

Research Brief 201202

It's Raining Men: INPEX and Darwin's Gender Balance

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1. RESEARCH AIM

To compare and contrast a range of scenarios about the likely effects on Darwin's gender balance and population size from the construction of INPEX's Blaydin Point onshore gas facility. We discuss why issues of gender are important and overlay variations in the size and local composition of the workforce onto existing population projections to examine the impacts.

2. KEY FINDINGS

- The construction phase of INPEX, commencing in 2012 and running to 2016, is said to be creating an economic 'boom' for Darwin.
- Around 3,000 construction jobs are expected to be filled, almost all by males.
- Since the rebuilding of Darwin after Cyclone Tracy, when there was a peak of 125 men for every 100 women, the NT and Darwin have steadily become less 'blokey'.
- We can expect INPEX to arrest this long-term decline and add up to 2,500 males to the population in some years of construction.
- There may be significant social effects based on past experiences and Darwin will need to plan for and avoid negative consequences.
- Longer-term policies for promoting a 'balanced population' are encouraged.

3. THE ARRIVAL OF INPEX

In January, 2012, the INPEX Corporation announced it had finalised a deal to construct and operate a major liquefied natural gas (LNG) processing plant near Darwin (ABC, 2012a). The project involves the extraction of natural gas from the Ichthys gas field, located offshore in the north of Western Australia, and piping it almost 900km to Darwin for processing at the facility to be located on Blaydin Point, only a few kilometres from the city centre (Figure 1). The total value of construction for the project is estimated at around \$34 billion, making it one of the biggest private sector projects in Australia's history.

Construction of the onshore processing facility is said to require thousands of workers, although estimates of numbers vary according to the source. INPEX itself has estimated as many as 3,000 full-time jobs will be created during the construction phase (2012 to 2016) and up to 700 ongoing jobs to operate the plant subsequent to construction (2016 onwards) (Northern Territory Government, 2012).

Figure 1 – Artists impression of the Blaydin Point facility



Source: INPEX, 2012a

Research on impacts from large oil and gas projects on regional and rural communities elsewhere in the developed world suggests that significant social effects usually accompany the construction and early operational phases (Jacquet, 2009). Indeed, a range of economic, social and environmental concerns have been aired over the onshore Darwin plant including:

- Environmental impacts – blasting of reefs, danger to dugongs and dolphins
- Crime and anti-social behaviour – from the anticipated largely male workforce
- Economic inequality and marginalisation – especially inflationary housing effects
- Straining of core services – damage to roads, strains on emergency services etc.
- Social and economic polarisation – creating 'have's' and 'have nots'
- Local Government's ability to cope – scale effects on local government services

Underlying many of the community's concerns are anticipated impacts from the injection of the large male dominated construction workforce for a period of five years. In short, we can expect large numbers of additional young males to be resident in Darwin (although the group itself is likely to be constantly churning) during construction, and peaking in 2014. In this brief we examine why this might be an issue and model the likely size and scale of gender-based impacts on the population of Darwin from the injection of the Blaydin Point construction workforce.

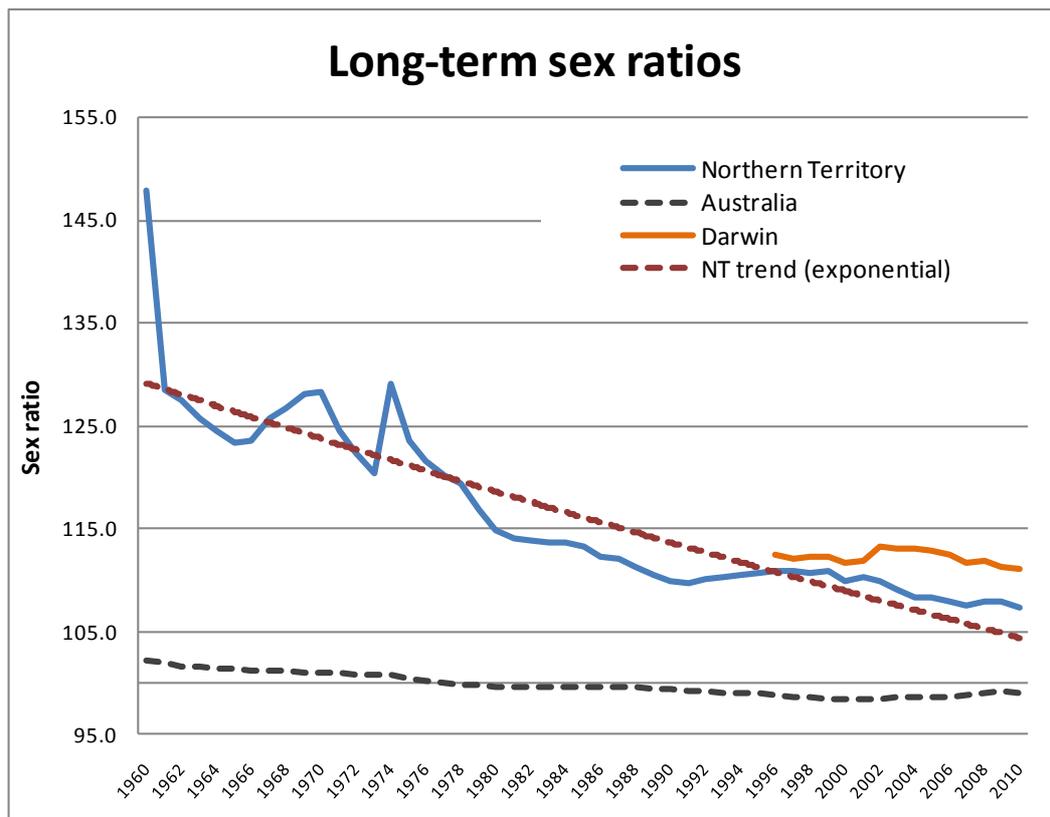
4. BOOMTOWNS AND GENDER BALANCE

A number of research initiatives were conducted in the United States in the 1970s and 1980s examining the economic and social consequences of large, single source infrastructure and investment programs like the INPEX project. That research led to the development of what are known as "Boomtown Impact Models". Broadly these models suggest that boomtowns often become overwhelmed during the construction phase by the scale of impacts from 'mega projects' in the oil and gas industries, such that they succumb to "Boomtown Syndrome" (Jacquet, 2009). The syndrome is characterised by an initial period where the community is euphoric about the project because of perceived and realised economic benefits, only to become subject to fear about (usually severe) accompanying social impacts which begin to manifest early on during construction. Social deterioration is most noticeable when the project 'bust' cycle commences after the labour intensive construction period is over and the far less labour demanding operational phase begins. This bust is triggered by the sudden withdrawal of construction labour, leaving a legacy of inflationary effects and sudden declines in the demand for local goods and services. Of particular concern has been the deflation of housing market values from the withdrawal of demand by construction labour.

Issues of gender balance as a result of the boomtown syndrome are important in considerations about Darwin's social and economic wellbeing (Gilmore, 1976). Male-biased populations have been demonstrated to have a reduced savings capacity, to plan less strategically for the future and to exhibit anti-social behaviours as a result of competition for mates (Griskevicius et al., 2012). In the case of Darwin, the demographic imposition of a large number of men for the construction of the onshore INPEX facility has the capacity to significantly alter its population structure. The scale of gendered population effects and the extent of male-bias which results will be determined by a number of complex and interrelated factors. Not least are the eventual size of the construction workforce (which is as yet unknown) and the proportion of labour which is sourced locally. In simple terms, the larger the workforce size and the lower the proportion sourced locally, the bigger the gendered impacts which might be expected and consequently the greater the social impacts.

It is important to note that the construction phase for INPEX comes at a time when Darwin has been making long-term progress towards a more gender balanced population (Figure 2). Gender balance is important for resident amenity and to meet economic and social goals, for example, in attracting and retaining females in skilled occupations, retaining grandparents in the community and so on. Since the 1960s the sex ratio for Darwin (the number of males for every 100 females in the population) has been in steady decline. The city is becoming less 'blokey', although is still considerably more male-biased than Australia as a whole (with a sex ratio of 98). Shortly following the reconstruction of Darwin after Cyclone Tracy, for example, the sex ratio was at 125 while by 2010 it had declined significantly to 112. A continuation of this long-term decline would have seen Darwin reach a balanced sex ratio of 100 by around 2020 but the arrival of the construction phase for INPEX will signify an arrest of this trend.

Figure 2



Sources: ABS Catalogue no. 1362.7 (2001, 2003, 2004, 2007); ABS Catalogue no. 3105.0.65.001 Australian Historical Population Statistics, 2008; ABS Catalogue no. 3101.0

In this research brief we provide first insights on the likely scale and composition of population effects from the construction of the Blaydin Point facility by modelling a range of construction workforce scenarios and overlaying these onto existing population projections. We examine the effects on sex ratios and population size, discuss the possible implications and provide advice for policy makers as the project gets underway.

The research questions are:

- What are the likely size and scope of gendered effects on the population of Darwin under various scenarios about the composition of the construction workforce?
- Will the scale of the construction workforce associated be sufficient to arrest long-term declines in the Darwin and NT sex ratio towards a gender balanced population?

5. METHODS

In this study we model a number of scenarios in relation to the size and the extent of local resident employment in the construction workforce for the Blaydin Point facility. The scenarios are outlined in Table 1 and vary from zero local employment (scenarios a1 and a2) to 50% local employment (scenarios c1 and c2). As a guide, one industry analyst has proposed that around 30% of work will be undertaken by local contractors (ABC, 2012b), but the real figure may not be known until after the event and even then will be difficult to ascertain precisely. While INPEX is publicly stating that it will endeavour to ensure labour is sourced from within the Northern Territory, very high labour force participation rates (recently around 80% for males and around 70% for females, compared to 72% and 59% respectively for Australia) (ABS, 2012)

indicate that a substantial share of the construction workforce will need to be sourced from interstate and overseas. Consequently, the middle scenario used in this study is for 20% local engagement.

Table 1 - Details of scenarios modelled

Scenario	Construction workforce size	Percent of local employment	Males to distribute	Females to distribute
a1	2,000	0%	1,740	260
a2	3,000	0%	2,610	390
b1	2,000	20%	1,392	208
b2	3,000	20%	2,088	312
c1	2,000	50%	870	130
c2	3,000	50%	1,305	195

The total size of the onshore INPEX construction workforce is also varied across the scenarios. It is anticipated to be somewhere between 1,500 and 3,000 with the latter reflecting the Chairman of the company's best estimates (ACTIL Tasman, 2008; Northern Territory Government, 2012). We model sizes of 2,000 and 3,000 in combination with variations in the proportion of the workforce sourced locally. The disaggregation of the workforce according to gender (shown in the table below) reflects the sex ratios for the construction industry in Darwin as they stood at the 2006 Census. We then apply the age and sex profile for construction at 2006 to develop an age and sex distribution for the Blaydin Point construction workforce. This workforce is overlaid onto existing population projections for Darwin for 2012 to 2016 inclusive. Population projections are sourced from the baseline scenario published by the Northern Territory Treasury (Northern Territory Treasury, 2012). In the results section of this brief, these existing population projections are labelled as 'NTPOP' (for Northern Territory Population Projections).

The size of the workforce engaged in the construction of the gas facility in Darwin will vary from year to year during the construction period. In this modelling we use peak workforce ratios (with the peak workforce anticipated in year four of the construction period) provided by economic modelling for the INPEX project undertaken in 2008 by ACTIL TASMAN (ACTIL TASMING, 2008). These ratios are 66.9% (of the peak workforce) in 2012, 99.5% in 2013, 99.8% in 2014, 100% in 2015 and 73.1% in 2016 (ACTIL Tasman, Appendix b-2).

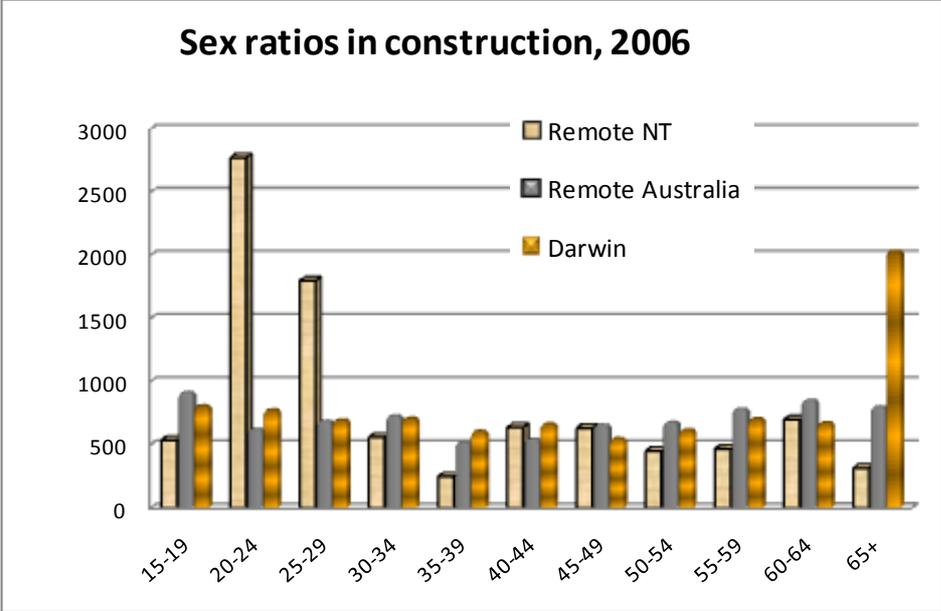
A number of assumptions were required to facilitate the modelling undertaken in this study. The scenarios above represent various combinations of workforce size and locally source labour which might be thought of as plausible. In reality, however, any combination of size and local share might eventuate. The modelling also excludes any offshore workforce which might be based in Darwin or multiplier effects for job creation in this or other sectors. In addition the assumed age and sex profile for the INPEX construction workforce reflects the broad construction workforce for Darwin (Statistical Division) rather than the age and sex profile specifically for gas plant construction because these data are not available. Nevertheless, these limitations are relatively minor for the purpose of the research. The application and real value of this research lays in comparisons between scenario outcomes rather than the absolute numbers which result from the modelling of each scenario.

6. RESULTS

6.1. Sex ratios in the construction industry in Darwin

Sex ratios in the construction industry in Darwin confirm that we can expect around ninety percent of INPEX construction jobs to be filled by men. In 2006 the sex ratio stood at 675 (Figure 3) and was highest for those aged under 35 years (above 700) and those aged 65 years or more (around 2,000). In remote parts of the NT, construction sex ratios were even higher (up to 2,700 for ages 20-24).

Figure 3



The domination of young males in the Darwin construction industry relative to other industries is highlighted by comparisons of the age-specific sex ratios between construction and the general workforce (Figure 4). For example, the construction industry sex ratio is around seven times that of all industries in Darwin for those aged 15-19 years and around 17 times for those aged 65 years and over.

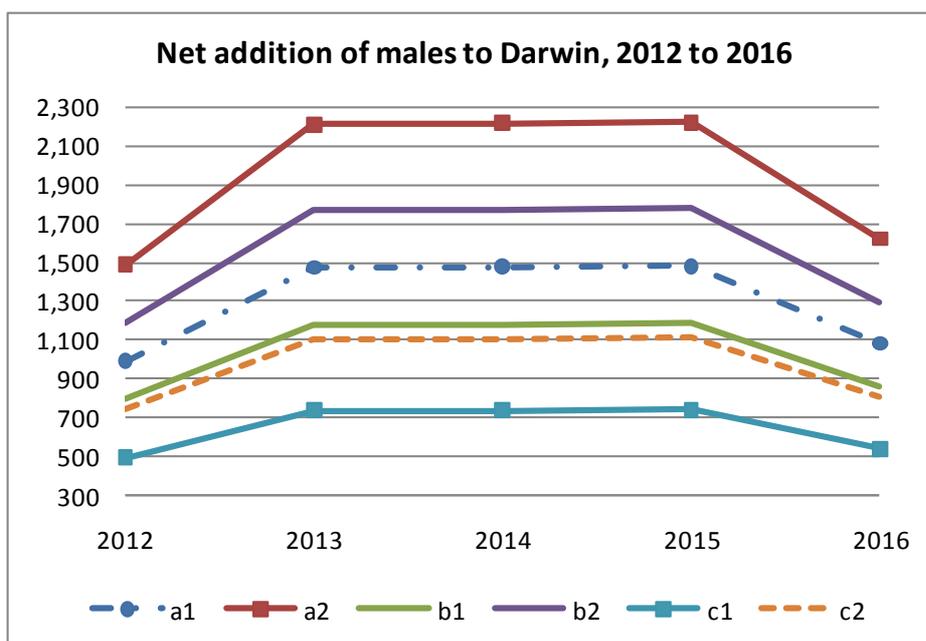
Figure 4



6.2. Net population effects from construction of the Blaydin Point facility

Applying the age-sex distributions reported above to the Blaydin Point facility construction workforce anticipated under each scenario, and then overlaying these onto existing population projections for Darwin, demonstrates the scale of gendered impacts. The largest absolute and net additions to the population will be made in 2014 and 2015 under scenario a2 (no local employment and a 3,000 person construction workforce). These will see an addition to the population of 2,605 (or a 2.6 percent increase) and 2,040 males respectively and a net of 2,216 and 2,220 males added when females in the workforce are taken away from the total (Figure 5). This net figure recognises that some females will be employed in the construction phase (as outlined in Table 1).

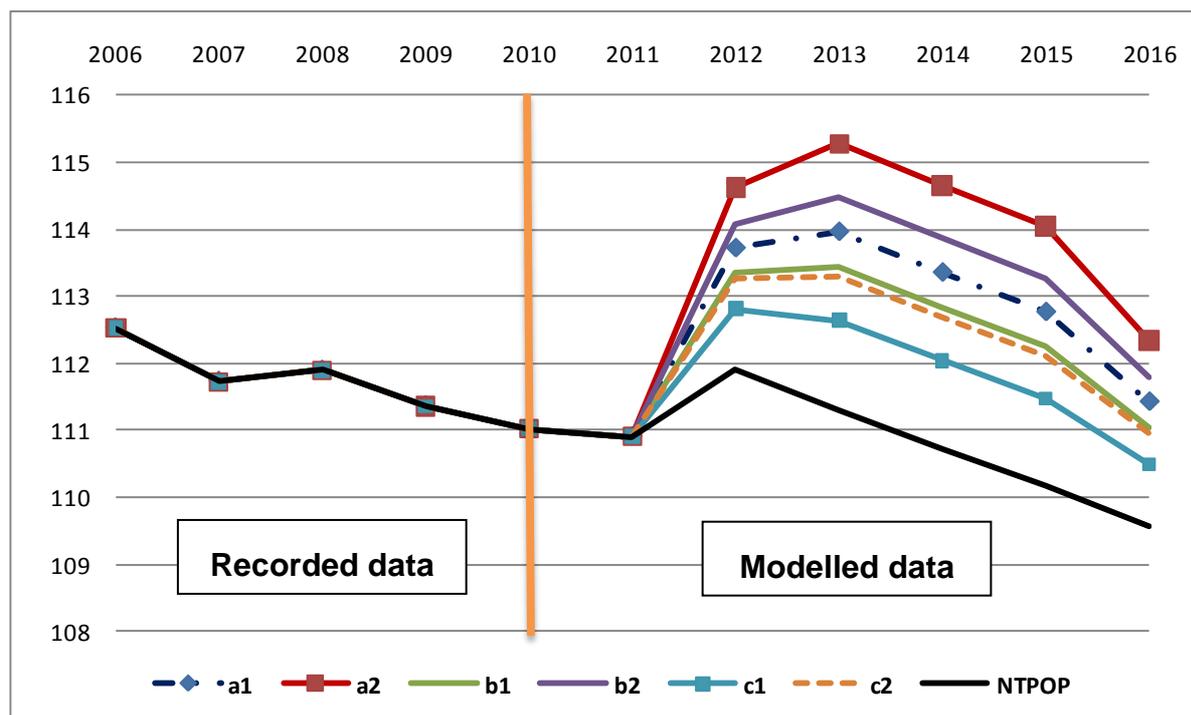
Figure 5



6.3. Impacts on long-term sex ratios for Darwin

The scale of the net addition of males to Darwin’s population under each of the construction workforce scenarios modelled here will be sufficient to arrest the long-term decline in Darwin’s overall sex ratio during the construction period. Differences between each scenario and between these and gender ratios which might have eventuated in the absence of the gas plant construction phase are provided in Figure 6 below. The line ‘NTPOP’ indicates the projected sex ratios for Darwin from 2010 to 2016. The greatest variation from these projections will be experienced under the scenario of a 3,000 strong construction workforce with zero local engagement (scenario a2) where the sex ratio would rise from a projected 111 to a peak of 115 in year two of construction (2013). In demographic terms this increase is quite large.

Figure 6



7. DISCUSSION AND CONCLUSIONS

This research brief has reported on modelling of likely impacts from the construction phase for INPEX’s Blydin Point gas facility for Darwin’s gender balance and population size. With an anticipated construction workforce of around 3,000 from 2012 to 2016 the project will arrest Darwin’s long-term declining sex ratio and enhance its male-biased population structure. The construction industry in Darwin was found to be very highly male dominated when compared to other industries of employment. This was particularly the case for those aged less than 35 and those aged 65 or more. Modelling of the impacts on Darwin’s sex ratios and on the net additions of males to its population under various scenarios (of workforce size and local employment) suggests that significant demographic effects will be experienced regardless of the eventual combination of these. Gendered impacts will be greatest where a large workforce is engaged and few are sourced locally. A workforce of 3,000 and no local employment, for example, would see 2,605 people added to Darwin’s population (or 2.6 percent) and a net of 2,216 males. This would lift the sex ratio for Darwin from 111 to a maximum of 115.3 in 2013.

The modelling here has examined short-term and temporary effects on Darwin’s population using gender balance and net additions to the population to highlight differences in scale under various scenarios. What it has not done is to examine possible longer-term impacts. It may be, for example, that social and

economic impacts felt by the community during and after the construction phase will alter migration patterns to and from Darwin. Rising house prices (there was evidence of speculative pricing and buying in the housing market almost immediately after the formal announcement of the project) might deter interstate residents from moving to Darwin (where prices are already relatively high). Local businesses may be significantly affected by further tightening in the labour market as they try to compete for skilled labour already in short supply. And importantly, social issues which will inevitably accompany the injection of a large male workforce may 'crowd out' resident amenity such that some decide to leave Darwin altogether. Keeping abreast of tangential impacts such as these will require specific pieces of research and monitoring. Furthermore, INPEX may help re-enforce the focus and attention on Darwin as the hub for economic development and activity. It is far from clear whether and how the rest of the Northern Territory might benefit in meaningful ways, if at all, and this is a concern.

In summary, while the announcement of the INPEX project for Darwin came with great fanfare, policy makers and planners will need to carefully consider whether and how the boomtown syndrome might play out. The modelling undertaken for this brief provides indications about the scale of gendered and population effects and these are a starting point for discussing and planning to alleviate any negative consequences. While the economic benefits which are realised for Darwin will be tangible, there may be a range of externalities which are not costed into reflections about net benefits from the INPEX project for Darwin and the Northern Territory as a whole. With lead-up construction now moving forward at a rapid pace, Darwin residents may be left scratching their heads in 2016 wondering where and why the boomtown went wrong. In the longer-term, policy makers would benefit from considering how Darwin might develop with a more balanced population structure so that negative impacts from major projects like INPEX are manageable and minimal.

8. REFERENCES

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