

# **Lessons Learned from the Pilbara: The Socio-economic Ills of Mono-economies**

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## **ABSTRACT**

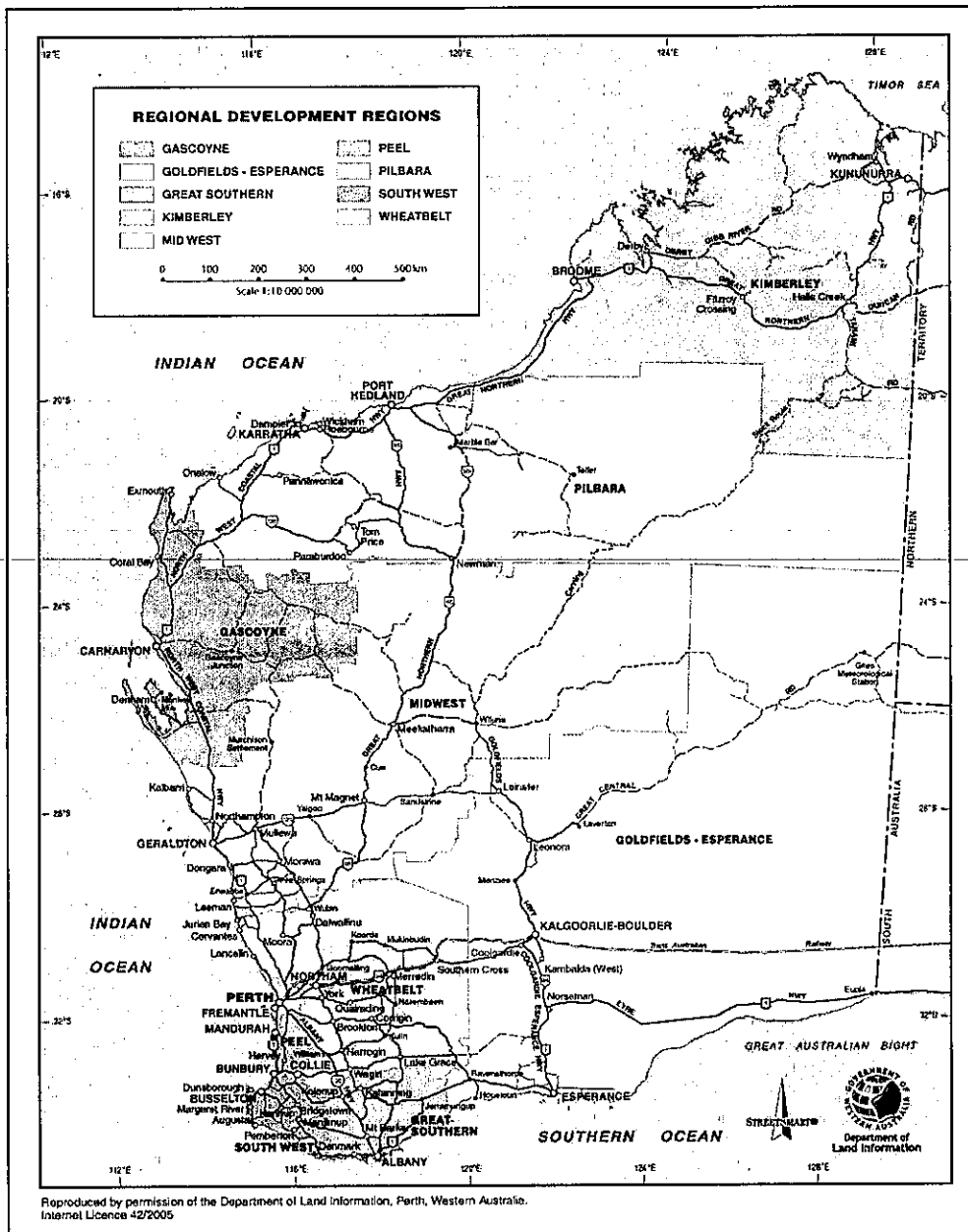
The Mid West region of Western Australia is set to embrace major resource development due to an increasing global demand for iron ore. Aside from market forces, sophisticated extraction processes and emerging (or junior) mining companies are also bringing this region's resources into play. Many impacted communities in the Mid West are welcoming the potential economic growth, yet they remain wary of the social and economic challenges experienced by neighbouring Pilbara communities. Currently, the Pilbara region generates 70 percent of the WA's resource wealth. Due to this, the Pilbara has developed into a mono-economy dominated by the resources sector with all the attendant socio-economic weaknesses this causes, particularly high cost of living. This paper presents findings from a range of stakeholder interviews about experiences in the Pilbara and the mistakes to avoid if the Mid West (and elsewhere) is to remain a liveable community with a diverse economy, including mining.

## **INTRODUCTION**

The Australian mining and energy sector has been important to the Australian economy since colonial times. Gold discoveries in 1851 around Bendigo and Castlemaine in Victoria were the catalyst for the first Australian gold rush, and as a consequence the arrival of many immigrants to Australia and the flow of wealth which funded considerable infrastructure in both Sydney and Melbourne. Resource discoveries have also been important for the development of the Western Australian economy, particularly since the 1960s. Gold and tin discoveries were responsible for significant Western Australian colonial regional economic development with many towns and communities established around mining activity. After the relaxation of the embargo on iron ore exports in 1959, exploration and development of rich iron ore deposits were the foundation of considerable State and corporate wealth in Western Australia. About 50 different minerals are now mined in the State, but the most profitable is iron ore from the Pilbara (see Figure 1).

The resource market is cyclical and dependent on global economic demand. This sector has a long history of boom and bust cycles, reflecting its exposure to international markets and fluctuations in demand and supply. The prolonged rise in commodity prices and the inevitable downturn that follows it are colloquially termed as a 'super-cycle'. Various analysts have argued that current boom conditions would last longer than in previous periods because of the strong underlying demand for key commodities from the emerging economies of China and India, but tying Australian economic fortunes to regional economies means that the economy is vulnerable to international political and other forces over which Australia has no control (Conley, 2009).

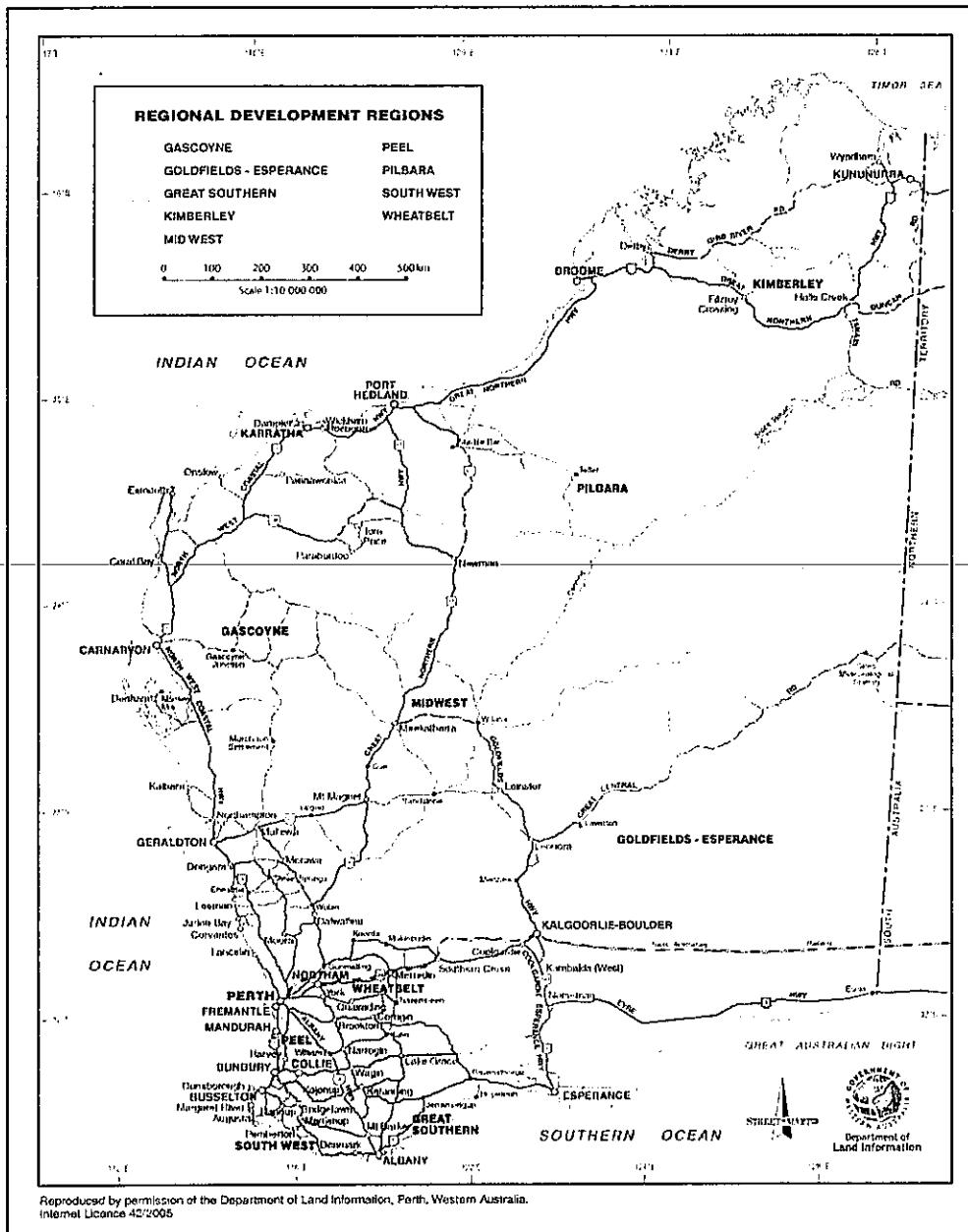
Figure 1: Regional Development Regions



Source: Department of Land Information (2006).

This paper focuses on two key areas of iron ore mining in Western Australia; the Pilbara and the Mid West (see Figure 1). The Mid West is at a nascent stage of iron ore industry development whereas iron ore mining in the Pilbara is well established and conducted on a large scale by, amongst other companies, two of the largest iron ore mining multinationals, BHP Billiton and Rio Tinto, generating millions of dollars in income and royalties. Due to the sustained boom, high market prices and refined mining technology, it has now become viable for miners, mostly junior mining companies, to develop other areas, such as the Mid West, with less concentrated ore deposits. The scale and rapidity of mining development in the Pilbara has wrought social, economic and environmental challenges, especially for those not involved in the mining industry. In the past few years, at a series of Mid West regional economic planning events a common refrain has been to heed the lessons learnt from the Pilbara. Clearly government, industry and communities are keen to avoid some of the pitfalls of rapid

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industry expansion. However there are few studies that synthesise what this actually means. This paper reports on interviews undertaken with community and industry leaders who are preparing for development of new mines in the region, cognisant of potential growing pains while also keen to capitalise on the opportunities presented by industry and regional economic expansion. This work is part of a larger, CSIRO-sponsored project assessing the enduring value of mining, especially in communities where other industries are already established (see [www.csiro.au/partnerships/mineral-futures-collaboration-cluster.html](http://www.csiro.au/partnerships/mineral-futures-collaboration-cluster.html)). This paper will consider the impacts of mining on communities and regions more broadly and reflect upon experiences from the Pilbara so that other regions and communities impacted by mining can avoid costly mistakes and develop in a more prescient manner.

The paper begins by contextualising mining and its history in Western Australia, followed by an overview of the impact of mining in the Pilbara region, particularly since the current boom ramped up in 2003. Strategies to address the unmet demand for labour and accommodation such as fly-in/fly-out (FIFO) are introduced and the often unintended consequences discussed. The following section introduces the Mid West and interviewee perceptions regarding the opportunities but also the lessons learned from the Pilbara. Based on views expressed by research participants, better informed planning could avoid regional-level growth problems, and thus inform strategies for other communities and regions to assist in avoiding some of the adverse consequences experienced in the case study sites examined and the broader economy.

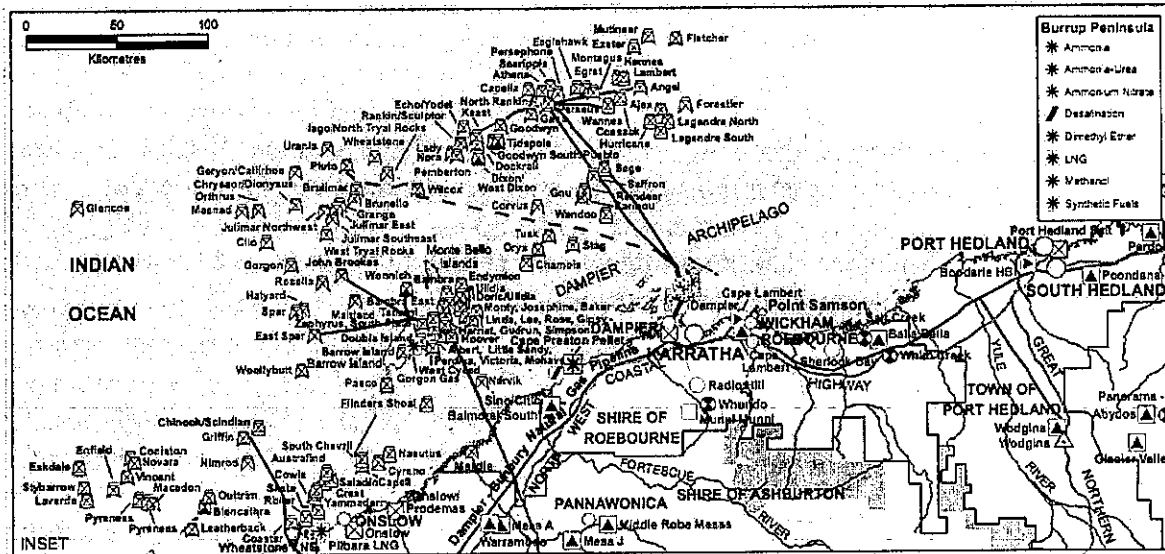
## **MINING IN WESTERN AUSTRALIA**

Since the 1970s, mining has consolidated its position as the major generator of export income for Western Australia, currently comprising approximately 70% of total exports revenue (Department of Local Government and Regional Development, 2007a; Department of Treasury and Finance, 2009). Currently the resource sector contributes 39 per cent of Australia's exports and eight per cent of our GDP (Australian Bureau of Statistics, 2009). Domestically, mining has also been important for the related activities it has spawned in construction, processing and other services supporting the mining industry.

Most of the mining activity in Western Australia has tended to be in remote and regional areas (see Figure 2), although there is now a large bauxite mining operation on the peri-urban fringes of Perth and considerable investment in what is projected to be the largest gold mine in Australia's history at Boddington, 150 kilometres from the city in what has traditionally been a productive grazing area. Improved technology and the strengthened Australian dollar have meant that mining is now viable in what have traditionally been rural communities.

The focus on mining in Western Australia has had far reaching impacts, not only in the usually remote regions servicing the mines but also in the capital city Perth and the nation more generally. The nation is experiencing the highest rate of population growth since World War II; faster than most other developed countries and many developing countries (Australian Bureau of Statistics, 2010a). Western Australia, and in particular, the capital city Perth, have consistently lead the country in percentage growth of population since 2006, largely from immigration due to the booming resource sectors. The sustained growth has made Australia one of the wealthiest nations according to the United Nations Human Development Index (United Nations Development Program, 2009) but despite the enviable international liveability status, the statistics mask a less attractive reality (Abjorensen, 2009). Evidence (Australian Bureau of Statistics, 2010a; Conley, 2010; Langton, 2010) suggests that in fact the Western Australia economy and community more generally has become increasingly polarised by the resources boom and the gaps between the 'haves' and the 'have nots' is widening depending upon people's access to the wealth generated by the resources boom.

Figure 2: Pilbara Oil and Gas Projects



Source: Department of Regional Development and Lands (2010).

The prolonged Asian demand for primary resources has put pressure on the technical skills of the mining and energy industries on a global scale. Consequently, global competition for skilled labour has shown that Western Australian industry is vulnerable unless salaries, work conditions and liveability of communities is comparable to other international destinations, most particularly cities otherwise skilled workers are lured to other cities to live and work. The skilled technicians in the resources sector tend to be peripatetic depending upon where the work is and who is offering the best package. This has a flow-on effect throughout the labour force. There have been persistent and widespread labour shortages since 2001 in Western Australia with the resources boom sparking an overall labour shortage (Australian Bureau of Statistics, 2010). As a result, Western Australia has experienced a much greater average wage increase over the last four years, 22 per cent, than any other State (Reserve Bank of Australia, 2009) which has driven up the cost of living (Department of Local Government and Regional Development, 2007b) making housing, land, food and services generally more expensive. The median price of Western Australian non-metropolitan housing is now the highest of any in Australia (Rowley and Haslam McKenzie 2009).

The scale of the resource sector means that there is very limited local supply or procurement, with most supplies and mechanical and technical servicing provided by the head office or capital city suppliers. Few, if any, mining companies source large scale supplies in the region, or have local procurement policies of any kind. Even where companies have a local procurement policy, many regional economies simply do not have the capacity or a sufficiently diversified economy to supply large scale mining operations, except for minor supply goods (Haslam McKenzie, 2010 (forthcoming)). Further, with the proliferation of fly-in/fly-out (FIFO) (see next Section), there are limited opportunities for workers to spend locally and consequently, despite the local community hosting a large industry there is very limited local level expenditure: the so-called 'fly-over' effect (Maxwell, 2001; Storey, 2001).

## THE PILBARA REGION

After adjustments to accommodate undercount, a highly mobile Indigenous population and the discrepancies associated with multiple places of residence, it is estimated that the resident population has increased by at least 17 per cent since the last census. In 2009, the population



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of the Pilbara was 47,528 (Australian Bureau of Statistics, 2010). This population is located in the few towns (about eight) or the mining camps scattered across this large region of 507,896 square kilometres which stretches from the coast to the Northern Territory border. The greatest concentration of people is in the Shire of Roebourne which incorporates the settlements and towns of Roebourne, Karratha, Wickham, Dampier and Port Samson. The largest town is Karratha with about 11,350 people and between 2001 and 2006 there were population increases in all age categories with the exception of those aged 55 and over where there was a 69 per cent fall. Only 1.3 per cent of Karratha residents were aged over 64 compared to 12 per cent in Western Australia. Given the high cost of living in Karratha (23 per cent higher than Perth (Department of Local Government and Regional Development 2007a) and the limited activities available for older residents, it is not surprising there are few retirees.

As noted earlier, the Pilbara economy is dominated by iron ore mining although in the last decade oil and gas exploration has spawned the development of numerous large scale energy projects (see Figure 2). The Pilbara contributes more than 62 per cent of the value of Western Australia's mineral and petroleum production (Department of Mines and Petroleum, 2009). Nearly all of the Pilbara's population is now employed in the resources sector and in the industries that support it, making it highly vulnerable to global markets. The tourism, pastoral and fishing industries have all been important employers and economic contributors in the past but their relative significance has been reduced compared to the dominance of the minerals and energy sector. These industries have been marginalised, or in the case of tourism, almost completely squeezed out. Furthermore, these other industries' wage rates are considerably less and labour is attracted away from them to the higher paying resource sector.

The housing stock fluctuates depending upon the resource cycle and commodity prices. The large scale and sustained boom conditions recently experienced have meant that there is high demand for accommodation and supply has not kept up with demand. Furthermore, land suitable for development has not been released by government in a timely way due to both poor planning and insufficient consultation between government and the resource companies to gauge demand. Government agencies complain that the mining companies do not provide sufficient notice of housing and land requirements to allow a suitable and measured land supply response. Consequently, the current demand for accommodation from mining companies and supporting organisations has placed severe pressure on the housing markets of many regional towns, both large and small. Resource industry led demand has increased house prices and rents dramatically in some areas resulting in serious affordability issues for communities (Rowley and Haslam McKenzie, 2009). Housing and accommodation more generally in the Pilbara is some of the most expensive in non-metropolitan Australia (Haslam McKenzie *et al.*, 2009; Pilbara Development Commission, 2009).

In addition a shortage of accommodation has affected employment supply for both the mining industry and local businesses. Under current conditions (intense competition for accommodation, differentials in remuneration between the resource sector and other non-mining businesses and expensive infrastructure), places such as the Pilbara region has become a mono-economy, dominated by mining and associated activities. Other less affluent industries such as retail, service, entertainment and childcare which pay significantly lower wages than the mining sector and cannot compete in the highly competitive accommodation markets have all been marginalised. Commercial property is also under-supplied and consequently expensive. Unless non-mining businesses have access to a ready supply of affordable accommodation for their businesses and employees and can pay comparable wages to the resource sector, there is constant labour force cannibalism and poaching, causing considerable workforce turnover and community churn.

There has been a general lack of investment in key infrastructure by government in the Pilbara and services such as childcare, medical and higher education facilities are either not available in some towns or oversubscribed in others. The need for quality secondary and tertiary education is a major reason why families may prefer to live in these centres. Services normally expected in a functioning community are increasingly unavailable either because of lack of staff or lack of accommodation causing the liveability of many mining town to become compromised, thus contributing to the high population churn through the region (Haslam McKenzie *et al.*, 2009).

### **FLY-IN/FLY-OUT WORK ARRANGEMENTS**

Until the 1970s, mining companies had considerable involvement in mining communities when entire towns were built and maintained by companies. In the 1980s as towns were 'normalised', (meaning they are no longer 'company towns' and there were no restrictions on who lives in the town and local government took over governance), the provision of infrastructure and other capital intensive amenities became too expensive for the public and community sectors. State governments have been reluctant to invest in resource towns and mine camps, presuming that to do so, is to meet the needs of an industry sector that can, seemingly, afford to provide its own resources including housing. Arguing that they are paying substantial royalties to government, companies publicly resist calls to provide infrastructure and services that they see as being the responsibility of government or other sectors of society (Haslam McKenzie, 2010 (forthcoming)). Shorter mine lives, the impost of Fringe Benefits Tax on employers, the relative efficiencies, flexibility and low costs of air travel and enhanced communications all make FIFO a more attractive business option.

FIFO arrangements are intense; blocks of work time followed by blocks of time with family and/or friends. The impact of FIFO on relationships and families is well documented (Beach, 1999; Watts, 2004; Gallegos, 2005). At the same time, FIFO has advantages which may make it a 'lesser evil' than living in remote mining communities for many individuals and their families. The inadequate provision of key infrastructure in the Pilbara is an oft cited reason for many workers preferring to take the FIFO work arrangement option, leaving their family in the larger population centres with the superior facilities.

FIFO work and living arrangements mean that employees have minimal living costs as everything including recreation is provided by the company. From a regional economic development perspective, the "marginal propensity to consume within the region" (Maxwell, 2001b, p. 9) means that there are considerable income leakages (Johnson, 2009). The cost to community of large numbers of transient workers is considerable, particularly as the Australian Bureau of Statistics does not gather data about transient workers or workers who reside in one region and work in another. There is inadequate data collected about the scale of FIFO and this influences Federal funding such as General Purpose Grants and Special Purpose Payments to State and local governments for the provision of big ticket infrastructure funding such as roads, health and education. Consequently, while the census might indicate that a certain number of people live permanently in a particular location, the reality is that a significantly higher number of people, (perhaps up to 35 per cent more), are using and degrading the infrastructure. Furthermore, because the census is undercounting the number of people living in the region, it is difficult for government agencies and local government to justify the high demand for services.



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## THE MID WEST REGION

The Mid West region of Western Australia covers almost one-fifth of the land mass of the State. Extending along the coast from Greenhead in the south to Kalbarri in the north, the Midwest is bordered by four regions, the Wheatbelt (south), the Gascoyne (north), the Pilbara (north-east) and the Goldfields Esperance (east and south-east) (see Figure 1). Its geographical features include a lengthy coastline to the Indian Ocean, a large agricultural hinterland and inland pastoral and mining leases covering a total area of 466,766 square kilometres (including offshore islands), slightly smaller than the Pilbara. According to ABS statistics, in 2008 the total population of the region was 53,741 with an annual growth rate of 2 to 3 per cent since 2006 (Australian Bureau of Statistics, 2010; see also Mid West Development Commission, 2008). Although 70 per cent of the region's population live in the regional centre Geraldton, overall, the greatest proportion reside on the coastal fringe or hinterland, leaving the dry, eastern parts of the region sparsely populated. There has been a continual decline in population in all but coastal areas of the Mid West for more than a decade (Wiley & Larson 2008; Australian Bureau of Statistics, 2010). The region comprises 18 Local Government Areas (LGAs), mostly with a main township as the seat of local government, although the number of Shires is set to reduce due to local government amalgamations (Dollery and Goode, 2009).

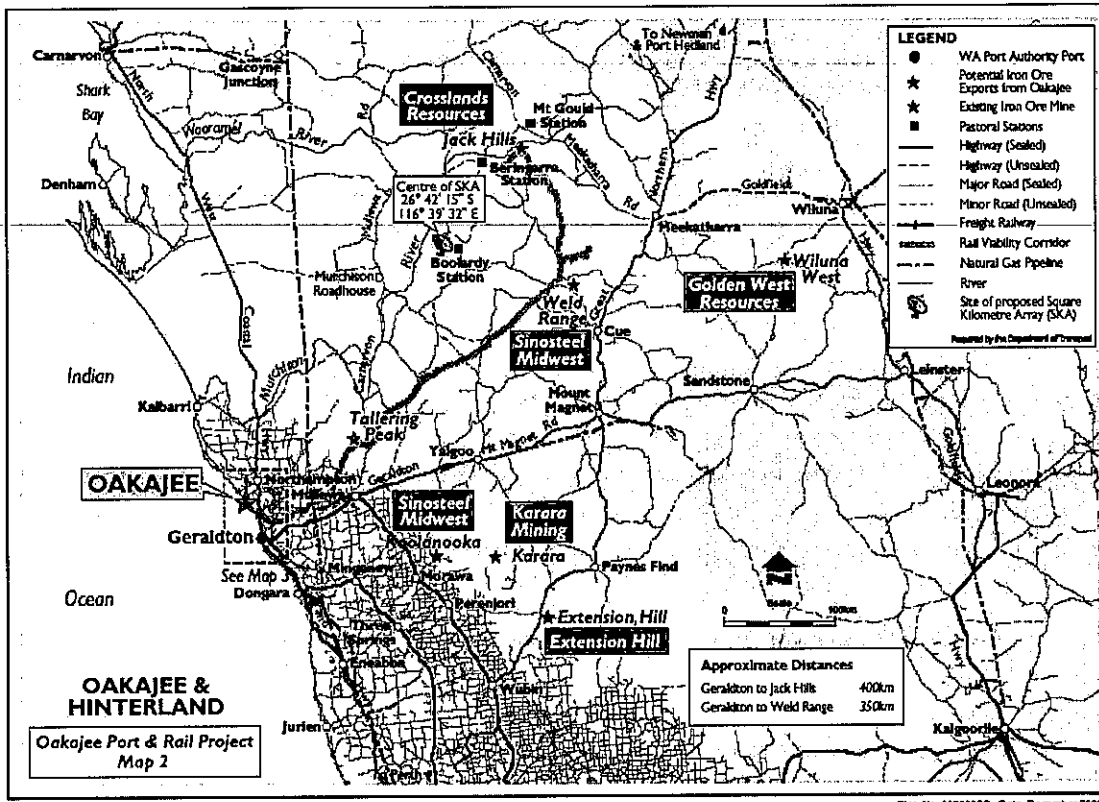
Since its early history, the Mid West has been associated with mining albeit on a modest scale. From 1846 expeditions into the area opened up the Mid West to farming and mining. Lead deposits were discovered in the Murchison River Valley on the first expedition, along with good grazing land for sheep (Department of Environment and Conservation, 2006). Mining commenced at the Geraldine Lead Mine in 1849 and the first railway line in the State was built from Northampton to Geraldton in 1879. The population grew slowly until the discovery of gold and the proclamation of the Murchison Goldfield in 1891, and following this, the population and the economy boomed (Economic Consultancy Services, 2007).

Iron ore in the Mid West was first extracted at Koolanooka Mine, near Morawa following the lifting of the iron ore export embargo. Five million tonnes were shipped from 1965 to 1974 to Japan. However a combination of high energy prices, declining reserves and competition from the larger scale Pilbara mines saw iron ore mining in the Mid West abandoned in 1975 (Shire of Morawa, 2008). Many mining projects continued to operate in the Mid West but while the relative strength of the region diminished with the expansion in the Pilbara and the Goldfields, mining remains an important contributor to the regional economy.

The economy of the Mid West is predominantly based on the mining, agriculture, fishing and tourism industries. In 2005/06, the Gross Regional Product of the Mid West was \$3.5 billion representing three per cent of the Gross State Product (Mid West Development Commission, 2008). In this period the production value of the mining sector was \$2.4 billion or 56 per cent of the regional economy based predominantly on nickel, gold, mineral sands and crude oil. Other major economic contributors during the 2005/06 period included agricultural commodities (wheat, wool and livestock disposal) at \$792 million (14%), tourism at \$202 million (5%) and fishing valued at \$142 million (3%) (Department of Local Government and Regional Development, 2007b). In addition, the Mid West region has a significant manufacturing sector supplying products to the agriculture, fishing and mining industries. Identified were 345 manufacturing locations in the Region, generating an estimated total sales and service income of \$383 million (9%) (Department of Local Government and Regional Development, 2006).

In recent years, due to the rise in global demand, higher resource commodity prices and more sophisticated mining technologies, three iron ore projects have commenced exporting ore through Geraldton Port with up to five projects scheduled for operation once the Oakajee Port and Rail (OPR) project is commissioned (see Figure 3). Commencement of commercial operation is expected by early 2014 (Oakajee Port and Rail, 2010). OPR combined with new mining operations have the potential to further diversify the industry base in the Mid West region and strengthen the region's economy as a significant participant in the Western Australian mining sector.

Figure 3: Oakajee and Hinterland, Mid West Region, Western Australia



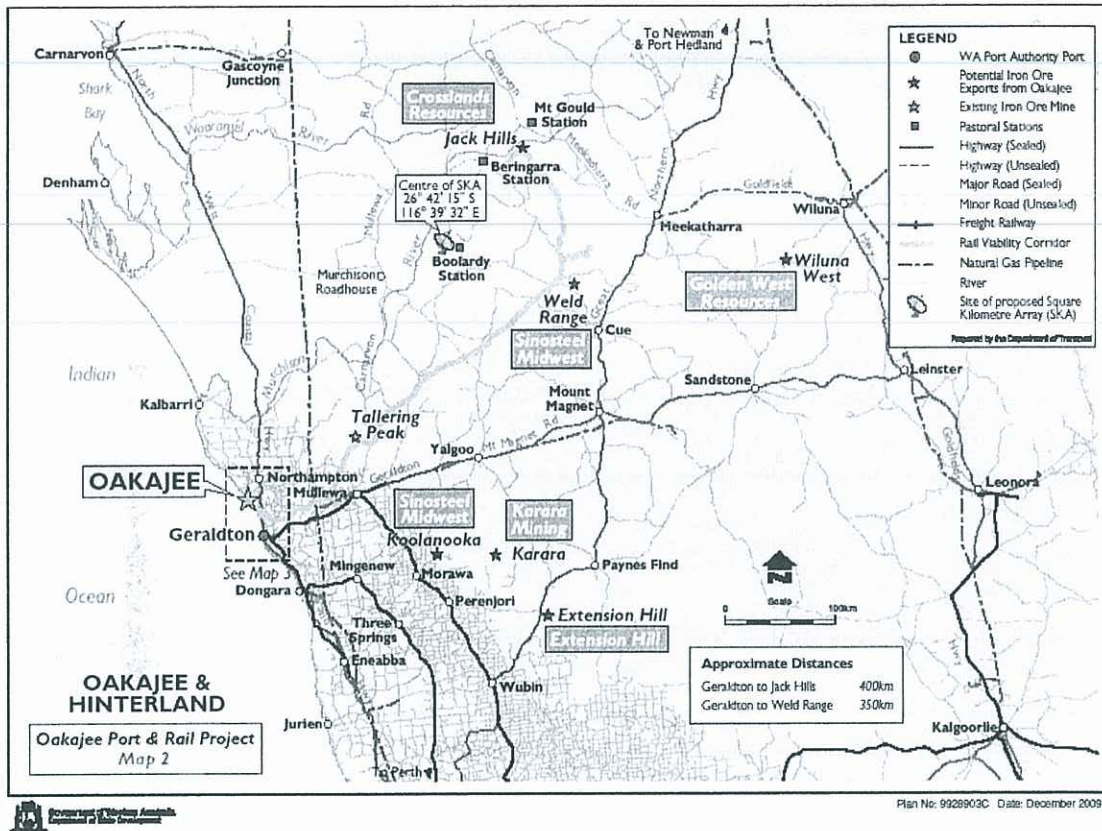
Source: Department of Planning and Infrastructure 2009

The literature section establishes the global context of the resources boom for Australia and particularly for Western Australia. Overviews are the regional characteristics as well as the economic profiles of two Western Australian regions, namely the Pilbara and the Mid West. The Pilbara has experienced a range of factors associated with large scale mining including unmet labour and accommodation demand, infrastructure deficiencies and the impact of FIFO on Pilbara communities and the regional economy. Discussed also are a range of attendant social consequences. While the Mid West has a considerable history of mining and a more diverse economy, impending new mining may introduce many of the unintended aspects of mining experienced in the Pilbara. The following section of this paper outlines the approach adopted for the study and perspectives of a range of stakeholder about their assessments of these impacts.



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## APPROACH

Data was collected through in-depth interviews involving a range of stakeholders familiar with the mining sector in the Pilbara and with the capacity to reflect on proposed resource development in the Mid West. This stakeholder sample involving 10 interviewees provided a mix of mining, local government, regional bodies, community (Aboriginal and non-Aboriginal) and business perspectives. Study respondents were recruited through purposive means (Patton, 1990), namely, they were selected into the study on the basis of their knowledge /experience in both regions. Interviews, conducted in-person and by telephone, occurred from June to August 2010. Prior to the commencement of this research, ethics approval was sought and received from the relevant ethics body. Confidentiality and anonymity are maintained throughout this paper, with study respondents being associated only with the sector they represented. The study sought information from these interviewees about the challenges and opportunities related to mining in the Pilbara, whether these experiences were unique to the Pilbara or could inform regional development and planning in the Mid West and elsewhere. Audio interviews were transcribed and computer-assisted qualitative data analysis software (NVivo8) was used to code and analyse these into major themes, these form the basis of the following results section.

## DISCUSSION

The results section explores the interviewees assessments of the differences between the two regions, identified challenges in the Pilbara attributed to mining and the opportunities that mining creates. The latter part of this discussion examines planning and management suggestions and the potential risks to Mid West communities due to major resource development.

### *Identifying Regional Differences*

As discussed in the literature review, study respondents identified the Mid West as having an established economy, and unlike the Pilbara, a greater level of economic diversity. In addition to a historic connection to mining, the Mid West's Small to Medium Enterprises (SMEs) contributes mining services and manufacturing skills and knowledge to the Pilbara mining sector. Some of the greatest differences between the two regions are the type and quantity of iron ore and the presence of emerging or junior mining companies. The Pilbara has extremely large quantities of hematite. A non-technical explanation is that hematite requires little processing, colloquially depicted as "dig it up and ship it out". In the Mid West, there are marginal hematite deposits with considerable magnetite deposits, the latter considered a 'lesser ore' requires processing or beneficiation into talc prior to export. Differences in the scale of mining operations for each region are best summed up by a mining industry interviewee:

*The size of operation in the Pilbara is one billion tonnes a year for iron ore, whereas for the Mid West over the next five years, it is estimated at 50 million tonnes, so a vast difference in scale. (Mining)*

Aside from scale and ore difference, mining operators in the Mid West are predominantly junior or minor mining companies backed by Asian, particularly Chinese investment, as distinct from the chiefly major or large multinational mining corporations of the Pilbara.

Study respondents from both the mining and community sectors with knowledge of the Mid West characterised the region as agriculturally dominated with a close affinity to the major centre, Geraldton. Many Mid West townships have over a century of establishment and for



interviewees these geographically dispersed communities have distinct 'place' identities. Nevertheless, many communities are experiencing population decline despite a growing regional profile. For both agricultural and pastoral areas, this population decline has been primarily associated with the aggregation of farms, modern farming methods, and a prolonged period of drought. Over the last two decades, many agricultural/pastoral families were reported to have 'left the land' and relocated to coast centres particularly Dongara and Kalbarri. These coastal centres, in addition to Geraldton, are experiencing inverse population trends whereas the inland townships such as Meekatharra, Cue and Mt Magnet, once bustling gold mining communities, are now without operating mines. These communities also have large proportions of Aboriginal people and what was described by a community interviewee as a range of "daunting social problems" not currently being addressed. In addition to new mining, industries such as tourism are steadily developing with a focus on coastal recreational pursuits, wildflowers and outback heritage trails including mining history of the region and geo-tourism.

The Mid West was identified as having long established, yet disparate communities mostly experiencing population and economic decline despite resources development. Mining is not a new enterprise for the Mid West; the region has more than a century of engagement including associated resource extraction, servicing and manufacturing. These activities are currently engaging the junior or emerging mining sector and regional SMEs. Compared with the Pilbara, mining in the Mid West is of a significantly smaller scale with lower grade ore and considerably smaller deposits. Looking specifically at experiences with the mining industry, the following sections outline study respondents views about challenges and benefits associated with the mining industry in the Pilbara.

#### *Perceived Challenges of Mining in the Pilbara*

Interview respondents outlined a range of views about challenges involved with mining in the Pilbara. These broadly included: delays in land release and housing construction, un-affordability of existing housing (both rental and purchase), poor infrastructure and community services, social and economic divide between the mining and non-mining sectors, the impact of FIFO and lack of long term planning. While many of these issues are canvassed in the earlier section, interviewee perspectives offer a range of sectoral interpretations.

Respondents representing all sectors in the study agreed that there was a complex and at times contradictory relationship with the mining sector in the Pilbara. Resource towns, such as Karratha and Port Hedland primarily service the mining industry, and much of the amenity within these towns has been supplied by the mining industry due to the identified absence of government provision. Some respondents argued that the cyclical nature of the mining industry make it difficult for government to plan land release and infrastructure. Mining's impact on land availability and housing costs, for a business sector interviewee, was often a "double edged sword" as the mining sector "creates the demand, a positive demand, but it is in excess of what the market can handle".

Discussed also was the limited success in integrating the mining industry and its workforce into the broader community as outlined by a mining industry respondent:

*... the impacts on Pilbara communities, we have never really dealt with the influx of a couple of thousand people either doing construction or trying to live in the towns. (Mining)*

Often doubling and at times quadrupling the residential population, the mining workforce in the Pilbara has created different sets of issues for different sectors. Respondents from the non-government/community sector were acutely aware of the socio-economic consequences when a large number of people involved in the mining and associated industries and with

interviewees these geographically dispersed communities have distinct 'place' identities. Nevertheless, many communities are experiencing population decline despite a growing regional profile. For both agricultural and pastoral areas, this population decline has been primarily associated with the aggregation of farms, modern farming methods, and a prolonged period of drought. Over the last two decades, many agricultural/pastoral families were reported to have 'left the land' and relocated to coast centres particularly Dongara and Kalbarri. These coastal centres, in addition to Geraldton, are experiencing inverse population trends whereas the inland townships such as Meekatharra, Cue and Mt Magnet, once bustling gold mining communities, are now without operating mines. These communities also have large proportions of Aboriginal people and what was described by a community interviewee as a range of "daunting social problems" not currently being addressed. In addition to new mining, industries such as tourism are steadily developing with a focus on coastal recreational pursuits, wildflowers and outback heritage trails including mining history of the region and geo-tourism.

The Mid West was identified as having long established, yet disparate communities mostly experiencing population and economic decline despite resources development. Mining is not a new enterprise for the Mid West; the region has more than a century of engagement including associated resource extraction, servicing and manufacturing. These activities are currently engaging the junior or emerging mining sector and regional SMEs. Compared with the Pilbara, mining in the Mid West is of a significantly smaller scale with lower grade ore and considerably smaller deposits. Looking specifically at experiences with the mining industry, the following sections outline study respondents views about challenges and benefits associated with the mining industry in the Pilbara.

#### *Perceived Challenges of Mining in the Pilbara*

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significantly higher disposable incomes reside alongside the general population not involved in mining, thus driving a wedge between the 'haves' and the 'have-nots', inflating the cost of living as "commerce, pricing and priority of access to services are oriented towards the mining sector". Another acknowledged division wrought by mining was its divisiveness for Aboriginal communities in the Pilbara "pitting community members against each other" in a bid to establish traditional ownership of mining land leases. Although employment in the mining industry provided significant benefits to Aboriginal communities from a community interviewees perspective "not every Aboriginal person wants to work in mining, 12 hour shifts and long periods away from the family/ community, leaving caring responsibilities to grandparents is far from ideal". For local governments, providing infrastructure for the residential population was compounded by a sizable mobile FIFO population most of whom do not pay local government rates and are not identified as living in the region through the five yearly Censuses, as discussed earlier. This places considerable pressure on local governments, particularly during boom times, as they are urged to expedite approvals in short time frames and often with inadequate resources, resulting in undesirable planning consequences. Karratha "is ringed by mining camps that offer little social integration while having an incredible amount of social benefits (amenity) that aren't accessible to the general community". For business, aside from commercial space being at a premium, the study's business respondents reported struggling to recruit and retain staff, particularly as they were "often lured away by the higher salaries offered by mining".

In the opinion of many study respondents, lack of industry diversity due to the mining industry's complete domination of the Pilbara economy ensured little scope for long-term investment and settlement in the region. Discussed were the boom/bust nature of resources industry and a longstanding preoccupation with 'projects', both resulting in a lack of confidence to invest by governments which was also evident in the residential population and the business sector. As one mining interviewee assessed, the Pilbara "has not grown into its skin" and for others, a limited "sense of place" spoke strongly to the need to address affordability, connectivity and liveability. In more recent times, cognizance of the long-term future of the Pilbara has been more fully recognised, a point articulated by a local government study respondent:

*Long term planning has always been over-ridden by the cyclic nature of resource project development. People come and then leave; it has only been recently that government has seen the Pilbara and Karratha as a long term option for population. (Local Government)*

Overall, study interviewees reflected upon the already well documented problems associated with the Pilbara. In addition, these respondents identified the ambiguous relationship with mining, the problems associated with planning around a largely cyclical industry and the somewhat belated attention to planning the Pilbara's future. The next section discusses the potential opportunities arising from new mining in the Mid West.

#### *Perceived Benefits from Mining in the Pilbara*

Despite the challenges posed by resource development in the Pilbara, research respondents identified substantial gains largely falling under the rubric of 'growth and opportunity' or economic benefits. As outlined in the literature overview and identified by study participants, mining benefits extend from exports, national economy (GDP), government revenue, state economy, national and international investment and technological innovation through to localised benefits. These included rural and regional development, employment (direct and indirect), population increases, infrastructure development and enhanced lifestyle choices relative to other remote non-mining areas.

Mining was characterised by interviewees as “opening up the Pilbara” by providing towns, community facilities, transport and communications infrastructure including road, rail, port and airports largely funded by mining thereby making the region relatively less remote and in doing so creating greater access to the region’s natural assets. The unique presence of a number of large multinational companies provided the Pilbara with “significant attention” in comparison to other regions in the State.

Large scale mining was reported to escalate the level of activity, attracting other industries into the area, introducing a population (albeit largely a young male workforce) with high levels of disposable income with potential to spend locally. Where there was residential housing for mining employees, the arrival of families with young children was reported to add pressure to address “family oriented” service provision. In the interests of retaining its workforce, mining companies were reported to have proactively provided lifestyle choices for its employees unavailable in most remote locations, although as identified earlier such amenity is not always accessible to the broader population. Nevertheless there was considerable investment and support of local arts and cultural events provided by the resources sector as well as the introduction of educational, recreational and social activities into the region. Mining industry’s local investment was considered by community interviewees to have enabled a considerable degree of community development, for both the Aboriginal and non-Aboriginal populations.

From a local government perspective, the “avalanche of funding from mining companies” offers the possibility of strategic investment opportunities. Priority projects for Pilbara communities leveraged by local government from mining investment included: normalising regional towns (footpaths, playgrounds), building multi-purpose community infrastructure and developing projects that have been a long held aspiration in local communities.

Opportunities or benefits arising from large scale mining were largely described in terms of the economic benefits at the local, regional, state and national levels as well as the mining industry’s enormous infrastructure legacy in the Pilbara. For local communities, increases in population with disposable income created the opportunity for local spending which benefitted many SMEs. While mining investment in lifestyle and entertainment aspects were acknowledged, some sectors were working towards more strategic outcomes from mining investment.

### **Planning and managing mining in the Midwest**

One of the most important considerations for the Mid West is that iron ore mining projects are still at a relatively early stage. Timely and coordinated planning was viewed as an essential precursor to providing physical infrastructure such as roads, power, water, land release and housing as well as social infrastructure in the form of health, education, policing and local community engagement and support. Frustration was expressed by mining sector respondents about the considerable lag in government response and investment. This is summed up by a mining industry respondent:

*A mining company is committed to finding the ore; they then attract overseas investment and spend \$100 or \$200 million on investigating bankable feasibility. This is when government needs to spend \$50,000 to \$100,000 to investigate whether it needs to, say, extend the local school in Morawa or Perenjori. When the mining company lodges its bankable feasibility and assembles around 1.5 billion dollars, then government should invest in infrastructure, a parallel process, enacting a strategy ... that is what private enterprise does. (Mining)*

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with or constructed for the mining industry. Study respondents discussed the limited and ageing infrastructure in many rural locations in both the Pilbara and the Mid West and the need for longer term and more strategic benefits for local communities. From a local government respondent's perspective:

*We have many examples in the Pilbara of companies wanting temporary accommodation built to get over a hump that has lasted two years and 20 years later the building is still there. At the time of these requests, we needed to have considered what we could do with it next. (Local Government)*

Prescience about infrastructure, existing and planned, was also the focus of interviewees involved in regional planning. Infrastructure planning for new iron ore projects was reported to be complicated by the geographical spread of Mid West mining, the number of projects, constantly shifting plans and timeframes and the relatively low level of industry collaboration necessary to align mine project schedules to more fully enable infrastructure development. The notion of infrastructure sharing and its benefits were discussed from a regional planning perspective:

*Where possible existing infrastructure needs to be better used, however due to the relatively small population and the large area it will be difficult although not impossible [for the mining industry] to join hands. There needs to be far more collaboration for the region to get the most out of current and future infrastructure. (Regional Development)*

Understanding and managing the impact of the mining workforce was a frequent topic of discussion in the study, given that a mining workforce (particularly construction) can double the population of a small Shire in a very short period of time and can withdraw just as quickly (as was the case in Ravensthorpe in southern Western Australia). In general, the construction phase of mining is from two to five years and operations from three to 20 years. These phases involve two distinct workforces, with construction often a contract workforce and operations, mainly company employees. The construction workforce—FIFO in the Pilbara—were characterised as highly transient and the largely “unmanaged” aspect of the mining sector who had the capacity to damage the overall reputation of the mining operation. According to a mining respondent:

*Initial impressions are created by ‘construction’, especially with the locals who struggle to separate construction from mining [workforce]. This unfortunately creates first and lasting impressions. (Mining)*

The social problems imported by mining were considered a potential concern for the Mid West (and indeed any community) due to alcohol and drug use as well as increased crime and prostitution, all reportedly exacerbated by the high levels of disposable incomes. Negative consequences were also identified for the natural environment arising from recreating workforce as described by a community respondent:

*Generally speaking the outlet is somewhere, usually in nature that the locals consider special. These generally become less special. (Community)*

In planning and managing mining in the Mid West, respondents to the study considered of paramount importance timely and coordinated planning for infrastructure development with a view to long term sustainable use. While ‘partnering’ is an oft used axiom in resources industry public relations, the need for greater collaboration across the resources sector, incorporating a better understanding of potential shared benefits for communities and mining projects’ business. In particular, the possibility of infrastructure sharing to resolve deficiencies was raised. Finally, managing the mining workforce’s impact was considered an important aspect of positive mining industry/community relations. Some of these identified issues if not



planned and/or well managed have the potential to become risks for communities associated with mining in the Mid West; other potential areas are detailed in the following section.

### **POTENTIAL RISKS FOR MID WEST COMMUNITIES**

This section will examine specific risks identified for Mid West particularly around the mining sector potential reach into the agriculture workforce and some cautionary aspects of mining for the community and region.

Unlike other greenfield mining areas in Australia, current mining projects in the Mid West have limited competition with agriculture for land use. However, concerns were raised by community interviewees that mining would adversely impact upon the agricultural workforce and put this sector into further decline, effectively reducing the diversity of the Mid West economy.

It was understood by study respondents that there was considerable support for new mining in the Mid West, with one interviewee considering mining as the potential “economic saviour” of the region with the demise of agricultural production. However some community discernment was recommended, as a local government interviewee cautioned:

*It is important that communities are not too eager to see it happen, taking anything and not the best option, not that local communities necessarily have a say ... when you are pro mining sometimes you just take whatever you can get without being selective about what is the best outcome. (Local Government)*

Finally there are risks for individual communities based on how they are perceived by the mining industry and the actual realisation of benefits; a reality that may be broader than the Mid West. A number of mining respondents discussed the tempering of community expectations due to the reduced scale and scope of mining in the region and the location of mining projects considerable distances from regional townships. As discussed by a mining interviewee:

*Communities can aggressively manipulate or overdo the extraction of benefit out of mining companies. If companies feel this way, there will be a minimalistic approach rather than an engaged approach. (Mining)*

This underscores a potential risk for Mid West communities that there may be minimal benefits due to mining’s presence in their Shire or region, the permanent population may continue to decline and the identified challenges of mining, so evident in the Pilbara may become a reality in the Mid West.

### **CONCLUSION**

Both the literature and study respondents emphasise the importance of economic diversity, which currently sets the Mid West’s economy apart from the Pilbara. Recognition and support for this diversity is essential for sectors such as agriculture and SMEs who generally possess greater commitment to place and community. For sustainable regional development to occur, it appears necessary to engage all levels of government in taking responsibility for planning and overarching management of growth and development, particularly for regional infrastructure with the long term view in mind. From the mining sector, what is required is a greater integration of the mining workforce into existing communities, so that infrastructure can be better utilised and the mining workforce can connect with local people. This would also increase local spending by employees, reducing the ‘fly-over effect’ already acknowledged as a negative consequence of a temporary mobile mining workforce.



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As discussed, most of the mining activity in Australia tends to be in remote and regional areas. Ironically, this usually occur in places within closest proximity to mining activity and resource extraction which have experienced the lowest levels per capita of infrastructure investment, the most unaffordable housing, the highest levels of population turn-over, escalating cost of living and higher than average crime rates. If Australian wealth is to be truly sustainable, it is critical that institutional frameworks, growth-promoting policies and valuing of human capital be viewed as investments for the future.

Most of the interviewees canvassed for this paper had experience of the Pilbara and had witnessed the risks associated with the slide into mono-economy status. Nonetheless, most welcomed mining development in the Mid West and the potential opportunities this would bring to the region. However, they were clear that careful planning and government, corporate and community commitment to infrastructure and social investment were critical if the mistakes made in the Pilbara were not to be repeated in the Mid West. Most acknowledged that mining would bring change but if the change was carefully managed by all stakeholders rather than allowed to occur in a rampant, unplanned manner then the outcomes would have broad benefit at the local and regional levels.

## REFERENCES

- Abjorensen, N. (2009) *Australia: The State of Democracy*. Canberra, Democratic Audit of Australia, Australian National University.
- Adler, R. G. (1988) "Daddy Come Home Soon! Intermittent Father Absence and the Family." *Australian Journal of Family Therapy* 4(2): 87-90.
- Australian Bureau of Statistics (2009) *Australian National Accounts: National Income, Expenditure and Product*, December Quarter (Cat. 5206.0). Canberra: Australian Bureau of Statistics.
- Australian Bureau of Statistics (2010a) *Australian Social Trends* (Cat. 4102.0). Canberra: Australian Bureau of Statistics.
- Australian Bureau of Statistics (2010b) *Regional Population Growth* (Cat. 3218.0). Canberra: Australian Bureau of Statistics.
- Australian Government Child Support Agency (2002) *Me and My Kids: Parenting from a Distance*. Canberra, Australian Government Child Support Agency.
- Beach, R. (1999) "The Impact of Intense Work Schedules on Family Structure: A Case Study of a 4:1 Fly-in/Fly-out Schedule in the Australian Mining Industry. In M. Collis, L. Munro and S. Russell (Eds) *Sociology for a New Millennium: Challenges and Prospects*. Churchill: CeLTS, pp. 289-300.
- Conley, T. (2010) "The Politics of Prosperity." *The Griffith Review: Still the Lucky Country?* (28, [www.griffithreview.com/edition-28-still-the-lucky-country.html](http://www.griffithreview.com/edition-28-still-the-lucky-country.html)).
- Conley, T. (2009) "Globalisation and Australian Economic Vulnerability." In E. Van Acker and G. Curran (Eds) *Business and the Politics of Globalisation: After the Global Financial Crisis*. Sydney: Pearson.
- Department of Environment and Conservation (2006) *Gascoyne Murchison Outback Pathways*. Perth: Department of Environment and Conservation.
- Department of Local Government and Regional Development (2006) *An Update on the Economy of Western Australia's Mid West Region*. Perth: Department of Local Government and Regional Development.
- Department of Local Government and Regional Development (2007a) *Gross Regional Product 2005/06*. Perth: Department of Local Government and Regional Development.
- Department of Local Government and Regional Development (2007b) *Regional Price Index*. Perth: Department of Local Government and Regional Development.

- Department of Local Government and Regional Development (2007c) *Indicators of Regional Development in Western Australia: Supplementary Report*. Perth: Department of Local Government and Regional Development.
- Department of Local Government and Regional Development (2008) *Indicators of Regional Development in WA – Supplementary Report 2007*. Perth: Department of Local Government and Regional Development.
- Department of Mines and Petroleum (2009) *Western Australian Minerals and Petroleum Statistics Digest*. Perth: Department of Mines and Petroleum.
- Department of Planning and Infrastructure (2008) “Oakajee and Hinterland.” Retrieved 26 November 2009 from <http://www.dpi.wa.gov.au/imarine/20065.asp>.
- Department of Treasury and Finance (2009) *Western Australian Economic Summary 03*. Perth: Department of Treasury and Finance.
- Dollery B. and S. Goode (2009) *A New Future for the Mid-West Group of Councils: An Analysis of Structural Reform Options for Mingenew, Morawa, Perenjori and Three Springs Shires*. Armadale: New England Education and Research.
- Economic Consultancy Services (2007) “Mining Expansion in the Mid West: Social and Economic Benefits. A report prepared for Geraldton Iron Ore Alliance.” Retrieved 14 April 2010 from <http://www.gioa.com.au/images/gerioa-35--gaeyu.pdf>.
- Gallegos, D. (2005). “‘Aeroplanes Always Come Back’: Fly-in Fly-out Employment: Managing the Parenting Transitions.” Perth: Centre for Social and Community Research, Murdoch University.
- Haslam McKenzie, F. (2010 (forthcoming)) “Fly-in Fly-out: The Challenges of Transient Populations in Rural Landscapes.” In G. Luck, D. Race and R. Black (Eds) *Demographic Change in Rural Landscapes: What Does it Mean for Society and the Environment*. London: Springer (Landscape Series).
- Haslam McKenzie, F., R. Phillips, S. Rowley, D. Brereton and C. Birdsall-Jones (2009) “Housing Market Dynamics in Resource Boom Towns.” *AHURI Research & Policy Bulletin*, Issue 120. Perth: Australian Housing and Urban Research Institute ([www.ahuri.edu.au/publications/p80370/](http://www.ahuri.edu.au/publications/p80370/)).
- Langton, M. (2010) “The Resource Curse.” *The Griffith Review: Still the Lucky Country?* (Issue 28, [www.griffithreview.com/edition-28-still-the-lucky-country.html](http://www.griffithreview.com/edition-28-still-the-lucky-country.html)).
- Maxwell, P. (2001) “The Rise of Fly-in, Fly-out: A Mineral Industry Perspective on Work Place, Residence and Regional Development in Western Australia. Minex 2001, Mining and Exploration International Conference and Expo, Perth, Minerals Economic Program, Western Australian School of Mines, Curtin University of Technology.
- Mid West Development Commission (2009) “ABS Estimated Resident Population 1997-2008 Period for the Mid West (Regional Summary by LGA).” Retrieved 25 August 2010 from <http://www.mwdc.wa.gov.au/default.aspx?WebPageID=119>.
- Oakajee Port and Rail (OPR) (2010) “Oakajee Port and Rail Fact Sheet 8.” Retrieved 15 May 2010 from [http://www.opandr.com/media/latest\\_news.phtml](http://www.opandr.com/media/latest_news.phtml).
- Patton, M. Q. (1990) *Qualitative Evaluation and Research Methods* (2nd ed.). Newbury Park: CA, Sage Publications.
- Pilbara Development Commission (2009) *Housing and Land Snapshot: Karratha*. December Quarter. Port Hedland: Pilbara Development Commission.
- Reserve Bank of Australia (2009) “The Level and Distribution of Recent Mining Sector Revenue.” *Reserve Bank Bulletin*, January, pp. 7-12.
- Rowley, S. and F. Haslam McKenzie (2009) “Housing Markets in Regional Western Australia: Boom and Bust?” Housing Researchers Conference. Sydney, The Australian Housing and Urban Research Institute.



- Department of Local Government and Regional Development (2007c) *Indicators of Regional Development in Western Australia: Supplementary Report*. Perth: Department of Local Government and Regional Development.
- Department of Local Government and Regional Development (2008) *Indicators of Regional Development in WA – Supplementary Report 2007*. Perth: Department of Local Government and Regional Development.
- Department of Mines and Petroleum (2009) *Western Australian Minerals and Petroleum Statistics Digest*. Perth: Department of Mines and Petroleum.
- Department of Planning and Infrastructure (2008) “Oakajee and Hinterland.” Retrieved 26 November 2009 from <http://www.dpi.wa.gov.au/imarine/20065.asp>.
- Department of Treasury and Finance (2009) *Western Australian Economic Summary 03*. Perth: Department of Treasury and Finance.
- Dollery B. and S. Goode (2009) *A New Future for the Mid-West Group of Councils: An Analysis of Structural Reform Options for Mingenew, Morawa, Perenjori and Three Springs Shires*. Armadale: New England Education and Research.
- Economic Consultancy Services (2007) “Mining Expansion in the Mid West: Social and Economic Benefits. A report prepared for Geraldton Iron Ore Alliance.” Retrieved 14 April 2010 from <http://www.gioa.com.au/images/gerioa-35--gaeyu.pdf>.
- Gallegos, D. (2005). “‘Aeroplanes Always Come Back’: Fly-in Fly-out Employment: Managing the Parenting Transitions.” Perth: Centre for Social and Community Research, Murdoch University.
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- Haslam McKenzie, F., R. Phillips, S. Rowley, D. Brereton and C. Birdsall-Jones (2009) “Housing Market Dynamics in Resource Boom Towns.” *AHURI Research & Policy Bulletin*, Issue 120. Perth: Australian Housing and Urban Research Institute ([www.ahuri.edu.au/publications/p80370/](http://www.ahuri.edu.au/publications/p80370/)).
- Langton, M. (2010) “The Resource Curse.” *The Griffith Review: Still the Lucky Country?* (Issue 28, [www.griffithreview.com/edition-28-still-the-lucky-country.html](http://www.griffithreview.com/edition-28-still-the-lucky-country.html)).
- Maxwell, P. (2001) “The Rise of Fly-in, Fly-out: A Mineral Industry Perspective on Work Place, Residence and Regional Development in Western Australia. Minex 2001, Mining and Exploration International Conference and Expo, Perth, Minerals Economic Program, Western Australian School of Mines, Curtin University of Technology.
- Mid West Development Commission (2009) “ABS Estimated Resident Population 1997-2008 Period for the Mid West (Regional Summary by LGA).” Retrieved 25 August 2010 from <http://www.mwdc.wa.gov.au/default.aspx?WebPageID=119>.
- Oakajee Port and Rail (OPR) (2010) “Oakajee Port and Rail Fact Sheet 8.” Retrieved 15 May 2010 from [http://www.opandr.com/media/latest\\_news.phtml](http://www.opandr.com/media/latest_news.phtml).
- Patton, M. Q. (1990) *Qualitative Evaluation and Research Methods* (2nd ed.). Newbury Park: CA, Sage Publications.
- Pilbara Development Commission (2009) *Housing and Land Snapshot: Karratha*. December Quarter. Port Hedland: Pilbara Development Commission.
- Reserve Bank of Australia (2009) “The Level and Distribution of Recent Mining Sector Revenue.” *Reserve Bank Bulletin*, January, pp. 7-12.
- Rowley, S. and F. Haslam McKenzie (2009) “Housing Markets in Regional Western Australia: Boom and Bust?” Housing Researchers Conference. Sydney, The Australian Housing and Urban Research Institute.





- Shire of Morawa (2008) *The History of the Morawa Area Since 1950s*. Morawa: The Shire of Morawa.
- Sibbel, A. M. (2001) *The Psychosocial Well-being of Children from Fly-in/Fly-out Mining Families*. Unpublished Dissertation, Faculty of Community Studies, Education and Social Sciences, Edith Cowan University, Perth.
- Storey, K. (2001) "Fly-in/Fly-out and Fly-over: Mining and Regional Development in Western Australia." *Australian Geographer*, 32(2), pp. 133-148.
- United Nations Development Program (2009) *Human Development Report: Overcoming Barriers, Human Mobility and Development*. New York: United Nations.
- Watts, J. (2004) *Best of Both Worlds: Seeking a Sustainable Regional Employment Solution to Fly In - Fly Out Operations in the Pilbara*. Karratha: Pilbara Regional Council.
- Wiley, T. and A. Larson (2008) "A Review of the Effectiveness of Community Development Officers in the Murchison." Geraldton: Combined Universities Centre for Rural Health.
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