Gender and climate change in Australia

Margaret Alston
Monash University, Australia

Abstract

Debate continues to rage as to the veracity of evidence around the permanence of climate change. There is no doubt that changes are occurring across the world and that these changes are causing significant social hardship, including food and water insecurity and large-scale movements of people. What is also emerging in research across the world is that these social impacts and adaptations are highly gendered. This article draws on several years of research on the Australian drought and more recent research on declining water availability in the Murray–Darling Basin of Australia. It notes the significant social impacts, particularly in remote and irrigation areas, and draws out the gendered impacts of these changes. The article argues for more sensitive rights-based social policy to address people who are under extraordinary stress during times of unparalleled change.

Keywords: food security, social impacts, trauma, water, women

Unusual weather patterns and cataclysmic weather events have led to a contentious community debate about the permanence of climate change/variability and what actions should be taken, if any. In late 2009 and early 2010, this debate has been highly politicized in the Australian political arena, with politicians adopting diverse positions pre- and post- the World Climate Change Forum in Copenhagen in December 2009 (see, for example, AAP, 2010; Rodgers, 2010). While this debate has tended to become polarized around environmental and economic factors, little if any emphasis has been placed on the ongoing social impacts and even less on the gendered consequences.

Yet in 2008 gender and climate change featured as one of the critical emerging issues for women across the globe at the United Nations (UN) Commission for the Status of Women meeting in New York (Revelo, 2008).

Journal of Sociology © 2010 The Australian Sociological Association, Volume 47(1): 53–70
DOI:10.1177/1440783310376848 www.sagepublications.com

The rapid escalation of gendered impacts has surprised even women's rights advocates, who are only now coming to terms with the widespread gender implications of climate variability and are struggling with effective ways of bringing women's voices and concerns to international deliberations (Terry, 2009). Following the previous Climate Change Global Forum in Indonesia, in 2007, a new non-governmental organization (NGO), GenderCC, was established as a result of women delegates' disquiet at the lack of attention to gendered implications (Hemmati and Röhr, 2009). While in 2009 there were several side events on gendered impacts at the Climate Forum in Copenhagen, gender experts, including those from GenderCC, were concerned at the lack of attention to gendered aspects of climate change both before and during the forum (see for example Röhr, 2010). This lack of attention is also very evident in the Australian debate and this article draws out these aspects of climate change.

What is widely acknowledged globally is that climate change/variability is causing widespread food and water insecurity, negative health and welfare issues, including higher mortality rates, increasing malnourishment and an increase in climate-related health consequences (FAO, 2007; McMichael, 2003). It has also led to widespread social movements of people within and across national borders escaping food and water insecurity (Nampinga, 2008). Emerging research is drawing attention to the gendered nature of these social impacts – including that women are much more likely to die in catastrophic climate events, and that they are more susceptible to malnourishment and poverty when food and water security are threatened (FAO, 2007; Lambrou and Piana, 2006; Neumayer and Pluemper, 2007). The writer is part of an international research team working under the auspices of the Gender, Equity and Rural Employment Division of the UN's Food and Agricultural Organization (FAO) investigating the gendered impacts of climate change. The first stage of this project is under way in India. The writer has also been researching climate change impacts in the Murray-Darling Basin area of Australia, where a long-running drought has decimated the countryside, affected food production and significantly affected water supplies. At the same time, there has been a rise in the number of catastrophic weather events, including floods and bushfires, leaving many Australian communities reeling.

Drawing on the UN research and work conducted in Australia over the last decade (Alston and Kent, 2006, 2009; Alston and Whittenbury, forthcoming; Alston and Witney-Soanes, 2008; Alston et al., 2004), this article focuses on the social and gendered aspects of climate change in Australia, arguing for a rights-based framework, with sensitivity to gender, to be applied to climate change discussions and responses. Such a framework would make transparent the consequences of climate variability for people and communities, and their gendered implications. First, the article describes

climate change events and the social impacts of these before moving into a discussion of gendered adaptations to these climate change/variability events. The article presents evidence that there are, indeed, gendered impacts as well as gendered adaptations to climate change, both positive and negative, which are very evident in the Australian context, and that they act to restrict and constrain the lives of women and men, leaving many overburdened with work and emotional care tasks. The need for a greater attention to the human rights of people deeply affected by climate change becomes apparent.

Climate change – what is it?

Climate change refers to the build-up of greenhouse gases in the atmosphere causing temperature rises, melting of the ice caps and rising sea levels. In particular, there is dispute as to whether the build-up of greenhouse gases is irreversible or whether the earth is experiencing a period of unusual, but normal, global warming and consequent climate variability. There is no doubt that climate change is a highly contested notion which has tended to polarize opinions around the scientific veracity of the evidence. Nonetheless the UN Intergovernmental Panel on Climate Change (IPCC), in a series of reports over a number of years, warns that the build-up of greenhouse gases has been significant in the last four decades, that climate change appears to be accelerating and that the global consequences will be dire (IPCC, 2007). Sceptics such as Australian writer Ian Pilmer (2009) argue that current changes are within the normal range of expectations and that those warning of irreversible climate change are zealots. Real or imagined, what is without question is that climate change/variability is causing significant problems in relation to food and water security across the world and hence has major social consequences.

At this point it is important to note that the consequences of climate change are exacerbated by uncertainty surrounding food production and water availability, a rising world population, biofuel production on previously food-producing land, pressure on natural resources, corporatization in agriculture and changes in the social relations of food production. These factors intersect with climate variability to enhance the social consequences of food and water insecurity. In 2008, for instance, food riots occurred in Bolivia, Cameroon, Egypt, Haiti, Indonesia, the Ivory Coast, Mauritania, Mozambique, Senegal, Uzbekistan and Yemen (Adams, 2008), signalling increasing malnourishment among the increasing populations of these countries and destabilized food production. Water and food security is also threatened in many countries, including Australia (Alston and Mason, 2008a, 2008b), again signalling major social upheaval. The complexity of factors intersecting with climate change demands a sophisticated

response which factors in the human consequences of declining access to food and water.

While the focus of world attention and Australian political debate has been largely on the economic and environmental consequences of major climate events, there is increasing concern about the social sequelae of potential climate change. The UN's Food and Agriculture Organization (FAO, 2007) argues that there will be increasing, and large-scale social movements of people, health and welfare consequences, rising levels of poverty and declining levels of education. What is also understood, and what constitutes the substance of this article is that there are significant gendered consequences emerging – that women and men are differentially impacted and that adaptations to climate change/variability are highly gendered.

Climate change in Australia

Australia has been subject to both incremental climate change as well as a series of catastrophic events in recent years. Incremental climate change is evident in a long-running drought that has lingered across the country for at least the last decade, causing significant interference with food production and a decline in the amount of water available for irrigation and for community water supplies. This drought has created significant upheaval and hardship and has reshaped where and when food production can occur. It has also had a significant impact on water supplies, as river systems are under extraordinary stress and water available for irrigation has become extremely scarce. As a result, there has been increasing political activity around water – who owns it and who has priority – matters which are discussed briefly below. Of note is that water has become commodified – making it a tradable commodity available to the highest bidder. There is no doubt that the drought has cost the country dearly and that its impact on the environment has been significant. As we will see below, it has also had extraordinary social consequences.

At the same time, Australia has experienced a rise in the number of cataclysmic climate events and these have included severe floods and bushfires – including the infamous fire in Victoria in February 2009 which killed 173 people. This event, which has become known as the 'Black Saturday' bushfire, is viewed as the most serious natural disaster in Australia's history. The scale of the fire was unprecedented and resulted from a combination of extremely high temperatures, high winds and excessive dry foliage as a result of drought conditions. In the same month, and indicating the significant climate variability within Australia, floods devastated coastal areas of Queensland. Fires and floods impact communities immediately and have major economic, environmental and social consequences.

Regardless of opinion on climate change and its permanence, there is no doubt that Australia has experienced severe climate variability in the 2000s and that this has resulted in unprecedented change. A report commissioned by the Australian Government, the *Garnaut Report* (Garnaut, 2008), notes that the consequences of climate change for Australia could include:

> over 90 percent reduction in irrigated agricultural production;
> catastrophic destruction of the Barrier Reef (Australia's beautiful coral reef extending hundreds of kilometers off the coast of Queensland);
> a retreat of the snowline, resulting in a significant reduction in flora and fauna in these areas and destruction of the snow-based tourism industry;
> a significant rise in the cost of household water;
> a significant threat to coastal housing and greater likelihood of coastal flooding and wind damage;
> over 4000 additional heat-based deaths in Queensland each year; and
> sea-level rises causing displacement of people in the islands around Australia (Garnaut, 2008: 127; see also Barratt et al., 2009: 31).

A rights framework – through a gendered lens

Addressing these significant potential social outcomes of climate change and the intersecting variables outlined above requires a fundamental change in the discursive construction of climate change in Australia. The 2010 political debate post-Copenhagen is very much focused on economic consequences of climate change most evident in Opposition leader Tony Abbott's argument that the government's position on climate change represents a 'big new tax' (Phillips, 2010). The federal government debate and media representations appear to have become bogged down in rhetoric and political point-scoring.

In order to move beyond this two-dimensional, simplistic, rhetoric it is useful to adopt a human rights framework when attending to the impacts on people and communities. Since 1979 there has been global acceptance of three levels, or generations, of human rights – the first covering the basic rights of people to free speech and liberty; the second generation referring to equality of access to economic and social benefits in society; and the third to collective rights over such things as natural resources, water, etc. (Ife, 2001). It is this third level/generation of rights that provides a useful framework for bringing the rights of people and communities into discussion of climate change impacts. If we accept that these basic human rights are threatened, then there must be political pressure to act to protect the rights of citizens. Further, acknowledging that there are gendered differences emerging in access to these third-generation rights draws attention to the differential impacts on women and men, and the need for differential responses.

White (2009) makes a strong case for a human rights framework to intersect with climate change and increasing food insecurity to bring the social impacts on people and communities more squarely into the discussion. This framework is also useful in addressing the increasing vulnerability of rural people and communities in Australia, who are deeply involved in the consequences of climate change events. Food insecurity, and declining water availability and resultant water politics, illustrate how climate change *sequelae* can have wide-ranging, highly politicized and gendered consequences.

Farm families and rural communities are becoming more vulnerable to changing policy circumstances because their interests/rights have become marginalized, a factor recognized as long ago as 1987 by Lawrence (1987). Their power to influence political decision-making to protect their rights is diminished and their vulnerabilities exposed. Under such circumstances our investigations reveal adaptations on the part of farm family and rural community members which are highly gendered, and often negative and unsustainable. This is very evident in Australia's water politics, where the key players are federal and state governments, private companies and corporate farmers. The rights of irrigators have been increasingly under threat in the new era of water politics and their lack of political influence is evident.

Social consequences of climate change/variability – threatened rights?

In the context of food and water security in Australia, it is important to understand the significance of the Murray–Darling Basin (M–DB), an area known as Australia's food bowl. Much of Australia's food is produced in the M–DB, an area now under serious stress. It covers 1,058,800 sq. km or approximately one-seventh (14%) of the total area of Australia (7,682,300 sq. km), is home to approximately 11 percent of Australia's population and produces over 40 percent of our agricultural produce (MDB Initiative, 2006).

Because of the long-running drought and a history of over-allocation of water for irrigation purposes, there has been major disruption to the river systems and ground water in Australia in the early years of the 21st century. This has created significant political tensions between key players, including the federal government and state governments, along the rivers, between irrigators and environmentalists, and between urban and rural consumers. Increasingly involved are corporate businesses buying water as a tradable commodity, divorced somewhat from agricultural production. These competing interests have led to significant concerns about ecological damage, the preservation of natural species and wildlife corridors, and

the health of the river system, issues that White (2009) would describe as environmental crimes.

In response to declining water in the M–DB following long years of drought, then Prime Minister John Howard announced a $10 billion National Water Plan in 2007, a plan which included the Commonwealth government taking over the Murray–Darling Basin system from the states, modernizing irrigation systems, boosting water efficiency systems on farms and addressing the over-allocation of irrigation water licences by buying up water entitlements. The intent was to conserve water more effectively and to allocate more water to the environment.

The new Labor government, elected in 2007, established a Ministry of Climate Change and Water. In April 2008, surpassing the Howard Water Plan, the new minister announced a $13 billion plan for water management, including significant funds to buy back water from irrigators and to fund small farmers to exit farming altogether (ABC, 2008). This has meant that the government has entered the open market to buy water licences, a process that has led to major disquiet and significant social consequences in various irrigation areas because of the problematic nature of haphazard purchases. People and communities involved have become bit players in a debate being

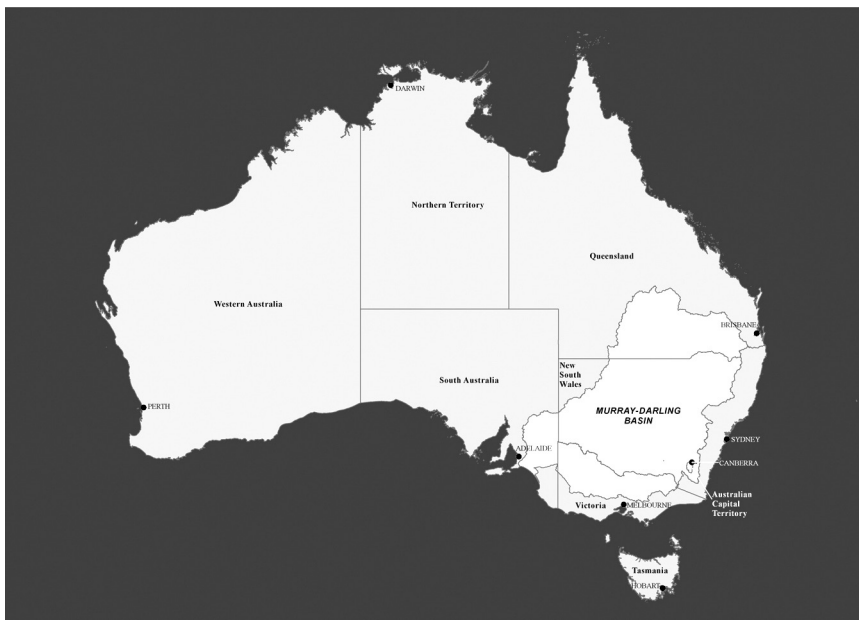

Figure 1: The Murray–Darling Basin and its location in Australia
Source: Spatial Analysis (SPAN) unit, Charles Sturt University.

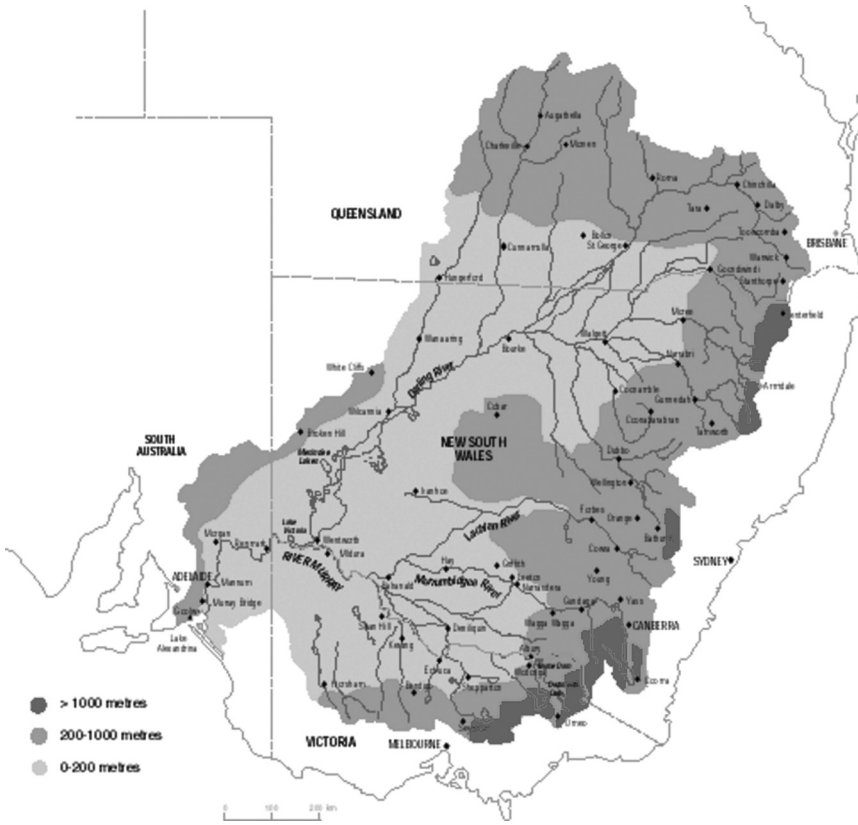

Figure 2: The Murray–Darling Basin
Source: http://www.mdbc.gov.au/about/basin_statistics

carried out at federal and state levels. The buy-back schemes, while useful in intent, have focused heavily on economic imperatives, ignoring the social impacts for disrupted communities. One of the major contributors to negative social outcomes has been the lack of water available to irrigation farmers. Many are now receiving no water and others only a small percentage of their entitlements, and low or no water allocations to irrigators have continued for some years (Alston and Whittenbury, forthcoming). On a recent visit to the area the writer was confronted by kilometre after kilometre of dead and dying orchards and vineyards – a legacy of the lack of water. This horrendous landscape is a feature of the psychological trauma experienced by farming families along the Murray River and its tributaries. It indicates the scale of the water disaster, the consequences of years of over-allocation for political reasons, the environmental implications of declining water and the reduced political influence of farming organizations.

Declining water availability has become a highly visible and politicized consequence of climate change/variation in the Australian context – it has pitted farmers against environmentalists and urban users against rural community users. Very quickly, water has become an economic commodity with a market pricing system, and several water bodies dominate the way water is allocated, to whom and for what purpose (Alston and Mason, 2008b). Responses to declining water in Australia have been what Terry (2009: 6) describes as stereotypically 'masculine' – that is, more reliant on technological solutions and economic measures rather than local social and community interests. Water bodies are also dominated by older men and the position of women and Indigenous people is marginalized. Previously the author has examined the way water has become commodified and noted two particular issues. One is the dominance of men on bodies making decisions about water and its value and uses, and therefore a strong focus on the economic value of water (Alston and Mason, 2008b). This confirms Lane and McNaught's (2009) contention that resource allocation decisions are most often taken by men, that these do not always incorporate the views/rights of all community members, that they are more likely to be based on economics rather than the social good and that they are not always fair. The other notable issue is that there is limited focus on the social value of water – the 'social flow' (Nathan, 2007), which we define as the aesthetic benefits of waterways to community, the spiritual significance to Indigenous Australians and the enjoyment of waterways for recreational uses (Alston and Mason, 2008a) – alternative rights to those of the dominant water purchasers.

While there is no suggestion of a rigid gender divide in the way women and men value water, our research suggests that women's concerns are more likely to encompass the 'social flow' value of water (Nathan, 2007). Yet what we have seen develop very quickly in Australia is a market for water as an economic commodity and its value has not included the qualitative valuing of water described above. Further, there are potential gendered consequences in this commodification process as men are far more likely to have access to economic resources than women, and hence to control the way water is used and distributed.

Climate events and their economic and environmental impacts, together with food insecurity and the increasing commodification of water, are significant political issues in Australia and ones that are debated almost daily. Less attention has been paid to the social consequences of extreme climate variability, and yet, as Hemmati and Röhr (2009) note, if social issues are included in climate change debates and policies, women's voices are far more likely to be heard. The author has focused on the social aspects of climate change over a number of years, in several studies and across several states in Australia, including those covered by the M–DB. The following section provides a summary of the social consequences of climate change

events, focusing particularly on those resulting from incremental change – the long-running Australian drought.

The social consequences of climate change/variability events in Australia have been extensively documented and indicate significant gender differences (Alston and Kent, 2006; Alston and Whittenbury, forthcoming; Alston and Witney-Soanes, 2008; Alston et al., 2004; Stehlik et al., 1999). In summary they include:

increasing poverty, particularly among those associated with agriculture – farming families, farm workers and contractors;
farming families being forced to make decisions about whether they can continue to farm;
limited funds causing difficult decisions as to how to stretch these across personal and farming costs;
a significant rise in levels of stress and other health impacts;
a need to source off-farm income;
difficulty accessing employment;
significant loss of jobs in small communities affected by drought;
involuntary separation, particularly as women leave to find work elsewhere;
an inability to afford farm labour, putting pressure on women and children to work on-farm;
men in particular being locked into farms because of the need to hand-feed and water livestock;
intergenerational conflict;
marital conflict;
increasing social isolation, particularly among men;
declining educational access among children;
increasing feelings of alienation and mistrust;
small community decline;
loss of social capital evidenced in a decline in social participation;
stress caused by water politics and a lack of information dissemination about this issue;
difficulties in accessing income support;
older couples continuing in farming and putting retirement plans on hold;
low levels of access to services;
depopulation and a particular loss of young people; and
declining levels of individual and community resilience.

Mapping these social impacts

In 2007 funding was received from the federal government to investigate social impacts in the Murray–Darling Basin (Alston and Witney-Soanes, 2008). This project involved selecting a sample of local government areas

across the Murray Darling Basin crossing state and industry boundaries. Within these communities key informants and farm family members were interviewed about their communities, the impacts of the drought and their options for continuing within agriculture. Based on this research we experimented with social mapping of levels of disadvantage. Determinations of area-based disadvantage were reliant on information concerning resources and infrastructure in the local government area, and qualitative key informant knowledge about opportunities for employment, alternative industries and services. As a result of this research, we developed three categories of level of social impact to describe the negative social impacts of the ongoing drought within the local government area – these categories are labelled *patchy*, *significant* and *profound*.

Patchy areas are described as areas where farming families are suffering significant negative social impacts of drought but where the communities retain a high level of resilience because of a diverse range of industries and employment conditions and service infrastructure.

Significant areas are those that had significant numbers of people suffering negative social impacts and these predominantly included irrigation and dryland farming families and agricultural workers. However, there are some larger regional centres in these local government areas with sufficient size and diversity so that there is not total reliance on agriculture. Thus there are options for employment and some service infrastructure, and therefore not all are feeling the same pressures.

Profound areas are defined as those where most people in both the farming and small communities are negatively impacted, largely because these areas are almost totally reliant on agriculture, have limited service infrastructure and almost no alternative avenues of employment. Thus these areas are significantly socially depressed.

As a result of this research we drew up a spatial map to plot the trends in local government areas in relation to levels of social impact. In Figure 3, red areas are those profoundly affected, yellow are those which have significant social impacts and the green areas are regarded as patchy.

Surprisingly, our map showed a definite pattern across the basin with the profoundly affected areas being those with a limited population base and/or along the rivers where irrigation industries are focused. Thus the worst-affected areas are in the remote western regions of the Basin and along the Murray River in the south, where irrigation farming is substantially located and is the basis for the areas' economic activity.

As we worked on our research we were aware of pronouncements made by a senior policy-maker that the people in the towns along the Murray River would be Australia's first 'climate change refugees'. Responding to this message, a leader of one the local government areas in question, Swan Hill mayor, Greg Cruikshank said:

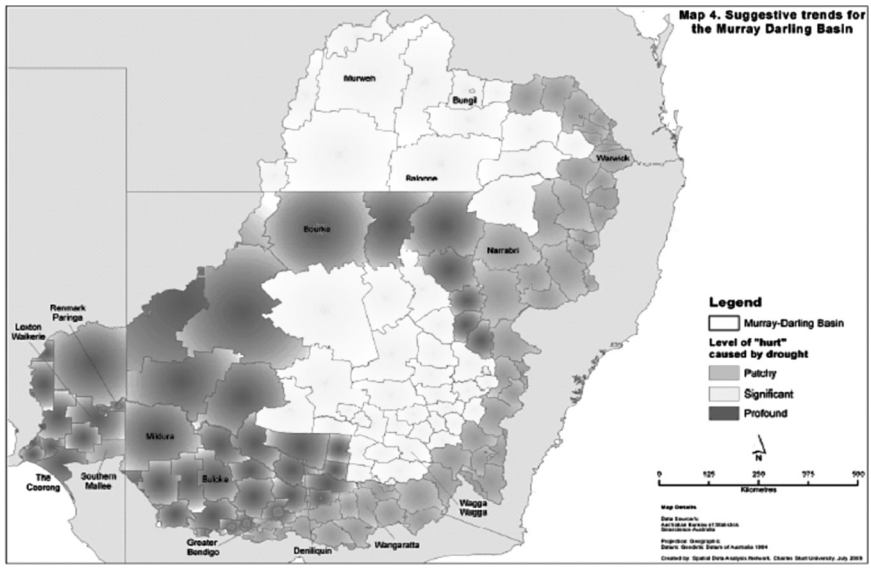

Figure 3: Levels of social impact in the Murray–Darling Basin
Source: Spatial Analysis (SPAN) unit at Charles Sturt University.

> it was the wrong message to be sending out. It's true that Swan Hill's economy is very dependent on Murray River irrigation [but] such comments and newspaper headlines of an 'exodus' from Murray towns are sending the wrong message. If anything, such headlines are the thing to make it happen. Basically coming out and saying we are going to die or are going backwards is not the message we want to be sending to our river communities. (Mossman, 2009)

As a further result of our research and this new debate about potential large-scale social movements within Australia, the author determined to seek further funding to assess the adaptations adopted by people and communities in the profoundly affected areas along the Murray River. This funding was provided by Monash University. Further supplementary funding was sourced from a women's grants program in the federal Department of Agriculture to assess issues affecting women in these areas. Drawing on this current project and other studies conducted over the past decade, it is evident that there are significant gendered impacts of climate change/variability in Australia in these profoundly affected areas.

Gendered adaptations

Our research corroborates emerging international research that recognizes gender as shaping vulnerability and therefore one's capacity to adapt to change, whether it be to catastrophic or incremental change. This results

largely from poverty, cultural norms and vulnerability to disasters (FAO, 2007; IPCC, 2007). Women are more likely to live in poverty, to be constrained by cultural norms surrounding factors such as dress and mobility, and are potentially more vulnerable in disasters because they are more focused on saving/protecting children (Neumayer and Pluemper, 2007). Much of this research on gendered impacts emerges from developing countries. Yet it is clear from our research program and those of others (see, for example, Stehlik et al., 1999) that the social impacts of Australia's climate change events are significantly gendered.

Australian women's contribution to agriculture has been recognized as significant and critical to farm family survival (Alston, 1995; Alston et al., 2004; RIRDC and DPIE, 1998). Women contribute to the farm economy through their on-farm work, their off-farm income generation, their voluntary community work and their extensive contributions to household and carework (Alston, 2000; RIRDC and DPIE, 1998). This work enables the family farming system to continue as the dominant mode of agricultural production (Alston, 2000; Pini, 2002; Shortall, 2002). What is clear is that their efforts to provide off-farm income, on-farm labour and to fill in gaps in community infrastructure through their voluntary efforts have increased during the last decade. Nonetheless, because their input on farm is largely unacknowledged, or their off-farm work takes them away from the farm, it is invisible in discursive constructions of farm and rural living.

What is significant for this article is that research conducted in 1994–5, 2003, 2005, 2007 and currently on the social impacts of drought – or incremental climate change (Alston and Kent, 2006; Alston and Whittenbury, forthcoming; Alston and Witney-Soanes, 2008; Alston et al., 2004; Stehlik et al., 1999) illustrates that women and men adapt differently because of their different orientation to, and diverse roles within, agriculture and rural communities. Men are more likely to be attending to the heartbreaking and constant physically demanding tasks of feeding livestock, carting water, destroying frail animals and generally coping with the realities of a barren and eroding landscape. Women, on the other hand, are more likely to be assisting with farm tasks and working off the farm for the much-needed income for the family to survive in agriculture. The result is that men are more likely to be locked into the farm, becoming more socially isolated and depressed (AAP, 2006; Alston and Kent, 2006; Alston et al., 2004). Women are more likely to be interacting in the community, monitoring the health of their family and ignoring their own health and welfare (Alston and Kent, 2006; Alston et al., 2004).

Our current research in the M–DB also reveals that years of hardship and uncertainty, and new realities of declining water access, have resulted in significant gendered impacts and adaptations in these profoundly affected areas. Men are facing crises in relation to their identity and masculinity as their lives as farmers are under significant threat, and suicide levels

are higher by comparison with rural women and urban men (Alston, 2010). This has led to significant health issues, increasing social isolation and a very real sense of grief and loss as they struggle with the physical reality of eroded landscapes and dying livestock, and the likely loss of their farming identity (Alston and Kent, 2008). Many are facing decisions about leaving farming as climate change, and resultant new policies around water, reduce their options and their resilience – issues that significantly impact their view of rural masculinity (Alston, in press; Alston and Kent, 2008). These factors, which are very much out of their control and unresponsive to continued hard work, have significantly increased their stress and affected their capacity to respond. What has also added to their health and welfare issues is that they have limited input into policies (for example, water policy) being made around their livelihoods and futures, and that they feel demonized by a community view that farmers are somehow responsible for the crisis. Farming men, as a group, have lost political power, and other key players, such as governments and corporations, now dominate policies around food and water security, leaving the former feeling increasingly disempowered.

Women in these profoundly affected areas are working in a number of areas on-farm, off the farm and in the community – often up to an advanced age. It is not unusual for researchers to interview health professionals and teachers in communities that have been profoundly affected to find that these same women are from farming families, that they take their holidays in times of high work load on-farm in order to contribute farm labour and that they are themselves extremely stressed by their circumstances. They can see no end to their working lives and they face stresses related to climate change both at work and at home. What is also clear from our research is that women are constantly monitoring their husband's health, sometimes to the extent that they will turn off the radio or television if reports include bad news on weather, drought or water access. Women have taken on the role of guardians of men's health, often at the expense of their own, and are continuing to work past retirement age to ensure their partners can remain in farming.

Our research reveals that adaptations to climate change in rural areas of Australia are highly gendered. Men are more susceptible to negative adaptations in the areas of health and welfare, and are more prone to social isolation. Making informed decisions about their futures is difficult because many of the variables that might determine their future are out of their control.

Women's adaptations, while more positive in the sense that they are sourcing off-farm income and protecting their family members, are also negative because they ignore their own health and welfare and work hard in all areas of their lives. Women have adopted a natural caring role that extends beyond their family to their communities. In doing this, they are

failing to care for themselves and there is a lack of responsive support to the very real emotional, health and welfare needs of women.

Conclusion

Regardless of views on the permanence of climate change/variability, this article reveals there are very real social consequences emerging across the world and that these are highly gendered. Our Australian research mirrors this view, detailing the impacts on and adaptations of women and men to large-scale and ongoing climate events. Drought and a lack of water have had profound social consequences in the food bowl of Australia – the Murray–Darling basin. Our ongoing research reveals a significant crisis, particularly in the profoundly affected areas that have been the focus of our research, and reveal a likely large-scale movement of people away from areas where water has become a scarce commodity. Yet the debate about water and climate change in Australia has become fixated on economic consequences, and the commodification of water is one result of this, leaving these urgent social consequences unaddressed. The reasons for this include declining political power of farmers, the increasing power of other key players, a lack of focus on the social and a dominance of decision-making by men – often not necessarily those with significant local knowledge. What is being lost is both the incorporation of local understanding of the environment and landscapes and of local people as active, positive change agents. As Lane and McNaught (2009) argue, if people are unable to earn a decent living then they will aggravate the negative impacts of climate change and their adaptations will be dysfunctional and unsustainable. Failing to incorporate local knowledge will hamper sustainability and exacerbate negative adaptations. White's (2009) articulation of the need for a rights-based framework in relation to the environment and its impact on people is one that can be fruitfully extended to the people and communities in areas profoundly affected by climate change events. Incorporating an understanding of the third generation of human rights into the climate change debate will give a framework to address the very real hardships being faced by people in rural areas, who face daily struggles with the consequences of climate change/variability and other intersecting variables.

Ongoing research reveals that there are gendered consequences to these events, that men and women have responded and adapted differently, and that the health and welfare of both women and men are compromised by their adaptations. Further research is needed to inform policy on the social fall-out of climate change and lack of water. Gender-sensitive social policy is also required to provide a safety net that protects people seriously impacted by these events and allows them to adapt in more positive and sustainable ways.

There is no doubt that a lack of gender awareness is a factor in Australia's lack of preparedness for significant social outcomes from ongoing climate change events. Gender-sensitive policies and the incorporation of women into decision-making about climate change are essential. The rallying cry for feminists who launched GenderCC at the Bali conference was: 'No climate justice without gender justice' (Terry, 2009: 15). There is no doubt this holds true for Australia as for the rest of the world.

References

AAP (Australian Associated Press) (2010) 'Abbott Challenges Rudd to Early Election', *Sydney Morning Herald* 5 February, URL (consulted Ferburary 2010): http://news.smh.com.au/breaking-news-national/abbott-challenges-rudd-to-early-election-20100205-nh19.html

AAP (Australian Associated Press) (2006) 'Beyond Blue: Calls for Rural Counselling', National Nine News, 19 October, URL (consulted November 2006): http://news.ninemsn.com.au/article.aspx?id=153751

ABC (Australian Broadcasting Commission) (2008) 'Minister Penny Wong – Transcript of Interview with Tony Jones', Media Release, *Lateline* 30 April, URL (consulted July 2009): http://www.environment.gov.au/minister/wong/2008/pubs/tr20080430.pdf

Adams, David (2008) 'UN Warns of a Hungry and Less Stable World: Food Riots Likely to Be More Frequent', *The Age* 10 April: 12.

Alston, Margaret (1995) *Women on the Land: The Hidden Heart of Rural Australia*. Sydney: University of NSW Press.

Alston, Margaret (2000) *Breaking through the Grass Ceiling: Women, Power and Leadership in Rural Australia*. Churr, Switzerland: Harwood Publishers.

Alston, Margaret (2009) 'Gender and Climate Change', in John Martin (ed.) *Climate Change in Regional Australia: Social Learning and Adaptation*. Canberra: ASSA.

Alston, Margaret (2010) 'Rural Male Suicide in Australia', *Social Science and Medicine* (special issue) 70.

Alston, Margaret and Jenny Kent (2006) *Impact of Drought on Rural and Remote Education Access: A Report to DEST and Rural Education Fund of FRRR*. Wagga Wagga: Centre for Rural Social Research.

Alston, Margaret and Jenny Kent (2008) 'The Big Dry: Exacerbating the Link between Rural Masculinities and Poor Health Outcomes for Rural Men', *Australian Journal of Sociology* 44(2): 133–47.

Alston, Margaret and Jenny Kent (2009) 'Generation X-pendeble: Declining Human Capital Investment in Rural and Remote Young People', *Australian Journal of Sociology* 45(1): 89–107.

Alston, Margaret and Robyn Mason (2008a) 'Who Turns the Taps Off? Introducing Social Flow to the Australian Water Debate', *Rural Society* 18(2): 131–8.

Alston, Margaret and Robyn Mason (2008b) 'Who Determines Access to Australia's Water? Gender, Citizenship and Stakeholder Priorities in the Australian Water Crisis', *Rural Society* (special issue, *Gender and Water*) 18(3): 214–19.

Alston, Margaret and Kerri Whittenbury (forthcoming) *Social Impacts of Climate Change in the Murray–Darling Basin*. Melbourne: Monash University.

Alston, Margaret and Kym Witney-Soanes (2008) *Social Impacts of Drought and Declining Water Availability in the Murray-Darling Basin*. Wagga Wagga: Institute of Land, Water and Society, Charles Sturt University.

Alston, Margaret, Jenny Kent and Anne Kent (2004) *Social Impacts of Drought: Report to NSW Agriculture*. Wagga Wagga: Centre for Rural Social Research, Charles Sturt University.

Barratt, Paul, Graeme Pearman and Mike Waller (2009) 'Climate Change: What Sort of Resilience Will Be Required?', pp. 30–5 in Steve Cork (ed.) *Brighter Prospects: Enhancing the Resilience of Australia*. Weston, ACT: Australia 21, Shaping the Future. URL (consulted June 2010): http://www.australia21.org.au/pdf/A21%20Brighter%20Prospects%20Report.pdf

FAO (Food and Agricultural Organization) (2007) *Gender and Climate Change: Existing Research and Knowledge Gaps*. Rome: Gender and Population Division, FAO.

Garnaut, Ross (2008) *The Garnut Climate Change Review: Final Report*. Melbourne: Cambridge University Press.

Hemmati, Minu and Ulrike Röhr (2009) 'Engendering the Climate-change Negotiations: Experiences, Challenges, and Steps Forward', *Gender & Development* 17(1): 19–32.

Ife, Jim (2001) *Human Rights and Social Work: Towards Rights-based Practice*. Cambridge: Cambridge University Press.

IPCC (Intergovernmental Panel on Climate Change) (2007) *Fourth Assessment Report*, URL (consulted March 2008): http://www.ipcc.ch/

Lambrou, Yianna and Grazia Piana (2006) *Gender: The Missing Component of the Response to Climate Change*. Rome: Food and Agricultural Organization.

Lane, Ruth and Rebecca McNaught (2009) 'Building Gendered Approaches to Adaptation in the Pacific', *Gender and Development* 17(1): 67–80.

Lawrence, Geoffrey (1987) *Capitalism in the Countryside*. Sydney: Pluto Press.

McMichael, Anthony J. (2003) 'Global Climate Change and Health: An Old Story Writ Large', in Anthony J. McMichael, Diarmid H. Campbell-Lendrum, Carlos F. Corvalan, Kristie L. Ebi, Andrew Githeko, Joel D. Scheragaet et al. (eds) *Climate Change and Human Health: Risks and Responses*. Geneva: World Health Organization.

MDB Initiative (2006) *Basin Statistics*, URL (consulted July 2009): http://www.mdbc.gov.au/about/basin_statistics

Mossman, Simon (2009) 'River Mayor Upset by Climate Refugee Tag', *Sydney Morning Herald* 18 March, URL (consulted July 2009): http://news.smh.com.au/breaking-news-national/river-mayor-upset-by-climate-refugee-tag-20090318-91ze.html

Nampinga, Rachael (2008) 'Gender Perspectives on Climate Change', paper presented at the Emerging Issues Panel, UN Commission for the Status of Women meeting, New York, February.

Nathan, Erica (2007) *Lost Waters: A History of a Troubled Catchment*. Carlton: Melbourne University Press.

Neumayer, Eric and Thomas Pluemper (2007) 'The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981–2002', URL (consulted November 2009): http://papers.ssrn.com/sol3/papers.cfm?abstract_id=874965

Phillips, Jesse (2010) 'Abbott's Plan "No Big Tax"', *The Manly Daily*, URL (consulted February 2010): http://manly-daily.whereilive.com.au/news/story/abbott-plan-no-big-tax/

Pilmer, Ian (2009) *Heaven and Earth – Global Warming: The Missing Science*. Sydney: Connor Court Publishing.

Pini, B. (2002) 'The Exclusion of Women from Agri-political Leadership: A Case Study of the Australian Sugar Industry', *Sociologia Ruralis* 42: 65–76.

Revelo, Lorena Aguilar (2008) 'Gender Perspectives on Climate Change', paper presented at the Introductory Session to the Gender and Climate Change Emerging Issues Panel, UN Commission for the Status of Women meeting, New York, February.

Rodgers, Emma (2010) 'Rudd Rattled on Climate Change: Abbott', ABC News On-line, 3 February, URL (consulted February 2010): http://www.abc.net.au/news/stories/2010/02/03/2809402.htm

Roehr, Ulrike (2010) 'Gender in the Copenhagen Outcomes: Half of Nothing is Nothing', GenderCC website, URL (consulted February 2010): http://www.gendercc.net/policy/conferences/cop15.html

RIRDC (Rural Industries Research and Development Corporation) and DPIE (Department of Primary Industries and Energy) (1998) *Missed Opportunities: Harnessing the Potential of Women in Australian Agriculture*. Canberra: Commonwealth of Australia.

Shortall, Sally (2002) 'Gendered Agriculture and Rural Restructuring: A Case Study of Northern Ireland', *Sociologia Ruralis* 42(2): 160–75.

Stehlik, D., I. Gray and G. Lawrence (1999) *Drought in the 1990s: Australian Farm Families' Experiences,* Rural Industries Research and Development Corporation (RIRDC) Publication No. 99/14. Kingston: RIRDC.

Terry, Geraldine (2009) 'No Climate Justice without Gender Justice: An Overview of the Issues', *Gender & Development* 17(1): 5–18.

White, Rob (2009) 'Introduction: Environmental Crime and Eco-global Criminology', in Rob White (ed.) *Environmental Crime*. Cullompton, Devon: Willan Publishing.

Biographical note

Margaret Alston is Professor of Social Work and Head of Department, and is also Director of the Gender Leadership and Social Sustainability Research Unit at Monash University. *Address*: Monash University, Victoria 3800, Australia. [email: Margaret.Alston@monash.edu]