Studies in Land Use Change and Socio-economic Consequences

Community Perception of Forest Sector Development on the New Zealand East Coast: Likely and Acceptable Employment Activities, Infrastructure and Landscape Change

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Preface

Research on people and their perceptions of a variety of topics have been reported in AERU research reports in recent years. These reports have focused on proposed land use changes in the Mackenzie Basin, tourist experiences in Kaikoura and Rotorua, and public perception of natural character in the Coromandel. The approach has been to use Q method with photographs to allow subjects to express their views about each topic. Research on forest sector development in the East Coast of New Zealand continues this theme and is here applied to locals' views about forest sector development and its different manifestations. The results will be relevant to East Coast people concerned with development issues associated with forestry, and to policy makers and planners both on the East Coast and elsewhere as they plan to take advantage of the potential that forestry has to offer.

Ross Cullen
Director

Acknowledgements

Alan Thorn (Forest Research Ltd, Rotorua) was involved in the initial photography and Mike Heinemann (Ambidextrous Ltd, Christchurch) prepared the images. Nicola Robertson and Craig Tomlinson undertook the field survey.

Images 1A, 2A, 3A, 4A, 6A, 7A, 8A, 10A, 6L and 3I are reproduced from the Forest Research Ltd library.

Summary

Conclusions:

- Opinion leaders in the Gisborne East Coast community have contrasting views on the likely character and benefits of employment, infrastructure and landscape change arising from Forest Sector Development.
- The views expressed in the survey suggest that there is a need to address such issues as scale of land conversion, felling practices, and log transportation. There is a need for public education on the extent of downstream processing already being undertaken, and of the extent and benefits of indirect employment created by the sector.

Background and Rationale:

- Work on forest sector development in the Gisborne/East Coast region requires background information on community perception of changes due to forest sector development.

Research Objectives:

- Identify community attitudes towards employment activities arising from forest sector development and towards consequential changes in infrastructure and landscape.

Method:

- 60 opinion leaders from Gisborne and other places in the East Coast region completed Q sorts for a variety of forestry employment activities, infrastructure effects and landscape change.
- For each of these three topics, subjects Q sorted ten photographs in terms of what they thought were more or less likely outcomes, and what they thought would give more or less benefit to the community as a whole.

Results:

- The table below shows the key themes.

	Forestry Employment Activities	**Infrastructure**	**Landscape Effects**
	Most Likely		
Factor 1	Outdoor, manual work	Existing transport	Production forestry
Factor 2	Value added, processing work	Processing, product handling	-
	Most Benefits to the Community		
Factor 1	Processing, forest activities	Capital infrastructure	Status quo. Revegetation
Factor 2	Processing, office activities	-	Mixed Functional use

- These results indicate a broad convergence of views about the most likely landscape effects of forest sector development, and about the most beneficial types of infrastructure development. They indicate a divergence of views upon the types of employment activity likely to be associated with forest sector development, and upon the relative benefits of different activities for the community, and contrasting views on the most likely types of infrastructure. This reveals clearly different perceptions of the nature of forest sector development, and of the benefits this creates for the community.

- The factors also indicate that there is divergence between people's expectations of the most likely landscape and infrastructure outcomes, and what they believe would be of most benefit to the community. This suggests potential for longer-term dissatisfaction with some outcomes of continued forest sector development in the region, for a significant proportion of opinion leaders.

Chapter 1
Research Objectives and Method

1.1 Introduction

The research presented in this report is part of a broader programme of research aimed at facilitating social and economic development in the Gisborne-East Coast region of New Zealand. The overall Forest Research Ltd./Lincoln University programme seeks to examine the interrelationship between market dynamics, investor motivation and constraints, and community well-being and adaptability to change in response to forest sector growth. It aims to promote social and community adaptation to emerging markets by providing timely and useful research results relating to social and economic issues associated with forest sector development.

The primary objective of this part of the research was to identify community attitudes towards employment activities arising from forest sector development and towards consequential changes in infrastructure and landscape.

The Gisborne-East Coast region was chosen for study for two main reasons. First, it is a relatively isolated and economically disadvantaged region which has been the focus of regional development schemes involving forestry since the 1960s. The most recent of these, the East Coast Forestry Scheme, although directed at erosion control, includes socio-economic objectives and clearly has socio-economic as well as environmental effects. Second, partly in response to this scheme, forestry land use has increased markedly in recent years in the East Coast region, and replaced a significant proportion of hill country pastoralism. The increase in forest area has generated a number of social issues, for example, resistance from some people who prefer pastoral land uses. It has long been recognised that there are important social factors involved in the response to land use change and in achieving maximum benefit from forest sector development (Robb et al., 1970). This report investigates attitudes to change amongst a selection of opinion leaders, community representatives, and other key informants within the region, using images of different aspects of forest sector development to stimulate response and comment.

The report is organised as follows: the remainder of this chapter summarises some of the history of community attitudes towards forestry, and notes some key influences. It then describes the methods used in this research. Chapter 2 presents the results and Chapter 3 provides a discussion and conclusion.

1.2 Community Responses to Forestry

The planting, tending and management of forest trees is a dramatically different culture from that of pastoralism (Schama, 1996). Both have been brought to New Zealand by European colonists, but it has been pastoral agriculture, first of sheep and more latterly, cattle, that has dominated rural land use over much of the country for the past 150 years.

Taylor (1997) documents the dramatic impact this culture has had upon the indigenous vegetation cover, replacing a range of tall forest ecosystems with predominantly ryegrass species. Pastoral agriculture in New Zealand is characterised by owner occupancy, with rural

areas comprising a mosaic of largely family-based pastoral units, increasing in scale on poorer land, and maintained in their open condition by an annual cycle of stock rearing and grazing. Although based from an early stage upon export of commodities, and increasingly upon processing of animal products, pastoral agriculture until very recently has been an industry in which decision making has been largely decentralised, with significant autonomy to individual farmers.

Forestry, in contrast, as Roche (1990) describes, has been dominated by the role of the state until recently, but is now privatised and corporatised, with increasing vertical integration, or, where smaller investors are involved, characterised by 'absentee' partnerships. The cycle of activity within forests is also dramatically different, extending over one or two human generations.

O'Connor (1981) has characterised the debate over proposals for afforestation in the South Island high country as a clash of cultures, and the same phenomenon arguably underpins many of the tensions that arise in rural New Zealand when land use change involving forestry occurs. Le Heron and Roche (1984, 1985) and Fowler and Meister (1983) have documented the way in which rural communities dominated by pastoral farming interests for many years used Town and Country Planning legislation to inhibit conversion of pasture to forest. The main agent for such change as did occur was the New Zealand Government, through the New Zealand Forest Service (NZFS). The NZFS typically focused upon areas where either there was less competition from pastoral land use (e.g., Central Plateau), or where pastoralism was evidently not sustainable, due to its effect on rates of land erosion.

The afforestation schemes which established the industry in the Gisborne-East Coast region during the 1960s and 1970s, were primarily a response to such soil and water conservation issues. However, even at this early stage, concerns about the socio-economic effects of, and community responses to, a large-scale change from pastoral agriculture to forestry began to emerge (Robb et al., 1970). Since then there have been some detailed studies of community responses to forestry development, the findings of which were summarised in Fairweather et al. (2000a). Scott et al. (1997), for example, identified a range of concerns that emerged in Northland in reaction to conversion of pasture to plantations.

Overall, concerns appear to relate to one or more of several dimensions of forest development, including its effects upon employment, upon community profile and structure, upon landscape, and upon infrastructure. All of these dimensions have been identified and may be expected to be significant in the Gisborne/East Coast region case study.

Issues of community profile and structure, and total employment, are being investigated in other studies within the overall research programme. This report presents the results of an investigation that focused upon types of employment activity, infrastructure and landscape change. It forms an integral part of the wider programme, the overall results of which will be drawn together in a later report.

1.3 Q Method and Community Attitudes Towards Landscape Change

The use of the Q method to study attitudes, perceptions and experiences is documented in Fairweather and Swaffield (1995, 1996, 2000a), Swaffield and Fairweather (1996) and Fairweather and Swaffield (N.D.). In essence, Q method involves taking a diverse sample of photographs and presenting them to a non random sample of people, asking them to sort the

photographs into a normal distribution, factor analysing the Q sort data, and identifying themes in perception among the subjects based upon the pattern of response, and the comments of respondents made during the sorting process.

Forest sector development has effects on activities, infrastructure and landscapes. A theoretical sample frame was developed, based upon work being undertaken in other parts of the programme, which had identified the most likely scenarios of development over the next ten to 20 years. The dominant scenario is that export of logs will continue to be a major focus of activity, with processing into composite wood products also likely to grow, based close to Gisborne. Exports will be concentrated upon an expanded Gisborne port, although there is a possibility of barge transport from a subsidiary northern location, such as Hicks Bay. The future of rail transport is currently in question. There is no doubt, however, that the growth in forest production will result in increased road transport, which in turn will require either highway upgrading, or construction of dedicated forest roads, and possibly both.

There are several possible types of forests that could be planted over the next decade, including continuation of conventional managed pinus radiata plantations, planting primarily for erosion control, or a shift to smaller woodlots integrated with existing pastoral agriculture. There is also the possibility of different ownership structures, each with different implications for access to forests. Retention of pasture and reversion to bush were also included as options. In forest management, most techniques are likely to remain broadly the same.

A sample frame was prepared that included all these options, under the broad headings of forestry related activities, infrastructure and landscape. Images were prepared to represent each possible outcome. The forestry-related activities images show different types of employment created in different parts of the sector, from forest-based work (planting, pruning, felling), through transportation (loading, driving, vehicle maintenance) to management, consultancy and process plant operations. The infrastructure images show different regional transportation options (forest road, state highway, barge), and their physical expression in road improvement, as well as log, chip or product export options, processing in the region, and port expansion. The landscape images show forestry at different stages in the rotation, from new plantings to mature production forest. They also include the main alternative land uses of erosion planting, indigenous regeneration, and continued pastoral agriculture. Three images suggest different forms of ownership: local Maori in partnership, private investors in partnership, and corporate ownership.

These images were based initially on digital photographs from the case study region, supplemented by some ‘generic’ images of forest activities. A number of the base images were edited using Photoshop, to create representations of scenarios that do not yet exist (e.g. barge export, port expansion, port bypass). The sky backdrop of all images was standardised, as was colour balance etc., to ensure that variation between images related only to the focus of study, rather than incidental context. Initially some 40 images were prepared, and these were narrowed down to ten images for each of the three main dimensions of forest development. The images were reproduced at postcard size, laminated for ease of field use, and randomly numbered.

In this study we were interested in what people saw as likely to occur and what they saw as providing most benefit to the community as a whole. Thus, for each of the three sets of images, subjects were asked to Q sort under two conditions of instruction: the first was for what they thought would be most likely to occur as a consequence of forest sector development. The

second was for what they thought would provide more or less benefit to the community as a whole. In addition, in order to gain some insight into people's perceptions of the relative significance of different dimensions of forestry (i.e., activities, infrastructure and landscape) the final step was for each subject to take the top three images from each set and order these nine images in terms of their judgement of more or less benefit to the community as a whole.

Sixty people in the study area completed a Q sort. There were 50 Q sorts completed in Gisborne and ten in the some of the northern towns. Some of the Q sorts in Gisborne were by people from other East Coast places. As a result, there were 32 respondents from Gisborne, 12 from places near to Gisborne and 16 from places that were well away from Gisborne such as Ngatapa, Whangara, Motu, Ruatoria and Tolaga Bay.

The sampling frame for selection of respondents included opinion leaders from Maori and European communities, politicians, the business sector, education, community organisations, as well as the primary production sector including forestry itself. Table 1 shows the numbers selected in each category and Appendix 2 lists all respondents classified by role, age and gender. Among the 60 respondents there were a total of eight Maori. Views of Maori have been given more emphasis in other parts of the overall study.

Table 1: Numbers and Types of People Who Completed Q Sorts

Category	**Number**
Council (elected or staff)	13
Business	16
Community or social group	14
Environmental	4
Primary production	13
	60

The selections by each respondent were recorded on a standardised sheet (see Appendix 1), to which notes are added recording the comments, rationale and justifications offered by respondents while ordering the images.

Q sorts were analysed using the PQmethod computer programme. The number of factors used was determined by the presence of at least two significantly loaded subjects on the unrotated factor matrix. A significant loading has to be over 0.82 at the 0.01 probability level. Using these criteria meant that only one or two factors were significant in each Q sort and Table 2 shows these results.

Table 2: Number of Factors Used for Each Q sort

EmploymentActivities		**Infrastructure**		**Landscape Effects**	
Likely	Benefits	Likely	Benefits	Likely	Benefits
2	2	2	1	1	2

Chapter 2
Results

2.1 Introduction

Analysis of Q sort results is based upon two main aspects of the collected data: interpretation of the images that characterise each Q sort, expressed as factor 'arrays', and interpretation of the comments made by respondents during the Q sort process.

Table 3 shows the overall results. Along the top of the table, the three sets of images are labelled in bold: activities, infrastructure, landscape change. For each set, results from two Q sorts are recorded, the 'likely' columns refer to the question about the most likely effects of forest sector development; and the 'benefits' columns refer to the question concerning benefits to the community. Under each of the six Q sorts (three for Likely and three for Benefits) there are one or two columns, each recording a significant factor, or theme. These are labelled 1 or 2 for each Q sort. As noted in the end of Chapter 1, identification of themes is derived statistically: in four of the six Q sorts, there were two significant factors, and in the remaining two Q sorts, only one each. This shows that, within the 60 people surveyed, there were two distinctly different ways of evaluating both the likelihood and benefits of the forest activities presented in the images, two ways of evaluating likelihood of infrastructure effects, and two ways of evaluating community benefits of landscape effects, but only *one* dominant way of evaluating the benefits of infrastructure and the likelihood of landscape effects.

The numbers in each column refer to the different images within each Q sort, with a reference number marked on each image as 1A-10A (the activities Q sort), 1I-10I (the infrastructure Q sort), and 1L-10L (the landscape Q sort). Each image therefore has a unique reference number.

The scores on the left of the table refer to the piles in the Q sort itself: scores of 2 or -2 refer to the single image selected that is 'most' or 'least' likely, or that provides 'most' or 'least' benefit. The 1 and -1 scores represent the next pile (still expressing either likelihood or benefit), while the 0 scores refer to the centre, or neutral pile (neither most nor least). The bottom row of the table (numbers) indicates the number of respondents (from the total of 60) who loaded significantly onto each actor. The totals for each Q sort do not equal 60, as there are always responses which do not match the factor arrays closely enough to be significant at the designated statistical level.

The following analysis highlights first, the images that characterise each factor for each Q sort; second, summarises any differences between Q sorts for the same question (i.e., different ways of responding to the questions of likelihood and benefit for the same set of effects (images); third, summarises any differences between assessments of likelihood and benefit, for the same set of effects (images); and fourth, presents the overall characteristics of the types of effects (images) selected as most or least likely across the three Q sorts. Each array of images in the Q sort factors, or themes, is reproduced in Figures 1 to 8.

Table 3: Factor Arrays for Each Q sort

	Employment Activities				**Infrastructure**				**Landscape Effects**			
	Likely		Benefits		Likely		Benefits		Likely		Benefits	
Score	1	2	1	2	1	2	1		1		1	2
2	3	6	6	6	7	9	9		1		5	7
1	4	8	1	8	3	8	5		6		4	4
1	1	10	3	7	10	3	8		3		7	6
0	10	3	4	9	5	7	6		2		8	2
0	9	1	5	2	8	10	4		8		9	8
0	5	4	10	5	9	5	3		9		6	1
0	7	7	9	4	2	1	10		10		3	3
-1	8	9	7	3	1	4	1		7		10	9
-1	6	5	8	1	6	6	7		4		1	10
-2	2	2	2	10	4	2	2		5		2	5
Number	31	11	19	18	19	12	23		24		19	13

2.2 Likely Forest Sector Employment Activities

There are two distinctly different factors. Figure 1 shows that both factors agree that recreation (fishing) (2A) is the *least* likely activity. However, the two factors show two quite different perspectives upon the sort of activities *most* likely to characterise forest sector development in the region. Factor 1 sees the most likely activities as those directly related to forestry establishment and silviculture, including planting (3A), felling (4A) and pruning (1A). Added value activities such as milling (6A) and technical work (8A) are seen as unlikely. In contrast Factor 2 sees milling (6A) as most likely, followed by technical work (8A) and trucking (10A). The three activities directly related to forestry establishment (3A, 4A, 1A) are located in the neutral pile.

This Q sort shows that there are two contrasting perspectives upon the most likely types of activity to result from forest sector development. Factor 1 expects outdoor manual activities to be the most likely while Factor 2 expects technical and processing activities to be the most likely.

2.3 Benefits of Forest Sector Employment Activities

There are also two factors in the evaluation of the benefits of the different activities for the community. Figure 2 shows that both factors see most benefits from the activity of milling (6A). Factor 1 then emphasises benefits from pruning (1A) and planting (3A) while Factor 2 emphasises technical work (8A) and office work (7A). In contrast, Factor 1 puts these two images on the -1 pile, that is, rating them as giving least benefits, while Factor 2 puts planting (3A) and pruning (1A) on that pile. Clearly, the two factors see benefits in quite different ways for these four activities. However, for nearly all of the remaining activities there is agreement: felling (4A), R & M services (5A) and contracting (9A) are on the neutral pile. The two other activities placed quite differently are trucking (10A) and fishing (2A). Factor 1 places trucking in the neutral pile, while Factor 2 rejects it and places it in the -2 pile, indicating that there are few perceived benefits. Factor 1 sees least benefit from recreational fishing (2A).

Figure 1: Factor Arrays for the Likely Activities Q sort

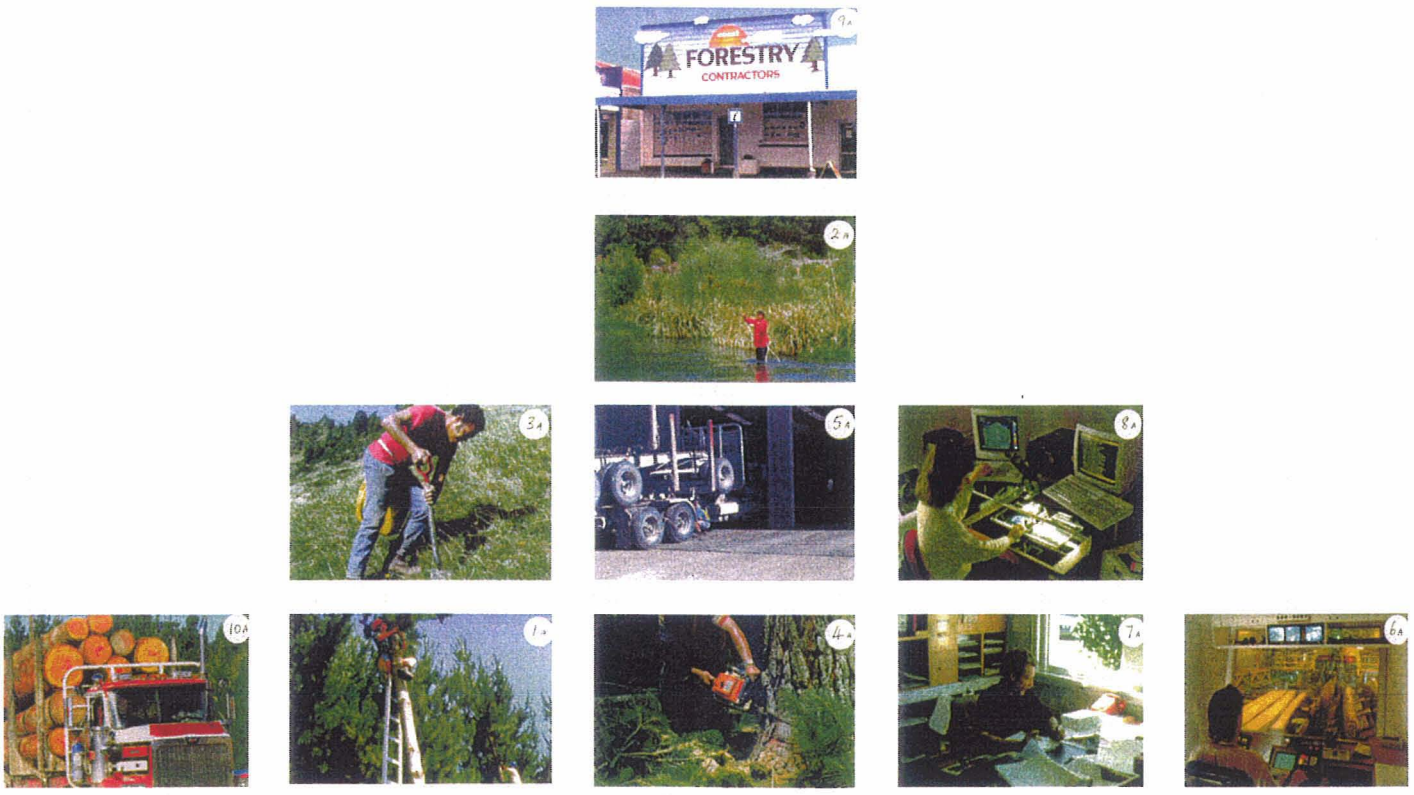
Factor 1

Factor 2

Figure 2: Factor Arrays for the Activities Benefit Q sort

Factor 1

Factor 2



Factor 1 therefore emphasises the benefits from the more visible processing activities and manual activities (milling, pruning, planting), whereas Factor 2 emphasises value added, processing and office-based benefits, and sees least benefit from log haulage and forest-based, manual activities.

2.4 Likely Infrastructure

Figure 3 shows that both factors rate the new road to port (6I) as moderately unlikely. Factor 1 sees the most likely infrastructure elements as those related to log hauling and loading including: log haulage on the existing highway (7I), log handling areas (3I) and logging trucks on forest road (10I). Factor 2 sees processing and loading infrastructure as most likely including: the JNL plant (9I) and extended port (8I) with log handling (3I). The latter is placed in a similar position to Factor 1 but the first two are in the neutral pile for Factor 1. Another contrast between the factors occurs with the image showing a logging truck passing through Gisborne city (2I): Factor 1 has this in the neutral pile while Factor 2 sees is as the least likely infrastructural aspect of forestry. The remaining images are rated in a similar way.

These two factors clearly differ in their evaluation of the likelihood of capital infrastructure: Factor 1 emphasises the use of existing regional transportation facilities, while Factor 2 places greater emphasis upon Gisborne-based processing and product handling. It is notable that neither factor considers that a port bypass, or a subsidiary barge handling facility, is likely.

2.5 Infrastructure Benefits

There is only one clear factor for this Q sort. Figure 4 shows that respondents see most benefits occurring with the capital infrastructure, such as JNL plant (9I), state highway upgrading (5I) and the extended port (8I), while least benefits are seen to occur with trucks using existing roads (2I, 1I, 7I). This indicates a significant consensus among respondents that the main benefits that could arise would be from capital investment in specified ‘greenfield’ sites, or improvement of existing sites (state highway, port), with least benefit arising from increased use of existing roads, particularly in the city.

2.6 Likely Landscape Effects

There was only one set of likely landscape outcomes identified. Figure 5 shows the images for the factor which considers the most likely landscape outcomes are related to conventional production forestry, including: clearfell scene (1L), pruned and thinned pines (6L) and younger managed pines (3L). In the neutral pile are immature trees under different forms of ownership (8L, 9L, 10L) and pine on eroding land (2L). Least likely is native regeneration (5L), with the farm woodlot (7L) and the pastoral farming scene (4L) seen as unlikely. Clearly, people perceive the landscape as likely to be dominated by production forestry, with the effects of clearfelling most prominent in their thinking.

2.7 Landscape Benefits

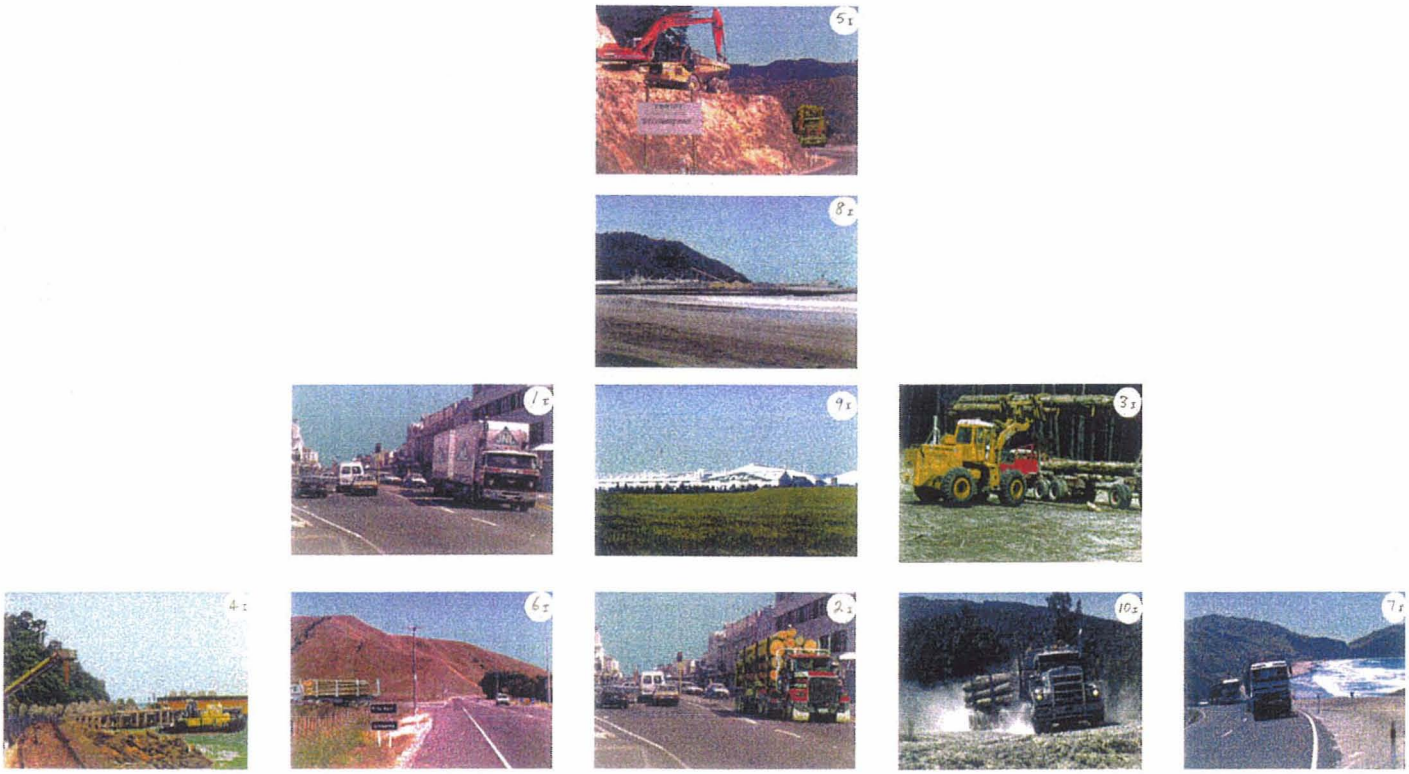
Although there was only a single factor for most likely landscape outcomes, there were two distinctly different factors for the landscape benefits. Factor 1 expresses a belief that the most benefit for the community comes from bush vegetation (5L), and continuation of pastoral

farming (4L), with woodlots (7L). Various aspects of forestry are neutral (8L, 9L, 6L, 3L), but clear felling (1L), forestry or erosion-prone land (2L) and absentee ownership which constrains access (10L) are seen as representing least benefit. In contrast, Factor 2 sees bush regeneration (5L) as the landscape outcome which is *least* beneficial to the community. However, pastoral woodlots (7L) are seen as most beneficial, with benefits also from continued pastoralism (4L) and mature forests (6L). For this factor, new plantings (8L), erosion control (2L) and clear felling (1L) are all neutral. Absentee ownership that constrains access (9L, 10L) is seen as least beneficial.

Factor 1 emphasises benefits from regenerating bush, farming and woodlots - in other words the status quo - which reflects a more traditional and somewhat picturesque sentiment and recognition of conservation benefits. Factor 2 emphasises functional use of the land sharing the positive evaluation of the farming and woodlots but sees bush regeneration as least beneficial.

Figure 3: Factor Arrays for the Likely Infrastructure Q sort

Factor 1



Factor 2

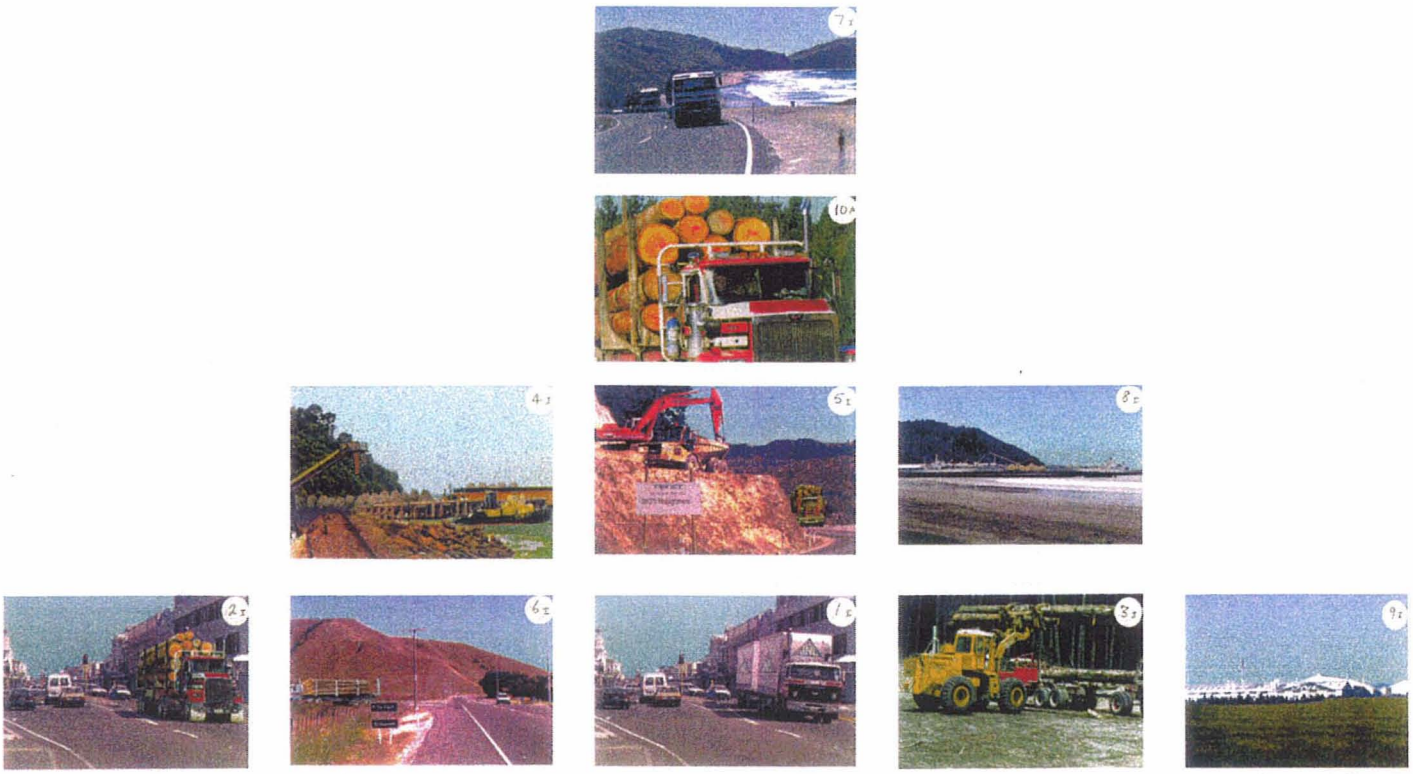


Figure 4: Factor Array for Infrastructure Benefits Q Sort

Factor 1

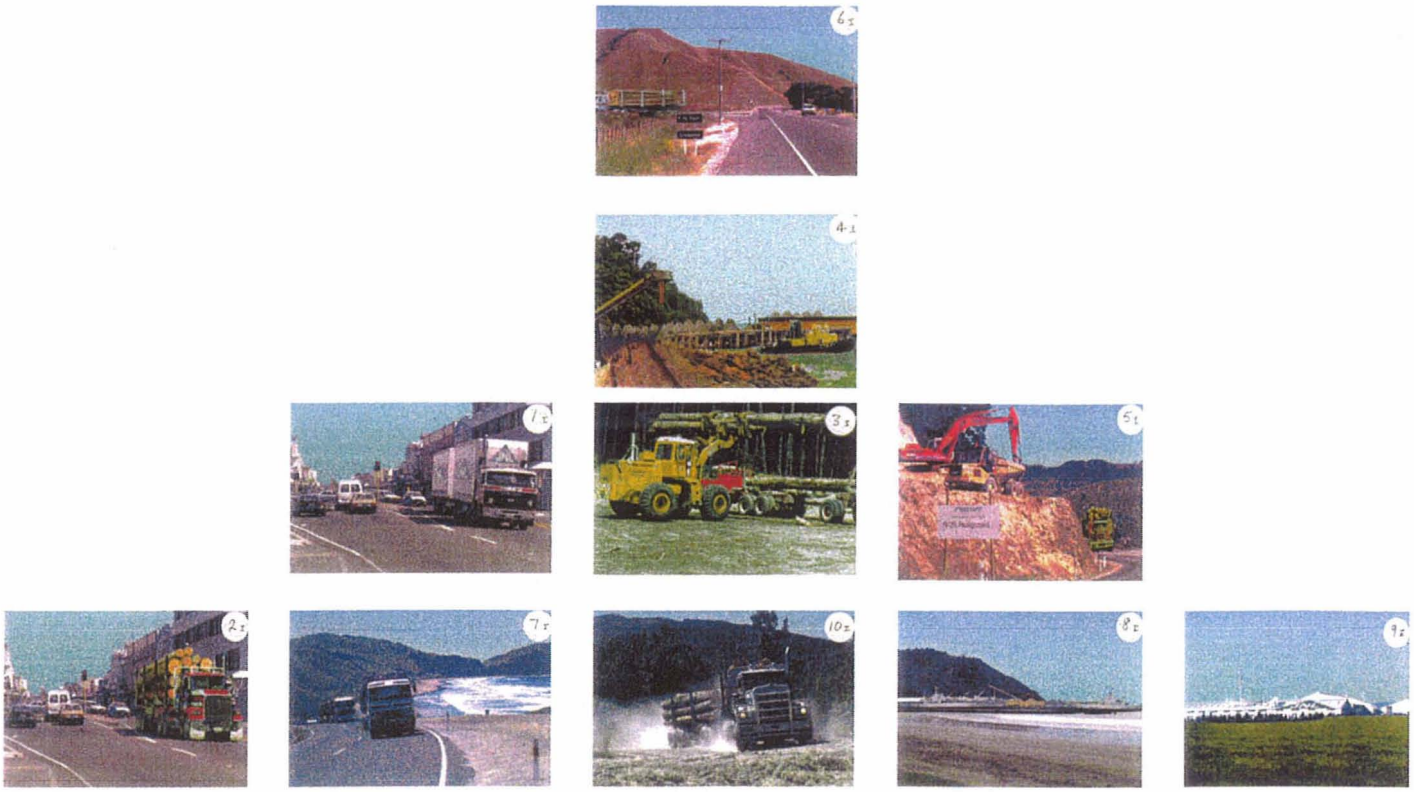


Figure 5: Factor Array for the Likely Landscape Q Sort

Factor 1

Figure 6: Factor Arrays for the Landscape Benefits Q Sort

Factor 1

Factor 2

Chapter 3
Discussion and Conclusion

A particular strength of Q sort method is its ability to distil common patterns of response to a particular issue in a community. Sometimes the analysis reveals just one factor, indicating a widespread agreement among respondents in their evaluation of a standard set of images (or words). In other situations, the analysis reveals a range of positions, each coherent in itself but distinctly different from others. In this analysis of attitudes towards forest sector development in the Gisborne-East Coast region, there are one or two factors that underlie responses to each of the six Q sorts. The key results are summarised in the table below.

	Forestry Employment Activities	**Infrastructure**	**Landscape Effects**
	Most Likely		
Factor 1	Outdoor, manual work	Existing transport	Production forestry
Factor 2	Value added, processing work	Processing, product handling	-
	Most Benefits to the Community		
Factor 1	Processing, forest activities	Capital infrastructure	Status quo. Revegetation
Factor 2	Processing, office activities	-	Mixed Functional use

In summary, the results show two factors or themes for four out of the six Q sorts. The likely employment activities Q sort showed two contrasting perspectives: Factor 1 expects outdoor manual activities to dominate, while Factor 2 expects technical and processing activities to be the most likely. For the activities benefits Q sort, Factor 1 emphasises the more visible and distinctive benefits (milling, pruning, planting), whereas Factor 2 emphasises value added, office-based benefits and sees least benefit from log haulage. For the likely infrastructure Q sort, Factor 1 emphasises the use of existing regional transportation facilities, while Factor 2 places greater emphasis upon Gisborne-based processing and product handling. It is notable that neither considers that a port bypass, or barge handling, is likely. For the infrastructure benefits Q sort, most respondents see benefits occurring with the capital infrastructure, such as JNL plant, state highway upgrading and the extended port, while least benefits are seen to occur with trucks using existing roads. For the likely landscape effects Q sort, most respondents perceive the landscape as likely to be dominated by production forestry, with the effects of clearfelling most prominent in their thinking. Finally, for the landscape benefits Q sort, Factor 1 emphasises benefits from regenerating bush, farming and woodlots and so favours the status quo. Factor 2 shares the positive evaluation of farming and woodlots emphasising mixed functional use but sees bush regeneration as least beneficial.

There appears to be a convergence of views upon the most likely landscape outcomes of forest sector development, and over the benefits and disbenefits of forestry related infrastructure. There is marked divergence of attitudes over the likelihood and benefits of forest related employment activities, and over the most likely types of infrastructure. There is also a dramatic contrast between what is felt to be most likely, and what would be of most benefit to the community, in regard to landscape outcomes, for one factor in particular.

Starting with the convergent viewpoints, the most likely landscape outcome of forest sector development can be described as conventional plantation forestry, characterised by extensive pinus radiata monoculture, with pruned stands and a clearfell harvesting regime. Woodlots do not figure in people's expectations. There was a similar degree of convergence of views over the benefits of infrastructure development, with a clear belief that capital intensive, specialist facilities, such as port facilities and processing plant, bring greatest benefit, and that log transportation upon existing infrastructure brings least benefit (or greatest disbenefit).

The main dichotomy of views is over the most likely and beneficial employment activities and most likely infrastructure. In both, there was a clear split between those factors which focused upon the 'forest' part of the industry, and those focused upon processing. In both activity and infrastructure Q sorts, one factor identified forest based and manual activities and existing infrastructure as the most likely feature of future development, while a second factor identified processing activities and related infrastructure as most likely. This revealed clearly different perceptions of the nature of forest sector development.

In terms of benefits of activities both factors recognised the benefits of processing, but one factor saw this as most closely associated with benefits from forest based activities, while the other linked it with associated office activities. Again, there is a contrast between a focus upon the manual and physical dimensions of forestry, and on the more technical dimensions.

In regard to the desirability of landscape outcomes, two factors emerged. One emphasised the benefits of regenerating bush, pastoral farming and woodlots, with least benefit from new plantations, clear felling and extensive forest cover. This can be characterised as a 'status quo' view with evidence of some picturesque sentiment. The second gave more emphasis to the benefits of land use favouring integration of forestry with pastoral farming. It was notable that views of what was most likely contrasted markedly with what was of most community benefit. For example, the status quo view of the landscape outcome which gave most community benefit was the inverse of the generally accepted view of what is most likely to happen. Similarly, with the infrastructure assessments, respondents appeared to expect future forestry development to continue pretty much along current lines, but saw least benefit from the impact of logging trucks on existing infrastructure, and the effects of large scale plantation forestry upon the landscape.

The divergence between people's expectations, and their assessment of what is of most benefit to the community, in both landscape and infrastructure dimensions, suggests potential for a significant level of long-term dissatisfaction with continued forest development, which may be expressed as either resistance or resignation.

Another notable feature is that there was very little overlap between people loading on apparently similar factors. The greatest consistency in expressed views was between Factor 1 for the likely activities, likely infrastructure and likely landscape Q sorts, in which some 9-10 people expressed a consistent view that emphasised the conventional view of forestry, and in Factor 2, where five people expressed similar views on activity and infrastructure. Overall, though, the most marked characteristic was that although the numbers loading on a factor were always above ten, and between 20 and 30 for several factors, different people loaded on outwardly similar factors across different Q sorts. Analysis of previous work has suggested to us that factors become very stable as the numbers loading on them approach 20, so we are quite confident in the factor analyses presented here. What they show is that, as was found in an earlier study of the Mackenzie Basin (Fairweather and Swaffield, 1995; Swaffield and

Fairweather, 1996), while factors may be strongly expressed and stable, they do not correspond closely with particular interest groups in the community. Rather, they represent a more general way of thinking about an issue, which different people may share in different contexts or circumstances.

Notably, there is a contrast between what many people expect will happen, in both landscape effects and infrastructure, and what they believe will bring most benefit to the community as a whole. This result suggests that there is a significant view in the community that current and most likely directions of development are not necessarily in the best overall interests of the community. Some features, such as log transportation, large-scale plantations and clearfelling, are seen to bring least benefits and presenting disbenefits by this group of opinion leaders, yet are also seen as likely. Management efforts to minimise impacts and gain community support might usefully be directed in these areas. They also suggest areas of future work for the industry, as features around which resistance and opposition could develop and focus. It is the consistency of view that is enduring and robust, even though different people may express it at different times.

Overall, these results confirm that there are differing views in the East Coast community about the likelihood of different activity and infrastructure effects of forest sector development, with one view focusing upon traditional forest activities and existing infrastructure, and the other upon processing activities and associated infrastructure. There are also different views about the benefits of forest sector development in terms of activities and landscapes. The benefits of activities are seen by one group as relating to the forest, while the other group focuses on mill and office activities. The benefits of landscape are seen by one group to derive from the status quo and for the other group to derive from mixed use. There is some convergence of views on *most likely* landscape outcomes, and upon the benefits and disbenefits of different infrastructure developments.

One of the longer-term goals of the overall programme within which this research is undertaken is to identify attitudes to forestry practices and their perceived consequences. Clearly some forestry practices attract negative comments, and this report has provided confirmation of the need to address such issues as scale of land conversion, felling practices, and log transportation. It also suggests that there is still a need for public education on the extent of downstream processing already being undertaken, and the extent and benefits of indirect employment created by the sector.

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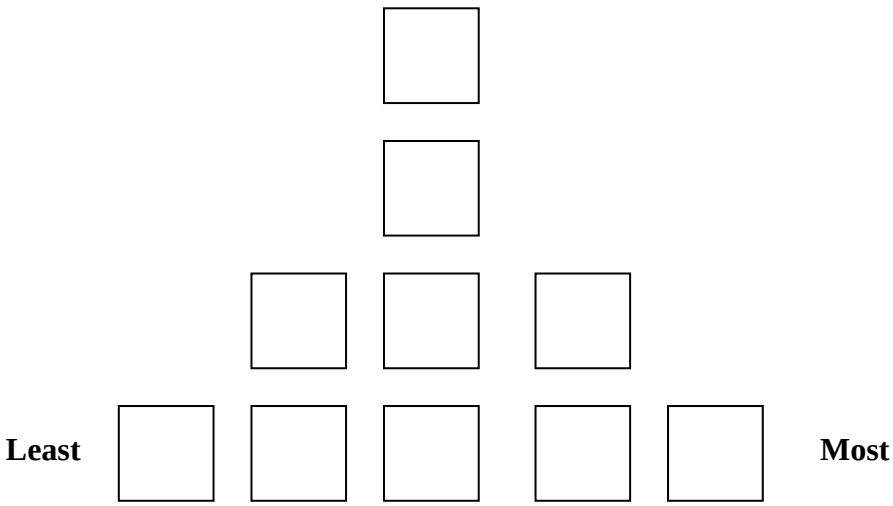
Appendix 1
Data Recording sheet

Forest Sector Development Study: Gisborne/East Coast

Subject No.:_____ Date:_____ Location:_____

What do you expect the main effects of forest sector development to be?

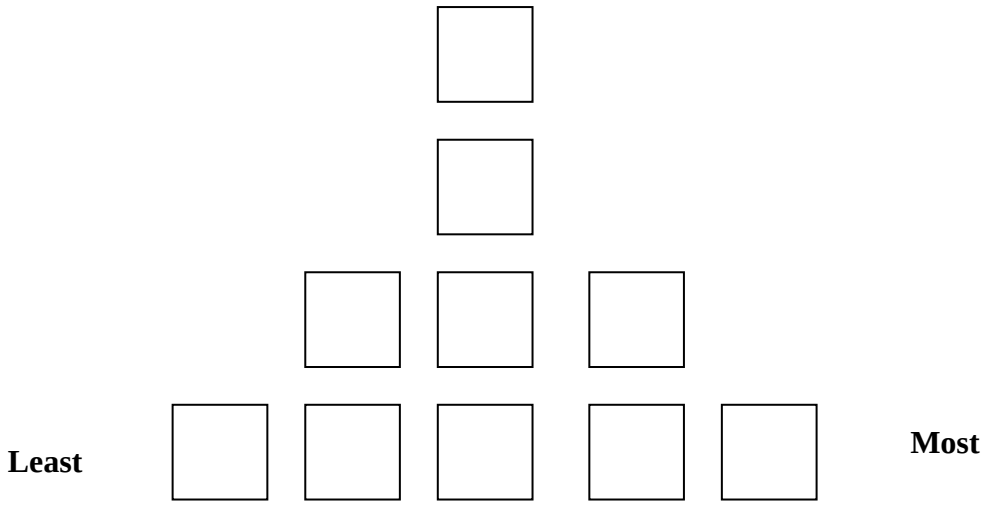
Order in terms of what you think will be likely or typical forestry *activities*.



Likely or typical activities

What do you expect the main effects of forest sector development to be?

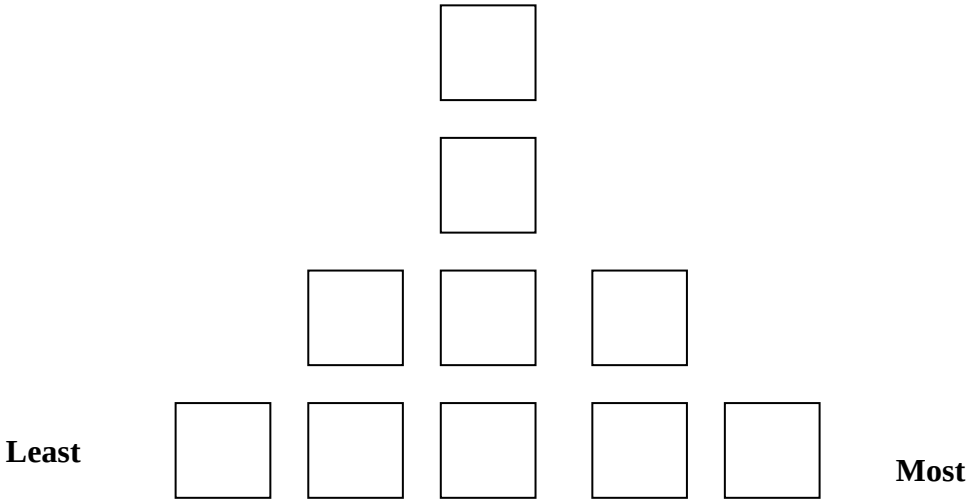
Order in terms of what you think will be likely or typical forestry *infrastructure*.



Likely or typical infrastructure

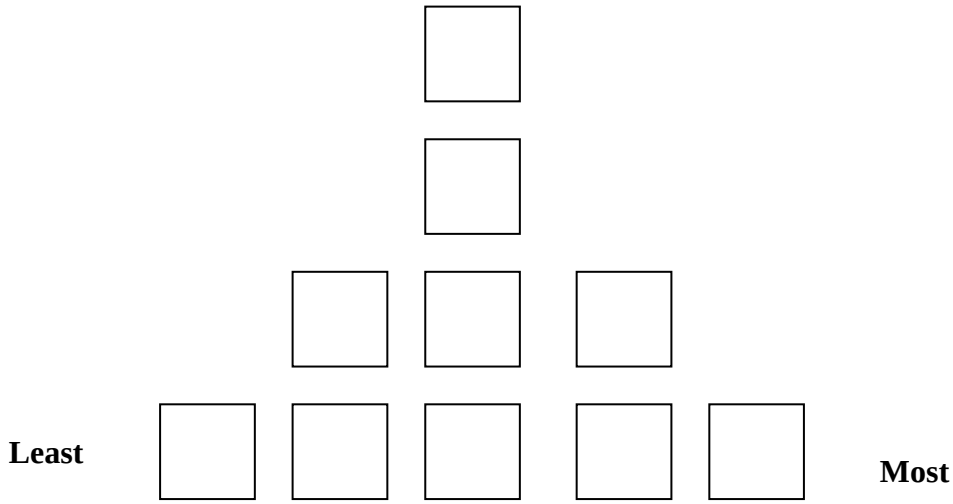
What do you expect the main effects of forest sector development to be?

Order in terms of what you think will be likely or typical forestry *landscapes*.



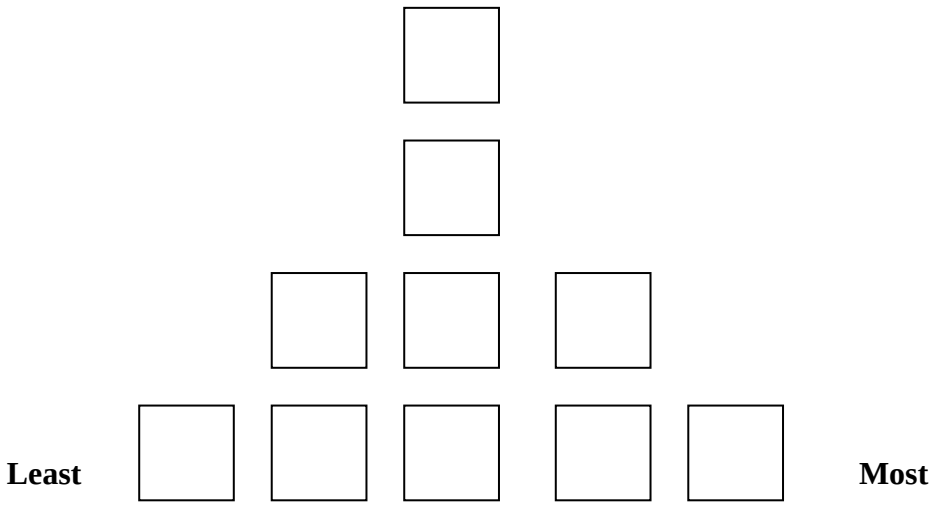
Likely or typical landscapes

Which forestry *activities* provide more or less benefit to the community as a whole?



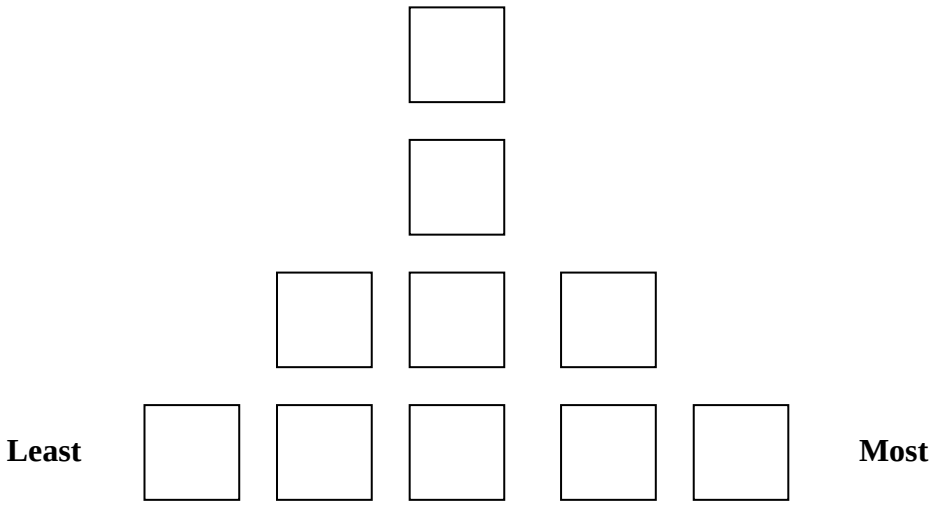
Beneficial activities

Which forestry *infrastructure* provides more or less benefit the community as a whole?



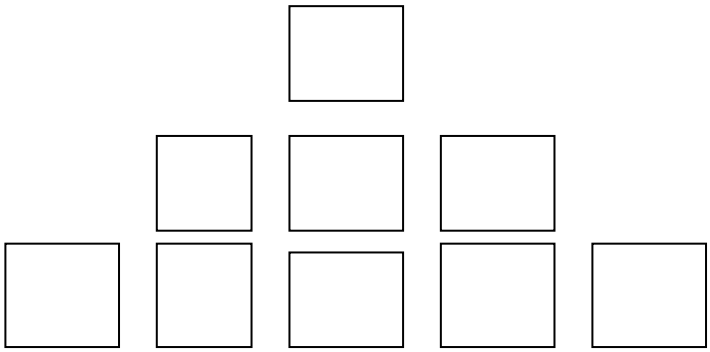
Beneficial infrastructure

Which forestry *landscapes* provide more or less benefit to the community as a whole?



Beneficial landscape

Using the top three images from each Q sort above, which provide more or less benefit to the community as a whole?



Least **Most**

Background Information

Occupation:_____ Gender:_____ Age:_____

Where do you live?_____ How long in Gisborne/ East Coast _____

Please describe your involvement in any community activities:

Appendix 2
List of Respondents, by Role, Age and Gender

Number	Role	Age	Gender
1	Council	29	Female
2	Primary	43	Male
3	Council	64	Male
4	Business	54	Male
5	Council	58	Male
6	Business	59	Male
7	Primary	48	Male
8	Council	46	Female
9	Council		Male
10	Council		Male
11	Community group	39	Female
12	Environmental	47	Male
13	Business	55	Female
14	Community group		Male
15	Council	49	Male
16	Primary production	50	Male
17	Community group	60	Male
18	Business	52	Male
19	Community group	34	Female
20	Primary production	62	Male
21	Environmental	53	Male
22	Primary production	48	Male
23	Council	48	Male
24	Council	50	Male
25	Business	40	Male
26	Community group	28	Female
27	Primary production	44	Male
28	Council	56	Male
29	Council	55	Female
30	Business	52	Male
31	Primary production	55	Male
32	Community group	57	Female
33	Primary production	52	Male
34	Community group	27	Male
35	Community group	53	Female
36	Community group	47	Female
37	Community group	50	Male
38	Business	45	Male
39	Community group	60	Female
40	Community group	53	Male
41	Community group	50	Female
42	Business	47	Female
43	Business	65	Male
44	Environmental	47	Male
45	Council	50	Male

46	Community group	45	Male
47	Community group	49	Female
48	Community group	69	Male
49	Primary production	43	Male
50	Community group	46	Female
51	Primary production	50	Male
52	Business	50	Male
53	Primary production	22	Male
54	Business	44	Male
55	Community group	58	Female
56	Primary production	49	Male
57	Business	68	Male
58	Business	60	Male
59	Community group	59	Female
60	Primary production		Male

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