

The 1998 Floods in the Tambo Valley

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This paper examines the flood event of June 1998 and its effect on residents of the upper Tambo Valley, in Victoria south east Australia. While the concept of vulnerability has been widely employed to understand disasters, this case study is unique in that it adopts a long-term historical perspective of vulnerability. It shows that rather than being the result of a chance occurrence of a natural event, the 1998 flood disaster was in fact foreseeable, and the culmination of various social, political, economic and environmental pressures, some of which had existed for well over a century.

Introduction

Today it is fairly widely accepted that 'natural' disasters are not solely the product of a natural phenomenon, but of the social, political and economic environment that shapes the manner in which a natural event affects people. 'Vulnerability' has emerged as a central concept for understanding what it is about the condition of people that enables a hazard to become a disaster. Broadly speaking, 'vulnerability' has physical and social components, and refers to the characteristics of a person or group in terms of their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard (Wisner et al. 2004).

The vulnerability perspective is based on the recognition that unsafe conditions are rooted in the opportunities and limitations of everyday life, and become obvious only with the impact of a hazard. As part of everyday life, vulnerability is not static, but is continuously modified. However in practice, the concept is frequently implemented through taxonomic checklists listing characteristics such as gender, age, health status, disability, and socio-eco-

conomic status. While these checklists identify *who* is most vulnerable, they present vulnerability as a static condition and fail to assist an understanding of *why* and *how* these people came to be unsafe.

Numerous explanations and tools have been developed to describe how vulnerability arises. Some writers identify the basic forms of vulnerability experienced by people in a particular place at a specific point in time (i.e. Hewitt 1997), and others focus on the social and political-economic structures that cause high levels of vulnerability (i.e. Wisner et al 2004, Watts and Bohle 1993). These approaches acknowledge that vulnerability has a temporal dimension, referring not only to the potential for loss arising from an event, but to limitations on the capacity to recover after disaster (see Anderson and Woodrow 1989, Cannon 1993, Koob 2000). Vulnerability is therefore rooted in history.

Although numerous writers have acknowledged this historical dimension of disasters and have sought to examine the causation of vulnerability, very few case studies exist of how history has shaped vulnerability over a long period of time. This case study offers a singular insight into the manner in which various social, political, economic and environmental processes interacted over a period of more than a century to produce a flood disaster that was anything but unforeseeable.

The 1998 Floods In The Tambo Valley

In late June 1998, the Shire of East Gippsland, which lies in the far east of the state of Victoria, Australia, was declared to be in a State of Emergency following a one-in-100 year flood event. While the entire shire was affected, significant government and media attention was directed towards the Tambo Valley (Figure 1). Media coverage of the “flood mayhem” tended to blame the “natural disaster” on “a record flood on top of a...drought”. However a historical analysis of the conditions creating and shaping vulnerability reveals that the disaster was not the result of an unusual coincidence of abnormal events in nature, but entirely foreseeable. While torrential rain may have provided the trigger for a ‘1-in-100 year flood’, the disaster that resulted was shaped by underlying conditions and processes which had existed for well over a century.

The Tambo Valley

The Tambo River begins near Bindi, in the Great Dividing Range in north-east Gippsland (the eastern region of the state of Victoria). It flows through the narrow Tambo Valley, which is bordered by Tongio Gap in the north and Tambo Crossing in the south. “The Gap”, as it is known by locals, is a break in the Great Dividing Range that runs through the area of the old Omeo Shire. The high

Figure 1: Study Area

mountain ranges and expansive plains of Omeo and Benambra lie 'above the Gap', in the catchment of the northerly-flowing Mitta Mitta River. The Tambo Valley lies 'below the Gap', in the catchment of the Tambo River, which flows south. The valley lies in a rain-shadow associated with the Great Dividing Range, and differs in climate and soils from the area above the Gap. The Gap provides both a geographical division and a cultural one, because the identities of residents are strongly tied to their position 'above' or 'below' the Gap. The study area is therefore defined by administrative, cultural and biophysical boundaries.

Understanding Vulnerability In The Tambo Valley

There is no common conceptualization of vulnerability, but all definitions describe a *potential* state of affairs (Hewitt 1997). Examples include “the potential for disruption or harm” (Wisner 2001), or a “lessened ability to cope with potential situations” (Allen, 2000, 1). This research was concerned with vulnerability associated with a specific natural hazard (flood), and defined it as:

The potential for individuals, households and communities to experience harm to life and livelihood as a result of flood.

Vulnerability is often assessed in terms of potential for loss to individuals and households. However the degree of exposure experienced by individuals occurs within the context of the exposure experienced by the broader community. The goal of this research was to examine the broad processes shaping and producing vulnerability. As a result this study was not confined to a single unit of analysis, but examined the broad patterns of vulnerability existing at the individual, household and community¹ level, through an inquiry into:

- (a) the historical processes that have shaped the economic and social life of residents of the study area;
- (b) how changes in the economic climate have interacted with the biophysical climate; and
- (c) how policy interventions have altered conditions of vulnerability for different groups within the study area.

Information was gathered during interviews and focus groups, and was supplemented by information on the key economic, demographic, social and environmental features of the study area and its population. Newspaper reports, and residents’ personal records and scrapbooks (both published and unpublished) were key sources of historical information.

The History of Settlement in the Tambo Valley

...one of the most beautiful spots I have ever seen, but the climate is fickle and the land is subject to drought. (Rev. Clarke’s diary, 21 December 1851, in Pearson 1969)

Omeo's Glory Days: Exploration And Gold Mining

The original inhabitants of the Omeo and Tambo Valley districts were the Kandagormittung clan of the Kurnai (or Gunnai) nation. Non-indigenous peoples arrived in the area in the late 1830s, as graziers from the Monaro plains across the border in New South Wales moved south in search of new grazing runs. The graziers used the indigenous people's traditional route to travel down the Tambo River to reach the plains and the harbour at Port Albert. This track was the first road in the Gippsland region, and became the vital route linking the graziers to the outside world (LCC 1982, Wells 1986, Morgan 1997). European settlement in Gippsland was particularly bloody, and by the 1850s the indigenous population had been reduced from 2,500-3,000 to merely 200 (Gardner, 1993, 12).

North-east Gippsland experiences lengthy dry periods interspersed by relatively heavy rainfall events, and is characterized by low winter temperatures and extensive dry summers. The severe climate caused graziers to suffer heavy cattle losses, and meant that large runs were needed to ensure adequate pasture and water sources, particularly in the Tambo Valley, which lies in a rain-shadow. Omeo provided the gateway for traffic into the Gippsland region, but development of the township was slow due to poor communications, transport and markets. Construction of the road through the Tambo Valley was slow, due to the difficulty of construction in the steep terrain. Heavy rains could occur at any time of the year, damaging the existing track and making it impassable (Davidson 1981, Watson 1984, Morgan 1997, Webber 2001).

The second phase of settlement occurred following the discovery of gold in Omeo in 1851. Although the isolation of Omeo prevented any "rush" to the district, hundreds of miners journeyed south along the Mitta Mitta River to Omeo, and on to the Tambo Valley. Roads improved significantly and townships developed as businesses opened to support the rapidly growing population. Development slowed as alluvial mining declined, but regained momentum in the 1880s when large reef mines were established (Boldrewood 1892; Osborne 1920)

Free Selectors From The South

Although miners provided a market for farm produce, the expansion of agriculture other than grazing was slow. In the 1860s land was opened up for selection, and a steady stream of selectors made their way to the Tambo Valley from the newly-established port at Port Albert. This third phase of settlement brought stability and permanency to the district, and the Omeo Shire was created in 1872 (Pearson 1969; Powell 1974; Davidson 1981).

Although fertility varies, the depth of soil is shallow throughout the Tambo Valley, limiting agricultural productivity. The valley is narrow and the hills are

steep, particularly at Swifts Creek and Bindi. Agriculture became the dominant economic activity as gold mining declined, but its profitability was limited by the severe climate, poor soils, steep terrain and expensive freight to distant markets. Selectors found that they needed more than the allotted 320 acres to generate an adequate income, and by the mid-1870s significant farm consolidation had occurred as some selectors abandoned their properties and others acquired them (Mackay 1916; Pendergast 1968; Pearson 1969; Davidson 1981; Court 1990; Morgan 1997; Arup Environmental and Planning 2000).

The isolation of the Tambo Valley grew more problematic as the importance of Omeo in transport routes declined from the 1860s onwards. Traffic ceased to enter the Gippsland region via Omeo following the establishment of a port at Port Albert, and the focus of Gippsland's development moved even further away following the establishment of a road from Melbourne to Sale in the 1860s, and a parallel railway line in the 1890s. When use of the Tambo River was abandoned in the 1890s, the only route to the Tambo Valley and Omeo was the road through the valley, which was frequently damaged by flooding. Alternative routes were developed, but abandoned because they ran above the snow-line (Gippsland Community Reference Group 1993).

In the 1890s, the Australian agricultural industry collapsed, and this coincided with the beginning of a drought and the arrival of rabbits in the Tambo Valley. Overgrazing occurred because farmers were struggling to earn a living in conditions of drought and low commodity prices, and this land degradation was exacerbated by rabbits (Gippsland Community Reference Group 1993). The steep terrain was left without vegetation and exposed to erosion from rainfall and increased the velocity of runoff, so that when rain occurred, it led to significant soil loss and damage to bridges and roads. Farmers and businesses suffered as trading was brought to a halt, and the Council lacked the funds to repair infrastructure because residents were not paying shire taxes (Pearson 1969, McRae 1976; Thompson 2000).

The lack of water arising from the drought caused significant damage not only to agriculture, but also to the mining industry. A further blow came, causing the last remaining mines to close, when the outbreak of World War I led to serious labor shortages. The loss of the mining population meant that local businesses were now solely dependent upon spending by farmers, who were spending very little due to their low incomes. Many townships became ghost-towns, but Swifts Creek and Omeo survived due to the location of banks and public offices there. Drought conditions continued until 1920, interspersed by several heavy floods that caused widespread damage land which was exposed due to rabbits, overgrazing and drought; and to infrastructure which residents and the shire lacked the financial resources to repair (Daley 1960; Pearson 1969; McRae 1976; Davidson 1981).

Soldier Settlement And The Development Of A Timber Industry

The Tambo Valley's population increased at the end of the end of WWI when the Federal Government's closer settlement scheme was utilised to provide work for ex-servicemen. Several stations around Ensay were acquired by the government, subdivided, and the blocks provided to soldier settlers.

Heavy floods in 1923 and 1924 caused extensive damage to bridges and roads, which the Shire lacked the financial resources to repair, because most residents were experiencing low incomes and were not paying shire taxes. Damage to infrastructure restricted access to markets and exacerbated the sense of remoteness experienced by residents of the Tambo Valley. The state government ultimately recognized the need to relieve the Shire of construction and maintenance costs, and declared the road through the Tambo Valley the first State Highway in 1925. When heavy floods occurred again in 1925, the Shire's financial situation meant that most roads could not be repaired, but state government funding was available to repair the re-named Omeo Highway (Pearson 1969).

The economic conditions in the Tambo Valley grew still worse during the Great Depression in the 1930s. The profitability of grazing had always been limited due to the severe climate and high freight costs, but became even more so due to the low prices being received for stock. However local markets for dairy products were good, enabling most farmers to supplement their incomes with dairying. Soldier settlers were the hardest hit, because their blocks were too small to generate adequate profits. In later years these farms would be subsidized by off-farm employment, but unemployment was rife during the 1930s. Many soldiers abandoned their properties, and local businesses suffered reduced trade as a result of low farm incomes and depopulation (Pearson 1969; McRae 1976).

A further blow came in 1939, when horrific bushfires decimated much of south-eastern Australia. Several weeks after the fires, heavy rainfalls resulted in flooding and further damage to infrastructure as water poured off the burnt-out hills. Farmers, businesses and the Shire Council had been hard hit by the Great Depression, and lacked the economic means to restore damage caused by the bushfire and floods. Yet another setback came in the form of the rationing associated with World War II, which had a heavy impact on the Shire due to existing isolation from markets and commodity supply (Pearson 1969; McRae 1976).

When fuel rations were lifted at the end of World War II, improved transportation and the demand for timber associated with the post-war housing boom enabled the establishment of a timber industry, including a number of saw mills. This resulted in marked progress for the Tambo Valley, which following the demise of mining had been left to depend on agriculture,

supplemented only by banks and government offices. The establishment of the timber industry provided the district with a vital secondary industry, and led to improved trade for local businesses. In 1947, the Omeo Shire showed a credit balance for the first time since its inception (Pearson 1969; Davidson 1981; Arup 2000; DNRE 2000; Webber 2001).

Gippsland's "Outback": Floods And Isolation

The Tambo Valley prospered throughout the 1950s, but it remained isolated in terms of service provision and communications and transport infrastructure. This intensified not only the economic costs, but also the sense of isolation arising due to long-distances to centers of commercial and political power. The Omeo Highway provided the only route through the area, and despite numerous government reports highlighting the need for an all-weather road, it remained unsealed (see, for instance, EGPC 1976, EGRPC 1977, TCPB 1979). This left the area susceptible to isolation due to flooding, and restricted the ability of farmers and businesses to trade.

The experiences since European settlement showed that floods caused damage to bridges and roads every two or three years, but had the greatest effect when following periods of major drought and low commodity prices. The combined effect of drought and low commodity prices would result in extensive overgrazing, leading to increased environmental degradation of the steep slopes. Low incomes and the need for off-time work would limit the funds and time available for farmers to maintain farms, allowing rabbits to breed uncontrolled and resulting in further damage to land and productivity. East Gippsland experiences exceptionally heavy downpours (over 75mm in 24 hours) more frequently than any other part of Victoria, creating a need to guard against surface erosion. When heavy rains followed long periods of drought, the hills would be without cover, and water would pour off the steep terrain, causing extensive erosion and heavy damage to roads and bridges. The same places experienced the most damage from each flood, not only because of physical exposure to flood waters, but because the financial resources of residents and the Shire were always limited, and trouble spots could never be completely reconstructed.

The period 1946-1976 was marked by sharp population decline (25%), as farmers gave up the struggle against difficult climatic conditions and limited access to markets, and vacated their properties. In the 1960s, good cattle and wool prices enabled some of the remaining farmers to expand their holdings by acquiring vacant properties. Transport and communications also improved, because government policy became increasingly concerned with social equity issues. Improved transport provided better access to markets for

farmers and business, but it also removed the need for local creameries and butter factories. By the 1980s dairying had completely ceased in the Tambo Valley, and properties were devoted to sheep and beef farming .

A New Era For Rural Australia

The 1970s ushered in a new era in Australian economic policy that led to changes in the social and economic life of the Tambo Valley. A series of major structural changes in the world economy during the early 1970s contributed to falling demand for goods and services, rising unemployment and increasing levels of public and private debt. In response to this, the Australian government turned away from policies based on economic protectionism and the welfare state, towards neoliberal policies emphasizing minimal government intervention in the economy. Agricultural industries were increasingly exposed to international markets and commodity price fluctuations. While the remove of tariffs and import restrictions enable the penetration of overseas markets, it also enabled the penetration of favored imports. Technological innovations increased efficiency, but were costly to adopt and favored large, capital intensive producers rather than small family farmers with restricted incomes .

Farmers in the Tambo Valley had limited resources with which to respond to these changes because of the difficult environmental conditions, geographical isolation, and the small size of farms. The profitability of agriculture in the Tambo Valley had always been poor, and the removal of tariffs and the demise of dairying left farmers highly exposed to fluctuations in wool, lamb and beef prices. Due to the small size and limited diversity of the district's economic base, the experiences in the agricultural sector had significant downstream impacts. The Tambo Valley's population has experienced a number of conditions and trends since the 1970s, including:

- declining farm incomes and increasing dependence on off-farm incomes as costs of production increase while prices paid for most products decrease ('the cost-price squeeze');
- significant farm consolidation as producers either leave agriculture or increase the scale of production through land acquisition;
- a decline in the numbers employed in farming due to farm consolidation and the substitution of capital for labor;
- an ageing and declining population;
- declining farm incomes and depopulation leading to decreased expenditure on goods and services in the local community;
- decreased viability of many businesses and erosion of non-agricultural employment opportunities;

- further ageing and depopulation as younger people move out in search of education and employment opportunities;
- increasing pressure to reduce or remove local education, health and community services as the depopulation results in less demand for these services;
- deterioration of local social institutions and social interaction due to depopulation, ageing and loss of hope in the future of the Tambo Valley.

The ongoing economic and social viability of communities in the Tambo Valley therefore faced new challenges as incomes, employment opportunities and population declined in the context of withdrawal of state support for rural communities. The structural changes occurring since the 1970s both exacerbated the traditional conditions of vulnerability facing residents and created new ones, and this became increasingly apparent throughout the late 1980s and early 1990s.

The Struggle of Everyday Life

...and it just goes on day, after day, after day... (Ensay farmer)

The history of the Tambo Valley since settlement in the late 1830s reveals that residents in the Tambo Valley have always had a limited ability to respond to adverse climatic or economic conditions. However during the 1990s, various changes in the economic climate interacted with existing social and biophysical conditions in the Tambo Valley to intensify or create new conditions of vulnerability. Residents described the 1990s as a period characterized by “a series of blows”, each giving rise to escalating vulnerability.

Restructure, Rationalization And Downsizing

The Tambo Valley has experienced depopulation and an associated decline in the local economic and employment base since the 1940s. In 1996, the estimated population of Swifts Creek was 230 and Ensay 130, with an estimated 250 people in the surrounding areas of Bindi, Tongio, Cassilis, and Tambo Crossing (ABS 1996). Depopulation has resulted in increased pressure to downsize government services, and has reduced the ability of businesses to trade. This has led to further reductions in employment opportunities and reinforced the pattern of population decline and economic decline. As one resident noted:

Small communities such as ours have found in the past, and are finding again, that it's difficult to survive with a small population (local business person, September 2001).

In the late 1980s, economic activity in the Tambo Valley was heavily based on agriculture and the timber industry, supplemented by State Government employment. The timber industry provided the district with a vital alternative industry to agriculture. The Swifts Creek community relied heavily on the sawmill, which in 1988 provided 55 on-site jobs, or about 40% of the jobs in the town. Mill firefighters provided an essential community service to the district, and the owners of the mill supported the local community by donating land, equipment for community projects, and scholarships for students. The role of the mill was so significant that one study stated: “Swifts Creek is probably more dependent on the future of the timber industry than on any other factor” (Henshall 1988, 210).

Communities in the Tambo Valley were therefore significantly affected by changes occurring in the timber industry in the early 1990s as a result of changing State Government policies. The viability of forestry in the Tambo Valley had always been limited by the steep terrain and severe climate, and reduced timber quotas provided an additional obstacle. Mills were downsized as a result, and by 1997 the Swifts Creek mill offered only 21.5 full-time jobs (Court 1990; RFA Steering Committee 1999). This had both economic and social impacts, as residents of Swifts Creek regarded themselves as a “timber town”, and the location of the mill at the entrance of the town provides a constant reminder of their hardship.

Downsizing in the timber industry meant that the local businesses relied more heavily on the presence of banks and government offices for trade. However these supports were eroded during the early 1990s as bank branches were closed, government services were restructured, and State Government offices were relocated. A further blow came in the form of the amalgamation of the Omeo Shire with four other shires in 1995 to form the Shire of East Gippsland. This resulted in the direct loss of over 20 jobs and additional contract work.

The small size and limited diversity of the Tambo Valley’s economic base meant that the direct and downstream impacts of these changes were more significant than they would have been in larger towns. For instance in Swifts Creek, the downsizing of the mill alone resulted in the loss of approximately 25% of all the jobs in Swifts Creek, a proportion of its economic base that no locality can readily absorb or replace.

A Toxic Combination: Low Commodity Prices And Drought

As employment in other sectors declined, agriculture became the main employment base, accounting for approximately 30% of the labor force. However the jobs offered by agriculture had also declined (by 27% between 1986-1996), and farm incomes have been decreasing since the 1970s. Farmers

have sought to alleviate the 'cost-price squeeze' by increasing their productivity through diversifying their activities and/or increasing their farm size. However both coping strategies are difficult in the Tambo Valley. Opportunities for agricultural enterprises other than sheep and cattle grazing are limited by the severe climate, poor soil quality, and high freight costs arising from long distances to markets and mountainous terrain. Expansion is also difficult due to the length of intergenerational family ownership and mountainous topography, which greatly restricts the availability of farm land (Arup 2000).

Structural changes in agriculture have therefore exacerbated the high potential for disruption to farm incomes that has historically existed in the Tambo Valley. The demise of dairying also meant that when commodity prices dropped in the early 1990s, farmers were unable to supplement their incomes with dairying as they had in the past. The reduced incomes experienced by farmers impacted upon local businesses, which were highly exposed to experiences in the agricultural sector due to the downgrading of activities in other sectors. As one local business owner explained,

The main income here is farming, so when the farmers suffer, everyone suffers.

This drop in commodity prices coincided with the beginning of a drought, and farmers noted that the combined effect of the two conditions was greater than the impact of one alone:

Farmers can deal with drought, and they can deal with low prices, but they can't deal with both (farmer, March 2002).

Farmers struggled to manage the increased costs and reduced productivity that arose from the drought. Land was overstocked because farmers had retained stock in the hope that commodity prices would improve, and their ability to rapidly de-stock through sale or agistment was limited due to restricted finances and high freight costs (Arup 2000). Farmers with small holdings had traditionally relied on off-farm incomes, and were increasingly dependent on these incomes, but this increased dependency coincided with decreasing employment opportunities and rising unemployment. Farmers with larger holdings were not necessarily better off, as many had bought further land by taking on high levels of debt and low living costs prior to the drought. Their ability to respond to the drought by cutting expenses and borrowing money was therefore limited.

The combined effect of drought and overstocking resulted in widespread overgrazing, leading to vegetation loss, erosion and compaction of soil. Many

farmers lacked the finances for fertilizer or weed and vermin control, which led to further degradation and reductions in productivity. Respondents described the hills as “like sand dunes” and the soil as “like concrete”. By the mid-1990s, the steeply-inclined slopes were without cover, allowing precious topsoil to blow off bare paddocks in severe dust storms (Mercer 2000).

The highly visible land degradation had a significant impact on the morale of residents, and one farmer recalled going outside one morning, only to come straight back inside because he “just couldn’t face it, watching the country blow away.” Farmers were frustrated by their financial inability to manage their land in what they regarded to be a “sustainable” manner, and were physically exhausted by the amount of work generated by the drought. This led to a loss of morale and deterioration of support networks as people withdrew from community life:

We were that busy looking after our own survival that it was hard to look at the big picture.

Ovine Johne’s Disease: Income, Identity And Social Conflict

In December 1995, the Tambo Valley suffered a further blow with the first discovery of Ovine Johne’s Disease (OJD) in Victoria, on a property in Ensay. The disease and the Victorian Government’s control program had a number of negative social and economic impacts on residents of the Tambo Valley (Hussey and Morris 1998; ENRC 2000a; ENRC 2000b).

At the time the disease was discovered in Victoria, the government control program involved quarantining properties so that the sheep on them could only be sold directly for slaughter. Properties adjacent to those infected with OJD were also quarantined and placed under trading restrictions. This prevented the transfer of stock around properties, which was essential due to the drought, and had a particularly severe effect at Ensay where holdings are highly fragmented due to soldier settlement and subsequent farm consolidation.

Farmers who slaughtered their sheep received compensation, but adjoining farmers did not, despite suffering the costs of quarantining (ENRC 2000a). De-stocking led to the loss of shearing jobs, furthering declining local employment. Other direct economic consequences of the disease and the control program included lost production, increased flock mortality, restrictions on market access and sales, loss of bloodlines, and reduced value of stock and properties (Hussey and Morris 1998, ENRC 2000a).

The social impacts of OJD and the control program were described by one social worker as “pushing people right to the edge in terms of psychological health and social cohesion”. Farmers experienced trauma arising from the

highly visible suffering of sheep, and the loss of bloodlines often represented the loss of generations of work. At least one farmer was diagnosed as experiencing post-traumatic stress disorder following the slaughter of his sheep (ENRC 2000b, 260). One farmer described de-stocking as representing:

...not just my lifetime, but my father's lifetime, down the drain (farmer, March 2002).

Social cohesion was damaged as the individuals responsible for implementing control programs, and their families, were subject to abuse in public venues such as local supermarkets. Controversy also surrounded the appropriate response of the community following the initial discovery of the disease, because two prominent families had divergent views on whether it should be reported. Due to the small size of communities in the Tambo Valley, this resulted in "a huge rift". At least one individual was described as being "ostracised", and another stopped going to the pub because it was "too stressful" (Morgan 1997, 147; ENRC 2000a; ENRC 2000b).

Anger And Social Conflict

By the mid-1990s, residents of the Tambo Valley were experiencing a great deal of social and economic hardship, which was exacerbated by their sense of being neglected by the government. A government inquiry found that the OJD control actions were implemented with insensitivity and a "lack of regard" for the distress experienced by farmers (ENRC 2000a; ENRC 2000b; Hood et al 2000). The resentment that arose from this was exacerbated by the shire amalgamation, which caused local government offices to become further away. This heightened the isolation, both real and perceived, that has historically been experienced by residents (Project team from DNRE 1999; Buckle et al 2001).

This sense of neglect was compounded by the persistent refusal by the Federal Government to declare the area drought-stricken. While the State government declared the area drought-stricken in 1994, the Federal government did not respond until March 1998. While community organizations offered some drought relief, the distribution of donations often served as a further source of conflict in communities that were already divided.

Increased levels of social conflict impeded social organization, which is vital in the small communities of the Tambo Valley. Community organization offsets some of the disadvantages arising from remoteness, rationalization of government services, and private sector downsizing. Community organizations provide disaster relief and the recreational facilities essential for

well-being, and facilitate social interaction. Reduced social interaction and increased social conflict provided a further threat to this informal security system, which had already been damaged by the ageing and declining population (see also Bryant 1992).

A Community In Crisis?

By 1998, morale among residents of the Tambo Valley was low and social tensions were escalating. Restricted incomes, environmental degradation and social conflict gave rise to feelings of hopelessness, inadequacy and failure. Many residents, including children, were experiencing high levels of stress, as indicated by increased incidence of stress-related illnesses and substance abuse. Residents described listening to the bellowing of starving cattle, and of seeing men cry because their cattle were too weak to walk. There was a sense among some residents that suicide was the only way out. One farmer titled his record of 1998 “The anatomy of a drought—or a bastard of a year.” He wrote:

A very poor start to 1998. Hot and windy, no pasture growth, no hay cut. April and May very bad, river into pools...dams empty...Selling cattle and feeding something every day...End of April sees the country devastated, with much bare ground. Worst situation in our memory...Try many schemes to help the situation...Feeding and inspecting stock every day. Lifting animals and finding that few survive (personal reflections of a farmer, 1999).

It seemed that life in the Tambo Valley was, as one resident put it, “a major disaster”.

“...And Then You Had The Bloody Flood” (Ex-Community Development Officer)

By 1998, residents of the Tambo Valley were asking “what does life have in store for me next?” Then on Tuesday the 23rd of June, the Bureau of Meteorology reported a severe weather dumping torrential rain on the drought-declared area. Heavy snows fell in alpine areas, and the five major rivers in East Gippsland, including the Tambo River, flooded. The East Gippsland Shire suffered an estimated \$77.5 million worth of damage and was declared to be in a State of Emergency. The Tambo Valley was particularly badly affected because, as many people noted,

The flood rode on the back of other issues.

I'd never seen anything like it

East Gippsland experiences exceptionally heavy rainfall more frequently than any other part of Victoria, and can result in high stream flows and floods at any time of the year. Every 2-3 years a particularly heavy fall of rain will cause flooding that results in erosion, and fence and pasture damage. Residents of some properties at Ensay and Tambo Crossing indicated that it is not unusual for them to be isolated for 1-2 days (see also Adams 1981; Court 1983). However they did not regard these situations as "a flood":

...my kids have only ever missed a couple of days of school, and you'd hardly call that a flood (farmer, September 2001).

When the Bureau of Meteorology issued storm warnings for East Gippsland on June 23, few people took them seriously because "so often had the promised rain failed to eventuate" (Gibson 1998). However the rain did fall, and the warm, dry drought conditions changed. One farmer described how "suddenly it was winter", with bitterly cold gale force winds driving torrential rain horizontally "like knives". In less than 48 hours, Swifts Creek had recorded 152mm of rain, Ensay 207mm, and Tambo Crossing 220mm. The Tambo River, which had not flooded for six years, began to rise, with flooding beginning in the upper reaches. A resident of Cassilis described how he watched what was little more than a series of large puddles become "a wall of water" which was "eerie". Another resident described his astonishment that:

...the little creek below our house, which you can usually walk across in your slippers, had whole trees coming down it! (Ensay resident, August 2001).

A State of Emergency was declared as flood waters tore down the steep slopes "like a steam train", stripping away valuable top soil and leaving sheep and cattle in the branches of trees four to six meters above the ground. Residents were taken completely by surprise, and had never imagined a flood of such proportions:

Most floods come after a week or two of rain. But it just went BANG! It was an unusually venomous flood, it just bellowed down, it left people totally stunned—there was no warning! (community worker, September 2001)

There was a roar, it was very high, it was very quick. I don't know of anyone who had seen anything like it (East Gippsland Shire officer, August, 2001).

The potential for damage to result from the flood was heightened by the fact that it followed several years of drought and overgrazing, which had led to the loss of vegetation and compaction of soil. Residents described how "sand" had blown off the hills and blocked waterways, and willows flourished along the rivers because farmers were cutting willows for stock feed and leaving timber behind. The combined effect of torrential rain and land use enabled the water falling on the steep slopes of the Tambo valley to build up to an enormous velocity. This resulted in significant environmental damage, and caused substantial financial losses due to damaged assets, incomes and infrastructure.

Damage To Land, Stock And Incomes

Several years of drought and overgrazing had left the Tambo Valley exposed to damage from rain, floodwater and strong winds. As with other floods described by Pearson, a significant portion of the debris was willow timber because it had been cut for stock feed (Pearson 1969, 253-61). The lack of vegetation on the hills enabled floodwaters to tear down the steep slopes at enormous speed—one farmer recalled that upon getting up on the first morning following the rain, he thought, "the ground is so white, it must have snowed". He quickly realized that what he thought was snow was actually water running down the hill in "huge sheets", stripping away top soil and causing extensive erosion. Further environmental damage arose due to the rapid germination and growth of weeds after the rain.

The severe weather conditions caused major stock losses, adding to those already experienced as a result of OJD and drought. Sheep and cattle were already weakened by the drought, and the limited warning time prior to the event limited the ability of farmers to move stock to safety. Large numbers died as a result of the cold weather and floodwaters, and many that survived died in the following days, unable to withstand the cumulative stress.

Extensive fence damage occurred, representing not only a large economic loss, but causing anxiety amongst residents due to the potential for sheep infected with OJD to wander throughout the countryside. Some businesses sustained water damage, and the automechanic in Swifts Creek lost all its equipment. The economic impact of the flood was greater than it might otherwise have been because farmers and businesses were already struggling with limited incomes:

The flood just knocked the stuffing out of people. They'd spent all their money, and they were called upon yet again to spend more. The drought was there, the farmers hadn't been earning and hadn't been spending, so the people that serviced the farmers hadn't been getting their money. Then all of a sudden BANG! You've got a flood. It was just that on top of everything else (community worker, September 2001).

Damage to business property and farm land placed further restrictions on incomes, not only because of damage to the assets necessary for life and livelihood, but because the time spent repairing and replacing assets was therefore unavailable to pursue a livelihood (Wisner et al 2004; Project Team from DNRE 1999).

“We Were Totally Isolated”: Damage To Communications And Transport Infrastructure

The storm and flood resulted in considerable damage to infrastructure, leaving residents isolated and businesses unable to trade. Floodwaters, landslides, uprooted trees and other debris destroyed bridges and left extensive stretches of road impassable. The Highway was closed to traffic, along with many local roads, and it was 24 hours before emergency vehicles could access the roads. Damage to infrastructure reduced the ability of businesses to trade, compounding their ongoing difficulties.

Social And Psychological Impact

The effect of previous suffering had left communities and individuals in a vulnerable situation due to their limited ability to respond to further hardship and social disruption. By the time the flood hit, “people all through the community were at a pretty low level in terms of morale” (resident, September 2001).

Residents experienced a sense of losing control, of being unable to provide for their children, and of being a failure at the enterprise to which they had committed their lives. As one man noted:

The damage to agriculture was compounded because the flood followed a long and severe drought, which had reduced the economic ability of farms and business to withstand a further disaster. There was Ovine Johne's as well, which had wiped out a major part of the agricultural sector. When you've got money in the bank, you can cope with all sorts of things – the tendency to worry, the tendency to get depressed. But when the money's gone and you don't know how you're going to eat,

then these things assume gigantic proportions. There are people who exaggerate, and I don't want to - but there was definitely a tendency for people to contemplate suicide (community worker, August 2001).

The unfamiliar characteristics of the flood increased the trauma arising from the event, because residents "just didn't know what was going to happen next". Elderly residents were devastated by damage to gardens they had struggled to maintain during the drought. Residents were also disturbed by the alien landscape they found themselves in once the storm subsided. The suffering of men tended to receive more attention than that of women, because the division of labor meant that it was usually men who were outside cleaning up, removing dead stock and repairing fences:

Men suffered more—women weren't involved outside to the extent that men were (female farmer, March 2002).

Variation In Impact Upon Settlements

The impact of the storm and flood on settlements varied due to their different geographies and experiences prior to the flood. Residents believed that the velocity of floodwaters was greatest at Cassilis, where terrain is extremely steep. However Cassilis is described by other residents as populated by "alternative lifestylers" (referring generally to teachers, retirees, and hobby-farmers). Some of these individuals are isolated from community life, sometimes by personal choice and sometimes by social exclusion. As a result, they didn't have "the intangibles—the local knowledge and local connections" that made it easier to respond to the flood. The experiences of these residents was often overlooked by others:

Well, I don't think the flood would have created much hardship for those people. Sure, they [school teachers] have got to care for people, and they would have done a fair bit of overtime, but that's the reason they're there! What else are they there for? (community worker, September 2001).

Farms at Bindi, Tongio and Swifts Creek are generally larger than those further south, and were in a better financial position when the flood occurred. However the terrain in these areas is particularly steep and, due to overgrazing, was without vegetation to protect it from severe erosion and loss of topsoil.

While the river flats are wider and the slopes more moderate at Ensay, flooding nevertheless resulted in extensive environmental damage. The area

around Ensay is dominated by small farms of between 500-700 acres, with all farmers relying heavily on off-farm incomes. These farmers were heavily hit by reduced employment opportunities, and lacked the financial resources to maintain their properties. The combined effect of drought, quarantining, farm fragmentation and low incomes lead to severe overgrazing of the hills at Ensay, which are dominated by soil types prone to erosion (Russell 1983). The psychological and social impacts of the flood were particularly high at Ensay, in part because the incidence of OJD was concentrated at there, compounding low morale and leading to poor social cohesion.

‘A Hundred Year Event’

When torrential rains and gale force winds hit the Tambo Valley on June 23-24, 1998, the district had already experienced several years of drought, low commodity prices, mill downsizing, rationalization of government services, and OJD. Residents had limited financial resources to respond to damage to assets and income, and flood damage exacerbated the ongoing hardship and social disruption experienced throughout the district. The flood was, as many people put it, “the straw that broke the camel’s back.”

Conclusion: A ‘Natural’ Disaster?

The vulnerability perspective reveals that the 1998 flood disaster was not the product of an abnormal event in nature, but was largely determined by the high potential for harm experienced by residents of the Tambo Valley:

The flood was just a roaring monster that came on top of all that, and the effect was much greater because people were very vulnerable at the time (community worker, September 2001).

Torrential rain may have provided the trigger for a ‘1-in-100 year flood’, but the disaster that resulted was shaped by a variety of social, economic, political and biophysical factors and processes (Table 1). These include the physiographic features of the Tambo Valley, such as the harsh climatic conditions, steep terrain and poor soils, and characteristics of local economic and social activity, including limited access to transport, restricted access to markets, a small economic base, and depopulation. What a historical analysis reveals, however, is that at the core of flood disasters in the Tambo Valley, there has always been the coincidence of and interaction between drought, low commodity prices, and poor land management practices. This observation is articulated by A. M. Pearson in his book, *Echoes from the Mountains*,

and has also been noted by local Landcare groups (Gippsland Community Reference Group, 1993, 20).

A historical analysis also reveals that while the biophysical, economic and social environment of the Tambo Valley has always limited the ability of residents to respond to further shocks, many of the conditions affecting vulnerability were heightened by changes occurring since the 1970s and accelerating during the 1990s. By the time rain fell in June 1998, a situation of extreme vulnerability had arisen. This case study reveals that while critical linkages—such as that between agricultural profitability and land management—may be identified by taking a relatively short-term view, long-term historical analysis is needed to better understand the manner in which ‘disasters’ arise from the accumulation of various conditions over many years.

Notes

1. The definition of ‘community’ in the context of disaster and emergency management is uncertain. Alley identifies a number of definitions of the term in the context of disaster management, including: a territorial area and a sense of ‘belonging’ (Alley, E.E. (1993). "Combating The Vulnerability Of Communities". *Natural Disasters: Protecting Vulnerable Communities*, London, Thomas Telford.) For the purpose of this research, ‘community’ referred to the communities that were identified by respondents. Residents consistently self-identified as living ‘below the Gap’, and also identified themselves as being from one of Bindi, Cassilis, Swifts Creek, Ensay or Tambo Crossing.

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