

# Drought Communities Programme Extension Review

## Interim methodology for the DCP Extension

13 January 2020

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13 January 2020

Donna Wieland

Acting Executive Director, Regional Development and Local Government Division  
Department of Infrastructure, Transport, Cities and Regional Development  
111 Alinga Street  
Canberra ACT 2601 Australia

Dear Donna,

**RE: INTERIM METHODOLOGY FOR THE DCP EXTENSION**

In accordance with your instruction, we have performed the work set out in our engagement agreement dated 10 December 2019 for the development of an interim methodology for the allocation of funds for the Drought Communities Programme Extension ("DCPE" or "Programme").

This report was prepared on the specific instructions of the Department of Infrastructure, Transport, Cities and Regional Development ("DITCRD" or "Department") for the allocation of \$50m of discretionary funds, and should not be used or relied upon for any other purpose. As set out in the engagement agreement, it should not be quoted, referred to or shown to any other parties, unless so required by court order or a regulatory authority, without our prior consent in writing which will not be unreasonably withheld.

The scope and nature of our work, including the basis and limitations, are detailed in the engagement agreement which was signed on 10 December 2019, with our field work commencing on 29 November 2019 and our final report being completed on 13 January 2020. Therefore, our report does not take account of events or circumstances arising after that date.

The nature and content of this report is reflective of the specific scope of our engagement, the amount and accuracy of information provided to us and the timescale within which the report was prepared. Our report to you is based on inquiries of and discussions with management and a review of documentation made available to us. We have not sought to verify the accuracy of the underlying data or the information and explanations provided to us by the Department and other parties involved. This engagement did not involve a formal reliance based due diligence exercise on the financial information provided.

Our work did not constitute an audit or review in accordance with Australian Auditing Standards and, consequently, no assurance or audit opinion is expressed. Our services are performed and our report is prepared for the Department of Infrastructure, Transport, Cities and Regional Development only, and we disclaim all liability to any other party in connection with the Services and/or our report.

It has been a pleasure working with you on this strategic initiative.

Yours sincerely

**Darren Chua**

EY Partner

# Executive summary

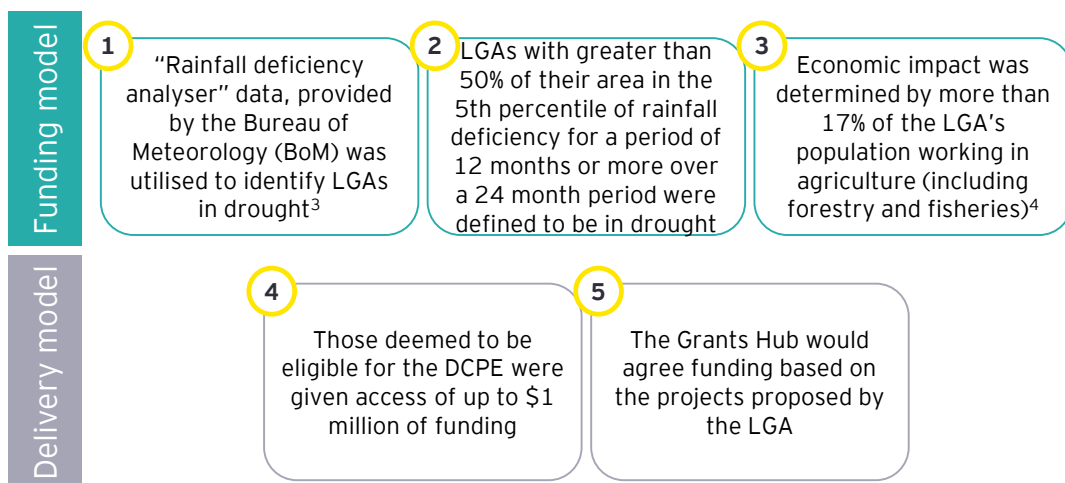
- ▶ Drought continues to be an enduring part of the Australian landscape with States and Territories around the country continuing to declare drought and request support, including from the Commonwealth Government
- ▶ On the 14<sup>th</sup> of November 2019 EY commenced a review of the Drought Communities Programme Extension (DCPE). The findings of this review indicated that the programme had many strengths including providing much needed rapid economic stimulus for communities affected by drought. The review also found a number of areas for improvement. Our recommendations included developing an interim funding model along with a broader refresh of the programme. These are detailed in our report titled *“How can the DCPE be designed to rapidly respond to the effects of drought through economic stimulus?”* from the 9<sup>th</sup> of January 2020
- ▶ This paper outlines the interim funding methodology, which has been developed to enable further immediate funding to be made available to Local Government Areas (LGAs) which are being economically impacted by drought. This recognises that a broader refresh of the program takes longer to complete
- ▶ To enable rapid stimulus, two options of interim funding methodology have been considered. One being simplified while the other is enhanced
- ▶ The simplified interim methodology:
  - ▶ Targets LGAs that have not received drought assistance funding under the DCPE
  - ▶ Uses a single time period of consecutive rainfall deficiency and uses a more widely used rainfall deficiency indicator
  - ▶ Expands and adjusts data sets to include downstream agricultural employment and focuses on hours worked in overall employment in the LGA
  - ▶ Uses a two tier system of funding to ensure adequate funding is supplied to LGAs based on size (as measured using population)
- ▶ The enhanced methodology:
  - ▶ Targets LGAs that have not received drought assistance funding under the DCPE
  - ▶ Multiple time periods are used and weighted to review rainfall deficiency, using a more widely used rainfall deficiency indicator
  - ▶ Increases the data sets used to include the absolute employment numbers in agricultural and downstream industries, weighted against the figures as a percentage of overall employment in the LGA. This is measured using hours worked in overall employment in the LGA
  - ▶ Allocates funding based on a matrix assessment of need, along with a three tiered assessment of funding using LGA size (as measured using population)
- ▶ While this interim methodology has been developed to improve the identification of drought conditions and the wider economic exposure to those conditions, it is limited to internal analysis performed by EY. It could be further developed and refined through consultation with relevant Government agencies and impacted regions. These limitations should be addressed in the broader programme refresh



# The purpose of this engagement is to recommend interim adjustments to the current DCPE as a solution for allocating grants to drought-affected communities

- ▶ Drought continues to be an enduring part of the Australian landscape with States and Territories continuing to declare drought and request support, including from the Commonwealth Government
- ▶ With 100% of NSW declared to be in drought or drought-affected<sup>1</sup>, and another 67.4% of QLD being declared to be in drought on the 1<sup>st</sup> of December 2019<sup>2</sup>, it is clear that economies impacted by the drought are still in need of rapid stimulus activity
- ▶ Recently, the Department engaged EY to perform a review of the DCPE
- ▶ The review titled *“How can the DCPE be designed to rapidly respond to the effects of drought through economic stimulus?”*, identified that the current DCPE had many strengths including providing much needed rapid economic stimulus for communities affected by drought. However, there has been several opportunities for improvement identified
- ▶ The purpose of this programme remains to provide rapid economic stimulus to communities that are impacted by drought. As identified in our previous report, a range of other programs are targeting other stakeholders (such as farmers) that are also impacted by drought
- ▶ While the Government considers the review and any subsequent actions, this interim funding methodology has been developed to inform the allocation of further immediate funding to LGAs which are being impacted by drought. The focus of this interim model is on the funding model as shown in Figure 3, with the delivery model to remain unchanged
- ▶ The interim funding model was developed in a three-week period in close liaison with the Department
- ▶ This report provides an overview of the interim methodology developed

**Figure 3: Previous DCPE methodology**



<sup>1</sup>NSW Department of Primary Industries, 2019

<sup>2</sup>Queensland Government, 2019

<sup>3</sup>This data set is no longer produced by the BoM

<sup>4</sup>This figure is based on absolute headcount in the region and not FTE, using place of residence data from the 2016 census

# Simplified interim methodology



# The simplified interim funding model involves three stages to identify funding for eligible communities

1

## Evaluate the severity of drought for each LGA using 24 month rainfall deficiency data

- ▶ Rainfall deficiency over 24 consecutive months is used as the primary indicator of drought
- ▶ This is measured using % of the LGA which has been rainfall deficient in the 5<sup>th</sup> percentile
- ▶ A 5<sup>th</sup> percentile rainfall deficiency indicates the lowest 5% of rainfall in the LGA since 1900
- ▶ LGAs with more than 50% of the area in the 5<sup>th</sup> percentile are deemed to be eligible for step 2
- ▶ Data is obtained from the Bureau of Meteorology and is current up until the 30<sup>th</sup> of November 2019

2

## Evaluate the exposure to economic impact as a result of drought by analysing employment data for each LGA

- ▶ Economic exposure is determined by reviewing the agricultural (excluding forestry and fisheries) and related downstream employment<sup>1</sup> in the LGA
- ▶ The employment figures are measured as the % of hours worked as a proportion of overall employment in the LGA, by place of residence
- ▶ The agricultural and downstream employment percentages are added together to give an overall economic exposure percentage
- ▶ LGAs that meet step 1 are then ranked by the economic exposure percentage
- ▶ Data is obtained from the 2016 Census and is measured according to the number of full time equivalent workers (FTE) who reside in the LGA

3

## Funding amount is scaled based on LGA population

- ▶ LGAs are ranked by economic exposure percentage
- ▶ Those with Modified Monash Model (MMM) ratings of 1 are removed as these areas are considered metropolitan and generally have less exposure to the economic impacts of drought. MMM 2's (inner regional) may be considered subject to ministerial judgement
- ▶ LGAs with a population above 1,000 are allocated \$1m
- ▶ LGAs with a population below 1,000 are allocated \$500k
- ▶ LGAs that have previously received funding are removed, as they have recently been funded and are working on DCPE projects
- ▶ Final funding decisions are made by the Minister for Water Resources, Drought, Rural Finance, Natural Disaster and Emergency Management

<sup>1</sup>Downstream employment sectors are described in step 2 of the enhanced interim methodology



# Enhanced interim methodology



# The enhanced interim funding model involves four stages to identify funding for eligible communities

1

## Evaluate the severity of drought for each LGA using a 'drought index'

- ▶ Rainfall deficiency is used as the primary indicator of drought. This is measured using % of the LGA which has been rainfall deficient
- ▶ A drought index (between 0 and 1), is determined using the 5<sup>th</sup> percentile rainfall deficiency which indicates the lowest 5% of rainfall since 1900, using four time periods
- ▶ Longer time periods (e.g. 48 months) are more heavily weighted
- ▶ An index of 0 indicates that a LGA has no measured average rainfall deficiency in the 5<sup>th</sup> percentile
- ▶ An index of 1 indicates that 100% of the LGA is in the 5<sup>th</sup> percentile of deficiency

2

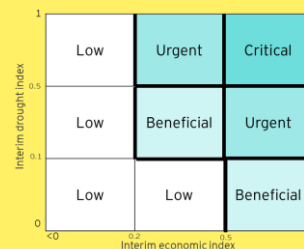
## Evaluate the exposure to economic impact as a result of drought using an 'economic index'

- ▶ A factor model is used to assess exposure to economic impact as a result of drought, and allocate it into an interim economic index (between 0 and 1)
- ▶ Factors used to determine the index include employment in the agriculture sector (excluding forestry and fisheries) and downstream processing (relative and absolute measures)
- ▶ An index of 0 indicates that the LGA is less likely to be economically impacted
- ▶ An index of 1 indicates that the LGA is likely to be significantly economically impacted

3

## Combine indices to obtain an overall categorisation of funding need

- ▶ Funding need is identified using the drought and economic indices
- ▶ Locations which have:
  - ▶ Large and diverse economies such as Metropolitan areas, are removed using the MMM. These areas generally have less exposure to the economic impacts of drought
  - ▶ Previously received funding are also removed, as they are working on DCPE projects already



4

## Funding amount is scaled based on need and LGA population

- ▶ Funding is allocated based on the level of need and population of the LGA

Level	Population	Funding Allocation
Critical	>15 000	\$1 million
Critical	<15 000	\$750K
Urgent	>5000	\$750K
Critical	<5000	\$500k
Urgent	<5000	\$500k
Beneficial	>0	\$500k

- ▶ Final funding decisions are made by the Minister for Water Resources, Drought, Rural Finance, Natural Disaster and Emergency Management



# Evaluating the severity of drought for each LGA is based primarily on rainfall deficiency

1

## Historical rainfall deficiency is assessed

The % of the LGA in the 5<sup>th</sup> percentile is measured using 18, 24, 36 and 48 month periods

- ▶ The BoM designates rainfall totals significantly lower than the average (over the record from 1900) for a given period at a given location as a rainfall deficiency. A percentile is a value where a certain percentage of observations fall below that value. Therefore, the 5<sup>th</sup> percentile is defined as the lowest 5% of rainfall totals since circa 1900 for a particular location (e.g. LGA) over a particular time period (e.g. 24 months)
- ▶ 5<sup>th</sup> percentile data is used. This therefore captures the LGAs suffering the most extreme rainfall deficiency relative to other percentiles for each respective period
- ▶ A prolonged duration of rainfall deficiency is best measured by longer time periods. We have therefore selected 48, 36, 24 and 18 month periods to indicate drought
- ▶ As 12 months is not a clear indicator of a prolonged deficiency, we have used 18 months as the minimum period duration
- ▶ In order to capture the regions experiencing drought for a significant period of time, whilst still being in immediate need, we have selected periods from 18 to 48 months

## Weighting is applied for each time period

The rainfall deficiency data for the 48, 36, 24 and 18 month periods is weighted respectively at 35%, 25%, 20% and 20%

- ▶ In line with the prolonged duration of drought, longer time periods are weighted more heavily than that of the shorter time periods
- ▶ As such, regions experiencing drought for a significant period of time are identified as being in greater need than that of regions only recently suffering from drought
- ▶ 5<sup>th</sup> percentile data is extracted for each of the identified time periods (48, 36, 24 and 18 months)

## Sum the weighted data to obtain the interim drought index

- ▶ The total interim drought index is calculated by summing the weighted rainfall deficiency percentage
- ▶ The index ranges between 0 and 1
- ▶ An index of 0 indicates that a LGA has no measured average rainfall deficiency at the 5<sup>th</sup> percentile
- ▶ An index of 1 indicates that 100% of the LGA is in the 5<sup>th</sup> percentile of deficiency over each time period

## Rank the LGAs by the interim drought index

- ▶ All LGAs in Australia are ranked

# Evaluating the exposure to economic impact as a result of drought has been expanded to provide a more robust data set

2

## The relative factor of regional economic impacts is analysed

- ▶ Historical proportion of direct employment in the agriculture sector
- ▶ Historical proportion of indirect employment in the downstream processing sector

- ▶ This factor is analysed to estimate the direct impact the drought has on the agriculture sector
- ▶ It indicates the relative size or % of the employment in the LGA that is in the agriculture sector as defined by the 1-digit ANZSIC category, excluding employment in the forestry and fisheries sectors
- ▶ The 2018 LGA boundary changes are incorporated into the data used
- ▶ Estimations of the indirect impact the drought has on downstream sectors has been assessed
- ▶ This factor indicates the relative size or % of the employment in the LGA that is in the downstream sectors including, Meat and Meat Product Manufacturing, Dairy Product Manufacturing, Fruit and Vegetable Processing, Oil and Fat Manufacturing, Grain Mill and Cereal Product Manufacturing, Bakery Product Manufacturing, Sugar and; Beverage and Confectionery Manufacturing and Other Food Product Manufacturing
- ▶ The data used for this analysis is employment by hours worked from the 2016 ABS Census, converted into FTE workers

## Absolute factors of regional economic impacts are analysed

- ▶ Historical total direct and indirect employment

- ▶ This factor is designed to capture the absolute size of the direct and indirect employment in the LGA
- ▶ The data used for this analysis is employment by hours worked from the 2016 ABS Census, converted into FTE workers
- ▶ This is used to ensure that LGAs with large populations who are affected are weighted appropriately

## Weighting is applied for each factor

- ▶ Applicable weightings are applied for each economic factor:
  - ▶ 40% direct employment
  - ▶ 35% indirect employment
  - ▶ 25% absolute direct and indirect employment

## Sum the weighted data to derive the interim economic index

- ▶ The total interim economic index is calculated by summing the weighted economic factor percentages
- ▶ The index ranges between 0 and 1
- ▶ An index of 0 indicates that the LGA is less likely to be economically impacted
- ▶ An index of 1 indicates that the LGA is likely to be significantly economically impacted

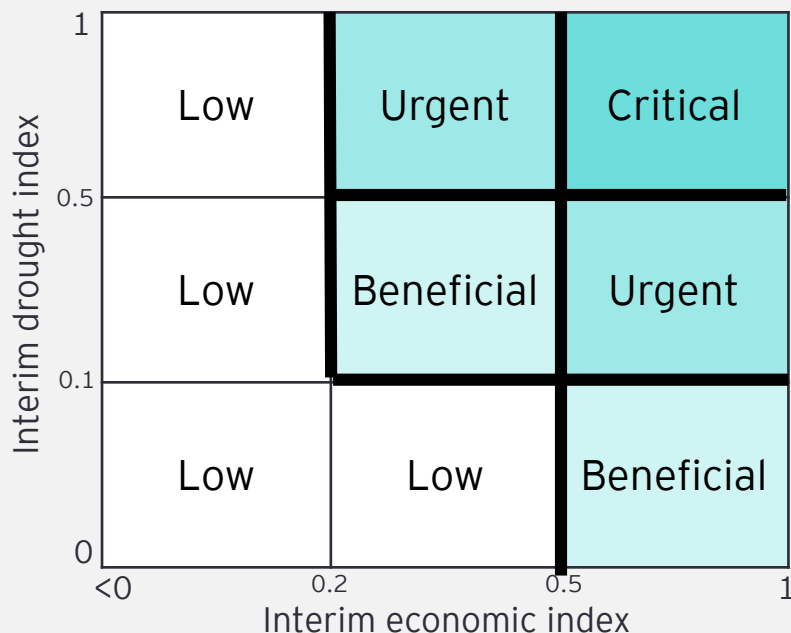
## Rank the LGAs by interim economic index

- ▶ All councils in Australia are ranked

# Funding is allocated according to the assessed level of funding need and the size of the LGA

## Assessed level of funding need

- ▶ LGAs are allocated into defined levels of need based on their interim drought and economic indices
- ▶ Each level determines the maximum funding that can be received by each LGA
- ▶ The eligibility calculation therefore weights drought and economics together. This ensures the key purpose of the DCPE is being met, assisting communities that are economically impacted by the effects of drought
- ▶ Thresholds have been determined based on their correlation to the purpose of the DCPE
- ▶ LGAs that have a MMM score of 1 or 2 do not meet eligibility criteria and are removed. Unincorporated areas should be separately listed for consideration by the Minister



3

## LGA size

- ▶ Allocation of funding is then apportioned based on the size of the LGA, measured in terms of set population thresholds
- ▶ This is intended to provide an appropriate level of funding to LGAs with an assessed funding need, with the size of the community being considered

Level	Population	Funding Allocation
Critical	>15 000	\$1 million
Critical	<15 000	\$750K
Urgent	>5000	\$750K
Critical	<5000	\$500k
Urgent	<5000	\$500k
Beneficial	>0	\$500k
Low	>0	Not Eligible

4

## Ranking within levels

- ▶ LGAs within each level are ranked using the interim economic index. This is because the purpose of the DCPE is to assist communities economically affected by drought



# We applied key findings from our review of the existing DCPE programme, applying thresholds for more flexible decision-making

- ▶ The review of the current DCPE indicated that metrics were used too rigidly to account for the complex nature of communities economically impacted by drought. This resulted in some LGAs not being considered for the DCPE despite potentially being in need
- ▶ In response to this limitation, thresholds have been applied across the interim model, enabling increased flexibility for both the eligibility of LGAs for the DCPE and the amount of funding which is provided
- ▶ Eligibility of LGAs and funding provided within the thresholds is at the discretion of the Minister

Metric	Threshold	Rationale
Drought index	10%	<ul style="list-style-type: none"> <li>▶ When categorising LGAs to levels of assessed need based on the process outlined on page 8, the following thresholds are applied to the drought and economic index factors respectively: <ul style="list-style-type: none"> <li>▶ Drought Index threshold: 0.1, 0.5</li> <li>▶ Economic Index threshold: 0.2, 0.5</li> </ul> </li> </ul>
Economic index	10%	<ul style="list-style-type: none"> <li>▶ By applying a discretionary threshold, LGAs with drought or economic indexes within 10% of these thresholds may be considered eligible to ensure LGAs do not miss out based on marginal factors</li> </ul>
Population	10%	<ul style="list-style-type: none"> <li>▶ The 10% threshold applied to the population thresholds impacts the scalability of funding</li> <li>▶ The maximum funding available to LGAs is determined by their assessed level of need, scaled by population</li> <li>▶ Therefore, by applying a 10% variance to this factor, LGAs with populations within the applicable ranges may be eligible for increased funding</li> </ul>
Modified Monash Model	Change rating 2 to be eligible	<ul style="list-style-type: none"> <li>▶ To ensure that funding is allocated to regional LGAs experiencing drought and the associated economic impacts on drought, funding to LGAs with Modified Monash Model (MMM) ratings of 1 or 2 are excluded</li> <li>▶ Ministerial judgment may be applied to consider any LGAs with MMM ratings of 2, making these LGAs eligible for funding allocation where they meet the drought and economic index factors</li> </ul>
Short-term deficiency and actual rainfall consideration	6 months	<ul style="list-style-type: none"> <li>▶ The following rainfall data can also be considered: <ul style="list-style-type: none"> <li>▶ 6 month rainfall deficiency in the 10<sup>th</sup> percentile</li> <li>▶ 6 month actual rainfall (absolute measure)</li> </ul> </li> <li>▶ Although this data is not an input within the model itself, the inclusion of this data as a consideration for the application of Ministerial judgment could ensure that LGAs impacted by drought, with the greatest assessed need, receive funding by identifying LGAs that may have received significant rainfall in the last 6 months</li> </ul>

# The interim methodology has several key limitations - these should be considered in the programme refresh

<p><b>Previously funded LGAs are excluded</b></p>	<ul style="list-style-type: none"> <li>▶ LGAs that have previously received funding under the DCPE are not considered for the interim methodology as they recently received funding and are working on DCPE projects. While many LGAs may have sufficient funding, and some may have limited capacity for further immediate stimulus, some may warrant additional funds. This has not been investigated as part of this engagement</li> </ul>
<p><b>Time limitation on interim method development</b></p>	<ul style="list-style-type: none"> <li>▶ The current effects of drought require a rapid allocation of funds to enable economic stimulus. This has impacted the ability to investigate all data options to include in the methodology. It could be further developed and refined through consultation with relevant government agencies and impacted regions</li> </ul>
<p><b>LGA and other stakeholder engagement</b></p>	<ul style="list-style-type: none"> <li>▶ No LGA engagement activity has been conducted beyond the Department providing insight on their experiences. This is due to time constraints and the nature of developing this methodology as an interim approach for DCPE</li> </ul>
<p><b>Eligibility and capped funding allocation is the focus of this engagement</b></p>	<ul style="list-style-type: none"> <li>▶ The methodology developed covers the identification of LGAs available for funding only, it does not include changes to the mode of delivery</li> <li>▶ As there is no universal definition of drought, Federal and State declarations of drought-affected areas may vary and therefore, may not be accurately identified</li> <li>▶ The amount of funding able to be allocated is capped at the current \$50 million of DCPE funds available</li> <li>▶ Thresholds applied may need to be re-configured for subsequent iterations of this interim model</li> </ul>
<p><b>Data from external sources is relied upon</b></p>	<p>Data relied on is provided by<sup>1</sup>:</p> <ul style="list-style-type: none"> <li>▶ The Department of Health</li> <li>▶ The Bureau of Meteorology (BoM)</li> <li>▶ The Australian Bureau of Statistics (ABS)</li> </ul>
<p><b>Data analysis limitations</b></p>	<ul style="list-style-type: none"> <li>▶ By utilising only historical rainfall data, forecasted rainfall is not considered and therefore any fluctuations in future rainfall patterns are not accounted for</li> <li>▶ As rainfall deficiency data is derived on an individual LGA basis, relative to that LGA's historical rainfall deficiency, prolonged drought may not be identified</li> <li>▶ Census data used to determine the economic impacts of drought is dated 2016 and therefore may not be an accurate reflection of the current economic climate. Additionally, the nature of data collection for transient workforces in the Census notes their place of residence and their location on the day of the Census</li> <li>▶ The model focuses on the impacts of drought on an LGA boundary basis, therefore, cross-LGA downstream impacts may not be identified (for example, an LGA not in drought but being impacted as a result of downstream processing activity)</li> <li>▶ The determination of a "drought-affected area" is based on rainfall deficiency in the 5<sup>th</sup> percentile. It does not include other environmental factors such as soil moisture, temperature and whether the rainfall detected was during a beneficial period. The implications of onset desertification have not been considered and individual local conditions are not reflected</li> </ul>

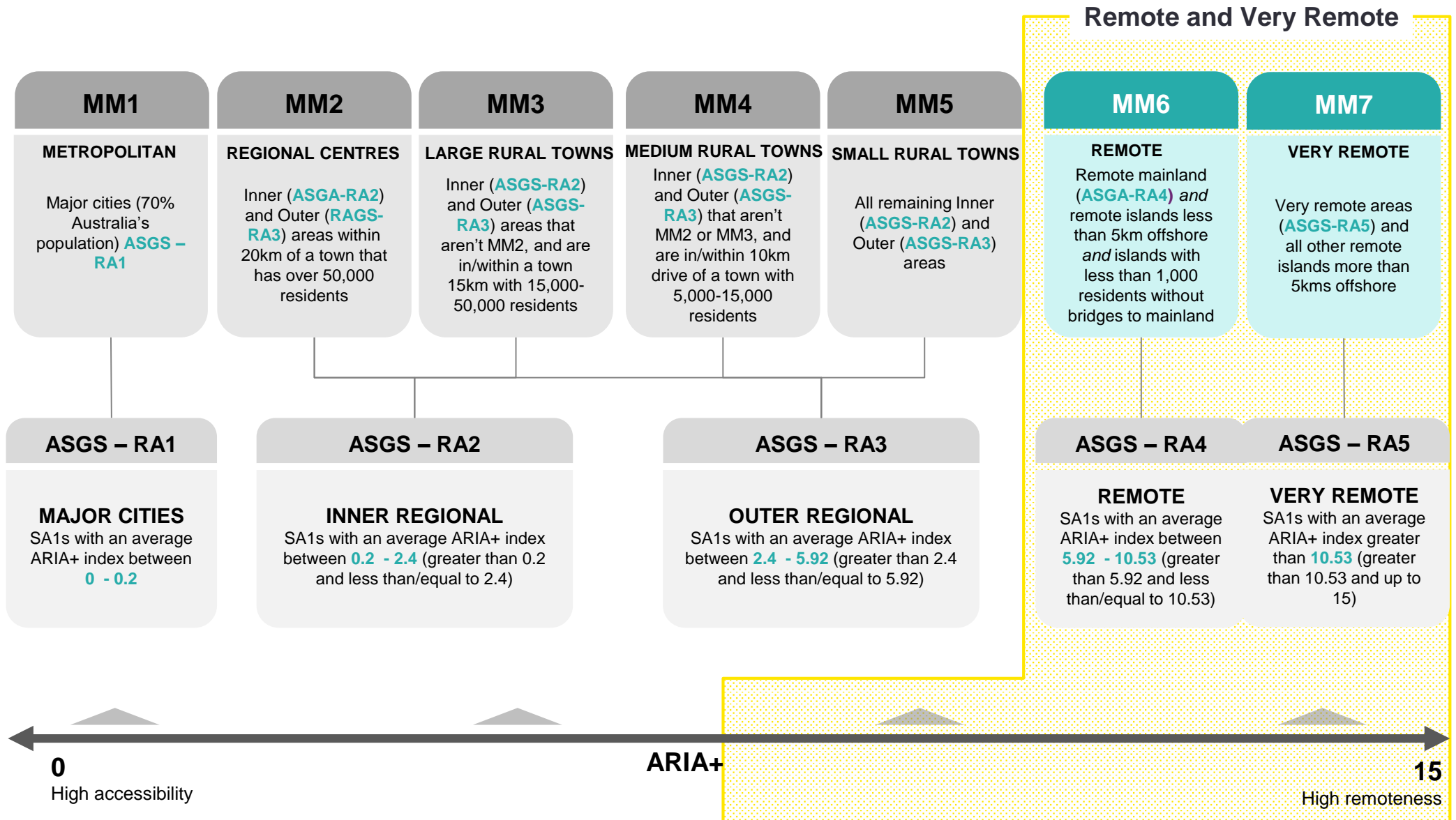
<sup>1</sup>See Appendix 2 for more detail

# Appendices





# Appendix 1: The Modified Monash Model is being used to determine if LGAs are in metropolitan areas



## Appendix 2: Data sources used

Data Point	Source
Historical Rainfall Deficiency	Bureau of Meteorology - Rainfall Deficiency Data current to November 30 2019
Direct employment	Australian Bureau of Statistics Census (2016)
Indirect employment	Australian Bureau of Statistics Census (2016)
Population	ABS.Stat Estimated Resident Population by LGA (ASGS 2018), 2001 to 2018
Local Government Regions	ABS cat. no. 1270.0.55.003 - Australian Statistical Geography Standard (ASGS): Volume 3 - Non ABS Structures, July 2018
Modified Monash Model	Australian Government Department of Health

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ED None

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