Climate Change Adaptation Research Grants Program
- Social, Economic and Institutional Dimensions Projects

Project title:
Impact of Climate Change on Disadvantaged Groups: Issues and Interventions.

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Objectives:
There is an emerging concern in the international literature that the negative impacts of climate change will be disproportionately experienced by the most socially and economically disadvantaged. However there is little empirical evidence of the link between disadvantage and the potential effects of climate change. This study seeks to make a contribution to this gap in our knowledge by investigating the vulnerability and adaptive capacity of disadvantaged groups to the adverse impacts of climate change and identify interventions which can enhance resilience and counteract these effects in South Australia (SA). Working with the South Australia Social Inclusion Unit this study will undertake detailed mixed method studies of three local government areas (LGAs) in SA which are expected to experience significant climate change impacts over the next half century and which have significantly disadvantaged communities. The three LGAs - Port Adelaide (urban coastal), Renmark (rural Riverland) and Wallaroo (rural coastal) - represent differing environmental and human settings. Working with key stakeholders the project will generate a set of specific policy and program recommendations for consideration of the SA Social Inclusion Unit, the Sustainability and Climate Change Division of the Department of Premier and Cabinet and local government. Specific objectives include:

- To identify the vulnerability and adaptive capacity of disadvantaged groups in differing spatial contexts to cope with climate change impacts.
- To develop a set of indicators to measure their vulnerability and adaptive capacity using primary and secondary data.
- To identify intervention strategies to enhance adaptive capacity and reduce vulnerability.

Project design and methods:
The framework for constructing vulnerability indicators and a decision support tool:
Mixed methods will be utilised including a literature review, quantitative analysis of available data, GIS mapping & modeling, surveys, in-depth interviews & focus groups. We hypothesise that vulnerable groups of the South Australian population will have specific vulnerabilities to floods & extreme heat, due to demographic & wide range of socio-economic factors, & their vulnerability will be further mediated by perceptions & behaviours in response to climate change impact at household & community levels. Three steps are involved in the development of vulnerability indicators: (**1**) definition of what is to be indicated.. (**2**) selection of the indicating variables; & (**3**) defining the indicator function itself.

A number of domains which reflect the vulnerability (or resilience) of the disadvantaged groups include: (i) **Social**: comprising health, education & awareness, climate information, social capital, social cohesion, preparedness, etc., (ii) **Economic**: comprising income, employment, household assets, finance & saving, budget & subsidy, etc., (iii) **Institutional**: comprising environmental policies, cnSIS management, institutions, institutional collaboration, governance, etc., (iv) **Physical**: comprising electricity, water, sanitation & solid waste disposal, accessibility of transport, housing & land-use, etc., and, (v) **Natural**: comprising intensity/severity of climatic hazards, frequency of hazards, vulnerability of ecosystem service, land-use in natural terms, environmental security, etc.

The decision support tool will take account of scenarios of climate change impacts on sea level rise & associated flooding inundation, extreme weather events & the interaction of these with the socioeconomic characteristics of local communities. Climate change scenario mode ling for sea level rise & associated storm surges & flood inundation will be incorporated into GIS environment. Essential data required for modeling will be provided by state government departments. The health & socio-economic indicators of local disadvantaged populations will be linked with the climate change scenario layers. We propose a 2-year work program that involves 5 stages.

***Stage 1*: Systematic literature review, constructing vulnerability indicators through quantitative analysis of secondary data, stakeholder engagement**

The first stage will establish: (i) the relationships between the impact of climate change on the 3 local communities & the specific characteristics & spatial distributions of each of the disadvantaged groups; (ii) the link between different forms of disadvantage & climate change impact; (iii) the changing ways in which each of the vulnerable populations is being disadvantaged by climate change; and, (iv) indicators for assessing social vulnerability & adaptive capacity of the disadvantaged people.

***Stage 2*: Planning for data collection**

In this stage the data collection instruments will be developed. This will involve an intensive examination of the literature but also extensive discussion with key stakeholders in government agencies & in the three communities under study. It will form the basis for developing a comprehensive set of dimensions of vulnerability & adaptive capacity. These dimensions will be developed without reference to the data availability to ensure that they are not 'data driven'. They will be robustly tested in qualitative work in the study areas. Once they are decided upon they will be incorporated into the qualitative & quantitative measurement instruments to be used in the 3 LGAs.

***Stage 3*: Data collection from households & community**

This will be done through a survey & face to face interviews. The fieldwork will be undertaken in close cooperation with the Social Inclusion Unit. In relation to the Aboriginal community, much of the data collection will be undertaken by community members who are provided specific training. Information & data on perceptions about health & livelihood & factors relating to social exclusion in adapting to climatic hazards will be collected with the aim of deriving indicators & assisting strategy formulation to minimise social exclusion by climate change impact. In-depth interviews with various stakeholders across government, NGOs, city councils, local governments, community groups, service providers, & representatives from diverse vulnerable groups of people will be undertaken to review preliminary survey findings. Interviews will be structured & semi-structured, based on the research questions. There are expected to be 6 focus groups with approximately 10 people in each group, in each community. In contrast to surveys, in-depth interviews & focus groups have the capacity to capture information that is not already 'known', e.g., conflicts or new types of disadvantage that people identify. The focus groups will be transcribed & NVIVO software will be used for coding & analysis

***Stage 4*: Analysis of primary data**

This stage will involve the analysis of the data & importantly the linking of the primary data collection results to secondary data indicators which can be used across wider population. The analysis is based on the conceptual framework (constructed in Stage 1). Statistical relationships between the outcomes & a range of factors for vulnerability will be used to identify key vulnerability indicators. Validation of indicators, relationships between vulnerability, adaptive capacity, & the sensitivity of subsequent vulnerability assessments to different sets of weightings will be explored by using mixed methods. The results of a robust assessment of vulnerability of different disadvantaged groups to health, livelihood, & social inclusion related outcomes will represent an entry point to more detailed explorations of vulnerability & adaptive capacity. The pathways of, & the extent of, interaction between climate change impact & various domains of disadvantage – personal, economic, social - will be identified & quantified. The key factors that predominantly restrain the adaptive capacity will be identified.

***Stage 5*: Policy & strategy development**

The strategic & policy implications of the research will be identified in collaboration with key stakeholders especially the Social Inclusion Unit. This component complements the quantitative work with original qualitative work on the impact of climate change on different forms of disadvantage, on health & livelihood, & on sources to reduce such disadvantage. The mediating effects of gender, income, household structure, levels of social capital, accessibility, & institutions will be a particular & original focus of all aspects of the research program. Engagement with SA Social Inclusion & local community policy networks relevant to climate change & social inclusion will be a feature of the research program to maximise the chances of our research influencing policy & operational programs. A series of policy workshops will be convened with key stakeholders & a climate change adaptation & social inclusion strategy discussion paper prepared for wider discussion.