Summary of Charles Darwin University demographic modelling for Nhulunbuy

During May to August 2014, population researchers from the Northern Institute at Charles Darwin University undertook a project to independently examine the population profile of Nhulunbuy now and into the future, based on a range of data and scenarios. Some of the research findings were presented to the East Arnhem Regional Development Committee and a wider community forum on 13 August 2014.

The key facts in relation to the research are:

- This research was undertaken primarily to help the community and others consider and discuss opportunities and challenges in relation to population change from the refinery suspension.

- The research aims to:
  - Gather then analyse data and other research to inform modelling on the potential short and mid-term (10-15 years) population prospects for Nhulunbuy.
  - Examine possible impacts from the refinery suspension on the population and develop some alternative scenarios or simulations for new (economic) development.
  - Provide some insights into what the modelling might reveal about opportunities and challenges for Nhulunbuy and the region now and into the future.

- The research consisted of four components:
  1. An examination of relevant international examples of towns where alumina refineries were curtailed or wound-back as well as examples from other industry wind-backs/shut downs which were considered;
  2. Gathering and analysing data from a wide range of sources to ascertain the population profile now and into the future;
  3. Mapping out the immediate population implications from the suspension; and
  4. Building two demographic modelling tools to run various scenarios based on initiatives which are being considered for the future to look at and compare the population impacts from these.

- Importantly, the research is not intended to:
  - Be a prediction about what the population size and profile will be. There are many initiatives being discussed by the community and others and many impacts which will play out differently to what might be anticipated. Research in this area shows that smaller towns tend to vary further from expectations or assumptions which are initially made about the future as a basis for scenario modelling.
  - Be a definitive solution or represent particular views about what should be done in relation to the suspension of the refinery and who should do it.
• The research necessarily makes a range of assumptions about the ‘starting’ population (the residential population in town subsequent to the departures of refinery workers and families). These assumptions are based on the data provided to the researchers at the time of the project. For these reasons the researchers encourage the community and others to focus on discussing and comparing the variations between scenarios and the patterns of population change over time and not the actual numbers, because these may vary considerably from the assumptions which are used for the modelling.

• The results of the international comparisons suggest some common themes:
  o A reduction in the population of between 40% and 70% was common followed by a ‘bounce back’ after 5-10 years;
  o An increase in the ratio of male to female residents;
  o Population ageing;
  o The numbers of children tends to diminish; and
  o Towns with a relatively large Indigenous residential population tended to be subject to less of a decline and more of a bounce back.

• Strategies pursued in the international examples to manage the effects from suspension have broadly included: efforts to re-establish the industry which was wound-back; seeking to establish a major new industry; investing to establish the town as a regional service centre; encouraging tourism and other private sector activities (e.g. light manufacturing); and pursing new or expanded government services (e.g. defence or detention facilities).

• Results of work to understand the prior demographic profile of the town show that the pre-suspension population featured a relatively high ratio of kids to adults, a high proportion of families, a relatively low proportion of people aged 15-24 and a small number of retirees.

• The researchers used Rio Tinto Alcan data on the intentions of workers and families to stay or leave the town to establish what the population might look like towards the end of 2014.

• The results suggest:
  o The suspension will reduce the population by around 42% to circa 2,400.
  o This figure does not incorporate any losses of residents from impacts to the private sector during 2014. Equally this figure does not include the possible effects from initiatives which may be implemented during 2014 that may boost the town population (for example there is discussion about transitioning FIFO jobs to resident based jobs).
  o The profile of the town is likely to change significantly during 2014 with relatively large reductions in children and those of working age, especially those aged 40-59.
  o Importantly the suspension is likely to reduce the ‘birthing capacity’ of the town because of the departure of children who otherwise may have stayed on and given birth combined with the departure of those already in birthing ages.
The population modelling applied the post-suspension population described above as the base and projected forward a range of scenarios including:

- A baseline to look at what would change if the town only grew through births and deaths (as a basis to comparing against other scenarios);
- Private sector losses and private sector gains scenarios which simulate the effects of the suspension on private sector jobs, and the effects of creating more private sector jobs;
- A boarding house scenario which simulates effects from the construction and operation of a 40 bed boarding house;
- A regional servicing scenario and a service loss scenario which simulate changes to jobs based on increasing services to the region, or decreasing services to the town population; and
- Simulations of the net effects when all of these scenarios are run at once.

The scenario results all featured losses of children which could not be replaced, an increased male bias and population ageing, most of which was already in place subsequent to the suspension and is in line with the international experiences.

The scenario results produced a range of population outcomes by 2025 which vary according to the assumptions of the modelling but nevertheless demonstrate that relatively small changes to assumptions (which themselves represent specific initiatives or impacts) can have relatively large impacts over time.

Overall the research highlights that:

- It might be very difficult to attract new people to a town while it is declining – normally newcomers arrive before an old group leaves, or there is a gap between departures and arrivals;
- Anticipating the net effects from implementing a range of initiatives is very hard to do; and
- Downward multipliers (other people leaving because of refinery departures) tend to be bigger and more immediate than upward multipliers (other people who might arrive on the back of, but are not directly associated with populations arriving for new activities).

The researchers will maintain the models for the community so that alternative scenarios which are seen as important to the community can be run.

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