

FARMS AND MINES: A CONFLICTING OR COMPLIMENTARY LAND USE DILEMMA IN WESTERN AUSTRALIA?

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Abstract

Farms and Mines: A conflicting or complimentary land use dilemma in Western Australia?

The Western Australian economy has always been underpinned by farming and mining. Over the last five years the economy has experienced phenomenal growth due to unprecedented global demand for resources and increasingly, agricultural land is being given up for mining. Changing land uses challenge industry and community leaders; some communities are overwhelmed by a new population connected with mining, bringing with it a range of social and economic tensions that small communities struggle to cope with. This paper will discuss the conflicting issues regarding land use planning, local and environmental governance and sense of place while also canvassing positive developments that have enhanced community and regional economic development, thus building a resilient future.

Keywords

regional economic development, mining and energy sector, agricultural production

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1. Introduction

The Western Australian economy has experienced phenomenal growth on the back of unprecedented demand for resources by the developing Chinese and Indian economies. The Australian mining and energy sector has been important to the Australian economy since colonial times and has been particularly important for the development of the Western Australian economy since the 1960s. By the end of the twentieth century, Western Australia was one of the most productive and diversified mineral regions in the world with about 50 different minerals in commercial production (Storey 2001). Since the 1970s, mining has consolidated its position as the major generator of export income for Western Australia, currently comprising approximately 70% of the States' total exports revenue and 34% of the nations' exports (Department of Local Government and Regional Development 2007a; Department of Treasury and Finance 2009). The majority of mining activities are significant distances from the State's capital city, Perth. Figure 1 shows the population distribution of Western Australia and the major mineral and petroleum activity centres in the State. It is evident that most mining activity occurs long distances from established communities.

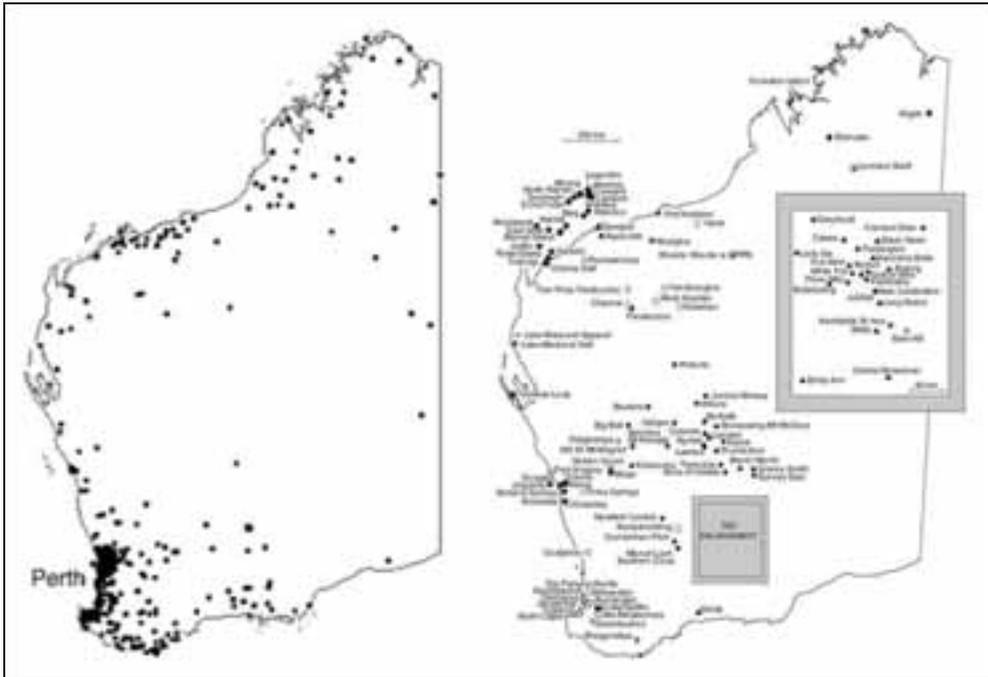


Fig. 1: (a) Population densities in Western Australian. (b) Location of active resource developments. Source: Australian Bureau of Statistics (a) and Western Australian Department of Mines and Petroleum (b), (Reproduced with permission).

Until very recently, mining was not a dominant industry in the Midwest and South West regions (see Fig. 2) where agricultural production has always predominated. However, with increased returns from mining and diminishing profit margins from agriculture, traditional agricultural communities have been challenged by land-use changes which, as will be discussed further in this paper, have confronted long-

term residents and the governance structures of some communities as mining has overtaken agriculture.

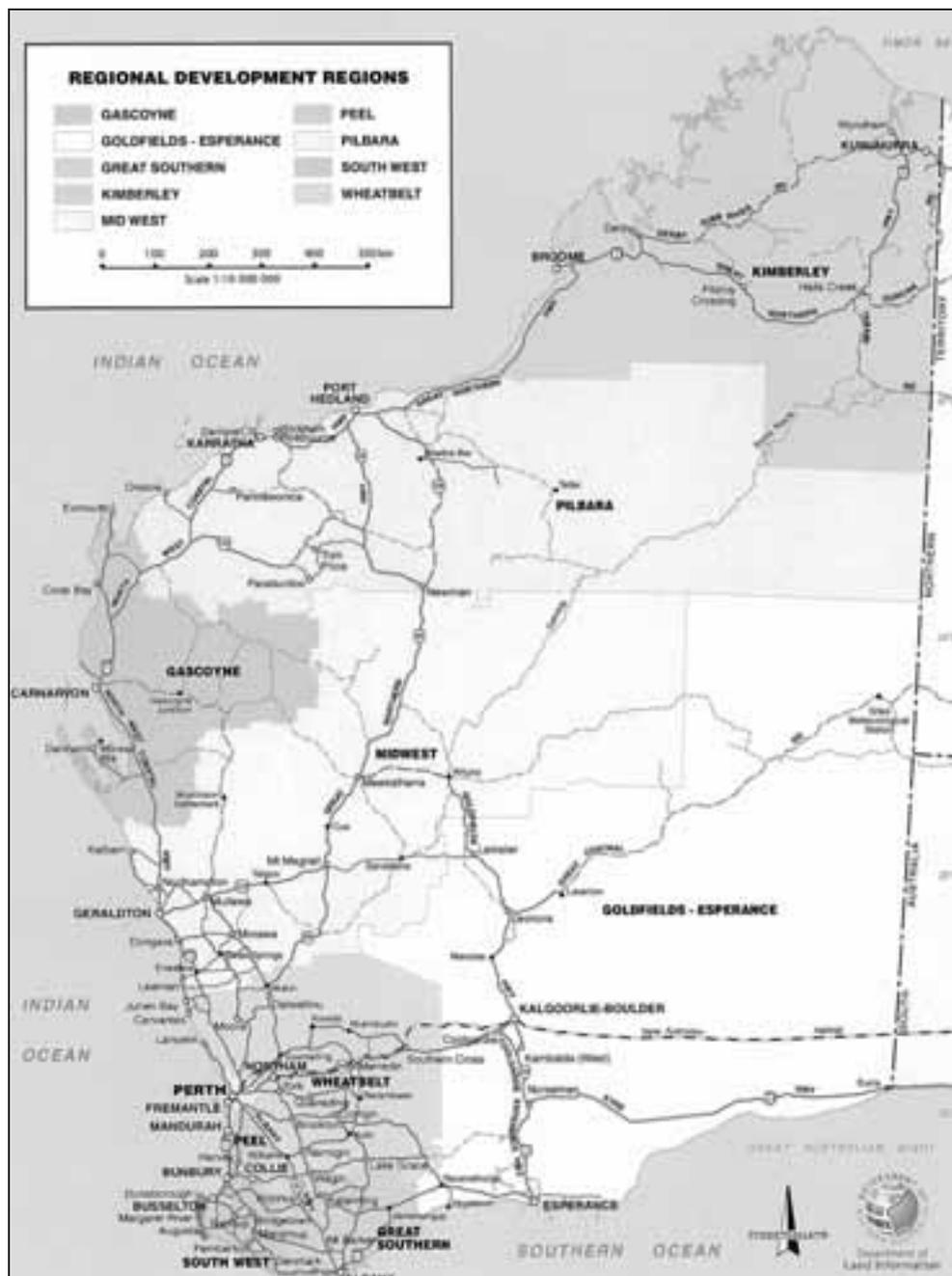


Fig. 2: Regional Development Regions of Western Australia. Reproduced with permission from Landgate, Government of Western Australia

According to the Australian Bureau of Statistics (Australian Bureau of Statistics 2007a; Australian Bureau of Statistics 2007b; Australian Bureau of Statistics 2008) the Western Australian economy has doubled in size over the past sixteen years, with Gross State Product (GSP) in chain volume terms rising 107% between 1990 and 2006. The contribution of mining to GSP has doubled (15% to 30%) to \$53.4 billion (Au) in production value, while the sectors of property and business services (9% to 11%) and construction (8%) have remained fairly steady contributors.

The heightened economic activity in the State has impacted on Western Australia's population and local communities (Australian Bureau of Statistics 2007a; Australian Bureau of Statistics 2008a). There have been changes to patterns of migration and internal mobility, (the rate of interstate immigration is currently higher than it has been for more than one hundred years (Australian Bureau of Statistics 2009a)), as well as family and household composition. Until now, this type of demographic change and its effect, particularly on small communities such as rural areas, has been largely overlooked.

Focusing on two small rural communities, the Shire of Ravensthorpe on the Southern Coast and the Shire of Boddington in the Peel region of Western Australia, this paper will examine the impact of land use change. Both communities have, until recently, been dominated by agricultural activities, but with rising global resource prices, multi-national mining companies have moved in and established large mines with concomitant opportunities and adverse pressures. Drawing on in-depth, semi-structured interviews and focus groups with local community members in both locations, this paper will document the socio-economic changes that have been experienced by the communities and the people who live in them and the inevitable challenges these bring. The provision of infrastructure and the management of people and resources in frenetic economic boom conditions have tested policy makers and local governance structures. These challenges will be discussed and the inevitable opportunities that arise from such circumstances will also be considered.

2. The Shifting Industry Bases in Western Australia

Until the latter half of the twentieth century, agriculture had been dominant in Western Australian macro and micro economies. However, as noted earlier, their overall contribution to GDP has been contracting. In 1970, agriculture contributed 70% of total exports revenue but by 1999 agriculture contributed only 15% of the State's export earnings (Australian Bureau of Statistics 2001). This has now declined to about 7 per cent (Department of Agriculture and Food 2009). While the agriculture, forestry and fishing sectors have grown in absolute terms, they have declined in relative terms compared to the mining sector. Further, despite significant increases in productivity over the last two decades (in excess of 12%), the active labour force has decreased by 18% (Australian Bureau of Agricultural Resource Economics 2008). The area under agricultural cultivation is approximately the same as it was 50 years ago but the number of farms has decreased 27% since 1961 (Department of Agriculture and Food 2009). Like other developed countries, farming in Western Australia is highly technical and economies of scale are critical for viability (Bureau of Rural Sciences 2008). It also has the same social issues too; rural populations and consequently, communities are shrinking, there is an ageing trend and men outnumber women.

By contrast, mining communities are also highly technical but they employ vastly more people in Western Australia than do the agricultural industries. In 2007, the sector directly employed 54,330 people, (105% increase in a decade), many of whom were in the 25-45 year age cohort and a growing number of women. However, many of those mining jobs are city-based and mining communities are often relatively temporary, with many only surviving as long as the ore body. For a variety of economic reasons, company towns have disappeared as the local resource has run out. The philosophies of neo-liberalism and free market mechanisms have guided governments since the late-1970s, with a central aim being the efficient allocation of resources, including government services and infrastructure. Government investment in small towns and communities has consequently been significantly curtailed with almost no government financial support for new town development (Storey 2001). A mining company will now only establish a residentially based operation where there is already a pre-existing community nearby with at least basic services, and the location is considered 'liveable', meaning that there are services such as retail services, a school and medical post suitable for families to take up permanent residence if so desired.

3. Western Australian Case Studies

Two such communities are Boddington in the Peel region, 120 kilometres from the capital city, Perth and Ravensthorpe and Hopetoun in the Shire of Ravensthorpe on the Southern Coast, 600 kilometres south east of Perth (see Fig. 4).

Boddington was established in 1912 to service an area of broad acre mixed cereal crop and sheep farming. Boddington town is small but very liveable, surrounded by picturesque landscapes and within easy access of three large regional centres. In the 1980s and 1990s the community struggled to survive as wool prices dropped and returns on broadacre cropping were variable. Many of the younger generation moved away and did not return to take over the family farm (Tonts 2000, Haslam McKenzie 2000). A gold mine was established in the 1990s but it closed in 1999 due to variable prices and unstable demand. Businesses in the town struggled and houses and land were sold off cheaply. A bauxite mine has operated for nearly two decades but it is relatively small in scale employing approximately 150 people. Community development minded people in town were constantly looking for new opportunities to bring people back to the town but until 2006, with limited success. However, as gold prices have increased in recent years, a decision to re-open the Boddington Gold Mine, operated by Newmont, was made in early 2006. The operation involves open-cut mining from two large pits and is expected to produce an average 850,000 ounces of gold and 30,000 tonne of copper a year for more than 20 years. During operation, expected to commence in the latter quarter of 2009, the project is expected to contribute an estimated \$550 million to the Peel region's economy and \$770 million to the Western Australian economy per year (Peel Development Commission 2008). Immediately after the decision to re-open the mine, house prices and land in and adjacent to, the town escalated in value. Housing stock increased in value by 275% in the decade 1998-2008, the greatest rise in value occurring between 2004 and 2008 (220%) (Rowley and Haslam McKenzie 2009). Boddington could not cope with the influx and the unmet demand for accommodation so the company encouraged employees to drive-in/drive-out (DIDO) from the urban fringe or from nearby rural communities, particularly during the construction phase which peaked at a workforce of 2000. The operational workforce is projected to be between 650 and 800 workers and Newmont is encouraging employees to live 'local' (within 50 kilometres of the town). An

'accommodation village' has been built in the town to provide additional accommodation and during the construction phase this has been at capacity (approximately 2,400 workers). Inevitably, there are impacts on the established social networks of the town and community (Storey and Jones 2003) and the services and infrastructure, creating tensions which will be discussed in more detail in the next Section.

The second case study, the Shire of Ravensthorpe, incorporates two small towns; Hopetoun, a quiet coastal town where, mostly, farmers chose to recreate in the summer or retire and Ravensthorpe 50 kilometres inland, which was the local service centre and the bigger of the two towns (see Fig. 4). After a large corporation, BHP Billiton announced in 2004 that it would develop a large nickel mine, the Ravensthorpe Nickel Operation (RNO), the Shire was transformed from being a small, marginal farming community to busy places with a local population dominated by an entirely different demographic, most of whom wanted to live in Hopetoun. It was anticipated that the mine, projected to be Australia's largest nickel laterite mine and processing plant, would be operational for about 25 years and that the returns to the State and the nation through royalties would be substantial. Like Boddington, previously inexpensive housing became highly sought after. House prices increased 588% between 1998 and 2008 (Rowley and Haslam McKenzie 2009).



Fig. 4: Map of Shire of Ravensthorpe on Southern Coast of Western Australia.
Source: www.ravensthorpe.wa.gov.au/maps/maprac/view (Retrieved 6th March 2009).

However, unlike Boddington where the impact of an increased population was shared across neighbouring communities, Ravensthorpe and Hopetoun are isolated with the next town more than 100 kilometres distant and local services and

infrastructure ill-prepared for such an increase in a residential local population. Sewage and other water services were inadequate and the power supply was so poor that businesses frequently went without electricity for hours at a time. RNO, government and the local government authority spent considerable funds upgrading and building new infrastructure, including roads, a primary school, airport, wind-generated energy, water and sewage services to cope with the influx of people for the construction phase of the mine.

4. Land-use Changes: Stresses and Strains

Both communities welcomed the mining companies to town; residents were pleased when their housing and land values increased and business owners were optimistic that the new population would strengthen their enterprises. Both mining companies are large, international corporations and residents were buoyed that these ventures were not going to be 'fly-by-night' operations but rather, well researched and resourced initiatives. The farming sector was particularly keen for the opportunity to boost their often variable incomes with off-farm earnings either through working on the mine or with businesses providing ancillary services.

However, the stresses and strains of new land uses soon created some concerns. Large mines are noisy, capital intensive and often incorporate cooling ponds and other physical processes that are potentially environmentally vulnerable. Consequently they require significant environmental buffers and in the case of Boddington, the mine boundary is adjacent to the town site. There were immediate concerns that if there was an environmental mishap, the township and its residents were vulnerable. At both sites, farmers were concerned that water courses and land could be poisoned by mining activity and were unsure that the authorities properly understood their business and health vulnerabilities. Both mines had a projected mine life of about 25 years. Environmental approvals have been given by the government which require the physical rehabilitation of the mine sites but there is uncertainty regarding what level of rehabilitation was required, although in Boddington, land has been successfully rehabilitated back to farm production standards as bauxite has run out. In Ravensthorpe however, there is an ongoing argument as to whether the land will be suitable for safe and productive farming once the nickel ore bodies have been exhausted. Both mining companies initiated community reference groups but the environmental and health concerns have not been fully allayed.

The lack of suitable housing and accommodation for the new labour force has been an enduring problem in both communities. Demand for accommodation from the mining companies and mine employees as well as investor demand attracted by the escalating rental returns had inevitable price effects and affordability consequences, especially for those on non-mining incomes.

Despite claims that the RNO workforce would be based at either of the two nearby towns, it became apparent that some workers would be housed in Esperance, 180 kilometres east of the mine and transported by bus on a daily basis (DIDO). As the commuting workforce increased, farmers were competing for road space, especially during the busy harvest period when they were transporting grain to the central collection points. Parents of country-based school children also complained, claiming that the increased traffic on the road endangered their children as they waited for the school bus on remote roadsides. Another accommodation alternative

offered by RNO in response to the shortage of local houses was a fly-in/fly-out (FIFO) work arrangement whereby some workers chose to be resident in Perth (the capital city, 600 kilometres north west) and FIFO on a weekly or ten day rotation, living in single person's quarters four kilometres outside Hopetoun. This caused real concern, mostly because of the negative connotations of FIFO work arrangements for both the workers and the *host* community. Because of their compressed work schedules and where they live while on site, many FIFO workers do not develop a sense of place and have limited sense of connection to the mining community (Haslam McKenzie, 2010 (forthcoming)). Workers stay in employer-provided or subsidised accommodation with close proximity to the mine site with meals and recreational services provided and consequently, their "marginal propensity to consume within the region" (Maxwell 2001, 9) means that there are considerable income leakages (Johnson 2009). Inevitably, wages paid to FIFO workers living elsewhere flow outside of the region and thus, local investment and micro-economic benefits in the *host* community are compromised at the local level.

Another significant concern, especially for the local government authorities and local Chambers of Commerce, is the use of services and infrastructure by FIFO and DIDO workers. As they are not residents and therefore ratepayers, these employees do not contribute directly to local government rates and thus local infrastructure. This has significant implications for local government and the distribution of Commonwealth and State government grants. It means that local governments with mining activity and transient workforces are providing infrastructure and services for which they are not given resources commensurate with the resident population. Host communities, and certainly those in small rural communities, generally believe that DIDO and FIFO workers do not contribute to local community organisations, they do not participate in community building activities such as sporting groups or volunteering, and take from the community with minimum return. Further, while the mining companies and government have combined to provide new infrastructure and services in both the case study communities, the local government authority is responsible for the maintenance of these not insubstantial assets. In the case of the Shire of Ravensthorpe which is spatially large but with relatively few ratepayers spread over large distances, the cost of long term maintenance of newly bituminised roads and the new airport is of particular concern if the rate of population growth recently experienced is not maintained.

Local businesses in Boddington, Ravensthorpe and Hopetoun have benefitted from the increased patronage and turnover, the mining companies do not source large scale supplies in the region or have local procurement policies of any kind; the regional economies simply do not have the capacity or a sufficiently diversified economy to supply large scale mining operations, except for minor supply goods. The companies have head offices outside of the region and the skilled workforce is usually recruited elsewhere so there is minimum investment by the large companies locally (Storey, 2001). Nonetheless, RNO claimed that between July 2000 and March 2004 it spent \$11.6 million in the Shire of Ravensthorpe (Ravensthorpe Nickel Operation 2004) and businesses have been purchased in Boddington in the hope that Newmont will honour their commitment to provide permanent contracts to local businesses (Spencer 2009).

Small towns with relatively stable populations, such as Boddington, Ravensthorpe and Hopetoun, have felt the impact of a large number of 'strangers' moving into the town en masse. As noted by Zandvliet, Bertolini and Djist (2008, 1469) "the social

homogeneity among residential populations is greater than the heterogeneity among mobile populations" and local residents, particularly in Hopetoun and Ravensthorpe, have found the transient population challenging because many of the newcomers do not value the town and community the same way as the long-term residents. This has put unplanned and unresourced pressure on the community leaders, most particularly the local government authority required to manage community development. Some residents value the economic opportunities a new mine and DIDO and FIFO workforce represent, but others put a higher value on other less tangible things such as knowing everyone when they go shopping or not having to queue at the bank. One of the arguments posed against DIDO and FIFO workers is that they essentially 'sit outside' the residential community and do not positively contribute to the functioning of the town.

Not surprisingly, employment for many local residents in both communities has changed as people are lured to high paying jobs associated with the mine. Agricultural work, by comparison, is poorly paid and often highly seasonal. This shift in local labour force participation has had a particularly adverse effect on the farming sector in the Shire of Ravensthorpe because, due to its remoteness, access to a casual labour force in particular is limited. The local farmers struggled to hire labour for shearing teams and the problem became so acute that some farmers reduced their flocks or focused exclusively on cropping. Even though the workers remained local, the compressed 12 hour shifts were exhausting, hence limiting their willingness to offer their time for community volunteering and locally-based activities. In the Peel and adjacent Wheatbelt region, the community leaders, not only in Boddington but also from surrounding towns, are concerned that the gold mine is attracting the most able cohorts of the population away to DIDO jobs in the mining industry. The non-mining communities fear that local productivity, profitability and/or the quality of service delivery will be undermined for lack of an available and willing labour force. A further problem has been that some workers returning to the resident community with inflated pay packets and increased spending money have had detrimental impacts when the money is spent on alcohol and drugs or sets up resentment and conflict with those in the community who do not have the same spending capacity (Lambert 2001).

Without warning, on 21st January 2009, BHP Billiton placed the RNO on indefinite suspension after only eight months in operation. The employees and the community were shocked and devastated. The reasons for the suspension were not clearly stated by the Company but it was broadly accepted that the price of nickel on the global market had dropped during the global financial contraction and the mine was no longer viable. The suspension of mining coincided with a global downturn in almost all sectors of the economy, including the housing market. It was clear that without RNO the local housing market would be directly impacted by the suspension of operations at RNO as a significant part of the residential population had lost their local employment and would move from the region. Over the subsequent months, company employees withdrew their children from the local school, packed up their homes and moved away. It was generally considered that the employees of the company were the 'lucky ones'; it was small business owners who had set up businesses locally who were the most vulnerable, although after considerable media exposure and local anger the Company negotiated some payments to local businesses. Within six months the new school was struggling to remain viable with less than 50 enrolments and some local businesses closed.

Long standing residents of the Ravensthorpe and Hopetoun communities had a sense of bewilderment and betrayal when they reviewed all that had happened over the previous six years and they were concerned about the future of the communities. Some thought that the Shire of Ravensthorpe and Hopetoun in particular, would simply revert to the Shire and town it was prior to BHP Billiton coming to town. It was clear however, the Shire and town were not the same as they were six years before. There was now an established mine and entirely new infrastructure, not to mention the experience of dealing with a large corporate stakeholder. The impact of the sudden suspension had reverberations around the nation. The buoyancy and sense of optimism for communities such as Boddington was dampened; there was a concern that "if this should happen to a BHP Billiton mine then it could happen to any mine". There was further general unease, not only at the local levels but within broader Western Australian and business communities when it was announced in June 2009 that despite the economic downturn, the BHP Billiton profit for the year was above expectations and that the net operating cash flow was a record. At the same time, the company paid down debt and invested nearly US\$11 billion in growing the business, despite the 'exceptional items' being US\$4.84, the bulk of which was for the suspension of the Ravensthorpe mine and the associated investment in the Yabalu nickel refinery in Townsville (FitzGerald 2009). The message was clear; mining is big business and even governments can do little to change corporate actions once the company is established in the community. Family owned farm enterprises and local government authorities have limited, if any, power.

5. Conclusion

The export data (Australian Bureau of Statistics 2009b) show that the resources sector is very important for Australia's foreign exchange as well as for domestic revenue, with earnings being directed to company profits, tax revenues and input costs including transport, business services, fuels, construction and construction materials. Incomes generated in the mining industry are dispersed into the rest of the economy through the multiplier effect (Richardson 2009) and the development of the mining industry has prompted associated need for public and private infrastructure. This paper, focusing on two small rural communities in Western Australia which, until recently, had limited industry diversity and were almost wholly dependent on agricultural business, have now experienced significant land use changes since large mining companies established substantial mines in their localities. Unlike farming, which in Australia is still dominated by family ownership, mining companies are multinational corporations with hardnosed decision-makers directing local operations based on economic and financial parameters rather than social capital and sense of place.

As shown in this paper, the establishment of a mine requires significant capital investment and upgrading of infrastructure such as the local school, the medical facilities, roads, and in the case of Ravensthorpe, the airport, all of which are of significant benefit to the local community. This has been especially the case in broadacre agricultural areas such as Boddington and Ravensthorpe where global competition has depressed agricultural returns and government investment in infrastructure and services has been significantly rationalised over two decades causing an ongoing depopulation and ageing trend in rural areas throughout Australia (Gray and Lawrence 2001, Australian Bureau of Statistics 2007a, Bureau of Rural Sciences 2008). The influx of people to the towns boosted local businesses

and diversified the local economy. In both cases, the average age of the local communities decreased and individual spending capacities also increased.

However, there were also challenges which the local authorities and community had to confront. Negotiating with a powerful multinational with strong links to both State and Federal government meant that decisions were made with only cursory inclusion of the local stakeholders. In the case of Boddington, the mine is the largest rate payer but there is no local representation. The mine manager does not live locally and most negotiations are conducted at a level beyond the Shire. As evidenced in this paper, the cost of land and housing increased dramatically in both locations, pushing up the local cost of living (Department of Local Government and Regional Development 2007b) and marginalising those who weren't already home owners and who are not employed in high paying jobs. In Ravensthorpe, the local government authority employees could not compete for accommodation and the Shire was forced to provide rental assistance for all employees to ensure equity; a very expensive outcome. In Ravensthorpe, even though farming struggled to maintain its outputs it continued to be an important industry but in Boddington, mining has now overtaken the town's *raison d'être*.

As was the case in Ravensthorpe, global prices for nickel slumped during the 2008 global financial crisis and BHP Billiton decision-makers responded by suspending operations at the Ravensthorpe mine indefinitely. As noted by Pick, et al., and others (Pick et al. 2008, Humphreys et al. 2007, Stiglitz, 2007), the 'resource curse' thesis is not restricted to economic performance, whereby those places with a resource advantage are often left at a disadvantage after the resource has been extracted. The experience of a large multi-national company establishing a mine in a small remote Western Australian community was a direct link to global forces and hence a vulnerability to the 'resource roller coaster' (Wilson 2004). This is no different to the vulnerabilities of the agricultural global market forces but it would appear that farmers have stronger links to their community and a greater commitment to local social capital. The communities of Hopetoun and Ravensthorpe, which had experienced significant industry and social disruption when BHP Billiton announced the commencement of construction of the mine in 2002, were again in a state of flux. As this paper goes to press, the Boddington Gold Mine is going into full production and while world gold prices remain buoyant it is likely that agriculture will not be the once important industry it once was in Boddington. In the Shire of Ravensthorpe however, the communities are looking to attract a new population to town to replace the young, vibrant people who came with the nickel mine and the farmers and their families have returned to full-time farming or moved on.

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Summary

The value of mining to the Australian, and particularly the Western Australian, economy has escalated in the last decade. Exploration and development of previously unviable mining operations has meant that mines are now operational in what have previously been well established and highly productive agricultural lands. This paper draws on in-depth, semi-structured interviews and focus groups in two traditional rural communities where large mines have been established. The socio-economic impact of mining on the communities was examined.

Neo-liberal government policies have meant that services to small rural towns have been rationalised over the last thirty years and the onus has been on community and industry self-sufficiency. As a result, towns and communities became smaller and smaller as farmers pursued economies of scale and invested in highly technical machinery thus reducing the labour force. The arrival of large scale mining promised new jobs and increased patronage of local business but it has also put considerable strain on the available infrastructure including power, water, sewage, building materials and housing, particularly in the construction phase of the mine. As a result, there has been a tightening on housing and local labour markets and considerable inflation of accommodation, construction and materials costs. This has meant that many who did not own homes or those who were the most vulnerable in the community have struggled to stay as prices have escalated and some have been squeezed out. The pressure on housing has meant that many workers either fly-in and fly-out (FIFO) or drive-in and drive-out (DIDO) from the mine, living at the mine site in mining camps for up to six days at a time before returning to their home community. This practice reduces local expenditure because all services are provided by the mining companies and hence, the local community struggles to benefit from the increased population. Similarly, the transient, non-resident workforce use local services and infrastructure but because they are not ratepayers, these employees do not contribute directly to local government rates and thus local infrastructure. This has significant implications for local government and the distribution of Commonwealth and State government grants. It means that local governments with mining activity and transient workforces are providing infrastructure and services for which they are not given resources commensurate with the resident population.

The establishment of large scale mines has also impacted on rural industry. Many of the farms depend on seasonal and transient labour for planting and harvesting of crops and for casual labour during shearing. This labour cohort has been lured to mining by the high paying jobs offered by the mining companies and local businesses servicing the mine, to the extent that in one community, sheep farming has contracted considerably. On the other hand, the mines offer jobs to many who previously had to leave rural communities because the work was no longer there.

The mines have also affected many of the social activities. For example, rolling twelve hour shifts mean that many people can no longer participate in team sports and community leaders report that community group participation has dropped off because people are either too tired or their shifts preclude their attendance at meetings and activities. Many local residents report that the sense of community,

commitment to local activities and quality of life has been undermined by the presence of the mines.

In summary, the increasing presence of mining in rural communities has wrought considerable change which has challenged long term residents and community leaders to presciently manage the changes. Certainly mines do bring with them job opportunities and community expansion, but the changes inevitably put pressure on local community groups, infrastructure and local services. Our research also showed the impact on a community when mining activity ceases and this too created considerable broader community hardship. The peripatetic traditions of mining meant that the miners moved out almost as quickly as they moved into the community. The lessons to be learned from this is that there is much to be gained from the presence of a mine but the activities and impact of a mine need to be very carefully managed if the benefits are to be enjoyed for the long term.

