, Peoples Republic of China, Singapore, Hong Kong, Philippines, Papua New Guinea, Cambodia, Thailand, Vietnam, Bangladesh, Laos Europe: United Kingdom, Netherlands, Russian Federation Americas: Nicuagua, Chile
Language skills	English Indonesian – familiarity NZ Maori

Other skills	Comprehensive knowledge of Microsoft Office suite. Intermediate level knowledge in GIS and remote sensing software (ArcGIS).
Publications	1. Dykstra D.P., Kuru G.A., Taylor R., Nussbaum R., Magrath W.B. and Story J., 2003. Technologies for wood tracking – verifying and monitoring the chain of custody and legal compliance in the timber industry. Environment and Social Development East Asia and Pacific Region Discussion Paper. Environment Department, World Bank, Washington DC, USA. 68 pp.
	2. Dykstra D.P., Kuru G.A., Nussbaum R., 2003. Technologies for wood tracking. International Forestry Review, Volume 5, Number 3, September 2003, pp. 262-267.
	3. FAO 2007. Information Note 1: Procurement of Timber for Tsunami Reconstruction in Indonesia. FAO publication. George Kuru prepared the document. http://www.fao.org/forestry/11702-1-0.pdf.
	4. FAO 2007. Information Note 2: Timber Usage for Tsunami Reconstruction in Indonesia. FAO publication. George Kuru prepared the document. http://www.fao.org/forestry/11703-1-0.pdf
	5. FAO 2007. Guideline 1: Required Documentation for Transportation of Timber within Indonesia for Tsunami Reconstruction. FAO publication. George Kuru assisted in preparation of this document. http://www.fao.org/forestry/11700-1-0.pdf.
	6. FAO 2007. Guideline 2: Clearance Procedures for Timber Imported into Indonesia for Tsunami Reconstruction. FAO publication. George Kuru assisted in preparation of this document. http://www.fao.org/forestry/11701-1-0.pdf.
	7. International Labour Organization 2011. Local investments for climate change adaptation: green jobs through green works / ILO Regional Office for Asia and the Pacific. - Bangkok: ILO, 2011, 288 p. ISBN: 9789221247685; 9789221247692. George Kuru prepared the chapter 8 on forestry.
	8. Kuru, G.A. 2005. FAO Assessment of Timber Demand and Supply for Post- Tsunami Reconstruction in Indonesia. FAO publication. http://www.fao.org/forestry/8455-1-0.pdf.
	9. Kuru, G.A. 2005. Development and Implementation of a Wood Procurement Plan for Post'Tsunami Reconstruction in Indonesia. FAO publication. http://www.fao.org/forestry/10473-1-0.pdf.
	10. Kuru, G.A. 2000. Development of Forest Management Information Systems. New Zealand Journal of Forestry Vol. 44(4).
	11. Kuru, G.A. 1992. Simulation of thinning effects on stand structure using linear co-ordinates. Australian Forestry 55(1).
	12. Kuru, G.A., Whyte, A.G.D. and Woollons R.C., 1992. Utility of the reverse Weibull and extreme value density functions to refine diameter distribution growth estimates. For. Ecol. Manage., 48 : 165-174
	13. Newell, J. and Kuru, G 2008. Legal Verification Systems for Wood Supply Between Russia and China. WWF-International, Gland, Switzerland. 77 pages.
Selected Project Experience	2017 Project Leader for carbon impact assessment of the APP Forest Conservation Program in Indonesia
	2016 Project Leader for REDD+ Project Design for the intercommunal forest reserve Bangtate—Banga—Bangou, Western Region, Cameroon.
	1998—2005 Managing Director of Forestech Research and Dev. Ltd, Christchurch, New Zealand

Professional experience

Years	Location	Company	Position	Description
Professional Experiences				
1998 -now	Christchurch, New Zealand	Forest tech Research and Development Ltd	Managing Director	
2007 -now	Indonesia	Ata Marie Systems Ltd	President Director	
2019	Indonesia	APP	Project Manager	**Final Peer Review for The Assessment of the Impact of APP's Forest Conservation Policy on Greenhouse Gas Emissions** Provide reviewing service on the greenhouse gas emissions models and project reports.
2019	South Sumatera, Indonesia	SMB Kenzai Co.,Ltd	Project Manager	**Forest Plantation Due Diligence and Valuation in Jambi, Indonesia and Due Diligence of Raw Material Supply for an MDF Factory** Professional level assessment of the plantations to verifies planted area, the quality of the plantations, growth rates, potential volumes at harvesting. The assessment will also include social, environmental and management elements that will then go into a risk matrix. This will be followed by a valuation of the existing resource and then an Enterprise Model that shows the value of the project through to the end of the licensing period.
2018	South Sumatera, Indonesia	PT Muratama Manis Madu		**"Go – No Go" Assessment for Sugarcane Plantations.** Operations management service by giving professional review on topography, soil type, drainage, and access to ensure this project is viable from a technical perspective after analyse the nett plantable area.
	Central Suau/ Papua New Guinea		Carbon specialist	**GIZ Project Design Document Development for Forest Carbon Project (logged – protected Forest)** - Oversight of remote sensing/GIS resource mapping and carbon inventory. - Analysis of forest carbon inventory, and preparation of baseline assessment according to VCS/CCBS requirements. - Preparation of preliminary manual for MRV System (based on outcome of preparation phase)
	Ghana	Forestry Commission of Ghana	Project manager	**Development and deployment of wood tracking system in Ghana** project developing and deploying the timber administration systems. The system records all forest standing stock, logging and wood processing. The system will provide full chain of custody and legality assurance services for the Government of Ghana.
	Indonesia			**Growth modelling and production planning for major pulp and paper corporate** Responsible for analysis of forest plantation growth and yield for 3 major species totalling 1,000,000 hectares.
2013	Liberia			**Design and analysis of high carbon stock (HCS) forest inventory in Liberia** Responsible for sample design, preparation of computer databases for data capture and inventory analysis.
2012	Milne Bay, PNG Papua New Guinea	New Britain Palm Oil Company Ltd	Project Manager	**Design and analysis of high carbon stock (HCS) forest inventory** Management of HCS inventory. Responsible for inventory design, management of field work, preparation of computer databases for data capture, and inventory analysis.
	Indonesia			**Preparation of carbon emissions inventory for mining company** Preparation of emissions inventory from Land Use, Land Use Change and Forestry (LULUCF) for a mining company prepared under the Greenhouse Gas Protocol.

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	Indonesia	APP Group		**Preparation of carbon emissions inventory for mining company**
				Preparation of emissions inventory from Land Use, Land Use Change and Forestry (LULUCF) for a mining company prepared under the Greenhouse Gas Protocol.
	Indonesia			**Preparation of carbon sequestration and carbon foot print and lifecycle assessment program**Preparation of carbon sequestration and carbon footprint assessment. The carbon modelling is implemented under the GHG Protocol, ISO 14040 and ISO 14064.
	Vietnam			**Biometrician for Forests for Livelihood Improvement in the Central Highlands program**
				Provide biometric support for the FLITCH project providing forest management planning services to 6 provinces in the central highlands in Vietnam. Services being provided include forest inventory analysis and growing stock assessment, derivation of growth and yield models, assistance for forest management planning and development of sustainable forest management plans.
2011	Indonesia	Headed by the Leuser International Foundation (LIF) with funding from NZAID		**Review of carbon foot print and lifecycle assessment program in Indonesia**
				The consultant participated in an assessment of Carbon Footprint of a major forestry company in Indonesia. The scope of review included Life Cycle Assessment of selected wood products and determination of carbon emissions estimates from Land Use, Land Use Change and Forestry. The carbon modelling was implemented under the GHG Protocol, ISO 14040 and ISO 14064.
				Aceh Tengah and Bener Meriah Watershed Protection Program Project
				The consultant leading a land use and reforestation/forest rehabilitation project in central Aceh, Indonesia. The project is part of the Watershed Protection Programme in Aceh that aim to protect the head water catchments of the main river systems in central Aceh. The project is focus on community-based initiatives in turn based on afforestation and agricultural activities.
				Teak forest industry tour
				Organization and support of a forest industry tour visiting teak plantations and wood processing facilities in central Java.
				Plantation forest management information system
				Deployment of a MIS system at Green Wood Resources (Beijing) Forestry Co. Ltd to support management of various plantation investments.
				Forest biomass resource assessment
				Assessment of PT Tusam Hutani Lestari HTI Concession and its suitability for supply of sustainable pulpwood production.
	Aceh Province, Indonesia			**Carbon assessment project** The consultant is preparing monitoring, reporting and verification procedures for direct measurement of carbon stocks and estimation of carbon emissions from land conversion. The carbon profile is then used, in conjunction with other criteria, to identify lands that can be converted to oil palm without generating net carbon emissions in the long term. The client is The Forest Trust (TFT) and the beneficiaries are the members of the RSPO. The consultant is also involved in planning and implementing field survey and data analysis. The project is conducted in cooperation with Greenpeace.
2010	Indonesia			**Contributing author with paper on climate change adaption from forestry perspective**
				Preparation of the "Forestry" chapter of the "Green Jobs Through Green Work". A document being prepared by the International Labour Organization of the United Nations. The chapter focuses on forests and climate change, impacts of climate change on forestry, mitigation and forestry, and impacts on project design and implementation.

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	Sabah, Malaysia			**Forestry expert on the Leuser Ecosystem REDD+ project team.**
				The Leuser REDD project is funded by German Ministry Of Environment, Nature Conservation, And Nuclear Safety (BMU SBF) as part of the German Financial Cooperation with the Indonesia International Climate Intiative (ICI) and is being implemented by KfW. The purpose of the project is to design policy and specific activities to reduce deforestation and rehabilitate degraded forest lands in the Leuser Ecosystem in Aceh and North Sumatra Province, one of the largest remaining natural forest areas in Asia. The consultant is part of a multi-disciplinary team and his responsibilities are to provide general forestry expertise as well as specific technical advice with regards to MRV.
				Plantation mapping in East Kalimantan
				Supervision of mapping project to map land use and identify palm oil plantation boundaries.
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				Supervision of mapping project to map land use and identify palm oil plantation boundaries.
				Reduced Impact Logging Assessment
				Management of independent field inspection and assessment of Reduced Impact Logging program in Sabah Indonesia. The client was the Sabah Forestry Department and the consulted was sub-contracted through Global Forest Services Inc.
				Land Valuation of Cassava Bio-energy property in South Sulawesi
				Evaluation and valuation of 65,000-hectare property in South Sulawesi. The property is proposed for a large-scale development of cassava plantation to be used as feedstock for ethanol production.
				Forest Inventory in South Kalimantan
				Management of field forest inventory inspection for 50,000 hectare of forest plantation in South Kalimantan Province, Indonesia supervising 3 field crews.
				Forest Inventory in Aceh Province
				Management of field forest inventory inspection for 110,000 hectare of forest plantations in Aceh Province, Indonesia supervising 3 field crews and one GIS and remote sensing team.
				Review of proposed Global Conservation Standard
				Part of an international panel of experts conducting a review of the draft text of the proposed Global Conservation Standard.
	China			**Resource assessment and remote sensing training**
				Management of resource assessment and training program for a forest investment project in Dandong, Liaoning Province, Peoples Republic of China.
	Aceh Province, Indonesia			**Development of Voluntary Carbon Standard PDD**
				Preparation Project Design Document for 1-million-hectare property for a confidential client.
2009	Mindanao Island, Philippines			**Natural forest assessment**
				Evaluation and valuation of 35,000-hectare natural forest concession
	Cambodia			**Assessment of teak plantations**

Years	Location	Company	Position	Description
				Evaluation and valuation of Teak Plantation project in Western Cambodia.
	Indonesia			**Due diligence for plantation asset sale.**
				Evaluation of 60,000-hectare plantation resource in Central Kalimantan. Consultant responsible for project management. Project including assessment of site, inventory of forests assessment of companies environmental and CSR performance.
	Indonesia			**Preparation of pre PDD VCS assessment.**
				Pre-assessment of 120,000-hectare natural forest concession in Central Kalimantan under Voluntary Carbon Standard (VCS). Project was conducted on behalf of Carbon Conservation Ltd.
	South East Asia - Pacific	New Zealand Imported Tropical Timber Group.		**Verification of legal origin for various jurisdictions**
				Evaluation of wood products legality verification systems in Asia and Pacific regions
	Guondong Province, China			**Assistance with plantation resource assessment**
				Analysis of establishment and growth for teak and eucalyptus plantations in China.
		Fiji Hardwood Corporation Ltd, funded by an ITTO grant		**Design and implementation of sawmill management systems for Fiji Hardwood Corporation Ltd**
				Design and implementation of sawmill management systems at Waivunu sawmill.
	Malaysia			**Verification of legal origin**
				Part of a team evaluating the procurement procedures of an exporter of logs and processed wood products from Sarawak Malaysia. The purpose of the project was to document the client's current operating procedures and make recommendations regarding establishment of verified legal origin status for all the wood products procured by the client.
	Indonesia			**Asset Mapping Assistance Project.**
				Implementation of monitoring and evaluation project for the Asset Mapping Assistance Project. AMAP is an AUSAID funded project, with GTZ IS as implementing agency, with the role of monitoring and evaluating fixed asset survey in Aceh province. The consultant was project leader managing a team of 9 staff of GIS technicians and construction inspectors.
	Indonesia			**Asset Mapping Assistance Project.**
				Preparation of the monitoring and evaluation project plan for the Asset Mapping Assistance Project. AMAP is an AUSAID funded project, with GTZ IS as implementing agency, with the role of monitoring and evaluating fixed asset survey in Aceh province.
	Laos			**Design of forest MIS for plantation development company.**
				The design involves design and development of silvicultural operations planning and management systems for 50,000 plantation development projects.
	Indonesia			**Provision of advice for CO2 offset and environmental investment.**
				The project involves the providing technical advice to an investment company negotiating investment packages for CO_2 offsets, avoided deforestation, non-timber forest management and sustainable forest management.
	Indonesia			**Derivation of CDM CO2 footprint for forest plantation company**

Years	Location	Company	Position	Description
				The project involved the estimation of the carbon footprint of the plantation forest operations of a major forestry corporation in Indonesia. The carbon footprint study involved modelling of the CO_2 sequestration from growing plantation forests and the emissions from forest fires, harvesting, degradation of logging waste and fuel consumption from machinery used in forest operations. The study was conducted in association with ERM as part of an analysis of options for application for carbon credits under the clean development mechanism (CDM).
	Indonesia			**Derivation of CO2 footprint for forest plantation company** The project involved the estimation of the carbon footprint of the plantation forest operations of a major forestry corporation in Indonesia. The carbon footprint study involved modelling of the CO_2 sequestration from growing plantation forests and the emissions from forest fires, harvesting, degradation of logging waste and fuel consumption from machinery used in forest operations. The study was conducted in association with ERM.
2006 - 2008	In Aceh and Nias Island, Indonesia Nias	Badan Rekonstruksi dan Rehabilitasi (Indonesia Government Reconstruction Coordinating Agency) BRR Nias	logistics coordination advisor Acting Logistic Manager	**Indonesia – Monitoring of Needs for Construction Materials and Logistics Planning for Aceh and Nias reconstruction** Involving the coordination of GOI Ministries, Indonesian timber industry groups, UN Agencies and NGO's to determine needs and facilitate the availability of all building materials supply for reconstruction. Position initially funded by AUSAID / AIPRD and now by UNDP. Coordinating and supporting logistics policy and projects of BRR, NGOs and UN Agencies in the the area of shipping, port development, temporary materials storage facilities, and road transport development. Specific tasks completed on Nias included: ○ Monitoring of the progress and status of reconstruction programs in Aceh and Nias. ○ Organizing roading needs assessment for reconstruction activities. ○ Quantifying building materials needs, identifying bottlenecks and supply shortages and advising addressing materials supply problems. ○ Organizing logistics working groups and workshops on logistics. ○ Coordinating transport infrastructure projects to assist BRR and NGO relief program. ○ Provision of specialist advice on timber supply including identifying suppliers, providing advice on timber use, and advising on timber procurement and transport.
2007	Indonesia/Thailand			**Project management for various forest due diligence** Management of forest inspection and due diligence projects for several commercial clients in Aceh, West Papua, and Thailand. The due diligence included forest resource mapping using remote images and GIS, field inspection and forest inventory, and yield modelling and forest valuation. The consultant was responsible for overall project management, coordination of GIS and field technicians, data analysis and reporting.
	Russian Federation			**Legal verification of wood supply chains for WWF** Design of legal verification systems for logs and timber produced in and exported from central Siberia in the Russian Federation. The project involved travelling to Russia, visiting timber production sites, documenting the production and distribution processes of selected companies, and making recommendations for improving the verification and auditing of legal wood supply. The project conducted on behalf of World Wildlife Fund (WWF) and IKEA.
2006	New Zealand			**Implementation of GIS, forest management and financial management systems** Working for Ngati Porou Whanui Forests Limited, have prepared and compiled spatial data, established GIS systems, designed and developed customized forest management systems, migrated company financial systems to JADE financials, and implemented training and support.

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	Aceh, Indonesia	BRR (Indonesia Government Reconstruction Coordinating Agency)	Wood Coordination Supply Expert	**Wood supply coordination for Aceh reconstruction** Involving the coordination of GOI Ministries, Indonesian timber industry groups, UN Agencies and NGO's to facilitate the availability of wood supply for reconstruction. Position funded by UNDP.
2004 - 2006	New Zealand			**Carbon systems analysis for New Zealand Permanent Forests** • Development of procedures manual for management systems associated with financial control, operations control and reporting, yield and CO2 forecasting, and carbon yield monitoring. • Development of yield and CO2 forecasting models for pine, fir, and Eucalyptus species.
2005	Sabah State, Malaysia	Yayasan Sabah		**Reduced impact logging program** Assessment of needs for implementation of reduced impact logging
	Aceh, Indonesia	FAO		**Planning wood supply for Aceh reconstruction** Assessed wood supply needs and prepared a report providing information on the wood demand and supply situation for reconstruction purposes, recommending measures to be taken to meet the timber requirements, and indicating possible roles of FAO in providing assistance.
	Fiji			**Implementation of mill and timber yard management systems** Design and development of systems management of mill production, timber distribution and sales systems for an integrated sawmill, timber moulding and distribution company.
	Australia			**Growth and yield modelling of *Eucalyptus globulus*** Derivation of growth functions for *Eucalyptus globulus* and analyse the impact of site-specific indices such as land use class, rainfall and potential evaporation on growth and yield.
2004	New Zealand	Fiji Hardwood Corporation Ltd		**Systems Review** Review of procedures and systems of forest resource description and forest inventory systems maintained by a major corporate client in New Zealand. The review included (i) documentation of procedures, process, methodologies and rationale of corporate systems and data models, (ii) testing procedures, responsibilities, and validation and audit procedures.
	Fiji			**Design of logistics / chain of custody / resource management systems** Design and development of systems for complete chain of custody from log stock inventory, log delivery, invoicing of contractors and customers. Also implementing forest inventory, resource mapping and production planning systems.
	Indonesia	The project is sponsored by DFID and USAID and managed by The Nature Conservancy.		**Chain of custody system design and development** Design and development of systems for complete chain of custody from forest inventory, to log delivery, product tracking through saw and plywood mills through to dispatch to customers.
	Indonesia	Report prepared for CIFOR on contract to Global Forestry Services.		**Chain of custody report** Preparation of report on the status of technology for management of harvesting operations, product identification and labelling, transport of material and chain of custody.
	Hawaii, USA			**Weed management systems**

Years	Location	Company	Position	Description
				Design and development of a weed management system as a decision support system for the management and control of weeds on agricultural lands. The system supports the following functions (i) Description of weed species, their infestation rates, control strategies and priorities for control. (ii) Layout of management areas, properties and management units. (iii) Programming of weed control operations on individual management units. (iv) Reporting and analysis of weed control operations.
	New South Wales - Australia			**Yield table preparation for confidential client** Analysis of inventory data from across New South Wales and preparation of site and silvicultural regime specific yield tables for radiata pine.
2003	Indonesia			**Wood flow and sustainability modelling.** Modelling of wood flow projections for a major pulp and paper company in Indonesia and determination of sustainable levels of plantation and pulp mill production.
	Indonesia			**Design of FMIS for corporate plantation management company.** Design of Forestry Management Information System (FMIS) for a large corporate forest plantation company in Indonesia. The FMIS incorporates forest and infrastructure asset register, operations management system, financial management systems, and supply chain management system.
	Fiji			**Analysis of systems requirements for Mahogany management** Reviewed Fiji Hardwood Corporation Ltd in terms of current company structure, processes and system requirements. Prepare an overview of alternative systems for forest management, supply chain management, planning and financial control consistent with the systems requirements. Also assisted in growth and yield assessment and forest valuation.
	New Zealand			**Permanent sample plot systems** Design and development of permanent sample plot database systems for confidential client in New Zealand.
2002	Indonesia	APP		**Wood flow analysis** Assessment of growth functions, forest inventory data and forest resource description and preparation of wood flow forecasts for APP, a corporate forestry enterprise in Indonesia.
	Indonesia			**Forest management and chain of custody systems** Review of existing forest management and chain of custody systems for a corporate forestry enterprise and the recommendation of "best practices".
	Indonesia			**Development of growth and yield models for *Acacia mangium*** Development of height, basal area, mortality and volume growth functions for *Acacia mangium* grown in Sumatra, Indonesia.
	New Zealand			**Review of Government forestry policies for Maori land** Prepared a review of the Governments proposed policy for the development of plantation areas on land owned by indigenous New Zealanders (Maori). The review covered an analysis of the consultation processes used, the quality of the proposal in terms of desired outcomes, and the ability of the proposal to address the underlying problems land management problems.

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	Cambodia	World Bank		**Chain of custody project – World Bank** Member of team of experts assessing and comparing the utility, limitations and costs of new and available systems and technologies for tracing the source of wood and verifying that it was legally harvested and traded.
	New Zealand			**Design of dispatch systems** Design of transport planning and truck dispatch system for corporate client in New Zealand.
	New Zealand			**Participation in due diligence for a major corporate acquisition for confidential client** • Management of large-scale plantation forest inventory. Responsible for inventory sample design, co-ordination of field operations, data capture and processing and reporting. • Assessment of corporate requirements for financial management and forest management IT systems for the new company.
2001	Indonesia			**Volume and taper equations for *Acacia mangium*** Development of compatible volume and taper equations for *Acacia mangium* grown in Central Sumatra, Indonesia.
	Bangladesh			**Inventory Specialist for World Bank Forest Resources Management Project** Design of forest inventory project for native and plantation forest in the Chittagong Hill Tracts. Preparation of field procedures, planning of field logistics and manpower, organization of GIS and maps, and design of information systems.
	New Zealand			**Review of forest resource description systems for Weyerhaeuser NZ Inc** Reviewed the systems and procedures for quantifying the company's forest resources and for modelling future wood flows and cashflows.
	Niue			• Development of forest records and inventory sampling and analysis systems for implementation in Niue Island. • Assessment of the impact of soil and site variables on the growth and yield of Mahogany (*Swietenia macrophylla*) plantations. • Preparation of growth and yield equations and tables for Mahogany plantations.
	New Zealand			**Review of log conversion factor systems for a large corporate** Reviewed the methods and systems for deriving conversion factors from tonnes and JAS to cubic metres for a large corporate client in New Zealand. The review included analysing the existing log conversion rates, deriving estimates of m3 production rates from actual tonnes and JAS for the whole company and describing potential sources of error.
	New Zealand			**Design of integrated transport monitoring system** Prepared a specification for a system for the management of truck dispatch and pickup and delivery of logs. System specification included description of database elements and radio/cell phone communications between the control centre and logging trucks.
	New Zealand			**Environment Court** Reviewed the indigenous forestry management rules of the revised District Scheme of the Southland District Council.
	New Zealand			**Review of log sales management systems for a large corporate** Reviewed existing log sales and accounting systems for a large corporate client in New Zealand. The review included analysing the data processing systems and risk assessment systems used by the company in controlling and monitoring log purchases and sales. The review resulted in improvements to the computer systems and management processes resulting in increased efficiencies.
	New Zealand			**Review of Silvicultural Quality Control Systems**

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				Reviewed existing silvicultural quality control systems for a large corporate client in New Zealand. The review included assessing the management of QC and reviewing sampling designs and field implementation.
	New Zealand			**Review of Preharvest Inventory (PHI) Systems** Reviewed existing preharvest inventory systems for a large corporate client in New Zealand. The review included assessing the management of PHI and implementing management improvements, reviewing sampling design and field implementation, and reviewing all PHI computer systems and specifying system improvements.
1998 - 2000	Indonesia			**Management systems for natural forest management – EU foreign assistance project** • Development of a documented national standards and quality management systems for Permanent Sample Plot implementation. • Design and development of database information systems for species identification, forest inventory and permanent sample plot growth monitoring. • Analysis of natural forest inventory data in Berau, East Kalimantan; including stratification of forests by vegetation types and analysis of forest yields by environmental factors.
1999	New Zealand			**Forest growth modelling** • Validation and calibration of Douglas Fir growth and yield functions for a large company in New Zealand. • Analysis of growth and yield effects of bio-solids application to forest plantations in Canterbury.
	Western Province, Solomon Islands			Development of compatible volume and taper equations for plantation grown *Terminalia brassii*, *Gmelina arborea* and *Campnosperma brevipetiolata*
	Fiji			Development of forest records and inventory sampling and analysis systems for implementation in Fiji for Fiji Pine Ltd.
	Australia			• Modeling of wood production from, and valuation of, the Victorian Plantation Corporation for a confidential client. • Modeling of wood production from, and valuation of, the wood resources of a confidential client in Tasmania. • Development of specialist inventory and silvicultural scheduling systems for Norske Skog, Tasmania.
1998 - 2000	Tonga & Philippines			**New Zealand foreign assistance project** • Development of forest records and inventory sampling and analysis systems for implementation in Tonga and the Philippines for Landcare NZ Ltd. These systems included an integrated land management database and GIS. The GIS used were Arc View and Map Info. • Analysis of natural forest inventory data for the establishment of wood processing plant in Mindanao, Philippines.
1998 - 2001	New Zealand			**Installation of various MIS** Development, installation, and training in MIS systems for 6 different commercial forestry companies. Details provided on request.
1998	Thailand			Review of volume and taper equations for Eucalyptus camaldulensis, and development of merchantable yield tables for a confidential client in North East Thailand.
	Cambodia			**IMF foreign assistance project** Preparation of recommendations for wood product monitoring and inspection procedures for Cambodian Government. Prepared for the DAI consulting group
	Papua New Guinea			**Sawmill feasibility study** Prepared an analysis of the feasibility of a cut-stock wood processing plant for Brown River Forestry Partnership Ltd, Port Moresby, Papua New Guinea.

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	New Zealand		Trainer	Presentation of the FORE419 lecture series (4th year B.For.Sc.) on forest modelling and resource assessment at the School of Forestry, University of Canterbury.
	New Zealand			**Log Tracking** • Prepared procedures and guidelines for Weyerhaeuser NZ Ltd to assist in the on-site testing, evaluation, and modification of a Canadian log tracking system. • Assessment company quality procedures and development of quality manual for Groome Pöyry Ltd, a forestry consulting firm in preparation for certification under ISO9000.
1996 - 1997			**Systems Specialist, SGS Forestry, Oxford, United Kingdom**	• Supervision of the design and specification of systems for sampling, measurement and quantification wood products for the purposes of (a) monitoring log and timber exports for commercial clients and Government agencies (b) derivation of international trade statistics. • Supervision of upgrading and maintenance of computer systems at the operational sites. • Member of the company management team responsible for development and presentation of technical and financial proposals to companies/Governments for the implementation of monitoring services. Also team leader of projects for development of new products and services. • Supervision of SGS Forestry computer systems including co-ordination with the Group IT services in the UK and Geneva. • Knowledge of procedures and systems for measurement, inspection, tracking, and export of wood products and other commodities. • Design and specification of data capture systems (hand-held computers/PDA), database systems (SQL Base, SQL Windows), and data communication systems. • Management of software development projects. • Design and implementation of labelling systems – bar-coding, scanning and field data capture, and communication to central data processing sites.
1988 - 1995				• Forest Resources Specialist Consultant • Self-employed and subcontracting to Groome Poyry Ltd
1995	Solomon Islands			Development of silvicultural management and planning systems for Kolombangara Forest Products Ltd, Western Province, Solomon Islands.
	New Zealand			**Forest appraisal** Assistance with development of forest appraisal training course for in major New Zealand Forestry Company.
	Australia			**Inventory and resource assessment** Planning, supervision, and data analysis logging waste assessment in East Gippsland, Victoria, Australia. The project involved planning forest inventory procedures, supervision of field operations, design of specialist forest inventory computer program, and analysis of field data. Field procedures used 3P sampling methods.
	Australia			**Resource assessment** Assessment of privately owned radiata resources in northern Tasmania, Australia. The project involved collation and analysis of forest stand record systems, GIS databases, and growth and yield data. Forests were modelled using growth and yield functions developed in Tasmania in conjunction with the STANDPAK growth and yield modules.
	New Zealand			**Information system** Development of lumber management systems for a small vertically integrated timber marketing company. The system is written in Microsoft Access. The system tracks wood flows from the logging site, through small contract mills, to kilning and dressing, through to

Years	Location	Company	Position	Description
				delivery to the lumber buyer. The purpose of the system is to track product and cash flows throughout the production and distribution process.
1994	Indonesia			**Inventory** Planning, supervision and data analysis for forest inventory of 28 concessions in Indonesia. The project involved planning forest inventory procedures, supervision of field operations, design of specialist natural forest inventory computer program, and analysis of field data. Data analysis comprised developing yield tables for multiple species in Kalimantan, Seram and Irian Jaya.
				Australia - Resource assessment Forest resource analysis of plantation and natural forest resources in Western Australia conducted to assist the future planning and development of existing MDF and particleboard capacity. The project involved preparing yield table estimates for both plantation and natural forests, preparation of growth and yield forecasts, and the formulation and solution of LP forest estate model.
				China - Inventory and resource assessment Inventory and GIS of forest resource in Yangchun County, Guangdong Province, People's Republic of China for Hong Kong clients. The project involved preparing estimates of current stocks of both plantations; design of GIS to record forest, road, and population locations; preparation of yield tables and growth forecasts; and the formulation and solution of LP forest estate model.
				New Zealand - Inventory Inventory and growth and yield project of sand dune forests in Northland, New Zealand. Development of plantation monitoring procedures and plantation estate resource description and modelling of future productivity. Project undertaken to assist planning of major MDF and veneer mill development in the region.
1993	New Zealand			**Inventory and growth and yield** Inventory and growth and yield projection for plantations at mid-rotation in the Central North Island, New Zealand. Development of plantation monitoring procedures and management information systems for Winstone Pulp International Ltd. The system concentrated on quantifying plantation quality and growth potential at the mid-point between planning and harvesting, and then using this information to prepare yield tables of final harvest by log quality grades.
				New Zealand - Logging Management System Development of LOGTRAK (written in Microsoft Access), a log tracking and management system. Systems analyst for development of MIS that records all aspects of log flows from the forest site to the mill. The system includes modules for recording contractual arrangements with loggers, loaders, transportation operators and log buyers and for calculating payments to the respective parties.
	Indonesia			**Log Tracking Systems** Report on the use of Australasian Technology to assist in the eco labelling of tropical logs. Systems design as above, but included other aspects such as legislative and cultural framework, use of electronic measurement equipment and telecommunications.
	New Zealand			**Provision of advice to Ministry of Maori Affairs and Ministry of Forestry on natural forest management policy:** Actively involved in development and formulation of legislation and government regulations regarding natural forest harvesting and conservation.
1991 - 1992	New Zealand			**Natural Forest Inventory and Valuation - New Zealand Government 2-year Project:** Joint project leader for the planning, collection and analysis of inventory data for Maori owned indigenous forests. Developed software for data analysis (PARADOX database language) and resource mapping (Terrasoft GIS language). Produced growth and yield projections for several natural forest species.
1992	Indonesia			**MIS and training** Development, installation and support the Plantation Record System called FMS (written in DATAFLEX database language). Installation and staff training of FMS with Inhutani II Head Office in Jakarta for management of plantations. Described below, but modified for Indonesian management techniques, conditions and requirements.

Years	Location	Company	Position	Description
1992	New Zealand			**Econometrics** Econometric modelling for evaluation of the socio-economic impact of large-scale afforestation on the East Coast of New Zealand. The East Coast is an isolated, sparsely populated, and economically depressed region of New Zealand. The project examined the long-term economic, social and environmental impact of a planned 100 000 ha afforestation project in the region. Special emphasis was placed on examining the impact on indigenous Maori people who comprise a majority of the population.
1991	New Zealand			**Plantation Record System - FMS:** Development of FMS package for plantation forest management. Installed with plantation forest owners within New Zealand. Integrated tool for recording plantation location, species composition, management history, growth and yield, and inventory data.
1990	New Zealand			**Post-Harvest Assessment Systems:** Development of inventory procedures and MIS for the assessment of monitoring of harvesting operations and waste volumes. Systems designer of sampling methods and statistical analysis methods.
1989	New Zealand			**Growth and Yield Modelling:** - Development of growth and yield functions for plantation forest species in New Zealand for production forecasting and yield prediction. Scientific methodology published in *Journal of Forest Ecology and Management*, January 1992. - Sector Modelling of Natural Forest: Development of regional sector models for natural forest in New Zealand. Modelling involved the use of forest estate simulation and encompassed financial analysis of future natural forest management and plantation reafforestation program, employment projections, and industrial development.
1983 - 1987	New Zealand	Forest Service	Forester Trainee	Junior forester with posted to several offices throughout New Zealand, including Lake Taupo Forest, Franz Josef, Blenheim District Office, Forest Research Institute in Rotorua, and Wellington Conservancy office in Palmerston North. The position involved one year's full time work followed by 4 years University studies and full time holiday employment. Left the New Zealand Forest Service following the privatisation and dissolution of the Department in 1997. Employed as a full-time junior trainee officer at Lake Taupo Forest for 1 year. This involved in general silvicultural, harvesting, and inventory activities. Employed for 4 months as inventory assistant at Franz Josef, West Coast. This involved being team leader of a forest inventory team working in natural forests. Employed for 4 months as technical assistant to the district forester, Blenheim. This involved planning and undertaking forest resource inventories throughout the Marlborough region. Employed for 4 months as technical assistant in Genetics and Tree Improvement Division, Forest Research Institute, Rotorua. Responsible for assisting in tree selection, creating genetic trials, and field assessment of trials. Employed for 4 months as technical assistant to the Regional Forester, Palmerston North. Responsible for preparation of department databases on local government plans and regulations relating to forest management.