

Evaluating Impact Assessment Processes and their possible future contribution to Regional Development

Mr Grant O’Dea and Prof Bob Miles
Institute for Sustainable Regional Development Central Queensland University

Abstract

Impact assessment currently forms and will continue to play a major part of industrial development in Australia and increasingly globally. While the impact assessment processes used have evolved they are still traditionally undertaken as a single issue and point in time analysis (social, environmental or economic assessment). With an increased focus on regional growth management and a Triple Bottom Line (TBL) approach to sustainable regional development it is now timely to think about the existing contribution and possible future role the impact assessment process could take. It is the purpose of this paper to report on (a) a review of the existing impact assessment processes in Queensland (b) an evaluation of the effectiveness and limitations of the existing process and (c) to propose a need for a more holistic and integrated approach for the future.

The review has found the current system, while evolving, does not adequately take into consideration contemporary needs of the whole of industry life cycle or the TBL implications of the various stages of (1) the industry establishment, (2) growth and operations and (3) the eventual wind down and closure of the industry activity on the site. The paper explores the opportunities to further enhance the existing process to take these matters into account.

The paper firstly explores the genesis of impact assessment and how it has evolved through time. The paper then explores the various strengths and weaknesses of the existing assessment processes as they relate to emerging community and environmental interests and needs. The paper then proposes and explores the various options and challenges to meet the future sustainable development needs of regions and their communities. The paper closes by with suggestions and opportunities to improve the current system that will take into account the wider implications of a whole of industry life cycle approach, the cumulative impacts of industry growth and the necessary linkage with regional planning and growth management frameworks.

Introduction

The wealth and economic improvements that flow from coal mining and industrial developments are recognised as considerable contributors to the Nation's economy. While these benefits are substantial, in recent years an increasing focus has been on the potential for negative impacts. Specifically, the focus has turned to the regional and local level where the impacts and benefits are not always acknowledged or so clearly defined. For example, coal mining by virtue of its scale and export value is clearly recognised as an asset to the State and National economy. However the economic, social and environmental benefits at the regional community level may not be as positive or the impacts known. Thus at any local level there is a need to gain a greater understanding and insight of these local issues – positive or negative. Traditionally the regional or local dimension has been directed toward assessing the environmental impacts.

The social dimension of any new large scale development is now of increasing interest to Industry and Government. These sectors recognise that if the social issues are not dealt with effectively the result is usually expressed through community outrage. This outrage often leads to a non-rational approach by all parties. As a consequence, much of this tension and anger often remains unresolved (for example, long wall mining impacts on farming and grazing lands in the Central Highlands of Queensland). Non coal examples of these issues are also common and are demonstrated in the Yarwun Targinnie area which overlays the shale oil deposit at Gladstone (Queensland) and the East End Queensland Cement Mine in Mt Larcom (Queensland).

As a consequence of and in response to these needs, the traditional environmental impact assessment system has evolved and continues to change. Historically the focus of the Impact Assessment (IA) processes was on the physical environment. Over the last decade, the value and importance of the adoption and inclusion of socio-economic impacts have been recognised and in part incorporated into the IA process. However, it is only more recently that it has received any serious consideration. Even today the social dimension largely plays a more subsidiary role to the economic and environmental interests.

Harvey (1998) defined Environmental Impact Assessment (EIA) as “a process of identifying and predicting the potential environmental impacts...of proposed actions, policies, programmes and projects and communicating this information to decision makers before they make decisions on the proposed actions” (cited in Vanclay, 2004). Through the evolutionary and continuous improvement process the practice of EIA has become more comprehensive and is now part of the legal and policy framework of undertaking major development projects throughout the industrialised world.

However while there is now recognition of the need to explore all possible impacts, generally the various aspects of implementation and practice still favour the earlier focus on the biophysical components over Economic Impact Assessment (EiA) and Social Impact Assessment (SIA). It is of note that the economic benefits, regardless of how brief in detail, are often perceived to carry great weight in achieving approvals. Vanclay (2004) states that EIA and SIA have failed to consider the positive outcomes and the goals of

development while SIA itself has tended to focus on individuals rather than society as a whole.

In addition over the years, the preparation of Environmental Impact Statements has reflected a shift from a purely technocratic approach to a participatory-consultative one. The practice of EIA indicated that EIA were mainly undertaken by physical and environmental scientists with no formal training in the social sciences. As a result the human dimension of environmental impact was not adequately addressed or explored through the EIA process, nor reported in the EIS. These technocratic consultants were often not appreciative of the values and belief systems of the community or their perceptions of the possible implications of the project on the community. As a result, many projects were met with resistance and conflict from the local community through a lack of consultation and engagement in the decision making process.

This reliance on EIA, particularly for the purpose of decision-making and in determining whether a project should proceed or not is also coming under increased scrutiny. Of note is that the Environmental Assessment has been the world-wide standard since the 1970s as a tool to assess impacts. It remains relevant today and the EIA is now the most commonly referred to process and focus for the community, practitioners and law makers.

One of the major developments in Australia is the collaboration between the State or Territory EIA process and the Commonwealth. This collaboration now requires the proponent to produce only one set of documentation and conduct one community consultation/participation program to satisfy the requirements of both jurisdictions. This framework has improved with Bilateral Agreements to ensure consistency of the assessment process among all levels of government, avoiding unnecessary duplication whilst ensuring the required level of protection of the environment.

Given the increased focus on the adequacy of the EIA process to deal with the socio-economic dimension it is the purpose of this paper to examine a number of EIS from both mining and industrial developments, and assess the capacity of EIA to identify, mitigate and monitor the socio-economic impacts of large scale developments. It is the purpose of this paper to provide a platform for discussion on how the IA and related processes can be further refined and improved to minimise pre and post large scale development impacts. In addition, the capacity of the current IA process to adequately deal with the socio-economic impacts of the whole of industry life cycle is examined.

Methodology

This paper is based on a literature review and minor consultation with stakeholder agencies and community individuals employed in the various sectors. The literature reviewed includes EIS from across various sectors and a range of academic literature. Where possible the literature reviewed has focused on pertinent works published in the past five years. In assessing the adequacy of the reviewed EIS, attention is given to the methodological adequacy, the comprehensiveness and the accuracy of the data used for decision making purposes.

Observations in the reviewed EIS

In considering the published literature on EIS's a number of recurring themes are evident. These elements provide a useful context to consider the strengths and limitations of the existing processes. The recurring themes also provide a framework in which to explore pathways for improvement. Accordingly these themes are initially explored and set the scene for the paper. In summary the recurring themes identified from the literature are:

- Difficulties associated with quantifying social impacts;
- Reliance upon ABS census data as the major data source;
- Lack of recognition for broad scale cumulative impacts ;
- An increase focus on and interest in community consultation; and
- A requirement for follow-up monitoring and the development of adequate socio-economic indicators.

The importance of considering and addressing these themes are particularly evident in the mining sector. For example, the EIS for the recently developed Mount Isa Mines (MIM) mining project in Rolleston, Queensland, acknowledged that “the rapid increase in economic activity associated with a large scale investment project in a sparsely populated rural area is likely to have some adverse impacts upon the Shire community” (DSD 2003, p 47). A review of the community consultation process used by MIM during the EIA process (Cavanagh & Prowse, 2003) indicated that the process helped to develop a level of trust between MIM and the Rolleston community.

One recurring factor and a weakness that was observed in a number of EIS was the use of what could be considered as *out of date* ABS data when undertaking socio-economic analyses. Examples of this are readily found in a range of EIS's. The Lake Lindsay Project EIS 2005 (Anglo Coal) in developing their community profile utilised 1996 and 2001 Census data. Similarly, the Clermont Coal Mine Project EIS (2004) relied upon 2001 Census data. The Swanbank Paper Plant EIS (2003) comprised data from a multitude of years. This EIS used 2001 Census data for many demographic indicators, while rental data sourced from REIQ was from 2003. In some of the EIS reviewed, proposed projects were located in high growth areas of Queensland yet socio-economic impact predictions were based on potentially out-of-date data. Predictions based on an assumption that data has not changed significantly since the last census collection is flawed and prone to result in inaccurate predictions and decision making.

Another factor is that where an EIS has identified housing and accommodation as an issue, mitigation measures are not necessarily always addressed in detail in the EIS report. This is in part due to a change in approach from the proponents directly providing housing, and also a change in mining operations from employees being accommodated in local communities move toward more drive in/ drive out operations. In these cases the responsibility for housing and accommodation is passed on to others. Either contractors or the community are left to deal with the impacts of the demand generated by the increased population or the inflationary issues that come with demand and supply for existing residents. For example, one EIS (mining sector) started to undertake impacts at a

local and regional level, acknowledged a potential housing accommodation issue but then discounted the impacts on the assumption that a significant number of employees would take up residence on the coast. In this case of a claimed regional level assessment, no impact analysis for accommodation on the coast was provided. Another example of the inflationary impact is that in October 2005 house rentals for the limited available housing in Moranbah exceeded \$700/week. This places the cost of accommodation outside the capacity of the original local community to pay.

Where positive economic impacts typically detailed in EIS are of a quantitative nature, predicted social impacts are generally of a qualitative nature and expressed as having an “anticipated minor impact”. The unintentional vagueness of such qualitative descriptions is problematic in accounting for impacts and in some instances is open to interpretation. One approach to alleviate this problem is for proponents to have in place a “community liaison officer” and/or continue a program of community consultation, including agencies and social service providers, to address social impacts of the project.¹

Where the EIS’s of more recent projects make mention of cumulative impacts, the EIA process in the past has typically been applied on a project by project basis. Shrimpton and Storey (2000) report on a growing belief that such assessments occur too late in the planning process to adequately consider all alternatives and impacts to be consistent with sustainability. Considering the recent growth in the mining sector in the Bowen Basin as an example, the cumulative impacts from a regional perspective are particularly relevant. Many rural communities within this region are presently facing housing and accommodation shortages and a range of other social issues as a result of rapid growth in this sector. As housing demand has outstripped supply property values have risen quickly. Rapid rises in rental prices have generally followed soon after. Those that suffer the consequences of these impacts the most are often not those associated with high income benefits of employment within the mining sector.

It should also be noted that such issues are not necessarily restricted to those employed outside the mining sector, with some contractors choosing to base families elsewhere and commute great distances to the mine sites. The EIA process often predict positive economic flow-on effects to the community in which the large industry development is based, through increased expenditure associated with an increased population. However such predictions cannot be justified if staff / contractors either choose or need to reside external to the community that hosts the development site. This can result in significant economic leakage from the region and compound the impact on the provision of local infrastructure and services (eg Zinifex Mine in the Southern Gulf of Carpentaria).

Rapid growth in the mining sector and other large industry development (e.g. 2002-2005 Comalco Refinery development in Gladstone) has been largely responsible for the out-migration of skilled workers from neighbouring communities. The socio-economic

¹ (See for example Coordinator-General’s Evaluation Reports on the “Environmental Impact Statement for the Aldoga Aluminium Smelter Project” and “Environmental Impact Statement for the Rolleston Coal Project”.)

outcomes for the community are some of the significant positives reported in the EIS with a focus (and positive intent) on recruiting employees. On occasion, the assumption of positive employment outcomes is made without the benefit of any investigation to determine capacity of the community to provide the predicted workforce, either in terms of quantity or quality – e.g. skills audit. Or alternatively the negative impacts of securing employees at the expense of the surrounding communities (ie Dutch Disease)

With large industry development, the community may accrue benefits such as: retaining the population, and offering new employment pathways. This is particularly valuable in time of industry restructuring and or engaging the young unemployed population that tends to migrate elsewhere in search of employment. In addition the facilitation of employment and training initiatives in the mining and other large industry sectors for women, indigenous and other underrepresented groups is a considerable benefit for any community. Furthermore benefits also accrue where applicable reemployment of workers from neighbouring large industry developments that are closed or nearing closure is provided. However, where high unemployment is a pre-existing condition, the availability of employment due to large industry development cannot be considered a certainty in alleviating local unemployment issues if wide sourcing of employees is undertaken or where specific skill sets are needed that are not available in the local community.

Also of note is that the EIS reviewed acknowledged and indicated commitment to training schemes and / or consultation with local training providers. However the EIS' have not always recognised or dealt with the impacts of the subsequent skill drain on neighbouring communities and or sectors, or the region as a whole. For example, a research project into regional, rural and remote Queensland's difficulties attracting and retaining professionals found that regional shire councils were losing staff, both professional and skilled, to large industries because they were unable to compete with the financial packages being offered (Miles et al, 2004). It could be viewed that, to some extent at least, the EIS process has been inadequate in recognising and accounting for the interaction and cumulative impacts of multiple projects associated with large industry development. The question that this raises is should the proponent(s) be expected to be accountable for these aspects?

Large-scale developments typically require a large specialised workforce during the construction / commissioning / decommissioning stages of the project. These workers are either accommodated in existing housing within the community or in purpose built temporary workers camps. There has been some reporting of possible negative impacts associated with this transient workforce. For example, the EIS developed prior to the Aldoga Alumina Refinery development in Gladstone, Queensland (DSDI, 2003) highlighted concerns from social service providers with regard to housing arrangements. Adverse social effects may arise, including increased activity in a community, more strangers, communities just 'not what they used to be' for some residents. Associated impacts may include changed social behaviour (brawls), increase in incidence of traffic offences and petty crimes. Even when health impacts are considered or identified as an issue or impact, some EIS report no negative impact on health and well being of the

community as a consequence of the project activity. Others, such as the Aldoga project, suggest programs to alleviate the issue. From a process/methodology point of view, the indirect or cumulative impacts of the project may be difficult to quantify as these impacts may represent incremental additions to existing social problems in some areas. Ensuring baseline data is gathered and monitoring is included as part of the ongoing methodology and operations of the industry would assist in overcoming this dilemma.

Some projects have a contentious and / or political nature. Examples of these in Queensland include the Paradise Dam at Bundaberg, the Southern Pacific Petroleum's (SPP) Oil Shale Project at Gladstone and Queensland Cement Limited's (QCL) operations at Mt Larcom. The literature available reveals some concerning but common recurring issues in each of these projects. A common major deficiency includes the lack of transparency with regard to community consultation. Other shortcomings include denying public access to relevant reports. These oversights or inactions/action do little to inspire public confidence or trust and do not allow for the effective resolution of contentious issues of community concern.

As an example and in exploring this a little further, the Queensland Conservation Council (QCC) (2003) reports that the economic justification for the construction of Paradise Dam was largely based on enhancement of the region's sugar industry (as a result of the increased water supply that the dam would provide) and on the subsequent potential construction of a pulp mill, should sugar production increase as projected. The QCC (2003) contested the basis of this decision given the uncertainties for sugar production reported in an independent assessment of the Sugar Industry (Hildebrand Report). Hildebrand (2002) reported that the economic outlook for sugar prices appeared set to remain low for the short to medium term. The QCC (2003) further argued that any increases in water charges (brought about as a result of the dam), combined with the already high production costs would likely exacerbate pressures on growers in the region. Contention over the viability of the Paradise Dam project was possibly further enflamed through a lack of transparency in the EIS process. The QCC (2003) claim a denial of access to several reports that supported the economic justification of the Paradise Dam proposal.

The SPP's Oil Shale Project is another example of an initiative and approach that was fraught with operational problems. The Whittaker and Brammer (2001) report identified the following impacts arising from SPP's operations:

- local area odours and emissions with residents complaining about eye and ear infections;
- risk of potentially the largest point source of air and solid waste dioxin in Australia;
- unresolved toxic impacts on local ground water;
- other local and climate impacts on the Great Barrier Reef; and
- local residents threatening to take legal action against SPP/CPM.

In a submission commenting on SPP's Draft EIS for stage 2 development, Walton (2002) identified a number of shortcomings in the EIS that primarily focused on an absence of information and/or inaccuracies in accounting for greenhouse gas emissions. These issues highlighted by Greenpeace while of a technical nature were on top of social and economic problems associated with the residents of Yarwun/ Targinnie area.

With the limited literature available, it appears that the EIS did not account for the potential odour and health impact on the nearby community and had no mitigation measures in place. As a consequence, SPP was slow to react to these issues when they arose. Property values dropped as did the resale potential and this was reported as contributing further to the decline of the social well being of affected residents. To further exacerbate the situation, Roberts (2003) reports that when action was taken, properties were valued at current market levels without consideration for devaluation brought about as a result of SPP's operations. However, care should be taken in interpreting these published statements as the problems associated with the economic viability of the growers in this region extend over many years and are complicated by a wide range of issues including the limited availability of water for irrigation purposes.

Much has been written regarding Queensland Cement and Lime's operations at Mt Larcom (Roberts (2003)). In reviewing the Mt Larcom Community Restoration Project, it is apparent that community members were affected to varying degrees by the initial operations and that these impacts were inadequately catered for or addressed. However, Roberts (2003) succinctly questions the extent to which one can retrospectively apply modern assessment techniques.

In other examples Herbert-Cheshire and Lawrence (2002) discuss the structural adjustment impacts experienced by the Monto community as a result of deregulation in the dairy industry. This scenario is somewhat akin to that of Mt Larcom and no doubt many other rural areas that have or are experiencing a general decline in the rural industry. In assessing the extent to which structural adjustment had affected the sustainability of the rural community in Monto, Herbert-Cheshire and Lawrence (2002) identify a number of issues. While these issues may differ technically from the Mt Larcom case, similarities exist. The recommendations of Herbert-Cheshire and Lawrence (2002) include a combined effort that focuses on community engagement and capacity building across stakeholder groups and the building of social capital. Herbert-Cheshire and Lawrence (2002) went on to conclude that future development should be based on "triple bottom line" calculations that focus on social progress and environmental integrity. This is equally relevant when considering past, present and future options for rural communities.

Most recent EIS' have placed a greater emphasis on social impacts, in terms of both scope and depth. The approach to SIA in these EIS reflects some adoption of recognised methodologies and a progression towards sustainable development. A key area of advancement has been in the community engagement process to underpin the entire EIA process. Whilst increasing levels of community engagement is evident in recent EIS', including Aldoga, Clermont Coal and Swanbank Paper projects, community consultation

beyond the EIS (whole-of-life approach), particularly in the mining sector, also deserve recognition.

The limitations of the reviewed EIS to accurately identify the full spectrum of actual impacts can clearly be seen. The consequences of these limitations with regard to regional economic development are wide and varied and clearly evident in areas of Queensland today. Identifying these limitations provides scope for the progression of the EIS process to a higher level that encompasses economic growth and development.

The EIS as an integrated tool offers potential as part of a broader preferred development planning approach. The Central Queensland region provides a classic case study when considering failure to identify the consequences of rapid economic development. Growth in mining operations in the Bowen Basin will generate benefits for the local and regional economy that would not otherwise have occurred. Strengthening regional planning and promotion of business diversification and clustering is needed to maximise the benefits of this growth. Integration of the EIS process into regional planning provides an opportunity to identify potential social and economic impacts of growth at a regional (or greater) level.

Economic Development

The EIS process pays careful consideration to the potential economic contributions on a project by project basis. The consideration of economic development on a broader basis demonstrates greater potential from a planning perspective. The recent rapid growth in Central Queensland's coal mining sector suggests that there are some missed opportunities. A broader approach to impact assessment would better account for potential economic development at a larger scale. It is pertinent to consider the advantages and disadvantages of economic development. In so doing refers largely to the economic value of Central Queensland's coal mining sector. There can be many advantages and disadvantages associated with economic development not all of which are identified during the impact assessment process. Consequently it is necessary to recognise how some impacts are slow to occur and the usefulness of post project assessment or monitoring in identifying these.

The major economic benefits can be recognised as more income for society, job creation, increased business, facilities and infrastructure and an overall improvement in the standard of living. Disadvantages of growth can be identified as the potential creation of large negative externalities. These include a widening of the class gap, increased consumption, higher levels of pollution, higher crime rates, decline in social well being of marginal groups. High growth places increase pressure to encourage and accommodate employment generating activities.

To achieve a more ideal community outcome from development, the principles of Ecological Sustainable Development (ESD) issues must be considered when reviewing the impacts of a development. This essentially means that environmental factors need to be weighed against human impacts on the environment and their implications for

economic and social well being. Where a high level of development activity exists it is pertinent to consider the economic benefits this sector provides locally, regionally, state and nationally.

As an example, Queensland's coal production is predicted to increase by at least 7% per year over the next decade and regional Queensland is expected to benefit from substantial increases in regional income, output and employment. With the bulk of Queensland's export coal coming from Central Queensland's Bowen Basin, the region is well positioned to benefit from this growth.

Supplying more than 20% of the world's seaborne coal trade to 34 countries, Queensland is the largest single coal-exporting province in the world (QRC, 2004). Coal is the state's most mined commodity with mines in the Bowen Basin accounting for some 85%² of the state's coal, supplying the bulk of Queensland's export coking and thermal coal (DNR&M, 2004). The mining and minerals processing sector currently account for some 10.2% of Queensland's Gross State Product (GSP) or approximately \$9.4 billion per annum (ACIL Consulting, 2002). As of 2002 the mining industry accounted for 17% of the state's capital expenditure and 7.2% of overall employment. Producing a record 160.06 Million tonnes (Mt) of saleable coal in 2003 – 2004 financial year (FY) and exporting a record 134.98 Mt valued at \$7.2 billion, Queensland coal production experienced increases of 4.2% and 4.5%, respectively from the previous financial year (DNR&M, 2004).

The QRC (2004) report that global coal trade has increased steadily over the 1998 – 2004 period and is forecast to continue at a similar rate over the next 5 years. Queensland's share of this market has also increased during this period and current forecast exports indicate an increased market share penetration over the next 5 years (QRC, 2004). Given that Queensland coal producers are cost competitive, supply high quality coal and have a close proximity to the expanding market in Asia, the industry is well placed to increase its share in this market. Consequently, the outlook for the Bowen Basin is that of very strong growth in the export market with 'best estimate' forecasts indicating a 54% increase from 134 Mt in 2004 to 206 Mt in 2009 with an upside of a 68% increase to 218 Mt.

Given the global and national value and return from expansion on the mining sector it is also important to consider the impact and benefit on the local economy. A survey of businesses in the Nebo Shire in Queensland revealed that the 89% of the businesses identified mining as important to their business. Mining was also a contributor to the expansion of business opportunities. What is consistent between the pre and post mine study is the substantial economic impact on the Nebo Shire. However, the study did determine that there were also some missed opportunities.

² Mc Grady T 23/11/2004 Minister for State Development and Innovation Media Release cited on the Bowen Basin News website [http:// bowenbasin.cqu.edu.au/news](http://bowenbasin.cqu.edu.au/news)

As an example is the direct and indirect economic benefits associated with large-scale developments such as the Zinifex Century Zinc operations in the southern gulf region of Queensland. A study of the direct economic contribution that Century Zinc Mine makes to the regional communities found that since the mine commenced operations in 1999 it has contributed \$155 million to the state of Queensland and over the life of the mine the State is guaranteed a minimum revenue of \$520 million (Miles et al, 2004). At a regional level, the mine has contributed significantly to the social and economic fabric of the southern Gulf employing an estimated workforce of 535 people paying out in excess of \$30 million in wages (Zinifex, 2004). However it is also of note that a number of areas where products and services were sourced outside the region resulted in lost economic benefit and to some extent direct economic leakage from the area (Miles et al, 2004). This point reinforces the need for a more detailed assessment of the socio-economic implications of these major developments under an EIS'.

In the mining sector the economic impacts are evident and the indirect flow-on effect of the mine and its employees often matches the positive economic effect to the region predicted and identified in the EIA process. An analysis of mining industry and employee expenditure across four mining operations in the Muswellbrook area of New South Wales (Coakes Consulting, 2000) indicated that the mining industry contributes significantly to the economic viability of the Upper Hunter communities. The study, commissioned by Coal Operations Australia Limited (COAL), was undertaken in response to community concern in relation to where mine employees were residing and spending money. A community survey undertaken as part of this study was to obtain a better understanding of the contribution of mining to the area and to determine the residential location of mine employees, their use of services and expenditure patterns. Results indicated that significant expenditure occurs as a result of the four mining operations and their employees, with employees contributing approximately \$21.2 million annually to the Muswellbrook Shire.

Expenditure occurs in such areas as general business freight, banking, printing, repairs and maintenance to machinery, equipment and vehicles. Significant expenditure also occurs regionally in Newcastle and Sydney in areas such as purchases of fuel, power, coal haulage, accounting and legal, insurance and office supplies.

A post study of the Economic and Social Impacts of the Coppabella Mine on the Nebo Shire highlighted the direct effects of mining at the local and regional level, a level of detail often missing in economic impact estimates in EIS. Using a range of methodologies including economic modelling, surveys and interviews, the total economic impact on the Nebo Shire in 2003 was calculated at \$8.28 million (Rolfe et al, 2003). This figure comprises direct wage expenditure of \$4.5 million, \$1.7 million expenditure from miners not living in the area, \$0.282m. on contracted services and supplies from business, and \$0.595m. in miscellaneous supplies from business, with indirect impacts accounting for \$1.182 million. The Environmental Management Overview Strategy (EMOS) (APC 2002) indicated total approximate annual expenditure on employment is \$25 million based on 250 full-time equivalent jobs at the mine with 360 full-time

equivalent jobs per year created in the region. Based on the post study (Rolfe et al, 2003), the total effect on employment in the Shire is assessed at 62 additional jobs, while the total effect on employment in the Mackay region is assessed at 783 additional jobs.

It is interesting to note that the Canadian Environmental Assessment Act provides for a follow-up monitoring/auditing procedure that is designed to verify the accuracy of impact prediction and determine the effectiveness of mitigation measures be used to improve the overall quality of environmental assessment (Noble & Storey, 2004). Noble and Storey (2004) argue the focus of the *Acts* 'verification of accuracy' feature stating that too much attention is placed on expected impacts rather than on desired goals in terms of environmental outcomes. Such a tool presents many benefits in impact assessment and demonstrates great potential to enhance the current EIA process here.

While evidence exists that negative environmental (in the greater sense of the term) impacts have occurred either as a result of fundamental flaws in the EIS or through less transparent means, much of the impact felt by rural communities in some areas could be viewed as attributable to other issues. Hence care should be taken in EIS's to ensure that issues that do not relate to or are derived from the industry activity in question are identified and considered as such.

Some of the economic effects of large scale industry developments – certainly the positive and to some extent the negative – are evident early in the life of the project, whereas the social impacts may not emerge so rapidly. Due to the nature of some of the negative social impacts, these on some occasions may not be visible to the community. Given the expansion of mining development in the Bowen Basin some post mining studies are now needed to determine cumulative effects of the operations. A study of cumulative effects would enhance the EIS process in the assessment of future development needs and opportunities and therefore assist in regional planning decisions.

These examples demonstrate the economic significance of development and the need to consider the impacts adequately at the community, region, State and National scale. Where rapid growth is occurring such as in the Bowen Basin there is a need for a more integrated assessing process that takes into account the impact of multiple projects and there cumulative effects. The social issues identified in multiple large scale projects and rapid growth raises further questions and reinforces the need and evaluation of the effectiveness of community engagement within the EIS process.

Effective Community Consultation and the EIS

Community engagement and consultation needs to become a key focus area of the EIS process. While community engagement underpins and links to the EIS process, it is a stand alone activity with a scope that requires coverage of the entire project life.

In terms of scope, this review of EIS indicates that early examples of EIS focus on agency consultation, and these are predominantly government departments. While these

departments are still consulted as a requirement of the EIS process, they form only part of a much broader stakeholder group of the affected community. The current best practice approach recognises this and incorporate extended community consultation.

The scope and nature of ‘community’ engagement has changed significantly since the early requirements of EIS. What would once be considered stakeholder consultation and required as part of the EIS process has evolved into a comprehensive process now recognised as community engagement that is associated with a project and may occur long before the EIS process begins. Instead of a *tell and sell* approach where the proponent advises that ‘this is the project’ and asks for various comment and responses from the affected community, best practice ensures that the process incorporates the community at the planning stage.

Wallace et al. (cited in Thomas 2001) emphasise that just communicating information – a one way process – is not sufficient in itself, rather that the community must be involved in a two way process. This requires that the proponent that seeks the input must also listen and respond to issues of community concern.

The earlier focus of EIS is referred to as the project-centred approach, where the project was the proponent’s singular focus, with community interests secondary, if at all considered. Public relations techniques were used to sell the project, rather than community consultation techniques to develop the project. During this time a ‘develop at all costs’ ethos tended to prevail, thus community objections were not welcomed.

The timing of the consultation is also significant. There are instances where community consultation is carried out specifically in relation to the EIS process only, while others engage with the community long before the EIS process and put in place mechanisms for the engagement over the life of project.

A study conducted by Martyn et al (1990) indicated that while legislative and administrative arrangements provided opportunities for public participation in the EIS, the reality was that this was often limited to the lower levels of participation; that is, largely information and comment opportunities (Thomas 2001).

When comparing EIA participation (not only limited to mining projects) as a criterion in Australia, Petts (1999) compared findings across eight countries and concluded that consultation and participation must occur following the release of the EIA report, and that participation needs to be mandatory prior to the publication of the EIA report.

In other studies an even wider approach has been taken with regard to assessing the social effects of mining operations (in concentrated mining communities as well as fly in fly out operations) on family life. These studies have explored domestic violence, impact of marital relationships of absent partners and impact on family due to same. While some of these studies are more indicative than comprehensive, the emerging issues have not been included in the social impacts of EIS. The question then arises whether such social

conditions are directly attributed to the mining operation and whether they should be considered within an EIA process.

Other changes that occur in communities as a consequence of mining are the establishment of various facilities. Mining proponents have set up various formal and less formal community contribution programs. The approach depends very much on the proponent. For example, one entity operates a formal partnership in three communities in which it is the main mining venture. The Community Development Fund makes funds available to assist in the development of employment and training programs in the mine site communities. Others have a similar focus. Facilities are contributed to communities on larger and smaller scales with ongoing support. There are contributions to groups such as landcare, support for schools, community recreation facilities, and research programs. Much depends on the nature of the community and the relationship with the Proponent.

Through the various legislative requirements, checks and balances are in place regarding monitoring of physical impacts. In the Bowen Basin for example, proponents are required to 'rehabilitate' sites according to the agreed standards, and this is now undertaken where possible on a more progressive basis rather than at mine closure. While the efforts of mining companies in this regard are commendable, an alternative concept might be the provision of infrastructure that enhances the capacity for economic growth of the community (e.g. upgrade of sewage treatment plant to tertiary treatment) or alternatively investing in infrastructure that will support the socio economic wellbeing of the community in the post industry phase.

Futhermore a key development in terms of environmental monitoring is the voluntary Minerals Industry Code for Environmental Management. Signatories to the Code use this mechanism annually for monitoring sites against various elements of environmental performance through engaging in proactive, consultative processes, systematic management and reporting on environmental impacts and performance measures. The outcome is recorded in a public document such as a Proponent's Sustainability Report (which is publicly accessible). While this is largely a self-reporting mechanism, as a signatory to the Code an external environmental audit is conducted every three years. Proponents can elect (and those seeking 'best practice' status do) to be audited on a more frequent basis, e.g. every two years. This proactive approach is likely to have some benefits all round if conducted in an open and transparent way and is not just a public relations exercise to convince the community that the proponent is doing the right thing. Along similar lines, one proponent engaged an environmental group to provide an independent report on its environmental performance.

It is clear from the research on the impacts of large scale developments that rural communities are subjected to a range of pressures that ultimately influence the social well being and economics of that community. Responsible mining companies have incorporated sustainability indexes into company reports and the social performance is reflected to some extent in their stock market value. Increased community consultation and involvement and proponent commitment to community has improved this relationship. For example, Placer Dome's commitments and contribution to the

community at one particular mine site in the US involved the local development groups from day one and during the operation process have developed (among many other things) collaborative strategies to ensure economic sustainability post mine (Upton et al, n.d).

Such an approach suggests that regions subjected to rapid growth be it mining or industrial, would benefit from planning strategies that adopt a broader scope. Worrell (2004) suggests this scope should be considered at a State level with regional preferred development and infrastructure planning scenarios based on community aspirations.

Accordingly pre-EIA participation is considered the most important yet generally the most neglected point in leading to successful outcomes. In Australia, the existence of a scoping stage effectively ensures there is public participation but this is not mandatory. In contrast in New Zealand, local authorities can force consultation and participation to take place prior to the submission of EIA reports for notified projects. Canada's panel reviews enable full participation to occur but no mandatory requirements in preparation of other EIA reports. While the USA has full provision for early participation and consultation in the preparation of the main EIS report, the public involvement provisions are not adhered to. Public participation and consultation were considered strongest in process in EIS systems in Netherlands and in Western Australia. Petts (1999) and Sadler (1996) concur that participation provisions could be strengthened in many of the EIA systems.

One of the failings of the existing EIA process is the lack of follow-up monitoring of the implementation of any recommendations in the EIA. This inclusion of a follow-up process would further verify the accuracy of impact predictions and assist in identifying impacts not identified during the impact assessment process.

Future Opportunities

The key areas where the current EIS process have been identified raising the obvious question of how the process could be modified to better account for these and progress the process to a higher level. Rather than attempting to reinvent the process itself it is suggested that the incorporation of the EIS process into a more strategic framework offers great potential.

A review of EIS in Queensland has identified a number of general areas where improvement could be achieved with demonstrated potential application at a broader scale. The more recent approaches to EIA suggest that the field of community engagement is advancing and that some industry groups/companies are setting leading case examples. It is evident from the EIS that a number of proponent companies are now including community consultation in the project life cycle.

Where successful, this community consultation has been a dynamic component of the project and not a one-off strategy intent on gaining project approval - as is often a criticism of EIA process. When all proponents are actively engaging the community and

consistently applying best practice principles, and the community has the opportunity and the capacity to participate, then best practice is achieved.

While EIA is a legislative requirement and looks at predicted impacts in advance of any development, and this overall field is quite comprehensive, studies of actual post development impacts are not as prevalent. Most EIA systems throughout the world do not 'require' any monitoring of impacts other than some reporting on physical components. Where discretionary provisions do apply (such as in the Commonwealth of Australia) these are not implemented. The body of knowledge on what actually happens relies on other research undertakings. Provision for monitoring in the EIS process is generally through Environmental Management Plans (EMPs) and is largely restricted to physical impacts.

It is acknowledged that cumulative impacts are now receiving greater recognition in the EIA process however the assessment and monitoring of these impacts shows potential value in planning at regional or even state level.

Based on the observations found in this review it is recommended that, to ensure accuracy in EIS and positive socio-economic outcomes from large scale industry development in rural communities, the following be explored:

- I. That the concepts of Strategic Environmental Assessment (SEA), Cumulative Impact Assessment (CIA) and Environmental Impact Assessment (EIA) be integrated into Regional Planning

Bailey and Renton (1997) report that the extension of project based EIA to strategic levels of decision making is the predominant current approach toward SEA. SEA incorporates the principles of Ecological Sustainable Development (ESD) into the decision making process at the policy, plan and program levels. By addressing sustainable development considerations at the strategic level, the subsequent development of individual projects should be considered as part of a larger framework. In discussing desired future characteristics of EIA, Worrell (2004) suggests an assessment system that considers new development within a broad-scale strategic planning context based around a State Sustainability Strategy. Integration of the assessment process within such a strategy should further provide guidance to proponents of significant economic development projects how such projects can achieve the goals of sustainable development. Further to this, best international practice requires 'a systems view of development in its environment, multidisciplinary perspectives of impacts, effective scoping, rigorous prediction of environmental and social effects, and integration with planning and design, and community participation' (Brown and Nitz, 2000, cited in Thomas, 2001).

- II. That the Environmental Impact Statement have a follow-up process

One aspect where the current EIS process is severely lacking is the lack of a follow-up process. There is no requirement on the Proponent to verify the predicted impacts,

particularly in the social and economic fields, once the project is underway or throughout the life of the project. The adequacy of the EIS process would be greatly improved through the development and maintenance of a follow-up program. The actual social impacts of large-scale developments may take longer to emerge. Hence, follow-up would detect these and allow appropriate mitigating strategies to be employed minimising negative impacts.

Follow-up monitoring of projects and management plans provides a means to learn from experience (Lohani et al, 1997), data and knowledge. Notwithstanding the progression of EIA in recent years, attention has predominantly focused on pre-decision analysis (Arts et al, 2001). Follow-up auditing or monitoring of predicted impacts is an essential component of CIA that also offers other benefits such as ascertaining prediction accuracy. This procedure would provide a means of assessing the performance of assessment procedures and further allow rapid response or adjustments to inaccurate predictions.

Follow-up monitoring procedures are part of the Canadian Environmental Assessment Act and are applied where appropriate by the authority responsible and are intended to improve the quality of environmental assessment. Noble and Storey (2004) draw upon Canadian experience to discuss the virtues of follow-up monitoring procedures and found that follow-up can transform EA from a static to a dynamic process. Arts et al (2001) report that in the International Association for Impact Assessment workshop in 2000, it was argued that EIA follow-up should be comprised of four key activities:

- i. Monitoring: the collection of data and comparison with standards, predictions and expectations;
- ii. Evaluation: the appraisal of the conformance with standards, predictions or expectations as well as the environmental performance of the activity;
- iii. Management: making decisions and taking appropriate action in response to issues arising from monitoring and evaluation activities; and
- iv. Communication: informing the stakeholders as well as the general public about the results of EIA follow-up.

The inclusion of a follow-up process could occur at two levels. Firstly, it could become an inclusion in the EIS process and linked to project approval with monitoring undertaken throughout the project cycle (Morrison-Saunders et al, 2001). The second level to improve quality control would see an external (and independent) review of follow-up programs and results (Morrison-Saunders et al 2001).

- III. That community consultation is undertaken on a broader scale and beyond the project life-cycle.

Hardi and Zdan (1997) report that one of the key steps toward sustainable development involves increased public participation in the decision making process (cited in Cavaye et al, 2002). Although the EIA process is evolving to include greater community consultation there is a need to integrate impact assessment with other environmental management instruments to comprise a more strategic approach and account for

cumulative impacts. Ongoing community involvement can enhance the follow-up program suggested above, enabling cumulative social and health issues to be identified and addressed. While the assessment of single projects is important, such a narrow scope may ignore the incremental or cumulative socio-economic impacts of that project when combined with those in the past, present and foreseeable future that require a CIA (Shrimpton & Storey, 2000). The Placer Dome example mentioned previously in this paper demonstrates how an integrated approach enabled strategies focused on the continued sustainable economic development of that community to be initiated.

IV. That a centralised database be developed.

Provision for a centralised database of project proposals, EIS and data from monitoring programs would provide a centralised public accessible database. This would assist in identifying what issues arose, how they were addressed, what worked, what didn't as well as providing contemporary data for future project assessment. Such data would then be available for integration into performance indicators that would enhance state-of-the-environment reporting. Such a database would further assist government in the development of regional planning schemes.

Consequently it is suggested that the above features be incorporated into the EIS process as part of a broader more holistic approach within the concepts of Strategic Environmental Assessment (SEA). The first three recommendations would add a dynamic dimension to the process that would enhance the accuracy of predicted and unpredicted impacts. The provision of the fourth recommendation the centralised database would contribute greatly not only in the accuracy of the EIS but also in the broader approach to regional planning and development.

Conclusion

The aim of this research was to assess the capability of the EIA process to fully account for the social and economic implications of large-scale industry development of community. The EIS and literature reviewed indicates that the EIA process has continued to evolve since its inception. In undertaking a desktop study and consulting stakeholders regarding the effectiveness of the EIA in fully accounting for socio-economic impacts a number of observations were made and detailed in this paper. Rather than attempting to reinvent the process, this paper has identified a number of areas that may assist in leading the EIA towards sustainability.

The EIA process now needs to be taken to a higher level if the full benefits of sustainable economic development are to be realised. The EIS process should not be viewed primarily as a means of assessment but on its' potential to achieve the goals of sustainable development. Consequently, promotion of sustainable development should be a fundamental component of the process. Further yet, rather than focusing on measuring the impacts, the EIA process should be considered a useful tool in predicting changes that can be achieved. A progressive step for the EIA process would be to follow the concepts of SEA further incorporating the other features detailed above into regional planning.

Acknowledgement

This research was funded by the Queensland Department of Local Government, Planning, Sport and Recreation (Central Queensland – A New Millennium), Anglicare and the Central Queensland Local Government Association.

References

- ACIL Consulting 2002, Queensland's Mining Industries: Creating Wealth for the Community, the State, and the Nation, A Report to the Department of Natural Resources and Mines, Queensland February 2002 [Online] Date accessed: 21/04/2005 URL: nrm.qld.gov.au/resourcenet/mines/publications/pdf/creating_wealth.pdf
- Arts J, Caldwell P and Morrison-Saunders A 2001, *Environmental Impact Assessment Follow-up: good practice and future directions-findings from a workshop at the IAIA 2000 Conference*, Impact Assessment and Project Appraisal, Vol. 19 No. 3 Beech Tree Publishing UK.
- Australian Premium Coals Pty Ltd 2002, *Coppabella Coal Mine Environmental Management Overview Strategy, June 2002 Queensland*.
- Bailey J & Renton S 1997, *Redesigning EIA to Fit the Future: SEA and the Policy Process, Impact Assessment*, vol. 15, no.4
- Cavanagh N & Prowse L 2003, online, 'A miner is coming to town! The XSTRATA Coal Rolleston coal project: a community engagement case study'. Paper presented at 2003 Minerals Council of Australia Sustainable Development Conference, Brisbane, 11 November, 2003. <http://www.bowenbasin.cqu.edu.au/pdfs/MCA03cavanagh.doc>
- Coakes Consulting 2000, Muswellbrook District Mining Industry and Employee Survey May 1999, SIA for Coal Operations Australia Limited. Mount Arthur North Development.
- Department of Natural Resources & Mines 2004, The Queensland Coal Industry Review 2002-2003 52nd Edition, Bureau of Mining and Petroleum, Department of Natural Resources and Mines [Online] Date accessed: 20/04/2005 URL: www.nrm.qld.gov.au/mines
- Hardi P & Zdan T 1997, *Assessing Sustainable Development: Principles in Practice*, International Institute for Sustainable Development, Canada as cited in Cavaye J, Blackwood B, Lawrence G Paton S and Windle J 2002, Sustainable Regional Development: the Stalled Agenda, and the Way Forward Occasional Paper No. 2/2002 Institute for Sustainable Regional Development Central Queensland University
- Harvey, N (1998). *Environmental Impact Assessment: Procedures, Practice and Prospects in Australia*. Melbourne: Oxford University Press in Vanclay F 2004, *The Triple Bottom Line and Impact Assessment: How Do TBL, EIA, SIA, SEA and EMS Relate to Each Other?* Journal of Environmental Assessment Policy and Management Vol. 6, No. 3 pp 280-281 Imperial College Press UK.

- Herbert-Cheshire L & Lawrence G 2002, *Structural Adjustment and Sustainability: A Case Study of Monto Queensland*, Occasional Paper No. 1/2002 Institute for Sustainable Regional Development, CQU
- Hildebrand C 2002, Independent Assessment of the Sugar Industry 2002, Report to the Hon. Warren Truss MP Minister for Agriculture, Fisheries and Forestry [Online] Date accessed: 12/07/2005 URL:
http://www.daff.gov.au/corporate_docs/publications/word/sugar_assessment/report.doc
- Lohani B. J.W. Evans, H. Ludwig, R.R. Everitt, Richard A. Carpenter, and S.L. Tu. 1997. Environmental Impact Assessment for Developing Countries in Asia. Volume 1
- Miles R, Marshall C, Rolfe J & Noonan S 2004, The Attraction and Retention of Professionals to Regional Areas - the community perspective. Proceedings of the International ANZRSAI Conference (refereed)
- Miles B, Cavaye, J. Donaghy, P. Rayner, T & Marshall, C 2004, Post Mine Economy of the Southern Gulf of Carpentaria, Economic Development Following the Expected Closure of the Zinifex Century Mine in 2017 Institute for Sustainable Regional Development Central Queensland University.
- Morrison-Saunders, A. Arts, J. Caldwell, P & Baker, J 2001, EIA Follow-up: Outcomes and Improvement Discussion Paper, *Presented at the IAIA 2001 Impact Assessment in the Urban Context conference. 21st Annual Meeting of the International Association for Impact Assessment June 2001 Columbia, EIA Follow-up: Outcomes and Improvement Workshop.*
- Noble B & Storey K 2004, *Toward Increasing the Utility of Follow-Up in Canadian EIA*, Environmental Impact Assessment Review, Volume 25, Issue 2, February 2005, Pages 163-180 Elsevier Inc [Online] Date accessed 21/07/2005 URL:
www.sciencedirect.com/science/journal/01959255
- Petts J 1999, Handbook of Environmental Impact Assessment Volume 2: Environmental Impact Assessment in Practice: Impact and Limitations Blackwell Science, London.
- Queensland Conservation Council 2003, Submission-2003 Assessment of National Competition Policy for Water Reform, A Submission from the Queensland Conservation Council 24th March 2003 [Online] Date accessed: 17/08/2005 URL:
http://www.qccqld.org.au/rivers_alive/newsletter/September/qcc_submission.pdf

Queensland Department of State Development, Coordinator-General's Evaluation Report on the Environmental Impact Statement for the Aldoga Aluminium Smelter Project, 2003

<http://www.sdi.qld.gov.au/dsdweb/v3/documents/objdirctrled/nonsecure/pdf/4472.pdf>

Queensland Department of State Development, Coordinator-General's Evaluation Report on the Environmental Impact Statement for the Rolleston Coal Project, 2003

<http://www.sdi.qld.gov.au/dsdweb/v3/documents/objdirctrled/nonsecure/pdf/4480.pdf>

Queensland Resources Council 2004, Queensland Resource Industry Infrastructure Requirements *Report to Strategic Policy Advisory Group* August 2004 [Online]

Date accessed: 11/05/2005 URL:

http://www.qrc.org.au/_dbase_upl/Infrastructure_requirements.pdf

Roberts B 2003, *Mt Larcom Community Restoration Project*, East End Mine Action Group (Inc). Mt Larcom, Qld.

Rolfe J, Lockie S and Franettovich M 2003 *Economic and Social Impacts of the Coppabella Mine on the Nebo Shire and the Mackay Region* Final Report Prepared for Australian Premium Coals Pty Ltd, Centre for Social Science Research, Centre for Environmental Management and Faculty of Business and Law, Central Queensland University.

Sadler B. 1996 International Study of the Effectiveness of Environmental Assessment: Final Report-Environmental Assessment in a Changing World: Evaluating Practice to Improve Performance, Department of the Environment and Heritage, Canberra.

Shrimpton M & Storey K 2000, *Assessing and Managing Socio-Economic Effects: Improving the Process of Environmental Impact Assessment* Presentation to the European Centre for Occupational Health, Safety and the Environment

(ECOHSE) 2000 Symposium Kaunas, Lithuania [Online] Date accessed:

2/08/2005 URL: <http://www.gla.ac.uk/ecohse/2000papers/shrimpton-storey.pdf>

Thomas I 2001, *Environmental Impact Assessment in Australia theory & practice* 3rd edition, Federation Press Sydney

Upton B, Harrington T & Mendenhall S n.d, *Sustainable Development and Mine Closure Planning, A Case Study*, Golden Sunlight Mine, Jefferson County Montana.

Placer Dome Inc and Jefferson Local Development Corporation [Online] Date Accessed: 21/10/2005 URL:

www.minerals.org.au/__data/assets/pdf_file/6048/9A-4HarringtonTom.pdf

- Vanclay F 2004, *The Triple Bottom Line and Impact Assessment: How Do TBL, EIA, SIA, SEA and EMS Relate to Each Other?* Journal of Environmental Assessment Policy and Management Vol. 6, No. 3 pp 280-281 Imperial College Press UK.
- Walton, G 2002, Response to the Supplementary Report for the EIS of Stage 2 of the Stuart Oil Shale Project, Greenpeace Australia Pacific [Online] Date Accessed:12/08/2005 URL: www.greenpeace.org.au/climate/pdfs/EIS_stuart.pdf
- Whittaker M and Brammer M 2001, *The Stuart Oil Shale Project: Implications of Emission Constraints for Suncor Shareholders* Investment Research, Innovest Strategic Value Advisors, [Online] Date accessed:13/07/2005 URL: <http://www.greenpeace.org.au/climate/pdfs/spp.pdf>
- Worrell R 2004, Impact Assessment Special Interest Sector, NR&M Consultation Information Sheet #1