



REGIONS in TRANSITION

Survey Report: Intersections of Mining and Agriculture, Boddington Radius: land use, workforce & expenditure patterns

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ABSTRACT

There is considerable evidence that the recent strength of Australia's export oriented mining sector has contributed to economic growth both nationally and in the main mining states and regions although at uneven rates of growth. However investigation and analysis of the internal distribution of costs and benefits from mining within host regions transitioning from agricultural economies has been limited. This document reports results from a survey conducted by the lead author in the Peel Region during March-June 2012 as a part of the Regions in Transition (RiT) project under the umbrella of the CSIRO Minerals Down Under Flagship. The survey examines changing patterns of workforce participation, changing patterns of rural land use, income and expenditure flows and cross-sectoral influences between mining and agriculture. The targeted survey sample comprises adults over 18 years of age either living or working within a radius of approximately 50 km from Boddington town in the most sparsely populated shire of the region, where two separate mineral extraction and processing operations have been undergoing significant expansion. The data reveals that during the RiT project period (2009-2012) these developments triggered a considerable change in the existing socio-economic fabric sustaining proximate towns, communities and individuals. The particularities of the case mean that this report is most relevant to those with a close interest in the future wellbeing of the Boddington 50 km Radius during and beyond the life of current mining operations. The survey also makes a contribution to the wider literature concerning the socio-economic implications of mining. It investigates and confirms the possibility raised by Hajkowicz et al (2011) that the quantifiable benefits of mineral wealth they identify across 71 LGAs may "mask highly localised inequalities and disadvantage". By providing a nuanced account of the uneven impacts of mining experienced in one region, the survey serves to illuminate the temporally specific economic trends in mining LGAs that Measham and Reeson (2011) identify from ABS statistical data. The findings presented here are undergoing further analysis as a component of an interdisciplinary study at Curtin Graduate School of Business utilizing economic multiplier analysis and qualitative social data to track and map economic impacts of mine operations income expenditure at regional and state level.

REGIONS IN TRANSITION (RiT)

The RiT project is one of three streams of research in the Minerals Futures Collaboration Cluster 2009-2012, a broader program of research, which in turn is a part of CSIRO's Minerals Down Under Flagship. The Minerals Futures Collaboration Cluster brings together five University-based research institutions, each with a strong track record of working in the minerals sector and the CSIRO to address future sustainability challenges facing the Australian minerals industry. The RiT project is led by the Curtin Graduate School of Business.

The broad aim of the Minerals Down Under National Research Flagship is to find solutions to the technical challenges facing Australia's future minerals industry as mining operations occur in more environmentally and socially sensitive areas.

The RiT project has adopted a case study approach to explore issues of transition, and social and economic impact in regions where intensive mining activity now sits alongside established agricultural industries. The project has an emphasis on the implications of land use change. The three case studies in the RiT are: the Surat Basin in Queensland, and the Mid-West and the Boddington 50 km Radius (Peel Region) in Western Australia. RiT research engages with all stakeholders in a collaborative capacity building manner.

1. SURVEY SUMMARY

1.1. BACKGROUND

Despite considerable evidence that the recent strength of Australia's export oriented mining sector has contributed to economic growth nationally and particularly in the main mining states and regions, the distribution of associated costs and benefits is more contentious and difficult to measure (Richardson 2009). Rapid economic growth can intersect with existing social and ecological relationships in unanticipated and sometimes unwelcome ways that do not necessarily equate with local notions of progress. One recent comparative study of a range of quantitative 'quality of life' indicators for 71 local government areas (LGAs) across Australia with mining activity, confirmed that mining regions have higher average salaries than non-mining regions. It also found "no systematic negative associations between local mining activity and quality of life" at that level (Hajkowicz et al. 2011). Statistical analysis by Measham and Reeson (2011) of 781 statistical local area (SLAs) in regional Australia suggests a temporality in the way mining impacts local income distribution. Mixed economy settlements tend to have lower income and less equitable income distribution than settlements where mining is the main employer. The implication is that local wage inequality increases when a mine project brings a small number of high salaried employees into an area, but decreases if, and when, highly paid mine employees become the dominant group. Several bitter ironies can be found within this process, for example, when rising local income is achieved through population replacement or displacement, rather than through absorption of existing populations into the high-income workforce (Haslam McKenzie 2011; Langton 2010). Measham and Reeson (2011) also note a gender bias in income distribution. Others have demonstrated that high salary structures cause difficulties in other sectors from loss of staff and higher operational costs. Hajkowicz et al (2011) concede that the quantifiable benefits of mineral wealth they identify at the LGA scale may "mask highly localised inequalities and disadvantage" that require further scrutiny. The further irony in the newfound wealth of mining regions is the increased vulnerability to external shock that accompanies dependency on a narrowing economic base intimately linked to global influences.

These findings suggest that careful locally informed and negotiated policy and planning processes are vital to securing both short and long term benefits, and in mitigating inevitable associated stresses, for those whose livelihoods and places of living intersect with major resource projects. Solomon et al (2008) identify a need for approaches that address the values and concerns of a broad range of parties with a stake in the decisions and practices shaping large scale mining operations. This becomes most evident where matters of "social justice, ecological sustainability, economic equity and cultural diversity" that defy economic or technical solutions are at issue. Tonts and Plummer (2012) note however, that despite considerable popular discussion around the social, economic and environmental consequences of the recent mining boom, the "complex links between natural resources and regional economies, communities and environments" have received relatively limited attention from social scientists in Australia. This is especially so in more settled parts of regional Australia where new technologies and strong commodity prices have encouraged recent development of major export oriented mining projects.

This document reports results from a survey conducted by the lead author between 20 March and 30 June 2012 in the inland, most eastern portion of the Peel Region of Western Australia and an adjacent area of the Wheat belt Region, in an area described for the purposes of the RIT project as the Boddington 50 km Radius Case Study.

1.2. THE CASE STUDY SITE

The selection of the Boddington 50 km Radius as the third case study site in the RiT project was influenced by a significant increase in mining activity within the Shire of Boddington from the mid-2000s. In 2006 Newmont entered the construction phase of the recommissioned Boddington Gold Mine (BGM), now referred to as Newmont Boddington Gold (NBG). Gold and copper production commenced in late 2009. The much expanded project spans the site of the original BGM and the adjacent Hedges mine which were operated separately by Worsley Alumina Pty Ltd and Alcoa of Australia Ltd from the late 1980s until 1998 when Boddington Gold Joint Venturers acquired the Hedges tenement and Worsley Alumina Pty Ltd became sole operator (Environmental Protection Authority 2001). When the BGM was placed in care and maintenance in 2001 it had a workforce of 70, a fraction of the workforce for the current NBG as described at Section 2.1.

In 2011 the mine produced 714,000 oz of gold. At the end of 2011 the projected life of mine was 28 years with identified reserves of 19.5 million ounces of gold and 2.3 billion pounds of copper (Newmont Boddington Gold 2012). BHP Billiton Worsley Alumina Pty Ltd also entered an efficiency and growth phase in 2008 which included the development of a bauxite mine with a projected operational workforce of around 500, at Marradong close to the boundary of Boddington town site and some 11 km the north of its existing mine at Saddleback which has operated since the early 1980s. As indicated at Section 2, although the company has employees who are resident within the radius, it also recruited heavily from outside the radius for the construction phase, running buses from locations such as Mandurah and also utilizing the NBG mining camp (PDC 2010).

A particular point of interest for the RiT project team was the NBG's policy to actively promote a local workforce, with a target for 65% to be living within the 50 km radius of Boddington. The 50 km boundary was determined by the requirement that employees on a 12-hour shift be able to travel door-to-door from their place of residence within established occupational health and safety fatigue limits. The Boddington 50 km Radius includes the Shire of Boddington in the Peel Region, the Shires of Williams and Wandering in the Wheat belt Region, and the township and district of Dwellingup in the Shire of Murray, also in the Peel Region.

As is the case in many parts of regional Australia where agriculture has formed the mainstay of the economy since European settlement, in recent decades communities within the radius have experienced the effects of economic rationalist policies, increased exposure to global market conditions, declining or variable profitability and harsh environmental conditions contributing to farm amalgamations and out migration, especially of youth (Tonts and Haslam McKenzie 2005). Decline of the forestry sector has had a further depressing effect, offset in favoured localities by farm subdivisions and 'tree change' in-migration (Department of Local Government and Regional Development and Peel Development Commission 2006; Sustainable Development Facilitation 2006).

The rise of mining activity and NBG's preferential 'buy local live local' initiatives were, unsurprisingly, seen by regional and local government authorities as the key to revitalising local towns and communities. The Shire of Boddington, in particular, has gained new infrastructure and improved amenities funded through a combination of grants and corporate contributions, and ongoing annual Local Government rates of around \$2 million collected from the NBG (Newmont Boddington Gold 2012). The shire has also experienced considerable population growth, with an increase of 800 between 2006 and 2011 according to ABS census data, although population growth elsewhere within the radius has been incremental. It is notable however, that the level of population growth in Boddington, which is in line with

projections made in 2005, is more a factor of upward revisions in NBG's workforce requirements, rather than the establishment of a predominantly local workforce at the goldmine. In fact, the component living within the 50 km Radius has, as described in detail at Section 2.1, been conspicuously lower than the targeted 65%, hovering at around 20-25% of the total workforce.

Housing and land supply bottlenecks and the inability of government processes to keep up with the scale and pace of mining developments hindered relocation to the area in the early stages (Haslam McKenzie et al. 2009). However, qualitative data from several locality specific sets of in-depth interviews conducted as a component of the Boddington 50 km Radius Case Study prior to this survey, points to individual lifestyle choice as a contributing factor (Hoath 2013a, b). Geographical location is also implicated, with the proximity of the sparsely populated radius to both the Perth metropolitan area (123 km from Boddington) and the rapidly urbanising coastal strip around Mandurah in the western part of the Peel Region (93 km from Boddington), facilitating drive-in drive-out (DIDO) workforce options.

Interview data also reveals:

- That expanded mining activity is one of several key agents stimulating rapid but geographically uneven demographic and structural change within the Peel Region;
- considerable differences, measured in terms of aspirations, quality and sense of place, level of internal cohesiveness and outward orientations, are evident between individual settlements and townships within the Boddington 50 km Radius;
- individual experience of, and engagement in, social, economic and environmental change associated with mining is quite diverse, even within small localities. It is variously conditioned by worldviews and lifestyle values, proximity to mining operations, and the degree to which mining is perceived to be impacting or enhancing livelihood capacity and quality of life more generally;
- high expectation across the radius that increased local employment opportunities would be the greatest single benefit to ensue from mining;
- counter concerns that expanded opportunities in mining negatively impact on individual educational aspirations, skill development and long term economic security;
- scepticism concerning the robustness of government and corporate projections concerning the potential local economic value of mining operations;
- disappointment at lower than anticipated levels of mine related employment, income expenditure and mine related business opportunities within the radius;
- evidence that employment opportunities in mining can however contribute to the retention or acquisition of rural properties, enterprises and lifestyles, that would otherwise be economically unviable;
- high levels of frustration among a particular cohort concerning broader politico-economic conditions that have contributed to the contraction of traditional economic bases (especially agriculture, horticulture and orchards) within the radius;
- considerable but geographically uneven concern that current scales of mining compromise the emergence and survival of small to medium enterprises in areas such as nature tourism;
- frustration and concern regarding the safety, environmental and social implications of increased traffic and workforce mobility associated with a large DIDO workforce;

- uneven capacities to negotiate with differently scaled state and corporate interests for local benefit and values;
- diverse views and aspirations within localities and communities regarding appropriate levels of industry, land use change, population growth and economic development;
- evidence that mining companies inevitably operate with a partial or qualified local ‘social licence’, and;
- evidence that the scale and urgency of construction and start-up or ramp-up phases can overwhelm local capacity to strategically plan for positive enduring legacies from large scale corporate mining operations (Hoath 2013a, b).

Figure 1. Boddington 50 km Radius, Peel Region, Western Australia

Adapted from Department of Regional Development and Lands (2011).



2. SURVEY METHODOLOGY

The survey reported here forms a crucial component of the iterative mixed-method approach adopted by the Boddington 50 km Radius Case Study. The data contributes to the study's broad intent to achieve a nuanced holistic account of social and economic change attending the local expansion and intensification of corporate mining operations within the study site. Recent reviews of social impact assessment practice (Lockie 2001; Lockie et al. 2008) underline the importance of identifying and elaborating change that is meaningful to a particular situation rather than simply easy to measure. Robustness is achieved from the collation and validation of differently embedded and negotiated knowledge and data. Survey questions were designed to extend, complement and explore the wider salience of knowledge and understandings emerging from preceding sets of qualitative interviews as outlined at Section 1.2 above. The thematic foci of the survey include: changing patterns of workforce participation; changing patterns of rural land use; income and expenditure flows; cross-sectoral influences between mining and agriculture; and subjective feelings of wellbeing as described below at 2.1 and 2.2.

Target population:

The survey targeted adults (18 years plus) who lived and/or worked within the Boddington 50 km Radius. The size of the target population was approximated from existing ABS data allowing for current levels of flux and potential variation due to overlap between the two main components: adults over 18 whose usual place of residence is in the 50 km Radius, who may also be a part of the workforce employed within the radius, and adults who reside outside but are employed within the radius. The latter group is comprised primarily of employees and contractors at two major mineral extraction and processing projects located in close proximity to the town of Boddington, which is the administrative centre of the Shire of Boddington.

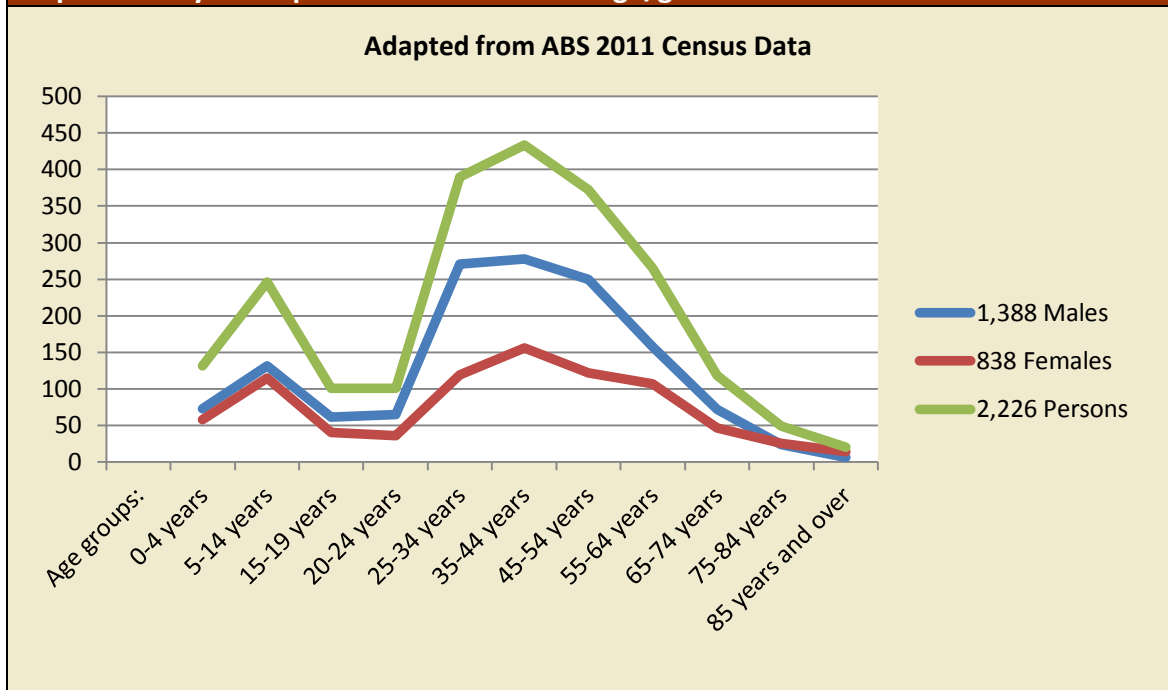
Based on Australian Bureau of Statistics (ABS) census data, the total population of usual residents within the radius at August 2011 was just over 4,000, comprising: Shire of Boddington 2,226, Shire of Wandering 442, Shire of Williams 914 (ABS 2012g, i, j) and Dwellingup. The population of Dwellingup, and the surrounding rural areas roughly within about 10 km of the town site that identify as a part of the Dwellingup district, are more difficult to ascertain. As of June 2006 Dwellingup ABS locality (2.1 square kilometres) had a population of 345 (ABS 2007), but equivalent locality data is not available from the 2011 census. In the 2006 census data for the surrounding area is aggregated into the ABS State Suburb (SSC), Meelon, an area of 556.8 square kilometres, which had a total population of 512. In the 2011 census, all of the target area described above is aggregated into the Dwellingup ABS State Suburb (SSC) (848.8 sq kms), which yielded a population count of 700 (ABS 2012h). It is reasonable therefore to assume that at August 2011 the combined resident population of Dwellingup town and district, was well under 700.

The minimum age of 18 years for survey respondents, which was determined by ethical considerations, does not coincide with usual ABS age categories. However ABS data indicates that in August 2011 approximately 80% of the total population residing in the 50 km Radius was over the age of 15 years. In other words the target population, 18 years plus and usually resident in the Boddington 50 km Radius, would be somewhat less than 3,200.

According to ABS data, indigenous people comprised 3% of the total population of the Shire of Boddington in 2011, 0.6% of the population of the Shire of Wandering, 1.7% of the population of Shire of Williams and 3% of Dwellingup (SSC) (ABS 2012g, h, i, j).

In August 2011, males comprised a significantly larger proportion of the total population of usual residents of the Boddington 50 km Radius than did females. The gender imbalance was greatest in the Shires of Boddington where males comprised 62% of the usual resident population (up from 52% in 2006) and Wandering (58%)(ABS 2012a). In both the Shire of Williams and the Dwellingup (SSC) males comprised 52% of the total population of usual residents (ABS 2012). As the graph below illustrates, the current gender imbalance in the Shire of Boddington is most pronounced in the working age groups between 25 and 54 years, correlating with a gender bias in the mine workforce described further below (ABS 2012a). The Shire of Boddington also had a lower median population age of 38 years measured at August 2011 than the remainder of the radius, comparing with a median age of 43 years in the Shire of Williams, 44 years in the Shire of Wandering, and 42 years in Dwellingup (SSC)(ABS 2012g, h, i, j). The median ages in all of the above were nonetheless higher than the median ages for Western Australia (36 years) and for Australia (37 years) at August 2011 (ABS 2012f).

**Figure 2. Shire of Boddington
Population by usual place of residence and age/gender distribution**

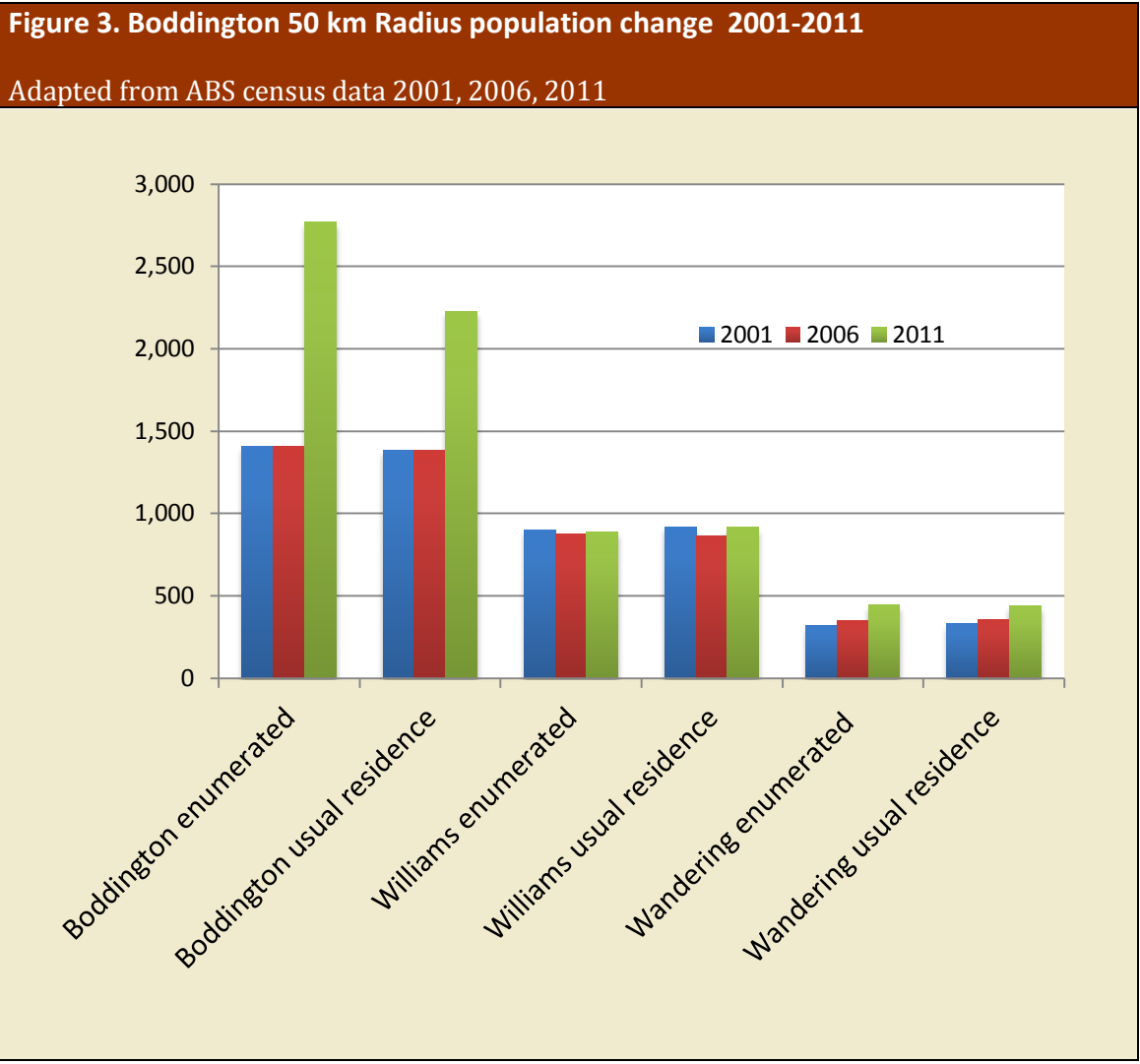


Prior to the release of 2011 census workforce data, estimates of the workforce residing or working in the Boddington 50 km Radius are drawn from several sources. The estimated workforce over the age of 15 for the three shires in 2008 was 1,237: Boddington, 665, Wandering 140, and Williams 432 (ABS 2011a). According to the March 2012 Peel Profile the estimated labour force over the age of 15 years located in the Shire of Boddington was 915 (PDC 2012).

Desensitized data provided to RiT researchers by one company, revealed that of approximately 950 company employees at the mine site in late 2011, just over 20% were residents of the radius. (See Appendix B for the mapped distribution of place of usual residence by postcode for the above workforce). Eighty three per cent of the 950 were male, and 17% were female. Personal communication with relevant staff indicated that, at that time, the operational workforce of the mine also included a similar number of contractors. A further 700 contractors were employed during regular shutdowns. The company also has an active

Aboriginal and Torres Strait Islander trainee programme.

Non-local mine employees of the two companies and mining contractors operating within the radius either DIDO, or bus-in bus-out (BIBO) to the area on a daily basis or live during their regular rostered work blocks in a 2,300 unit mining camp which NBG has maintained since 2006 at a site 11 kilometres from Boddington town site close to the goldmine (BHP Billiton 2008). Comparison below of two sets of data compiled from ABS census, one indicating the population enumerated within the radius on census nights in 2001, 2006 and 2011 (ABS 2012b, c, d, e), and the other indicating population by usual place of residence (ABS 2012g, h, i, j), is indicative of the increasingly uneven distribution of population within the Boddington 50 km Radius, the considerable population growth (847 persons) that occurred in the Shire of Boddington between 2006 and 2011, and the large non-resident rostered mining workforce present in Boddington in 2011. Anecdotal evidence suggests that local population figures may be somewhat exaggerated where mine workers who regularly DIDO to destinations outside the radius also maintain a nominal local address (Hoath 2013b).



Survey sample:

The survey attracted 126 respondents of whom 124 were eligible to participate. A total of 120 (95%) completed the survey. The sample of 124 was comprised primarily of people employed

in the mining workforce within the Boddington 50 km Radius (88%). The high ratio of male to female respondents is consistent with the male bias within the sector. Almost 70% of respondents were male.

Fifty three per cent of respondents had their usual place of residence within the Boddington 50 km Radius. The remainder indicated that they were employed within the radius but considered their usual place of residence to be elsewhere. The distribution of this cohort across postcodes in the Peel Region, the Perth metropolitan area and elsewhere in Western Australia was sufficiently representative of the workforce distribution indicated by mining company data described above. (See the mapped distribution of the survey sample and further discussion at Section 3, question 10 below).

Participation rates for several cohorts of the target population were less than hoped for: the first was farmers with larger landholdings within the radius; the second was Australian Aboriginal or Torres Strait Islanders either residing or working within the radius. The former cohort is represented in locality specific sets of semi-formal interviews conducted by the lead author as a part of the case study, the latter is less so, suggesting the need for an alternative methodology to achieve more adequate representation.

2.1. QUESTIONNAIRE STRUCTURE

Questions were grouped in seven sections; the first established the demographic profile of the survey sample, the second established the location of the usual place of residence and household composition for all respondents, and the third explored mining workforce participation and opportunities. Section 4 examined levels of rural land ownership and links between participation in mining and rural land use. The final three sections examined income and earning capacity, issues relating to household goods and services expenditure, and indicators of financial security and personal and national wellbeing. Some sets of questions were arranged in sequences that incorporated skip instructions so that the number of respondents reduced in the subsequent question. Variations in the number of possible respondents to each question are indicated throughout the report.

Where practicable, survey questions replicated current Australian Bureau of Statistics (ABS) classifications and variables. Given the relatively small size and focused nature of the sample, questions concerning levels of financial wellbeing sought to establish general trends rather than absolute dollar values to avoid possible identification of individuals.

The final two questions, 54 and 55, were designed to establish baseline knowledge concerning the subjective wellbeing of the target population. The questions were based on the Australia Unity Wellbeing Index, a collaboration between Australian Unity and Deakin University (Australian Unity 2012a) which has been applied annually since 2001 to measure the satisfaction of the average Australian with quality of life and of life in Australia (Cummins et al. 2010; 2003). The index, which is based on the theoretical model of subjective wellbeing homeostasis, is comprised of two sub-scales: the Personal Wellbeing Index and the National Wellbeing Index. In line with a strengthening global trend, it was devised as an alternative to economic indicators such as Gross Domestic Product (GDP) and objective social indicators (Cummins et al. 2003). Briefly, wellbeing constitutes a “stable state of being well and feeling satisfied and contented” as distinct from the ephemeral state of happiness (Australian Unity 2012a).

Questions 54 and 55 followed the Australian Unity Personal Wellbeing Index and the National Wellbeing Index asking respondents to score their level of satisfaction (where 0 is completely

dissatisfied and 10 is completely satisfied) for each of a given set of domains or aspects of life. The use of a tick box matrix to collect the data at questions 54 and 55 deviated from the Australian Unity methodology which obtains data for comparable annual indices via telephone interviews with a new sample of 2000 Australians selected to represent the geographical distribution of the national population (Australian Unity 2012b).

2.2. PROCEDURE

The survey was administered through the SurveyMonkey online survey software and questionnaire tool. It was made available online from 20 March until 30 June 2012. Prior to the commencement date, target groups were informed of the survey by several methods. Postcards providing a brief synopsis of the survey intent, the target group, the survey URL link and the lead author's contact details, were provided to the two mining companies operating within the Shire of Boddington for distribution to employees. Where permission was granted, the postcards were also placed in high traffic areas including community centres, shire offices in Boddington and Wandering, and shop counters, within the 50 km radius of Boddington. The lead author also outlined the purpose and scope of the survey during a radio interview on ABC WA Regional Drive on 22 March 2012, and provided a press release to local newspapers. Postcards and hard copies of the survey were also placed with a secure collection box in the Shire of Boddington administrative office in the centre of town. One school also undertook to send postcards home with students.

The majority of respondents (114) completed the survey online. Data from the seven completed hard copies of the questionnaire was transposed to the SurveyMonkey database by the authors before any analysis was undertaken. The data was then collated and analysed using contingency tables to identify trends between variables for every question in the survey. The method was first applied to the full set of respondents for each question to establish the main trends as reported below in Section 3. Some additional analysis of several meaningful sub-groups of the sample population is also reported below.

As a part of the survey analysis, data from question 54 measuring respondent satisfaction scores against the eight domains or aspects of life derived from the Australian Unity Personal Wellbeing Index was used to produce a baseline Boddington Radius Workforce and Resident (BRWR) Personal Satisfaction Index (Australian Unity 2012a).¹ Data from question 55 was similarly used to produce a Boddington Radius Workforce and Resident (BRWR) National Satisfaction Index (See Section 3). Consistent with Australian Unity methodology, each index represents the mean satisfaction score derived from individual satisfaction scores for the given set of domains expressed as a percentage of the possible maximum.

Although differences in sample size and methods of data collection applied mean that only tentative comparisons can be made between BRWR Satisfaction Indices and contemporaneous Australian Unity Wellbeing Indices, interesting indicative trends are identified and discussed further in Section 3.²

Results of any further analysis of survey data will be published in due course in relevant papers.

¹ The term *Satisfaction Index* has been chosen to avoid any suggestion of absolute equivalence with Australian Unity Wellbeing indices.

² The results of the Australian Unity Index Survey 25 April 2011 are provided at Appendix C

3. QUESTIONNAIRE RESULTS

3.1. DEMOGRAPHIC PROFILE

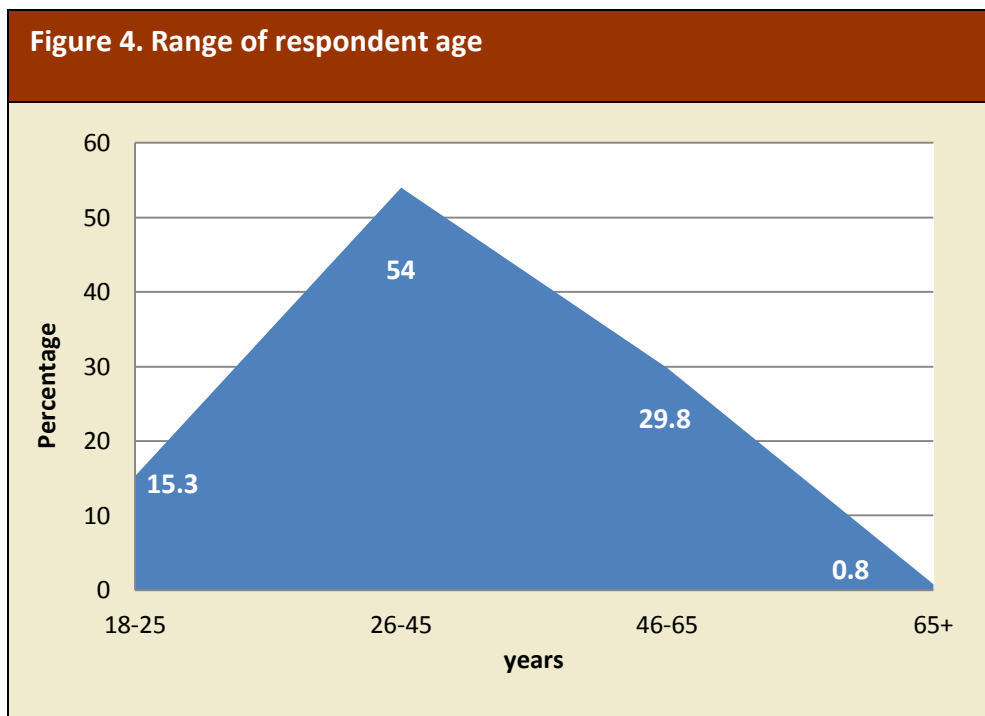
This set of questions sought to establish the demographic profile of the survey sample.

1. Are you currently 18 years of age or more AND currently work OR reside in EITHER Boddington Shire, Dwellingup, Wandering, or Williams?

Of the 126 people who commenced the survey, 124 were over 18 years of age and either currently residing or working within a 50 km radius of Boddington.

2. What is your age?

The survey sample (124) was predominately of working age, with only one respondent above the age of 65. The largest cohort of 67 respondents was aged between 26-45 years. This is consistent with the age profile of the Shire of Boddington at the August 2011 census (see Section2).



3. Your sex?

Eighty-six respondents were male and 38 female reflecting the significant gender imbalance that currently characterises the Boddington residential population and DIDO workforce.

4. Are you an Australian citizen?

Almost 90% of the 124 respondents were Australian citizens, again consistent with the composition of the 50 km Radius population as measured at the 2011 census (ABS data).

5. Do you identify as being Australian Aboriginal or Torres Strait Islander?

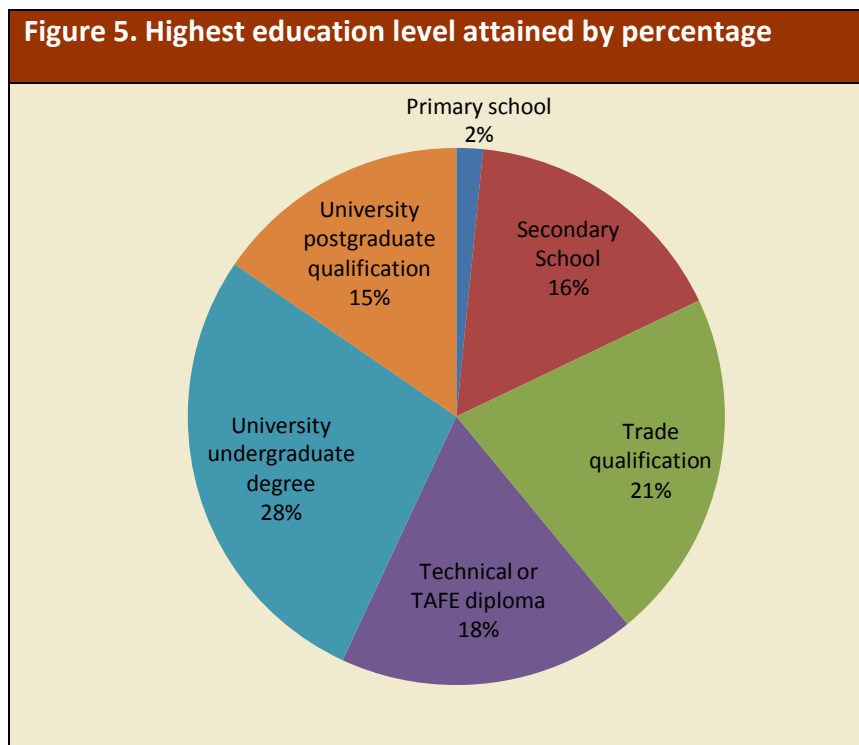
No respondents identified as being Aboriginal or Torres Strait Islander.

6. Do you hold an Australian work visa?

Of the 14 respondents who were not Australian citizens, 12 (86%) indicated that they held an Australian work visa.

7. Please mark the box showing the highest level of education you have completed.

All 123 respondents completing the question had completed some level of formal education. A high percentage of the survey sample had attained a level of tertiary qualification, with 28% holding a Bachelor degree and a further 15% holding a university postgraduate qualification. This compares very favourably with the 24% of people aged 15-64 years nationally reporting on May 2011, a Bachelor Degree or higher as the highest level of education attained (ABS 2011b). It is consistent with the high level of respondents defining their occupation as professional at question 17 below.



7a. Educational attainment by gender.

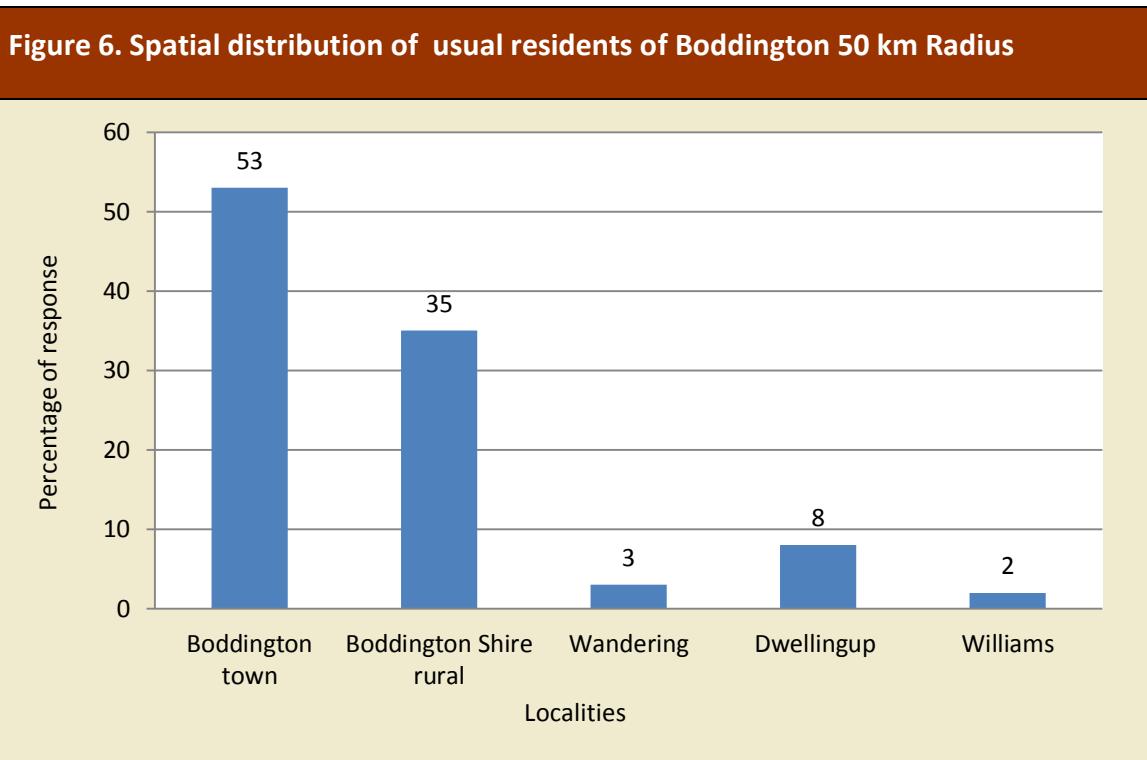
Cross tabulation with question 3 reveals that a larger percentage of the female cohort (38.5%) had attained a university undergraduate degree than male cohort (22.4%). Levels of attainment were more even at the postgraduate level (male 16.5%, female 15.4%) and for technical or TAFE qualifications (female 17.9%, male 17.6%), but trade qualifications were significantly higher for males at 27%, compared to 8% for women.

3.2. LOCATION OF USUAL RESIDENCE AND HOUSEHOLD COMPOSITION

This section establishes the spatial distribution of usual places of residence for the survey sample. Questions 11-13 explore the recent level of interest amongst respondents working in, but residing beyond the Boddington 50km Radius, to relocate to the area, and the significance of a range of possible determinants. The final questions establish ownership status, and household size and composition for all respondents.

8. Do you usually reside in one of the following places, which are approximately within 50 km of Boddington?

A total of 66 from a sample of 123 respondents indicated that their usual place of residence was within the 50 km radius of Boddington, of whom 35 were located in Boddington town and 22 in the remainder of the shire. Smaller numbers lived in Dwellingup, the Shire of Wandering and Williams. Williams, having the larger population of the latter three, was less well represented.³

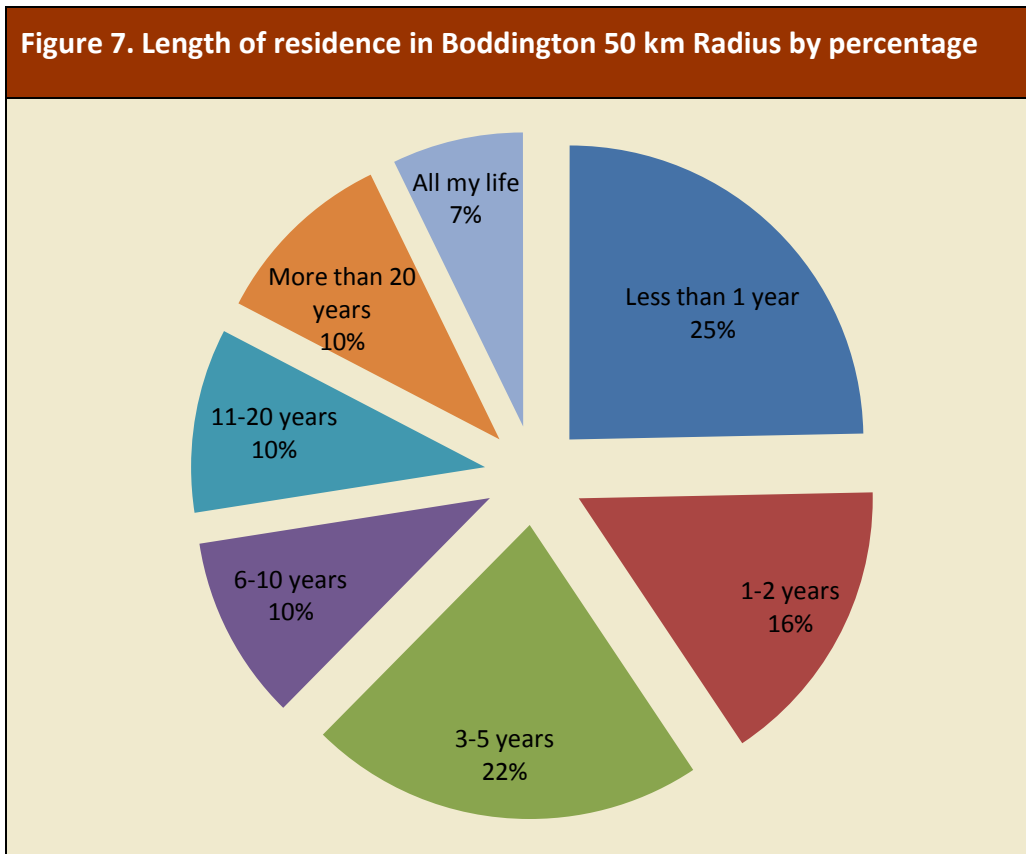


9. How long have you lived within approximately 50 km of Boddington?

Of the 69 respondents living in the Boddington 50 km Radius, 43 had moved into the area during the previous five year period. Of this group largest 17 had been residents for less than one year. A further 15 had lived in the area between 3-5 years, and 11 for 1-2 years. These figures indicate increased population growth and population churn coinciding with the period in which two international companies were separately engaged in the recommissioning and

³ Results in question 9 below suggest that the three respondents who skipped the question were also residents of the radius.

expansion of major export-oriented mineral extraction and processing projects. However responses also indicate population in-migration occurring, although at a lower rate, during the period from 2001-2006 when one of the mining operations was in care and maintenance, and the other was much smaller than its present size. This is consistent with data collected elsewhere (Hoath 2013a) indicating that factors such as affordable housing, lifestyle amenity and natural aesthetics have also attracted in-migration into specific localities in the area regardless of local employment opportunities. Only 7% of respondents had lived in the area all of their life. A further 10% had been resident for more than 20 years.

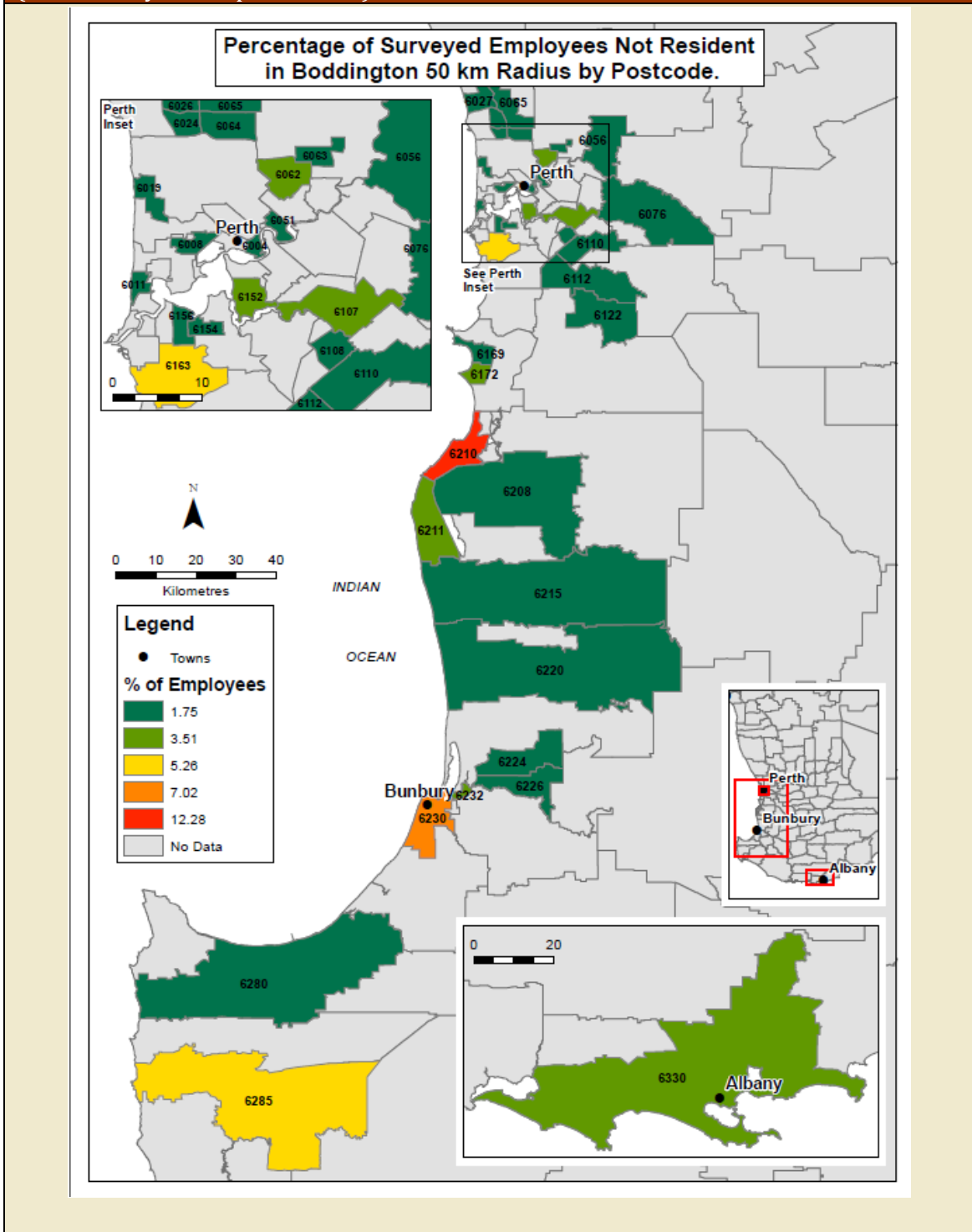


10. Please provide your residential postcode.

Fifty-seven respondents indicated that they were employed within the Boddington 50 km Radius but considered their usual place of residence to be elsewhere. Of this group, the highest proportion (12%), usually resided in the postcode 6210 that includes the coastal city of Mandurah and surrounding suburbs in the Peel region. A further 7% resided in the 6230 postcode that includes the South West coastal city of Bunbury and surrounding suburbs. Five per cent resided in each of the postcodes 6163 (a cluster of southern metropolitan area suburbs) and 6285 (a South West lifestyle amenity area including Margaret River). Place of usual residence for the remainder was dispersed more widely across 34 West Australian postcodes including 19 metropolitan postcodes as illustrated below.

Figure 8. Spatial distribution of non-resident employees by postcode

(Produced by K. Rampellini 2012)



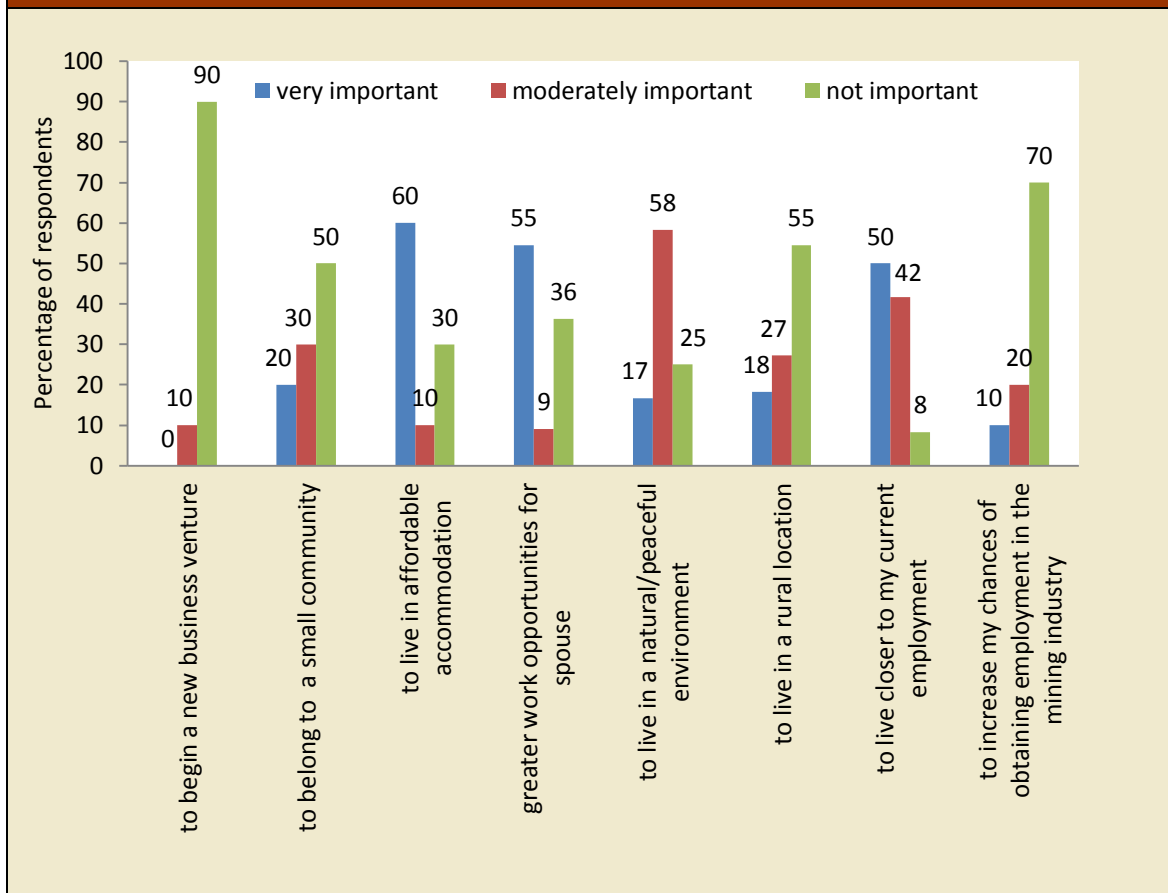
11. In the past 2 years, have you taken action, or considered taking action to relocate to any address within 50 km of Boddington (Boddington Shire, Dwellingup, Wandering and Williams)?

Of the 57 respondents who worked within the Boddington 50 km Radius but lived elsewhere, only 12 (21%) had taken, or considered taking any action to relocate to the Boddington area in the past two years.

12. Considering the past two years, which of the following would influence a decision to move to within 50 km of Boddington? Mark all that apply.

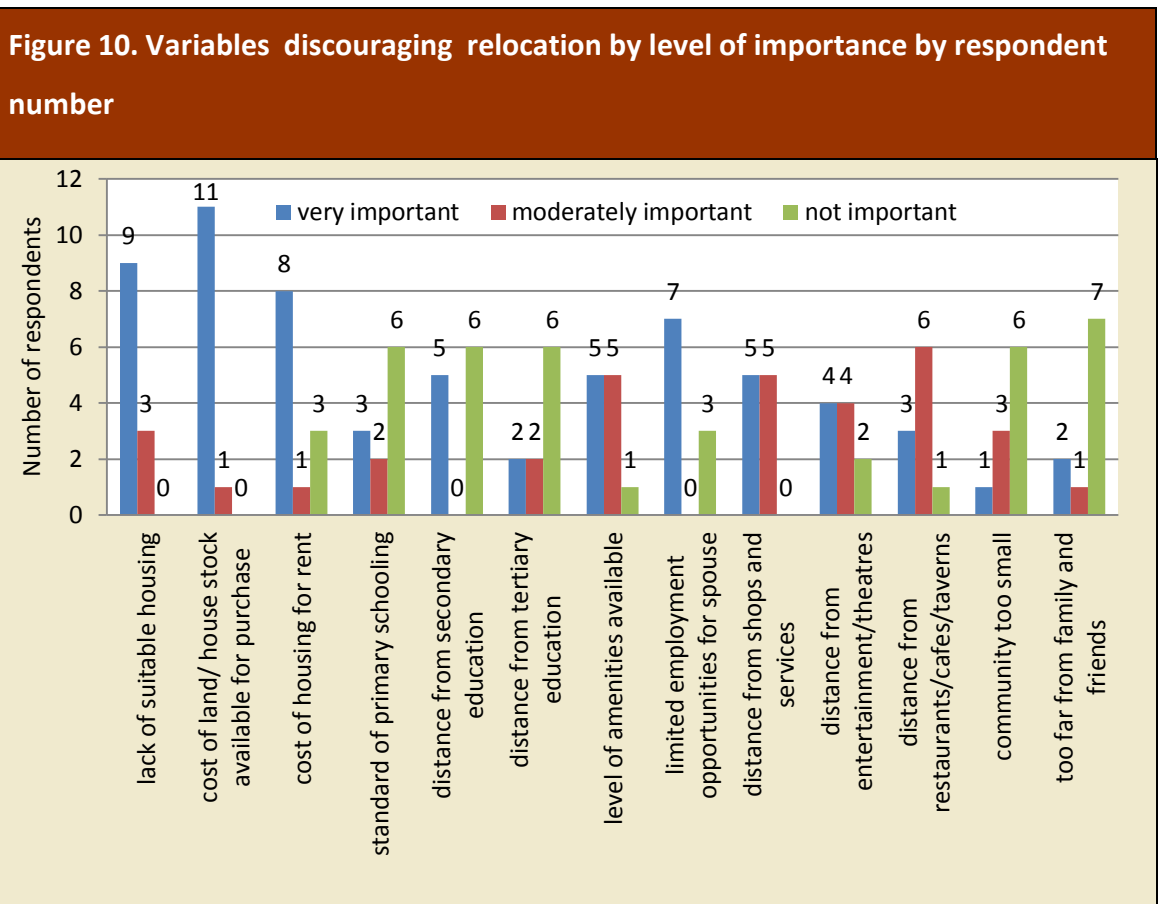
For the cohort of 12 who had considered moving to Boddington in the past two years, the three factors nominated by the highest number as being ‘very important’ to a decision were: *to live closer to my current employment*; *greater work opportunities for spouse*; and *to live in affordable accommodation*. *Living closer to my current employment* was also the category nominated by the second highest number as being ‘moderately important’. The one optional comment recorded, emphasised that the importance of living near to work was ‘to be home with the family every night, not working away’. *To live in a natural/ peaceful environment* was moderately important to the highest number, but only very important to a few. *To begin a new business* was the least important factor, followed by *to increase my chances of obtaining employment* in the mining industry.

Figure 9. Variables influencing decision to relocate by level of importance



13. Considering the past two years, which of the following would influence a decision not to move to within 50 km of Boddington?

Consistent with results in question 12, three categories relating to accommodation: *cost of land/house stock available for purchase*, *lack of suitable housing* and *cost of housing for rent*, emerged as significant deterrents to relocation to the Boddington area, as did *limited work opportunities for spouses*. *Level of amenities* and *distance from services* were also of some importance. Three factors: *standard of primary schooling*, *distance from secondary education* and *distance from tertiary education*, which were frequently raised by existing Shire of Boddington residents in semi-formal interviews (Hoath 2013b) as significant issues limiting anticipated length residence in Boddington, were ‘not important’ to a significant proportion of the survey cohort who lived elsewhere but had considered relocation to Boddington. This likely relates to the relatively high number of respondents usually residing in households without children (see question 15). One additional comment was recorded indicating that the standard of secondary schooling (ie. not simply distance from) was most important.



14. Please tick the box that best describes the ownership status of your residence.

Of 123 respondents, the majority, 75 (61%), owned their usual place of residence, 21 (17%) rented a residence not owned by their employer, and seven (6%) rented from their employer. Twenty respondents (a significant 16%) fell into the ‘other’ category. Data obtained from in-depth interviews in the area (Hoath 2013a, b) suggests that the latter cohort includes young adults who live in the parental home or board in a share house rented or owned by another occupant. It may also include people in caravan parks and cabins, possibly warranting further analysis.

15. How many people usually live in your household? (Please tick one box in each row).

Not all of the 123 respondents to the question entered data for each available category. From a sample of 122, the most significant cohort, 46 (38%), lived in households with two usual occupants. Thirty-one (25%) households had four usual residents while 19 (16%) respondents lived alone. Fifteen households (12%) had three usual residents, seven had five, and three had six or more residents.

Of 114 households, the majority had two or more adult occupants who contributed to household income: 64 (56%) had two contributing adults; 10 households had three, and three households had four.

From a sample of 111 respondents, the majority, 66 (60%), resided in households where no children under the age of 18 were usually resident. Twenty-five households had two children under 18 usually resident, 11 had one child, seven had three children and two had four.

From a sample of 108 respondents, 71 lived in households where no children were usually resident.⁴

Table 1. Usual number of persons per household by age and dependency

Answer Options	0	1	2	3	4	5	6+	Response Count
Total number of people	1	19	46	15	31	7	3	122
Adults over 18 who contribute to household income	8	29	64	10	3	0	0	114
Total number of children under 18	66	11	25	7	2	0	0	111**
Financially dependent children under 18 years of age	71	9	21	5	2	0	0	108***
<i>answered question</i>								123
<i>skipped question</i>								3

⁴ A difference in the number of respondents to the two final variables: the total number of children under 18 (111 respondents) ** and, the number of financially dependent children under 18 (108)***, precludes any precise calculation of the number of financially independent children residing in the usual residences of respondents.

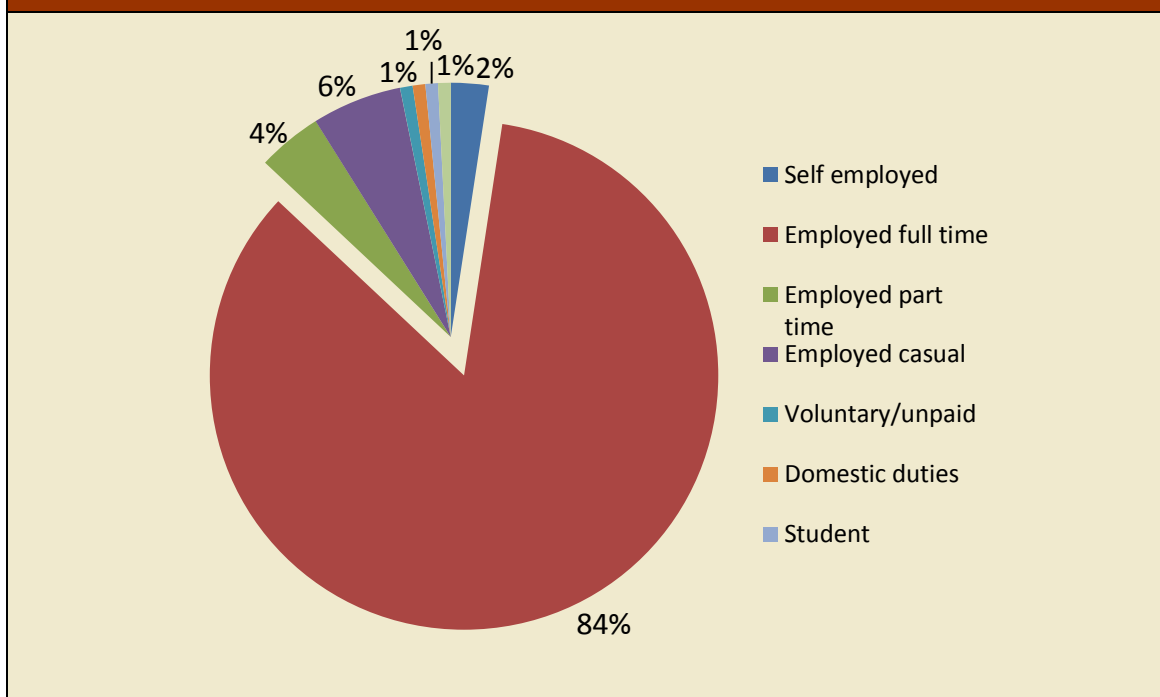
3.3. MINE WORKFORCE PARTICIPATION AND OPPORTUNITIES

The following questions establish employment status, current occupation and the level of participation in the mining industry workforce across the full survey sample. The section also explores the distance travelled from place of residence to place of employment by respondents employed in the mining sector in the Boddington 50 km Radius, and the level of involvement in the mining industry of the immediate family of respondents.

16. Which best describes your current employment status? (Tick one box that best applies).

Of 123 respondents, the great majority, 104, were employed full time. Seven were in casual employment, five were employed part time, and three were self-employed. None of the respondents were unemployed and only four were outside of the workforce.

Figure 11. Respondent employment status



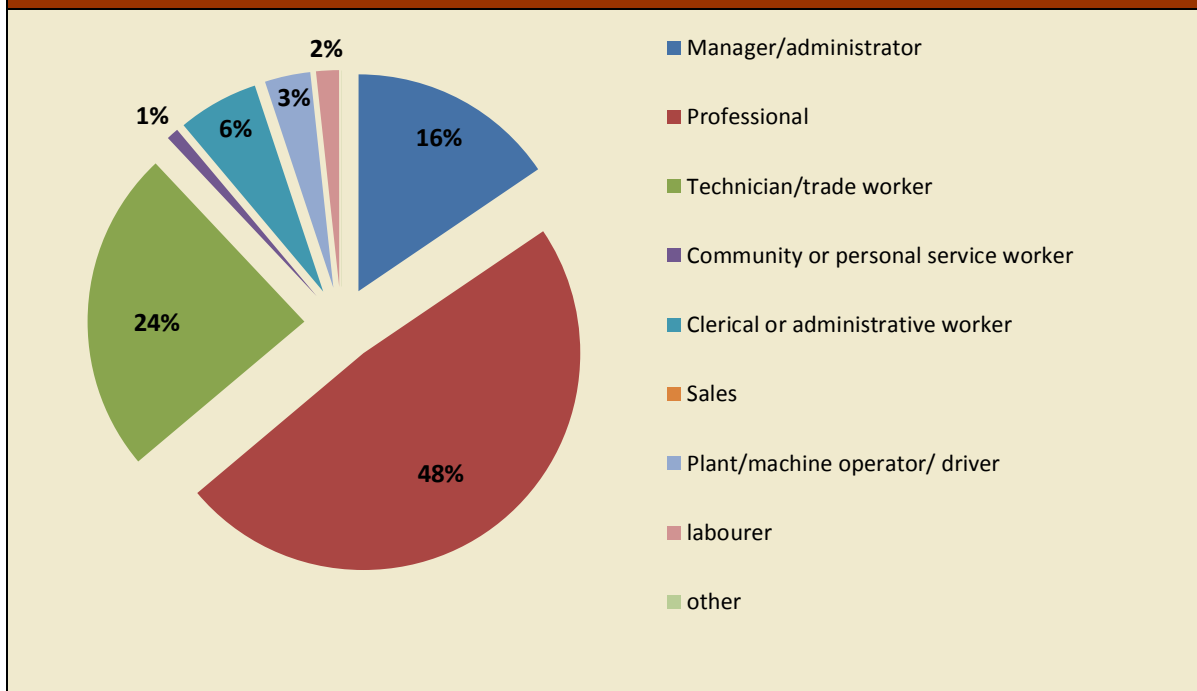
16a. Gender analysis of workforce participation.

Cross tabulation with question 3 reveals that 96% of males and 90% of female respondents were in the paid workforce with 89% of males and 71% of females engaged in full time employment.

17. Which best describes your current occupation? (Tick one box that best applies).

Of the 116 waged respondents, almost half (56) defined their current occupation as *professional*. *Technicians/trade workers* formed the next most common group numbering 28 and eighteen were *manager/administrators*. Smaller numbers were *clerical or administrative workers, plant machine operators and labourers*. Owing to the large cohort employed in mining operations, (see question 18 below) the remainder of nominated categories had limited representation apart from the *sales* category which was unrepresented.

Figure 12. Current occupation of respondents by percentage



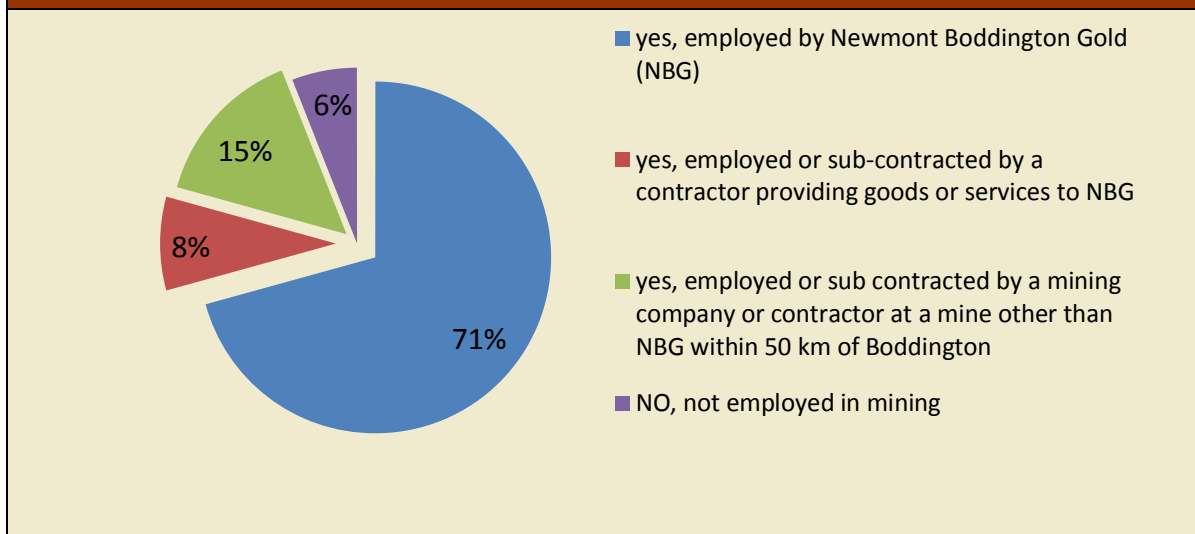
17a. Gender analysis of workforce.

Cross tabulation with question 3 reveals that a higher proportion of the employed female cohort (52%) were in professional positions compared to employed males (46%), while a higher proportion of employed males (29%) occupied technical/trade positions compared to employed females (11.4%). Sixteen per cent of employed males occupied managerial positions compared to 14% of employed females. A significantly larger proportion of employed females (20%) occupied clerical/administrative positions compared to employed males (1%).

18. Are you currently employed in the mining sector at a location within approximately 50 km of Boddington?

Of the 116 respondents who were currently in waged or contract employment, all but seven, were employed by mining companies or contractors within the Boddington 50 km Radius. The significant majority, 82, were employed by NBG, with a further ten employed by contractors providing goods or services to NBG. Seventeen were employed or contracted to a mining company or contractor at a mine other than NBG operating within the 50 km Radius.

Figure 13. Employment in mining by percentage



18a. Gendered division of employees in mining.

Cross-tabulation with question 3 indicates that 92 % of employed female survey respondents were employed in mining within the Boddington 50 km Radius. Of the 109 respondents employed in mining in the radius, 33% were female. Of the 82 respondents employed at NBG, 29% were female. No female respondents were employed by a mining company at a location further than 50 km from Boddington.

19. Do you currently provide contracted goods and services to mine companies operating within 50 km of Boddington?

Of the three respondents who identified as self-employed, one was currently providing contracted goods and services to mine companies in the Boddington area but lived outside the radius.

20. In the past 5 years have you ever tendered for contracts to provide goods or services to mine companies operating within 50 km of Boddington?

Of the self-employed respondents who were not currently contracting to mining companies, neither had tendered for such work in the past five years. Two comments were recorded. One indicated a lack of knowledge of ‘how to go about’ tendering, and the other reporting an order received from a mining company ‘for some xmas hampers of local produce’.

21. In the past year how many people have you employed as a direct result of contracts for provision of goods and services to mines within 50 Km of Boddington?

The one self-employed contractor providing good or services to mining companies with operations in the Boddington 50 km Radius employed between 1-5 full time employees.

22. Do you usually live in a mining camp/village accommodation during your work roster?

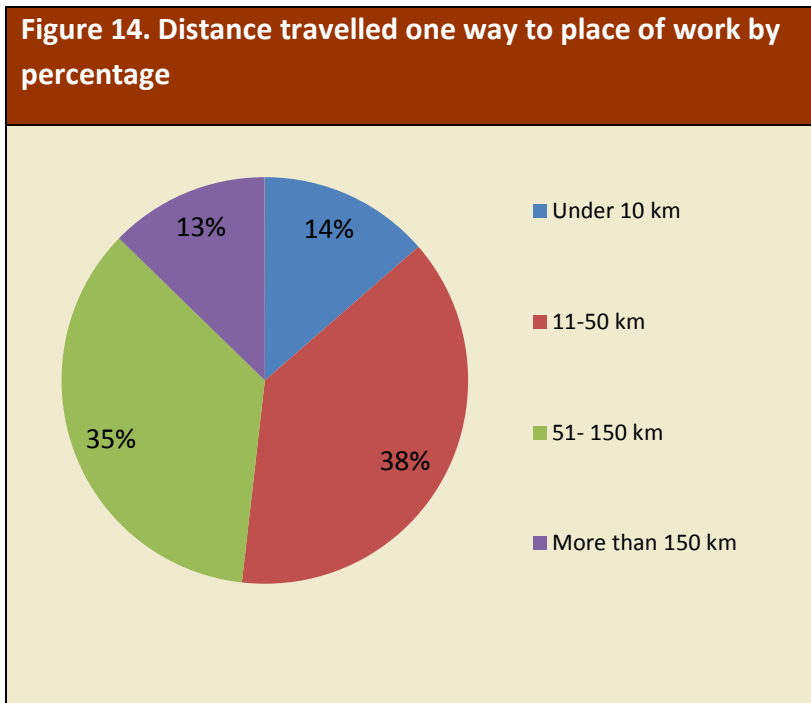
Of the cohort currently employed in mining in the radius, 57 (52%) usually lived in a mining camp during their work roster.

22a. Gendered division of employees regularly utilizing the mining camp during work roster.

Cross tabulation with question 3 shows that of the 57 respondents regularly residing in the mining camp during work roster, 48 (84%) were male and 16% were female.

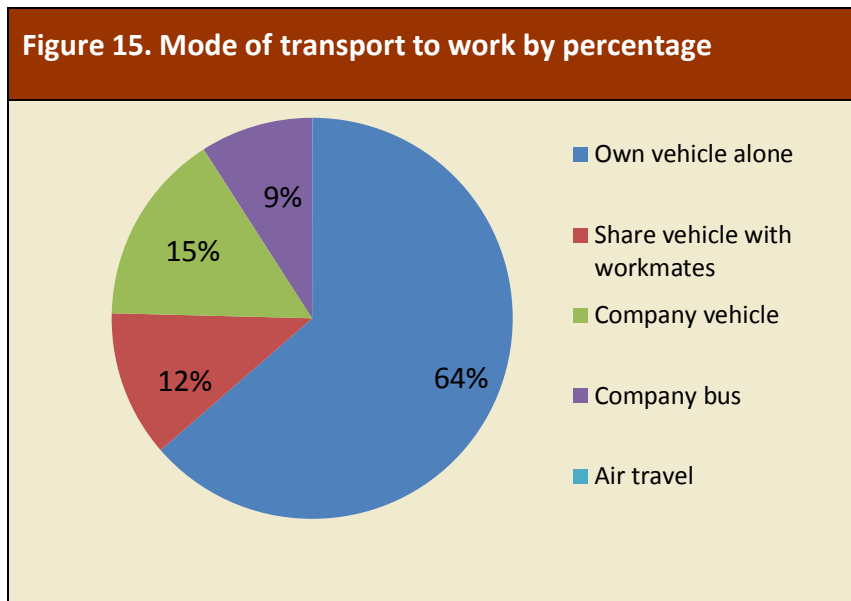
23. How far do you usually travel one way to your place of work?

Of 110 respondents employed or contracted to mining operations in the Boddington 50 km Radius, a total of 57 (52%) were travelling to work from within the radius (50 km or less). For the largest cohort 42 (38%), the usual distance travelled one way to their place of work was between 11-50 km. A further 14 travelled less than 10 km. However a significant number, 39 were travelling between 51-150 km, and a further 14 were travelling more than 150 km each way. The number (51) indicating that they travelled distances greater than 50 km is less than the number (57) indicating regular use of the mining camp during work roster blocks. No cross tabulations have yet been undertaken to confirm the degree of correlation between place of residence and use of mining camp.



24. How do you usually travel to work?

Of 110 respondents employed or contracted to mining operations within the 50 km radius of Boddington, 70 (64%), travelled to work alone in their own vehicle. Seventeen (15%) travelled in a company vehicle, 13 (12%) shared a vehicle with workmates, and 10 (9%) travelled on a company bus. Four comments provided further variations on travel arrangements with one using own vehicle but with a shared driver, one travelling together in shared car with a partner who worked onsite at the same mine, and one indicating a mix combining self-driving on several days with use of company bus.



25. During the past five years were you ever employed in any capacity in mining?

Of 13 respondents who were not currently employed in or contracting to mining operations, a total of four (31%) had been employed in some capacity in the mining industry in the past five years.

26. Considering the past 5 years, which of the following apply?

Of the four respondents who were not currently, but had been employed in mining in the past five years, two had been employed at NBG for two years. Two had been employed in mining less than one year, one at a mine inside the 50 km Radius, and one elsewhere.

27. In the past year, have you ever taken action, or thought about taking action to gain employment in the mining industry?

Of the 13 respondents not in the formal workforce, six had taken action, or thought about taking action in the past year to gain employment in the mining industry.

28. In the past year, which of the following steps did you take to gain entry into the mining industry? Please mark all that apply.

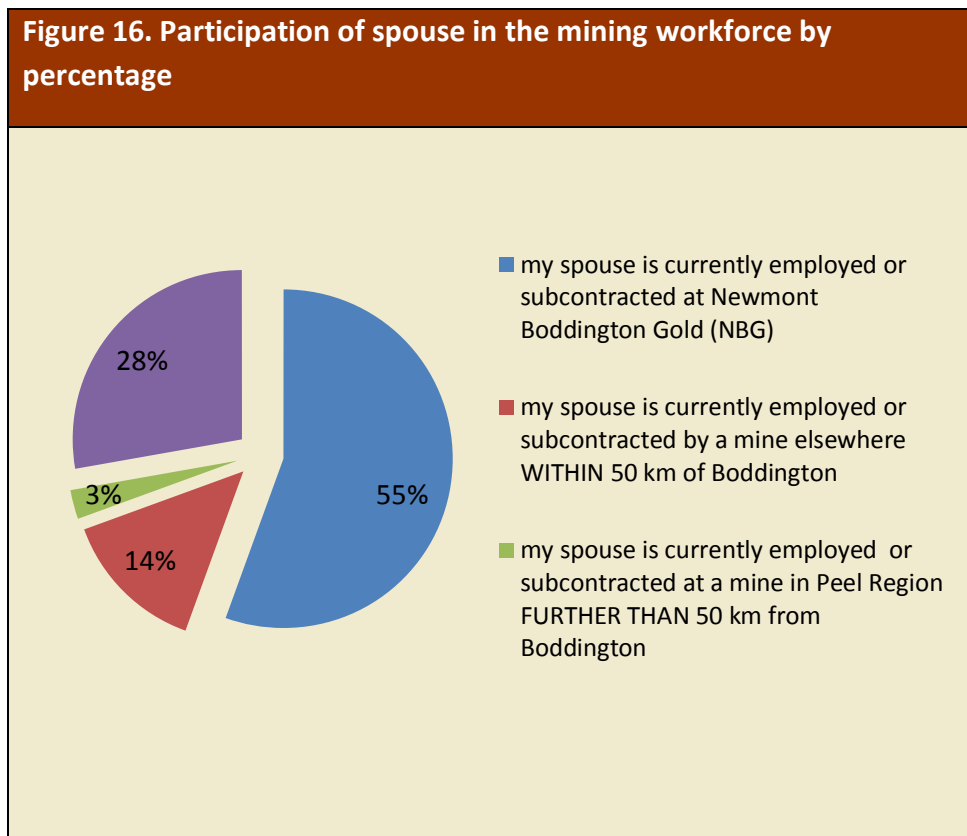
Six respondents who were not currently employed in the mining industry had taken a range of steps in the past year to gain entry into the industry. Submitting job applications and talking to friends and relatives in the mining industry about the right steps (two respondents each) were the most common actions taken. At least one had contacted employment agencies or potential employers, participated in short courses/training. One comment was also recorded indicating that the respondent gained an introduction into the industry through a successful application for a student vacation role at the Boddington Bauxite Mine.

29. Do you have a spouse who is currently employed by or sub-contracted to any mining company or mining contractor?

Of a survey sample of 122, a total of 36 (30%) respondents had a spouse currently employed by or sub-contracted to a mining company or mining contractor.

30. Considering your spouse's current employment, please indicate which of the following statements best applies.

Of the 36 respondents who had a spouse currently employed in or subcontracted to mining, 20 (55%) had a spouse who was employed or subcontracted at the NBG, and five (14%) had a spouse employed or subcontracted to a mining operation elsewhere within the 50 km radius of Boddington. In 10 (28%) cases, the spouse was employed at a mine outside the Peel region. Two comments were recorded: one named the employer, the other indicated the respondent's intention to change employers soon to 'be with' his spouse who worked at a more remote iron ore mine in the Pilbara and to gain a financial advantage at the same time because his current employer, NBG, "did not pay trades personnel well".



30a. Employment status of respondents with a spouse working in mining.

Cross tabulation with variables at question 18 shows that of the 36 respondents who had a spouse working in mining, all but one, were also employed fulltime in mining in the Boddington 50 km Radius. The highest number, 23 (68%), were employed at the NBG.

30b. Place of usual residence of respondents with a spouse working in mining.

Of the 36 respondents who had a spouse working in mining, 26 resided within a 50 km radius of Boddington and 10 lived elsewhere.

30c. Use of mining camp by respondents with a spouse working in mining.

All ten respondents, who like their spouse were employed in mining but had their usual place of residence outside the radius, indicated that they regularly lived in the mining camp during their work roster.

31. Do you have one or more parents or adult children currently employed in any capacity in the mining industry at a location within 50 km of Boddington?

Of a survey sample of 122, a total of 14 (11%) respondents had a parent or adult child currently employed by or sub-contracted to a mining company or mining contractor within the Boddington location.

3.4. LAND USE AND RURAL PRODUCTIVITY

The following section sought to understand the degree of interaction occurring between mining and agriculture, particularly linkages between participation in the mining sector workforce and productive rural land use within the 50 km radius of Boddington.

32. Do you and/or your spouse currently own, lease, manage, or hold a share in, rural property within 50 km of Boddington (Boddington, Shire, Dwellingup, Wandering, Williams)?

Of a survey sample of 122, a total of 31 (25%) respondents, either with or without their spouse, owned, leased, managed or held a share in rural property within 50 km of Boddington.

32a. Employment status of respondents who with or without a spouse currently owned, leased, managed, or held a share in, rural property within 50 km of Boddington.

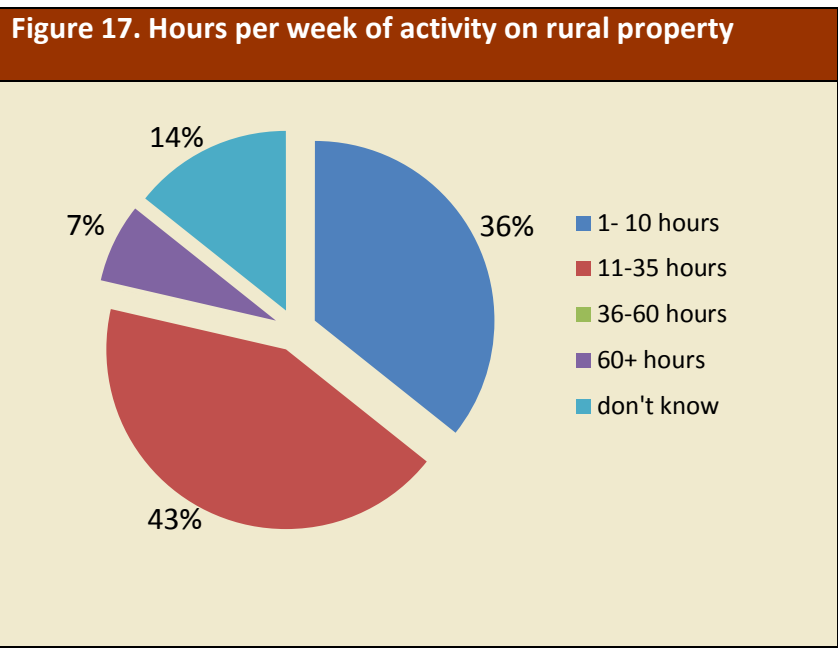
Cross tabulations show that 25 (81%) of the respondents who, with or without a spouse currently owned, leased, managed, or held a share in, rural property within 50 km of Boddington, were also employed in mining in the 50 km Radius.

33. Do you and/or your spouse own, lease, manage, or hold a share in rural property elsewhere FURTHER than the Boddington 50 km?

Of 91 respondents, a total of 14, either with or without their spouse, owned, leased, managed, or held a share in rural property FURTHER than 50 km from Boddington.

34. In the past year, on average, how many hours per week were you and your spouse engaged in maintenance, improvements, or productive activity on all your property FURTHER than 50 km from Boddington?

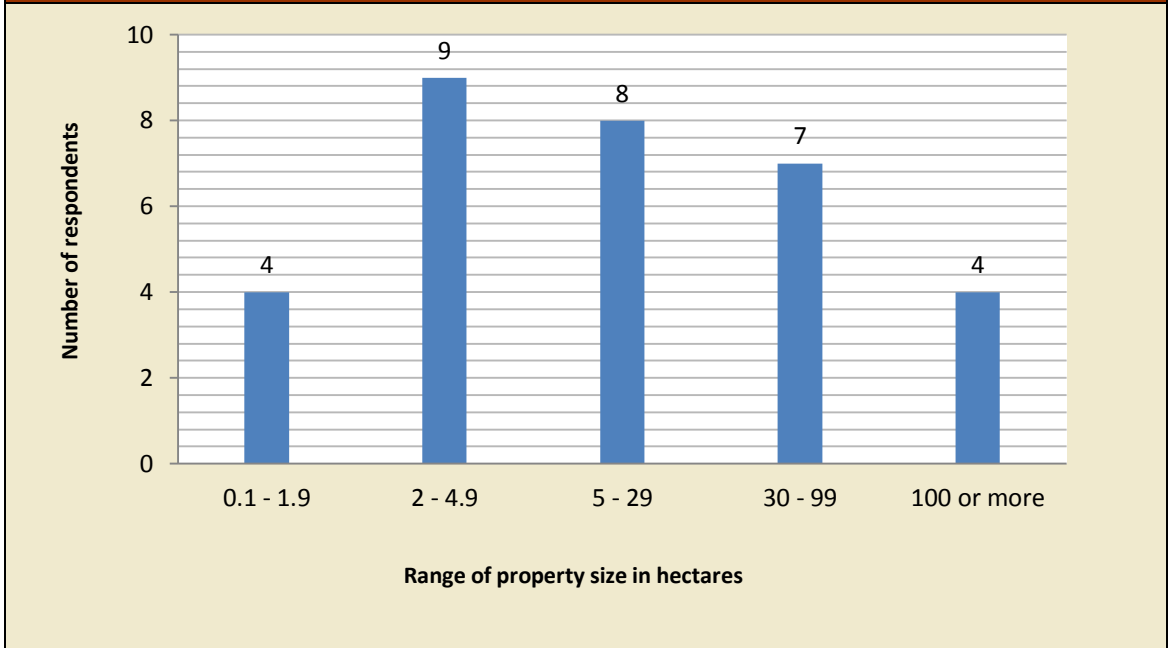
Of the 14 respondents who, either with or without a spouse, held one of the above interests in rural property further than 50 km from Boddington, five (39%) were engaged in maintenance, improvements or productive activity on their property for an average of 1-10 hours per week, while six (43%) were engaged for 11-35 hours, and one respondent for more than 60 hours per week.



35. Please indicate in hectares the total area of rural land WITHIN approximately 50 km of Boddington that you and/or your spouse, own, lease, manage or hold a share in.

Of the 32 respondents who, with or without a spouse, reported an interest in rural land within approximately 50 km of Boddington, nine (28%) owned, leased, managed or held a share in a total of 2-4.9 hectares, eight (25%) owned, leased, managed or held a share in 5-29 hectares, and seven (22%) in 30-99 hectares.⁵ Four respondents owned, leased, managed or held a share in greater than 100 hectares. A further four reported to hold an interest in less than two hectares.

Figure 18. Size and occurrence of rural land holdings within approx. 50 km of Boddington



36. Has the total land holding within approximately 50 km of Boddington that you and/or your spouse, own, lease, manage or hold a share in, increased or decreased in size in the past 5 years?

Of the 33 respondents who owned, leased, managed or held a share in a rural land holding within approximately 50 km of Boddington, the majority 28 (85%) had neither increased nor decreased the size of their total rural holding in the past five years. Only three had reduced their property size and two had increased it somewhat. One respondent comment referred a progression from first owning a house in town before renting it out after buying a block of land out of town to live on. This final point draws attention to a trend towards new subdivisions offering semi-rural lifestyle (Hoath 2013b).

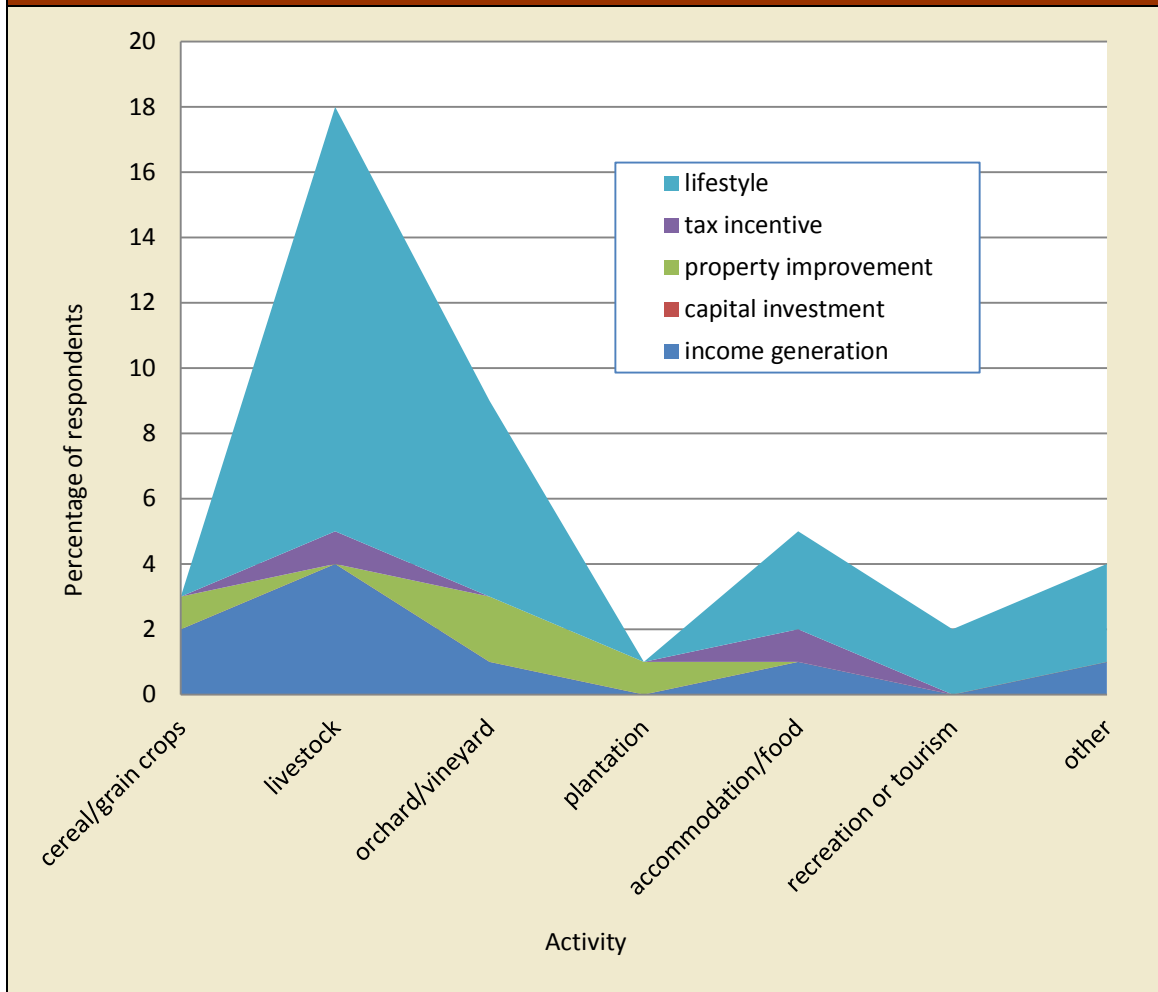
37. Which of the following land uses or activities have occurred in the past 2 years on the rural property you and/or your spouse, own, lease, manage, or hold a share in? Please indicate the one MAIN reason that applies for each category.

In this question not all respondents holding interests in rural land provided data for each of the nominated land use or activity variables. Amongst the 31 possible respondents, the most frequently recorded rural land use activity (13 of 27 respondents) was *livestock* for 'lifestyle'

⁵ There is an unexplained minor variation in the total number responding to each of the questions 35 - 38, where it would be expected for the number to be identical.

purposes, followed by *orchards* for ‘lifestyle’ purposes and *livestock* for ‘income generation’ (four scores each). However two respondents produced *cereal and grain crops* for ‘income generation’, while *accommodation, orchard/vineyard* and the category, *other*, were each identified as an income generating activity by one respondent. Four comments elaborated specific activities including: a registered Landcare for Wildlife property; a hotel; land to build a home on but currently paddocking a horse; and ‘hobby farming’.

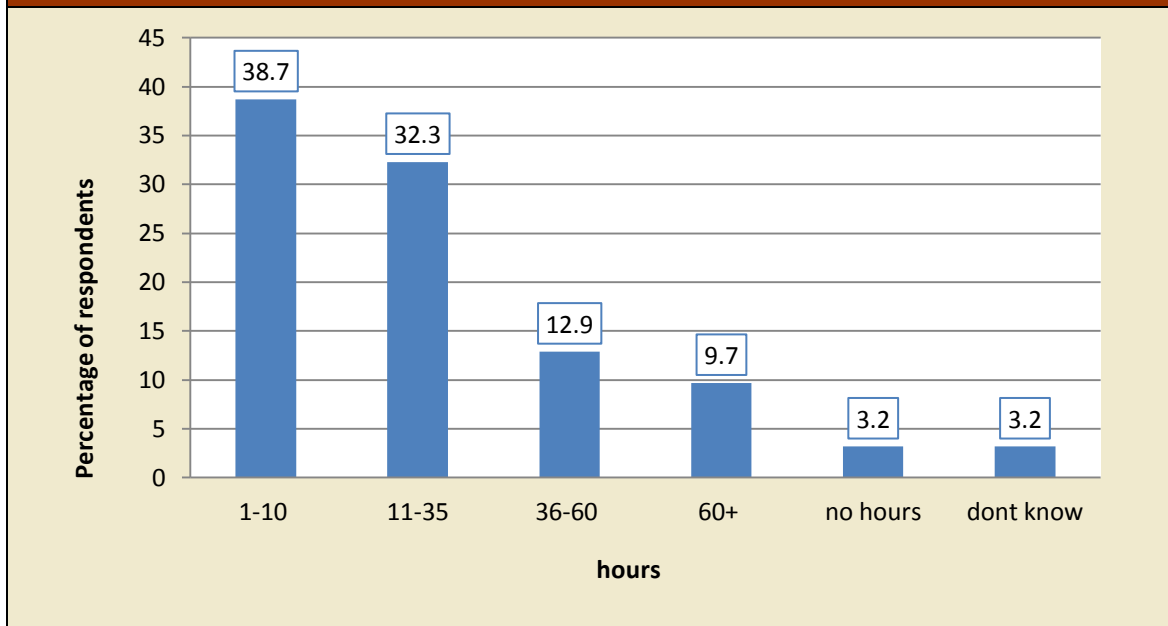
Figure 19. Frequency of land use activity



38. In the past year, on average, how many hours per week were you and/or your spouse engaged in maintenance, improvements or productive activity on all your property within approximately 50 km of Boddington?

Of 31 respondents who held any of the above interests in rural property, 12 (39%) were engaged jointly with their spouse in maintenance, improvements or productive activity for an average of 1-10 hours per week. Ten (32%) were engaged for 11-35 hours. Of the seven (23%) who spent over 36 hours on the nominated activities, three spent more than 60 hours.

Figure 20. Hours of activity per week on rural land by percentage



38a. Participation in the mining sector among those engaged in 36 plus hours of productive activity per week on rural property.

For the cohort of 7 who indicated engaging in 36-60 or 60+ hours of productive activity per week on their rural property somewhere within the 50 km Radius, just over 50% had landholdings ranging from 5 to 100 hectares. The remainder all held properties that were greater than 2,000 hectares in size. Around 50% were engaged in income earning activity on their property, either in grain production, livestock, or accommodation, with one engaged in ‘other’ activity. All but one, were employed fulltime in mining. Approximately 50% had a spouse also employed in mining, and a similar percentage also had adult children or parents employed in mining. The majority recorded mining as their main source of household income, with only one recording agriculture. Despite the relatively small size of the cohort of rural land owner/users engaged in more than 35 hours of productive activity, the data is indicative of the complex relationships that evolve in the presence of large-scale mining operations in a predominantly agrarian area, to influence individual earning capacity and land use choices. It is consistent with two trends identified elsewhere from interview data: one in which members of families traditionally engaged in farming are increasingly turning to mining as a main income source, and the other where mining employees moving to the area are opting to live a ‘rural’ lifestyle on smaller rural or semi-rural holdings (Hoath 2013a, b).

39. During the past five years has there been any change in the overall amount of waged labour you and/or your spouse employed on all your property within approximately 50 km of Boddington?

Of the cohort with interests in rural land in a 50 km radius of Boddington, the majority, (81%) reported using no waged labour on their property. Of the six (19%) who did use waged labour, three (10%) reported that the total annual hours of wage labour had increased, 1(3%) that it has decreased, and 2 (6%) that it had stayed the same. One comment was provided observing that staff members were unattainable ‘because of the mines’.

40. In the past year, how many labourers did you and/or your spouse employ on all of your property within approximately 50 km of Boddington during your peak season?

Of the cohort who held interests in rural land within a 50 km radius of Boddington, and employed labour during the past year, one respondent employed between 1-5 full time employees, two employed between 1-5 casual /seasonal employees, two employed between 1-5 unwaged family members and two employed between 1-5 unwaged non-family members.

41. Thinking about the past five years, have you and/or your spouse changed the mix of activities/land uses on the property you own, lease, manage, or hold a share in, within approximately 50 km of Boddington?

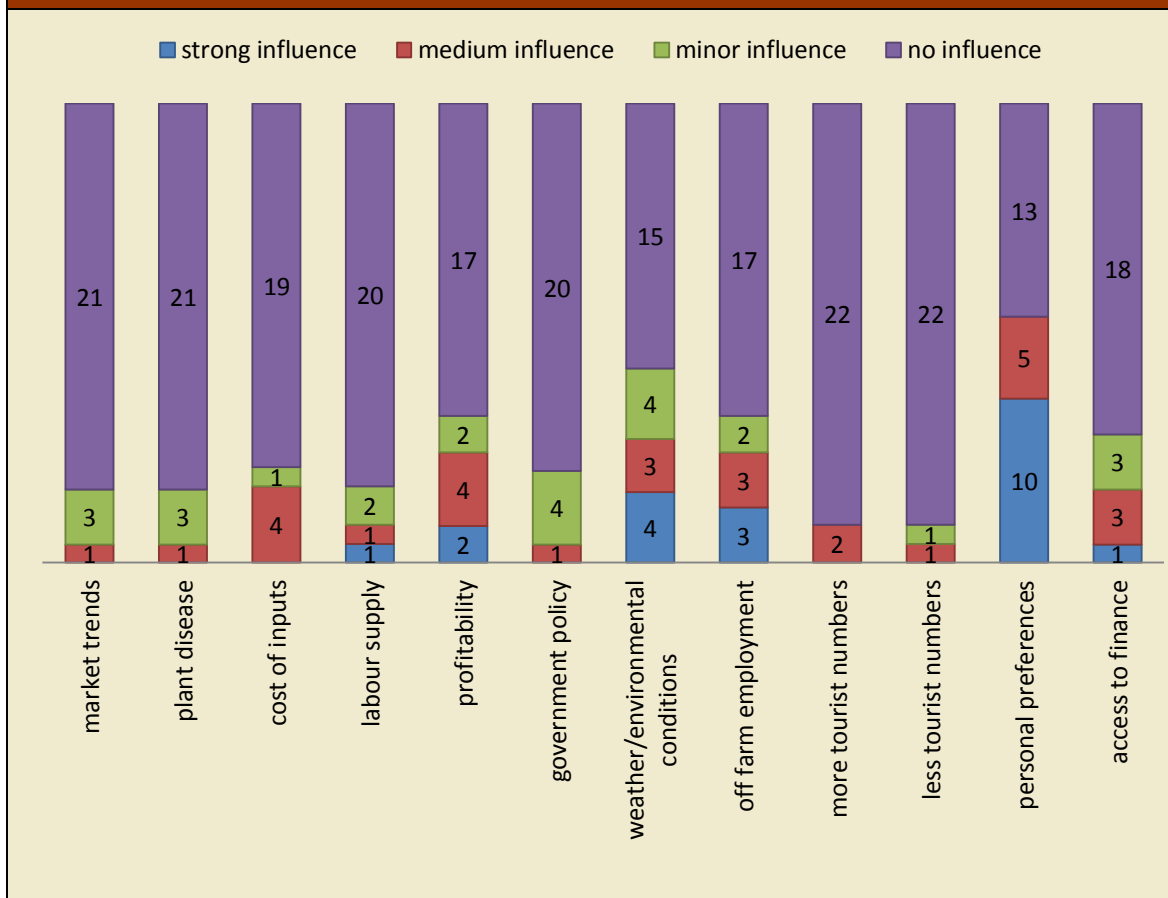
Of 31 respondents who owned, leased, managed or held a share in rural land in a 50 km radius of Boddington, the majority (81%) reported not changing the mix of activities/land uses in the past five years. Five (16%) had done so, and one was unsure.

42. Which of the following have influenced decisions in the past five years about the mix of activities on all property you and/or your spouse, own, manage, lease or hold a share in within 50 km of Boddington?

The strongest influence affecting the mix of activities on rural properties was *personal preference* reported by 10 respondents, followed by *weather/environmental conditions* (four respondents), *off farm employment* (three respondents), *profitability* (two) and *labour supply* (one). *Personal preference* was also a 'medium influence' for five respondents. *Cost of inputs* and *profitability* were each ranked a 'medium influence' by four respondents, with *weather/environmental conditions* and *off farm employment* ranked at that level by three. The limited influence of most variables is consistent with the relatively low number of respondents reporting engagement in productive activity for income generation on rural land.

This observation is supported by one comment indicating that none of the variables were applicable to the respondent. Another informs of a lifestyle change 'from sea change to tree change', with the motivation for a large property being 'to get away from having neighbours right beside you'. However other comments underline the diversity of circumstances among landholders/users, with one noting the 'lack of labour', and another, the detrimental impact of the two mines being 'a concern, whether or not we want to keep living here'. Another had not considered any change to activities on 'owned land'.

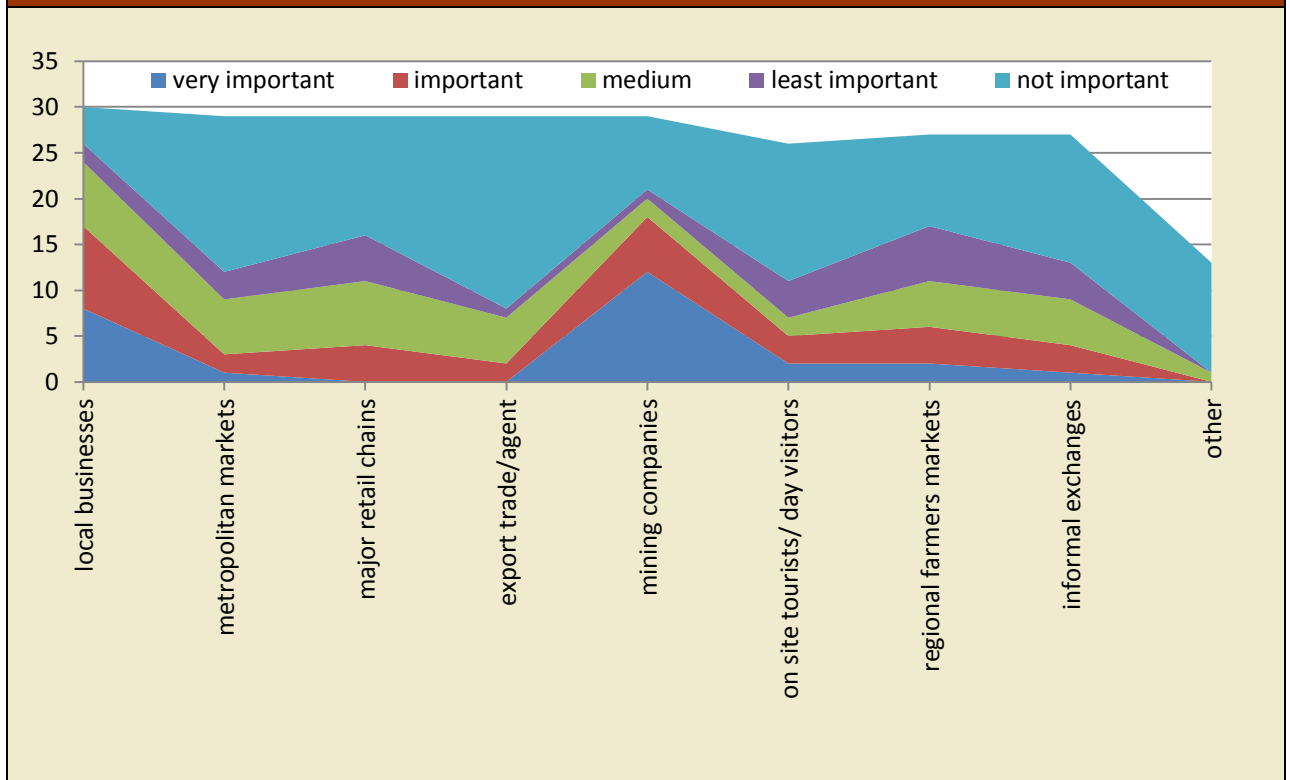
Figure 21. Ranked significance of variables influencing land use activity by respondent number



43. Please rank the importance for you of each of the following markets. (1 is not important ---- 5 is very important)

Of the 31 respondents who owned, leased, managed or held a share rural land in a 50 km radius of Boddington, 12 of 29 respondents ranked *mining companies* as a ‘very important’ market, as did eight of 30 respondents for *local businesses*. No one considered *major retail chains* or *export markets* to be ‘very important’. Conversely 21 indicated that *export markets* were ‘not important’ as did 17 for *metropolitan markets*, 15 for *on-site tourism*, 14 for *informal exchange*, 13 for *major retail chains*, 10 for *regional farmers markets*, eight for *mining companies* and four for *local businesses*. The one comment stating that ‘none [of the variables are] applicable –lifestyle block’ is perhaps indicative of the general irrelevance of the question to many of the cohort with a similar orientation. The significance of mining companies being highly ranked as a *market* is unclear, but possibly refers to their importance as a sustaining source of income for lifestyle blocks.

Figure 22. Ranked importance of markets by respondent number



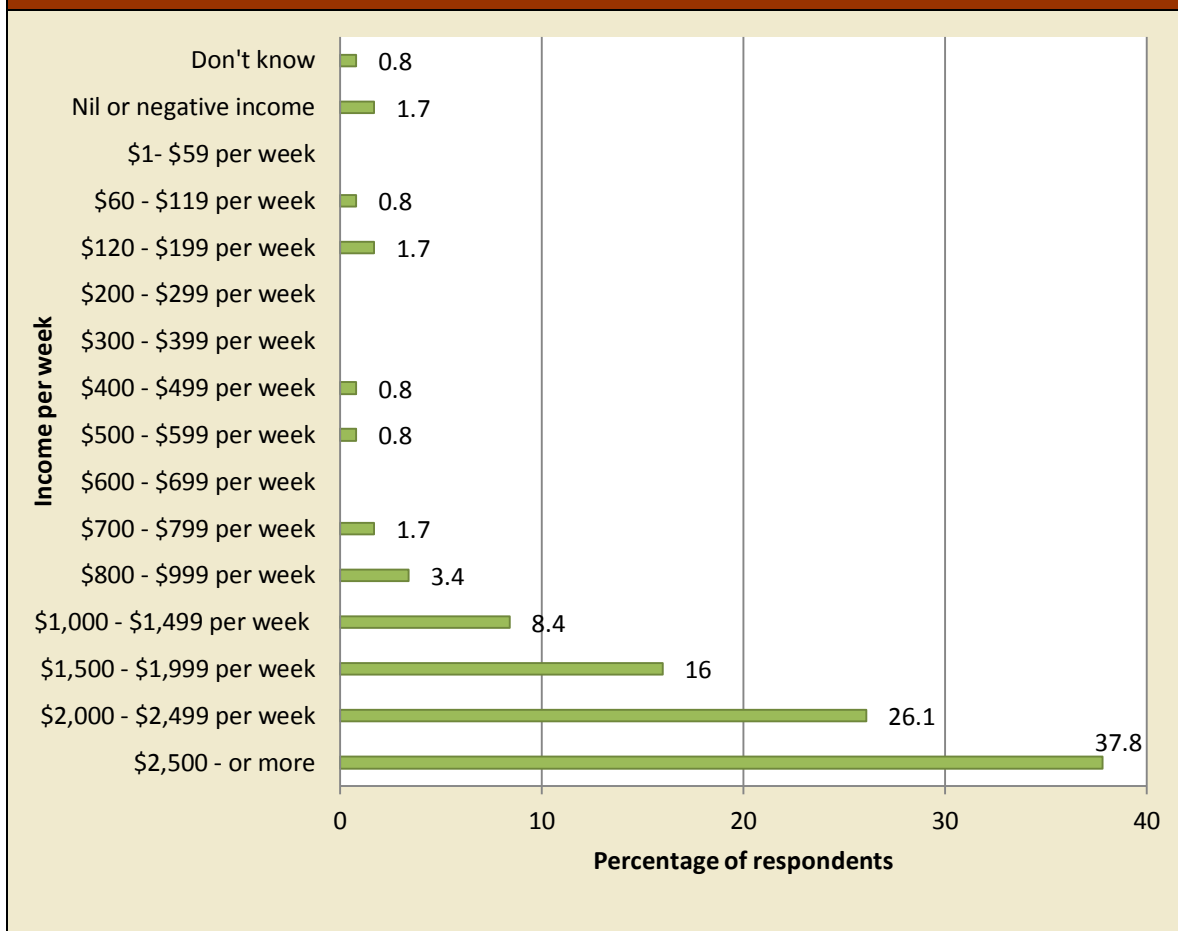
3.5. INCOME AND EARNING CAPACITY

The following section sought to understand the range of income levels and income sources for survey respondents.

44. What is your approximate GROSS PERSONAL income per week?

The personal income in the survey sample was heavily concentrated in the highest bands provided. More than one third (37%) of the survey sample had a gross personal income per week of \$2,500 or more (\$130,000 plus per annum). This is consistent with the high ratio of respondents who were either employed in or contracted to the mining industry, and the high number of this group reporting professional occupations.

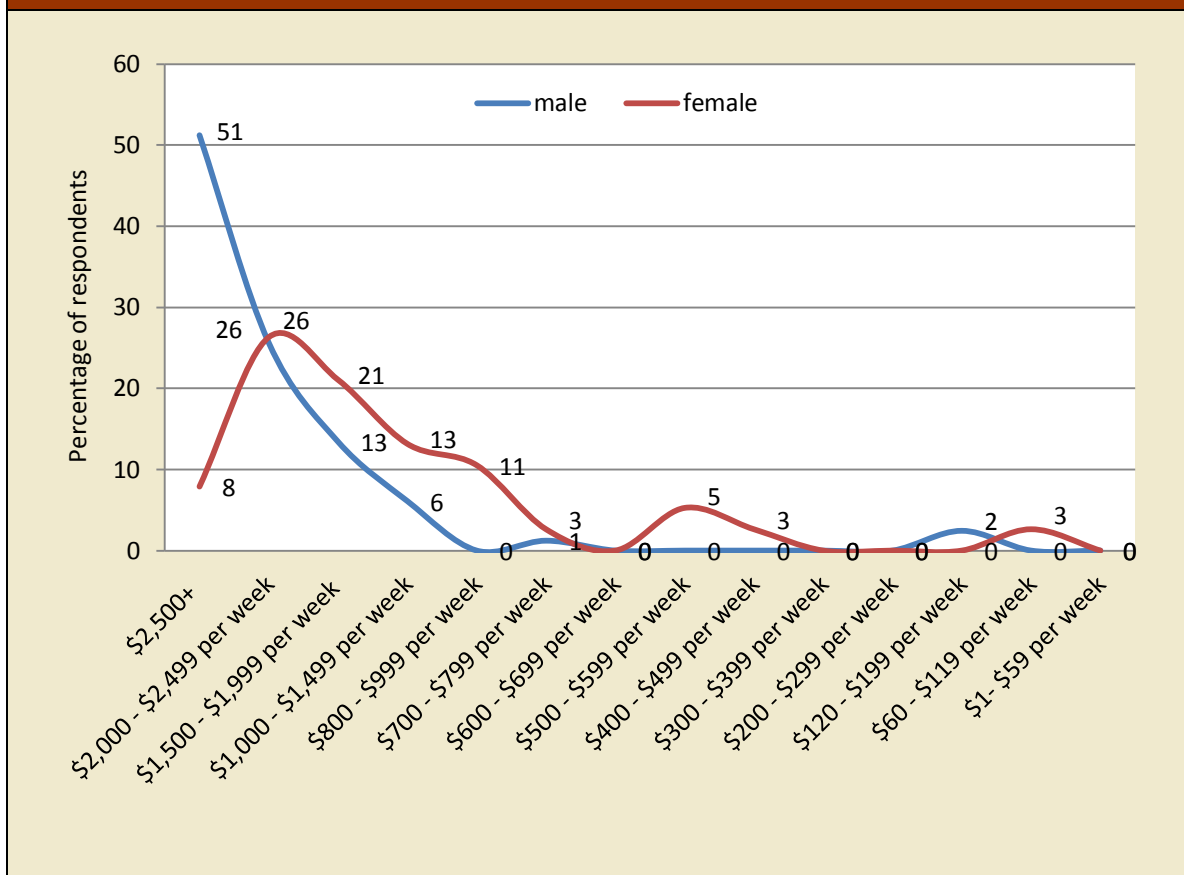
Figure 23. Distribution of GROSS PERSONAL income per week by percentage



44a. Gross weekly personal income: Gender distribution by percentage.

Further analysis of income distribution data along gender lines is interesting. The most notable feature is the significant difference between the percentage of male and female respondents located in the highest available weekly income bracket. This is despite the high proportion of the female cohort employed in managerial and professional positions (question 17a) and having attained a high level of educational (question 7a). The gendered difference likely reflects limited female representation in the most senior management levels, the higher proportion of males in technical and trade positions and higher proportion of females in clerical positions, as well as the lower female participation rate in full time employment (as detailed at question 16a). Nevertheless, the majority of the female cohort was located in the middle to upper-middle income bracket with 55% earning \$1,000 plus per week and 8% earning \$2,500 plus, thereby reflecting the high wage structures that prevail within the mining sector.

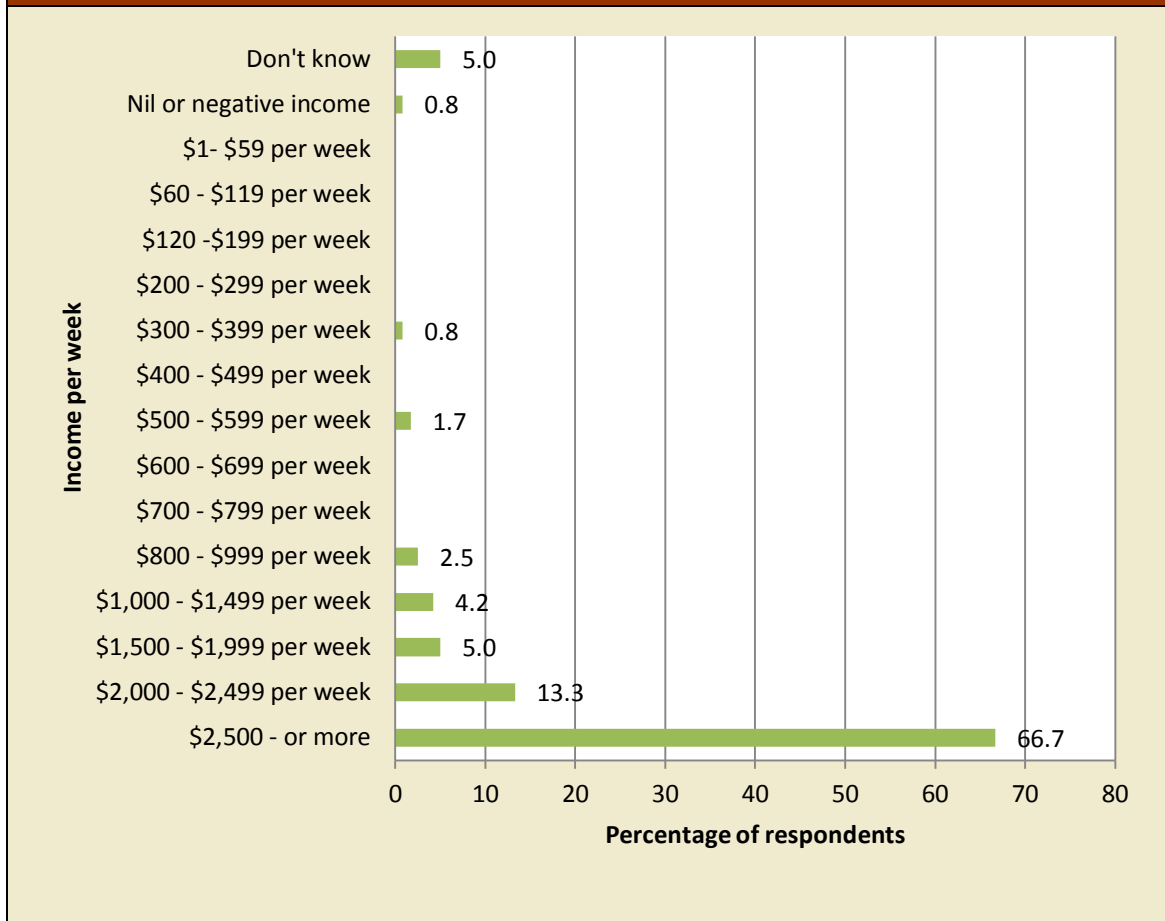
Figure 24. Gross PERSONAL income per week. Gender distribution by percentage



45. What is your approximate GROSS HOUSEHOLD income per week?

Gross household income was even more concentrated in the highest income band provided. Of 120 respondents, 80 (67%) reported a gross annual household income of \$130,000 or more, with a further 16 (13%) being in the \$100,000- \$129,948 band. The concentration of personal and household income in the upper bands is consistent with 84% of respondents reporting at question 47 below that the largest portion of their household income came from the mining sector. By contrast a handful of respondents reported gross annual household incomes of \$31,000 or less, indicating a sharp divide in the spending capacity of mining and non mining households.

Figure 25. Distribution of GROSS HOUSEHOLD income per week by percentage

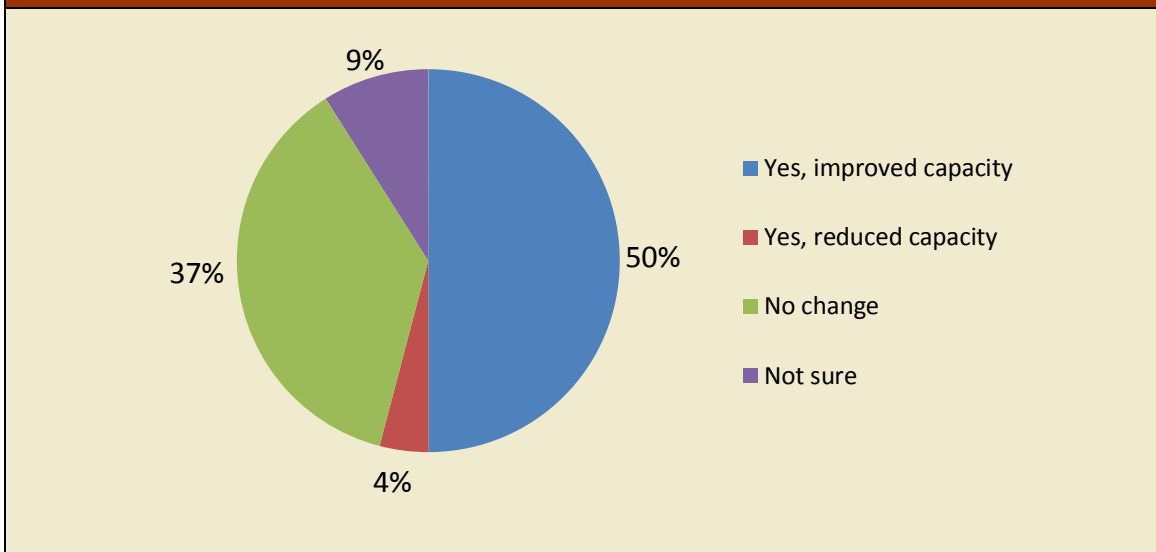


46. Considering the past five years, have changes in the level of mining activity within 50 km of Boddington in any way changed your capacity to earn an income?

Of 122 respondents, 61 (50%) considered that changes in the level of mining activity within 50 km of Boddington had improved their capacity to earn an income while five (4.1%) considered that it had reduced their capacity. Forty-five (37%) had experienced no change in income earning capacity as a result of local mining activity. Several respondents provided comments on their improved income, relating this directly to being contracted to, or having a job at NBG. Several provided comments explaining their reduced income: for one it was associated with a shift from FIFO to local mine work and 'lower money for the same job', but with the benefit of

a better roster; for the other, with a family relocation from the Boddington home to Perth for sport and schooling, facilitated by the existence of the NBG roster and village, but entailing one spouse resigning from full time work at the bauxite mine. One respondent attributed his/her unchanged income earning capacity in the current circumstances to ongoing employment in the industry over a long period. Another considered any income improvement to be more a factor of personal improvement in qualifications, skill levels and employability.

Figure 26. Change in earning income capacity due to changes in local mining activity by percentage



47. Which ONE of these sectors currently accounts for the largest portion of your HOUSEHOLD income?

The majority, 102 (84%) of 122 survey respondents, were in households where the largest portion of their income was currently obtained from the mining sector. The electricity, gas water and waste sector accounted for 3%, and professional, scientific and technical services for 2.5%. The health and community services sector, agriculture, forestry and fishing sector and the administrative and support services sector each accounted for approximately 2%. Construction, education and training, accommodation and cafes, public administration and safety, and transport, postal and storage were all represented.

48. Is your DISPOSABLE HOUSEHOLD income more or less than it was 5 years ago?

Of 122 respondents, a sizable majority, 83 (68%), reported currently having a higher disposable household income than they did five years ago, while 24% had less and 8% didn't know. Nine recorded comments attributed reduced disposable income to a diverse range of influences: having more children (5 comments); earning similar income but with a sole earner so losing tax advantages; moving from living with parents to having a mortgage; having a new mortgage; changing from FIFO to having a home life, and; in comparison to living overseas, total income is higher but so are taxes.

3.6. HOUSEHOLD GOODS AND SERVICES EXPENDITURE

The following section sought data from respondents, either living or working in the Boddington 50 km Radius, on the spatial distributions of their household expenditure and the key variables influencing decisions about where goods and services were obtained. Where people spend their money serves an important indicator of the level and distribution of local and regional economic benefit currently being realised from local mine related wage and salary disbursements.

49. Thinking about your household needs, where do you most often obtain each of the following goods and services?

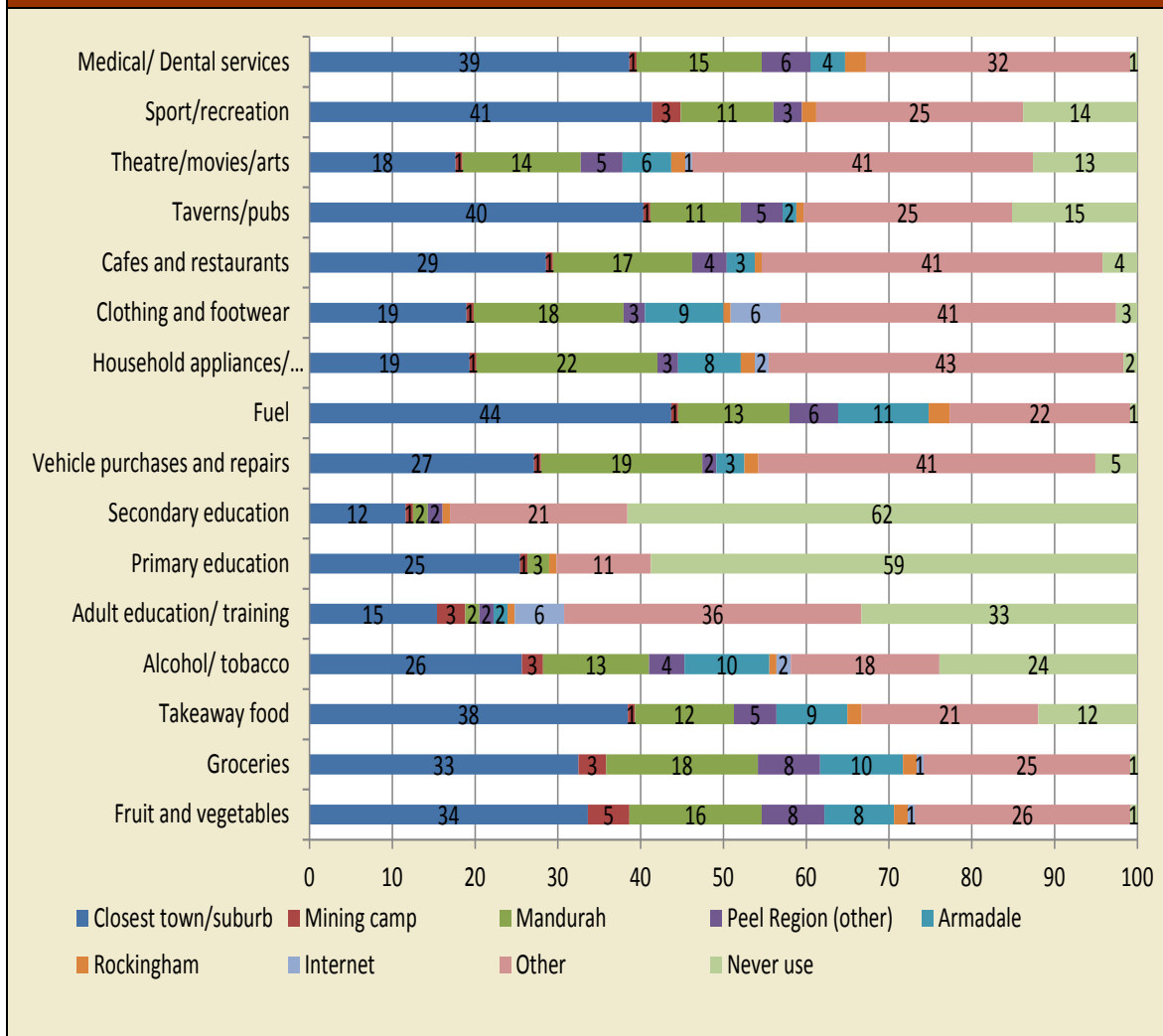
Consistent with the high number of households in the survey sample that were without children, *secondary* and *primary education* were the services never used by the largest number of respondents (43 or 38% and 47 or 41% of the possible number respectively). *Adult education* and *alcohol and tobacco* (21 or 18% respondents) were the next least used variables. *Medical and dental services*, *fuel*, *groceries* and *fruit and vegetables* were by contrast each obtained by all but one respondent.

There was considerable variation in the frequency with which the different categories of goods and services were obtained locally. *Fuel* was the item most frequently obtained locally (by 52 respondents) followed by *sport and recreation*, and *pubs and taverns* (48 each), *medical/dental services* (46 or 39%) and *takeaway food* (45). Of the two variables used by the least number of respondents, *primary education* was accessed locally more often than *secondary education*.

It is also notable that the scores for Mandurah as the place where goods and services are most often obtained, were, for all items other than education, significantly higher than would be expected from the number of survey respondents (7) who identified the city as their main place of residence. The city's popularity as a source of goods and services likely reflects its growing significance as a regional, transitioning to outer metropolitan, centre. The highest incidence of a nominated good or service being obtained most often from Mandurah was recorded for *household appliances and furnishings* (26). The number of respondents using Mandurah for each of the following: *vehicle purchases and repairs* (23), *groceries* (22), *clothing and footwear* (21), *cafes and restaurants* (20), *fruit and vegetables* (19), *medical and dental services* (18) *theatres, movies and arts* (17) and *alcohol/tobacco* (15), also ranged from double to treble the number of survey respondents usually residing within the city's postcode.

Figure 27. Survey Sample

Locality most often used to source goods and services by percentage



49a. Main localities where goods and services are obtained by residents of Boddington 50 km Radius.

Analysis of expenditure patterns for the cohort usually residing within the Boddington 50 km Radius reveals a more pronounced variation between the frequencies with which the different categories of goods and services were obtained locally. The most frequently obtained were *primary education* (86% of 22 users), *sport and recreation* (60% of 48 users) and *taverns and pubs* (60% of 48 users), *takeaway food* (48% of 50 users), *fuel* (40% of 62 users), and *medical and dental services* (40% of 61 users). *Theatre, arts and movies, clothing and footwear, household appliances* and *adult education/training* were rarely obtained locally, reflecting their very low local availability or non-existence.

Thus the data reveals significant leakage of mine-derived income from the area, not only because a significant proportion of the local mining workforce maintained a usual place of residence outside the 50 km radius, but also because the usual residents of the 50 km radius regularly expended income beyond its boundaries. For some goods and services such as *household appliances/furnishings* (28% of 61 users), *clothing and footwear* (24% of 59), *vehicle purchases and repairs* (22% of 59), *groceries* (21% of 63), and *fruit and vegetables* (18% of 62),

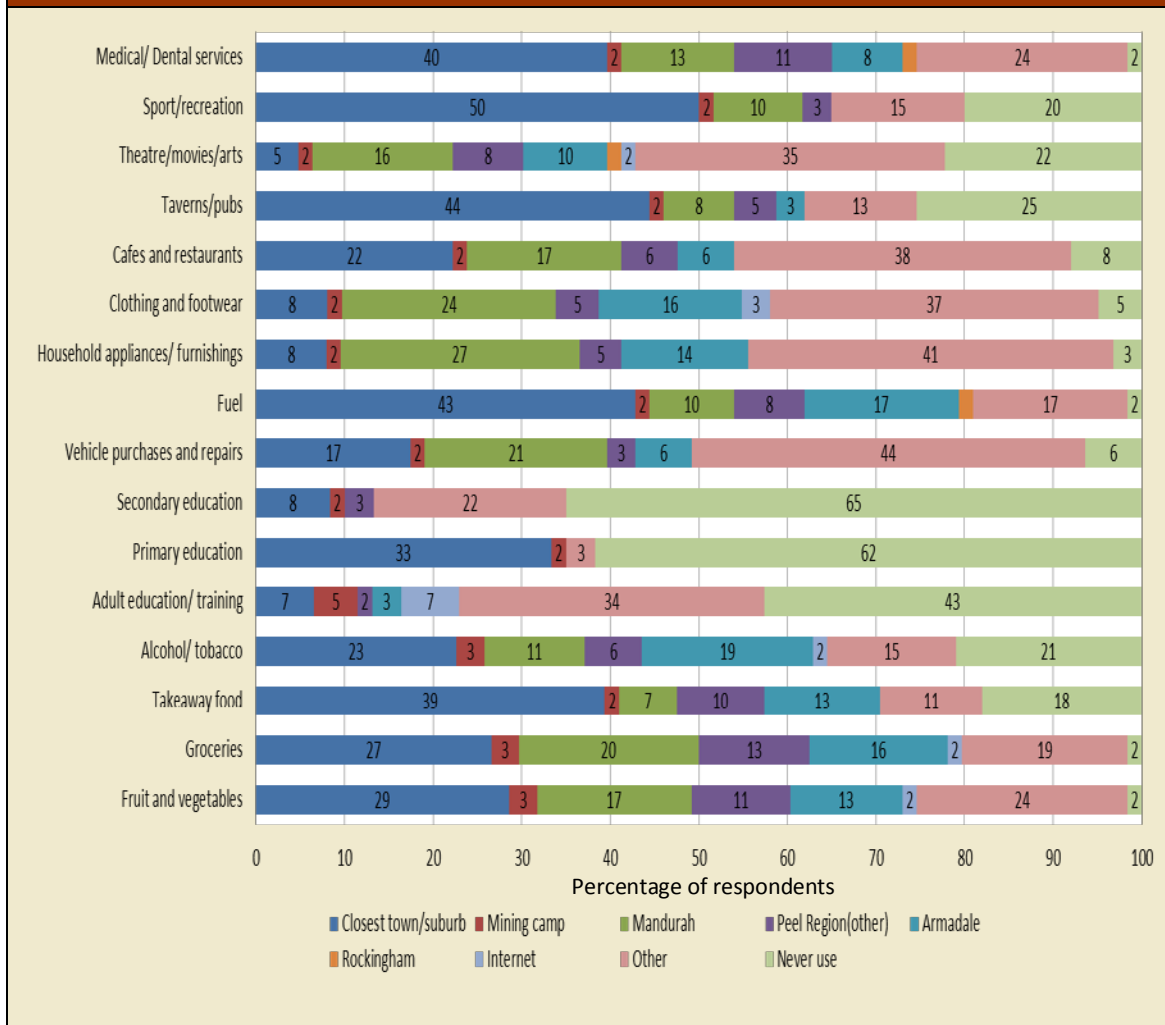
the leakage occurred into Mandurah, the main population centre of the Peel region. In the case of *groceries* (13% of users) *fruit and vegetables* (11% of 62), and *medical and dental services* (11% of 61), there was additional leakage into other parts of the Peel region.

Significant levels of expenditure by respondents who were usual residents within the radius also occurred outside of the Peel region. Armadale (the closest Perth metropolitan shopping precinct to Boddington, Wandering and Williams) was identified as the main locality for obtaining *alcohol and tobacco* by 49% of 49 users, *fuel* (18% of 62), *groceries* (16% of 63), *clothing and footwear* (17% of 59), *fruit and vegetables* (13% of 62) and *household appliances and furnishings* (15% of 61 users).

The largest number of residents within the 50 km radius usually obtaining a good or service from a locality identified as 'other' (ie. other than the closest suburb or town, Mandurah, elsewhere in the Peel region, or Armadale), was for *vehicle purchases and repairs* (47% of 59 users). Additional services frequently obtained from a locality 'other' than the above were *adult education/training* (47% of 35), *household appliances/furnishings* (43% of 61), *cafes/restaurants* (41% of 58), *theatre/movies and arts* (45% of 49), and *clothing and footwear* (38% of 59). Qualitative evidence gathered during interviews tells us that the particular locality represented by the category 'other' would not necessarily always be the same for each good or service under consideration. Although a significant proportion of expenditure would likely occur in the Perth metropolitan area, some would also occur beyond, (for instance where the respondent uses restaurants only when away on vacation). In the case of services such as *vehicle purchase and repair* the 'other' category likely includes both metropolitan suburbs and inland service towns such as Narrogin where a number of Boddington secondary students board (Hoath 2013b).

The range of goods and services never used by a proportion of usual residents of the Boddington 50 km Radius was also wider. Comparison of figure 49 above and 49a below reveals a disproportionate number of the cohort never using each of the following categories: *sport and recreation* (12 of 16 non users), *theatre/movies/arts* (14 of 15 non users), *cafes and footwear* (all of five non users), household appliances (all of two), and *takeaway food* (11 of 14). This indication that usual residents of the radius tend to expend their income on a narrower range of goods and services is consistent with anecdotal evidence recorded during semi-formal interviews by Hoath (2013a, b).

Figure 28. Residents in Boddington 50 km Radius
Locality most often used to source goods and services by percentage



49b. Main localities for expenditure by residents outside Boddington 50 km Radius.

The proportion of the cohort resident outside of the Boddington 50 km Radius who obtained goods *in the closest town or suburb* was generally higher and more consistent across the variables than was the case for the cohort resident within the radius. *Fuel* was again the good or service most frequently obtained locally by this cohort, (45% of 56 compared to 40% of the Boddington resident cohort).

A larger proportion of the cohort residing outside the radius most often obtained *groceries, fruit and vegetables* (39%), *café and restaurants* (38%), *clothing and footwear* (31%), and *vehicle repairs* (40%), locally than did the full survey sample. The proportion (27%), who most often obtained *dentist/ medical services* in the closest town or suburb was however lower.

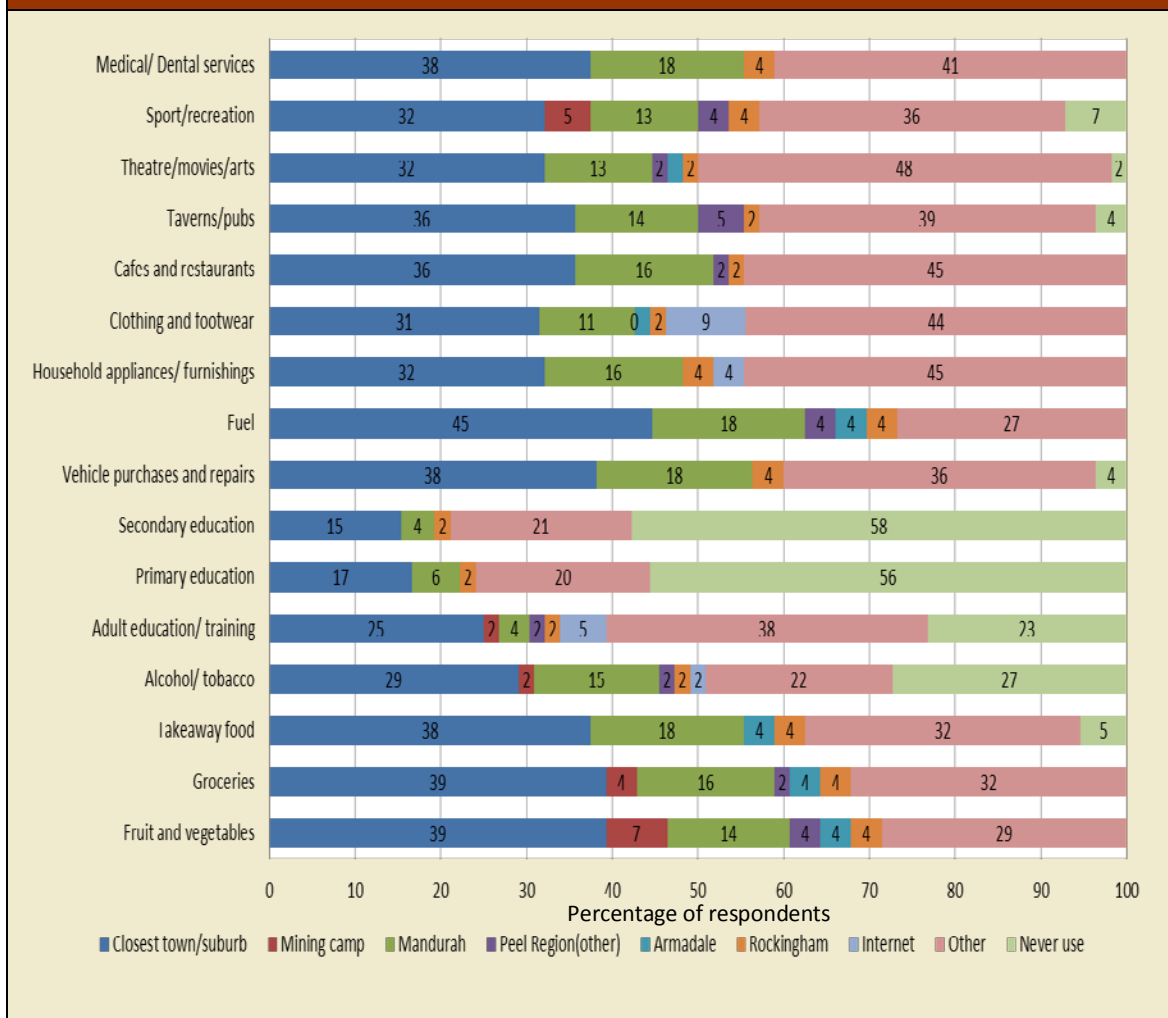
Secondary and primary education were again the goods and services least used by the cohort living outside the radius. *Adult education/training* was more frequently used (by 76%), but less often obtained from the closest town or suburb.

The data shows that, although a moderate amount of mining income earned within the Boddington 50 km Radius by the cohort residing elsewhere occurred in Mandurah, very limited

expenditure occurred in any other part of the Peel Region. The highest incidence was three for *taverns and pubs*. It is important to note that for this cohort, the 50 km radius falls within the category of ‘Peel Region (other)’. Thus the data is consistent with concerns expressed by residents of the radius during semi-formal interviews, that the majority who are employed in mining operations within the radius, but reside elsewhere, contribute very little to the local economy (Hoath 2013a, b).

Because of the wide geographic distribution of the cohort residing outside the 50 km radius, further analysis is being undertaken elsewhere to draw out the implications of expenditure data for other regions.

Figure 29. Residents outside of Boddington 50 km Radius
Locality most often used to source goods and services by percentage



50. How do each of the following influence where you shop for goods and services?

The number of respondents for each variable in question 50 varied from 119 to 115. The variables ranked most frequently as strongly influencing where the respondent shopped were: *I like choice* (74 of 116 respondents), *not the right goods and services in my town* (57 of 118 respondents), and *poor level of service in my town*, (49 of 119 respondents). When the categories 'strongly influences' and 'somewhat influences' are combined, *I like choice* remains the most significant, followed by *not the right goods and services in my town*. *I look for the least expensive* and *I like to shop on the internet* scored most frequently as issues of some importance. *Privacy issues, shopping nearby to work* and *I am in the habit of shopping elsewhere*, were of least influence. The relatively low preference for *shopping nearby to work* has significance for local goods and service providers hoping to attract the custom of a local workforce that resides elsewhere.

This question also attracted a significant number of comments expressing dissatisfaction with Boddington as a source of goods and services, in particular: the 'poor quality of service and fresh goods'; 'poor service (greed and poor salesmanship)'; lack of goods and services both generally, 'many goods and services NOT available in Boddington', and more specifically, as in 'there is nowhere to buy clothing, toys, horse supplies in Boddington'. There was frustration expressed at the inability to 'shop locally' for lack of a 'decent shop – I would use if there were'. One summed up:

whilst I would prefer to use either Boddington or Dwellingup, I find the customer service level at Boddington poor and prices overly high, apart from the roadhouse the shops are generally closed when I am at home making support of the local town difficult as I am out of the house 13hrs on a normal working day.

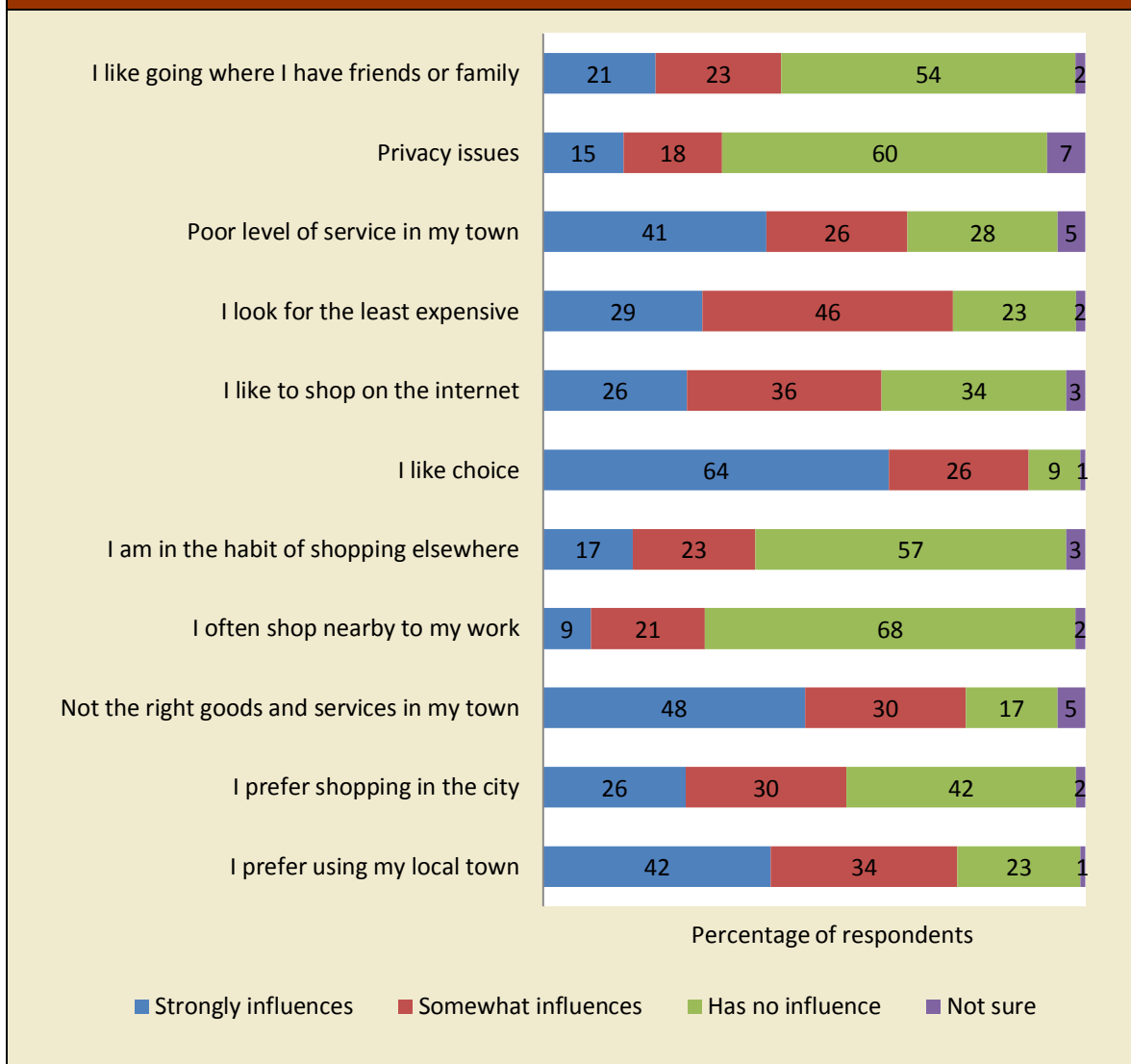
Another noted that: "Quality of product is also important and not listed above. Biggest factors for me in decreasing importance are: 1) choice/variety of goods/services 2) quality of goods/s 3) price of goods/s 4) service offered/s 5) distance to travel".

Other comments confirmed that travel distance was not the major obstacle, and conveyed an outward orientation to meeting needs: 'family shops in Perth, rarely go into Boddington now'; 'use IGA for small purchases. Go to Armadale for bigger shop as they have more variety', and 'visit Perth metro frequently and take advantage of shopping in our old Kelmscott precinct.'

Another underlines the mobility and spatial scale of service and support networks that typically sustain rural lives:

Residing in Perth at times for University purposes, otherwise the household will mostly shop where convenient, ie Williams, however should that good/service not be available then shopping will be undertaken in Perth or Narrogin. whichever is most convenient at the time.

Figure 30. Preferences for obtaining goods and services by percentage

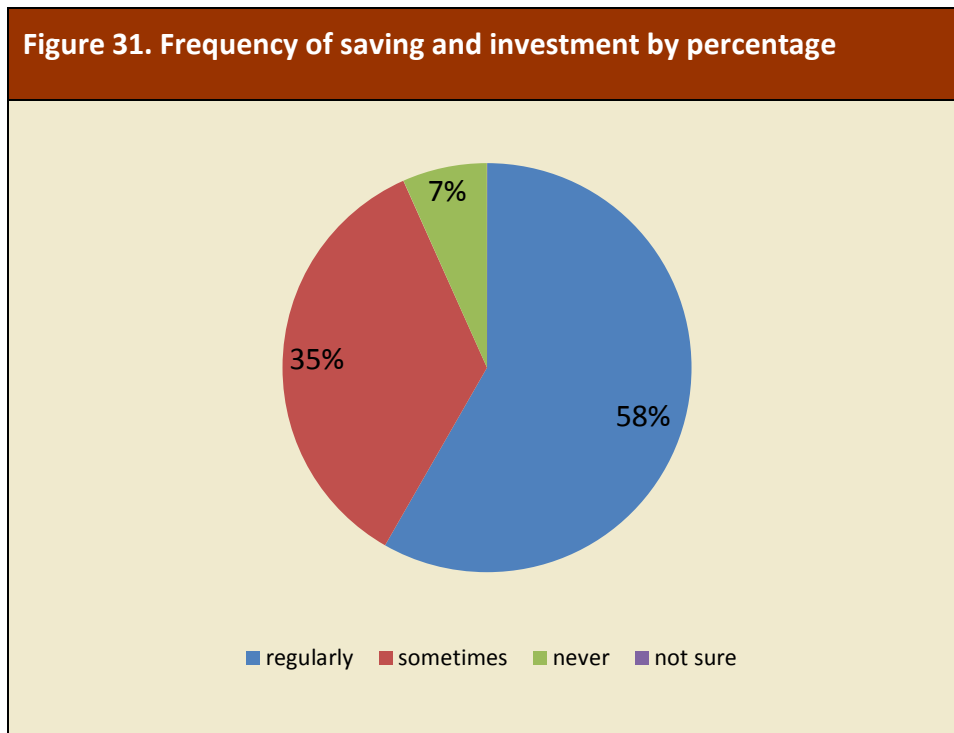


3.7. ECONOMIC SECURITY, PERSONAL AND NATIONAL WELLBEING

The final set of questions sought to establish the level of wellbeing and financial security currently experienced within the Boddington 50 km zone. To avoid potential identification of individuals from small sub samples, answers in dollar values were not sought.

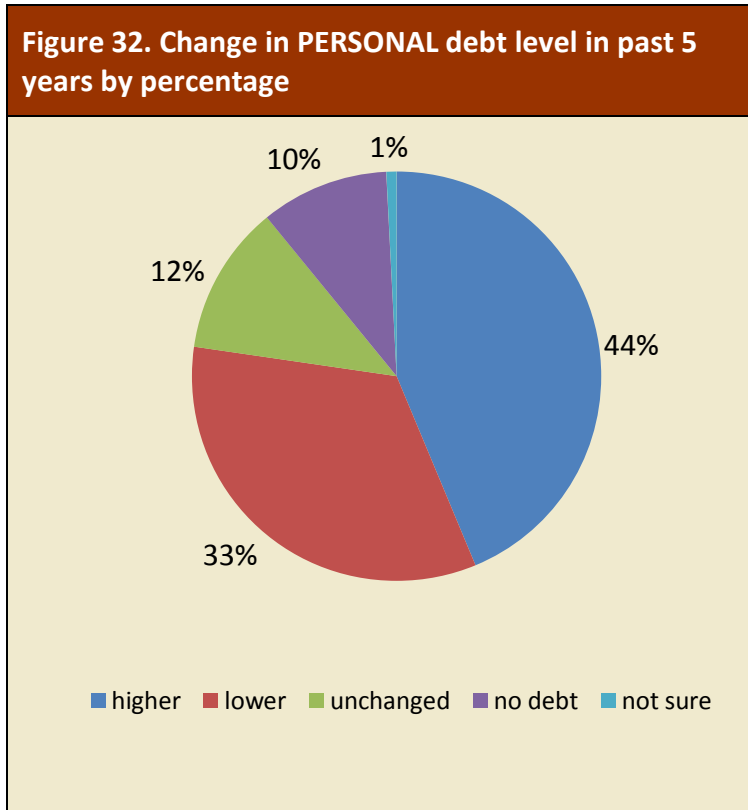
51. Do you regularly save or invest a portion of your income?

Of 120 respondents who completed the question, a significant majority 70 (58%) regularly saved or invested a portion of their income. A further forty-two sometimes did so. By contrast nine respondents (7%) never did.



52. Is your overall level of PERSONAL debt higher or lower than it was 5 years ago (house mortgage, car loan, hire purchase, credit card)?

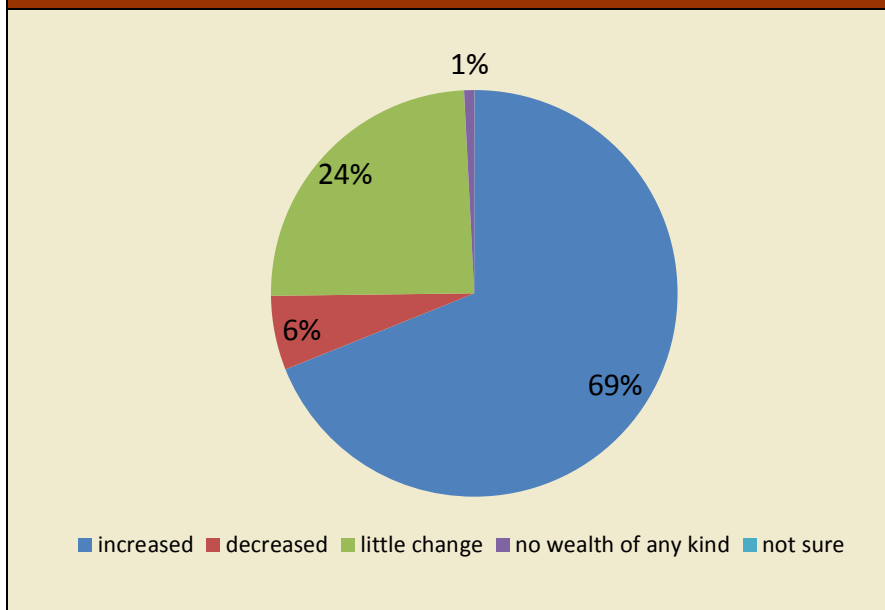
Of the survey sample of 119, the largest proportion 52 (44%) had a higher personal debt than they did five years ago. However just over a third, or 40 (34%), had less debt and 14 (12%) had experienced no change. One was not sure.



53. Has your overall level of PERSONAL wealth (ownership or equity in house, shares, etc.) changed over the past 5 years?

Of 119 respondents, 82 (69%) indicated an increase in overall wealth in the past five years. A further 29 (24%) had experienced little change while seven (6%) indicated a decrease and one had no wealth of any kind. Two comments elaborating the effects were provided: one referred to the effects of the GFC hitting pretty hard- but with a slow recovery occurring, and the other to increased wealth commensurate with land/house values since buying property several decades ago.

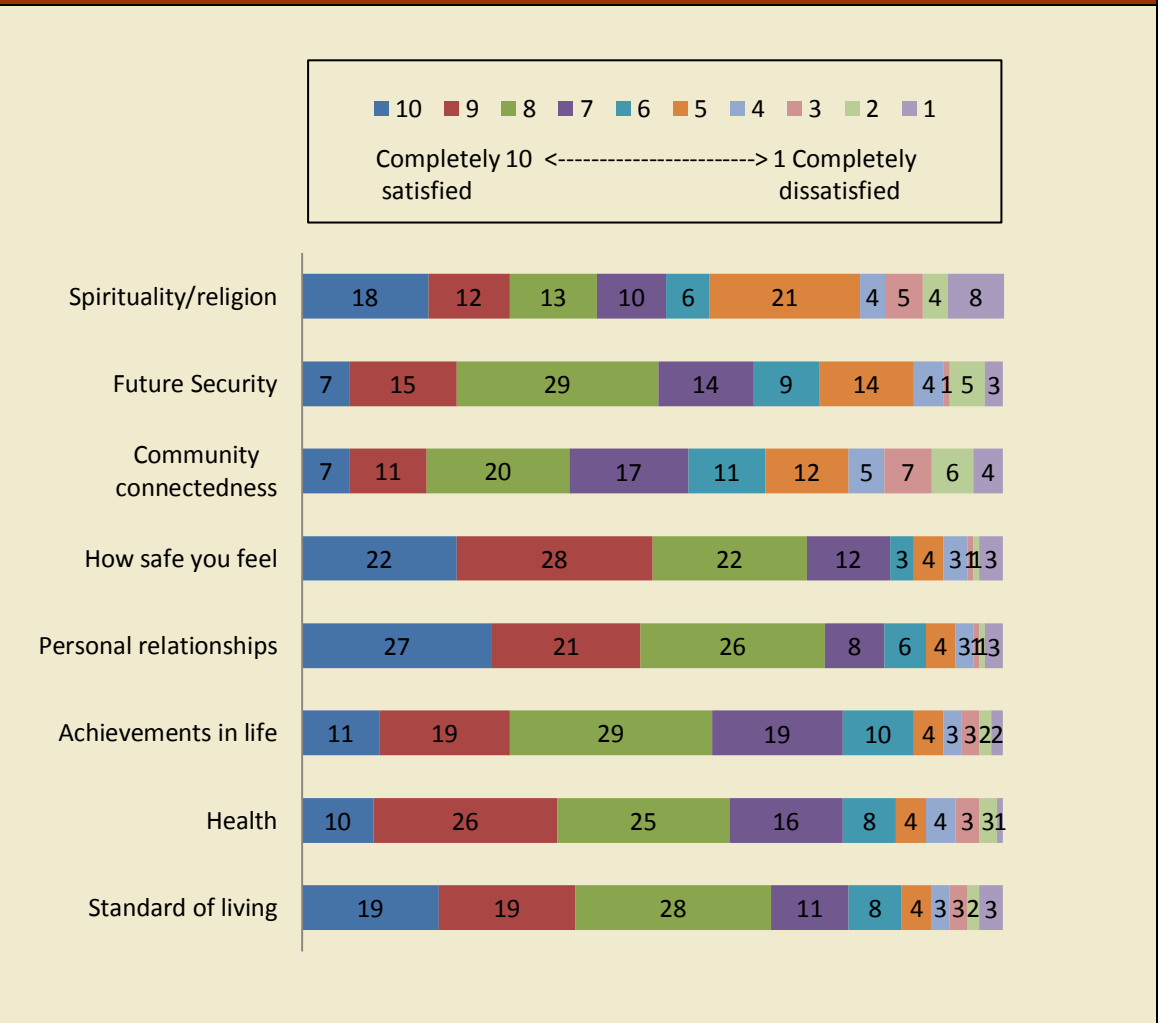
Figure 33. Change in PERSONAL wealth in the past 5 years by percentage



54. Thinking about your life, how satisfied are you with the following aspects? Rate each one on a scale of 1 to 10. 1 is 'completely dissatisfied'- 10 is 'completely satisfied'

Collated data at question 54 reveals that of 118 respondents, a substantial majority registered a level of satisfaction, rather than dissatisfaction, with most aspects of personal life. The most frequent score was eight for both *future security* and *achievements in life* recorded by 34 (29%) respondents. Thirty-three (28%), recorded a score of nine for *feelings of safety* and a score of eight for *standard of living*. Thirty-two (27%) indicated complete satisfaction (a score of ten) with their *personal relationships*. *Personal relationships* also received the most frequent number of scores (105 or 88% of the total) that were higher than five, closely followed by *feelings of safety* and *achievements in life* (103 or 86%), *standard of living* (101 or 85%), and *health* (100 or 84%). Only 12 and 13 respondents respectively indicated complete satisfaction (a score of 10) with *health* and *achievements in life* despite each variable's relatively strong average score. At the opposite end of the register, 47 of 112 (39 %) gave *spirituality/religion* a score of five or less, as did 40 of 118 (34%) for *community connectedness*, and 31 of 118 (26%) for *future security*.

Figure 34. Scale of personal satisfaction by percentage, where 10 is completely satisfied and 1 is completely dissatisfied



54a. Boddington Radius Workforce and Resident (BRWR) Personal Satisfaction Index

Following the Australian Unity Index model (discussed in more detail at Section 2.3), a BRWR Personal Satisfaction Index with a value of 72.7 has been calculated.⁶ The BRWR Index can serve as a baseline for subsequent comparative measurement of the subjective wellbeing of resident and workforce populations in the Boddington 50 km Radius at different stages in the cycle of the expanded mining operations in the region.

The mean score for the BRWR Personal Satisfaction Index is low compared to the Australian Unity Personal Wellbeing Index that was measured at 76.2 % in April 2011 (see Appendix C) and has an historical range of between 73.7% and 76.7%, (Cummins et al. 2010). Although any such comparison must be treated with great caution for methodological reasons explained more fully at Section 2.2, a BRWR Personal Satisfaction Index lower than a fully equivalent national index, would be consistent with published Australian Unity wellbeing trends. Scolaro (2012), for example, draws attention to lower than average capital city wellbeing indices reported for Perth and Sydney in the Australian Unity (November 2010) publication, “What Makes Us Happy”. Reasons posited for the low score in Perth include its relative isolation, and a level of mining boom population transience that is un conducive to building cohesive communities. These variables also have salience in the Boddington 50 km Radius.

The disproportionate representation of males in the BRWR survey sample could also predict a BRWR Personal Satisfaction Index that is lower than would be the case if the sample included equal proportions of male and females. Cummins et al (2003) indicated the individual homeostatic set-point, around which wellbeing fluctuates in response to external considerations, appeared on average lower for males than females, although subsequent contradictory findings suggest that gender differences are survey and variable dependent (Cummins et al. 2010; 2008).

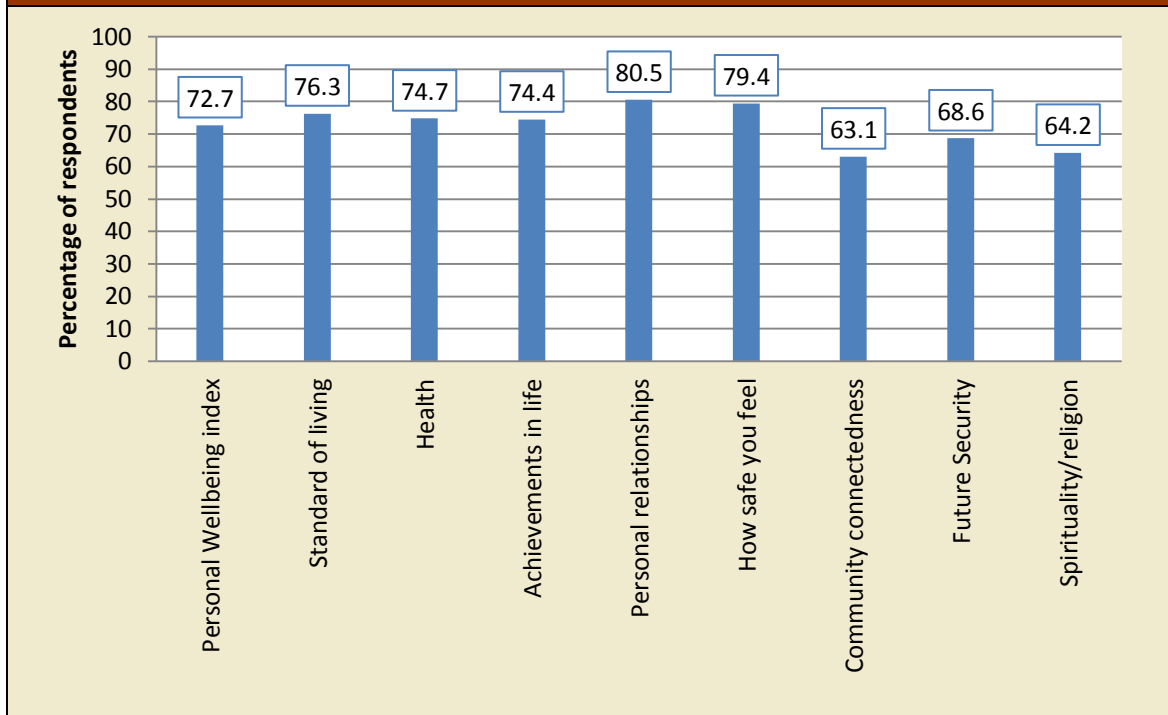
Within the above constraints, it is also interesting to examine the distribution of values across the ‘aspect of life’ domains. The profile of the BRWR Personal Satisfaction Index below demonstrates a similar profile to that of the Australian Unity Personal Wellbeing Index 2011 (see Appendix C). *Personal relationships* (80.5 and 79.2 respectively) and *feeling safe* (79.4 and 80.9 respectively) are the two highest scoring domains in both Indices, with *community connectedness* similarly the lowest scoring in both. However the score for *community connectedness* in the BRWR Index is 63.1 compared to 72.1 in the Australian Unity Index, and the resulting variation between its highest and lowest scores, is much greater at 17.4 points.

BRWR Personal Satisfaction Index scores for the aspect of life domains, *standard of living* (76.3%), *health* (74.7%) and *achievements in life* (74.4%) are also higher than the mean of 72.7%. Scores for *spirituality and religion*, (64%) and *future security* (68%) domains are below the mean. The Australian Unity Index 2011 domain, *standard of living* is similarly higher than the mean, but so is *spirituality and religion* while *future security* is similarly lower. In contrast to the BRWR Personal Satisfaction Index, *health* and *achievements in life* are also below the

⁶ The BRWR scale of satisfaction is calculated as a ranking from 1-10, where 1 is completely dissatisfied and 10 is completely satisfied. TOTAL SCORE =(total number of responses of 10x10)+(total number of responses of 9x9)+(total number of responses of 8x8)+(total number of responses of 7x7)+(total number of responses of 6x6)+(total number of responses of 5x5)+(total number of responses of 4x4)+(total number of responses of 3x3)+(total number of responses of 2x2) +(total number of responses of 1x1). Aspect of life Index = (TOTAL SCORE/ MAXIMUM SCORE) x 100.

mean in the Australian Unity Personal Wellbeing Index 2011. Again such comparisons can only be treated as indicative.

Figure 35. Boddington Radius Workforce and Resident (BRWR) Personal Satisfaction Index by percentage



54b. Usual Residents of Boddington Radius Personal Satisfaction Index

A separate Usual Residents of Boddington Radius (URBR) Personal Satisfaction Index (see below) has also been calculated by the method described at 54a. The URBR Personal Satisfaction Index (73.9%) is 1.2 percentage points higher than the BRWR Personal Satisfaction Index. In other words, people living within the radius had, in mid-2012 on average, a higher sense of satisfaction than those working in the radius but living elsewhere.

The overall profile of the URBR Personal Satisfaction Index is broadly similar to that of the BRWR Personal Satisfaction Index. All five aspect of life domains that score above the mean in the BRWR, also score above the mean in the URBR Personal Satisfaction Index. These are *achievements in life*, *personal relationships*, *how safe you feel*, and *standard of living and health*. Two of these five domains score significantly higher in the URBR Index. The *personal relationships* domain score is 82.1% in the URBR, 1.6 points higher than its BRWR score, warranting further analysis. *How safe you feel* (83.5%) is the highest scoring domain in the URBR, a significant 4.1 percentage points higher than the BRWR score. This score accords with the very low recent crime rate reported for Boddington (PDC 2012). *Health* (74.7/74.4%) and *spirituality/religion* (64.2/64.4%) have almost identical scores in each index.

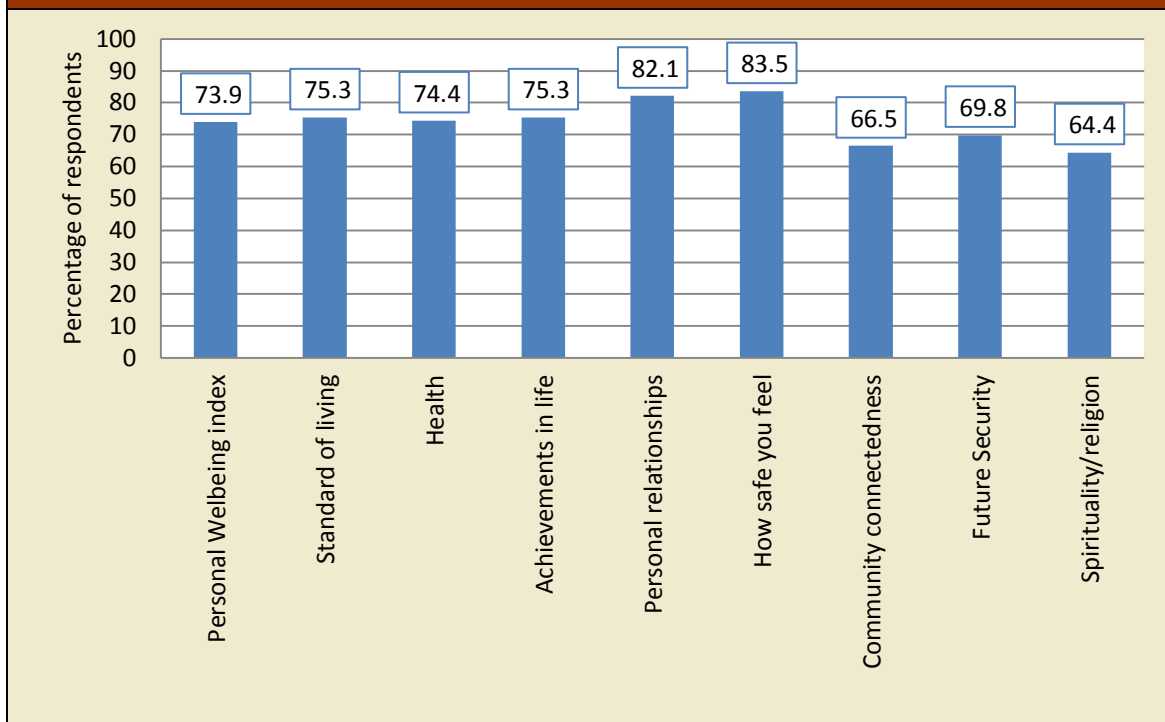
Community connectedness, *future security* and *spirituality and religion* score below the mean in both indices. However *community connectedness*, the lowest scoring domain in the BRWR

Personal Satisfaction Index, gains a significant 3.4 percentage points and moves to the second lowest position above *spirituality and religion* in the URBR.

Satisfaction with the *standard of living* domain is one percentage point lower in the URBR Personal Satisfaction Index than in the BRWR Satisfaction Index. The difference is likely influenced by at least two factors identified through this survey: firstly the occurrence of a small number of low income earners in the URBR sample in contrast to the dominance of high income mining sector employees in the BRWR sample, and secondly, the low level of goods and services currently available within the radius.

The low ranking of community connectedness in the personal satisfaction indices warrants further examination elsewhere as it echoes a persistent theme in running through qualitative data collected by Hoath (2013a, b) and elsewhere in the literature (Petkova et al. 2009) that block shifts, long rosters and long distance commuting undermine capacity for group activity and volunteerism in communities where mining is a dominant employer.

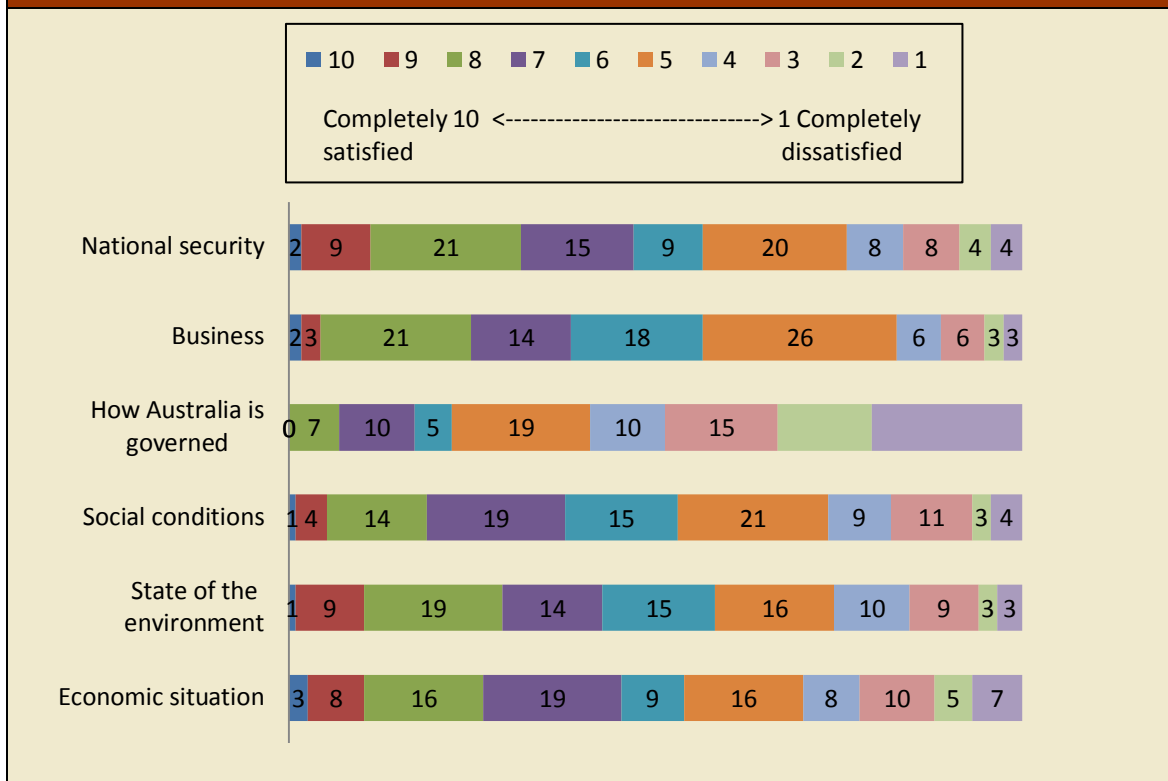
Figure 36. Usual Residents of Boddington Radius (URBR) Satisfaction Index Personal Satisfaction by percentage



55. Thinking about the nation, how satisfied are you with the following aspects? Rate each one on a scale of 1 to 10. 1 is 'Completely dissatisfied' ----- 10 is 'Completely satisfied'.

Data generated by question 55 indicates a generally lower degree of satisfaction among the survey sample with aspects of nation life than with aspects of personal life. The most frequent score was five recorded by 31 respondents for *business*. No more than three respondents (*economic situation*) were completely satisfied with any aspect of life in the nation. No one was completely or very satisfied with *how Australia is governed*. A total of 68 respondents (58%) gave the *state of the environment* a score of six or more, as did 66 (56%) for *national security*, 63 (54%) for *business*, and 62 (53%) for both the *economic situation* and *social conditions*. Conversely 24 (21%) were 'completely dissatisfied' with *how Australia is governed*. This aspect was the most poorly rated overall with only 26 (22%) expressing any level of satisfaction rather than dissatisfaction by recording a score of six or higher.

Figure 37. Boddington Radius Workforce and Residents (BRWR) satisfaction level by percentage, where 10 is completely satisfied and one is completely dissatisfied.



55a. Boddington Radius Workforce and Resident (BRWR) National Satisfaction Index, and Usual Residents of Boddington Radius (URBR) National Satisfaction Index

Comparable Boddington Radius Workforce and Resident (BRWR) National Satisfaction, and Usual Residents of Boddington Radius (URBR) National Satisfaction indices have also been calculated by the method described at 54a. Mean scores for the national satisfaction are lower than for personal satisfaction in both cases (54.8% and 55.8% respectively), although the URBR National Satisfaction Index is 1 percentage point higher than the BRWR National Satisfaction Index. This variation between the groups possibly reflects a trend identified in Australian Unity Indices (Cummins et al. 2003), that on average, 'people in country areas were more satisfied with their personal lives than city-dwellers, but less satisfied about the national situation'. However Cummins et al (2003) also cautions that in the case of the Australian Unity Wellbeing Indices, mean satisfaction scores for aspects of national life are much more volatile than mean scores for personal aspects.

Another notable feature in the BRWR National Satisfaction Index is the wide variation (21 percentage points) in mean scores between the domain *how Australia is governed* (38.5%) and the remaining domains, which occupy a quite narrow range between 56.8% and 59.5%. The lowest score within in this upper band is 56% for the aspect of national life domain, *social conditions*.

When represented in column charts below, the profiles of the BRWR National Satisfaction Index and the URBR National Satisfaction Index appear quite similar. Although mean scores for domains in the URBR National Satisfaction index are generally slightly higher, the variation between the domain *how Australia is governed* (41.6%) and all other domains remains similarly wide in the URBR National Satisfaction Index.

However it is also notable that the satisfaction score for the *social conditions* domain, which is higher than the mean of 54.8% in the BRWR National Satisfaction Index, is below the mean in the URBR National Satisfaction Index, indicating a relatively lower level of satisfaction with social conditions at the national level among usual residents of the radius.

Although direct comparison is precluded, reference to the Australian Unity National Wellbeing Index 2011 (as represented at Appendix C), reveals a similar profile to the satisfaction indexes from survey data represented below. Although mean scores in the Australian Unity Index are higher, variation between *how Australia is governed* and all other indicators is pronounced, suggesting that the satisfaction levels recorded in the BRWR National Satisfaction Index are consistent with the national mood. However satisfaction with the *social conditions* domain is relatively stronger in the Australian Unity Index 2011 than in either of the two satisfaction indices developed here, again suggesting scope for further analysis.

Figure 38. Boddington Radius Workforce and Residents (BRWR) National Satisfaction Index. Satisfaction with aspects of national life

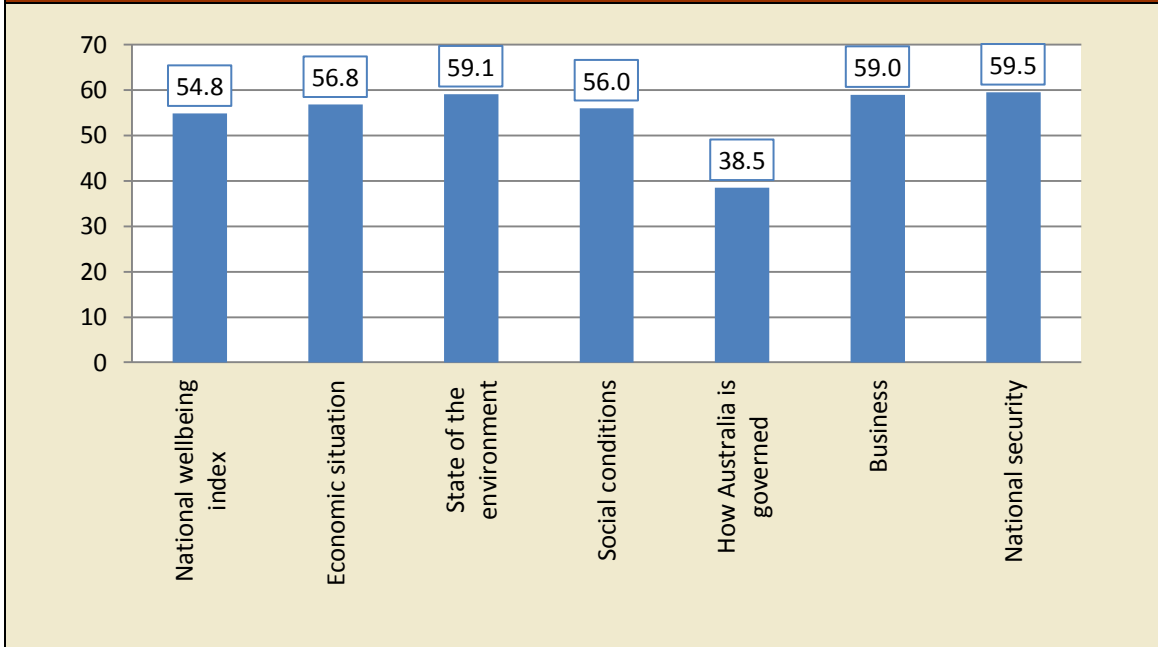
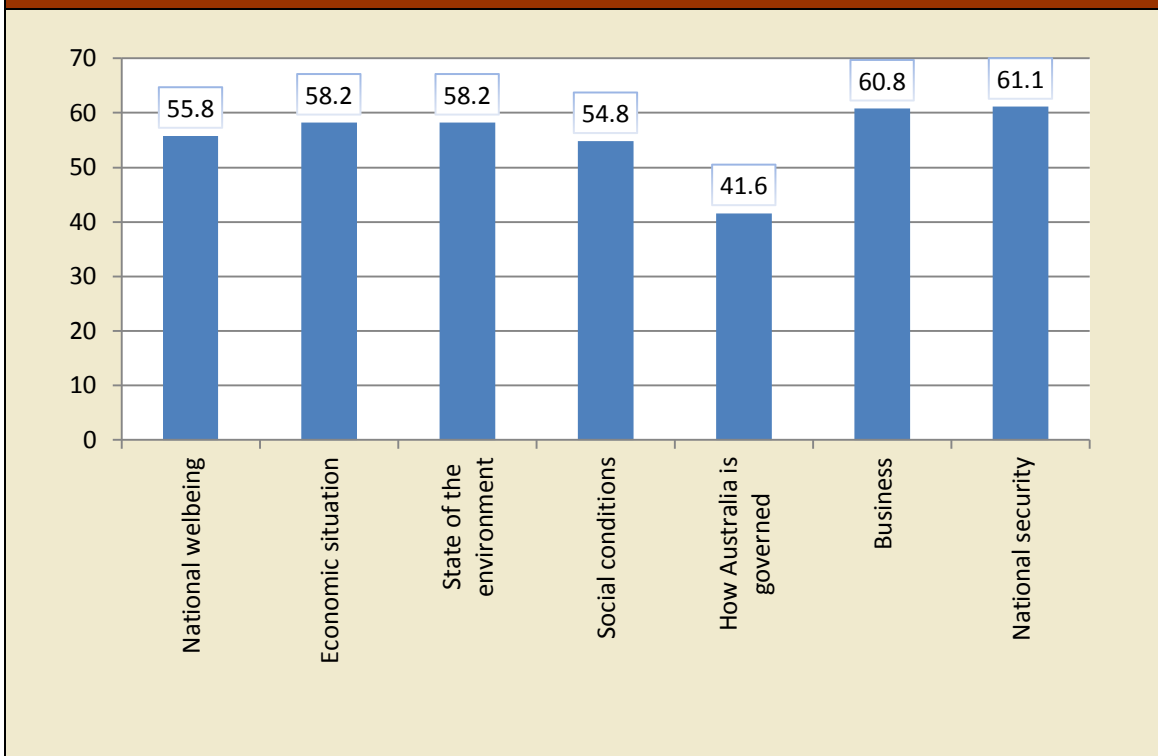


Figure 39. Usual Residents of Boddington Radius (URBR) National Satisfaction Index



4. DISCUSSION AND RECOMMENDATIONS

The RiT project spanned a period during which both the strengths and vulnerabilities of Australia's resource dependent economy were highlighted, firstly, through the relative ease with which both the nation and its 'resource states' negotiated the global financial crisis, and then more recently, through new uncertainties associated with major project delays, uneven contraction of the mining workforce, softening iron ore prices and falling confidence in the resilience of China's economy. Data collected through the mixed-method approach adopted by the Boddington 50 km Radius component of the RiT project, suggests that managing for the pace and scale of change associated with all stages of large export oriented mineral extraction projects and beyond, is especially challenging for small host and proximate communities and local governments.

Several aspects of the Boddington 50 km Radius case made it especially interesting for inclusion in a comparative study of traditionally agrarian areas transitioning to mining economies. The first was that the current expansion of export-oriented mining projects within the radius represented just one of a number of identifiable drivers contributing to rapid but unevenly distributed demographic, economic and socio-cultural change within the Peel Region. Proximity to the Perth metropolitan area, affordable housing developments and lifestyle amenity have each contributed to rapid population growth, increased population density and urbanisation centred on the coastal city of Mandurah and the surrounding coastal strip. By contrast, a range of market and policy pressures have contributed to the declining importance of the established economic base within the sparsely populated Boddington 50 km Radius. These circumstances have made the outcomes of NBG's ambitious proposal to employ a predominantly local workforce, with a targeted 65% of its permanent staff living within 50 km of the mine, especially interesting to study. The survey findings documented in this report contribute to understanding how the broader dynamics driving export oriented mining operations within the radius, are being played out and experienced at the local level:

Population growth and workforce participation

Despite cooperative efforts by the state, regional and local government administrations and the NBG to strengthen local infrastructure and facilitate the growth of a local mine workforce (ECS 2008; PDC 2008), the objective has been difficult to achieve. By 2012 an influx of NBG employees had contributed to significant population growth within the Boddington 50 km Radius. However the percentage of the company's workforce resident within the radius was approximately a third of that originally targeted. Population growth within the radius attributable to an influx of mining personnel has also been greatest within the Shire of Boddington, and more particularly within the near vicinity of the town.

The expansion of mining activity has nevertheless provided new employment opportunities at higher wage and salary scales than those offered by other sectors operating in the area, as evidenced in a higher median income recorded for the Boddington LGA than for other LGAs in the Peel region (ABS 2011a). There are indications however that the distribution of this benefit within the radius has been uneven. Consistent with Measham and Reeson's (2011) finding that the income disparity initially increases in mixed local economies as mining employees begin to move in, the range between the highest and lowest wage and salary brackets within the Boddington Shire is much greater than elsewhere within the Peel Region (ABS 2011a).

The survey data also reveals a gender bias in income earning capacity within the mining industry with the median female income falling well below the median male income for the survey cohort. This can be explained to some extent by the disproportionate representation of

males in technical/ trade positions and of females in clerical positions as well as the lower participation rate of women in full time positions. Poor representation of female mine employees in the highest wage brackets also points to their low level of participation in the more senior management positions. These effects on employment opportunities and income parity within the radius are important to understand as they have the potential to alter the existing social dynamic and inform new tensions and expressions of social stratification or differentiation.

Evidence collected through semi-formal interviews also indicated considerable drift at the local level by professional, skilled and semi-skilled personnel from other sectors into mining. While the transferring individuals have typically gained a higher income, government agencies and small to medium businesses have, reportedly, experienced greater difficulties in recruiting and retaining qualified employees (Hoath 2013a, b). The survey has explored this complex issue only tangentially. However, examination of the current employment status of the small cohort of respondents who are long term residents of the radius, does reveal that a significant proportion across the range of ages, are now employed at NBG or by other local mining operations or contractors. This finding is consistent with the relatively low unemployment rate within the Shire of Boddington in 2011 compared to both the Peel Region and regional Western Australia (PDC 2012). At the same time, gaps between corporate requirements and the local skill sets mean that 'employ local' policies do not translate directly into employment opportunities for all locals. There are young adults who have lived in the area all their lives who indicate an as yet unfulfilled interest in obtaining employment in the mining industry.

Rural land use and employment in mining

The survey reveals linkages between local land use change and mining that extend beyond the formal constraints imposed on land incorporated into mining tenements and buffer zones. At least two trends impacting agricultural productivity are evident. The first, which emerged most strongly in interview data, is that a considerable number of individuals, who are members of families with a history of land ownership and farming within the radius, are now deriving income from off farm employment in mining. Although the survey sample for the cohort was too small to be definitive, the indications are that mining has allowed some family units to maintain land ownership and/or a rural lifestyle and residence on a farming property that has been leased out or placed under alternative management arrangements. Other individuals currently combine a mining income with ongoing farming operations that would otherwise be unviable.

The second identifiable land use trend is that many mining employees who have recently opted to live locally are demonstrating a preference for semi-rural lifestyles on small landholdings. This trend extends a 'tree change' effect that has been evident for several decades in select parts of the radius where retirees and others have relocated for lifestyle considerations. While the trend provides potential benefits for well-located landholders to subdivide, it also exerts inflationary pressure on agricultural land prices, reduces supply of agricultural land, and generates new demands for infrastructure and scarce resources such as water supply that are still being debated and negotiated.

The above trends occur within a context of ongoing structural change in the agricultural sector, as individuals adjust and respond to the complex influences of global markets, economic rationalist policy frameworks, the vagaries of weather and other environmental stresses. They have implications for the sustainability and longer-term significance of agricultural productivity within the radius during and beyond the span of current mining operations. These issues are made more contentious by their location within wider debates or discourses concerning climate change, food security, and appropriate global marketing mechanisms.

Although the Peel Development Commission recognises the vital importance of the mining industry to the development of the Peel Region, it has increasingly emphasised the risks inherent in a narrowing regional economy heavily exposed to global market forces, and the need for economic diversity as the key to sustainability (PDC 2012). The two trends discussed above indicate that the recent expansion of mining activity within the radius has contributed in the short term to the improved retention of its existing rural population, as well as stimulating in-migration and the transformation of rural land. It is unclear however whether such transformations could remain self-sustaining without the injection of mining income. Skilful adaptive management and planning processes involving all levels of government will be necessary if these trends are to be harnessed as a foundation for the enduring liveable hubs within the radius that local authorities currently aspire to.

Live local/DIDO hybrid solutions

The continued reliance of NBG and other local mining operations on a predominantly DIDO workforce has had a number of consequences for local communities. One, which emerged in interviews and was confirmed through the survey, is an increase in light vehicle traffic generated by DIDO employees commuting on narrow rural roads and through several local town-sites. This is felt to impinge on both safety and quality of life. However, survey data suggests that the achievement of a predominantly local workforce sufficient to support the current scale of the NBG operation is unlikely due to a combination of structural constraints and individual agency. The greater proportion of the non-resident survey cohort reported no recent interest in relocating to the 50 km radius.

Responses from those interested in living closer to their work underline for companies, local government authorities and relevant agencies the importance of providing or facilitating the timely availability of suitable affordable housing. They also suggest that in the immediate future at least, the percentage of the mining workforce choosing to live in Boddington in particular is likely to increase gradually as accommodation options increase. The limited range of employment opportunities available to spouse nevertheless seems likely to remain a constraining factor.

The evidence that a high proportion of non-resident respondents have no interest in relocating to their place of work provides a cautionary message for government authorities and companies promoting the potential benefits of a localized mining workforce as the basis for a social license to operate. However hybrid solutions that anticipate from the outset the need for a diverse range of local accommodation and long distance commute options, could alleviate some of the inconveniences and unrealised expectations currently experienced by local communities.

Likewise, data indicating the ongoing, if less pronounced, movement of people into the area during the period when the goldmine was in care and maintenance, underline the presence of a cohort that have been attracted to parts of the radius for values other than the employment opportunities associated with mining. As Solomon et al (2008) acknowledge, for such people mining may have very little of value to offer, again suggesting the need for governments at all levels and mining companies to work carefully to minimize unintended threats to alternative livelihood and lifestyle opportunities in communities exposed to the influences of large scale mining operations. The challenges inherent in such an approach are considerable.

Income expenditure patterns

Despite the demonstrated increase in the level of disposable income within the Boddington 50 km Radius attributable to local mining activity, the economic benefit from income expenditure is widely dispersed, with income expenditure leakage from the area occurring quite rapidly.

There are several contributing factors. The first is the heavy reliance on a DIDO workforce. Members of the DIDO cohort, regardless of whether they commute from outside the radius on a daily basis, or reside in the NBG mining camp during rostered work blocks and commute home for furlough, spend very little of their income within the radius.

Local expenditure by local residents is uneven across the range of goods and services, and generally quite limited. On average, residents of the radius also expend their income on a more limited range of goods and services than do those who work locally but live elsewhere. Income expenditure by local residents on both everyday goods and discretionary items flows to the more urbanised parts of the Peel region, especially Mandurah. It also flows to Armadale, the closest major metropolitan shopping area and to other unspecified areas. There are several factors at work. For NBG, the relative proximity of the Boddington 50 km Radius site to the Perth metropolitan area and urbanising coastal strip was a factor influencing the decision to facilitate a predominantly residential mining workforce. Yet the survey data indicates that this same characteristic also, and somewhat paradoxically, makes it viable, not only for workers to live elsewhere, but for local residents to travel elsewhere for goods and services, thereby inhibiting the growth of local businesses. Further, the need to travel elsewhere for specific items or specialist services, often means that everyday goods are purchased at the same time, even when available locally. These findings have implications for policy makers and corporations promoting mining activity as a potential economic stimulus for local small to medium business. They suggest a need for very careful projections regarding the critical population mass necessary to sustain specific enterprises in specific localities.

Satisfaction with personal life and life in Australia

The satisfaction indices (see Section 3.3) produced for Boddington Radius Workforce and Residents (BRWR) and for the subset, Usual Residents of Boddington Radius (URBR), revealed several interesting differences. The URBR cohort recorded a higher overall level of satisfaction with personal life than did the BRWR. Both cohorts were on average quite satisfied with achievements in life, personal relationships, feeling safe, standard of living, and health. However of the two subsets, the URBR had the higher level of satisfaction with personal relationships and feeling safe, and the lower level of satisfaction with standard of living. Both groups were less satisfied with community connectedness, spirituality and religion and future security but the URBR level of satisfaction with community connectedness and future security was the higher of the two.

5. CONCLUSION

Survey data relating to the Boddington 50 km Radius case study reveals that during the RiT project period (2009-2012), the construction and early operational phases of the re-commissioned and vastly expanded NBG project, and simultaneous expansion of local bauxite mining operations, triggered a complex range of interrelated effects on the existing socio-economic fabric sustaining proximate towns, communities and individuals. Despite efforts by government at all levels to work collaboratively with NGB to anticipate and manage change for the mutual benefit of the company and local interests, a number of quite critical objectives relating to the economic wellbeing of the radius were overwhelmed by the pace, scale and volatility of developments. The most apparent unanticipated outcome has been NGB's ongoing reliance on a predominately DIDO workforce. The survey demonstrates that this development has significantly reduced the potential economic benefit accruing locally. However, close analysis of change occurring across several key indicators, namely, patterns of workforce participation, land use, income expenditure and life satisfaction, reveals that workforce arrangements are just one element in a complex set of motivations, actions and relationships contributing to the uneven distribution of economic benefits from local mining operations at both the LGA and regional level.

The particularities of the case mean that this report is perhaps of greatest relevance to those most intimately involved in the future wellbeing of the Boddington 50 km Radius, both during, and beyond the life of current mining operations. However the survey also investigates and confirms the possibility raised by Haijkowicz et al (2011) that the quantifiable benefits of mineral wealth they consistently identify across 71 mining LGAs may "mask highly localised inequalities and disadvantage". The detailed account it provides concerning the uneven effects of particular mining operations within and beyond one host region, also serves to illuminate the temporally specific economic trends in mining LGAs that Measham and Reeson (2011) identify from ABS statistical data. In this way the findings of the Boddington 50 km Radius Case Study reported here, make a timely contribution to the wider literature concerning the socio-economic implications of mining in regional Australia, and demonstrate the value of end-to-end research synergies that can produce a coherent multi-scaled story.

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APPENDIX A**Survey cover page:**Boddington Radius: land use, workforce & expenditure patterns

Are you 18 YEARS of age or more, and do you currently WORK OR LIVE within approximately 50 KM of BODDINGTON, (i.e. Boddington Shire, Dwellingup, Wandering, or Williams)? If so we would like you to participate in this survey.

The survey is seeking information about changing patterns of workforce participation, changing patterns of rural land use, income and expenditure flows and cross-sectoral influences between mining and agriculture within approximately 50 km of Boddington in the Peel Region of Western Australia.

The survey will take between about 15 and 30 minutes to complete. Questions marked with an asterisk are required. You are not asked to provide your name or any other personally identifying information and may exit the survey at any time.

The survey is part of the 'Boddington 50 km Radius Case Study' being undertaken by Dr Aileen Hoath of Curtin University. The case study is one of three studies being undertaken across Australia by the Regions in Transition Project (RiT) located in the Curtin Graduate School of Business and managed by Professor Fiona McKenzie.

The RiT project is investigating the challenges and opportunities for agricultural regions and local communities within Australia that are experiencing new and expanded mining operations. The selection of the Boddington 50 km Radius for one study was influenced by the recent recommissioning and expansion of the Newmont Boddington Goldmine. Other mining companies also operate in the study area.

The RiT project sits within the larger CSIRO Minerals Down Under Research Flagship.

This survey conforms to the ethics standards of Curtin University. All data collected will be managed in accordance with University guidelines to protect the anonymity of individual participants. Any publications incorporating aggregated survey results and analysis will be publically available.

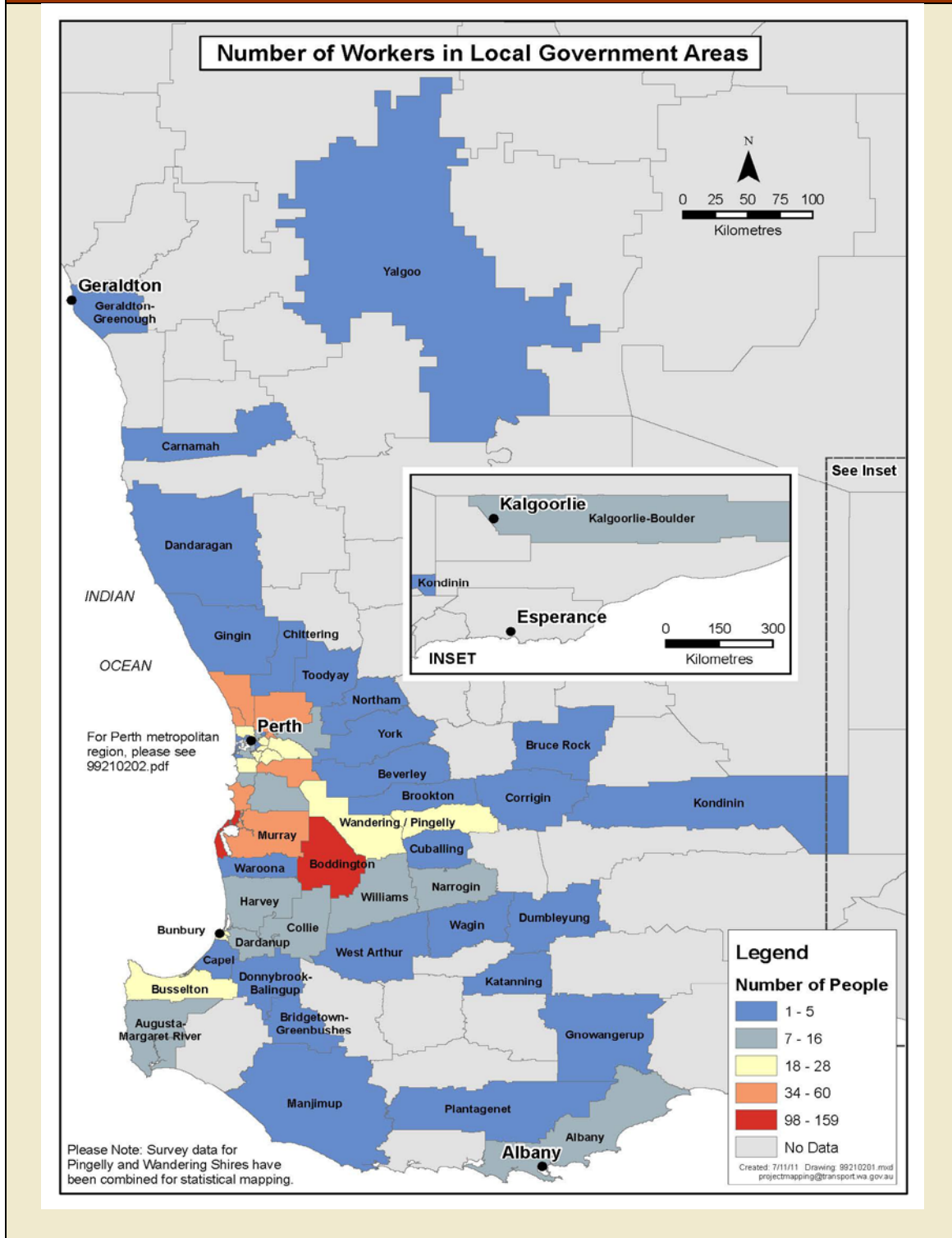
SUBMISSION OF THE SURVEY WILL BE UNDERSTOOD AS CONSENT FOR ANY DATA PROVIDED TO BE USED AS DESCRIBED ABOVE.

Further assistance or information about the RiT project, the survey and its outcomes can be obtained from Dr Aileen Hoath, Curtin Graduate School of Business.

Dr Aileen Hoath
Curtin Graduate School of Business
Curtin University
Email: A.Hoath@curtin.edu.au
Ph.: 08 9266 1157

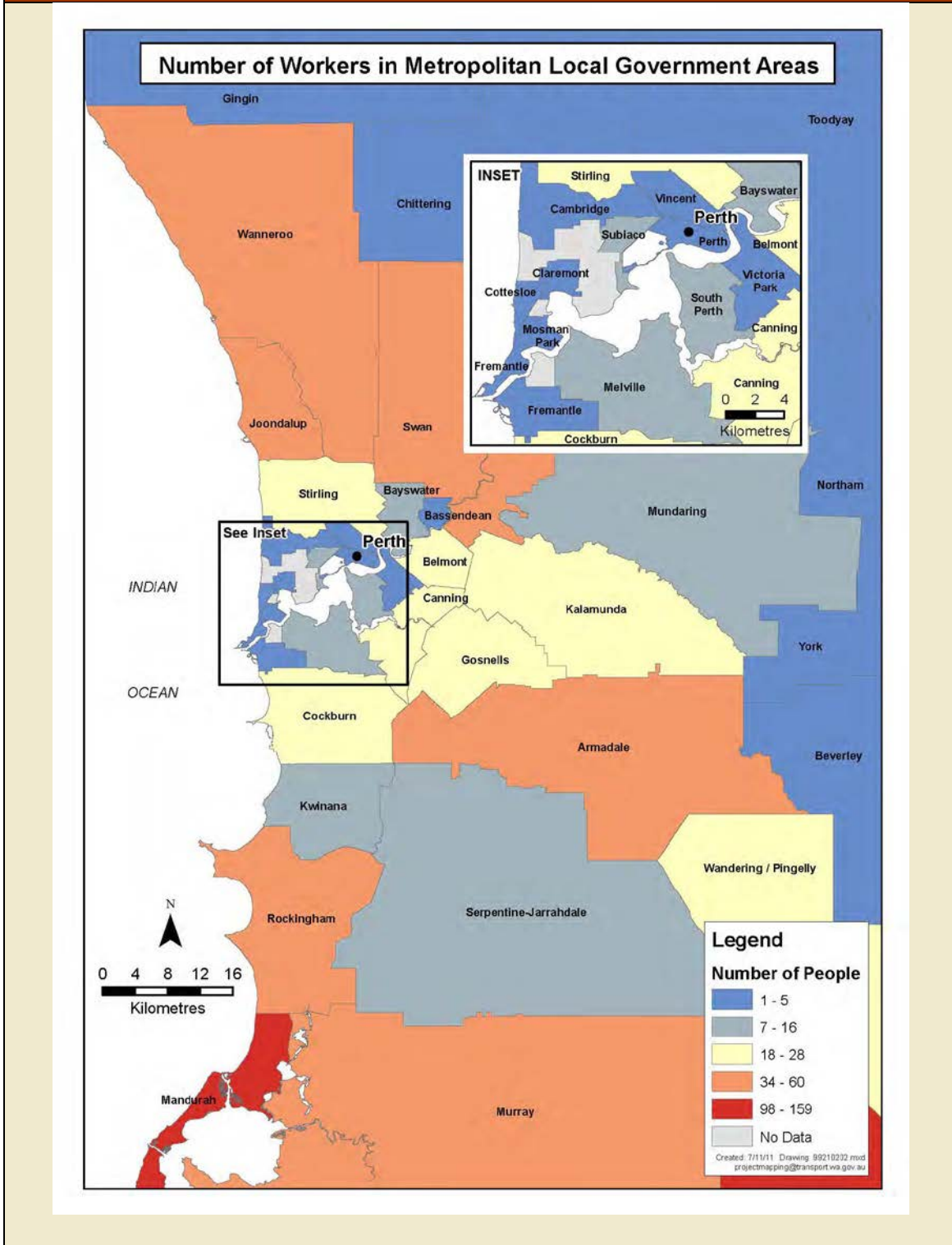
APPENDIX B

MAP A. Usual place of residence of employees at NBG located in the Boddington Shire, Western Australia (mid 2011). Distribution by WA postcode



(Produced by K. Rampellini 2012)

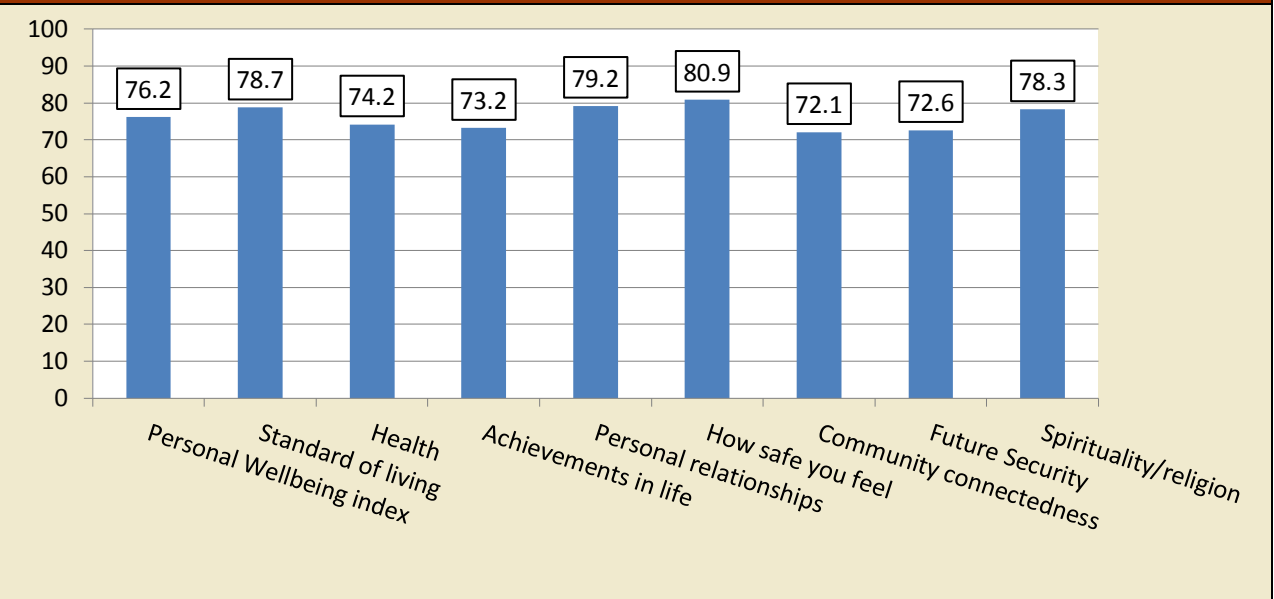
MAP B. Usual place of residence of employees at NBG located in the Boddington Shire, Western Australia (mid 2011). Distribution by metropolitan postcode



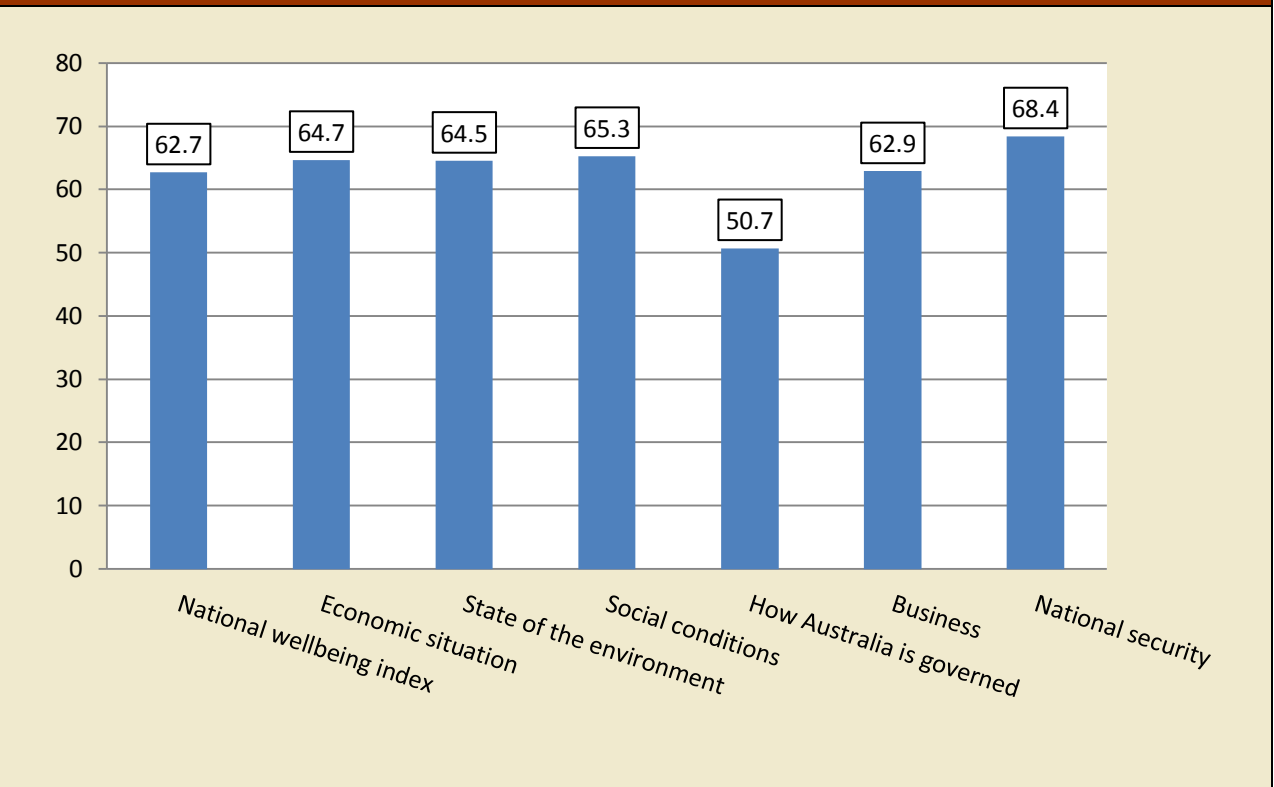
(Produced by K. Rampellini 2012)

APPENDIX C

Australian Unity Wellbeing Index, April 2011. Personal Wellbeing index



Australian Unity Wellbeing Index, April 2011. National Wellbeing Index



Adapted from: *Australian Unity Wellbeing Index: Results at a Glance*
<http://www.australianunitycorporate.com.au/Community/auwi/Pages/results.aspx>