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Understanding change in Basin communities

How to interpret the indicators of social and economic condition

Through working with communities, industry and Basin governments, the MDBA has identified those indicators which best define how communities are changing over time. Reflecting on the drivers of change in each community, together with the timing and scale of change in the social and economic indicators, provides the context for understanding how the Basin Plan water recovery has contributed to those changes. The profiles also provide the means for examining how, when and at what pace communities are changing relative to one another.

The MDBA's social and economic profiles are largely based on information collected through the Australian Bureau of Statistics (ABS) across the 2001, 2006, 2011 and 2016 census. Information covers changes in the total population of the communities and main towns or urban centres, the workforce and economic structure, and indicators of social condition. No one piece of information (from within the profiles) is a sufficient measure of change at the community level. All the indicators together help to describe the social and economic conditions of Basin communities.

The 45 southern Basin community profiles complement similar profiles published in 2016 for 21 communities in the northern Basin. The timeframe covered in the profiles means the observed changes incorporate shifts in agricultural production, technology and the climate, in addition to the changes in water available for irrigated production.

What geographical scale is used to produce the community profiles?

The community areas used by the MDBA to inform part of the social and economic analysis are based on irrigation areas where possible and/or distinctive reaches of the rivers based around particular types of irrigated production. For some of the communities (eg. Benerembah) there may be no town or urban centre identified. But for most communities, there are one or two urban centres included. From this information, it is possible to examine the relationships between water availability and what is happening in both the farming areas and in the towns which rely on the farm production. It is recognised that the communities may have social and economic linkages with each other. This is taken into account when the MDBA is using the information contained within the profiles.

What's happening with irrigation water availability?

At the community level, it is necessary to account for the volume of entitlements held in each community before the water recovery occurred, the volume of water recovered, the types of entitlement recovered, and whether it has been through buyback or infrastructure investment. Information presented includes the starting volume of

entitlements and water recovered, expressed in long-term diversion limit equivalent (LTDLE) terms. Entitlement types held in each community might include high security, general security, high reliability, low reliability or supplementary licences. The Basin Plan water recovery may be additional to other sources of environmental water recovery.

Where the water recovery has been through on-farm infrastructure investment, the water savings retained by farmers are used to estimate the net change in water available for production. Where the recovery has included the rationalisation or closure of particular parts of the irrigation districts, that water recovery is treated as if the entitlements had been purchased for the purposes of the MDBA community-level social and economic analysis.

What's happening with social and economic condition

This section of the profiles identifies changes in social and economic conditions at the community and town (urban centre) scales. The information provided below allows a comparison of the rates and timing of changing between each community and against the average change across the 40 irrigation-dependent communities.

Why does the MDBA look at the population and age distribution?

Population numbers are provided for the whole community and for the main town, towns or urban centres. Examining the rates and timing of population change builds an understanding of when people are leaving or moving into the towns and/or the farming area of each community.

Across the period 2001 to 2016, the average change in community population was a decrease of 8.7%. A decrease of 2.7% between 2001 and 2006, and of 7.5% between 2006 and 2011 was followed by an average increase of 1.5% between 2011 and 2016.

When considering changes to the population, further information is provided on the changes to the number of mums, dads and kids (people under 45) or people over 45 years of age within the towns and urban centres. Across the rural areas of the basin, those communities appearing to be doing reasonably well show a decrease in people under 45 of around 8-9% between 2001 and 2016 and a similar rate of increase for those over 45.

Why does the MDBA look at changes in the total area workforce and workforce by industry?

The mix of employment in the community provides an indication of economic diversity and how the economic make-up of the community is changing over time. Data presented relies on assigning the 720 job classifications within the census to industry sectors then aggregating part-time and full-time employment to provide an estimate of total employment as full-time equivalents for the whole community. Within the towns or urban centres, it is possible to look at the mix of full and part-time employment for the residents.



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Across the period 2001 to 2016, the average change in total employment across the 40 irrigation- dependent communities was a decrease of 24.1%. This was comprised of decreases of 2.8% between 2001 and 2006, 8.1% between 2006 and 2011, 13.1% between 2011 and 2016.

Employment information for each sector is relevant to understanding how a change in water can work its way through the agriculture and non-agriculture sectors of each community. In these profiles, the agriculture sector covers farm employment (including the farmers themselves), services to agriculture and the wholesaling of agricultural outputs. Value-adding to agricultural output is considered as a separate sector. The non-agriculture private sector represents the support network for the community and includes industries such as retailing, accommodation and housing construction. Government services are presented in a single grouping as employment in industries such as health and education are determined by a range of other general policy decisions from multiple layers of government.

The ABS data does not include a large proportion of the seasonal workers employed in rural communities. MDBA is preparing estimates of seasonal workers employed in the various irrigation sectors and the changes in demand for the seasonal workers across time.

Combining information on changes in total employment and the population provides an estimate of labour force participation. In 2001, average participation rates across the irrigation-dependent communities was 34.6 full-time equivalents per 100 people. In 2016, the average participation rate had fallen to 28.7 full-time equivalents per 100 people.

For the urban centres within the communities, on average 25% of people were in full-time employment in 2001, falling to 22% of people in full-time employment in 2016. With part-time work, an average of 13% of the town population was employed in 2001 and 2016.

Why does the MDBA consider ABS SEIFA indices?

Decile scores are used to represent the four ABS socio-economic indexes for areas (SEIFA, prepared by the Australian Bureau of Statistics from the census data) at the town scale for 2001, 2006 and 2011. The 2016 data will become available later in 2018. The four SEIFA measures compare the relative levels of disadvantage, advantage, wealth and qualifications/occupations across all communities in Australia.

A decile score of 1 for a community indicates it is amongst the 10% most challenged locations across Australia for that measure. A decile score of 10 index indicates the community is ranked amongst the top 10% of communities for that measure.

While it is not possible to compare the decile scores across time in any quantitative way, the SEIFA indices can be used to indicate how the social conditions of each community are shifting relative to the index decile scores observed in other places. A change in relative ranking of 2 deciles or more between 2001 and 2011 indicates a considerable degree of change. If there is such a change to three or four of the indices across time, it provides further evidence for the strength of the changing social conditions experienced within a community.

For some communities, there is more than one major urban centre to consider, such as in Kyabram-Tatura. With those communities, the SEIFA scores are provided for the two major urban centres of Kyabram and Tatura. For example, both urban centres of a decile score of 7 for disadvantage in 2001. However in 2011, the decile scores for Kyabram/Tatura are given as 4/6. That is, a decile score for disadvantage of 4 in Kyabram and 6 in Tatura.

Rural communities experiencing relatively good social and economic conditions tend to have decile scores around 4, 5 or 6 across the four indices. Communities with lower decile scores or scores declining by at least 2 deciles are likely to have a reduced capacity to initiate change than communities with higher decile scores. When used in combination with other data in the profiles, the SEIFA scores and changes provide insights to the overall adaptive capacity of communities.

What's happening in agriculture?

Why does the MDBA look at the mix of land uses?

Land use data was sourced from ABARES ACLUMP 2016 to estimate the mix of agricultural landuses at the community scale. Estimates are provided on the maximum area of development for irrigated agriculture, the area developed for dryland farming (cropping), and for the area of grazing in each community. This information combined with climate data is used to estimate the relative contribution of the different types of agriculture to each community across the period from 1999/2000 to 2015/16.

The mix of land uses between cropping, grazing and irrigation provides information to be used in conjunction with the farm and agriculture supply sector employment data to describe the particular demands for goods, services and employees across the sectors of each community. For more information on the ACLUMP dataset, see ABARES Guidelines for land use mapping in Australia: principles, procedures and definitions (2011).

How has the Basin Plan water recovery affected irrigated agricultural production?

The location, crop types grown and level of irrigated agriculture are influenced by a range of factors including the Basin Plan water recovery through purchase (buybacks) and on-farm infrastructure investment. To separate out the effects of the Basin Plan water recovery, production data from the period 2000-01 to 2015-16 has been used. Using this information, it is possible to relate the changes in entitlements and the benefits from on-farm infrastructure investment to the level of production each year. From this observed data two key sets of information are derived. What might be the expected level of production if there was no Basin Plan across the whole period and the expected level of production if the Basin Plan water recovery achieved as of October 2016 had been in place for the whole period. Using this approach, it is possible to investigate the effects of the Basin Plan water recovery on irrigated production across a mix of wet, dry and in-between climate years.

For most commodities, production is represented as the area irrigated. For dairy, production is represented as million litres of milk. In areas where rice and other annual crops (including cotton, cereals, oils and irrigated pasture) are grown, the area of production is defined as the hectares of rice-equivalent irrigation. For example, if



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rice uses 10 ML of water per hectare and pasture uses 2 ML of water per hectare in a given year, 5 hectares of pasture would represent 1 hectare of rice-equivalent production.

In modelling the with and without Basin Plan estimates for each community, the following general approaches have applied. The area of permanent plantings relates mostly to the volume of entitlements held in each community. For dairy, milk production is a function of the entitlements held, allocations against the entitlements on 1 November each year, milk production the year before and local rainfall. With the rice equivalent hectares, the area of annual production is largely a function of the entitlements held and the allocations against those entitlements on 1 November.

Other factors are influencing the level of irrigated production in each of the communities, outside of the climate and Basin Plan water recovery. Some of these factors include permanent and temporary water trade, other (non-Basin Plan) environmental water recovery, and productivity gains from the combination of both on and off-farm infrastructure investment. Where these outcomes have been identified, they have been represented within the estimates of changing irrigated production at the community scale.