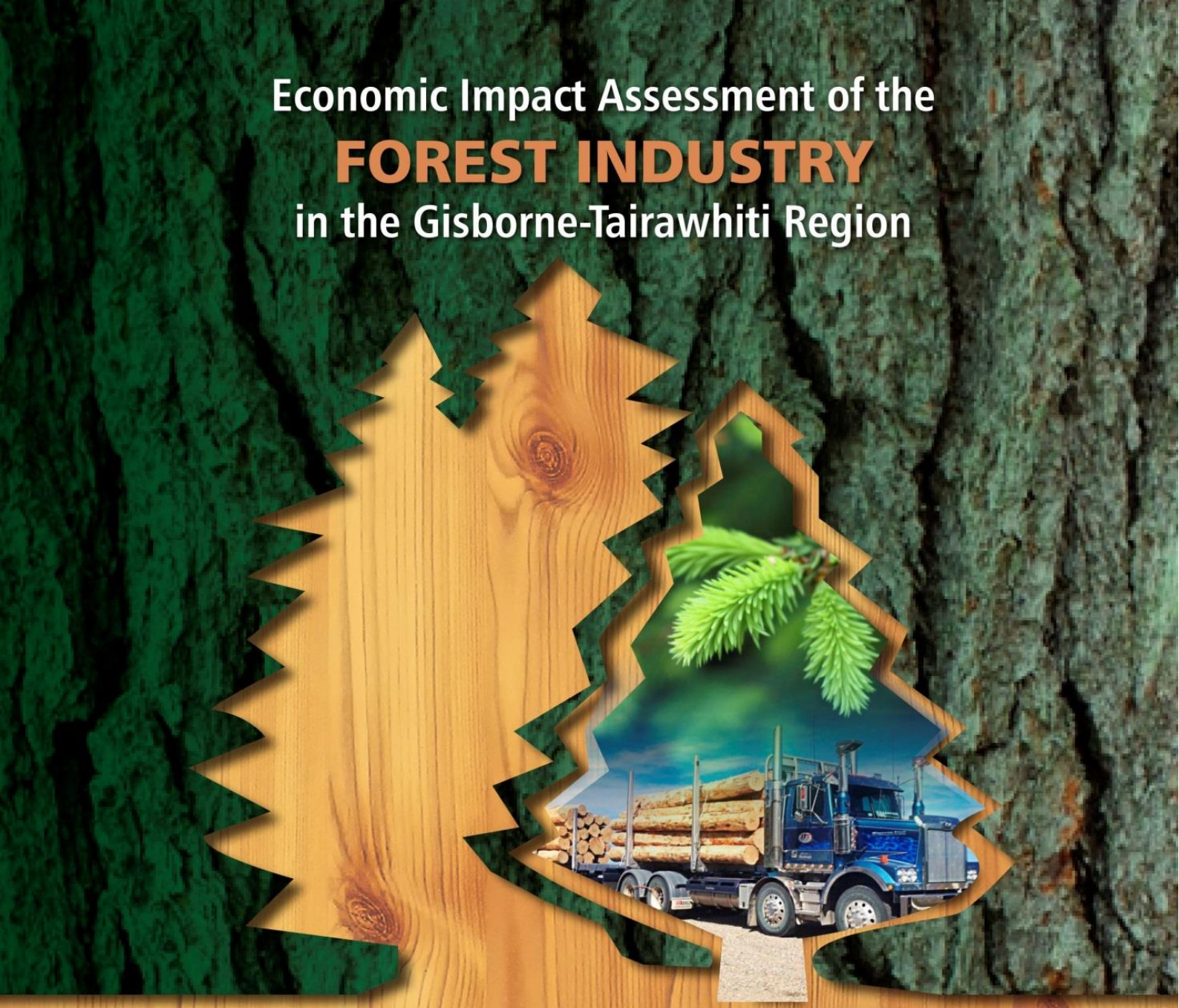
Economic Impact Assessment of the FOREST INDUSTRY in the Gisborne-Tairawhiti Region



EASTLAND WOOD COUNCIL

Report prepared for the Eastland Wood Council
10 October, 2013
by

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Economic Impact Assessment of the Forest Industry in the Gisborne-Tairawhiti Region

TABLE OF CONTENTS

Economic Impact Assessment of the Forest Industry in the Gisborne-Tairawhiti Region

LIST OF TABLES

Economic Impact Assessment of the Forest Industry in the Gisborne-Tairawhiti Region

LIST OF FIGURES

Economic Impact Assessment of the Forest Industry in the Gisborne-Tairawhiti Region

EXECUTIVE SUMMARY

The Gisborne-Tairawhiti region has a strong export oriented forestry industry.

In 2011/2012, the direct value of forest production (excluding processing) was $225 million from 154,000 hectares. Significant economic flows are associated with wood production, harvest, transport, port handling and processing activities and the expenditure of wages and other forest income.

Forestry sector income has positive spill over benefits on the region and the country

Backwards and forward linkages generate a multiplier of 2.7 and result in additional activity estimated to contribute a further $383 million annually to the regional economy.

The forestry sector contributes significantly to incomes, employment and infrastructure in the region.

The sector earns income and profits, provides employment and contributes by way of taxes, rates and other fees, and supports its local community through grants, sponsorships and projects. It is also attracts government funding for infrastructure.

Forestry makes an important contribution to employment by employing nearly 2,000 FTE in the region.

The forestry sector currently employs 1,610 FTE with approximately 1,035 FTE in the forests and 320 FTE in processing, 145 FTE in transportation and 80 FTE at the port. This is approximately 10.3 per cent of the regional workforce. The sector is an employer of similar size to manufacturing, construction, health and business services combined.

The forest sector is complemented by significant economic production from sheep and beef farms; vineyards, orchards and other agricultural and tourist activity.

More than 350,000 hectares in the region is used for sheep and beef farming. The direct value of production from this land was estimated to be $206 million in 2011/2012. Additional value of more than $350million is derived from meat processing and indirect expenditures in the region. Revenue from sheep and beef farms plus those from 7500 hectares of horticulture and nearly 2000 hectares of grapes ensure the region is not a one industry location.

The Gisborne-Tairawhiti strong forestry sector is increasingly important to the region.

In 2000 the forest harvest was 0.6 million tonnes and this has grown so that by 2012 it had reached 2 million tonnes. It is expected that in the decade to 2020 annual log exports will have grown a further 60 per cent. The existing forest stock provides a platform for growth and the potential for a harvest of 3.2 million tonnes annually by 2020.

Future forest industry growth represents an additional annual impact on the local economy of $378 million.	Assuming the same economic structure of the industry this growth will bring an estimated 630 new jobs into the region and increase export earnings. The growth will have positive flow on effects to associated sectors such as the port, transport and machinery services, and also creates a platform for the development of the wood processing sector creating and exporting higher margin manufactured wood products.
The forestry sector produces significant environmental benefit to the region.	Forestry plays a very significant role in maintaining land through the prevention of slips and erosion that damage both hill country, lowlands and infrastructure.
Forest sector activity requires careful development to minimise potential adverse effects associated with production, transport or processing.	Transport infrastructure, particularly roading involves potential conflicts between forestry and other road users. Appropriate consultation, planning and management is essential to minimise the potential for adverse outcomes.
The forestry sector is characterised by significant innovation and growth in productivity.	Growth from 2005 to 2010 demonstrated technology and innovation benefits gained through improved silviculture, harvesting, processing and logistics. The forecast growth until 2020 assumes similar technological gains. Productivity gains are the result of education, networking and investment in new technology, equipment, facilities and infrastructure.
Sustaining forestry sector growth requires development of people capability and infrastructure capacity.	The key development challenges to support growth in the forestry sector are ensuring the port and related infrastructure continues to develop with the sector managing skills and technology development so there are no gaps, and balancing the infrastructure needs of industry and residents.
A key economic asset for the region is the Port – one of the three largest log exporting ports in New Zealand.	Exports from Eastland Port are dominated by logs. Efficient management of logs through the port is a critical challenge. This requires attention to determining optimal patterns of storage and truck movement.
As an export industry, forestry has to be resilient to cope with international market dynamics.	The forest sector is exposed to changing exchange rates, freight rates and log prices – factors over which it has no control. This reiterates the importance of effective management of New Zealand challenges which can be addressed.

Economic Impact Assessment of the Forest Industry in the Gisborne-Tairawhiti Region

INTRODUCTION

This report has been prepared for The Eastland Wood Council (EWC), an incorporated society with members from major commercial forestry, wood processing and distribution interests operating within the Gisborne-Tairawhiti region. The EWC seeks to support its forestry sector members by undertaking initiatives that enhance the sector (see http://www.eastlandwoodcouncil.co.nz/).

Accurate information and analysis is important to sustain robust public policy. EWC has identified that there is limited data available on the economic and social wellbeing contribution the wood production and forestry sector makes within the Gisborne-Tairawhiti communities. Given this lack of information, the EWC commissioned the *Institute for Business Research* (IBR) at The University of Waikato, to prepare an economic impact analysis quantifying and analysing the contribution made by the forestry industry to the well-being of the region. It is anticipated this analysis will strengthen industry and public understanding.

This report examines the direct and downstream economic impacts of the plantation forestry and timber processing sector to the district's economy, including the sustainability of communities and regional employment. In particular, the report addresses:

- The current economic contribution of the forestry sector to the Gisborne-Tairawhiti economy and the forecast contribution through to 2020
- The current contribution of forestry in sustaining the communities in Gisborne-Tairawhiti in terms of employment opportunities, support of local businesses and social services, rates and other contributions towards the funding of public expenditures in the region and nation
- The forecast growth of the forestry sector over the next decade including consideration of some expected challenges and their potential resolution so they do not become a constraint on the sector or the region

NEW ZEALAND FORESTRY

Forestry is a significant industry in New Zealand, contributing an annual gross income of around $5 billion[1] (FITEC, 2010), three per cent of New Zealand's GDP and directly employing around 20,000 people. Wood products are New Zealand's third largest export earner behind dairy and meat. New Zealand supplies almost 9 per cent of the Asia Pacific forest products trade volume, representing nearly 20 per cent by value. New Zealand is a small player in the global international forestry industry, accounting for just 1.1 per cent of the world's total supply of industrial wood and 1.3 per cent of the world's trade in forest products.

The industry in New Zealand is based around sustainably managed exotic plantation forests which cover 1.751 million hectares (approximately 7 per cent) of New Zealand's land area (MAF, 2012). A further 6.5 million hectares is covered by indigenous forests, mostly managed by the Department of Conservation as part of the conservation estate. Approximately 90 per cent of exotic plantations comprise Radiata Pine (*Pinus Radiata*), with Douglas Fir (*Pseudotsuga Menziesii*) accounting for 6 per cent and the remainder of the estate is made up of eucalyptus and other softwood and hardwood species.

Company, industry and government decisions can have long term consequences. A case in point is the challenge of climate change policies and carbon storage. A decade ago, climate change policies were expected to increase forest plantings, but current policy uncertainty in New Zealand and internationally have resulted in more caution. Forestry is an industry with long payback periods. From planting to harvest is at least 25 years with significant capital investment and infrastructure requirements.

The top five export destinations for the forestry sector are China, Australia, Japan, Korea and the USA (Statistics New Zealand, 2012). The total value of New Zealand's forestry exports for the year ending the December 2011, increased $0.27 billion, on the 2010 year, to $4.5 billion, a 29 per cent increase on 2009. This is reportedly due to sustained high levels of log exports over the year contributing $1.5 billion (33.7 per cent) to the total value of forestry exports. As with all export driven industries, world events such as the global financial crisis, international prices and exchange rate dynamics impact on the profitability of the sector.

Log exports now account for half the estimated round wood removal harvest. Sawn timber production has been declining and continues to be affected by high domestic log prices, along with weak domestic and international demand for sawn timber. New Zealand-wide challenges include increasing energy costs, transport and logistics and rising fuel costs. Between 2000 and 2004, New Zealand diesel prices were consistently between 60 and 70 cents per litre. Throughout 2011 and 2012, diesel prices were consistently between 140 and 155 cents per litre.

[1] Includes both export and domestic markets.

Wood production volumes are expected to increase significantly in the coming years as forests planted in recent decades reach maturity. In 2009 the Ministry of Agriculture & Forestry (MAF) suggested that the quantity of wood available would double between 2010 and 2024. Hence, this expectation needs to be moderated by the recognition that the industry seeks sustained patterns of harvest rather than a pattern of peak-and-trough. This additional wood is expected to be held in smaller lots and further away from key infrastructure which is expected to lead to a raft of new challenges for foresters. New Zealand's climate change policies are still expected to encourage reinvestment and affect harvest decisions. There is also an increasing societal trend towards preservation of forests, retaining the environment and an increasing awareness of the social benefits that forests deliver.

THE GISBORNE-TAIRAWHITI REGION

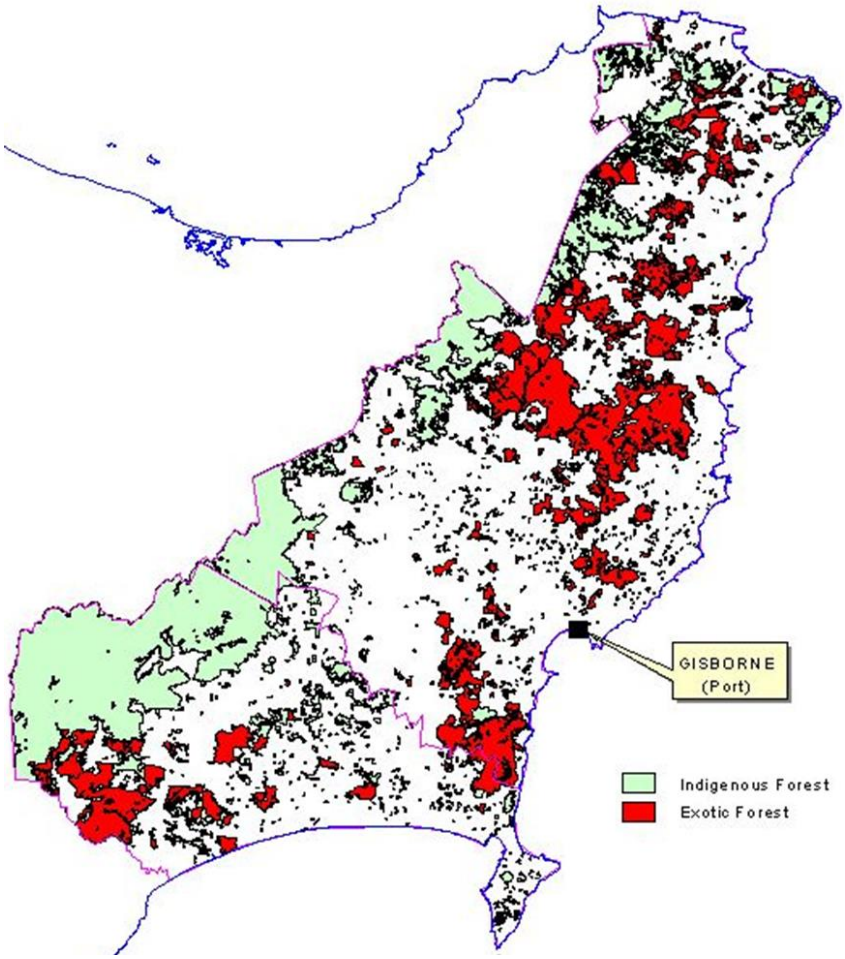
The region of Gisborne-Tairawhiti is located on the East Coast of New Zealand. The region's largest town is Gisborne with a population of around 34,000 representing over 70 per cent of the region's population. The key business sectors in the region are agriculture & fisheries, forestry and manufacturing along with the smaller, but growing sectors of wine and tourism. The key support sectors are education, retail, health and professional services.

The Gisborne-Tairawhiti commercial forest blanket covers 154,000 hectares which represents 8.8 per cent of New Zealand's total exotic forestry portfolio and 11 per cent of New Zealand's log exports. The location of these forests is shown on the map on page 11. Most logs are exported from Gisborne which is also shown on the map. Eastland Port (Gisborne) along with Tauranga, and North Port (Whangarei) is one of New Zealand's three largest log export ports. The leading destinations for logs exported from Eastland Port are China and Korea.

Employment and operational expenditures in the forestry sector in Gisborne-Tairawhiti are largely driven by forest harvesting with key sub sectors being specialised servicing, transportation, port handling and wood processing. Other subsectors contribute at appropriate times in the business and industry lifecycle.

The other significant land use in the region is sheep and beef farming. Beef and Lamb New Zealand estimate there are 220 class 3 (hard hill country) and 155 class 4 (hill country) farms of "commercial" size in the Gisborne region. These farms have by and large experienced declining terms of trade over the last decade with gross revenue ranging from $430,952 in 2001/02 to $373, 209 in 2008/09 for hard hill farms and similarly for hill country farms. However, 2010/2011 was a better year for these farms with gross revenue averaging $572,735 for hard hill farms and $530,853 for hill country farms. In aggregate this generated a return to farms in the region of $206m. Sheep and beef farming generates significant off farm activity in terms of meat and wool processing and resulting activity. Hence, in that year the sector generated economic activity approaching $600m including approximately $350m of off farm activity including meat processing.

FIGURE 1: FORESTS IN GISBORNE-TAIRAWHITI WOOD SUPPLY REGION



SOURCE: Eastland Wood Council

RESEARCH METHODS

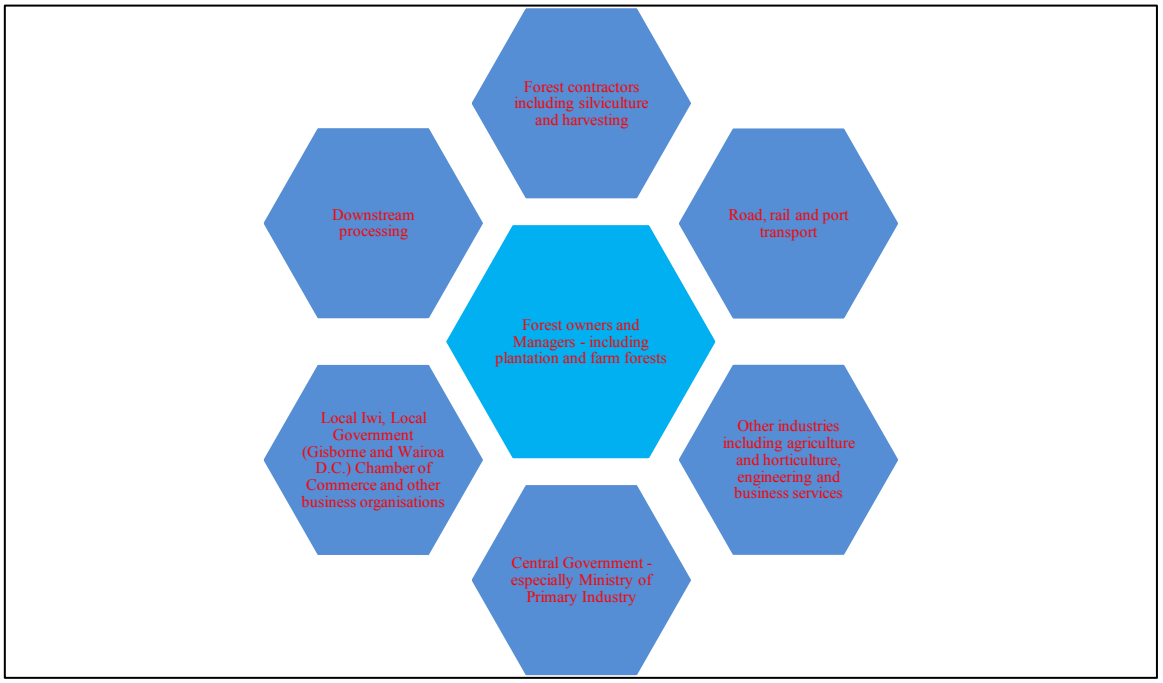
Research for this report involved three methods. Firstly, stakeholder interviews were undertaken to understand the industry and its economic and social context. It was also important to gain information that is not available in published sources and the perceptions of individuals who are involved in the industry. Secondly, a structured input output analysis of the economic impact so the industry was undertaken to quantify benefits to the region. Thirdly, documentary search was undertaken to enable estimation of non-market and non-measurable contributions of the forest sector to the Gisborne economy.

STAKEHOLDER INTERVIEWS

Stakeholder interviews supplemented the input output analysis. Information on the current and historical social and environmental benefits of forestry to the community was gathered from interviews with the stakeholder group. Figure 1 describes the make-up of the Gisborne-Tairawhiti Forest Industry stakeholders group and is the basis for determining who was interviewed.

Face-to-face and telephone interviews occurred between 13 and 29 July 2011. Between four and eight open-ended interview questions or "discussion topics" were prepared and emailed to the respondents before the interviews. Further information was gained from EWC and its members during 2012.

FIGURE 2: GISBORNE-TAIRAWHITI FORESTRY INDUSTRY STAKEHOLDER GROUPS



Input Output Analysis

This impact analysis considers the net effect of direct and indirect costs/benefits associated with a particular activity (Oosterhaven, and Stelder, 2008). The approach has two components or steps. Firstly, what are the direct benefits? These include disbursements from wood industry businesses such as wages paid to employees, local government rates paid, fuel purchased, etc. Secondly, what are the indirect benefits? These include the payments from wood industry employees to owners of service industries such as retail, education health or sports clubs. These indirect benefits have a ripple effect flowing through the economy and are captured by what is called a multiplier effect or impact.

In addition there are intangible effects or externalities. These may be social or environmental. They include for example, the effect on schools from having parents employed; less drug abuse and crime. Similarly, employment through the wood industry means fewer unemployed people in the area claiming benefits. Further forest plantings provide environmental values in addition to their commercial value. These external effects are not included in the input output analysis because of data and computational complexities but they are considered in another section called *Additional Community Benefits.*

This investigation of economic impact is based on input-output analysis, a technique widely used for at least five decades (Oosterhaven and Karen R. Polenske (2009). (Figure 2 describes the basic analytical framework used to consistently consider economic flows and impacts.

FIGURE 3: TRANSACTION MATRIX

From \ To		Purchasing Sectors 1	.....	j	.....	n	Final Demand	Total Gross Output
Producing sector	1	X_{11}	.....	X_{1j}	.....	X_{1n}	D_1	X_1
	.	.		.		.	.	.
	.	.		.		.	.	.
	.	.		.		.	.	.
	i	X_{i1}	.....	X_{ij}	.....	X_{in}	D_i	X_i
	.	.		.		.	.	.
	.	.		.		.	.	.
	.	.		.		.	.	.
	n	X_{n1}	.....	X_{nj}	.....	X_{nn}	D_n	X_n
Value added		V_1	.....	V_j	.....	V_n		
Total input		X_1	.....	X_j	.....	X_n		

Source: Economic Input-Output Analysis, 1978. http://www.masgc.org/pdf/masgp/78-029.pdf*)*

The first row of the table shows the sales of Sector I to the other sectors. The final demand column describes the total sales of the producers to each sector of the economy which consumes the commodities supplied by the producing sectors but does not contribute to the economy a product of its own. Final demand sectors include households, government, sales on

capital accounts and exports. Column entries represent the total purchases of a sector from the other sectors. In addition to the contribution of the n producing sectors to the production of each sector, a sector called "value added", which supplies primary input products such as labour, government services as reflected by tax payments, depreciation and imports, is added to each column (Nissan, et al. 1978).

The numbers in the analysis need to be estimated carefully. The modelling is based on expenditure flows using a sectoral model of the regional economy. The general equilibrium model, developed by the Department of Economics at the University of Waikato Management School, is built from Statistics New Zealand data and models the multiple flows of activity resulting from changes in inputs and outputs. Variants of this model have been used to estimate the impact of enterprises, such as Kawerau Mills, Hamilton Airport Extension, Port of Tauranga and Zespri/Kiwifruit industry. Others have pursued a similar approach in the forest sector, e.g. Butcher Partners, (2010).

A key consideration in the model is that the impact is assessed at the margin, (i.e. taking into consideration the second best alternative use of the resources in economic terms). For example, if the forestry and logging activities ceased, then what happens in terms of sales, contacts and information flows? It is most likely that resources would be reallocated and other less productive opportunities and channels would open up. The assumption of "less productive" holds as if the opposite were the case then they would have superseded the industry in its current form. This means there is some economic benefit, albeit less than the productivity and outputs of the current industry and this needs to be estimated.

The model shows the wider impact of marginal or small changes in levels of activity. This multiplier illustrates how a $1 change in output, or a change in sector employment, affects the economy under analysis. The bigger the multiplier is, the greater the impact. A larger multiplier enhances the importance of that sector of an economy. The underlying data which forms the basis of these multiplier estimates are historical shares of expenditure patterns by different participation in the economy.

The general equilibrium input output method is an objective and credible procedure for valuing the contribution of all industry sectors and the economic implications of change or shocks.

FINDINGS AND ANALYSIS

In assessing the direct and indirect economic contributions of forestry in the Gisborne-Tairawhiti economy we have reviewed the following components:

- Plantings, including plantations to control soil erosion, and production forests
- Harvesting and log production, log exports and downstream processing
- Employment
- Transportation, roading and port facilities

PLANTINGS

Gisborne-Tairawhiti's total planted production forest has grown substantially since 1992 (MAF, 2012). The *2002 Agricultural Census* indicated that as of June 2002, Gisborne accounted for 7.64 per cent or 124,957 hectares of 1,635,427 hectares of planted production forest. By 2010/11 the New Zealand Forest Owners Association (NZFOA) estimates that the region's share has grown to 8.8 per cent or 154,000 hectares of the 1,751,000 hectares of total forest plantation which is consistent with (MAF 2012). The Gisborne branch of New Zealand Farm Forestry Association estimates that some 58,000 hectares of the 2010/2011 estimate is considered small lot forest farms and mostly planted in pine spread across both Gisborne and Wairoa districts. The subsequent section on production forests, reports substantial planting between 2008 and 2012.

PLANTATIONS TO CONTROL SOIL EROSION

The planting of *Pinus Radiata* in Gisborne-Tairawhiti began in the early 1960s as a means to manage soil erosion.

The soil in the region is 'fragile' and prone to severe erosion. MAF estimates that *"26 per cent of Gisborne District's land is susceptible to severe erosion, compared with only 8 per cent of all land in New Zealand."* The land area of Gisborne-Wairoa is 12,474[2] sq km, approximately 7.5 per cent of New Zealand's total land area. Hence, MAF estimates that 20 per cent of the country's soil erosion problem occurs in this district (MAF, June 2006).

Erosion (such as large-scale gully erosion) contributes up to 60 per cent of sediment build up, earthflow erosion and deep-seated slumps, affecting roads and bridges and the productivity of rural land. This threatens rural businesses such as farms and orchards, lowers water quality, disturbs the natural value of land and coastal environments and subsequently has flow on consequences to communities.

[2] Department of Internal Affairs (www.localcouncils.govt.nz)

In the Waiapu catchment area 20,520 tonnes of sediment per square kilometre are produced yearly (Hicks et al, 2000), which equates to approximately 36 million tonnes of sediment flowing through the Waiapu River into the sea per annum – one of the highest sediment yields in the world. In contrast the Waipaoa catchment discharges sediments at the rate of about 16 million tonnes per annum into the Waipaoa River (Page et al, 1999 and 2000). The smaller Uawa catchment discharges about 5 million tonnes per annum into the Uawa River (Hicks and Shankar, 2003). The aggregation of sediment flowing into the Pacific Ocean from all the three rivers equates to around 0.3 per cent of the world's total silt.

Recognising the issues caused by soil erosion and the mitigation that trees provide, saw the Government, through the New Zealand Forest Service, planting trees, starting at Mangatu in the 1960s. The good growing conditions also attracted the interest of plantation forest growers like Hikurangi. In 1987, the Crown substantially exited from commercial forestry. The cutting rights were sold to the private sector in the 1990s with land ownership retained by the Crown with the potential for land to be used as part of *Treaty of Waitangi* claim settlements.

Extreme weather such as Cyclone Bola in March 1988 and prolonged rainfall in 2005 exacerbated the impact of erosion conditions in the region. Cyclone Bola brought heavy rains and strong winds resulting in devastating floods and landslides. MAF reported damage to the value of $120 million to properties in the region and 1,500 landowners received compensation payments of $60 million. A Ministry of Environment (1997) report stated that land which had been planted in forest for eight years or more only had 10 per cent of the soil loss that occurred from comparable land under pasture.

In 1992 MAF committed $184 million to the region over a 28 year period through the East Coast Forestry Project (ECFP) to assist landowners to control erosion and reduce the damage caused by extreme weather. Planting started in 1993 and the programme runs until 2020.

Many respondents agreed that plantation species intended to halt erosion, needs to be harvested and replaced before they die and fall naturally. This requires forest management – silviculture and harvesting, roading and forest engineering. If forest management is not applied the exposure to land erosion risk increases. This view is affirmed by the Waiapu River Catchment Study (SCION, 2012).

Some 90,000 hectares have been planted with government assistance by way of the Forest Service and various programmes like ECFP. About 23 per cent of the East Coast Forest Estate (approximately 35,000 hectares) has been planted through the ECFP. It funds a minimum block size of two hectares in designated areas, making small lot forest farm owners eligible. Ngati Porou Forests Ltd together with Hansol has planted significant forests with ECFP funding.

PRODUCTION FORESTS

Respondents commented that replacement planting and new planting initiatives are ongoing, regardless of other economic drivers, but with careful consideration as to the varietal type. Between 2008 and 2010 plantings averaged over 2,000 hectares per year planted (Table 1). Respondents indicated that more than 6,000 hectares were planted in the year 2011

and over 5,000 hectares were planted in 2012. MAF, through the ECFP, has another 30,000 hectares that it is ready to fund for planting. Although ECFP's forests are primarily for erosion control, stocks planted on them will have to be managed and harvested when they mature.

TABLE 1: GISBORNE FORESTRY PLANTING ACTIVITY, YEAR ENDING MARCH

	2008	2009	2010	2011	2012
Total new area planted (hectares)	592	1,229	530	1,781	1,373
Total area replanted (hectares)	2,433	1,854	2,427	4,519	4,180

Source: EWC members

Respondents commented that uptake and stewardship of ECFP projects are only attractive to the private sector if there are economic benefits in the form of production forestry or as a carbon sink.

HARVESTING AND LOG PRODUCTION

During the 2012 year 2.0 million tonnes of wood was harvested (where 1 tonne is roughly equivalent to $1m^3$) with some 1.86 million tonnes exported in log form. Some of this volume is from the northern part of the Wairoa District. Harvest rates are determined by when the stock is ready to harvest and when it is economic to harvest. With regard to biological readiness, in 2012 MAF reported the average harvesting age in NZ was 28.6 years that more than 50 per cent of the Gisborne forest stock is between 10 and 20 years of age. This suggests a surge of wood is approaching being ready for harvest.

Economic timeliness depends on costs of harvest, market conditions and utilization of industry capacity. Harvesting costs range from \$20-\$40 per m^3 and can be higher with steeper terrain, in environmentally sensitive areas and smaller wood lots. In the market place forest owners experience volatile market demand, exchange rates, shipping costs and product prices. For example, in February 2009 the \$NZD bought US\$0.52, whereas at 8 November 2012 the rate was US\$0.83. Clearly the higher rate already affects forest exports. Some forests with mature trees are holding out for better log prices before committing to harvesting their standing stock. One respondent estimated that this represented some 3,000 hectares with upward of 1 million tonnes of stock waiting for harvest. Further forest managers will seek to smooth the flow and harvest earlier or later so that the industry makes efficient use of scarce capital and other resources.

By 2020 the total forest area from the combined new plantings and MAF's ECFP project is expected to be around 180,000 hectares. Issues identified by respondents that will have a significant impact on harvesting volumes in the future included continuing access to forests and transportation given the difficult terrain in most forest areas in the district.

Forest infrastructure is currently adequate to handle production volumes, but certainty and predictability will provide confidence for further investment given the long cycle periods between planting and harvests. Investment in equipment will be required through to 2020 as harvest volumes are expected to jump 51 per cent reaching 3.2 million tonnes. It is worth noting that through its PGP Fund, MAF has agreed to invest $6.9 million in partnership with the New Zealand forestry sector to develop advanced tree harvesting equipment for steep hill country.

TABLE 2: GISBORNE FOREST HARVESTING ACTIVITY, YEAR ENDING MARCH (EXCLUDING WOOD HARVESTED IN THE WAIROA REGION)

	2005	2006	2007	2008	2009	2010	2011
Total exotic timber harvested (m^3)	655,080	743,117	727,848	960,801	1,088,828	1,328,211	1,466,310
Total exotic timber harvested (hectares)	1,323	1,447	1,551	1,894	2,166	2,458	2,458

Source: Statistics NZ

LOG EXPORTS

Log production has doubled between 2005 and 2010 (Table 2). This trend is likely to continue as more trees mature. Over 90 per cent of the logs produced in the Gisborne-Tairawhiti region will be exported unprocessed, assuming domestic consumption patterns do not change. This is already evident as the volume of logs exported through the Eastland Port is growing as shown in Table 3.

During the last decade, Eastland Port has been one of the three largest log export ports in New Zealand. In 2010 Eastland Port exported 1.36 million m^3 of logs valued at more than $169 million (Table 4), similar to Whangarei which exported 1.33 million m^3 valued at $166 million. In the 2011 year, the port exported 1.76 million m^3 of logs (11 per cent of NZ's total log exports) an increase of 600,000 tonnes over the last 3 years. With log exports estimated by respondents to exceed 2.9 million tonnes by 2020, it should continue to be a leading log export port.

Export log prices are shown in Table 3. MPI data shows that the average export price fell 6 per cent between 2005-2010 as a result of growing competition for wood products in New Zealand's traditional markets (Situation and Outlook for New Zealand Agriculture and Fisheries (SONZAF July 2011). However, the average export price is volatile due to variation in overseas prices, exchange rates and shipping s costs so the last 3 years have seen prices varying by up to 37 per cent between years). Returns to small growers are usually lower than those of big volume forest owners because of their lack of scale and the higher margins they have to pay to others in the value chain.

TABLE 3: EASTLAND PORT LOG EXPORTS

Quarter	Quantity (m^3)	Value (NZ$000)	Average Price (NZ$/ m^3)
March 2009	187,255	20,543	110
June 2009	240,367	22,733	95
September 2009	333,290	33,400	100
December 2009	281,383	29,073	103
March 2010	291,290	37,292	128
June 2010	341,282	44,258	130
September 2010	374,188	41,139	110
December 2010	345,257	45,615	132
March 2011	415,777	57,942	139
June 2011	410,762	57,536	140
September 2011	427,036	50,123	117
December 2011	402,822	42,485	105
March 2012	422,446	47,697	113
June 2012	500,287	54,543	109

Source: www.mpi.govt.nz/forestry/statistics-forecasting/forestry-statistics.aspx

TABLE 4: NZ LOG EXPORTS BY PORT OF LOADING BY QUANTITY AND VALUE (1, 2)

	2007		2008		2009		2010		2011	
Port of Loading	**Quantity (m^3 (r))**	**Value (NZ$,000)**	**Quantity (m^3 (r))**	**Value (NZ$,000)**	**Quantity (m^3 (r))**	**Value (NZ$,000)**	**Quantity (m^3 (r))**	**Value (NZ$,000)**	**Quantity (m^3 (r))**	**Value (NZ$,000)**
Whangarei	710,287	69,879	787,899	82,476	1,140,611	119,075	1,333,487	165,900	1,843,922	242,182
Auckland	15,399	2,244	114,639	14,705	30,169	5,158	642	209	14,286	16,212
Tauranga	2,327,940	249,994	2,691,079	303,889	3,651,477	411,020	4,186,576	538,565	4,688,575	618,488
Gisborne	**595,942**	**56,172**	**710,731**	**74,602**	**1,042,295**	**105,749**	**1,358,679**	**169,131**	**1,656,397**	**208,086**
New Plymouth	33,966	3,134	20,855	2,233	31,955	3,226	118,194	14,309	195,636	25,352
Napier	542,213	54,864	593,011	64,973	695,905	65,866	856,368	107,465	1,033,964	136,636
Wellington	222,259	21,464	285,863	27,992	359,824	37,607	468,624	55,178	606,107	83,680
Nelson	580,831	59,607	647,839	61,184	811,523	76,436	765,397	89,079	693,103	80,542
Picton	309,531	32,108	263,617	24,495	264,697	49,837	481,822	57,601	531,340	68,917
Lyttelton	166,934	14,823	152,167	14,679	212,849	21,396	238,644	29,133	291,202	36,148
Timaru	120,992	12,688	76,350	7,903	114,708	12,204	230,580	27,522	303,984	38,800
Dunedin	260,115	23,625	236,518	23,527	363,393	36,136	578,373	66,485	639,154	77,274
Bluff	91,816	9,035	103,435	8,754	101,371	8,721	269,488	30,785	301,357	37,066
Total	**5,978,226**	**609,638**	**6,684,002**	**711,412**	**8,820,776**	**952,432**	**10,886,875**	**1,351,361**	**12,799,029**	**1,654,784**

Source: Statistics New Zealand, MAF

Notes: 1. Logs are those items in HS item codes 4403. Logs include posts and poles. Values are NZ$ free on board (f.o.b.). Quantity of logs is expressed in cubic metres of round wood (m^3 (r)).

2. Individual entries may not sum to totals shown due to rounding

DOWNSTREAM PROCESSING

There is currently one integrated wood processing mill and other smaller mills operating in Gisborne. The one large mill processes 10-15 per cent of the region's production. This mill has been operating for 18 years and has invested heavily in plant and operations. It has the capability to produce high grade lumber, plywood and laminated veneer products. Ninety five per cent of the mills production is exported out of three New Zealand ports.

Historically, mills have not prospered in the region. In the last three years a sawmill at Matawhero closed for economic reasons as did another mill in Wairoa District.. However, a small domestic mill operates in Gisborne as does one in nearby Wairoa District. These are supplied in part by harvests from the Gisborne-Tairawhiti region. Another forest owner has started ground work on a planned processing facility but is currently on hold given the current market conditions.

It does appear that unprocessed log exports are growing at a faster rate than that other wood export forms. While public statistics provide an incomplete picture of downstream processing of logs, reports indicate approximately 150,000 tonnes of plywood and sawn timber leave the region each year, some through Eastland Port but more via Port of Tauranga and other channels.

The Gisborne Regional Economic Development Strategy Action Plan 2009-2011 describes the importance of a downstream processing industry in terms of adding value to the wood as well as increasing employment opportunities. More than a decade ago, the Gisborne District Council (GDC) proactively zoned lands for industries such as wood processing to help the sector avoid lengthy resource consent processes. The initiative included zoned industrial lands for engineering and servicing shops that support the forestry industry. Based on harvest projections, it has been suggested that the Gisborne-Tairawhiti region could easily sustain three or four wood processing mills geared for export production.

Market demand, exchange rates and shipping costs which are very variable, significantly impact the economic viability of processing plants. Respondents said less volatility would increase investment in downstream processing initiatives.

EMPLOYMENT

The population of the Gisborne-Tairawhiti region is approximately 45,000 with a total workforce of 21,600 FTE (Department of Labour, 2009 and 2011). Based on discussions with respondents and estimates from the Eastland Port, at least 1,600 are directly employed in forestry or servicing of the forestry with very few exceptions, all live and work locally.

Respondents estimated that 1,035 people are currently employed in the forests, 350 in downstream processing and 215 in transport and other forest industry activities (Table 5).

TABLE 5: FORESTRY, LOGGING AND WOOD PROCESSING EMPLOYMENT

	2003 levels	2012 levels	2020 forecasts [1]
Forestry and logging (FTE)	650	1,035	1,577
Downstream processing (FTE)	60	350	350
Total FTE	710	1,385	1,927
Total as a per cent of Gisborne region workforce	3.28	6.4	10.7
Total as a per cent of the Gisborne region population	1.54	3.01	5.0

[1] Assuming no change in downstream wood processing

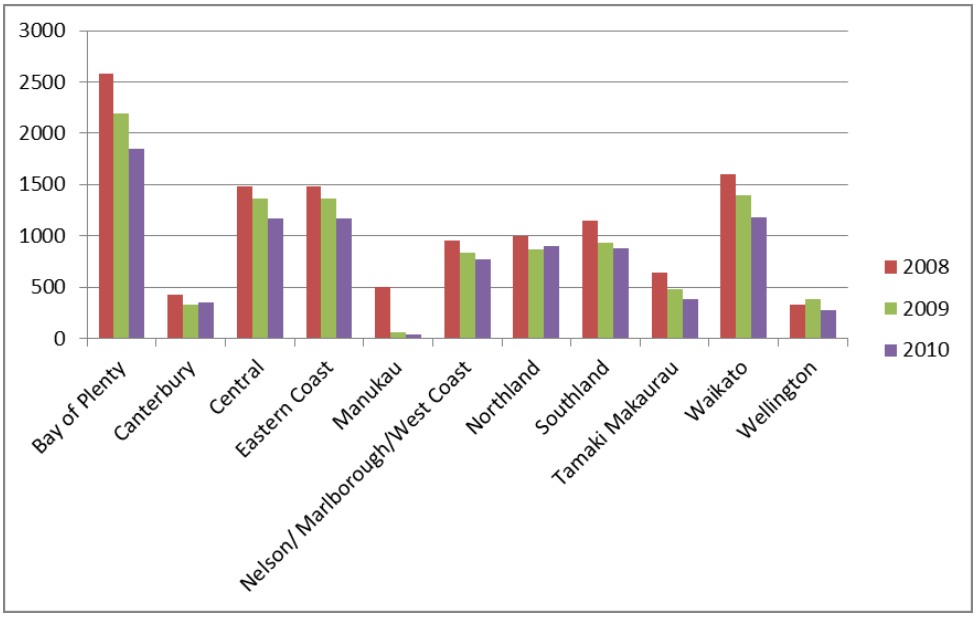
Source: Respondent inputs

Employment of 1,035 FTE within the forests is 4.8 per cent of the regional workforce. This is a 59 per cent increase from 2003 when 650 FTE were employed. Employment growth has occurred at the same time as improved productivity due to higher volumes being harvested per person and the full cyclical planting-to-harvest operations being implemented by forest owners. Given sustainable levels of harvest of 3.2 million tonnes (being more conservative than MAF's 3.4 m tonnes), and assuming that productivity continues to improve the forest, logging and processing industry will employ about 1,920 FTE by 2020. That is 542 FTE staff more than the current level. Even with productivity increases, the growth in wood volume will still lead to growth in employment. Further, if we add in the growth in logistics the industry employment growth will rise to 631.

The primary sectors plus tourism provide employment for approximately one third of the workforce in the Gisborne region. Forestry is the most significant employer of labour in the primary sector with a diversity of jobs and growth prospects. Public sector jobs, construction and retail are also important in the region, but they are dependent upon the success of the primary sector. Given the shrinkage of population in many districts, the growth of Gisborne forests harvests is not only important for the forest industry jobs, but also for public sector, construction and retail jobs.

The recent growth performance of the forestry sector is promising in terms of opportunities for employment and career development in the region. However, a number of respondents commented on their difficulty in attracting skilled or experienced people to advertised positions. They have found it particularly challenging to attract appropriately qualified and experienced people to move to the region. Another issue identified was the aging workforce, particularly in the trucking industry and the trend for young people to leave the region once they leave school. However, it should be noted the Forestry Industry Training Council (FITEC) reports 1100-1200 trainees and apprentices per annum for the Gisborne-Tairawhiti/Hawkes Bay region, the third highest regional total for this category which would imply the majority of forestry workers are in some form of training. This positive indicator needs to be balanced with concerns about the declining level of students involved in the modern apprenticeship scheme (Figure 3).

FIGURE 4: TRAINEES AND MODERN APPRENTICES BY REGION



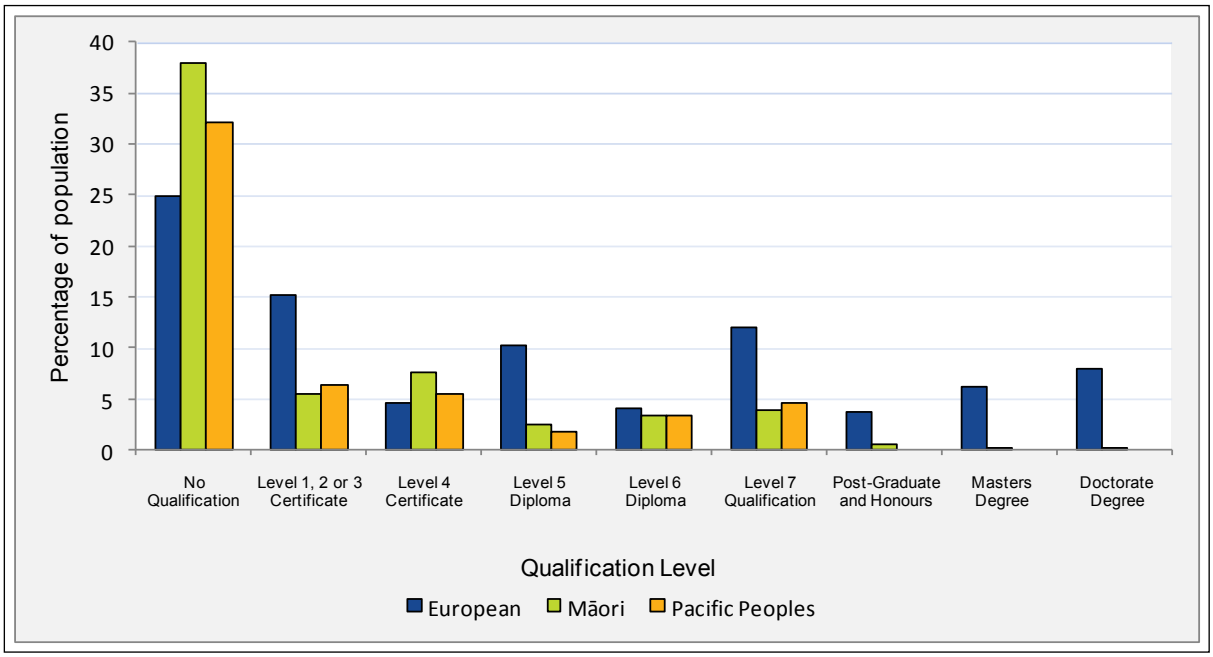
Source: FITEC Annual Report 2010

The industry seeks to develop a consistently competent and growing workforce (BERL, 2008). There is active engagement with stakeholders to address this challenge. However, it is important to note that both the ethnic mix and educational attainment levels in the region are markedly different from New Zealand averages. The 2006 census showed 44.3 per cent of the population were Māori, compared with a national average of 14.7 per cent and relatively youthful with 34.4 per cent of the Māori population under 15 years of age. However, Māori tertiary achievement currently sits below the national average (Tertiary Education Commission, 2010). Given greater investment in Māori education, there are opportunities for greater participation of Māori and the industry is expected to increase as *Treaty of Waitangi* settlements are completed and Māori ownership and investment in forests, the forest industry and service sector grows. One local Māori Runanga is expected to use Treaty Settlement funds to increase its forest holding by 30,000 hectares over a 30-year period. This is likely to result in greater Māori participation in management roles.

Figure 4 shows levels of tertiary education attainment by ethnicity for Gisborne. Forestry sector performance is potentially constrained by low levels of education attainment in the region.

The industry is helped by the fact that it is less seasonal than in the past. Several respondents said that while jobs in forestry and logging were "*very seasonal*" in the past, "*nothing is seasonal anymore*" now that the sector has reached a scale requiring various skill types and disciplines. Many individuals can build a career in the modern forestry industry.

FIGURE 5: TERTIARY ATTAINMENTS BY ETHNICITY FOR GISBORNE



Source: Tertiary Education Commission

Forecasted growth in forest production is a challenge for both staffing and technology. Education programmes are crucial for providing a complement and skilful workforce with the capacity to handle the supply of work coming forward. The Forestry Industry Training Education Council (FITEC) and two polytechnic institutes are able to train the labour requirements of both the forestry and logging and wood processing industries. By the same token there are challenges in attracting and retaining students with both ability and motivation.

The forestry industry seems to have the potential to play a significant regional economic development role as a prospective large employer, an employer of youth, in attracting new residents and in driving up-skilling and continued learning to produce productivity gains for Gisborne-Tairawhiti and New Zealand.

TRANSPORTATION

The log transportation sector in Gisborne-Tairawhiti is dedicated to servicing the forest industry, so it can be considered integral to the forest industry. It has been upgraded and developed alongside harvesting growth in order to make the flow of wood from forest to market as efficient as possible.

Respondents say there are about 120 logging trucks transporting logs from the forests of Gisborne to different destinations. Over the last two years they have coped with rapid growth in log volumes. Two companies operate over half the fleet. The rest are owned by SMEs with less than 20 staff each. The forestry transport sector employs about 145 FTE staff and spends about $48 million in operations plus road user charges. Of the operating costs, some $10 million is paid out as salaries and

wages, $6 million for repairs and maintenance and $10 million on tyres and fuel. Tables 6 and 7 detail the estimated annual activity and contribution of the transportation sector to Gisborne's economy in 2011/12 and through to 2020.

Not included in the analysis are an estimated 25 FTE staff that service the forestry sector by way of supplying metal for road construction and maintenance and upkeep of private forest roads, and fuel trucks that deliver fuel up into the forests.

TABLE 6: LOG TRANSPORTATION ACTIVITY AND OPERATING COSTS

		2011/12 level	2020 estimates
Annual total spend on operations (excl. RUC)	$million	48	75
Annual export tonnage transported	million tonnes	1.9	2.9
Number of trucks servicing Gisborne	unit	120	190
Number of employees	unit	145	229
Annual wage bill	$million	10.2	16
Annual repairs & maintenance	$million	5.8	9
Annual fuel & tyre cost	$million	10.2	16
Annual other operating costs including finance & insurance		21.3	34
Annual road user charges		5.6	9

Source: Distilled from interviews with respondents

Respondents explained that repairs, maintenance, fuel and tyre costs are higher than normal reflecting the difficult forest terrain and road composition that logging trucks operate in. Tyres for example are normally replaced after about 70,000 kilometres of normal road use, but have to be replaced after 40,000 kilometres of forest-to-port runs. The differences in road composition in steeper country and on the Gisborne plain results in a high band of transportation costs which may range from 25 cents per tonne per kilometre up to 35 cents per tonne per kilometre based on 2010/2011 cost inputs.

Due to the scale of the logging transportation industry, a dedicated trucking support industry comprising of three large engineering businesses and several smaller logging truck specialists has evolved. There are also mobile tyre and fuel supply crews and crews that specialise in "bush servicing" and/or servicing trucks at logging sites. Despite the current staff capability in the transport sector a number of respondents were worried about a shortage of skilled drivers as the industry expands.

ROADING

Gisborne District has a total of 1,867 kilometres of road network of which 779 kilometres or 42 per cent are sealed and 1,088 kilometres or 58 per cent are unsealed (MWH, 2012). Two hundred and thirty seven kilometres or 13 per cent of the roads are situated in urban areas, while 1,630 kilometres or 87 per cent are in rural areas.

Gisborne already has the highest road maintenance costs in New Zealand. In terms of dollars per kilometre, Gisborne costs $6.90 per kilometre, compared to New Plymouth at $2.90 and Napier at $0.86. The key factors influencing high road maintenance costs in Gisborne are the geology, topography and climate of the district and its isolation. Compared with other industries in the region, forestry and logging have the most impact on the roading network particularly in terms of maintenance. Private forest owners are responsible for their own internal road network but once at the gate, the collector and feeder roads joining into the state highway network is the responsibility of the District Council.

Over the next five years, GDC forecasts an 8.2 per cent yearly increase in heavy commercial vehicles usage, including logging trucks, which will impact on the maintenance of the roads. Over the next decade, GDC estimates that just over $18 million per annum will be spent on the district's roading network, about 65 per cent of which is being used by logging trucks. But even without logging trucks using the roads, GDC estimates that it would be required to spend a significant amount on maintaining those roads anyway because of the inclement weather and environmental conditions in the area. Respondents say the road network should be able to support a doubling or trebling of log production, but challenges are more likely to be social concerns in the city concerning trucks and Port infrastructure.

The use of heavier vehicles/trucks (greater than 44 tonnes) under the Vehicle Dimension & Mass (VDM) Amendment is being reviewed by roading authorities and the transportation industry. While heavier trucks have benefits in terms of higher payloads without additional damage to roads because of the efficient distribution of the load on the heavier trucks, there are infrastructure factors to also be considered like the current weight limits of some bridges and roads and other issues that are yet to be settled.

Table 7 below summarises a spending and funding scenario for Gisborne roading over the next 10 years.

TABLE 7: TOTAL COMBINED SPENDING GDC AND NZTA, $MILLION TO 2021

	GDC	SH	Total
Maintenance	221.1	159.4	380.5
Capital / Improvements	56.4	33.7	90.1
Total	**278.5**	**193.1**	**470.6**

Source: Gisborne District Council

In recent years some 60 per cent of the general roading activity was subsidised by the government and nearly $8 million came from roading rates. Roading rates in Gisborne have two components: a flat rate that is charged across the 21,800 ratepayers, and a variable rate that is tagged on the QV value of property based on its usage. The 2010/11 variable rate multiplier was 0.000549. The forest industry pays 4 times the residential multiplier (0.00219600). Similarly the horticulture and pastoral farm multiplier is 1.5 times the residential multiplier and the commercial and industrial multiplier is 2 times the residential multiplier.

In addition to rates the forest sector makes other important contributions to funding of roads in the region. Provisional analysis of road user charges indicates the sector makes an annual contribution in excess of $5 million. Fuel taxes contribute another $0.3m. The forestry sector with its economic potential also buttresses the regional case for Government roading subsidies to the region. . Gisborne-Tairawhiti has benefitted from more than $53 million in funding over eight years through the Regional Development Roading (RDR) subsidy, which has been directed to roads specifically to support the harvest of logs and transport to processing plants rather than to the port. About 338 kilometres of roads used by logging trucks have been upgraded with this 100 per cent roading subsidy from the government representing approximately 18 per cent of the regions total road network. Hence this expenditure benefits the diversity of road users within the region.

EASTLAND PORT

The sea port at Gisborne is the district's primary seaport, with about 92–95 per cent of the regions export production being shipped from it. Logs and plywood are the primary products handled; accounting for some 90 per cent in terms of volume and 82 per cent in terms of value (Table 8).

TABLE 8: EASTLAND PORT COMMODITY EXPORT RECEIPTS, NZ$ PER CALENDAR YEAR

Commodity	2006	2007	2008	2009	2010	2011
Wood and articles of wood;	68,409,477	73,231,085	80,305,326	114,438,282	185,996465	224,653,576
Vegetables	14,655,182	19,382,218	27,263,423	16,895,207	14,146,237	26,514,568
Fruit	9,230,214	21,646,270	15,996,841	22,701,112	26,731,878	16,832,453
Total (including others)	**92,466,237**	**114,317,523**	**123,586,215**	**154,068,084**	**226,894,016**	**274,415741**

Source: Statistics NZ.

Eastland Port employs between 60 and 100 staff at any one time and spends around $10 million on operations and $6 million in salaries and wages (Table 9). The Port is owned by a Community Trust and profits are reinvested back into the port or paid to the Trust as dividends for funding community projects.

Along with logs, vegetables like squash and kiwifruit are shipped out of the port. The Royal New Zealand Navy ships, cement carriers, fertiliser ships, fishing vessels, cruise ships and recreational boats also use the facilities.

TABLE 9: PORT AND WHARF OPERATIONS

		2011/12 level	2016 to 2021
Annual total spend on operations	$ million	10	15
Annual wage bill	$ million	6	8
Number of employees	unit	80	130

Source: Distilled from respondents

Between 2008 and 2012, log export volume through the port more than doubled from 0.72 million m^3 to 1.8 million m^3. The current port facilities typically handle about 250 truck movements carrying approximately 7,000 m^3 daily but have at times peaked at approximately 9,000 m^3 of logs per day. Assuming there are no changes to current domestic demand for logs harvested from the district, the port is expecting to handle about 2.8 million m^3 per annum by 2020 and more in the longer term as forests outputs reach sustainable levels.

Port management has sought to address these challenges as part of their 15-year strategic plan which talks to an impending boom in log production and the development challenges to enable the port to handle additional log volumes. Over the last few years the port has invested in a number of initiatives to support wood products exports. The largest log scaling facility in New Zealand, a sequential routing system, was commissioned in February 2011. It can simultaneously accommodate six truck and trailer units under cover. Also onsite is a debarking/fungicide treatment plant processing up to 1200 m^3 of high-value pruned logs daily. A three-hectare cargo storage yard in Matawhero can handle an additional 30,000 m^3. This site is now fully operational. It is completely self-contained with its own scaling and weighbridge facilities.

The port sits on 12 hectares and the associated log yards can store approximately 115,000 m^3 with on-going projects seeking to expand to 13.5 hectares to increase storage capacity. In addition there is an on-going $15 million project to asphalt seven hectares of the log yards which will increase log capacity by 10 per cent and improve storm water management and quality. The wharves have been refurbished and the entire length of the breakwater is undergoing refurbishment as well. There are also plans to deepen the channel by 0.3 metres to 10.5 metres so more logs can be loaded on ships at any time of the year. Port management is also investigating the possibility of expanding towards the sea by reclamation should the need arise.

Despite the great progress that has been made in improving road and port infrastructure it is a challenge to ensure alignment between the road system and the port system, between the needs of the port and the needs of the shipping lines, the needs of the industry and the needs of other Gisborne residents. It is critical to minimise inefficiencies (such as double handling) and negative externalities that impact other parties.

ECONOMIC BENEFITS ESTMATED FROM INPUT OUTPUT ANALYSIS

The economic benefits derived from the forestry sector fall into two categories. Firstly, those that can be valued directly through economic transactions like salaries and wages and secondly, those that cannot be easily valued like water and soil quality.

DIRECT IMPACTS:

Table 10 lists economic benefits determined based on input from the forest owners, wood processors, transportation operators and port management. Traditionally, transportation and port operations are considered second layers of an industry's economic activity, but because the operations in Gisborne are between 90-100 per cent reliant on the forestry sector, this report considers them as direct components of the forest industry.

In 2011/12, the Gisborne forest industry directly generated revenue of approximately $225 million (Table 10). Over the next decade revenues are expected to increase $148 million to $373 million. Respondents estimate that in excess of 90 per cent of this flowed directly into the Gisborne economy because of the isolation of the district. An estimated $94 million was paid out as salaries and wages to employees in the forests, processing, transport and handling of logs at the Port. These salaries and wages to Gisborne residents are likely to increase to $151 million by 2020.

Employment in the industry segments during the 2011/12 period is estimated at 1,610 FTE, roughly 3.3 per cent of the 45,000 population. Given 15,000 households in the region with 3,864 FTEs directly or indirectly employed in forestry then more than 1 in 4 households in the region have a person whose job is dependent on forestry.

INDIRECT IMPACTS:

Indirect impacts result when the sector buys inputs from other sectors (backward linkages eg electricity purchases) , produces outputs that become inputs from of other regional industries (forward linkages eg wood panels used in construction) and from the consumption and investment expenditures over those who have received wages, rents or profits from the sector (salaries spent on living expenses). Expenditure is each of these three activities involves goods or services and labour inputs. Not all of the inputs required for operations or used in the forward linked activity or desired consumption of employees is provided by the Gisborne economy. Other specialised firms throughout New Zealand provide inputs and consumption items for employees and residents. The impact of wood processing is important (subject to there being profitable demand for the processed product. The less than 10% of logs process generates revenue in excess of $150m. Table 14 below summarises the flow-on effects into the Gisborne economy. This analysis estimates indirect impacts of $417 million and indirect, employment of 2,254 FTE. Over the next decade indirect impacts are expected to increase $238 million to $654 million and indirect employment to increase by 883 FTE to 3,137 FTE.

TABLE 10: GISBORNE FOREST INDUSTRY DIRECT ECONOMIC CONTRIBUTION

	unit	2012 level	2020 forecast
Forest Industry and Wood Processing			
Plantation forest area	hectares	154,000[3]	180,000
Annual log export	tonnes	1,860,000	2,976,000
Annual log export value	$million	225	373
Annual wood products value	$million	$150	$150
Annual wage bill	$ million	78	125
Annual rates to Council	$ million	1.39	2.2
Number of employees	unit	1,385	1,928
Log Transportation			
Annual export tonnage transported	tonnes	1,860,000	2,976,000
Number of trucks servicing Gisborne	unit	120	192
Number of employees	unit	145	202
Annual wage bill	$ million	10.2	16
Annual costs other	$ million	37.3	60
Annual road user charges	$ million	5.6	9
Port and Wharf Operations			
Number of employees	unit	80	111
Annual wage bill	$ million	6	10

The table below shows each dollar of income generated by forestry has a regional multiplier of approximately 2.7. The regional multiplier is lower than the national multiplier as some of the income leaks out of the region. These figures are consistent with the work of Hughes, Locke and Scrimgeour on *Forestry in the Waikato-Bay of Plenty* but it should be noted that Gisborne is not characterised by the big mills of the Waikato -Bay of Plenty. Hughes (nd) reports multipliers ranging from 2.46 to 2.98 in the Waikato. Forward linkages are lower where product is exported without significant processing or other value adding activity.

[3] Plus there are additional hectares further south.

TABLE 11: DIRECT AND INDIRECT IMPACTS OF FORESTRY ON GISBORNE ECONOMY

	Revenue ($m)	Employment (FTE)
First round impact	$225	1610
Backward and forward linkages	$417	2,254
Total impact for Gisborne Economy	2.70	2.40

COMMUNITY BENEFITS OF FORESTRY

There are several economic benefits derived from forestry that cannot be readily valued. Environmental and social benefits are particularly important

Environmental benefits include better water quality than if land users put to alternative uses, recreational value from forest, the amelioration and mitigation of erosion risks and the amelioration and mitigation of social costs associated with limited employment opportunities in the region. Respondents suggest that economic benefits from water, air and soil quality and erosion-related disaster aversion may be indicated by the amount of investment the government has put into the ECFP to halt erosion, which is roughly $184 million. Other studies such as the Pakuratahi Study provide further information regarding these benefits. In summary the environmental benefits have direct benefit for today's residents. They are also an asset that will provide benefits to future generations. Further, they are a form of insurance reducing the community's exposure to the costs associated with environmental and infrastructure damage.

Social benefits derived from the forest sector income helps address the socio-economic challenges of the region including high unemployment rates, low income levels, lower than desired social wellbeing indicators, a younger population base, and yet a static population. Compared to the rest of New Zealand, Gisborne had the second lowest personal income of $20,600 and the lowest household income (2006 Census). By comparison only 12 per cent of its households earned an income above $50,000 compared to Wellington's 24 per cent. This data show the importance of the forest sector given the Careers NZ website in September 2012 notes "Pay varies, but forestry and logging workers usually earn between $26,000 and $60,000 a year. Experienced forestry and logging workers usually earn between $45,000 and $60,000 a year. Contractors can earn up to $80,000 a year, depending on how their business is doing."

Forestry plays a key role in communities such as Gisborne-Tairawhiti in building economic resilience in rural communities, diversifying economic activity, providing new skills and attracting new and younger workers. According to MAF, these benefits are amplified in communities such as this where there is more marginal land that is more suitable to forestry. The forestry sector also contributes to the local community by way of sponsorship of community events and donations to schools, community groups and projects.

A number of respondents indicated that through a permit scheme local people could use privately owned forestry land for recreational purposes, mostly for hunting pigs and deer, but also for mountain biking and tramping.

Historically, the 'labour force' had a strong transient characteristic in Gisborne-Tairawhiti region. Contrary to other industries, forestry now offers more employees permanent employment and provides an incentive for families to move to both Gisborne and smaller local communities. Approximately 30 per cent of those employed in forestry came from outside the region to work in the forests and processing plants and now live in the Gisborne-Tairawhiti area owning or renting houses. A recent trend for seasonal workers is to work in complementary sectors such as meat processing and be a permanent resident of the region.

A high proportion of those employed in forestry are male and in the younger age group. A younger workforce assists communities to retain their sports clubs, schools, retail services and other facilities that belong to young, vital communities (Sanderson et al, 2005). As well as building a younger community, forestry brings managerial and specialist technical skills into a district which can be utilised for managing public facilities such as school boards, community boards, sports facilities, etc. Finally, the drug and alcohol testing conducted by the forestry employers as a component of their Health & Safety programmes provides young people with a reason to abstain/limit their alcohol and drug use and is expected to contribute to both lower accident and crime rates. This has positive spill-over benefits for the wider community.

CONCLUSION

The forests of Gisborne-Tairawhiti were historically planted for erosion control. From the first soft wood forest plantings in 1959 they have evolved into an export earning, employment providing foundation of the local economy.

The forestry industry in Gisborne-Tairawhiti and the dedicated sub-sectors of transportation and port services make forestry a considerable contributor to the local economy. The economic benefits fall into two categories; those that can be valued directly through economic transactions and those that cannot be easily valued.

LOG PRODUCTION AND EXPORTS:

Within the next decade, Gisborne-Tairawhiti regional plantation forest is expected to grow to 180,000 hectares from 154,000 hectares in 2010/2011. Log production in 2011/12 was 2.0 million tonnes with 1.8 million tonnes exported in log form. By 2020 Harvest volume is expected to jump 51 per cent reaching 3.2 million tonnes with over 90 per cent exported in log form.

ECONOMIC IMPACTS:

Research estimates that forestry in the region generates direct revenue of $225 million with approximately $94 million paid out as salaries and wages to Gisborne residents. Post-harvest activities including processing and subsequent expenditures generate a regional economic impact of approximately $631 million which corresponds to a multiplier of 2.7.

Within the next decade, forest initiated economic activity is expected to add another $328 million to the Gisborne economy. Salaries and wages to Gisborne are likewise expected to increase by $55 million.

EMPLOYMENT IMPACTS:

The forest industry and its dedicated service sectors have become a major employment source for the district. They provide an estimated 1,610 jobs – roughly 3.1 per cent of the district's population. Given 15,000 households in the region with 4,434 FTEs then more than 1 in 4 households in the region have a person whose job is dependent on forestry

The recent growth performance of the forestry sector is promising in terms of opportunities for employment and career development. However, there are employment and educational challenges. Some of those challenges are meeting the labour and skills needs of the industry, an aging workforce and Māori and Pacific tertiary education engagement and achievement. Local education and training institutions are aware of the situation and there appears to be systems in place to manage the alignment between the changing needs of industry with education provision.

The region will also need to address the growing need for level 7 and above qualified people (degree) in the areas of management, ICT and engineering. There are examples of other regions buying in degrees through joint ventures with Institutes of Technology and Universities.

OTHER BENEFITS:

There are several economic benefits derived from forestry that cannot be readily valued. Among these are water, air and soil quality; recreation; erosion-related disaster aversion; and social-related cost aversion. A lower bound estimate of the economic benefits from water, air and soil quality and erosion-related disaster aversion is indicated by the amount of investment the government has put into the ECFP to halt erosion, roughly $184 million.

INVESTMENT IN INFRASTRUCTURE:

The roading networks play a vital link between the forestry sector and export facilities and processing plants. It is recognised that heavy transportation impacts the durability of roads. Natural effects amount to about 50 per cent of the costs of maintenance and capital improvements. It is approximated that after deducting other users the logging industries creates between 15-18 per cent of the costs of roading maintenance and capital works.

The forest industry contributes through rates to the maintenance of public roads. It is estimated that the portion of roading rates attributable to the forest industry is approximately less than the $2.9 million collected from the variable rate component alone; indicating that the forestry sector is subsidizing road maintenance and capital works programmes. Recently the district benefited from the $53 million in roading investment to upgrade some 338 kilometres of roads being used to bring logs from the forests to the city.

It seems that the current investment plans and work programmes will enable the road network to support a doubling or trebling of log production, but issues will evolve around ensuring roads/bridges can handle the weight of bigger units, port infrastructure, pinch points within the city and social concerns about trucks within the city and CBD. Currently port facilities are able to manage up to 300 truck movements per day carrying around 9,000 cubic metres. The inland port has been developed and provides capacity sufficient to cope with forecast wood volumes over the next decade. Port management is aware of the growth forecasts in log production and it is reflected in a 15-year strategic plan which includes major capital infrastructure projects to increase capacity and handling efficiencies. It is important this is done in a way that minimises negative external efforts.

FUTURE RESEARCH:

Appropriate public policy and commercial investment is facilitated by robust economic analysis. Forestry is a critical part of the economic reality of the Gisborne region. However consistent data, models and analysis are not available. Future research should address the challenges in preparing this report. Data collection was challenging because although a number of reports have been published, there are no consistent formats and no district-specific baseline data that enables direct comparisons of the forestry sector with other industries in the region. Further analysis should be undertaken to establish this and in the process reduce the confidence intervals around the estimates made as well as examining inter-related impacts of growth in greater depth. Particular care needs to be taken to do appropriate surveys of the industry participants and for these to be aligned with public data to generate data that is valuable in its own right and which can also be efficiently used for input output studies and other analyses.

In addition to the improving the information foundation for analyse of the sector and region it is appropriate for further work to be done analysing business and local government strategies for maximising economic benefit to the region. Historically the experience of many peripheral regions is that companies and Governments often do not make a sustained commitment the future of such regions. The current expansion of the Gisborne forest industry is an appropriate time to develop such strategies and so secure the economic base of the region for coming generations.

Although information and analysis needs to be improved and enhanced it is important to recognise that there is a very significant expansion of forest exports in train within the Gisborne region. It is imperative that the industry and region is prepared to take advantage of the economic and social opportunities this will create.

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APPENDICES

Appendix A Log Prices

Appendix B Land use in Gisborne

Appendix C Census Data

Appendix D Gisborne 2011 Average Population per Household

Appendix E NZ Exports of Forestry Products Ended 30 June 2005 to 2009

APPENDIX A – AVERAGE DOMESTIC LOG PRICES, NZ$ DELIVERED

	P1	P2	S1	S2	L1 & L2	S3 & L3	Pulp
1995	198	141	117	90	80	74	48
1996	173	132	106	94	76	72	48
1997	169	134	104	93	64	71	43
1998	170	147	95	86	70	63	38
1999	160	126	94	85	66	59	33
2000	165	132	106	93	71	65	41
2001	169	130	93	85	65	64	44
2002	175	130	92	88	70	66	43
2003	164	126	90	80	63	61	38
2004	154	121	85	76	61	60	39
2005	138	112	86	81	58	62	43
2006	137	108	86	83	66	64	45
2007	131	103	87	89	75	70	47
2008	125	99	86	75	67	63	48
2009	127	102	89	83	72	68	50
2010	140	116	98	95	85	81	51
March 2011 Quarter	138	119	93	98	88	87	52
June 2011 Quarter	141	126	112	96	95	87	55
September 2011 Quarter	142	122	102	101	87	86	52
December 2011 Quarter	131	120	101	97	84	83	52
March 2012 Quarter	127	119	98	94	100	74	52
June 2012 Quarter	149	117	97	93	88	78	49
September 2012 Quarter	128	119	99	92	85	79	48
December 2012 Quarter	136	117	100	94	87	82	51

Source: Derived from MAF data

APPENDIX B – LAND USE IN GISBORNE

	2006 Area (Hectares)	2011 Area (Hectares)
Sheep and Beef Farming	362,200	355,200
Horticulture	7,500	7,676
Wine/Grape growing	1,900	1,724
Plantation Forest	147,000	154,000
Others	95,900	95,900
TOTAL	**614,500**	**614,500**

Source: Gisborne District Council and estimates

APPENDIX C – CENSUS DATA

	2006 Census of Population and Dwellings		Gisborne District	New Zealand
Demographics	Population	Population 2006	44,463	4,027,572
		Working Age Population	32,808	3,159,948
		Share of NZ Population 2006	1.1%	-
		Share of NZ Population 2026	0.9%	-
		% Male 2006	48.7%	48.8%
		% Female 2006	51.3%	51.2%
	Ethnic diversity	% NZ European	51.0%	64.8%
		% Māori	44.4%	14.0%
		% Pacific Peoples	2.9%	6.6%
		% Asian	1.6%	8.8%
		% New Zealander	8.7%	10.7%
	Age groups	0-14	26.2%	21.5%
		15-24	12.9%	14.2%
		25-44	25.2%	28.2%
		45-64	23.7%	23.8%
		65 plus	12.0%	12.3%
	Highest educational qualification	% No qualifications	30.6%	23.2%
		% school qualifications only	29.1%	32.5%
		% post-school qualified	22.6%	22.4%
		% Bachelor Degree and Higher	8.3%	14.7%
Income	Usual hours worked per week	% Less than 30 hours	35.1%	25.9%
		% 31-40 hours	44.1%	36.6%
		% 41 hours plus	20.7%	37.4%
	Income Distribution	$1 - $10,000	11.8%	10.8%
		$10,001 - $25,000	26.5%	21.0%
		$25,001 - $50,000	39.6%	39.1%
		$50,001+	16.3%	24.3%

	2006 Census of Population and Dwellings		Gisborne District	New Zealand
Participation	Participation Rate	Participation rate 2001	64.5%	66.7%
		Participation rate 2006	66.4%	68.5%
	Gender Participation	Male	73.0%	74.8%
		Female	60.4%	62.7%
	Ethnic Participation	NZ European	66.7%	68.7%
		Māori	64.4%	69.3%
		Pacific Peoples	67.4%	65.0%
		Asian	65.3%	62.2%
		New Zealander	77.1%	77.4%
	Age Participation	15-24	63.7%	66.4%
		25-44	77.9%	82.6%
		45-64	79.1%	79.9%
		65 plus	20.4%	17.1%
Employment	Number employed	1996	17,649	1,630,812
		2001	17,907	1,727,271
		2006	19,284	1,985,775
	Employment growth	2001-2006	7.7%	15.0%
		1996-2006	9.3%	21.8%
Unemployment	Unemployment rate	2001	10.4%	7.5%
		2006	7.2%	5.1%
	Gender Unemployment rate	Male	6.4%	4.4%
		Female	8.1%	5.8%
	Ethnic Unemployment rate	% NZ European	4.6%	4.0%
		% Māori	12.4%	11.0%
		% Pacific Peoples	11.3%	10.7%
		% Asian	4.5%	8.5%
		% New Zealander	3.0%	2.6%
	Age Unemployment rate	15-24	16.6%	13.3%
		25-44	7.4%	4.2%
		45-64	3.7%	2.5%
		65 plus	1.1%	1.4%

APPENDIX D – GISBORNE 2011 AVERAGE POPULATION PER HOUSEHOLD

Total Population	46,450
Total Household	15,195
Average Person per Household	3.06

Source: Statistics NZ

APPENDIX E – NZ EXPORTS OF FORESTRY PRODUCTS ENDED 30 JUNE 2005 TO 2009

	2005		2007		2009	
	Quantity	Value (NZ$000)	Quantity	Value (NZ$000)	Quantity	Value (NZ$000)
Logs and wood chips						
Logs and poles (000 m^3)	5,077	396,380	6,250	680,767	7,591	877,476
Wood chips (BDU)	247,959	35,505	280,153	48,290	260,724	64,415
Total logs and wood chips	..	**431,885**	..	**729,057**	..	**941,891**
Round wood equivalent (000 m^3(r))	5,764		7,026		8,313	
Sawn timber						
Radiata pine (000 m^3)	1,701	684,029	1,813	694,537	1,702	675,149
Douglas-fir (000 m^3)	43	24,242	70	36,570	52	21,360
Other planted production forest (000 m^3)	91	71,780	49	51,628	33	36,211
Natural forest (000 m^3)	1	920	1	667	0	352
Sleepers (000 m^3)	..	..	..	..	0	1
Total sawn timber and sleepers (000 m^3)	**1,836**	**780,970**	**1,933**	**783,402**	**1,788**	**733,073**
Round wood equivalent (000 m^3(r))	3,379		3,499		3,234	
Wood pulp						
Chemical (tonnes)	439,021	305,716	642,103	541,772	598,907	476,812
Mechanical (tonnes)	418,182	171,894	201,877	80,013	225,488	92,776
Total wood pulp (tonnes)	**857,203**	**477,610**	**843,979**	**621,785**	**824,395**	**569,587**
Round wood equivalent (000 m^3(r))	2,417		2,715		2,607	
Paper and paperboard[4]						
Newsprint (tonnes)	291,526	238,076	..	..	..	..
Other paper and paperboard (tonnes)	350,688	279,925	..	..	..	..
Total paper and paperboard (tonnes)	**642,214**	**518,001**	..	..	..	..
Round wood equivalent (000 m^3(r))	1,784		..		..	
Panel products						
Fibreboard (m^3)	660,181	228,924	608,367	229,221	510,409	248,563
Plywood (m^3)	136,765	172,892	79,273	112,256	78,762	113,477
Veneer (m^3)	135,957	94,135	152,157	47,220	137,681	47,116
Particleboard (m^3)	119,897	72,624	118,227	55,276	115,508	63,556

	2005		2007		2009	
	Quantity	Value (NZ$000)	Quantity	Value (NZ$000)	Quantity	Value (NZ$000)
Total panel products (m^3)	**1,052,800**	**568,575**	**958,024**	**443,973**	**842,360**	**472,711**
Round wood equivalent (000 m^3(r))	1,507		1,350		1,179	
Other forestry products						
Manufactures of paper and paperboard	..	110,751	..	196,064	..	232,066
Continuously shaped wood (mouldings, etc.)	..	112,567	..	121,340	..	96,433
Wooden furniture and furniture parts	..	42,561	..	55,174	..	41,708
Miscellaneous forestry products	..	140,778	..	143,947	..	119,616
Total other forestry products		**406,657**	..	**516,525**	..	**489,822**
All forestry products[7]						
Round wood equivalent (000 m^3(r))	13,234		..		..	
Total value		**3,183,698**		**3,094,742**		**3,207,084**
Total NZ merchandise trade		29,214,631		33,361,308		41,034,302

Source: Statistics New Zealand, MAF

GLOSSARY

ECFP	East Coast Forestry Projects
EWC	Eastland Wood Council
FITEC	Forestry Industry Training Education Council
GDC	Gisborne District Council
IBR	Institute for Business Research
MAF	Ministry of Agriculture and Forestry
NAFOA	New Zealand Forest Owners Association
NZTA	New Zealand Transport Authority
RDR	Regional Development Roading
SONZAF	Situation and Outlook for New Zealand Agriculture and Fisheries
SMEs	Small and Medium Enterprises (<50 employees)
FTE	Full Time Equivalent