Economic Bottom Line

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Economic Bottom Line

- Financial Capital – variety of income sources (production and service activities). It includes access to other financial sources that contribute to wealth (i.e. credit and savings)

- Physical capital – capital items, infrastructure and improvements in genetic resources (e.g. crops)

Agriculture – Broadacre Crops

- Reduced yields due to:
  - lower rainfall (20%⬇seasonal rainfall 30%⬇yields)
  - altered rainfall patterns (e.g. more summer rainfall = grain sprouting)
  - more intense rainfall may increase runoff and erosion
  - more frequent extreme heat events, temperature changes may alter growing seasons, increasing risks (e.g. earlier flowering inside frost risk window)
- Increased CO_2 could increase wheat growth rates and water use efficiency (but weeds & pests may benefit)

Agriculture – Livestock

- higher temperatures may affect comfort levels of dairy cows, reducing milk yields
- compromise the viability of passively ventilated or free range pig production, other intensive livestock e.g. poultry
- increase the risk of heat stress in cattle
- Also increase water and energy needs - where livestock are farmed in indoor climate controlled conditions
- changes to pest and disease incidence and animal health

Viticulture

- mean temperature change will affect phenology and ripening process: ripening is likely to happen earlier, at a warmer time of the year, leading to decreased grape quality
- changes in rainfall will influence the water balance, and have an impact on pests, diseases and quality
- changes to the quantity & quality of water available for irrigation
- rising temp increase water requirements e.g. water demand of vines in the Barossa increase by 4% per degree of warming = increase in irrigation demand for vines by 100ML by 2045

Viticulture continued

- changes to extreme low temperatures: possible reduction in frost risk in the long term but warmer conditions may bring budburst forward, which will increase frost risk
- Increasing CO2 will influence vine growth

Manufacturing

- in addition to winemaking, activities include other food products mfg such as meat and dairy
- main risks: decreased reliability of energy and water supplies
- flow on effects due to any negative impact on agriculture (e.g. wine, food processing)
- OH&S risks for workers in warm environments due to increases in temperature and heatwaves

Mining

- production may be disrupted by adverse weather events (more intense rainfall, heatwaves), decreased reliability of energy and water supplies
- warmer temperatures may have health and safety implications for workers, efficiency of equipment

Tourism

- visitation may decline in response to:

  - increased temperatures during summer periods

  - deterioration in landscape, native attractions and sustainability of wine industry due to reduced rainfall and hotter temperatures, reduced environmental flows

  - erosion of beaches

Other industries

- Retail trade, building and construction, business and personal services
- Impacts on key sectors of the regional economy that are vulnerable to climate change flow to other sectors
- Other indirect exposures (energy reliability, water availability, transport infrastructure)

Gaps – Financial Capital

- crops, pastures and viticulture: modelling of impact of future rainfall patterns, temperatures etc on yields
- viticulture: potential adaptation options sourced from local producers
- relationship between future climate patterns, water availability, impacts on production in primary industries and subsequent economic flow on effects (e.g. food processing)
- implications for energy availability; health and safety of workers in various industries

Roads and Rail

- higher temperatures increase risk of cracking and oxidisation of bitumen, and buckling of rail lines
- reductions in rainfall may reduce deterioration of road pavement, while more intense rainfalls can increase damage risk
- drier conditions may lead to degradation of unsealed road surfaces

Jetties, coastal infrastructure

- Rising sea levels and more frequent extreme sea level events would affect coastal infrastructure and increase interruptions to service
- Recreational jetties most at risk

Energy (electricity)

- vital for various production activities and human needs
- increasing temperatures and heat waves will increase peak energy demands, increasing the risk of supply interruptions
- higher temperatures decrease the efficiency of energy infrastructure
- Local Energy Security Study: region has a greater than average reliance on energy as an input, considered to be a “strategic vulnerability” in environment of rising energy costs

Telecommunications

- demand expected to grow strongly
- increased temperatures and extreme weather events (e.g. bushfires) could damage telecommunications infrastructure

Buildings

- Housing, schools, hospitals etc
- Rising sea levels – First Pass National Assessment: between 640 to 1,300 homes in Alexandrina LGA at risk of inundation from sea level rise of 1.1 metres
- Higher temperatures and more frequent heatwaves will increase energy demand, encourage energy efficient building design
- increased bush fire risk due to an increase in the frequency of hot days

Gaps – Physical Capital

- quantitative information on infrastructure at risk from bushfires, heatwaves – i.e. roads, number of buildings at risk
- implications of climate change on electricity networks and infrastructure i.e. impact of heatwaves on demand and supply, reliability of supply, infrastructure at risk from bushfires
- any roads and/or rail at risk from coastal inundation in the Alexandrina and Coorong regions (coastal dynamics at the Murray mouth)
- potential physical impacts on lower rainfall on water infrastructure (reduced soil moisture may increased ground movement and therefore degradation)