

**LCLGA Leadership Program**

.....  
*Community Action Project*  
.....

**Future Land and Water  
Use in the  
Limestone Coast**



the  
**LIMESTONE  
COAST**

unearth our treasures

**LIMESTONE COAST  
LEADERSHIP PROGRAM**

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## Acknowledge of Country

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We recognise and acknowledge the land on which we created and executed the CAP Projects. We acknowledge the Boandik, Bindjali and Ngarrindjeri Peoples as the Traditional Owners of the land on which we met, and recognise the deep feelings of attachment, our Aboriginal and Torres Strait Peoples have with this land. We wish to pay our respects to Elders past, present, and emerging, and we extend that respect to any First Nations People who were a part of our research.

# Executive Summary

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## **Background**

As part of the third **Limestone Coast Local Government Association; Leadership Program** installment, participants were strategically separated into teams to complete 'Community Action Projects' (CAP's). The participants ideally do not work, study, or have involvement in the topic areas they're allocated into as to avoid conflict of interests, as well as provide local leaders a glimpse into an issue they may be very unaware and uneducated on. As the **LCLGA Leadership Program** is designed to be a collaboration between the Limestone Coast's Councils and various predominant (mostly local) local stakeholders, CAP topics are often chosen or inspired by issues that they have identified. This team was presented with the topic of 'future land and water use of the Limestone Coast', how to best sustain these resources.

The purpose of CAP's is to apply the elements of adaptive leadership learnt throughout the duration of our course, and potentially make social impact along the way, or inspire participants to continue with further community involvement.

The Limestone Coast Region is known for its abundant water resources, fertile soils, and highly productive agricultural land. Our region is often called "God's Own Country". Following allocation, this Community Action Team was presented with the following information:

## **Overview**

Our natural landscape is made up of our soils, water (surface & groundwater), native plants & animals, wetlands & coastline habitats. The management of our natural landscapes is predominantly done by those actively managing land, water, our national parks and reserves (primary producers, government, commercial, and Industrial property owners). Resources such as water are limited, and sustainable use is regulated through policy. In the Limestone Coast, water resources are used by the environment, industrial businesses, primary production, forestry plantations and town water supplies. The Limestone Coast also has an extensive drainage network enabling the productive use of the lower lying land, and opening up areas for residential use without flooding.

## **Possible questions to consider:**

Given the growing global demand for food and fibre production, and increasingly unpredictable climate, and the need to sustain water resources for the environment, commercial users, and future generations; **what should land use in the Limestone Coast look like going forward to ensure we maximise the sustainable use of our water resources?** How does the community have a conversation and identify solutions if this involves change and potential impact on the region's economy and businesses, its people, and the environment?

# Executive Summary

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## ***While interpreting this information, the questions that came up included:***

- Should we focus our research on one region area for our research?
  - Potentially Blue Lake Catchment Area
- Should we ignore our ocean resources in our research?

## ***Decisions made:***

- After trying to limit the research to one region area, it was found that the Limestone Coast region had many similarities and shared eco-systems that it was opened back out again
- It was decided to exclude ocean resources in researching

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## ***The CAP Team***

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### ***Aaron Izzard-***

Whilst Aaron has worked in the environmental sustainability field for over fifteen years, he hasn't worked on many land use and water projects. He has thoroughly enjoyed the opportunity to delve deeper into land and water use on the Limestone Coast. He has particularly enjoyed discussing the topic with a wide range of people directly involved in this important issue. He is inspired by those who want to leave their particular patch of ground in better condition than they inherited it.

### ***Naome Burdon-***

Currently experiencing a period of both personal and professional development and growth, Naome was born in the Limestone Coast, before completing her secondary and tertiary education in Adelaide. Returning to the country, Naome has acknowledged true passion for the beauty of the region, the natural landscapes and the diverse community. Enjoying the amazing LCLGA program has allowed for further self-development, recognizing a love for research.

### ***Tessa Deak-***

Passionate about making a difference for the lives of those living with disability, Tessa is educating the community through paid employment, volunteer roles, and sharing her lived experience. She loves the region she grew up in, and had very little knowledge on the intricacies of this problem before she joined this program. Tessa has loved this experience, and is glad to have learnt so much about a huge community issue.

# Snapshot of Land Use In the Limestone Coast

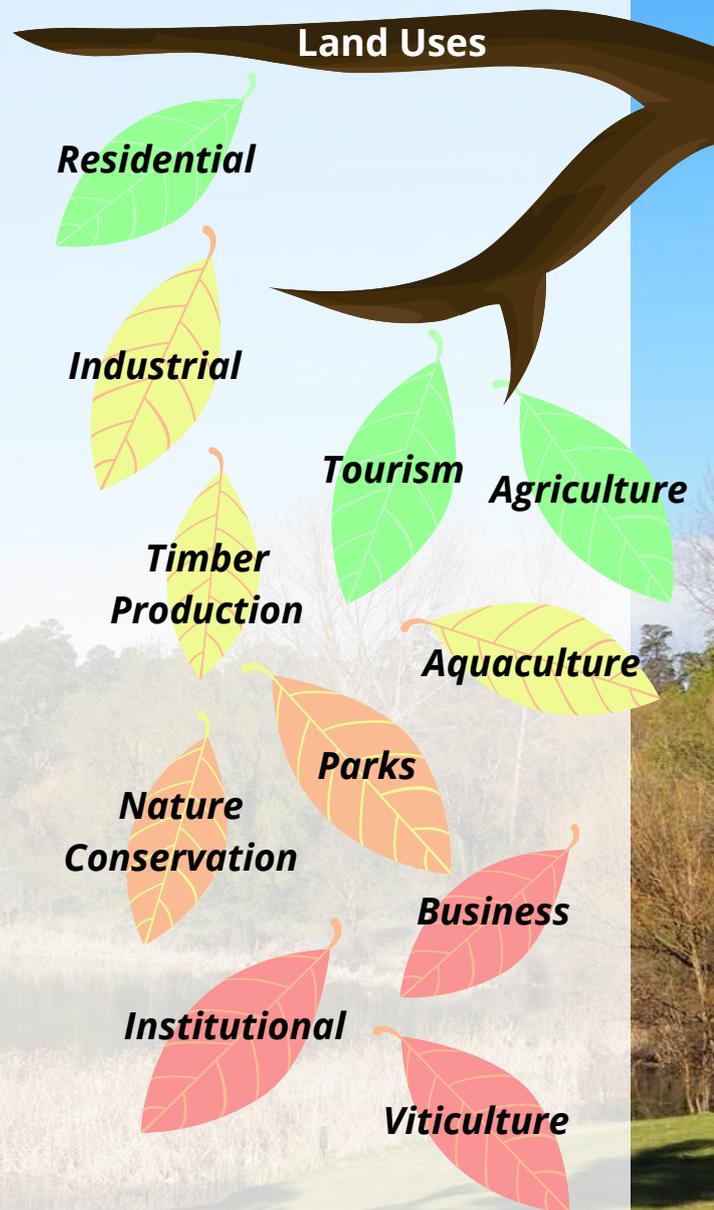
All uses for land were considered during this research, including all of the applicable industries, factions and stakeholders. There are many, and varied utilisations of land in the region. Agriculture in the area consists of farming including sheep, cattle, cropping, viticulture, goats, pigs, dairy and to a smaller extent; alpacas and camels. There are further primary industries inclusive of forestry; pine plantations and some planted gums. In fact, more Limestone Coast region residents worked in agriculture, forestry and fishing than any other industry in 2016.

In addition, land in the Limestone Coast is used for urban, commercial and residential developments.

This report has considered current, historical, and potential future land uses; particularly in regards to agriculture and primary production. The research has demonstrated that past decisions and actions will lead to necessary adaptations as we move forward (as a region). Most pertinent to the current and likely future land uses will be the land management practices that, whilst justifiable in their time, are now showing their damage.

A prime example of this has been the drainage system, created through the lower Limestone Coast, coastal areas; Beachport, Southend, Robe, Kingston and Millicent in the late 1800s.

The Limestone Coast is renowned for the drainage system that was created by the early settlers, opening up vast parcels of swamplands to become prime productive farming lands. In fact, this process has continued through the upper South East/Limestone Coast into the late 1990s.



# Snapshot of Land Use In the Limestone Coast

Today's researchers are well aware of the negative impact this drainage has now shown; the effects of salinity and the overall change to the ecology of these areas. The changes in the ecology means that the future use of this land needs to adapt, as the effective quality of the soils and the further available water supply continues to deplete.

The work of organisations like PIRSA and Landscape SA to manage the region's land and water resources are commendable. These organisations do a wide variety of work, including assisting primary producers to best manage their land and water. Existing control measures like the WAPs, land use zoning and native vegetation regulations mean people can be prosecuted for doing the wrong thing e.g. using more water than allocated, clearing native vegetation without permission etc. These measures assist in ensuring that these resources are used sustainably into the future.

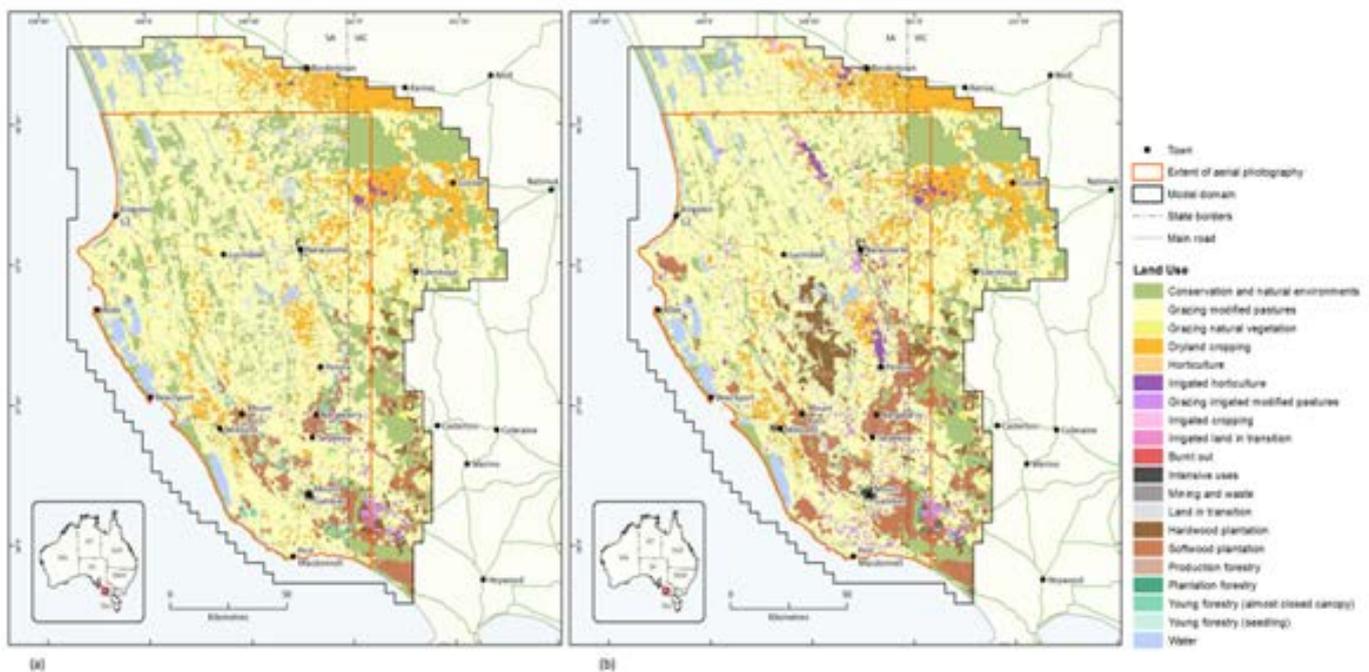


Figure 3.1 (a) 1969 land use map constructed by modifying the 2008 land use map based on aerial photograph interpretation. (b) 2008 land use map.

# Snapshot of Water Use In the Limestone Coast

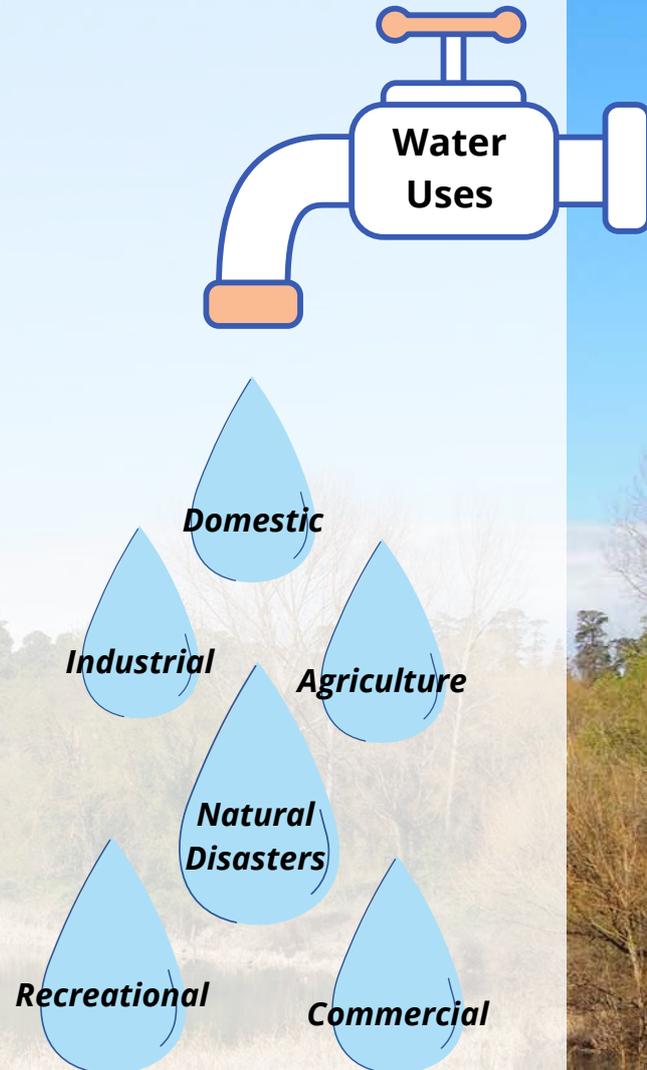
The predominant water resource in the region is groundwater, consisting of an unconfined aquifer, and a confined aquifer. The unconfined aquifer is managed through water allocation plans (WAPs). The confined aquifer is generally only used for town water supplies, with a few small exceptions.

Specific groundwater resources across the region vary widely in terms of quantity and quality. Some resources have not changed greatly in recent times, whilst others are experiencing a steady decline in water level. One example is the iconic Blue Lake in Mount Gambier. The Blue Lake aquifer has been experiencing an overall downward trend since 1910. Going down approximately 1m every ten years. Some localised groundwater resources are very clean, whilst others have water quality issues such as elevated nitrogen levels or salinity.

Extractions from groundwater resources in the Lower Limestone Coast PWA are used for a number of purposes, including town water supplies, irrigation, industrial purposes and stock and domestic supplies.

The focus of the report has been to consider the methods and amounts of extraction, of groundwater resources for each purpose and how this affects the ongoing availability of this resource; hence it's sustainability for the future. As one of the stakeholders, Troy Bell MP Member for Mount Gambier stated, 'Water has to be number one, and number two is the health of our soils'.

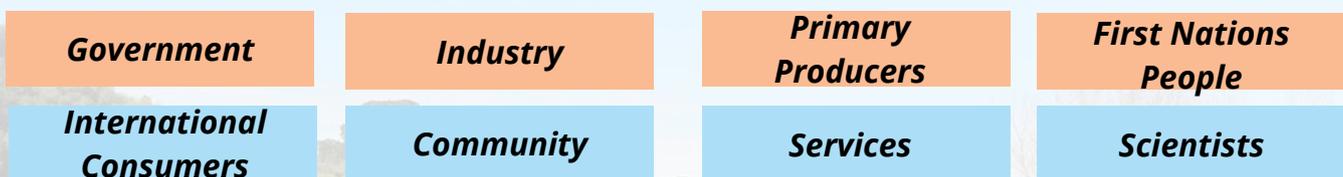
Furthermore, water has a value now and this value will only continue to grow. It is important that people understand the long term water resource and for them to be educated about the most appropriate, sustainable uses for the land that they are buying.



# Research and Methodology

The team began by doing general research into the sustainability movement, soil health, water issues, and drainage systems, as well as region-specific exploration. The team planned primarily the narrative inquiry and participatory action styles of research for the development of the project. The aim was to seek out the stories behind people's lives and to understand their interests behind this topic. The initial meeting set out to create the list of stakeholders and factions to determine who, what, where, and when to conduct further communication.

## Stakeholder Engagement & Findings



Initially, the above stakeholders were considered the main factions and stakeholders to approach in the way of:

- interviews
  - Face to face
  - Phone Call
  - Virtual (Zoom, Skype, Teams)
- Natural conversations (family, friends)
- Community forum/ World Café
  - Organised for the City Hall

Following review of the CAP information, a series of questions planned to pose to each stakeholder member to communicate with was devised.

**These questions include:**

1. What should land use in the Limestone Coast look like going forward?
2. What do you observe about land and water use now?
3. What issue is the most important?
4. How can the community contribute?
5. What are you currently doing to support land and water sustainability in the Limestone Coast?

The plan was to collect perspectives from all walks of life, as well as people who are heavily involved in this issue. A large focus was placed on the community forum as it would have been an opportunity to bring people together to begin a collaborative approach forward.

# Challenges

Over the duration of the **LCLGA Leadership Course**, there were a number of challenges faced by the CAP team. The benefit of greeting these challenges was the opportunity to apply the aspects of adaptive leadership to the project, to adapt and overcome.

## **Challenges**

### **One Man Down-**

Our CAP unfortunately lost a group member very early on in the process, making it the only group with less than four members.

### **Distance-**

Two of the CAP team members resided in the Mount Gambier District, while the other resided in Naracoorte. This meant that meeting in person was not an easy option and difficult to plan around other life and work commitments.

### **Complexity-**

The issue is a very complex one, with many stakeholders to consider, potential disastrous consequences, and very interdependent systems.

### **COVID 19**

The World Café was planned but unfortunately had to be cancelled due to lock down during the week of the event.

## **Adaptations**

The group divided the tasks, leaned into identified strengths, openly communicated, and used compassion to each other in sharing the workload. Regular meetings ensured the project stayed on track, with a common focus and goal.

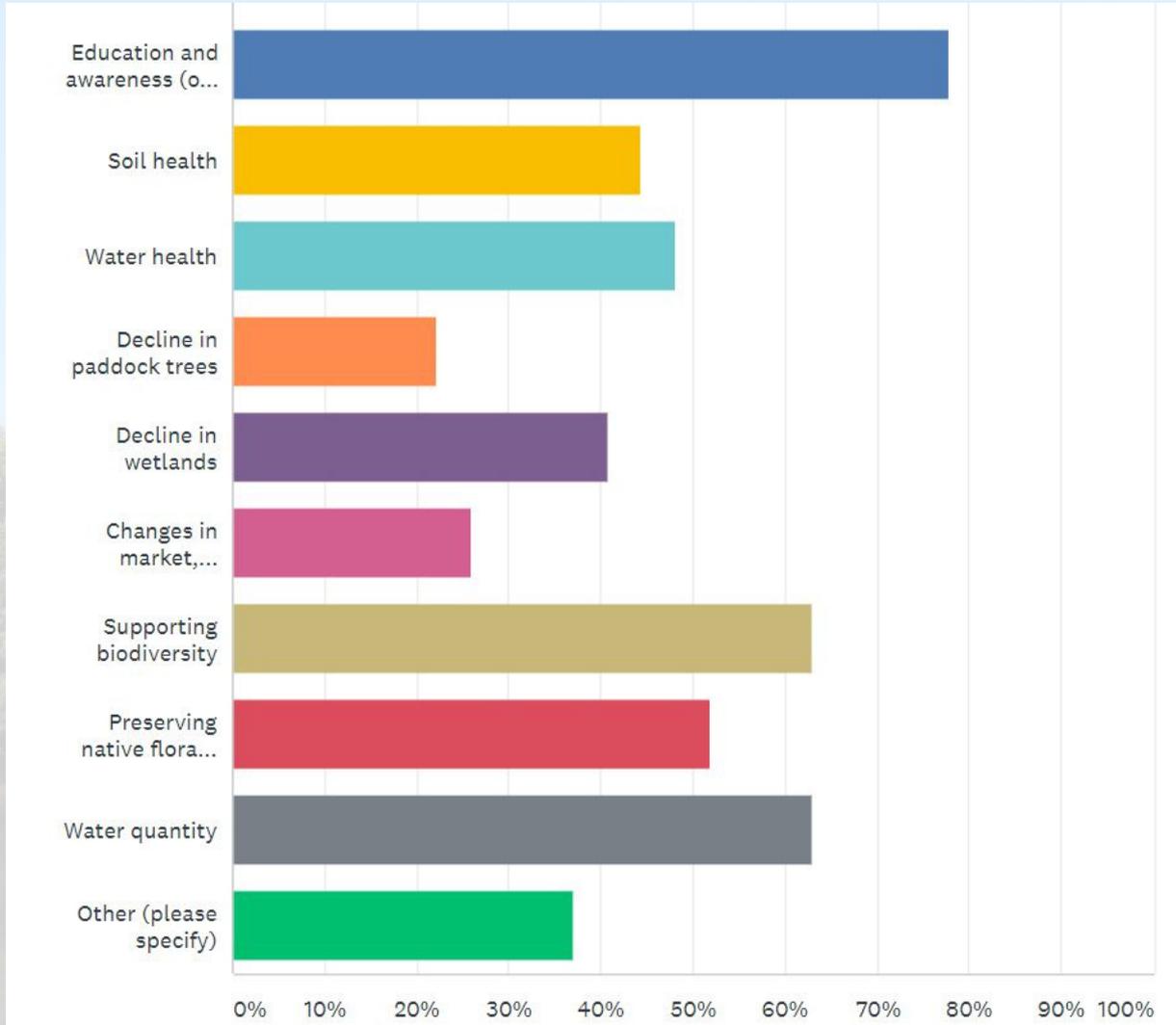
Instead of driving all over the countryside, current technologies such as Zoom meetings, regular communication through messenger and time allocated at our face to face monthly meetings were utilised.

By keeping the topic broad, looking for overarching problems and solutions, adaptive elements of recent learnings were able to be applied, by allowing the project to lead the team to the determinations.

In anticipation of COVID issues affecting the project, but also as part of the initial planning, an online survey was created. In response to the World Café having to be cancelled, a push was made towards collecting survey responses, especially from those who otherwise may have been missed.

# Complexity of Issues

As mentioned previously, the issue of land and water use is extremely complex and intrinsic and interdependent. One of the questions put into the survey read 'what issue do you believe is most important?' in regards to the sustainability of future land and water use. The graph below demonstrates the communities perspectives.



Education and awareness was highlighted as the most important issue, followed by supporting biodiversity and water quantity.

Most survey responses were qualitative in nature, therefore information learnt from those have been included in the findings are recommendations sections.

Survey participant age groups include:

ANSWER CHOICES	RESPONSES
Under 18	3.70%
18-24	0.00%
25-34	3.70%
35-44	29.63%
45-54	44.44%
55-64	3.70%
65+	14.81%

# Challenges

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The further complexity, as highlighted above, was the many varied opinions of our stakeholders, towards how, what, by whom, when and why changes should be implemented to best support the most sustainable use of our land and water resources.

The CAP team acknowledged and expected conflicting opinions in relation to the use of these resources from each stakeholder, against the responsibility and best managed practices for the resources.

A common example of the above statement relates to the forestry industry. They- the local forestry industry- are rumoured to have most dramatically impacted the level of the underground water aquifer. However, this same industry is funding research towards how best to support the sustainability of this water source and also making the results of this research publicly available.

Collectively, the CAP also made assumptions about the 'blame game' they expected to hear but were pleasantly surprised by the lack thereof.

# Land Use Findings

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It was clear through speaking to people from various industries that there is unlikely to be any significant changes in land use in the region in the foreseeable future. There may be some localised changes, such as an increase in cropping in the northern part of the region, especially winter broad acre cropping, but no regional changes.

It is interesting to note that there used to be more variation in the local horticulture industry in the region, including a bean processing plant. Horticulture is now much more limited to crops such as potatoes and onions, with a small number of fruit producing operations. Vegetable production in the region is very limited, despite having good soil, excellent water resources, and a good climate.

There may be an increase in 'regenerative farming' practitioners in the region. This style of farming seeks to actively manage the land to improve soil health for long term sustainability, and improving the land for future generations.

Although land use will not substantially change, it is likely that land ownership will. Land prices are at unprecedented highs, meaning that only those with significant financial means will be able to acquire land. In the words of one interviewee "The big will just get bigger". This includes an increase in foreign ownership of land. There may be some benefits to particular operations of increasing size, but the overall implications for the wider community and region should be carefully considered. Land prices are currently prohibitive to anyone who may want to get into farming and regenerating the land, as these operations tend to be small and medium sized family operations. There are no easy answers to this problem, but it is one that should not be ignored.

# Water Use Findings

The Limestone Coast region is very fortunate to have very robust water resources in its groundwater. The unconfined aquifer is currently fully allocated, so if a water user wishes to gain access to (more) water they must purchase it on the regional water licence market. This can work well for agriculture, where water is used and can be traded in real time. However, this approach presents issues for the forestry industry as trees can be in the ground for 30 years. The research currently being undertaken by Uni SA seeks to understand exactly how much water forestry trees use, and how. This should inform the next reviews of the relevant WAPs.

In terms of community involvement in decision making, Bordertown and Padthaway are good examples of community decision making. Farmers agreed on community reductions, to protect the freshwater lens. If the freshwater lens were to be used up then the groundwater resources would have to be desalinated. In that area both unconfined and confined aquifers are salty, indicating connectivity between the two. Another good example of collaboration is the Primary Producers Sustainable Water Group. This group meets regularly to inform future Lower Limestone Coast Water Allocation Plan reviews, and has representation from the forestry, dairy and potato industries.

Currently the confined aquifer is restricted for public water use (town water supplies), with a few small exceptions. The confined aquifer is a very large water resource, which could possibly be used for a wider variety of applications. The dynamics of the system, possible connections to the unconfined aquifer through fault lines etc., need to be well understood before this resource is opened up for wider use. It is also located much deeper in the ground, so would require more energy (and cost) to extract for use.

It is estimated that more than 110 gigalitres of fresh water runs to the sea via the drainage system every year. This volume may not just be surface water, but also include groundwater, as it is believed that some drains in the region have been dug too deep and may also be draining away groundwater. The possibility of redirecting this water back into the aquifer is worth investigating. It may be possible for industries like forestry to work with NGOs and government agencies to block drains, re-establish wetlands, and thus put water back into the aquifer. Obviously this would mean inundating land that does not currently get flooded. The overall impacts of potential flooding, especially on private land, would need to be thoroughly investigated before pursuing this option.

Water quality of groundwater needs to be carefully monitored. High nitrogen levels in groundwater can impact human health, but also animal health and irrigation. High input agriculture may see fertiliser levels in groundwater increase over time. Salt issues in the upper part of the region from historic land clearing are affecting the land and water. If the trend continues as is the groundwater will continue to get saltier. This severely limits what the water can be used for. It may be able to be used to grow lucerne, but if the value of that market drops it could make that crop unviable. Hydraulic fracturing (fracking) is also a risk to groundwater resources, as above all we need healthy groundwater.

# Recommendations

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Following research, the stance our community stakeholders have to this topic is encouraging. By no means, does that mean this topic becomes a technical challenge; easily solved. The issue of what land use in the Limestone Coast should look like going forward (to ensure we maximise the sustainable use of our water resources), clearly remains an adaptive challenge. However, the CAP team is optimistic with the current evidence of communication and collaboration between such a high number of stakeholders.

Though one interviewee warned that in trying to involve the community 'they don't care unless something catastrophic happens', the efforts that so many of the factions and stakeholders are making to ensure the most sustainable future exists for these integral resources has demonstrated the opposite.

From the youngest of school students, to the mature farmers, to keep doing their best to continue to improve and educate, to remain invested in maintaining the sustainability with our water and land use looks to be the best way forward.

Education is happening to inform the next generation of what has been learnt from past mistakes. Improvement could be made, however, on this modality by implementing more into the curriculum of secondary schools.

Farmers are carrying out regenerative agriculture, working to improve drainage and to gain more information as it becomes available from reliable sources such as PIRSA.

Community members are taking charge, in combination with cost saving measures of installing rain water tanks, composting, using worms to improve soil quality and even some regenerative agricultural examples in towns and city backyards.

The forestry industry, in collaboration with universities and research departments continue to carry out important studies so new, improved methods can be found.

Consumers are creating accountability to industries by choosing to spend their dollars on companies showing their transparency and supporting the community; not only in sporting scholarships and the like, but by supporting ethical and sustainable practices.

Superior departments in handling and the licencing of water have been created. Water resources are being managed now and into the future.

# Recommendations

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Overall, the Limestone Coast is in an enviable position in terms of its land and water resources. But like every area in life there are still potential improvements to be made. These may include:

- More promotion of sustainable land and water use in urban backyards. A significant proportion of the landscape levy revenue comes from residential property owners. Some of these funds could be invested back into urban areas. This could be undertaken by Landscapes SA, possibly in collaboration with local councils, LCLGA and other organisations.
- Education of consumers regarding local agriculture. When consumers know where their food comes from and how it is grown then they can make informed purchasing decisions. For example, regenerative farming leads to more nutritious food, higher quality of life for animals, improved soil health, puts carbon into the soil and are generally more family based farms.
- Connecting consumers to local farmers is also important. A directory of local farmers who sell their products locally would greatly assist this. This could take the form of a webpage on an existing website. It could be hosted by the LCLGA or Limestone Coast Food. It could list where farmers sell their produce locally, and also list information such as if the farmers practice regenerative agriculture or other sustainable practices.
- In association with the previous point, a Limestone Coast or Green Triangle food label or brand would assist in easily identifying food that is produced in the region.
- The Mount Gambier Farmers Market is a great connection between farmers and customers, but the current model is not attractive for many local farmers. It may benefit from partnering with other local markets, such as the Mount Gambier Library Market and/or Limestone Coast Food markets.
- Information that Landscapes SA provide regarding managing soils is good. However, it could be made more accessible and easy to understand. When creating the information it is important to put oneself in the shoes of someone who knows very little about the complexities of soil health. Information packs could also be sent to landholders every few years.

# Social Impact

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The main recommendation is to commit to continuous improvement and reflections.

**kaizen**

*/kai'zen/*

noun

- *a Japanese business philosophy of continuous improvement of working practices, personal efficiency, etc.*

The community needs to continue to collaborate, share research, share knowledge and be receptive to new ideas and methods.

Glimmers of hope through the implementation of new leadership methods are being seen. "Lead by example". From everyone doing their little bit, this can create a big change. From little things, big things grow- *Paul Kelly*

# References

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Ref. <https://profile.id.com.au/rda-limestone-coast/industries>

Ref. LOWER LIMESTONE COAST PWA (Prescribed Wells Area) GROUNDWATER LEVEL AND SALINITY STATUS REPORT 2009-10

[https://www.waterconnect.sa.gov.au/Content/Publications/DEW/Lower\\_Limestone\\_Coast\\_PWA\\_2009-10.pdf](https://www.waterconnect.sa.gov.au/Content/Publications/DEW/Lower_Limestone_Coast_PWA_2009-10.pdf)

Development of Preliminary 1969 and 1983 Land Use Maps for the South East of SA  
N Harrington, A Millington, M E Sodahlan and D Phillips Goyder Institute for Water  
Research Technical Report Series No. 15/16

[http://www.goyderinstitute.org/\\_r157/media/system/attrib/file/148/15-16\\_Historical\\_Land\\_Use\\_RAC\\_v3.pdf](http://www.goyderinstitute.org/_r157/media/system/attrib/file/148/15-16_Historical_Land_Use_RAC_v3.pdf)

# Appendices

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## ***And a big thank you to-***

**David Williamson**, *Team Leader Water Licensing – Limestone Coast, Department for Environment and Water*

**Dr Jim O’Hehir**, *General Manager Forest Research UniSA STEM*

**Jeff Lawson**, *Senior Research Engineer, UniSA STEM*

**Liam Brokensha**, *Regenerative Farmer, Splendid Egg*

**Liz McKinnon**, *Executive General Manager, Green Triangle Forest Industries Hub*

**Melissa Fraser**, *Senior Consultant Soils, Rural Solutions SA*

**Peta Crewe**, *PIRSA Regional Coordinator – Limestone Coast*

**Tracy Tzioutziouklaris**, *Manager – Development Services, City of Mount Gambier*

**Tom Linnell**, *Early Years to Year 12 Sustainability Coordinator- Tenison Woods College*

**Environmental Leaders-** *Tenison Woods College*

**Suzanne Harding**, *Teacher librarian- McDonald Park School*

**Katherine Bundy and Year 6/7 Environment Group-** *McDonald Park School*

**Landscape South Australia**

**Professor Lin Crase**, *Dean of Programs (Accounting & Finance) UniSA Business*

**Don Stolp**, *local Dairy farmer*

**Dr Kerry Degaris**, *Doctor of philosophy, viticulture and enology- viticulturist at Treasury Wine Estates*

**Troy Bell** *MP Member for Mount Gambier*

*Her Worship the Mayor of Mount Gambier, Mrs Lynette Martin OAM*

*His Worship the Mayor of District Council of Grant, Mr Richard Sage*

**Survey Completers-** *not named individually in order to maintain anonymity, though your contributions are highly appreciated!*

The CAP group would like to give a huge thank you to all of the people involved in making the Leadership Program happen, family and friends for believing and supporting in the team, program participants for being incredible to grow with, and everyone who contributed time and effort into this project; we are incredibly grateful!