Advances and key challenges in Economic Impact Assessment (EcIA)

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Economic impact assessment (EcIA)

- Environmental, social and economic impact assessments are normally key components of broader Environmental Impact Assessment (EIA) requirements, often performed at the project approval stage.

- EcIA plays an important role in determining the overall worthiness of a project.

- EcIA purpose: assist in establishing full facts about the development to support a well informed decision about the appropriateness of the development, minimize adverse impacts and maximize beneficial impacts, consider alternatives, to inform the planning and development process.

- Typical EcIA analysis includes reporting output, employment, income and value added at the project and state/national levels.

Economic development and EcIA

- Economic development is a multidimensional process that involves interactions among different goals of development such as increase in GDP and sustainable development (World Bank, 2003).
- Economic development policies need to take into consideration social, cultural and political systems and institutions as well as their changing interaction over time in a country (QoL indicators).
- EcIA:
  - Regional growth theories (eg economic base theory) are concerned primarily with explaining development by key macroeconomic indicators such as output, employment, income.
  - More projects, more developments typically are seen as desirable.
  - Regional prosperity is determined exclusively by the external demand for a region's products (multiplier effect).
  - Not all developments even with positive economic impacts result in a sustainable development for the community, region and/or country.
    - Social and environmental impacts
    - Marginal propensity to spend (MPS) locally is important
    - Reliance on external demand can lead to region's stagnation
    - Diversification strategies should be suggested.
  - It does not take into account other goals of economic development such as quality of life (QoL) or sustainability

Economic and QoL indicators

Quality of life 8+1 dimensions (Eurostat, 2015)

1) Material living conditions (income, consumption, material conditions)
2) Productive activity (working hours, work leisure balance, safety and ethics)
3) Health (life expectancy, infant mortality, number of healthy life years, access to healthcare)
4) Education (education attainment, number of early school leavers)
5) Leisure and social interactions (time at sporting/cultural events, rate of volunteering, frequency of social contacts)
6) Economic and physical safety (wealth, number of homicides)
7) Governance and basic rights (involvement in political parties, trade unions, satisfaction with public services, level of discrimi
8) Natural & living environment (air, water and noise pollution, state of natural environment)
9) Overall experience of life (life satisfaction, sense of having meaning and purpose in life)

Economic indicators

- Health of local economy
  - Level of export base/trade relationship, multipliers/linkages, local purchasing
  - Employment/unemployment/underemployment overall and by industry
  - Population growth rate vs population growth in popular areas (e.g. coastal)
  - Real GDP (GRP) per capita
  - Gross per capita disposable income, Income and income distribution
  - In-/out-migration levels, social assis
  - Office vacancy rates, building permi
  - R&D, staff training programmes
- Housing
- Health & Life expectancy
- Education
- Measures of poverty

EcIA

- Output
- Income
- VA
- Employment
- GRP

Eurostat (2015) Quality of life indicators- measuring quality of life, Last accessed 18 June 2016 http://ec.europa.eu/eurostat/statistics-explained/index.php/Quality_of_life_indicators_-_measuring_quality_of_life

Typical EcIA in Australia

A number of EcIAs undertaken to fulfil minimum legislative requirements have been inadequate (Lockie et al., 2008).

- Reporting impacts at the state or national level and ignoring socio-economic issues at the community level.
- Reported only basic results such as output, value added, income and employment multipliers at state/ national level.
- Ignore non-market impacts.
- Net economic impacts were presented mostly as positive. Negative economic impacts were not always identified and quantified.
- EcIA statements emphasized project justification and did not usually provide detailed understanding of the costs associated with proposed development, the distribution of costs and benefits, the opportunity costs involved in foregoing other potential development paths.
- Some EcIA: IO but rarely used CBA or other methodologies
- Risks and uncertainties, sustainable development and QoL were also rarely incorporated in the EcIA.

Lockie, S. Franetovich, M., Sharma, S. and Rolfe, J. 2008, Democratisation versus engagement? Social and economic impact assessment and community participation in the coal mining industry of the Bowen Basin, Australia, *Impact Assessment and Project Appraisal*, 26(3): 177-187.

EcIA and social impact assessment

- Typically EcIA is not integrated with environmental or social impact assessment (SIA).
- This lack of integration limit the usefulness of those assessments.
  - SIA reports finding at the personal and community level, while EcIA usually is focused on state or national levels.
  - At national level the project can be positive (e.g. brings revenue and increases employment), but at regional level the project might create bottlenecks, increases reliance on one industry and contribute to worsening socio-economic conditions of local community
  - Single project focus (not accounting for fluctuations in commodity cycles)
  - Duplication in data collection
  - SIA uses qualitative analysis (problematic in estimating the magnitude of impacts, monitoring them over time and developing mitigation strategies)
  - There are many options for the mitigations strategies from negative social and economic impacts and for community/regional development. Using only SIA is it hard to prioritize the development choices.
  - Adding non-market valuation techniques to EcIA allows to understand how the community might prioritize different options and choose development options that are more acceptable by the community (Rolfe et al., 2007).

Rolfe, J., V. Petkova, S. Lockie and G. Ivanova (2007). Mining Impacts and the Development of the Moranbah Township. Research Report No7, Impacts of the Coal Mining Expansion on Moranbah and Associated Community, Centre for Environmental Management, CQUniversity, Australia.

SIA and EcIA: integration example

- Ivanova et al. (2007) suggested integrating EcIA and SIA at the initial IA stage to collect the data for non-market valuation.
- Ivanova and Rolfe (2011) used Ivanova et al. (2007) framework in application to mining community about community development options.
  - They used SIA approach to identify issues in regarding mining expansions and identified preferred development choices among community using non-market valuation techniques (i.e. CM and CB).
  - The quantitative results of CM and CB were used to feed into the mitigation strategies.
  - Ivanova and Rolfe (2011) found that some issues that were stated to be important in SIA such as housing and rental prices and water restrictions were significant in non-market valuation study.
  - Results of non-market valuation indicated that the development that involves more FIFO/DIDO will encourage residents to reduce their planned stay in town by 1.3 years. That result can be used by town planners in developing options for town growth.
  - Furthermore, one of the most important issues such as housing pressures were taken further to develop a regional housing model underpinned by relationships between demographic and dwelling characteristics (Akbar et al., 2011).

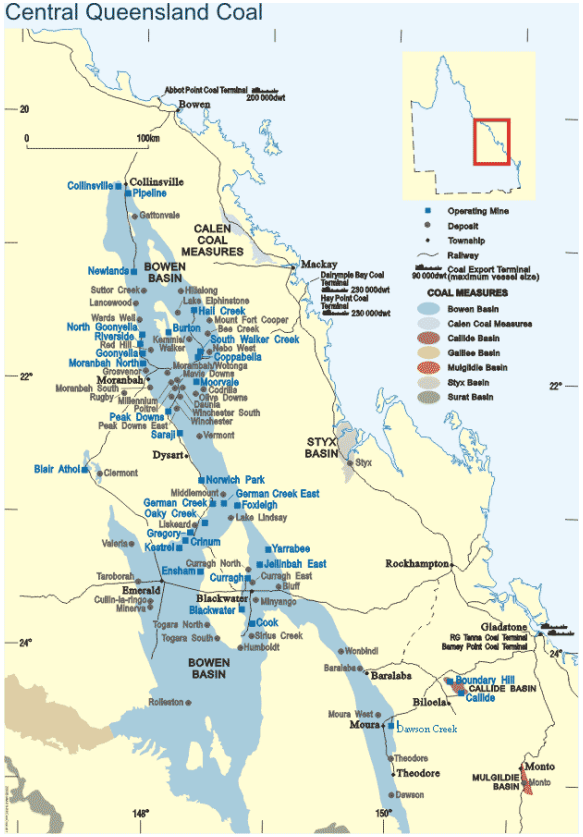
Ivanova, G., J. Rolfe, S. Lockie and V. Timmer (2007). "Assessing Social and Economic Impacts Associated with Changes in the Coal Mining Industry in the Bowen Basin, Queensland, Australia." Management of Environmental Quality: an International Journal **18**(2): 211-228.

Ivanova, G. and J. Rolfe (2011). "Assessing development options in mining communities using stated preference techniques." Resources Policy.

Akbar, D., J. Rolfe, L. Greer and G. Ivanova (2011). "Housing demand forecasting for the Bowen BasitnTowns: Lessons for Developing Countries." Bangladesh Journal of Regional Science(1): 19-29.

Example of CM & SIA integration

Bowen Basin map



Survey Question

2 Figure 1. Example choice set used in survey

	Question 2: Carefully consider each of the following three options. Suppose options A, B and C were the only options available, which would you choose?				
Additional annual costs to your household	Housing and rental prices	Level of water restrictions	Buffer for mine impacts close to town	Growth in population of 5,000 people	*I would choose*
	Potential Condition in 5 years time (Options A,B and C)				
Option A	(Expected outcome under current policy pressures)				
$0	No change	**Some** for households, town parks and gardens are **drier** than now	**Moderate** impacts from noise, vibration and dust	1,000 in housing, 4,000 in workcamps	☐
Option B					
$250 ($21/month)	No change	None for			
Option C					
$1,000 ($83/month)	25% increase				

Results of the Choice Modelling Experiment

	Coefficient	Standard Error
Constant	-0.599	0.937
Cost	-0.001***	0.000
Housing and Rentals	0.284**	0.119
Water Restrictions	0.218*	0.114
Buffer for Mine Impacts	0.248**	0.118
Population in Work Camps	1.583**	0.144
Female	1.243***	0.259
Number of Children	0.261***	0.098
Income	0.000**	0.000
Age	0.037**	0.015
Length of residence	-0.100*	0.053
Enjoy living in Moranbah	0.212*	0.125
Spending in Moranbah	-0.010**	0.005
Improved services less travel	0.025***	0.007
Number of observations	420	
Log likelihood function	-316.4385	
R-sqrd	.31	

	Part worth
Housing and Rentals	$276
Water Restrictions	$212
Buffer for Mine Impacts	$241
Population in Work Camps	$1,540

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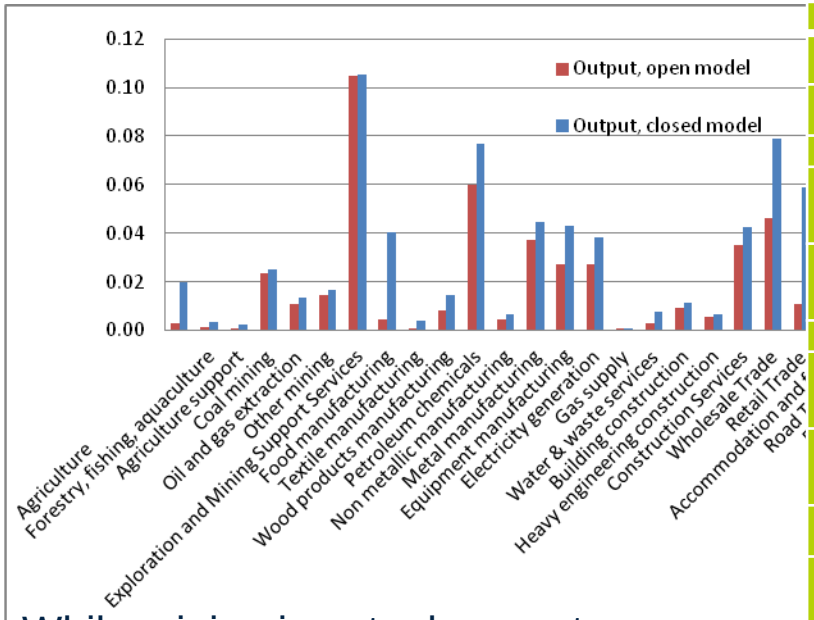
Example of extended Regional EcIA

Coal mining, Output multipliers Key sectors, open model

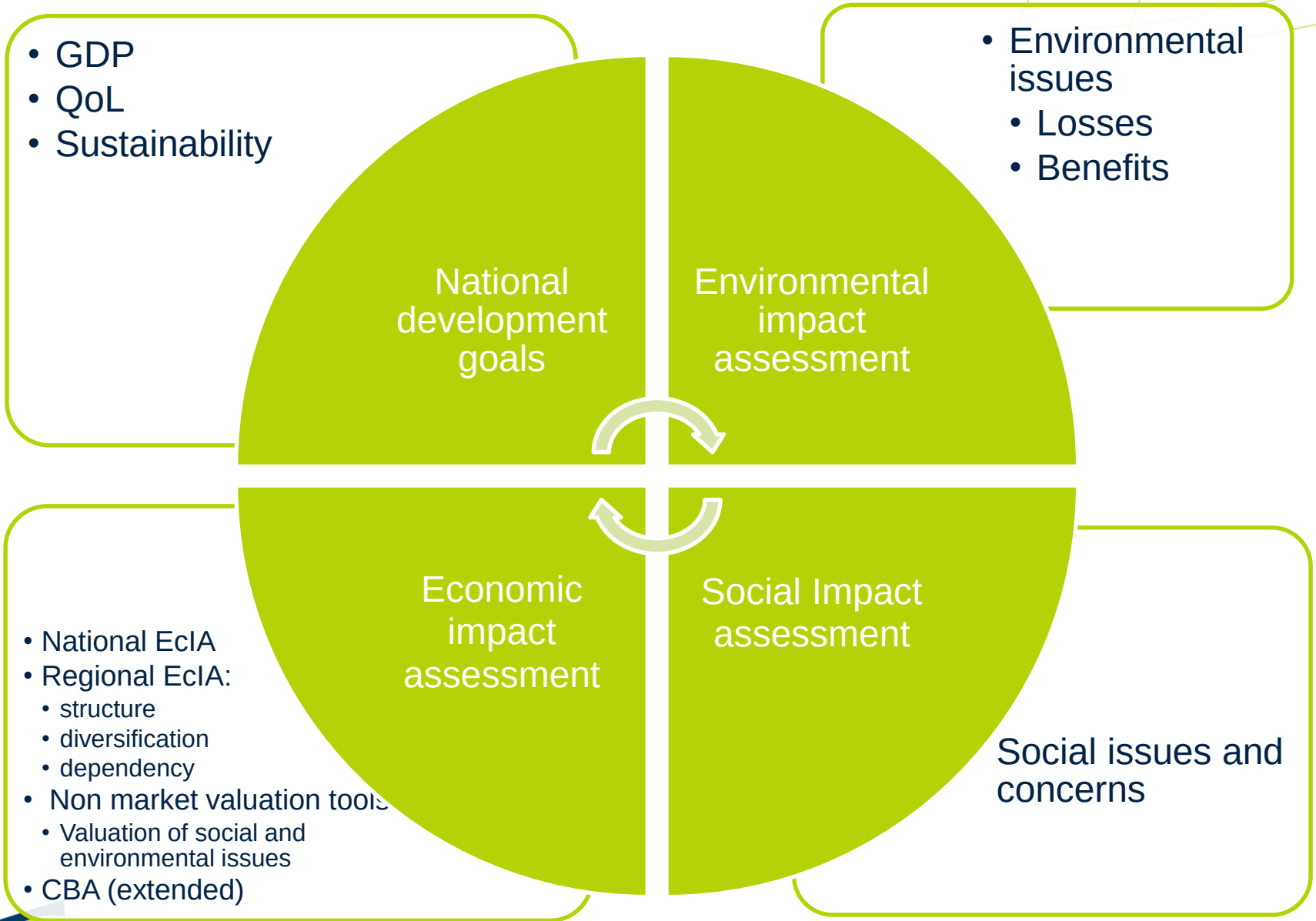


While mining is not a key sector, local connections between key sectors and mining industry in Fitzroy SD can be strengthened via wholesale trade, road transport, equipment manufacturing and transport and storage industries.

	Fitzroy					South West				
Sector	Name	Backward		Forward		Sector	Name	Backward		Forward	
		linkage	spread	linkage	spread			linkage	spread	linkage	spread
Output											
10	Wood products manufacturing	1.03	0.71	1.38	0.50	12	Non metallic manufacturing	1.23	0.84	1.10	0.97
21	Wholesale Trade	1.05	0.83	1.04	0.64	30	Media & telecommunication	1.02	0.65	1.10	0.57
Income											
10	Wood products manufacturing	1.06	0.74	1.73	0.53	24	Road Transport	1.24	0.98	1.61	0.81
30	Media & telecommunication	1.04	0.77	1.35	0.65	28	Postal services	1.10	0.80	2.58	0.77
24	Road Transport	1.08	0.82	1.20	0.47	21	Wholesale Trade	1.02	0.75	1.49	0.60
14	Equipment manufacturing	1.10	0.93	1.14	0.64	38	Art, sport, recreation & other	1.17	0.82	1.37	0.62
21	Wholesale Trade	1.07	0.84	1.14	0.47	30	Media & telecommunication	1.17	0.75	1.82	0.83
Employment											
10	Wood products manufacturing	1.01	0.71	1.82	0.65	28	Postal services	1.13	0.88	2.16	0.72
30	Media & telecommunication	1.07	0.73	1.37	0.74	30	Media & telecommunication	1.17	0.76	1.50	0.78
24	Road Transport	1.15	0.94	1.24	0.53	38	Art, sport, recreation & other	1.10	0.76	1.28	0.79
29	Transport and storage services	1.01	0.94	1.33	0.72						
21	Wholesale Trade	1.03	0.75	1.13	0.46						

Comprehensive EcIA: methodology

1. EcIA and SIA need to be coordinated during the initial data collection to reduce the duplication, cost of IA and to collect additional data (e.g. QoL).
2. Nonmarket valuation tools - to quantify the magnitude of issues, trade-offs community members are willing to take to reduce the negative or increase the positive impacts or mitigation strategies they are likely to support.
3. Regional analysis. It is suggested that models are calibrated using the data from stage one and two of the integrated socio-economic impact assessment (SEcIA) including MPS in the region, the location of the workforce and purchasing pattern of local industries.
4. Identification of the diversity of the regional economy and key sectors. Connections with the project (e.g. procurement strategies).
5. Alignment of the goals of the state/national development and impacts from the project under investigation.


• GDP
• QoL
• Sustainability
• Environmental issues
• Losses
• Benefits
National development goals
Environmental impact assessment
Economic impact assessment
Social Impact assessment
• National EcIA
• Regional EcIA:
• structure
• diversification
• dependency
• Non market valuation tools
• Valuation of social and environmental issues
• CBA (extended)
Social issues and concerns

Summary and discussion

1. Some issues in how most EcIAs are performed:
   - lacks a theoretical framework between models and development goals.
   - EcIA is performed at state or national level without due consideration of regional or community impacts.
   - EcIA is not utilizing the methods that are readily available to perform a more comprehensive EcIA at various levels.
2. The process where EcIA and SIA are conducted separately reduces the value of IA and increases the costs of SEcIA. EcIA and SIA can benefit by being conducted in collaboration.

3. More comprehensive EcIA (that also is integrated with other IA disciplines to provide a “holistic” picture of project’s impact at various levels) provides more value for national, state and regional development.