

Higher education and the minerals boom

A view from the regions

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This paper examines the impact of the minerals boom to date on the demand for higher education in Central Queensland, and the sustainability of higher education providers in high economic growth environments. Several datasets were used to examine changes in the demand for higher education among specific student groups within the region, the impacts upon currently enrolled students, and some of the potential consequences for regional employers and long-term regional competitiveness. It identifies challenges facing higher education providers operating in such environments and the policy implications of these challenges for government.

Introduction

Since 2002, Australia has experienced an export-driven minerals boom, which has a significant and generally positive impact on the national economy as a whole. Regional areas of Australia that are closely associated with the mining industry or host major mining operations have been particularly affected by this boom, with many of these areas experiencing significant economic growth and opportunities for development during this period. Despite the recent economic slowdown, the long-term growth prospects of countries such as China and India indicate that this mining-based growth is likely to continue to play an important role in Australia's economy for the foreseeable future.

The minerals boom has radically changed the social and economic norms of many regional areas in Australia. Economic growth has placed considerable strain on regional labour markets, with increased demand for labour and consequent higher salaries providing opportunities and incentives to drive a rapid expansion of the traditional labour market and encouraging many traditional non-participants to enter the labour force. This has had a signifi-

cant impact on the demand for higher education in these regions. Increased employment opportunities and rapidly rising costs of living have motivated many current and potential students to move into the workforce rather than continuing their education. This has in turn placed considerable short-term strain on several regional universities, and has the potential to have a serious long-term impact on the future sustainability of the regional communities that they service.

The recent history of Central Queensland University (CQU) has been dominated by the impact of the resources boom on its regional community. The massive growth in Central Queensland's coal industry over the past ten years has caused immense economic and social change within the University's campus footprint. Those changes have had an impact on the University in a variety of ways, the most obvious being a sustained fall in enrolments of domestic students from the Central Queensland region.

Central Queensland's declining demand for higher education is not unique among the regions impacted by Australia's resources boom – regions in Western Australia and the Northern Territory with high levels of expo-

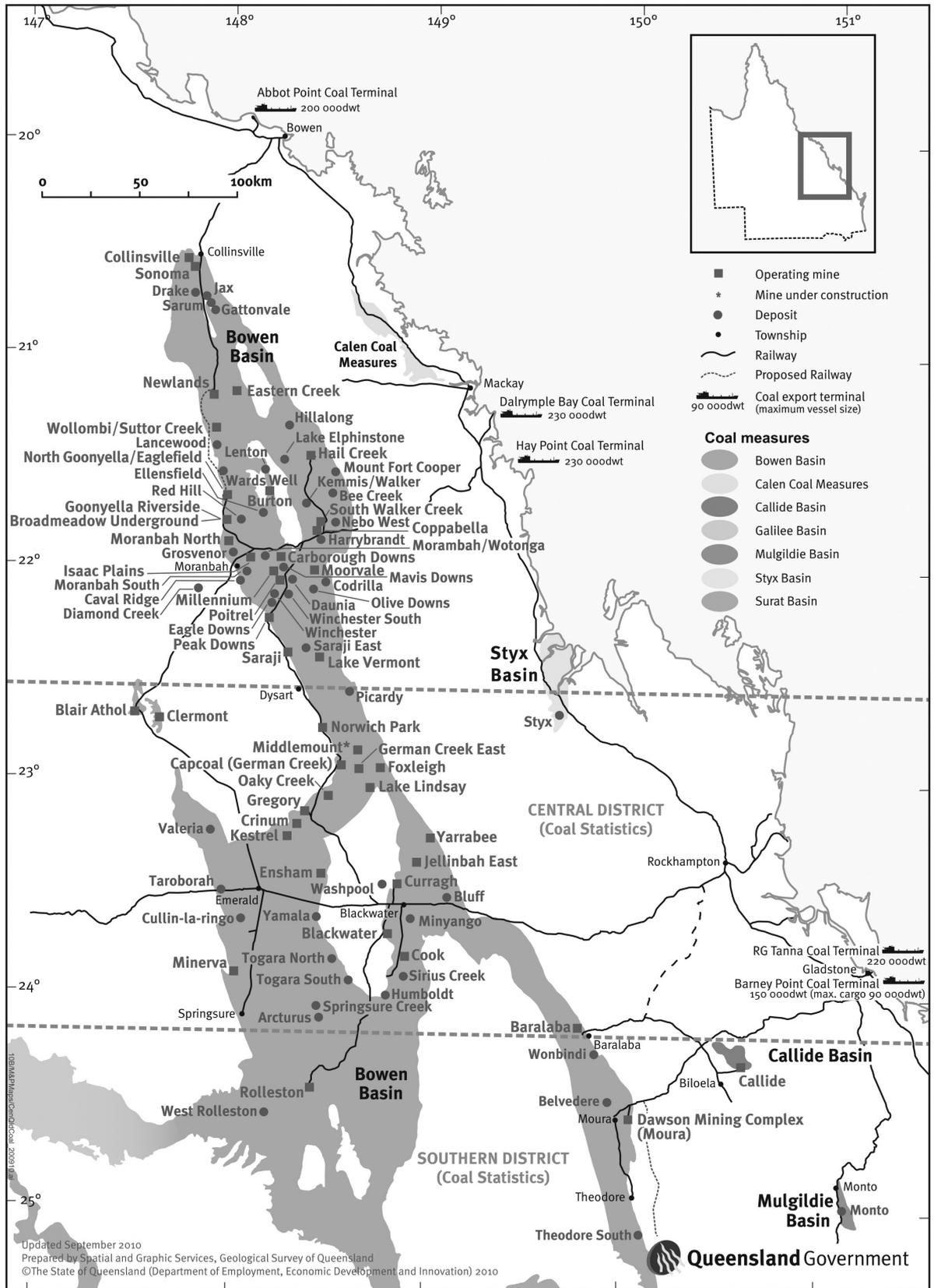


Figure 1. The coal industry in Central Queensland
 Source: Department of Mines and Energy (2010)

sure to the minerals industry have experienced similar falls in demand. However, it needs to be recognised that CQU is arguably the university most exposed to the economic impact of the resources boom. Along with Charles Darwin University in Darwin, the majority of its campus footprint is physically located in one of Australia's major resources regions, and it relies heavily on domestic enrolments from regional areas on which the resources boom has had the greatest impact. The University has therefore been uniquely exposed to the rapid economic and social change occurring in its regional community as a result of the expansion of the mining industry.

Central Queensland's coal boom

Central Queensland is the hub of Queensland's coal mining industry, with approximately 95 per cent of Queensland's coal exports either originating in the region or being processed through the region's ports (Department of Natural Resources and Mines, 2012). The growth in coal production and processing in recent years has been substantial, with Queensland's coal exports growing from \$5,946 million in 2003-04 (Office of Economic and Statistical Research, 2004) to more than \$29,022 million in 2010-11 (Department of Natural Resources and Mines, 2012). On a global scale, Central Queensland's maritime exports of coking coal total more than the rest of the world combined (Department of Mines and Energy, 2007), with the volume of exports of coking coal from Central Queensland now being almost double that of the world's next largest exporting nation (World Coal Association, 2013; Department of Natural Resources and Mines, 2012).

The geographic scope of coal mining activities and key related infrastructure in Central Queensland is shown in Figure 1. CQU's regional footprint overlaps with the region's coal extraction and export operations. Mackay and Gladstone both host university campuses and major coal export facilities. Rockhampton, Mackay and Gladstone all host significant service industries for the coal industry and act as accommodation centres for staff working on 'drive-in, drive-out' rosters at coal mines in the region, while Emerald plays a key regional role as the service and administrative hub at the centre of the coal industry in the Central Highlands region.

The coal boom and its impact on the Central Queensland economy

The expansion of mining activity in Central Queensland has significantly changed the region's economic landscape in a short period of time. The region has seen its traditional economic reliance on service industries, tourism and agriculture decrease, and mining take a key role in the regional economy.

Between 2001-2002 and 2010-11, the number of people employed in the mining industry in Queensland expanded from approximately 19,600 to 55,500 employees. During that period, mining was the fastest growing employment sector in the Queensland economy, with employment growth running at almost four times the all sector state average (Office of Economic and Statistical Research [OESR], 2011). Much of the employment growth in the mining sector was focused in Central

The employment opportunities associated with the mining boom meant that between 2001 and 2011 median weekly income grew by 98 per cent in the Mackay region and 86 per cent in the Fitzroy region, compared with 54 per cent Australia-wide

Queensland. Between 2001 and 2011 employment in the mining industry grew by more than 190 per cent in the Fitzroy region, and by more than 159 per cent in the Mackay region (Australian Bureau of Statistics [ABS], 2011). The boom in mining activity also gener-

ated growth outside the mining sector. As early as 2004-05 research by the Department of Mines and Energy (2007) estimated that approximately one in every six jobs in Central Queensland could be directly or indirectly attributed to the coal industry. Between 2001 and 2011, this growth in mining and related employment contributed to an increase in the number of people employed full time in the Mackay region of 54 per cent and in the Fitzroy region of 36 per cent, significantly higher than the national employment growth rate of 19 per cent during the same period (ABS, 2011).

Many of the jobs created by the boom were well paid and required minimal formal qualifications or training. The employment opportunities associated with the mining boom meant that between 2001 and 2011 median weekly income grew by 98 per cent in the Mackay region and 86 per cent in the Fitzroy region, compared with 54 per cent Australia-wide (ABS, 2011). By the peak of the mining boom in 2008-09, six Central Queensland postcodes were among the ten postcodes identified by the Australian Taxation Office as having the highest mean taxable incomes in Queensland (Australian

Taxation Office, 2010). In terms of incomes associated with specific positions, by 2008 the commencing salary of truck drivers in the Queensland coal industry was approximately \$80,000 per annum (Hays Recruitment, 2011). These and other positions in the mining industry were substantially better paid than comparable positions in other parts of the economy.

As a result of these opportunities, the growth in mining industry employment saw a rapid fall in regional unemployment and a change in the structure of the

local economy as mining displaced other traditional employers within the region and as industries required to support the growth in the mining industry also experienced substantial growth. As an example, between 2001 and 2011 as many employees moved to the mining

industry, employment in agriculture fell by more than 34 per cent in the Mackay region and 28 per cent in the Fitzroy region (ABS, 2011). Over the same time period, coal-related projects and their multiplier effect led to employment in the local construction industry growing by 135 per cent in Mackay, and 96 per cent in Fitzroy. Despite the growth in the number of people employed within the region and the transformation of the regional economy, the labour needs of the coal industry were such that a large number of workers needed to be attracted to the region through fly-in, fly-out (or drive-in, drive-out) employment options. Calculating the prevalence of fly-in, fly-out and drive-in, drive-out work arrangements across the region is difficult; however, at the time of the 2011 census, more than 8 per cent of all full time workers present in the Mackay region nominated their usual place of residence as being somewhere other than the Mackay region (Australian Bureau of Agricultural and Resource Economics and Sciences [ABARES], 2011). By 2011, the mining sector was the largest employment sector in the Mackay-Fitzroy-Central West region (ABARES, 2011). This represented a major change to the regional economy's traditional reliance on agriculture, typified by the historic labelling of the regional centre of Rockhampton as being the beef capital of Australia.

The growth in regional employment and income fuelled growth in other areas of the regional economy, such as real estate. By 2008, growth in housing prices in the Central Queensland region meant that regional centres such as Rockhampton, Mackay and Bundaberg were

all ranked in the 50 least affordable locations in the world for housing (Demographia, 2009), an outcome that ranked some regional Queensland locations as being less affordable than London or New York. Examples such as those cited in the *Courier-Mail* (Hele, 2011) of rental costs in regional mining centres of up to \$3,000 per week for a four bedroom house had become increasingly common, and played a major role in driving increases in the cost of living in these centres.

Government agencies have, in many cases, struggled

to respond to the pace and scale of the growth associated with the mining boom. The challenges facing government agencies in delivering adequate services in these conditions are summarised in a recent report by the Queensland Coordinator General on proposed

changes to BHP Billiton Mitsubishi Alliance's mining operations in Central Queensland:

The state government and other services providers are responsible for providing adequate social infrastructure and services. However, as funding for government services is generally based on five-yearly census data, the supply of services cannot always keep pace with the demand caused by the rapid growth, such as that seen in the resource sector.

While the challenges associated with service and infrastructure planning and delivery in a high growth environment are understandable, they also create real issues at a local and regional level. The health sector is one example where a failure to keep pace with the rate of regional economic development has created significant regional problems. *The Report on the Audit of Health Workforce in Regional and Rural Australia* (Department of Health and Ageing, 2008) found Central Queensland was substantially underserved in a range of health and allied health professions, creating ongoing problems in delivering an adequate level of service to the Central Queensland community.

In examining mental health issues in Australia prior to the 2010 federal election, *Four Corners* (ABC TV, 2010) chose to examine mental health issues and service provision in the Mackay region as a case study in the shortfalls of health service provision in regional Australia and for the impact that such shortfalls are having on regional communities. Queensland Health documents obtained by the *Courier-Mail* (Miles, 2011) show that during the

Between 2004 and 2009, enrolments of students from the Central Queensland region at Queensland universities fell by more than 20 per cent, contrasting with an increase in enrolments from students state-wide.

Table 1. QTAC enrolments 2004–2009 by geographic region of applicant

	2004	2005	2006	2007	2008	2009	Change %
Fitzroy	1231	1181	1097	1036	1096	933	-24.21
Mackay	868	720	727	732	769	662	-23.73
Queensland Total	29599	30668	30330	30215	29625	30064	1.57

Source: Compiled from the Queensland Tertiary Admissions Centre's Statistical Reports 2003–04 to Semester 1, 2009.

course of 2011, the Central Queensland Health District consistently had one of the highest levels of reliance on locum medical staff for service delivery in Queensland. Trying to build an adequate staff base to deliver key services in an environment where many local students are attracted to the high salaries offered by the mining industry and experts from outside the region being deterred by the high cost of living in the region, represent significant challenges to many regional communities in Central Queensland.

The impact on higher education

Gylfason (2001) undertook research on the demand for higher education in mineral-rich economies, and argues that natural resource-based economies create a well-paid work force that requires relatively low skill levels. As a result, they offer little incentive for individuals to invest in their education or other forms of human capital development. Auty (1993) argues that mining activity effectively 'crowds out' other activities by monopolising resources, including the human resources needed to develop and sustain other activities in the region.

These findings are supported by recent research on issues such as regional participation rates and regionality as a source of disadvantage in higher education. Regionality has been recognised as an indicator of disadvantage in the Australian higher education sector, with students from rural and isolated backgrounds classified as an equity group (James *et al.*, 2004). Students from regional areas are less likely to enrol in or complete a higher education qualification than students from metropolitan locations, and regional locations typically have relatively fewer tertiary educated employees than metropolitan areas (James *et al.*, 2004).

Research by the Department of Education, Employment and Workplace Relations (2010) suggests that socio economic disadvantage – particularly measured in terms of regional employment and education profiles – is one of the main contributors to regional areas having significantly lower participation rates in education. Despite the high salaries associated with the coal industry, the profile

and skill levels of many jobs associated with the industry mean that coal mining regions are typically regarded as disadvantaged when assessed using regional employment and education profiles such as Socio-Economic Indexes for Areas (SEIFA).

These research findings align closely with CQU's experiences during the minerals boom. The creation of a large number of well-paid jobs requiring limited professional or tertiary level education reduced the demand for higher education within the region. The high level of demand for labour during this period and the high salaries on offer from the mining industry led to many potential students choosing to take up employment opportunities rather than enrolling in tertiary study. The employment choices of Central Queensland's school leaver demographic are particularly illustrative of this trend.

Time series data from the Australian Bureau of Statistics Basic Community Profiles (2011) shows that between 2001 and 2011, the number of 15–19 year olds in the Mackay region working full time grew by more than 53 per cent, while the number in the Fitzroy region grew by 39 per cent.

By comparison, across Queensland during the same period, the number of 15–19 years working full time grew by just under 5 per cent. In the Mackay region, the proportion of 15–19 year olds describing themselves as not in the regional labour force (individuals neither working nor actively looking for work – a category that includes many full time students) fell from 39 per cent to 29 per cent, while in the Fitzroy region the proportion fell from 41 per cent to 33 per cent. By comparison, across Queensland during the same period the proportion of 15–19 year olds describing themselves as not in the labour force fell only marginally, from 42 per cent in 2001 to 40 per cent in 2011. These figures demonstrate that during this period the number of Central Queensland school leavers opting to move into full time employment was growing considerably faster than the state average, and the proportion of school leavers describing themselves as outside the labour force (and, by implication, available for full time study) fell from close to parity with the state average to a substantially lower level.

Queensland Tertiary Admissions Centre (QTAC) data (Table 1) indicate that this change in employment patterns had a significant impact on new enrolments of students from the Central Queensland region. Between 2004 and 2009, enrolments of students from the Central Queensland region at Queensland universities fell by more than 20 per cent, contrasting with an increase in enrolments from students state wide.

To some extent, this fall in enrolments had an impact on all Queensland universities, however, as a regional university relying on these areas for the majority of its domestic student intake, CQU was more heavily affected by these changes than other Queensland-based providers. It is worth noting that the regions that CQU relies on most heavily for its domestic student base - Mackay-Fitzroy-Wide Bay-Burnett and the Central West - now have among the lowest participation rates for higher education in Queensland.

Employment pressures were a significant factor in this change and to other changes in enrolment patterns. Between its inception in 2005 and the peak of the minerals boom in 2008, Education Queensland's *Next Step Survey* (2005, 2006, 2007, 2008) noted an increase in work related deferrals among school leavers considering higher education, as well as in the number of school leavers undertaking full time or part-time employment in their first year of university study.

In addition to its impact on the level of new enrolments, the increase in employment opportunities led to changed higher education enrolment patterns and higher rates of student attrition. CQU's student attrition rates rose from 26 per cent in 2005-06 to 31 per cent at the peak of the minerals boom in 2007-08. Data released by the Department of Education, Employment and Workplace Relations via the Teaching and Learning Performance Fund indicate that this is not an institution-specific phenomenon, and that other regional Queensland universities experienced similar pressures, as did Western Australian and Northern Territory institutions which also experienced pressures from increasing mining activity in their regions. Most of the bottom five rankings in student retention in all of the discipline areas considered by the Learning and Teaching Performance Fund were occupied by institutions in regions closely linked to the mining boom. The impact of regional economic conditions upon these retention outcomes needs to be more fully considered than it has been in analyses conducted to date (Department of Education, Employment and Workplace Relations, 2009).

At an institutional level, the impact of the decreased enrolments and increased attrition at CQU was such that

a report undertaken by the Queensland Treasury Corporation (2009) noted serious concerns regarding the impact of declining enrolments on the University's ongoing financial viability. While questions have been raised concerning the validity of that report, such analysis serves to highlight the vulnerability of regional higher education providers to economic and social trends within their regions, and is an example of the potential impacts on regional education providers of the resources boom.

Looking forward

The slowing of the global economy in 2008-09 led to a downturn in mineral prices and a slowing of the rate of growth in Australia's mining industry. The slowed regional employment growth resulting from this led to an increase in the number of students from the Central Queensland region enrolling in higher education programmes in 2010 for the first time since 2004 (QTAC, 2010), with this growth continuing into 2011 and 2012. While this growth in enrolments from its key catchment areas is positive news for CQU in the short term, it again highlights the close link between the regional economy and regional demand for (and enrolments in) higher education.

Based on continued demand for coal and other minerals to fuel China and India's ongoing economic growth, it appears that Central Queensland and other mining regions within Australia will continue to experience strong mining-driven economic and employment growth. While the value of Queensland's coal exports dipped following the global financial crisis, a recovery in the price of coal on international markets means the value of Queensland's coal exports now exceeds its pre-global financial crisis highs; numerous new extraction and infrastructure projects continue to be implemented to support this ongoing growth (Department of Natural Resources and Mines, 2012). Employment and other opportunities associated with growth will continue to place pressure on the regional economy and on CQU's enrolments. Hollows (2008) estimated that the Queensland coal industry will require 16,000 new employees over the next six to ten years to replace current employees leaving the industry and to staff new initiatives and expanded projects.

The development of Queensland's liquid natural gas industry will also see the employment pressures generated by Queensland's mining boom spread over a larger geographic area. Australia's liquid natural gas production is expected to quadruple between now and 2017, with Australia expected to become the world's largest exporter of liquid natural gas by 2020. Four proposed

liquid natural gas processing plants in Gladstone are a key part of that expansion, with those plants and their associated infrastructure expected to generate more than 23,000 jobs during the construction phase (Energy Skills Queensland, n.d.). The major gas extraction sites servicing those processing plants are expected to be located in Central and Southern Queensland, to the south of Central Queensland's main coal mining regions. Regional centres in Southern Queensland associated with gas extraction, such as Quilpie and Roma, are already experiencing unemployment rates of approximately 2 per cent due to the demand for labour associated with new gas-related construction projects (McCarthy, 2012). That rate is considerably below the Queensland state average, which in late 2012 sat at approximately 6 per cent. The extent to which employment pressures in these new boom regions impact on the regional demand for higher education and this change in demand may have on the universities that services those regions will be interesting to assess.

This demand for labour is likely to place pressure on the ability of the region to meet its own human capital needs. At a regional, it will certainly challenge level goals such as those articulated by the previous government (Gillard, 2009) to consistently increase the number of university graduates across Australia, and create further challenges to building a long-term skills base for Queensland's booming coal industry to draw upon for future growth. The key question for the federal government in responding to this situation will be how to motivate potential students to enrol in and complete tertiary programmes that involve a considerable investment in time, money and opportunity cost when there are extremely well-paid local employment alternatives available that require very limited formal training or study. Discussions around how to achieve this goal have mainly focused on supply-side issues – how to generate the additional places required to achieve the government's enrolment and completion targets. The idea that potential students may not wish to take advantage of those opportunities may instead prefer to continue to take advantage of well-paid but relatively unskilled positions in the mining industry has not been addressed, and will be a key issue in addressing the challenges currently facing Queensland's mining-intensive regions in developing their human capital base.

As previously noted, recent research by the Department of Education, Employment and Workplace Relations (2010) has indicated that regional employment profiles are a significant indicator of a region's higher education participation rates. Unfortunately, the federal

government strategies for encouraging and supporting students from regional or remote locations have, typically, focused on income support for students during their studies, with this support being means tested based on parental incomes (Department of Education, Employment and Workplace Relations, 2010). This strategy is of questionable real benefit to regions with low levels of educational attainment but high levels of personal income. The question of how the federal government intends to support and encourage individual students from high income regions, such as coal mining centres, to proceed into tertiary studies has been largely left unanswered.

The extent to which this question is an issue requiring further consideration in mining regions such as Central Queensland is indicated by SEIFA. SEIFA was developed by the Australian Bureau of Statistics to identify and measure relative socio economic well being and disadvantage in communities throughout Australia (ABS, 2008). It provides four indices of socio economic conditions across almost 1,400 statistical local areas in Australia. An indication of where means tested support for improving low levels of higher education participation is likely to be least effective can be found by comparing SEIFA's Index of Economic Resources, an index focusing on family income, rent and mortgage payments within a designated area, with the Index of Education and Occupation, which focuses on educational attainment and employment categories. A relatively low score in the Index of Education and Occupation indicates a relative shortage of degree-qualified individuals in a given area, while a relatively high score in the Index of Economic Resources identifies that incomes in a region are likely to make potential students from that region ineligible for means-tested income support. Quarter of the 20 statistical local areas in Australia where the regional Index of Economic Resources exceeds the region's Index of Education and Occupation by the greatest amount are located in Central Queensland. While not denying that means-tested income support will provide assistance and support for some parts of the Central Queensland community to access higher education, the difference between the two SEIFA indices indicates that such means-tested support is becoming increasingly irrelevant and inaccessible for many parts of the region. Identifying alternative strategies to maintain and increase participation rates in the region is therefore critical.

The idea of a regional higher education policy is something that has gained increasing support in recent years. Through the Education Investment Fund and other ini-

tiatives, the federal government has made significant funds available to regional universities to expand their infrastructure and the range of programmes offered in regional Australia (Battersby, 2011). While this contribution to supporting regional universities must be acknowledged, the decreasing relevance of the support available to individual students in specific regional areas must also be recognised. While programmes to develop regional higher education infrastructure and encourage capacity building are important, they should not be regarded as a substitute for developing appropriate regional initiatives to encourage and support student in undertaking further study.

Conclusion

As a result of its part in Australia's resources boom, Central Queensland has experienced massive social and economic change over the past ten years. Those changes have affected many parts the region, but have created particular challenges for regional higher education providers in terms of participation and retention, which have in turn led to lower enrolments in higher education among students from the region.

The fall in regional higher education enrolments as a result of the massive social and economic changes arising from the mining boom has consequences not only for regional higher education providers, but also more broadly for the region's community in terms of decreasing numbers of local graduates to work in regional businesses, hospitals, schools and other workplaces. Given that regional businesses in Central Queensland increasingly include minerals extraction and processing operations of national and international importance, this fall in graduate numbers also has the potential to impact on Australia's economy as a whole. Workforce composition and skills levels were identified as some of the potential reasons for decreases in the productivity of Central Queensland's mining operations during the minerals boom (Rolfe *et al.*, 2007). Given the importance of the resources industry to Australia, strategies to effectively address the factors contributing to such declines should receive a higher priority from government than is currently the case.

Failure to address the current decline in regional participation will see Central Queensland and other mining regions becoming increasingly reliant on attracting graduates from outside their region to meet their human capital needs, a strategy that imposes significant costs upon the industries driving Australia's current economic growth,

and that relies on those industries reversing the historical trend of graduates moving from regional areas to metropolitan centres in search of career and lifestyle options. The success of government policy in recognising and addressing these unique regional needs and challenges will play a key role not only in the future of higher education in Central Queensland, but also in meeting the human capital needs of key Australian export industries that make significant contributions to the whole of Australia's economic wellbeing.

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