

# Resilience, Vulnerability and Adaptive Capacity of an Inland Rural Town Prone to Flooding: A Climate Change Adaptation Case Study of Charleville, Queensland, Australia

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## CONCLUSIONS

The Charleville community was found to be highly resilient with strong social networks and a strong sense of community responsibility for preparedness in terms of flood events. The main characteristics of vulnerability in terms of adaptive capacity related to the difficulty and cost involved in obtaining household and business insurance and the need to implement more river gauging stations and mitigation works to reduce flood risk. New insurance products could be designed to ensure affordable uptake of insurance, supported by evidence of improvements to flood mitigation works and river height monitoring. Respondents were heeding flood advice (eg., boiling water, checking electrical appliances etc) and are confident about levels of preparedness of various agencies.

## RESULTS

- Temporary levee built, some felt vulnerable, others more secure
- More than 60% lived in Charleville for over 10 years
- 68% residents, 57% businesses do not have flood insurance
- Most been in 1-3 floods, knew evacuation routes
- Think Council & other agencies very prepared: State Govt 78%, Utilities 59%, Welfare 56%, Local Hospital 49%, BoM 46%, Local Govt 30%
- Community believe they & Council responsible for flood prep
- Psychological impacts (and impacts still felt from 1990 flood)
- Difficulty keeping children out of flood waters
- Onlookers caused waters to wake
- Snakes problem in flood water, sandflies also a problem
- Waste, furniture & whitegoods discarded could be repaired
- Rumours in absence of accurate info
- Staff fatigue due to excessive overtime
- Strong social networks, 77% evacuated to family/friends
- High levels social capital, cohesion, sense of community
- Govt office closed 10 days so staff could help with sandbagging
- Low risk prisoners helped, and now seen as community asset
- Few would leave town or relocate within town if another flood

## RECOMMENDATIONS

- improve flood modelling, mapping, warning info and alerts
- address issues related to Bradley's Gully, erect evacuation signs
- more targeted evacuations, localise decision-making
- greater commitment from insurance industry
- more apprentice plumbers, more relief staff to help with overtime
- regular, continual messages in media, info in other languages
- warning document, what to do, who to call, whose role does what
- swift-water rescue training
- improve land management practices upstream

## INTRODUCTION

- Australia is experiencing climate change with higher temperatures and more frequent extremes, such as floods, heatwaves, bushfires, droughts (McAlpine et al. 2009)
- Warmer climate is key to increase risk of floods (IPCC 2007) increasing risk of more severe damage to people, property, animals and the environment
- Adaptation measures and strong social networks and levels of cooperation are needed



## Charleville, Queensland

- Inland rural town 756 km SW Brisbane covering 13,924 sq km
- Established 1871 popln 58, peaking at 5,154 in 1961
- Steady decline to 3,278 in 2006 (12.9% indigenous) (ABS 2006)
- Low unemployment rate 3.1% (ABS 2006)
- Climate -3 to 21°C winter; 27 to 46°C summer, avg rainfall 450mm
- Most of town on an extensive floodplain, next to Warrego River and Bradley's Gully flows through the town and large areas of residents and businesses highly vulnerable to flooding (Fig 1)
- Frequent floods (Fig 2) & no significant elevated areas to relocate to
- Feb 2008 the Bradley's Gully flood reached 3.1 metres (Figs 3, 4)

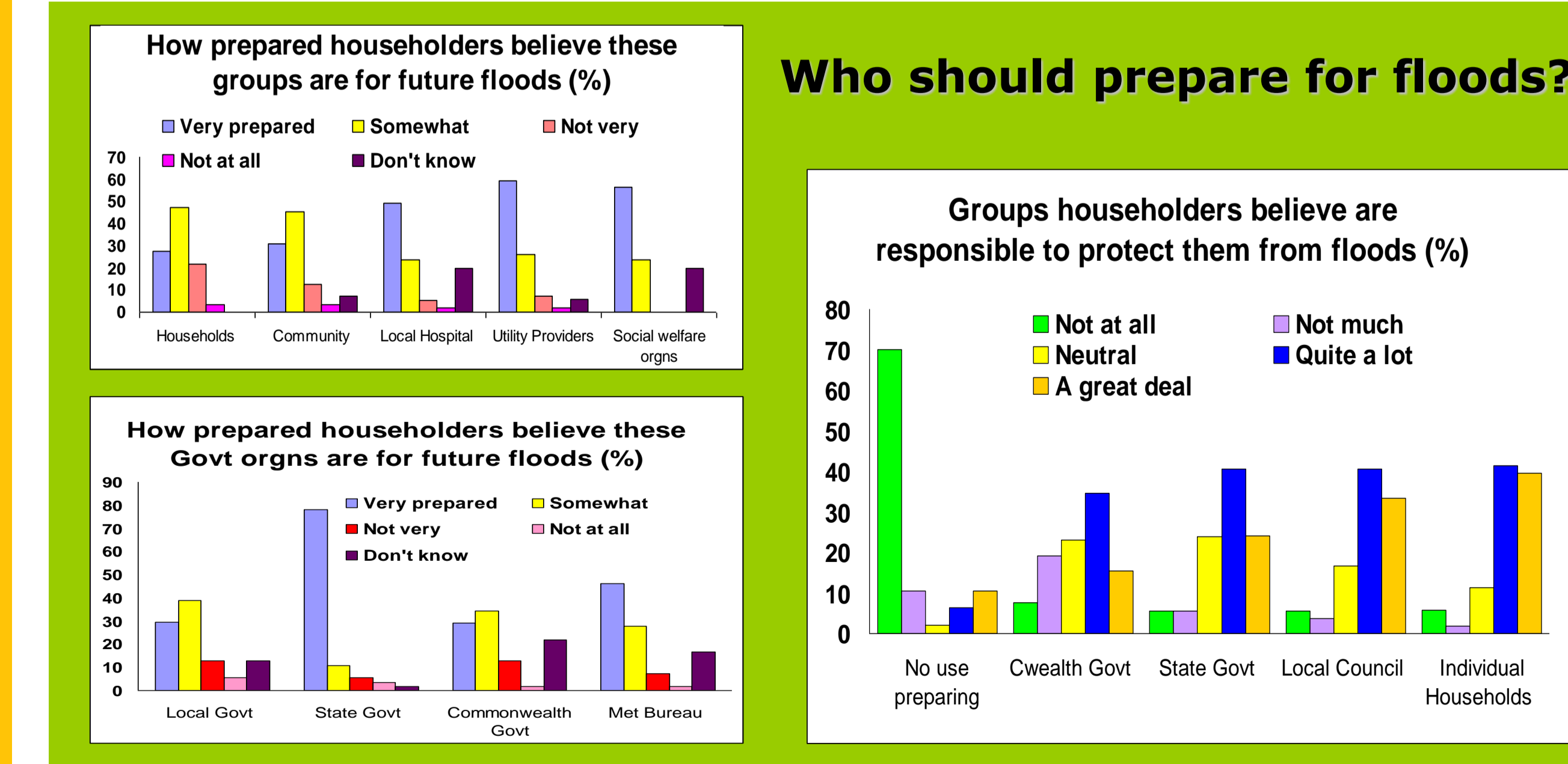
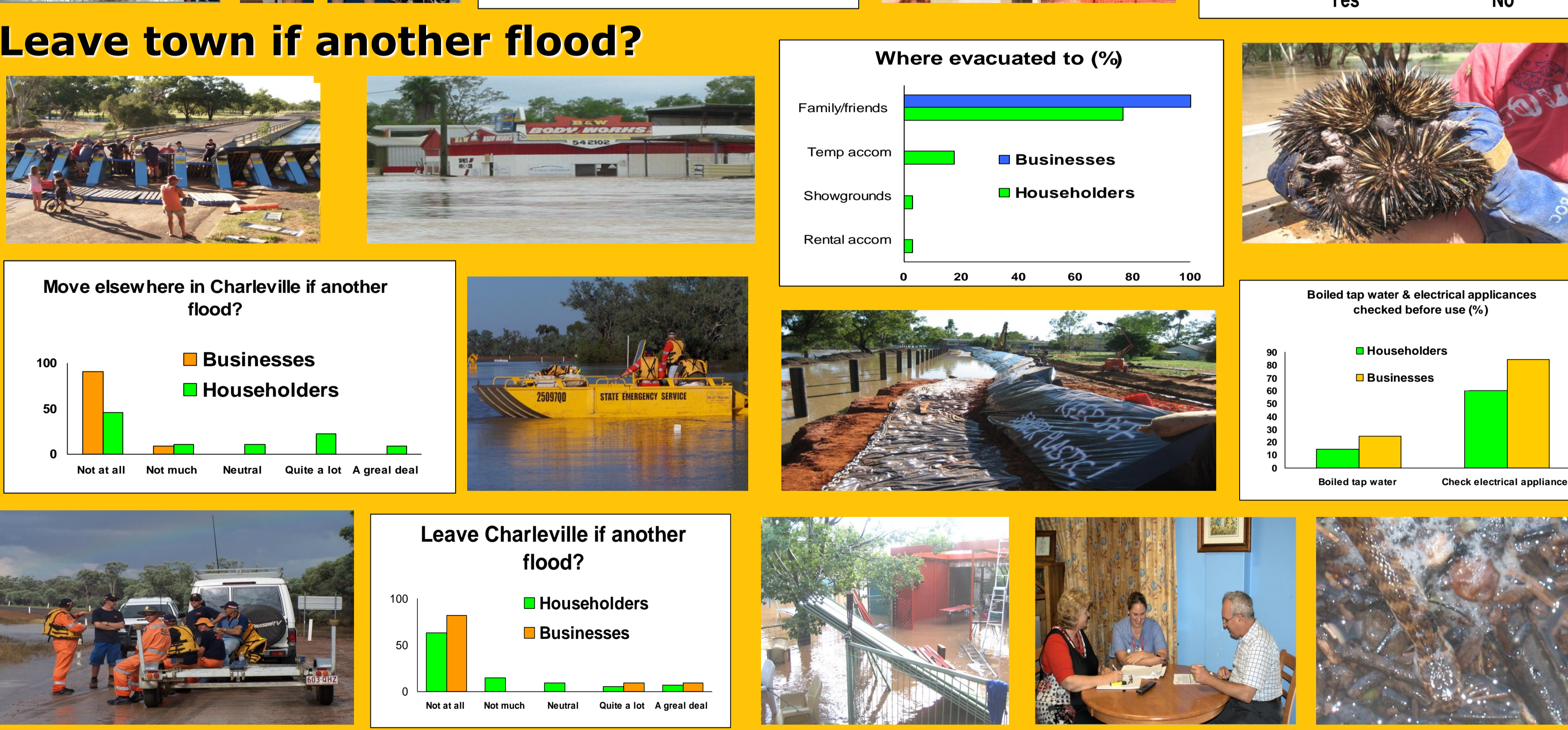
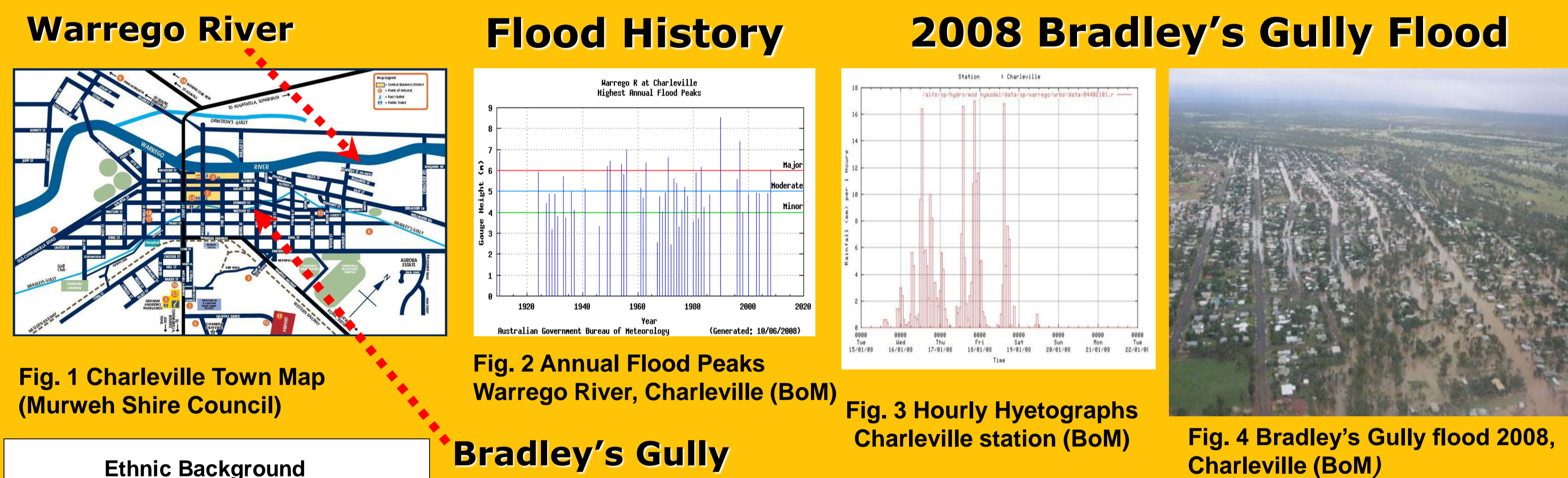
## STUDY AIMS

To understand:-

1. how societies that are regularly flooded operate and the characteristics of vulnerability, resilience, and adaptive capacity to flooding of households, businesses and institutions
2. the characteristics of communities that are 'on the edge', where flooding might push them into non-viability
3. the extent to which flood mitigation measures (including State Planning Policy 1/03) have been applied to reduce vulnerability to flood events

## METHODOLOGY

Structured questionnaires were administered to 91 participants in personal interviews with householders affected by the 2008 flood (n=55) and institutional personnel (n=23); and as drop-off pick-up surveys with businesses affected (n=13). Overall response rate 77%.



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