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HAZARDSCRC

UNPACKING THE SECTORAL INCOME EFFECTS OF NATURAL DISASTERS: EVIDENCE FROM THE 2010-11 QUEENSLAND FLOODS

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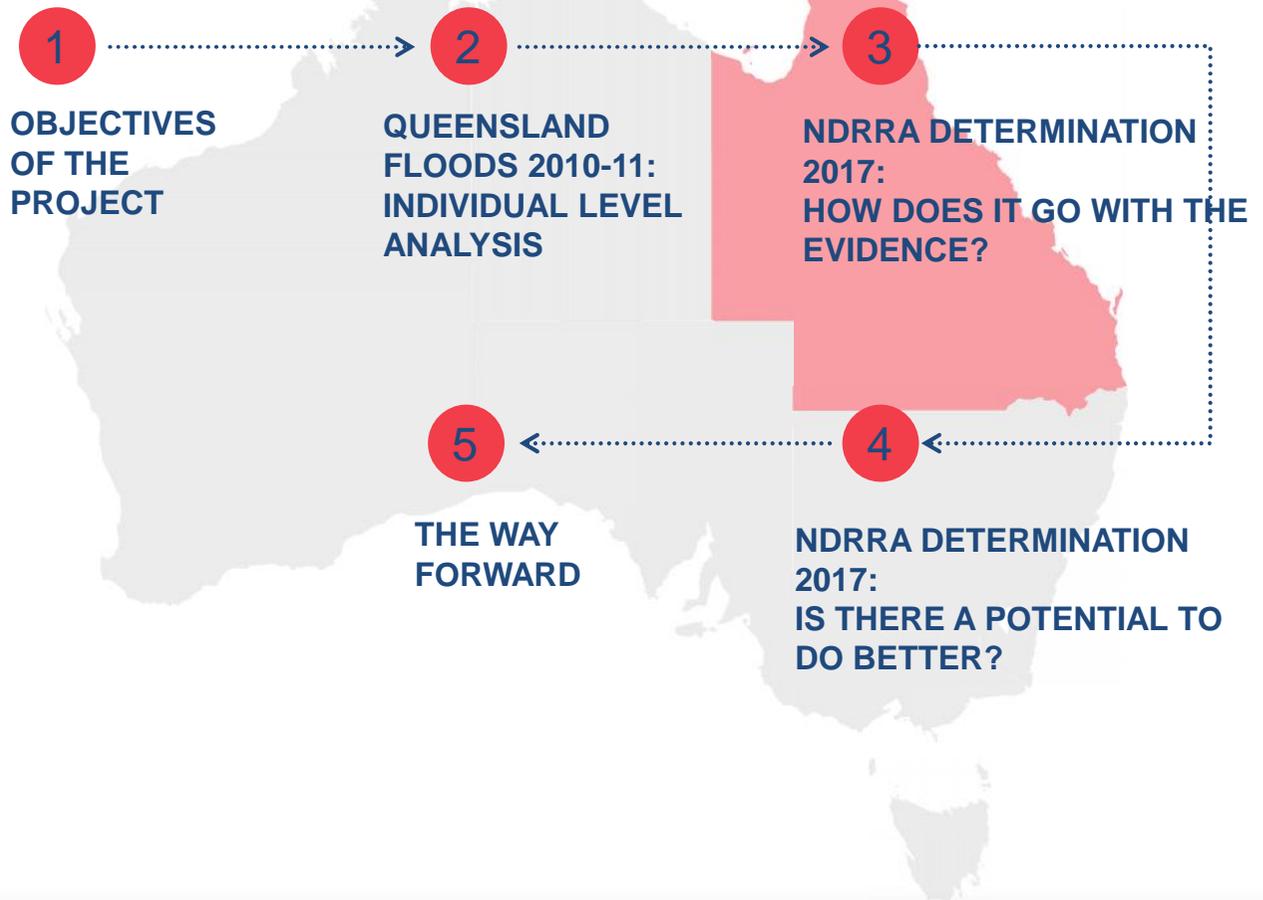


Australian Government
Department of Industry,
Innovation and Science

Business
Cooperative Research
Centres Programme



PRESENTATION OVERVIEW



1. OBJECTIVES OF THE PROJECT

OBJECTIVES OF THE PROJECT

IDENTIFYING
INCOME EFFECTS
OF QLD FLOODS

To identify those who are in need for disaster assistance:

- Vulnerable Economic Sectors
- Vulnerable Firms
- Needy Individuals

TRANSLATING
RESEARCH
INTO PRODUCT

To inform recovery and relief funding arrangements so that better decisions can be made for minimizing negative effects of disasters

- Develop a 'Policy Briefing Note' to support AGD

UTILISING
RESEARCH
PRODUCT

To facilitate effective decision-making within the context of the relevant policy documents

- Natural Disaster Relief and Recovery Arrangements (NDRRA)

2. THE QUEENSLAND FLOODS 2010-11: INDIVIDUAL LEVEL ANALYSIS

QUEENSLAND
FLOODS: DEC
2010- JAN 2011



4.46m

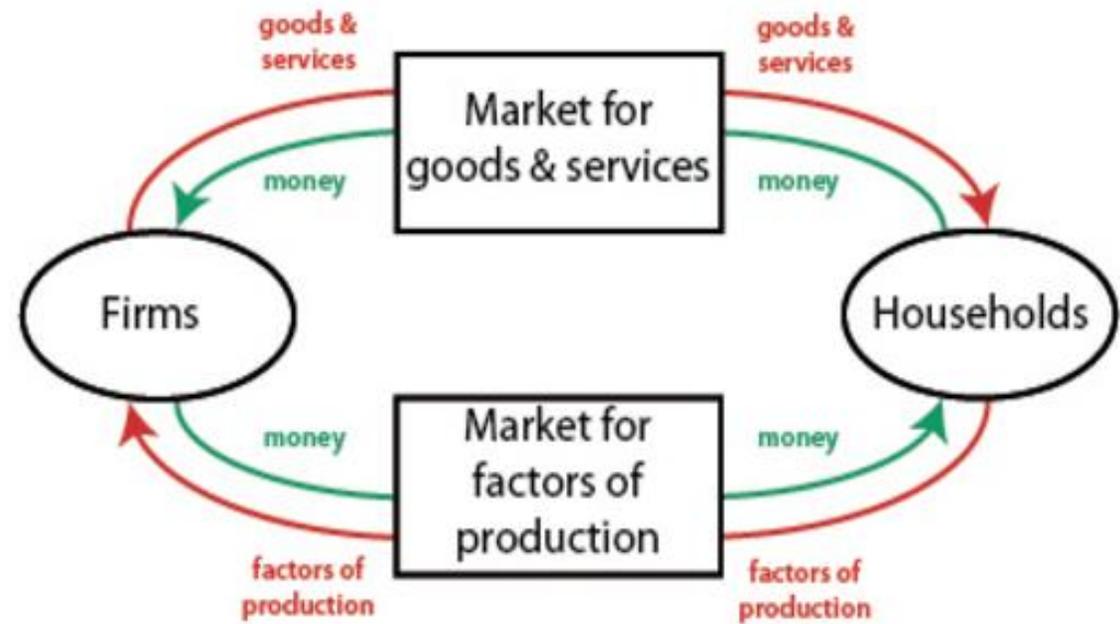
- In Brisbane, the river peaked at 4.46m on 13 January, 2011 flooding more than 28,000 homes and leaving 100,000 without power



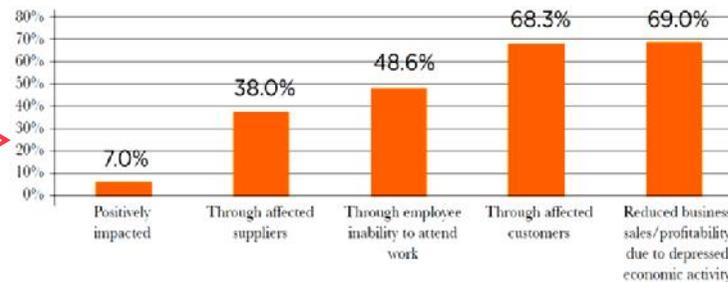
A person in a dark suit is seen from behind, standing in front of a chalkboard. The chalkboard is covered in white chalk drawings. On the left side, there are several overlapping, wavy lines that resemble a tangled path or a complex network. On the right side, there are several horizontal arrows pointing to the right, stacked vertically. The background is a solid dark blue color.

OUR APPROACH TO DISASTER IMPACT ASSESSMENT

CIRCULAR FLOW DIAGRAM OF THE ECONOMY



THE INDIRECT IMPACTS FOR BUSINESSES AFFECTED BY THE FLOODS



Source: Six Months on Queensland's Natural Disasters Survey - August 2011

A CCIQ longitudinal survey based on 200 Queensland businesses only

- No economic impact assessment of individuals
- What happened to individuals' incomes?

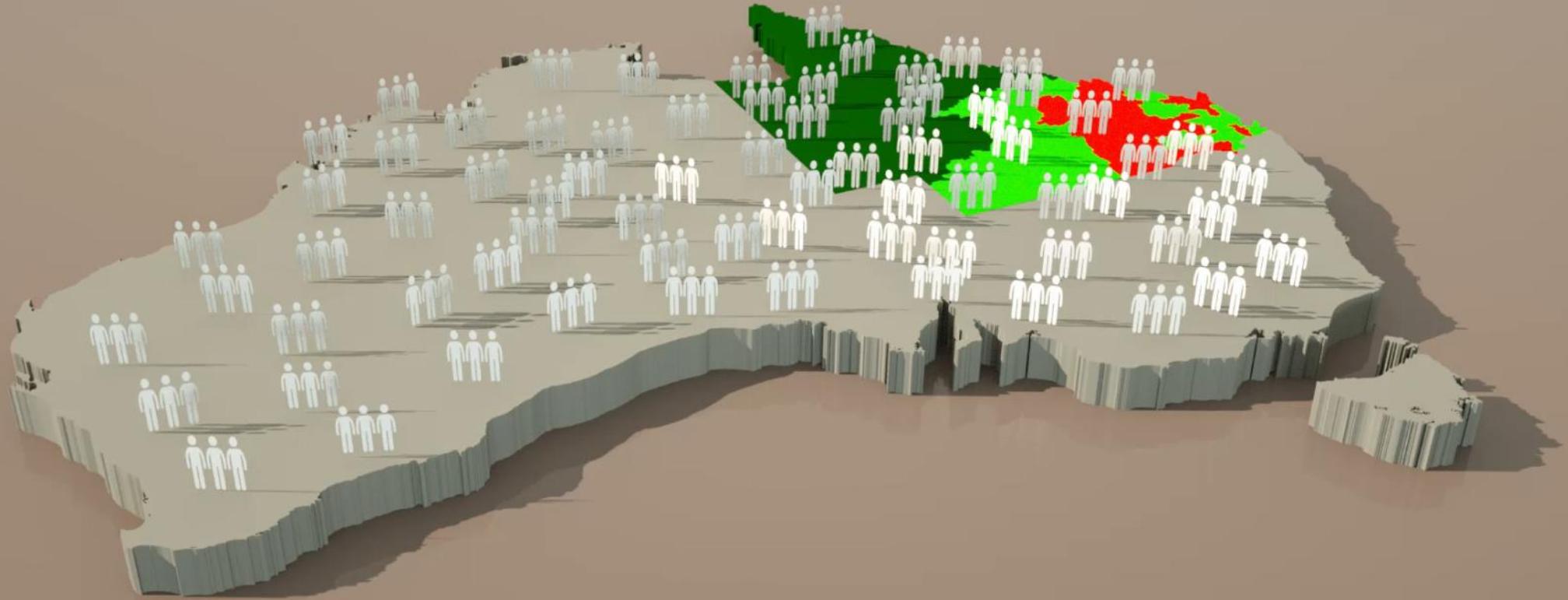
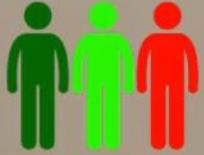
Strategy to Estimate The Economic Effects of Natural Disasters

1. Estimating the impacts of Queensland Floods 2010-11:

- *Economic Impacts:*
 - Individual Level
 - Firm Level
- *Impact Heterogeneities:*
 - Income Distribution
 - Level of Disaster Severity
 - Gender and Age
 -  Employment Type: Wage Employees Vs. Self-Employees



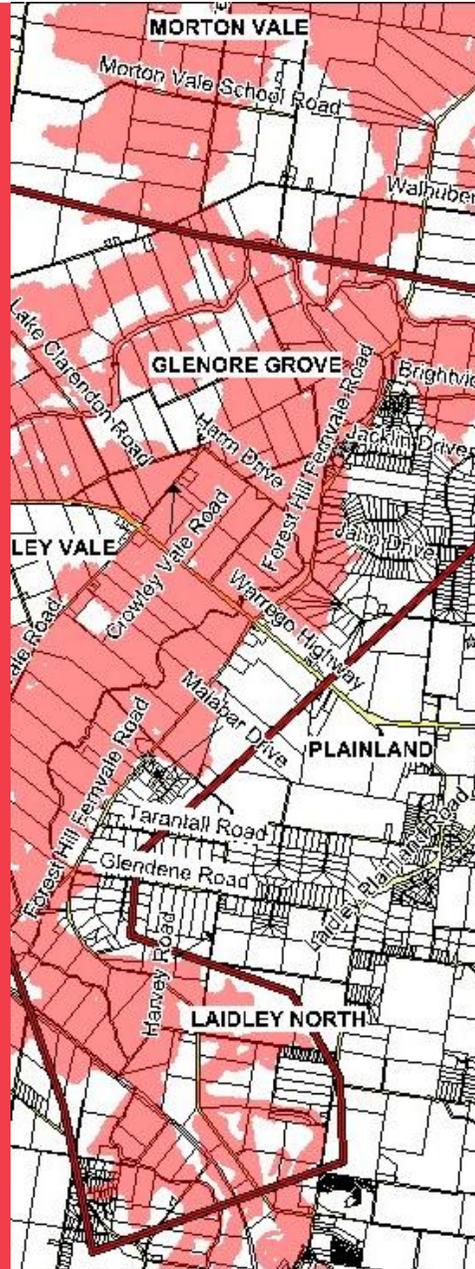
OUR APPROACH



A person in a dark suit is seen from behind, standing in front of a chalkboard. The chalkboard is covered in white chalk drawings. On the left, there are several overlapping, wavy lines that resemble tangled data paths or network connections. On the right, there are three horizontal arrows pointing to the right, stacked vertically. The background is a solid dark blue color.

DATA AND MEASUREMENT

THE DATA



+ DATA ON ECONOMIC INDICATORS:

Australian Census Longitudinal Dataset, 2006 and 2011.

Conducted in August 2006 and August 2011, respectively.

+ DATA ON FLOOD SEVERITY

Brisbane and SE QLD flood map: Dec 2010 - Jan 2011

Bureau of Meteorology (BoM), Govt. of Australia

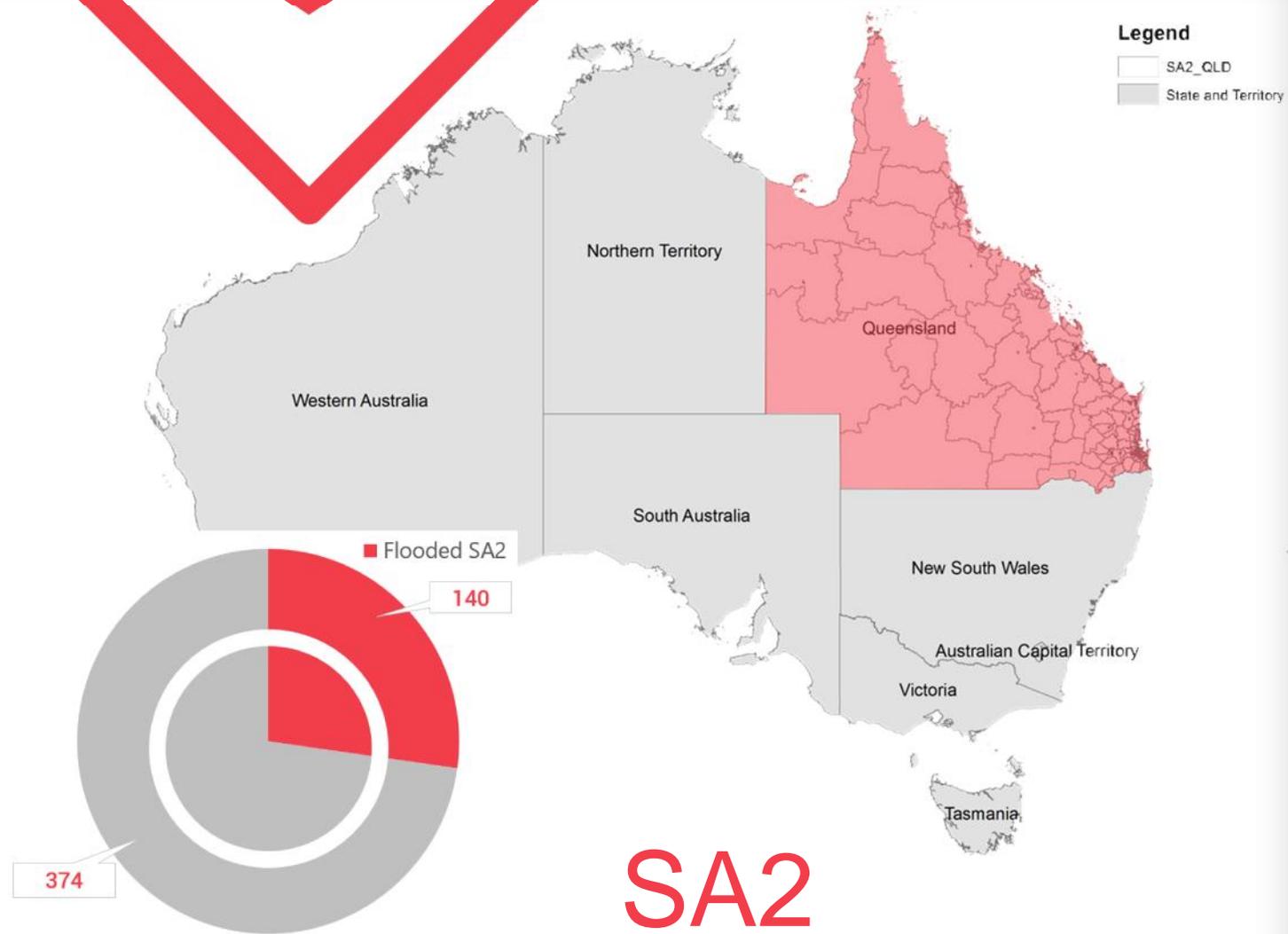
Australian Census Longitudinal Dataset

(ACDL), 2006 and 2011:

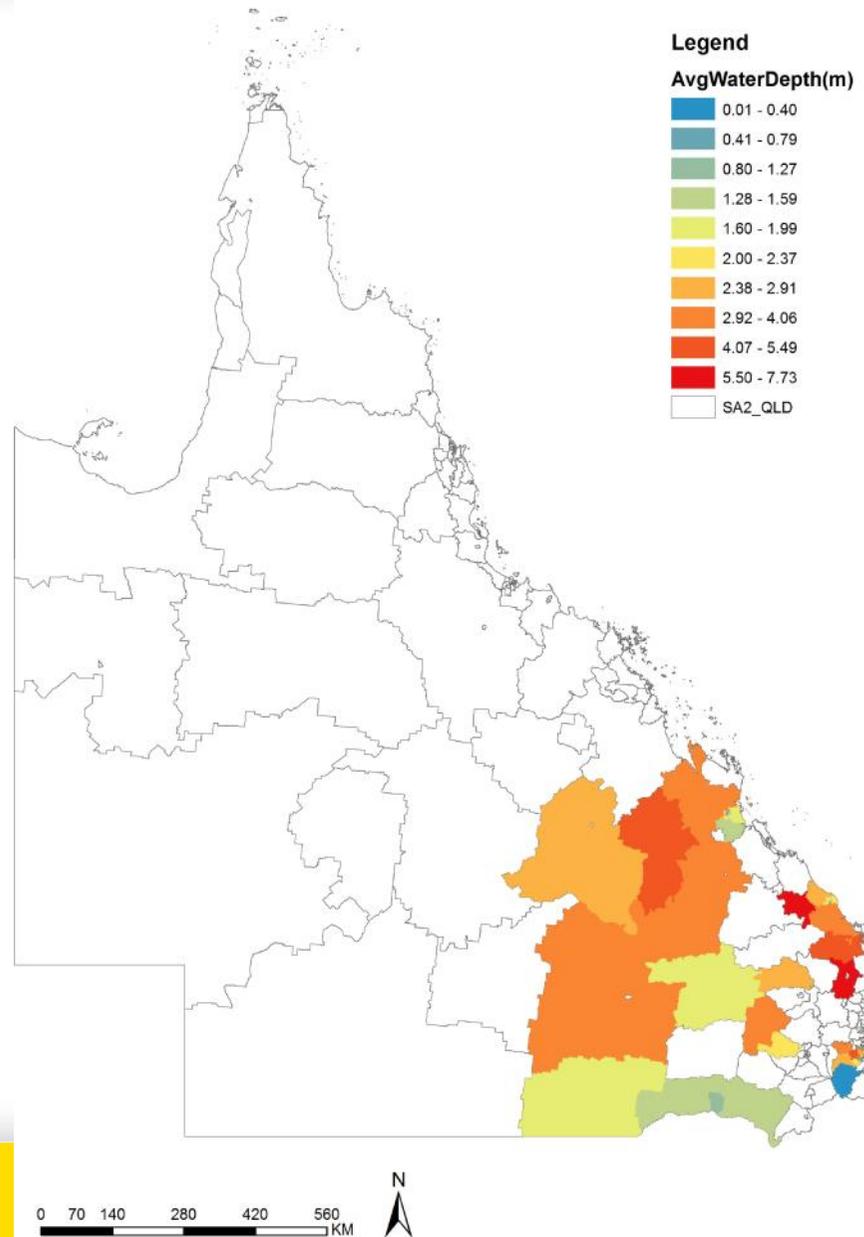
- **Random 5% sample of persons enumerated on Census Nights, 8 August 2006 and 9 August 2011**
- **Two censuses linked by the ABS to generate a longitudinal dataset**
- **Anonymised**
- **514 Statistical Area-2 units in Queensland.**



QUEENSLAND FLOODS IN 2010-11



Flood Severity



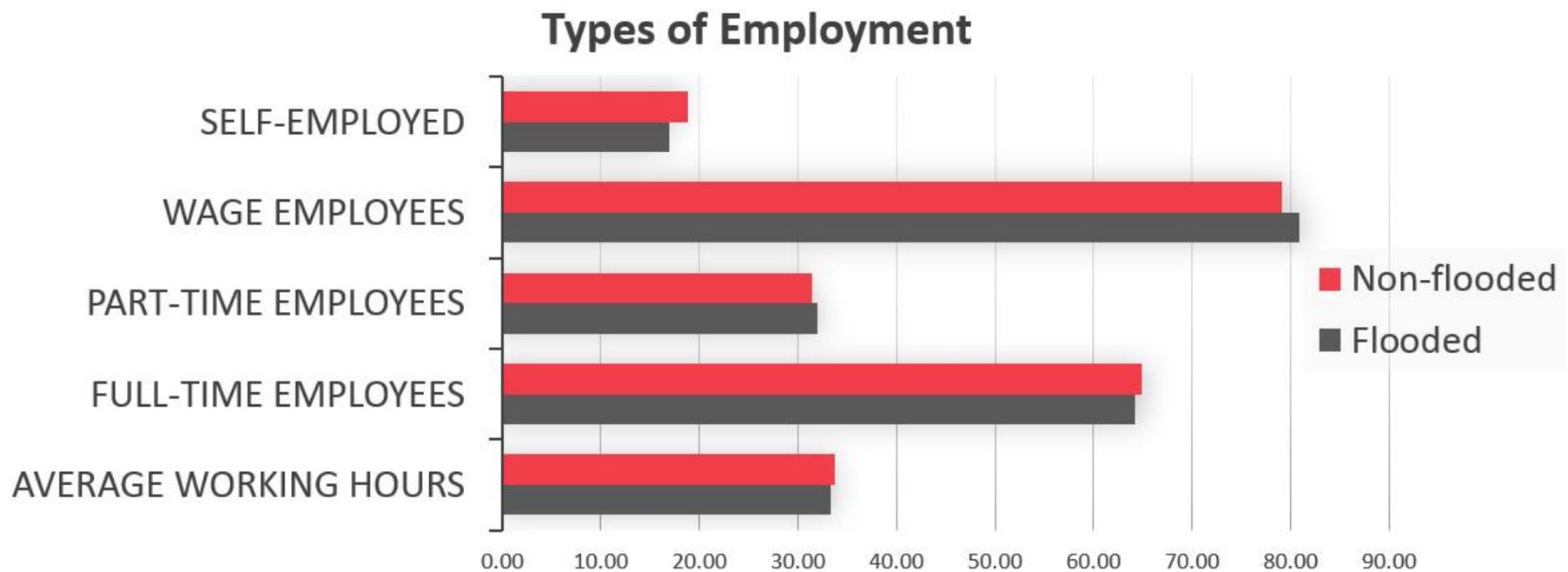
The QLD
floods map:
Dec 2010 -
Jan 2011



DATA IN A NUTSHELL...

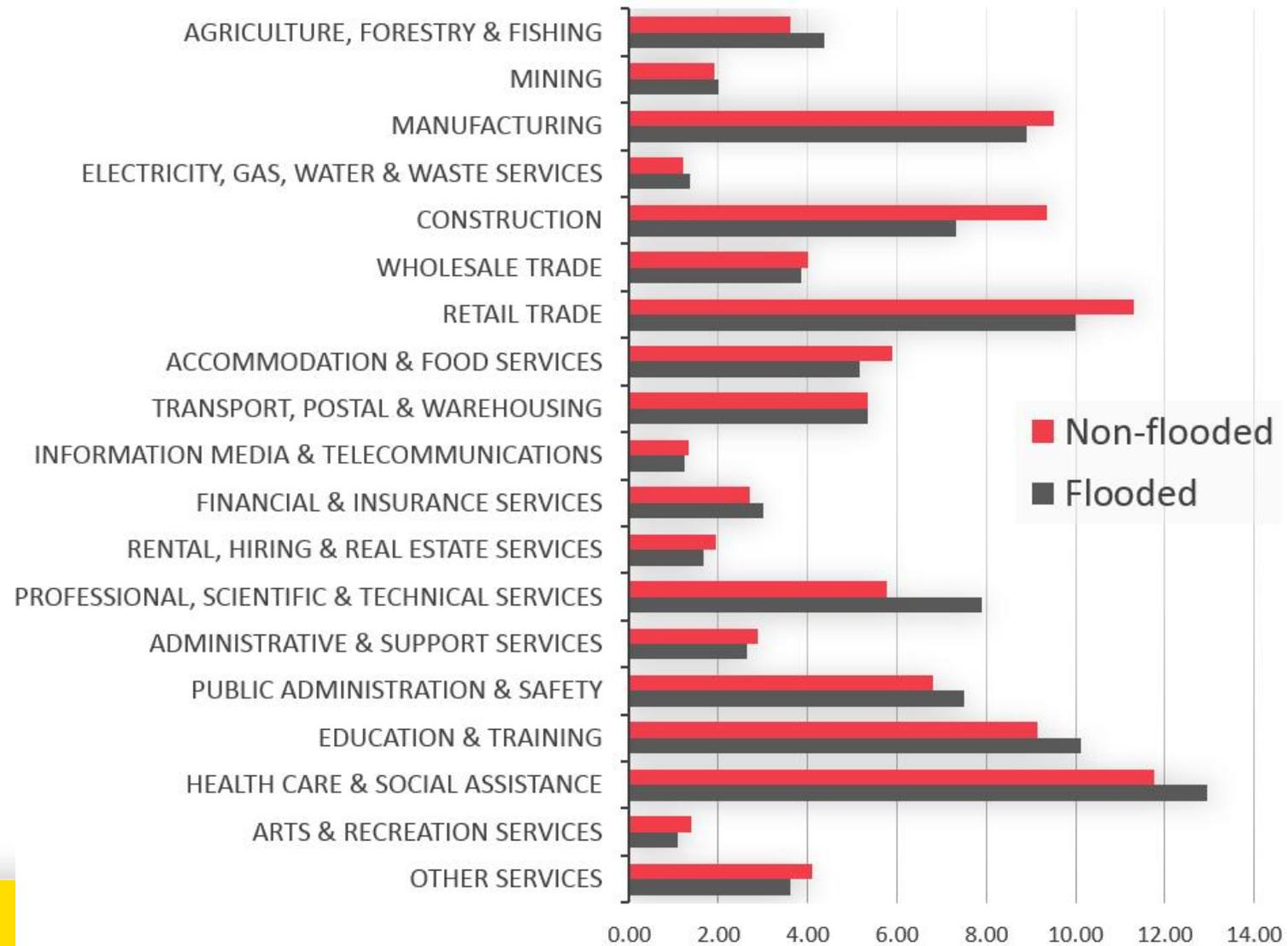
1. 22% Queenslanders were affected in the 2010-11 Flood
2. The average flood-water height in the flooded areas was 1.83 metres
3. 52% in our census dataset is female
4. Between 2006 and 2011, 32% migrated between affected and unaffected areas
5. Between 2006 and 2011, out of all Queenslanders:
 - 2% transitioned from the employed to unemployed
 - 2% transitioned from the unemployed to employed
 - 7% transitioned from the fully employed to part-time employed
 - 9% transitioned from the part-time employed to fully employed

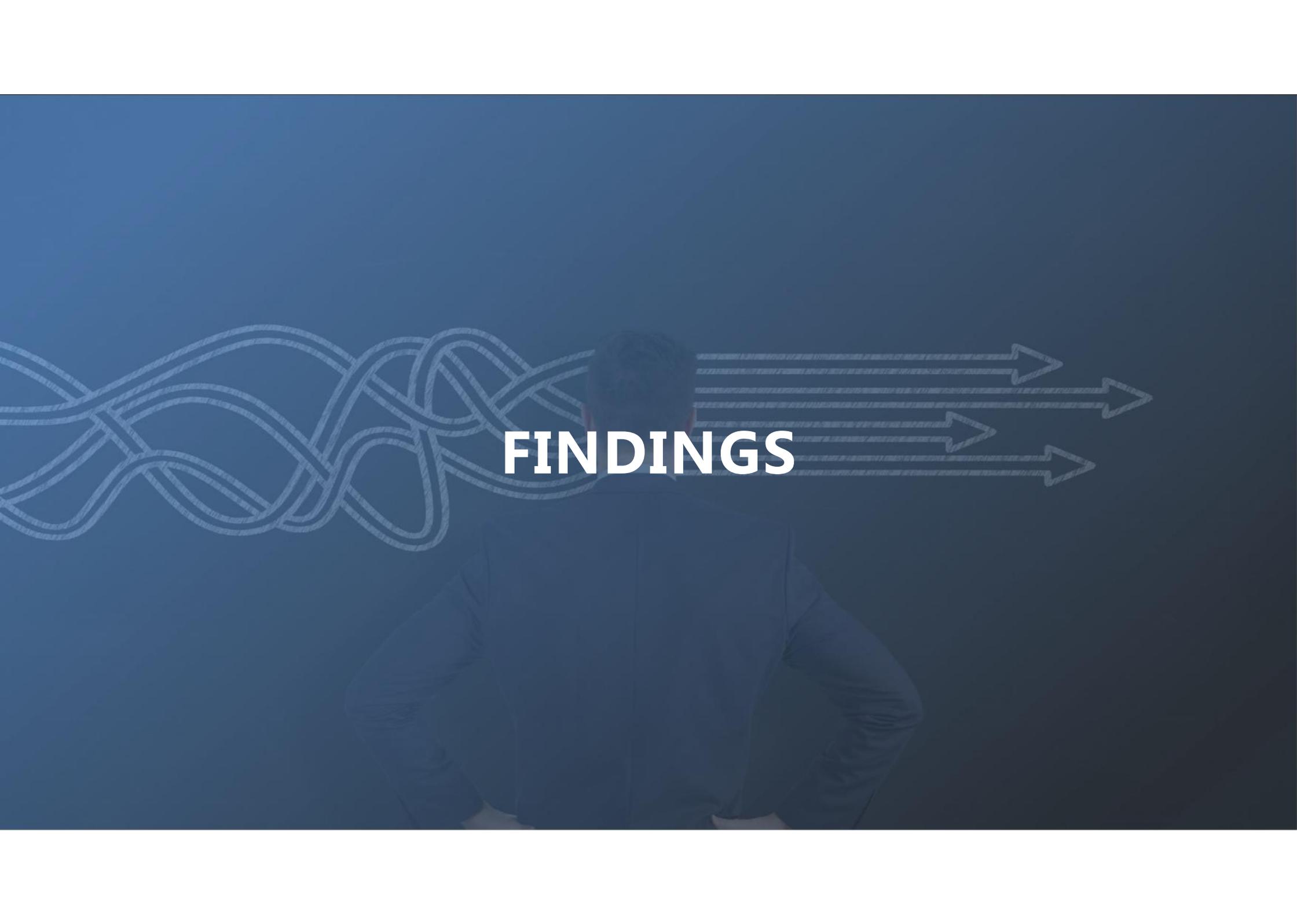
DESCRIPTIVE STATISTICS...



DESCRIPTIVE STATISTICS

Sectoral Decomposition of Employment, QLD (%)



A person in a dark suit is seen from behind, looking at a wall. The wall is covered in white chalk-like drawings. On the left, there are several tangled, overlapping lines. On the right, there are four horizontal arrows pointing to the right. The word "FINDINGS" is written in large, white, bold, sans-serif capital letters across the center of the image, overlapping the person's back and the wall drawings.

FINDINGS

**IMPACT
ASSESSMENT
FINDINGS:
SECTOR-
SPECIFIC INCOME
CHANGES**

Sectors	Change in Annual Income
Accommodation and Food Services	-20 %
Transport, Postal and warehouse	+5.5 %
Rental, Hiring and Real Estate Services	+12.8 %

Sectors that experienced **NO income difference:**

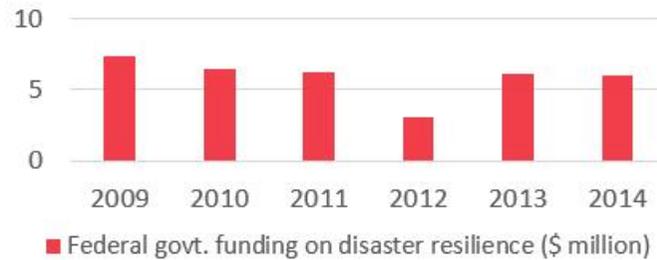
- Agriculture, Forestry and Fishing
- Mining
- Manufacturing
- Electricity, Gas, Water and Waste Services
- Construction
- Wholesale Trade
- Retail Trade
- Information Media and Telecommunications
- Financial and Insurance Services
- Professional, Scientific and Technical Services
- Administrative and Support Services
- Public Administration and Safety
- Education and Training
- Health Care and Social Assistance
- Arts and Recreation Services
- Other Services

MORE IMPACT ASSESSMENT FINDINGS ON THE **ECONOMICALLY VULNERABLE** GROUPS...

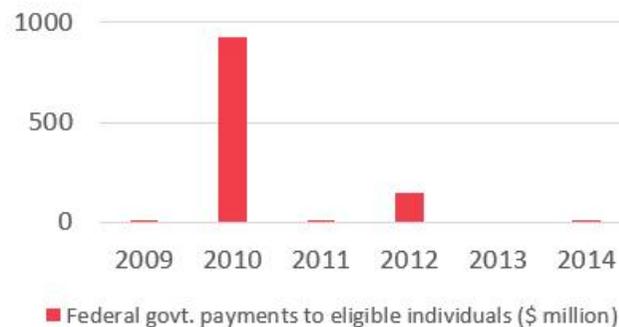
1. **WORKING HOURS:** People choose to **work for more hours** following floods and such tendency is stronger in the high-income group;
2. **GENDER:** We find **no gender differences** (male vs female) in terms of the income effect;
3. **INCOME DISTRIBUTION:** The **middle-income group** experienced slightly positive income effect (approx. 1 %)
4. **FLOOD SEVERITY:** People who are affected by **moderate** level of flood-water height (i.e., 1.17-2.60 Metres) experienced an income rise of around 8 %
5. **EMPLOYMENT TYPE:** Self-employed individuals in **incorporated** businesses gained around 7 % more income following floods, but those in **unincorporated** business experienced no change.
6. **AGE:** People **aged below 25** experienced no income change, while people aged 25 and above experienced 4 % income rise.
7. **SPILLOVER EFFECTS:** The spatial spillover effects are **present but not strong**.

**IMPACT ASSESSMENT
FINDINGS:
WHY POSITIVE/
NO CHANGE OBSERVED
IN
INCOMES FOLLOWING
THE FLOOD?**

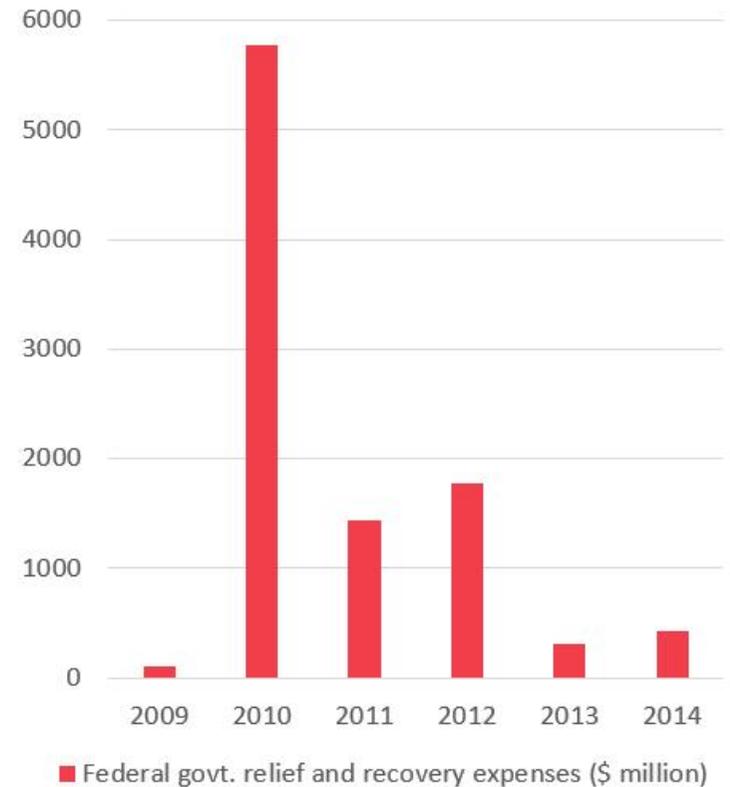
Federal govt. funding on disaster resilience (\$ million)



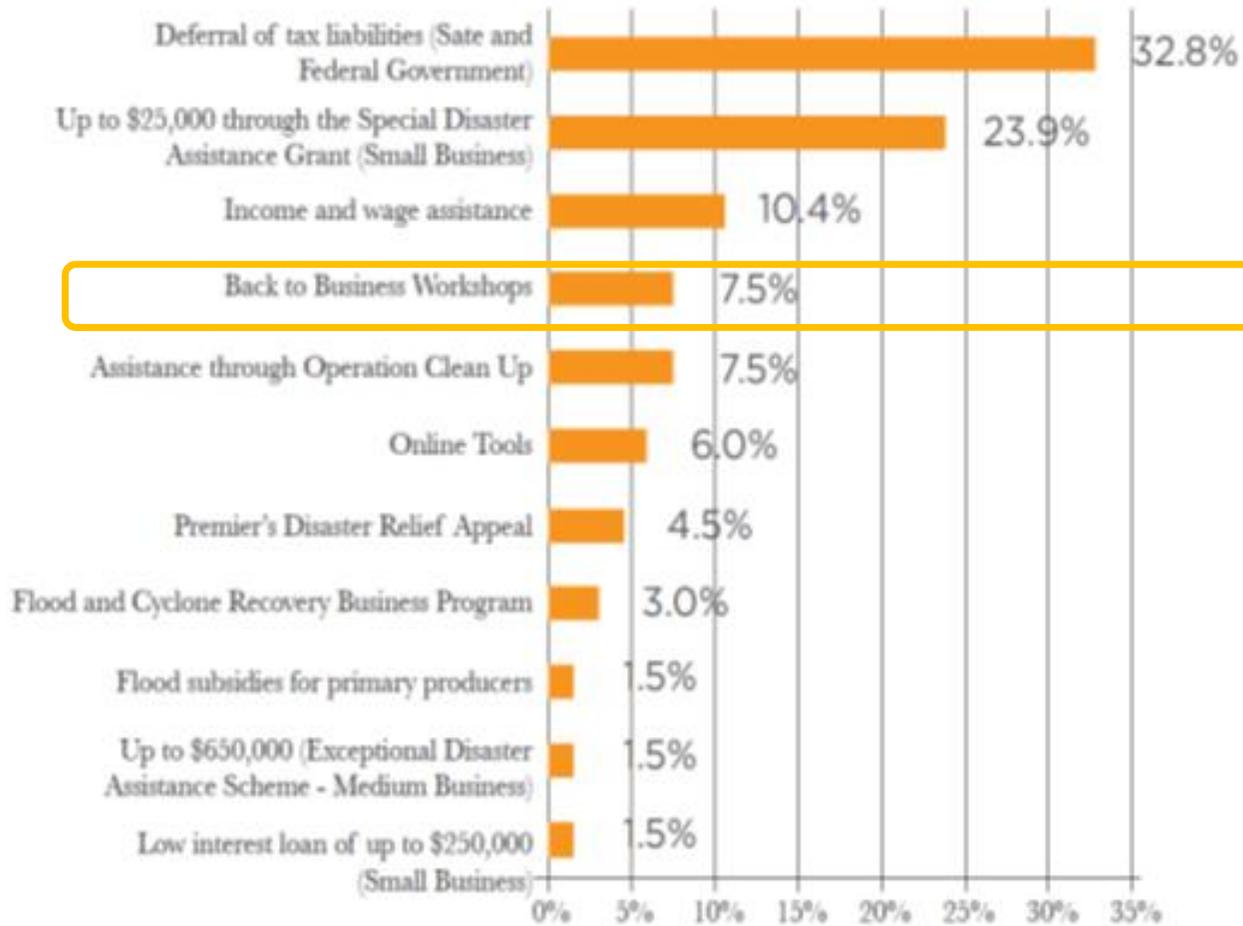
Govt. payments to eligible individuals (\$ million)



Federal govt. relief and recovery expenses (\$ million)



ASSISTANCE MEASURES SOUGHT BY BUSINESSES AFTER THE NATURAL DISASTERS



Source: Six Months on Queensland's Natural Disasters Survey - August 2011

WHY POSITIVE/
NO CHANGE IN
INCOMES?

Likely through

“recovery interventions”

**3. NDRRA
DETERMINATION: HOW
DOES IT GO WITH
EVIDENCE?**



NDRRA: Our Finding



Spillover effects are economically not significant

“Applicants outside the affected geographical area who do not operate in the affected geographical area are not eligible, including those with a supply chain relationship to the affected geographical area.” *(Source: NDRRA Determination 2017, pp. 6)*



NDRRA: Our Finding

- ✓ “Needy Individuals” must be addressed.

“An individual who is in urgent and genuine need of financial assistance.” *(Source: NDRRA Determination 2017, pp. 7)*

Policies related to disaster risk reduction (DRR) should not be generic, as one policy does not fit all; NDRRA determination does that through addressing “Needy Individuals”.

**4. NDRRA
DETERMINATION 2017: IS
THERE A POTENTIAL TO
DO BETTER?**

NDRAA: Policy Implications

Our results show that the income effects of disaster turn out to be positive within the first six months

Queenslanders experienced *positive income effects* following the floods.

✓ Are we overdoing post-disaster interventions?

Can we gain more efficacy in relief and recovery funding arrangements?

NDRAA: Policy Implications

NDRRA currently addresses some economic sectors exclusively

e.g., NDRRA Determination addresses “Primary Producers” and “Public Infrastructure” separately.

- ✓ **Is there any room to address other economic sectors in NDRRA?**

e.g., Accommodation and Food Services

NDRAA: Policy Implications

NDRAA Determination is tailored to address post-disaster interventions at two levels: Individuals and Firms.

Household level intervention remains open

- ✓ **Household level intervention will provide some new dimensions in NDRAA:**
 - Children
 - Elderly

NDRAA: Policy Implications

The definition of “Needy Individuals” is generic:

“An individual who is in urgent and genuine need of financial assistance.” (NDRRA Determination 2017, pp. 7)

- ✓ **Refining the definition of “Needy Individuals” may provide clearer policy direction**

NDRAA: Policy Implications

Disaster-related Unemployment is not addressed

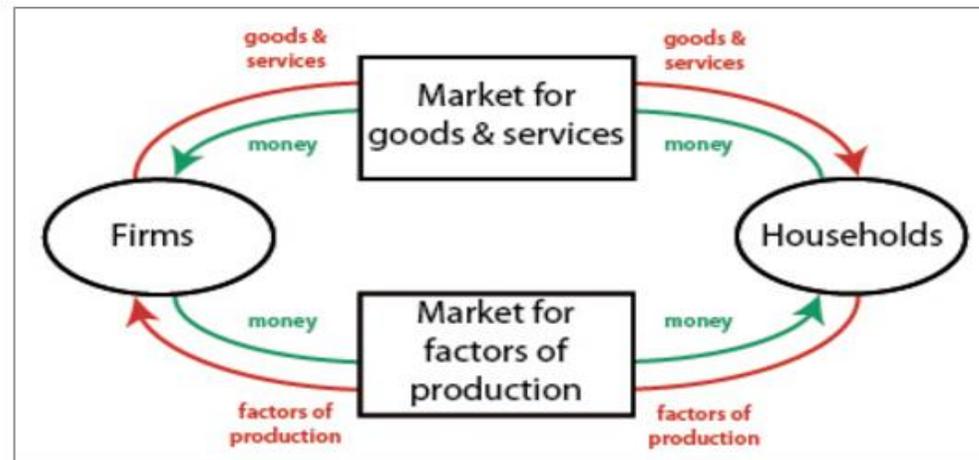
NDRRA Determination compensates loss of income based on the preceding financial year's income. However, some individuals may have become unemployed due to disaster adversities.

- ✓ Is there any way to assist those unemployed individuals owing to the disaster?

5. THE WAY FORWARD



6. THE WAY FORWARD



- **How were business firms affected by the QLD flood 2010-11?**
 - Profitability
 - Productivity
 - Large, medium and small-scale firms by No. of employees and market size
 - Firms targeted to domestic vs. overseas markets
 - Change in fixed vs. variable costs



THANK YOU