

**Factors Influencing Workforce Mobility to
Regional Mining and coastal Towns:
Moranbah**

RESEARCH REPORT No 5.

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**IMPACTS OF THE COAL MINING EXPANSION ON
MORANBAH AND ASSOCIATED COMMUNITY**

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5.1 Introduction: Background and Objectives of the Study

The mining boom that has occurred in the Bowen Basin since 2003 has raised key questions about the potential development of mining communities. The development of block shifts and drive-in/drive-out work patterns has created opportunities for mining developments to be serviced by a labour force based in coastal and regional centres. In the short term, labour force adjustments have followed this pattern, with the establishment of temporary accommodation (work camps) being a key response to housing needs.

In the longer term, patterns of location may be more fluid. The key options for future developments of a mining community such as Moranbah can be summarised as follows:

1. Additional labour force requirements met totally with workcamp accommodation;
2. Workforce accommodation transferred totally to permanent housing in towns as housing supply improves;
3. Workforce accommodation reaches some balance between permanent housing and workcamps.

To understand the issues that might influence these patterns, it is important to clarify the underlying factors that influence worker location choices.

There are a number of factors that can determine the “attractiveness” of a region to potential employees and their families. These are likely to relate to employment, demographic, cultural, geographic and other factors, including the level of services, housing and infrastructure available (Rolfe et al. 2005a).

The future changes in demographics for the Bowen Basin have to be viewed in the context of the present demographic movements in the regional Queensland. There have been population losses in many regional areas as increased efficiencies in agriculture and service industries mean that fewer people are employed in those sectors. In many cases the population movements are from rural areas and smaller towns to larger centres within regions. Better transport and communication facilities, increased emphasis on service industries and the increased scale of firms and enterprises are among some of the economic reasons why larger centres have grown at the expense of smaller ones.

There are also a number of social reasons why there have been population movements to larger centres. These include better employment opportunities (especially for partners), better education and health services, increased recreation opportunities, and quality of lifestyle factors. Many employees of coal mines (especially those with extended shift breaks) and their families choose to live in the larger centres or coastal cities and stay in temporary accommodation when they are completing a shift.

The further development of the Bowen Basin poses some interesting trade-offs for regional development. In the initial development of the Bowen Basin, the only viable way of supplying labour was to build or expand townships close to site. Since then, due to the changed shift work patterns (involving longer break periods), cheaper and

more efficient transport options and changed social preferences, two other models of development, compared to the “local township” option, have emerged.

The first main option is the “regional hub” model, where employees are based at a larger centre in a region and then travel to the work site for the period of shift. This is currently a major option in the Bowen Basin, with Mackay, Rockhampton, Emerald, and the Capricorn Coast emerging as regional hubs.

The second option is to base employees outside of a region, with transport by air back to major cities after the completion of the shift. This model is commonly used in Western Australia, where many mine employees are based in Perth. It could potentially be used in the Bowen Basin, with employees based in Brisbane or other centres.

These options mean that the development of some small towns in the Bowen Basin will not automatically occur as a consequence of increased production in the mining industry. For these towns the success of potential mining developments will be dependent on the attractiveness of the town to potential employees as a long-term residential location. Identifying the factors that contribute to attractiveness is a key factor in generating regional development.

This report focuses on the issues that need to be addressed in order to attract skilled workers to mining towns. A specialized technique called Choice Modelling has been used to identify the important factors that would encourage Mackay residents to move to mining towns. A random sample of households in Mackay was obtained. Respondents answered questions regarding their attitudes towards various issues in the region. Respondents were also asked about the factors that they would consider in moving to a small mining community or a medium sized mining community. For comparative purposes, options to relocate to similar sized coastal communities were also offered.

The rest of the paper is structured as follows. A relevant literature review is provided in section 2. Section 3 overviews a methodology used for the survey conducted in Mackay. Section 4 presents results of Choice Modelling section. Section 5 shows results of the attitudes towards various issues. Section 6 concludes.

5.2 Overview of the Relevant Literature and Examples of Similar Studies in the Bowen Basin

In the western world, the rise of the service economy, increases in the standards of living, and improvements in transport and communication are providing more flexibility over residential choices. There is more flexibility in where some jobs are located and where employees choose to live. As well, there is more focus on liveability issues, with drifts to regional centres and the ‘sea change’ patterns being examples of increased focus on lifestyle issues.

Social infrastructure (e.g. schools and hospitals), social capital (e.g. institutions, relationships, attitudes and values) and human capital (e.g. skills and abilities of people) are playing a more important role in the decisions of the individuals to live in

a particular community (Rolfe and Hyland 2004). These factors are often recognised in ‘liveability’ indexes (Table 1), which can be used to identify the desirability of different countries to live in and can be used for assessing the attractiveness of a particular community for newcomers. Factors like housing, education, recreation and amenity values can be important considerations when people make choices about relocating between countries or regions (Rolfe and Hyland 2004).

Table 1. Factors used in a country ‘liveability’ index

Factor
Housing
Healthcare
Personal security
Kindergarten/Primary schools
Secondary schools
University and post-graduate education
Sporting and recreation facilities
Nightlife
Sightseeing attractions
Heritage and other indigenous cultural attractions
Concerts and shows

Source: Political and Economic Risk Consultancy 2002; see NSW DSRD (2003).

One key challenge for regional centres is to find ways of attracting new people to move to their town and aid in the creation of an ‘innovation’ culture (Rolfe and Hyland 2004). Skilled labour is becoming more mobile at regional, national and international levels. As well, lifestyle choices are becoming more important to people when they consider relocation options. The combination of these factors mean that social infrastructure and services are likely to become increasingly important for regional areas that wish to both retain and attract skilled labour, particularly skilled professionals. Developing the ‘quality of life’ in regions across a range of public and private fields is emerging as a key way for regions to increase their stock of skilled labour and develop a competitive advantage (Rolfe and Hyland 2004). Miles et al. (2004) report that lifestyle factors (and by implication social infrastructure) are becoming increasingly important in the location choices that people make.

5.3 Design and Performance of Surveys

5.3.1 Design of survey

Choice Modelling is a stated preference technique that has been adapted from conjoint analysis roots in transport and marketing fields to estimate values in economic research. There have been a number of applications to recreation and environmental issues in recent years (eg Adamowicz et al 1998, Blamey et al 2000, Rolfe, Bennett and Louviere 2000, Morrison and Bennett 2000, Bennett and Blamey 2001). There has also been growing interest in using the technique to analyze the choices people make in production enterprises (Lusk and Hudson 2004, Windle and Rolfe 2005).

Of particular interest are efforts to adapt the technique to analysis of social issues. Rolfe and Windle (2003) used Choice Modelling to identify how both indigenous and non-indigenous groups valued the protection of Aboriginal cultural heritage sites. Bennett and Blamey (2001) used the technique to assess community preferences for the preservation of country communities in Australia. In this project, a key aim was to extend the application of Choice Modelling to social issues by analysing the potential factors that influence relocation choices to regional areas. This builds on efforts to adapt this technique to analyse development issues relevant to mining communities (Rolfe et al. 2005a, 2005c).

In this study the focus was to identify factors that would influence Mackay residents to relocate to coal mining communities such as Moranbah and Nebo. The information from the literature review and extended stakeholders analysis were used to design a survey for data collection. The survey needed to be broad enough to cater for key issues that might be important to different communities, and specific enough to provide useful feedback. The survey had to be simple and concise so that it was easy for respondents to complete, but still be capable of providing useful information.

The study adopted a multiple data collection strategy in order to reduce non-response bias and counter the perception that the data collection methodology introduced any untoward influence. The data collection period was also extended in order to capture those respondents who would have normally been absent during a shorter collection period. It is not usually possible to undertake Choice Modelling questions over the telephone. Potential respondents were contacted by telephone and asked to participate in the research. They were then offered two different ways of completing the survey questionnaire. The survey comprised of two parts: part A and part B. Respondents could choose to complete Part A of the survey over the telephone and have the Choice Modelling section (Part B) of the questionnaire mailed to their home address or emailed to them as a Microsoft Word attachment file, or they could have the whole questionnaire (Part A and Part B) sent to them via post or email.

Part A of the survey focused on questions related to

- the length of residence,
- occupation,
- structure of household,
- perceptions of the Mackay community,
- spending patterns,

- views about current coal mining development,
- attitudes towards current high housing demands,
- factors that would encourage respondents to live in Mackay,
- purchases outside Mackay,
- attitudes towards some environmental issues, and
- socio demographic characteristics of respondents.

Part B of the survey focused on presentation of the Choice Modelling questions. Four choice sets were offered to respondents in eight different versions of the survey, so that data was collected on 32 different choice sets in total. There were also some follow up questions after the choice sets to explore reasons why different patterns of choice had been followed.

5.3.2 Performance of the survey

A survey of residents was undertaken in Mackay using combined phone and mail out techniques. The survey was conducted during December 2006 – January 2007. A general quota of 100 residents was targeted for the Choice Modelling part, and the selection method was applied consistently until this quota was met. Potential respondents were selected at random from current land based telephone numbers using a market pro database. To allow for diversity in respondent lifestyles, the timing of questionnaire distribution was varied and covered weekends and weekdays, mornings, afternoons and early evenings. The questionnaire was pilot-tested by trained interviewers on a number of randomly-selected households in the Mackay area. Interviewer comments (e.g. confusing wording, inadequate response categories, question order effect, etc.) and pre-test frequency distributions were reviewed before modifications were made to the 2006 Mackay Study questionnaire.

The target population designated for telephone interviewing was all persons 18 years of age or older who, at the time of the survey, were living in a dwelling unit in the town of Mackay that could be contacted by direct-dialled, land-based telephone service or a mobile telephone service. The total random sample in Mackay attempted by telephone interviewers at the Population Research Lab in the Centre for Social Science Research in the Central Queensland University was 1,484 households. The response rate from contacted households was 47% and 133 usable Choice Modelling questionnaires were received.

5.4 Results of Mackay survey

A key section of the survey was a series of questions assessing the views of Mackay residents about the impact of mining on their community. The results of this section are summarized in following figures, while the list of questions is provided in the appendix. Figure 1 shows the percentage of respondents agreed and strongly agreed with the following statements:

- that the mines will bring more families to the Mackay region (67%)
- that the mines will help Mackay as a city to develop (63%)
- that local people get more work because of the coal mines (60%)
- that mines will improve the lifestyle of people in the Mackay region (32%)
- that there will be better roads and other services in the area (23%)

Figure 1. Attitudes towards mines and living in Mackay.

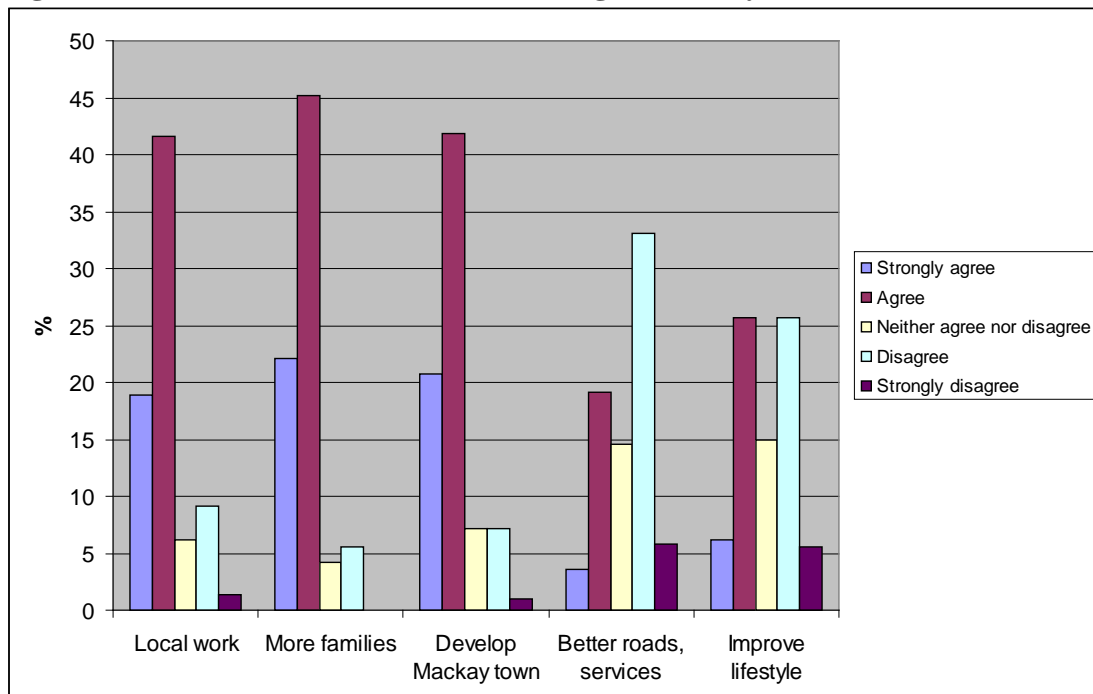


Figure 2 shows the percentage of respondents agreed and strongly agreed with the following statements:

- that the mines will help to develop Mackay as a business centre (62%)
- that coal mines support local businesses and events (50%)
- that the recent increases in house prices and rents in Mackay are a good outcome (53%)
- that mining in the district creates a good environment to invest in other businesses (54%)
- that the City Council has a good knowledge of local issues and what local communities want (19%)
- that the number of contractors working in the mines and living in Mackay has been good for the town (53%)
- that different people in the region may mean that crime and social problems are on the increase (50%).

Figure 2. Attitudes towards mines and business in Mackay

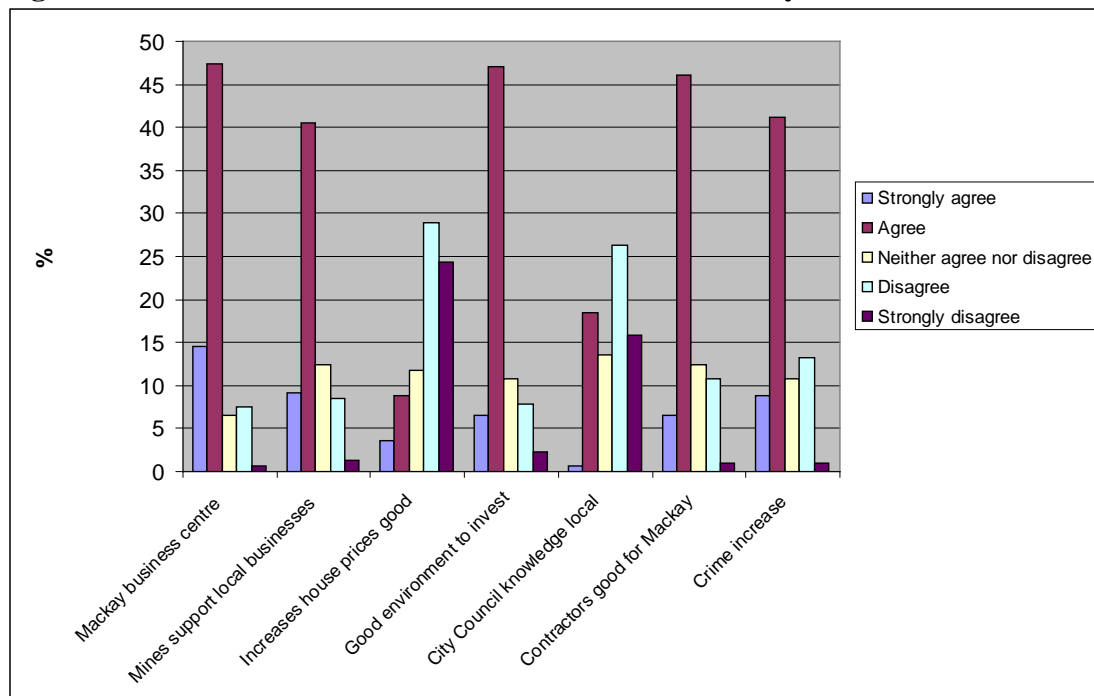


Figure 3 shows the percentage of respondents agreed and strongly agreed with the following statements:

- that new people mean that the character of Mackay is changing for the worse (16%)
- that Mackay should try to attract new mining families to move to the town (29%)
- that Mackay is attractive for new mining families to move to the town (58%)
- that the mining industry expansion is creating cost burdens on the local Council to provide extra services (53%)
- that increased traffic means that the district is not as safe as it used to be (58%)
- that driver fatigue issues mean that the district is not as safe as it used to be (62%)
- that the coal mines create environmental problems in the region (31%).

Figure 3. Attitudes towards mines and business in Mackay

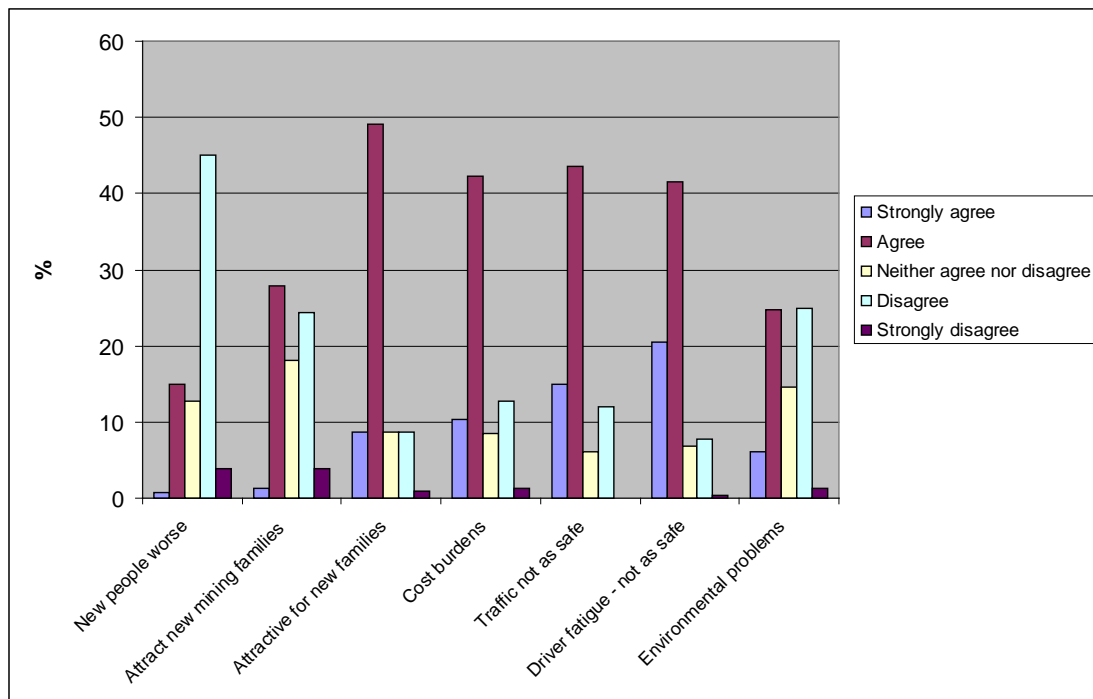


Figure 4 shows the percentage of respondents agreed and strongly agreed with the following statements:

- that Mackay would continue to survive if there was no coal mining (49%)
- that local rates may have to increase so that the Council can improve the infrastructure and services in Mackay (36%)
- that mining companies should focus only on production so that they can maximize employment and wage levels in the community (20%)
- that mining companies should contribute more to the community even if it increases their operating costs (59%)
- that State Government does a good job planning and controlling mine-related development in the region (17%)
- that Local Government does a good job planning and controlling mine-related development in the region (14%).

Figure 4. Attitudes towards mines and Mackay development.

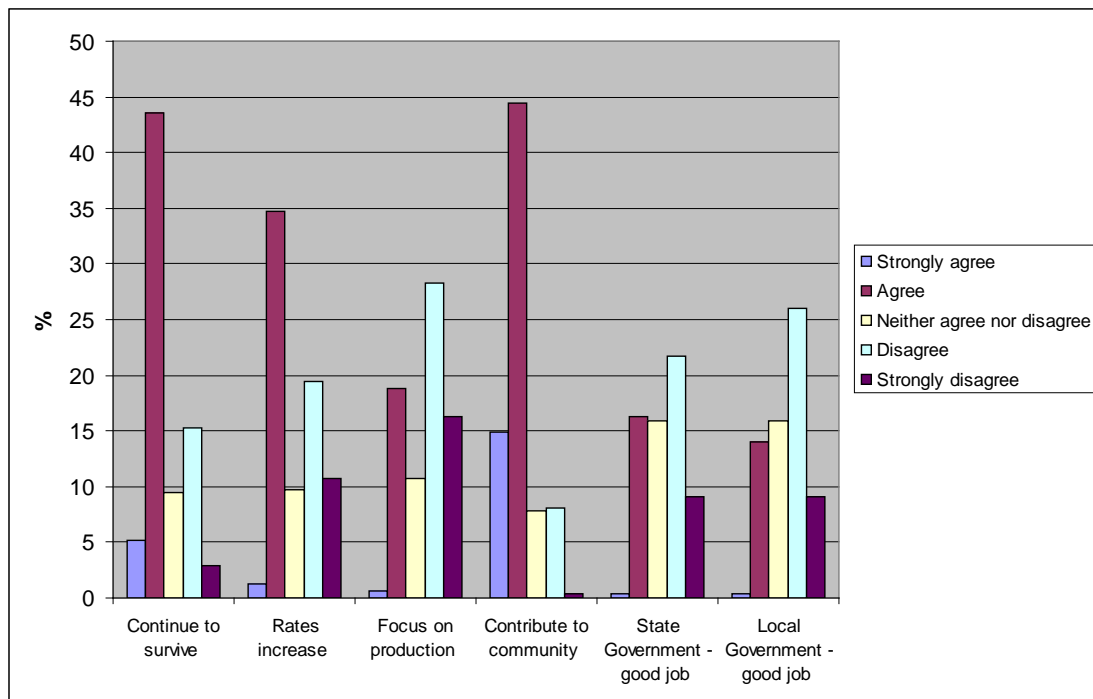


Figure 5 shows the percentage of respondents agreed and strongly agreed with the following statements:

- that cheaper housing in Mackay would be attractive for them to stay in Mackay (70%)
- that more job opportunities for children and partners would encourage them to stay in Mackay (64%)
- that more activities for teenagers would encourage them to stay in Mackay (61%)
- that more activities for younger children would encourage them to stay in Mackay (58%)
- that better entertainment options would encourage them to stay in Mackay (57%)
- that better educational facilities would encourage them to stay in Mackay (48%)
- that better shopping and services and more shops and services would encourage them to stay in Mackay (46%)
- less shift work would encourage them to stay in Mackay (34%).

Figure 5. What would attract Mackay residents to stay in Mackay.

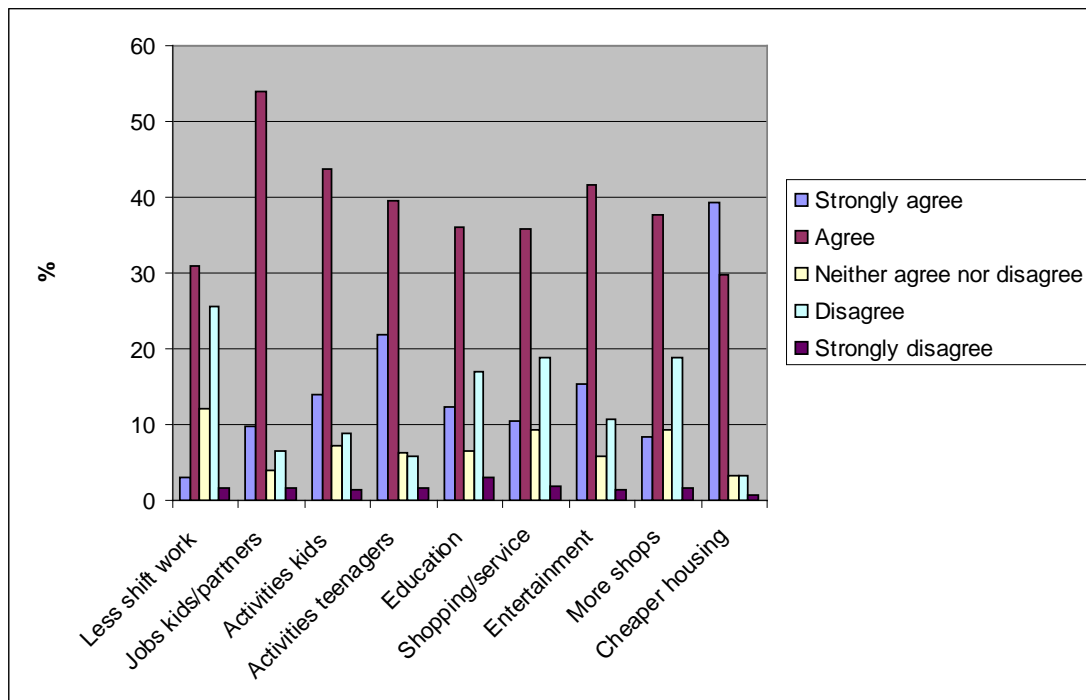


Figure 6. Attitudes towards environmental issues

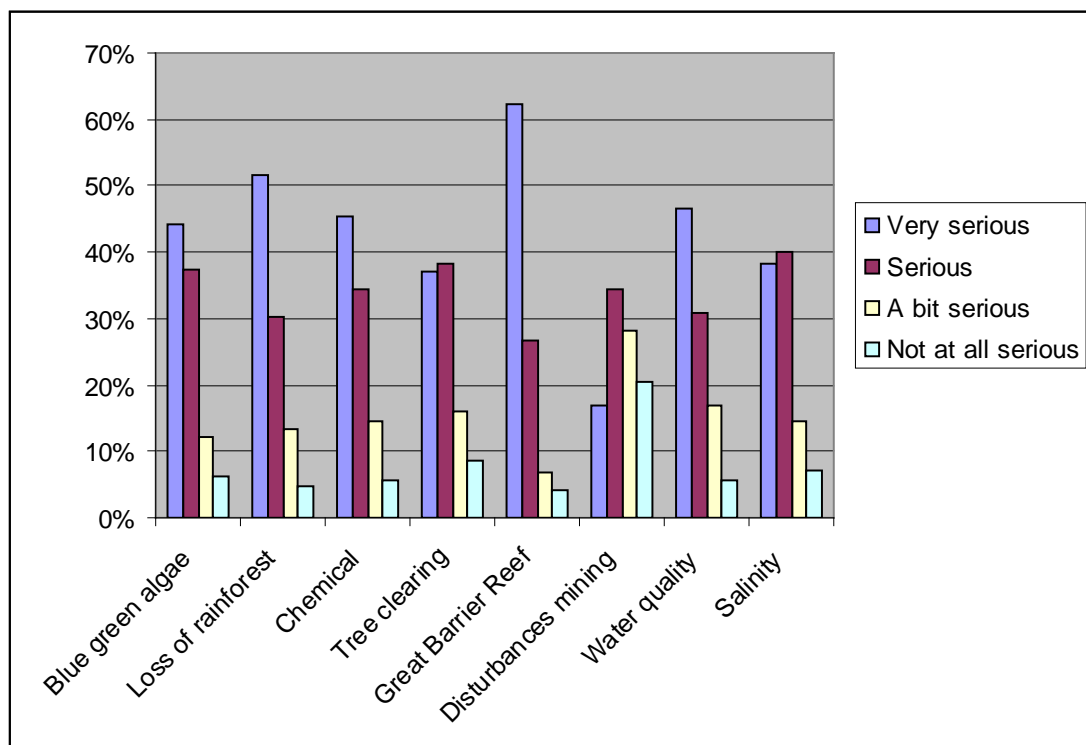


Figure 6 shows that a number of environmental issues were considered as very important, such as the protection of the Great Barrier Reef (89% support). By comparison, there were much lower levels of concern about levels of disturbance from coal mines (51% support).

5.4.1 Design of the Choice Modelling Section

Choice Modelling involves asking respondents to a survey to make a series of choices about alternative scenarios. Each choice set involves a number of profiles describing the alternatives on offer. One of the profiles describes a current or future status quo option, and remains constant between the choice sets. In this experiment, the “no choice” option fulfilled this role. The other profiles vary, so that respondents are being asked to make a series of similar, but different choices. An example of a choice set used in this experiment is given in Figure 8. Respondents could choose between four location options, which varied between choice sets, and two ‘opt out’ alternatives that were constant between choice sets.

The location options presented in the choice sets were as follows:

- medium mining town
- small mining town
- medium coastal town
- small coastal town

If only a single location option was used (e.g., a small mining town), it would have been very difficult to identify how this compared to other location choices. However, it would have also been difficult to offer a number of specific alternatives because these may not have been relevant to all respondents. To resolve these issues, four general location options were used that represented different types of location/life style choices. One of these was the small mining town, so the attractiveness of this location relative to the others could be evaluated.

The four location options were labeled into four different types of towns. These remained constant between the choice sets. The use of labels allows the most important determinants of choice to be flagged to respondents, and aids in the subsequent statistical analysis. The choice of a “standard” town out of four types of towns was framed to survey respondents with a broad description of community characteristics (Figure 7).

Each option for relocation to a town was described as a profile involving a number of attributes. In this experiment, seven attributes were used to describe each profile. To generate differences between profiles, these attributes were allowed to vary across four different levels (e.g. 1, 2, 3 and 5 year placements). These profiles then represent different options for respondents to consider.

There are a large number of potential profiles that could be drawn and presented to respondents from the attributes and levels. As it is only possible to present a selection of profiles, an experimental design process was used to select the profiles, and then partition them into blocks for presentation to survey respondents. These attributes and levels used in the profiles are shown in Table 2.

The key variables included:

- Type of town: medium mining town, small mining town, medium coastal town and small coastal town.
- Years of placement to improve career prospectives.
- Availability of jobs for partners and children.
- Quality of available health and education services.
- Prices of housing and rental compared with Mackay prices.
- Standard of public infrastructure (buildings, roads, parks areas).
- Choice of restaurants and social events.
- Change in income level.

Figure 7. The description of the “standard” town that was provided to survey respondents.

In the next few questions, we ask you about what factors are important for you in selecting where you might like to live. In each question, we are going to give you four options for moving from Mackay to a different town in a couple of years time. Each option is described in different, but similar ways.

The options given are to move to a smaller town in the mining area or in coastal region somewhere in Central Queensland region as described below.

Medium Town	Small Town
<ul style="list-style-type: none"> • 10,000 – 15,000 people • Small shopping centre (Woolworths) • Several pubs, some cafes, couple of restaurants, service stations, range of shops for local industries • A couple of hours drive to the next major centre • Housing a bit old-fashioned • Friendly people, tennis, golf, bowls, but a bit remote 	<ul style="list-style-type: none"> • 1,000 – 3,000 people • Small corner shop • One pub, couple cafes, one restaurants, service station, couple shops for local industries • A couple of hours drive to the next major centre • Housing a bit old-fashioned • Friendly people, tennis, golf, bowls, but a bit remote

In a couple of years time, you/your partner are offered a job or business opportunity at this town. What would it take to make you consider shifting to that town?

There are no right or wrong answers – we are just interested in your opinions. There are four similar choice sets on the pages that follow.

Figure 8. Example choice set used in survey

Question 4.

Option 1 – Mining Centre (medium town: 10,000 – 15,000 people)	Option 2 – Mining Town (small town 1,000 – 3,000 people)
• 1 year placement will improve career prospects	• 2 year placement will improve career prospects
• Jobs for partners/children very rare	• Jobs for partners/children easily available
• Almost no health and education services available	• Excellent health and education services available
• Housing and rentals are 25% higher than in Mackay	• Housing and rentals are 50% lower than in Mackay
• Standard of public infrastructure (buildings, roads, parks) is a bit rundown	• Standard of public infrastructure (buildings, roads, parks) is very high
• Good restaurants but few social events available each weekend	• Few restaurants but variety of social events available each weekend
50% increase in income level	100% increase in income level
Option 3 – Queensland Coast (medium town: 10,000 – 15,000 people)	Option 4 – Queensland Coast (small town: 1,000 – 3,000 people)
• 3 year placement will improve career prospects	• 5 year placement will improve career prospects
• Jobs for partners/children moderately available	• Jobs for partners/children difficult to find
• Most health and education services available	• Some health and education services available
• Housing and rentals are 25% lower than in Mackay	• Housing and rentals are the same as in Mackay
• Standard of public infrastructure (buildings, roads, parks areas) generally good	• Standard of public infrastructure (buildings, roads, parks) about average
• Good restaurants and variety of social events every weekend	Few restaurants or social events
10% increase in income level	20% increase in income level

Please indicate one preference: (Tick one)

<input type="checkbox"/> Option 1	<input type="checkbox"/> Option 2
<input type="checkbox"/> Option 3	<input type="checkbox"/> Option 4
<input type="checkbox"/> I am undecided	
<input type="checkbox"/> I would not move to any of these locations	

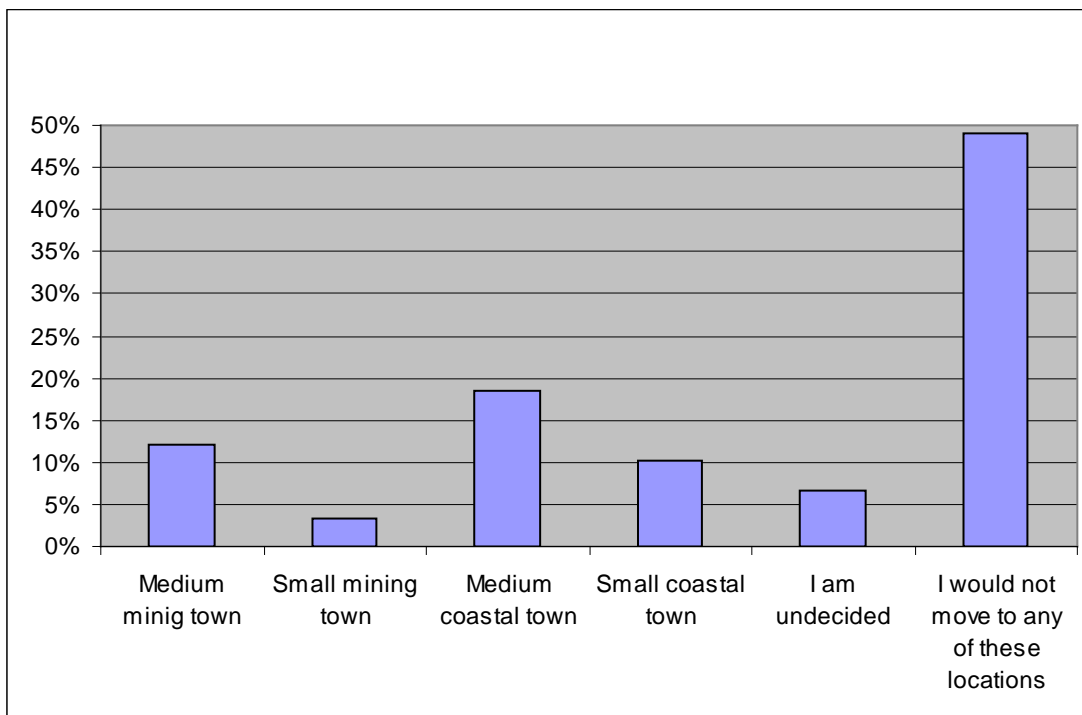
Table 2. Attributes and levels for the choice sets.

Attributes	Levels
Length of Placement	1, 2, 3, 5 years
Jobs available for partners and families	<ul style="list-style-type: none"> • Easily available, • moderately available, • difficult to find, • very rare
Health and education services available	<ul style="list-style-type: none"> • Excellent, • most, • some, • almost no
Housing and rentals	<ul style="list-style-type: none"> • 50% lower than in Mackay, • 25% lower than in Mackay, • the same as in Mackay, • 25% higher than in Mackay
Standard of public infrastructure	<ul style="list-style-type: none"> • Very high, • generally good, • about average, • Very rundown
Leisure and recreation	<ul style="list-style-type: none"> • Good choice of restaurants and variety of social events available each weekend, • Few restaurants but variety of social events available each weekend, • Good choice of restaurants but few social events available, • Few restaurants or social events available
Increase in income level	10%, 20%, 50%, 100%

5.5 Results of the Choice Modelling Experiment

In the Choice Modelling experiment, participants were given four similar tradeoffs relating to their potential relocation to another town, and asked to indicate their preferred choice in each. The number of choices made by respondents are summarised in the following figure. As expected, the dominant preference of respondents was to stay in their own community. Other key patterns that emerged were that Mackay residents were interested in moving to medium Queensland coastal communities (18.6% of respondents) rather than to small mining town (3.3% of respondents). Medium mining town and small coastal towns were chosen by 12.1% and 10.2% of respondents respectively (Figure 9).

Figure 9. Support for different types of town options



Those respondents (49.1%) who indicated that they would not accept any of the relocation alternatives were asked to indicate their key reasons. Responses about the key reasons for not taking a relocation option are summarised below. The results show that the majority of these respondents were satisfied in their current location and not interested in moving (Figure 10).

Figure 10. Key reasons for not choosing a relocation option

The choice information was analysed using a logistic regression model. The probability that a respondent would choose a particular type of town can be related to the levels of each attribute making up the profile (and the alternative profiles on offer), the socio-economic characteristics of the respondent, and other factors. The latter might include the ways in which the choices are framed to respondents through background information and structure of the survey, and the way in which the surveys are collected (Bennett and Blamey 2001, Rolfe, Bennett and Louviere 2002).

The logistic regression function can be used to generate probabilities of choice, and estimates of economic value between different choice profiles. Most interest usually lies in finding the difference in economic value between the status quo option and specific policy relevant profiles. As well as these estimates of economic values, the models can also be used to generate estimates of marginal value changes for each attribute. Known as part-worths, implicit prices, or attribute values, these provide an indication of the value to respondents of each one unit change in the provision of an attribute (Rolfe, Bennett and Louviere 2000).

The estimates of value required some monetary or cost tradeoff to be presented in the model. This was achieved by explaining to respondents that options to relocate to different towns may be associated with higher levels of income. The change in income level nominated in each choice set was multiplied by the estimated income level¹ nominated by respondents to convert the level in the choice set to an approximate monetary value. Not all respondents answered the income question, so for their choice sets the average income of respondents (\$60,000) was substituted. This maximised the number of responses to use in the analysis, but may have underestimated the variation in income levels between responses.

A summary of the logistic regression model that was derived is presented in Table 3 below. The model was significant (Chi-square value), while the Log-likelihood and Pseudo r-square statistics indicated that it had strong explanatory power. The coefficients associated with the choice for the different town types were significant and negative in the model. This confirms that the location descriptions were

¹ The final question in the survey asked respondents to nominate which category of income best described their household income.

important drivers of choices, and that the town options were viewed less favourably than Mackay. For Mackay residents, *Jobs for Family, Health and Education Services, Housing and Rental Prices, Standard of Public Infrastructure and Changed Income* were consistently important attributes. *Length of Placement, and Leisure and Recreation issues* were not significant drivers of respondents' choices of the type of town to relocate to.

Some demographic variables were included in the model to help explain those who choose to remain in Mackay rather than select another town option. The results showed that older and single respondents were more likely to choose another town option, while younger respondents, respondents with partners, and respondents with children were less likely to choose another town option, preferring to stay in Mackay.

The model also included a constant term for each town alternative. The negative values for these constant terms indicated that those choices were less preferred to the default option of staying in Mackay.

Table 3. Basic model

	Coefficient	Standard Error
Length of Placement	0.066	0.047
Jobs for Families	0.219***	0.065
Health and Education Services	0.373***	0.071
Housing and Rental Prices	-0.010***	0.003
Standard of Public Infrastructure	0.143***	0.067
Leisure and Recreation	-0.061	0.068
Changed Income (\$,000)	0.012***	0.000
Age of respondent	-0.626***	0.165
Single	-0.754**	0.356
Children in Household	0.033***	0.009
Constant – Medium Mining town	-4.620***	0.905
Constant – Small Mining town	-2.891***	0.875
Constant – Medium Coastal town	-3.779***	0.884
Constant – Small Coastal town	0.824	0.963
Number of observations	540	
Log likelihood function	-580.1	
Chi-square (D.F. = 10)	139.8	
Pseudo R-sqrd	.32817	

*** = significant at the 1% level, ** = significant at the 5% level.

The importance of the various attributes to the relocation choices can be demonstrated through the calculation of part-worths and 95% confidence intervals (Table 4). To estimate part-worths of the different attributes, ratios of each coefficient against the *Changed Income* coefficient have been calculated. The results show for example, that the value of a one-category improvement in *Jobs for Families* is \$21,469 per annum, while the value of a one-category improvement in *Health and Education Services* is \$35,681 per annum. A decrease in Housing and Rental prices had a negative value of \$936 per category to respondents, while a one-category improvement in the Standard of Public Infrastructure had an average value of \$14,971.

The values associated with the constant terms provide some indication of the income premiums needed to attract the average Mackay respondent from Mackay to another town. However, the constant terms can also include some residuals of statistical model variances, so may not be fully accurate. The results from this model indicate that while all alternatives were less preferred to Mackay, small mining towns were least preferred, while medium coastal towns were most preferred.

Table 4. Part-worths associated with Basic model

	Part-Worth	Lower CI (5%)	Upper CI (95%)	% choosing
Length of Placement	Not signif.			
Jobs for Families	\$21,469	\$8,932	\$37,880	
Health and Education Services	\$35,681	\$21,270	\$54,674	
Housing and Rental Prices	-\$936	-\$1,649	-\$382	
Standard of Public Infrastructure	\$14,971	\$3,643	\$6,092	
Leisure and Recreation	Not signif.			
Constant – Medium Mining town	-\$297,814	-\$473,325	-\$240,229	11.5
Constant – Small Mining town	-\$399,545	-\$607,410	-\$331,664	3.1
Constant – Medium Coastal town	-\$236,088	-\$402,835	-\$181,337	17.6
Constant – Small Coastal town	-\$322,673	-\$571,784	-\$263,850	9.6
Base Option – remain in Mackay	\$0			58.1

These models can be extended, as presented in the next section.

5.5.1 Differences between town sizes and town types

Separate models were developed to compare choices a) between mining and coastal towns and b) between small and medium size towns. Summary results are reported below in Table 5.

The results indicate that there is significant difference in choices between both mining and coastal towns, and between medium size and small size towns. Mining towns are less attractive to respondents than coastal ones, while medium sized towns are more attractive than smaller ones. The influence of attributes and demographics was similar in both models, with *Length of Placement* and *Leisure and Recreation* not being significant attributes on the choices made². Gender and Age were both significant, with females and older respondents being less likely to choose an alternative location option.

² *Length of Placement* was significant at the 11% level in the Medium/Small Towns model.

Table 5. Summary models for different types of towns.

	Medium towns versus small towns		Mining versus coastal towns	
	Coefficient	Stand. Error	Coefficient	Stand. Error
Length of Placement	0.076	0.047	0.066	0.046
Jobs for Families	0.196***	0.064	0.213***	0.063
Health and Education Services	0.403***	0.070	0.339***	0.067
Housing and Rental Prices	-0.010***	0.003	-0.008***	0.003
Standard of Public Infrastructure	0.158**	0.065	0.142**	0.065
Leisure and Recreation	-0.090	0.066	0.015	0.064
Changed Income	0.000***	0.000	0.000***	0.000
Gender	-0.598***	0.191	-0.600***	0.191
Age	0.587***	0.115	0.583***	0.115
Constant (medium town)	-2.735***	0.664		
Constant (small town)	-3.626***	0.671		
Constant (mining town)			-3.518***	0.670
Constant (Coastal town)			-2.915***	0.661
Number of observations	540		540	
Log likelihood function	-582.7		-592.4	
Pseudo R-sqrd	0.32611		.31486	

*** = significant at the 1% level, ** = significant at the 5% level, * = significant at the 10% level.

When the part-worths were calculated, estimates could be made of the salary premiums that would be required to attract respondents to move to the different town types:

- A salary premium of \$55,500 would be needed to attract the average respondent to a mining town as compared to a coastal town,
- A salary premium of \$89,700 would be needed to attract the average respondent to a small town as compared to a medium sized town.

5.6 Summary

The focus of the research reported in this study has been an assessment of factors that might influence people to move from regional areas into mining communities in the Bowen Basin. In the study, residents of Mackay were asked about their attitudes to mining issues and developments, and their potential relocation to other towns of different types and sizes. While this study was focused on the northern Bowen Basin region, the results are likely to be more generally applicable across the central Queensland and other regions.

The results of the study can be summarised into four broad groups. First, the residents of Mackay were generally very positive towards the impacts and consequences of mining on their communities. However, while there was strong agreement that mining was creating employment opportunities and flow-on business impacts, there were concerns about the lack of infrastructure development, cost burdens on local councils, and increased traffic risks and social problems. There was little agreement that either

the State Government or local councils were doing a good job in planning for the new developments.

Second, the environmental impacts of mining were not viewed as being as serious as other environmental issues in the region, although only 21% of respondents viewed them as not being at all serious.

Third, the key factors that Mackay residents saw as consistently important in evaluating relocation options included: *Jobs for Family, Health and Education Services, Housing and Rental Prices, Standard of Public Infrastructure and Changed Income*. The results show, for example, that the value of a one-category improvement in *Jobs for Families* is \$21,469 per annum, while the value of a one-category improvement in *Health and Education Services* is \$35,681 per annum. A decrease in Housing and Rental prices had a negative value of \$936 per category to respondents, while a one-category improvement in the Standard of Public Infrastructure had an average value of \$14,971. Some of these factors are likely to be relatively more important than salary increases in attracting people to relocation options.

Fourth, the results indicate that substantial salary premiums are required to attract the average Mackay resident to relocate in other centres. Coastal communities are preferred over mining towns, and medium sized communities are preferred over smaller ones. Results indicate that a salary premium of \$55,500 would be needed to attract the average respondent to a mining town as compared to a coastal town, and a salary premium of \$89,700 would be needed to attract the average respondent to a small town as compared to a medium sized town.

The implications for mining communities such as Moranbah and Nebo are that while it might be possible to attract some residents to the mining towns for relatively low salary premiums, it will be more difficult (and expensive) to attract larger numbers. Residents of larger centres such as Mackay may view mining developments in a generally favourable light, but are still likely to prefer to remain in larger regional centres. If government and coal mining companies decide to invest in economic and social services and infrastructure, the results presented above can help to identify what can attract people to relocate to the local communities of Bowen Basin.

5.7 References

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5.8 Appendix 1. Results of Mackay attitudinal survey.

		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know/No response	Total	System
Q10_1: Local people get more work because of the coal mines	Local work	18.8	41.6	6.2	9.1	1.3	1.6	78.6	21.4
Q10_2: The mines will bring more families to the Mackay region	More families	22.1	45.1	4.2	5.5	0.0	1.6	78.6	21.4
Q10_3: The mines will help Mackay as a city to develop	Develop Mackay town	20.8	41.9	7.1	7.1	1.0	0.6	78.6	21.4
Q10_4: The mines mean that there will be better roads and other services in the area	Better roads, services	3.6	19.2	14.6	33.1	5.8	2.3	78.6	21.4
Q10_5: The mines will improve the lifestyle of people in the Mackay region	Improve lifestyle	6.2	25.6	14.9	25.6	5.5	0.6	78.6	21.4
Q10_6: The mines will help to develop Mackay as a business centre	Mackay business centre	14.6	47.4	6.5	7.5	0.6	1.9	78.6	21.4
Q10_7: The coal mines support local businesses and events	Mines support local businesses	9.1	40.6	12.3	8.4	1.3	6.8	78.6	21.4
Q10_8: The recent increases in house prices and rents in Mackay are a good outcome	Increases house prices good	3.6	8.8	11.7	28.9	24.4	1.3	78.6	21.4
Q10_9: Mining in the district creates a good environment to invest in other businesses	Good environment to invest	6.5	47.1	10.7	7.8	2.3	4.2	78.6	21.4
Q10_10: The City Council has a good knowledge of local issues and what local communities want	City Council knowledge local	0.6	18.5	13.6	26.3	15.9	3.6	78.6	21.4
Q10_11: The number of contractors working in the mines and living in Mackay has been good for the town	Contractors good for Mackay	6.5	46.1	12.3	10.7	1.0	1.9	78.6	21.4
Q10_12: Different people in the region may mean that crime and social problems are on the increase	Crime increase	8.8	41.2	10.7	13.3	1.0	3.6	78.6	21.4
Q10_13: New people mean that the character of Mackay is changing for the worse	New people worse	0.6	14.9	12.7	45.1	3.9	1.3	78.6	21.4
Q10_14: Mackay should try to attract new mining families to move to the town	Attract new mining families	1.3	27.9	18.2	24.4	3.9	2.9	78.6	21.4
Q10_15: Mackay is attractive for new mining families to move to the town	Attractive for new families	8.8	49.0	8.8	8.8	1.0	2.3	78.6	21.4
Q10_16: The mining industry expansion is creating cost burdens	Cost burdens	10.4	42.2	8.4	12.7	1.3	3.6	78.6	21.4

on the local Council to provide extra services

Q10_17: Increased traffic means that the district is not as safe as it used to be

Traffic not as safe	14.9	43.5	6.2	12.0	0.0	1.9	78.6	21.4
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Q10_18: Driver fatigue issues mean that the district is not as safe as it used to be

Driver fatigue - not as safe	20.5	41.6	6.8	7.8	0.3	1.6	78.6	21.4
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Q10_19: The coal mines create environmental problems in the region

Environmental problems	6.2	24.7	14.6	25.0	1.3	6.8	78.6	21.4
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Q10_20: Mackay would continue to survive if there was no coal mining

Continue to survive	5.2	43.5	9.4	15.3	2.9	2.3	78.6	21.4
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Q10_21: Local rates may have to increase so that the Council can improve the infrastructure and services in Mackay

Rates increase	1.3	34.7	9.7	19.5	10.7	2.6	78.6	21.4
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Q10_22: Mining companies should focus only on production so that they can maximize employment and wage levels in the community

Focus on production	0.6	18.8	10.7	28.2	16.2	3.9	78.6	21.4
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Q10_23: Mining companies should contribute more to the community even if it increases their operating costs

Contribute to community	14.9	44.5	7.8	8.1	0.3	2.9	78.6	21.4
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Q10_24: State Government does a good job planning and controlling mine-related development in the region

State Government - good job	0.3	16.2	15.9	21.8	9.1	14.9	78.2	21.8
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Q10_25: Local Government does a good job planning and controlling mine-related development in the region

Local Government - good job	0.3	14.0	15.9	26.0	9.1	13.0	78.2	21.8
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Table 6. What would attract Mackay residents to stay in Mackay

		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know/No response	Total	System	
Q12_1: Less shift work	Less shift work	2.922078	30.84416	12.01299	25.64935	1.623377	5.194805	78.24675	21.75325	100
*Q12_2: More job opportunities for children and partners	Jobs kids/partners	9.74026	53.8961	3.896104	6.493506	1.623377	2.597403	78.24675	21.75325	100
Q12_3: More activities for younger children	Activities kids	13.96104	43.83117	7.142857	8.766234	1.298701	3.246753	78.24675	21.75325	100
Q12_4: More activities for teenagers	Activities teenagers	21.75325	39.61039	6.168831	5.844156	1.623377	3.246753	78.24675	21.75325	100
Q12_5: Better educational facilities	Education	12.33766	36.03896	6.493506	16.88312	2.922078	3.571429	78.24675	21.75325	100
Q12_6: Better shopping and service facilities	Shopping/service	10.38961	35.71429	9.415584	18.83117	1.948052	1.948052	78.24675	21.75325	100
Q12_6: Better shopping and service facilities		0	0	0	0	0	0	0	0	0
Q12_8: Better entertainment	Entertainment	15.25974	41.55844	5.844156	10.71429	1.298701	3.571429	78.24675	21.75325	100
Q12_9: More shops and services	More shops	8.441558	37.66234	9.415584	18.83117	1.623377	2.272727	78.24675	21.75325	100
Q12_10: Cheaper housing	Cheaper housing	39.28571	29.87013	3.246753	3.246753	0.649351	1.948052	78.24675	21.75325	100

Table 7. Attitudes towards environmental issues

		Very serious	Serious	A bit serious	Not at all serious
Q15_1: Blue green algae on Lake Elphinstone	Blue green algae	44.3%	37.4%	12.1%	6.3%
Q15_2: Loss of rainforest and coastal vegetation in the Mackay hinterland	Loss of rainforest	51.6%	30.2%	13.3%	4.9%
Q15_3: Chemical and fertiliser run-off from cane farms	Chemical	45.4%	34.5%	14.4%	5.7%
Q15_4: Tree clearing in the region further west from Mackay	Tree clearing	37.1%	38.4%	16.1%	8.5%
Q15_5: Damage to the Great Barrier Reef	Great Barrier Reef	62.3%	26.7%	6.8%	4.2%

Q15_6: Disturbances from coal mining in the region	Disturbances mining	16.8%	34.5%	28.2%	20.5%
Q15_7: Water quality issues in streams and estuaries	Water quality	46.5%	30.9%	17.0%	5.7%
Q15_8: Problems of salinity on farming and grazing lands	Salinity	38.2%	40.1%	14.5%	7.2%