A plan to push limits? Investigating the ecologically sustainable development dimensions of Melbourne's Central Region

Sustainable Water Strategy

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Abstract

Drawing upon theory from the field of urban political ecology, we analyse a major strategic water plan for Melbourne, Australia - the *Sustainable Water Strategy for the Central Region*, published in 2006. We assess the extent to which the strategy identified and addressed ecological sustainability in terms of: cultural frames; ecological context; social equity; and engagement processes. We identify that the strategy's framing of water was largely separate from its social and ecological context. This framing resulted in the importance of issues such as environmental flows, social equity and cultural values to be diminished thus avoiding the inevitable confrontation with environmental limits needed to ensure long term ecological sustainability. Our analysis shows the discursive dominance of economics limited the response to persuasive scientific arguments for greater ecological consideration in the strategy. Our findings suggest that broadening engagement with the diverse ways that water is valued is likely to contribute to more equitable and ecologically sustainable water futures.

1. Introduction

Since the construction of large scale dams and pipes to deliver water to the city of Melbourne in the 1800s (Dingle & Rasmussen 1991), there has been a dominance of supply side solutions to address issues of water supply scarcity. This continuity persists despite the considerable political and economic change accompanying water reforms since the 1990s (COAG 1994; 2004), which emphasized the achievement of ecological sustainability. These reforms have seen the widespread redefinition of water property rights and the introduction of market based approaches to water governance (McKay 2005; Bell & Quiggin 2008), including providing for permanent trading in water entitlements and pricing water for full cost recovery (COAG 2004, p. 214).

While environmental concerns were ostensibly a major driver of these reforms, per capita water use in Australia remains high, commitments to environmental flows are small, and the impact of river restoration limited (Broderick & Gill 2008). The discourse of scarcity has continued to justify supply-side interventions that further entrench conventional infrastructural approaches rather than fostering conservation and innovation (Hurlimann 2007). Considering the emphasis on ecological sustainability in shaping water reforms (COAG 1994), it is imperative to examine how it is addressed in practice

Our aim is to examine the extent to which water planning in Melbourne: 1) identifies, and 2) addresses, ecologically sustainable development. In doing so we adopt the definition posed by Diesendorf (1997) that: “*ecologically sustainable development includes types of economic and social development which sustain the natural environment and promote social equity*”. This central concern with social equity resonates with an urban political ecology perspective which recognizes that environmental and social changes co-determine each other and thus change is never neutral (Swyngedouw, Kaïka & Castro 2002). As such, questions of sustainability are fundamentally political questions of who gains from sustainability, what needs to be sustained and how is this to be achieved? (*ibid*) Ultimately through such enquiry strategies for more equitable social-environmental futures can be realized.

Planning processes present opportunities to shape more sustainable futures (Campbell 1996; Wheeler 2013). Hence we have chosen a major, long-term water planning strategy for the city of Melbourne in Australia, the *Sustainable Water Strategy for the Central Region* (2006b), (herein referred to as the strategy) to explore the extent to which ecologically sustainable development is both identified and addressed. We begin by presenting significant features of an urban political ecology of water which we use to structure our analysis of the strategy. We then describe the context of contemporary water planning in Melbourne, before outlining our research approach, discussing our findings and drawing conclusions.

2. Political ecologies of urban water

Water is strongly situated in local ecologies, histories and cultures. Theory from a political ecology perspective provides analytical concepts that allow the investigation of the political and cultural dimensions of environmental processes, and examination of the ways in which political economy and culture shape the environment in material and discursive terms (Heynen *et al.* 2006). We identify four themes from this literature relevant to analysing ecological sustainability in water planning processes, namely the: 1) influence of cultural frames; 2) significance of the ecological context; 3) commitment to social equity; and 4) nature of engagement processes. These themes resonate with the stated aims and guiding principles of the strategy itself (Victorian Government, 2006b, pp. 11-12) which seeks to “develop an appreciation of the value of water and a conservation culture in the community”; “protect and where necessary improve the health of rivers, aquifers and estuaries”; “maximise overall community benefits and ensure that no generation or group incurs unwarranted extra costs or receives additional benefits”; and seeks to ensure that “[d]ecisions should be transparent”. We discuss each of the four themes in turn.

Attention on the *influence of cultural frames* allows an examination of the social construction (e.g. language, words, perceptions) of the relationship between society and water. The frames used to understand societal relations with the environment can become so dominant that they become naturalized if left unconsidered (Mehta 2007; Descola & Pálsson, 1996). Attention on these cultural frames reveals assumptions about society-nature relations, notably the entrenched view that nature is somehow separate from and operates independently of social processes (Whatmore 1999). Specifically, attention on water discourses can reveal ways in which the implementation of radically different management strategies, such as marketisation and commodification, can come to be accepted and considered normal (Shove 2003).

The study of the implications of shifts in public, community and private control of water for social relations of access and use is a central concern within political ecology (Bakker 2000, 2001; Heynen *et al.* 2006; Kaika 2006). Such historically situated analyses of water have highlighted the social equity and environmental implications of neo-liberalism, the ever expanding spatial reach of cities, and the influence of discourses of scarcity and crisis. These themes resonate strongly with contemporary urban water planning in Australia (Sofoulis 2005; Allon & Sofoulis 2006; Head 2008; 2012). Australian scholars of water have looked at the implications of changing water cultures in shaping relations with the environment in diverse contexts (Sofoulis 2005; Allon & Sofoulis 2006; Gibbs 2006; Davidson & Stratford 2007; Jackson 2006; Head 2008; 2012). It is apparent from this literature that the dominant cultural framing of water is changing from one which sees water as a public good to one which sees water as a commodity subject to a neoliberal, technical managerial logic.

Significance of the Ecological Context: The significance given to the environment and its supporting ecology in water plans can act to undermine or facilitate the achievement of ecological sustainability. Recognising that planning is embedded within particular institutional configurations of power, knowledge and authority (Bakker 2000) helps us appreciate the politics associated with the representation of the ecological context within water plans. The authority of a technical managerial approach to water partly rests upon scientific knowledge. The positioning of science as neutral can allow highly political decisions to be justified. Demand forecasts are one aspect of water planning where the science is highly contested (*ibid*; Mercer & Lloyd 1986) and in periods of water scarcity can be used to justify quite controversial interventions, which can have far reaching ecological impacts.

The discourse of water scarcity is often produced within a political economy that favours efforts to increase supply rather than manage demand (Bakker 2000; Kaika 2006) – what Sofoulis refers to as ‘Big Water’ (2005). The discourse of water scarcity often negates scarcity as a

relational issue, shaped by factors of increasing demand and population and, instead, nature is framed as failing with the socio-political factors driving water scarcity left unexamined (Kaika 2006; Swyngedouw 2004).

A commitment to social equity is a basic tenet of ecologically sustainable development.

Different economic, technological, environmental and social conditions shape water relations and determine the extent to which people might be vulnerable to water-related changes, physical as well as political and economic (Swyngedouw, Kaika & Castro 2002). Planning can act to either ameliorate or exacerbate vulnerability and equity, thus influencing future sustainability.

The shift to market based approaches to water, and the associated increase in the cost of water, raise particular concerns regarding social equity. The positioning of water planning as a technocratic and managerial enterprise separate from its social context, and related policy areas such as health and urban planning, undermines a full and proper consideration of social equity.

The Nature of Engagement Processes: Related to social equity, the extent to which diverse communities are engaged in ways that genuinely facilitate their perspectives to determine plan directions is important to ecological sustainability. Swyngedouw (2009, p. 604) reminds us that, “the production of different socio-environmental urban trajectories is a decidedly political process”. With an increasing focus on market mechanisms such as water pricing and trading, people are increasingly framed within water management as consumers or customers, rather than as citizens and agents (Sofoulis 2011). This change in engagement processes requires situated investigations to appreciate the extent to which such a transformation reshapes social and ecological processes and conditions.

We use these four themes above to structure our analysis of whether the strategy: 1) identifies, and 2) addresses ecological sustainability. In Melbourne considerable effort has been invested since the late 1990s to seek a more sustainable approach to water planning. Yet there has been

little critical analysis of whether these efforts have been successful. We seek to address this gap in knowledge.

3. Water planning in Melbourne

Challenges facing water planning in Melbourne include the stressed ecological condition of catchments, increased climate variability and change, the limits of population and economic growth, and the social consequences of rising water costs. These issues came into stark relief during the period of 12 years of below average rainfall from 1997, which saw a progressive decline of inflows into Melbourne's main water supply reservoirs from a longterm of average of 615 GL/year (1913-96) to 376 GL/yr (1997-2009) (Melbourne Water 2013). While the long-term trend is of increased water demand, this demand tends to decline during periods of severe drought,¹ only to return to growth when drought conditions ease (Victorian Government 2006c).

The city endured low rainfall and subsequent state imposed water restrictions became progressively severe as dam levels decreased. A number of institutional changes were introduced, both in association with the national reforms and with the increased attention on environmental issues by the state government, particularly in the early years of the state Labor government (1999-2010) (Coffey 2012).

Table 1 provides a contemporary timeline of key events related to water planning in Melbourne, contextualizing the strategy which forms the focus of our analysis. The strategy was set to be a new paradigm of 'adaptive water management,' with no major infrastructure projects

¹ During the drought the community was highly responsive to demand management campaigns and in mid-2010 the lowest overall consumption for Melbourne since 1983 was recorded (Levin 2011) at 130 litres per person per day.

foreshadowed in the near future.² However, in 2007 the drought worsened and a ‘crisis’ discourse intensified, reinforced by a rising concern about the impacts climate change.

In this context, the state government chose to re-emphasize a supply-oriented approach to water planning that had historically shaped Melbourne’s water supply system (Mercer & Lloyd 1986) by ‘securing’ water through a series of large public and public-private investments in infrastructure, extending the water frontier of the city. A more general contraction of the sustainability agenda within state government also occurred at this time (Coffey 2012). This shift in approach was marked by the release of *Our Water, Our Future: the Next Stage of the Government’s Water Plan* report in 2007 (Victorian Government 2007). The plan outlined a number of large scale infrastructure projects including: the Wonthaggi desalination plant (Melbourne Water & GHD 2007); regional pipelines connecting waterways throughout the state via a ‘water grid’ - including the Sugarloaf (‘North-South’) pipeline bringing water generated from the Goulburn Valley to Melbourne; and an upgrade of the Eastern Treatment Plant to generate water through recycling (Victorian Government 2007).

TABLE 1: TIMELINE OF CONTEMPORARY WATER EVENTS AND PUBLICATIONS FOR MELBOURNE AND VICTORIA*

Date	Event/publication	Importance
1999	Election of Bracks Labor government	- Liberal-National Coalition government lost power due to swing to Labor and independents in regional areas resulting in ongoing sensitivity to metro/provincial matters
2000 (Oct)	- Signing of agreement between the Victorian and New South Wales governments to release more water to the Snowy River.	- Pioneering agreement on environmental water to enhance flow regime
2004	- <i>National Water Initiative</i> agreed by Council of Australian Governments (COAG 2004) - <i>Securing Our Water Future Together</i> (Victorian Government white paper on water) (Victorian	- National blueprint for water reform - Set out strategies for sustainable management of water in Victoria.

² The last major infrastructure investment in Melbourne was the Thomson Dam, completed in 1983 (Mercer and Lloyd 1983).

	Government 2004).	Introduces market mechanisms as basis for incentive to reduce water use
2005 (Oct)	- <i>Discussion Paper: Central Region Sustainable Water Strategy</i> (Victorian Government 2005).	- First Victorian regional water strategy
2005	- CSIRO and Melbourne Water study on climate change (CSIRO & Melbourne Water 2005)	- Prediction Melbourne to have 8% less water by 2020 (<i>ibid</i> , p. v)
2006 (April)	- <i>Draft Strategy: Central Region Sustainable Water Strategy</i> (Victorian Government 2006a).	
2006 (Oct)	- <i>Sustainable Water Strategy for the Central Region: Action to 2055</i> (Victorian Government 2006b)	
2006	- <i>Water Supply-Demand Strategy for Melbourne 2006 - 2055: Draft Strategy</i> (Victorian Government 2006c)	
2006-2007	- <i>State of Environment Report, Victoria</i> , ‘environmental flows’ not fully achieved in 40 locations owing to drought contingency conditions (Commission of Environmental Sustainability 2008, p. 10)	- Drought influences implementation of water plans
2007	- <i>Our Water Our Future: the Next Stage of the Government’s Plan</i> (Victorian Government 2007) - Updated statement regarding water planning in Victoria. Commitments to constructing a desalination plant and other augmentation activities representing a 60% expansion of capacity	- Drought influences water supply considerations by government
2008 (Dec)	- Save Water Target 155 launched – public engagement campaign to reduce per capita water consumption to 155L per day.	- Drought influences public engagement campaign and water
2009 (June)	- <i>Inquiry into Melbourne’s Future Water Supply</i> . Alternative sources of water explored and policy shift away from reliance on rainfall based supply of water. Further justification of the desalination plant.	- Relinquishment of strategy principles
2010	- <i>Target 155</i> discontinued - Easing of water restrictions	

* shaded text includes components of the strategy which are the focus of this research

The drought induced a period of heightened tension surrounding water. There was vehement public opposition to the Wonthaggi desalination plant (Watershed Victoria 2009) and the ‘North South’ Pipeline (Plug the Pipe 2009). The decision making process around the Wonthaggi plant (see Melbourne Water & GHD 2007) in particular was subject to strong opposition by community and environmental groups (King & Murphy 2009). Criticism focused on the lack of full financial disclosure, the social and environmental impact assessment process, and greenhouse gas emissions. Public protests, a federal court challenge and a 3000 signatory petition tabled in parliament are testament to the considerable opposition to this project, which

was eventually approved in January 2009 (*ibid*). Construction is complete, yet the plant lies idle for both political and climatic reasons.

So, very soon after the strategy was released a supply-oriented approach to water was re-emphasized, support of a conservation culture relaxed, and measures previously rejected in the strategy funded. Our interest in the strategy stems from this apparent disjuncture between the stated commitment to sustainable development in the Strategy and the direction of subsequent water plans. Our analysis below seeks to provide a fuller understanding of how such a disjuncture could occur.

4. Research Approach

Drawing on political ecology, we analyse strategic water planning processes associated with the *Sustainable Water Strategy for the Central Region* including: 1) the Discussion Paper; 2) the Draft Strategy; and 3) the Final Strategy (Table 1). The strategy was selected for our analysis because: 1) its main aim is to be a “guiding document for long term water planning”; 2) it was the first of four strategies guiding regional water management across Victoria; and 3) it addresses the greater Melbourne area, which encompasses the majority of the Victorian population and large agricultural areas.

Our content analysis of the strategy focused on four themes of ecologically sustainable water planning identified from the political ecology literature. Well established content analysis principles (Neuendorf 2002) guided our qualitative analysis of the three iterations of strategy. For each theme specific questions were developed to guide the systematic content analysis, including: does the strategy identify this issue; how does the strategy materially address it; how is the issue framed within the strategy? Data analysis templates were developed to record the analysis in a consistent manner. Each theme was initially analysed by one author and then reviewed by the other authors. Results were collectively discussed in specially convened

meetings. In addition, a random sample of a third of the (free form) public submissions (69/207) in response to the Discussion Paper (21) and Draft Strategy (48) was analysed to complement the strategy analysis, particularly in relation to the theme of engagement.

Limitations of our approach include the fact that our content analysis focused on a single policy and does not include other jurisdictions. Such comparative analysis would be insightful, but we anticipate that plans developed at a similar time may well be consistent with our findings (cf. Coffey 2012). Additionally our analysis was largely limited to content analysis, more detailed analysis of resulting actions would likely generate complementary insights.

5. An assessment of the Strategy's ecological sustainability

We present below the key findings of our analysis of the extent to which the strategy addressed ecological sustainability through the themes of the: 1) influence of cultural frames; 2) significance of the ecological context; 3) commitment to social equity; and 4) nature of engagement processes.

Influence of cultural frames

Attention on cultural frames allows an examination of the social construction of the relationship between society and water. We found that sustainability was the pre-eminent framing device in the strategy, however, it is conceived of as 'balancing demands' in the Discussion Paper (p.2) and Draft Strategy (p.3). This is in contrast to addressing economic, environmental and social aspects in terms of inter- and intra-generational equity consistent with the seminal World Commission on Environment and Development (1987) definition, and it does not focus on ecological sustainability (Diesendorf 1997). In fact in the Final Strategy sustainability is not explicitly discussed but rather 'securing water supplies' becomes the key reference point (p. 2, 3, 5). Thus the challenge of sustainability is obscured where it is supposedly the key concept.

The strategy draws on a range of discourses, including sustainability, ecology, engineering, economics and risk management. These discourses compete throughout, with particular terms and forms of discussion prevailing in particular chapters, such as risk management in the ‘Future Pressures and Potential Risks’ chapter or ecology in ‘Protecting our Rivers’. In all iterations of the strategy there is regular recourse to the language of science, quantification and measurement, with a strong emphasis on the importance of accuracy, as evident in the use of graphs, maps and calculations throughout.

Chapter headings are a key conceptual framing device in any document. All Discussion Paper chapter headings include the words ‘Security’ or ‘Resource’, and the Final Strategy opens with a chapter titled ‘Living Within Our Water Means’. As such, economics emerges foremost among the strategy’s discourses. This is consistent with other major water policy documents at the time such as *Securing Our Water Future* (Victorian Government 2004), where “the discourse of neoclassical economics provides the dominant frame” (Coffey 2012, p. 307).

Whilst there are other references to economics, in certain areas where economic analysis would be beneficial, it is absent, as in regards social equity (discussed below).

Water is portrayed as an issue over which professional water managers exercise control. This is reflected through the use of technical jargon such as ‘capturing water’, ‘returning water’, and ‘creating new water’ (Discussion Paper). This control is reinforced by references to the strategy as a ‘blueprint’ (Final Strategy, p.10), inferring a designed system. This discourse of control is consonant with the emphasis on interconnecting supply systems (e.g. ‘the grid’, Final Strategy, p. 62) and the substitution of water types to meet flow requirements.

The strategy appears to be premised on continued population and economic growth (Final Strategy, p.14), with unquestioned references to growth throughout the documents. Population and economic growth are parameters within which water planning is situated, rather than seeing environmental limits as setting the boundary conditions of the former. The reconsideration of

the pace and sustainability of population and economic growth, is explicitly rejected in the strategy's response to public submissions. Instead, market solutions are promoted, with government policy stated as being to "support development and [the] cost of water is one aspect of the viability of an industry in a specific location." (Draft Strategy, p.103).

Though tradition is a value which runs as a covert sub-text through these documents, simultaneously developments such as consideration of climate change impacts and new approaches to flow management are clearly identified as breaks with the past. There is an attempt to educate readers on climate change impacts and forewarn them of the need to adapt, especially by putting a different attention on ecosystems and flows, including the Environmental Water Reserve. The provision for an Environmental Water Reserve was introduced in legislation during the development of the strategy (Water Act, 2005). Thus change is highlighted by anticipating that certain things will be phased out, and certain new approaches, such as interconnected systems, market mechanisms and higher water prices introduced. Despite this, there is an absence of critical analysis of these new elements.

Science is highly visible in the strategy, with much description and analysis of the bio-physical system, actual and projected water supply and demand, stream flows and water availability, and environmental flows, taking account of different climate change scenarios. There is a strong pattern throughout the strategy and its earlier drafts that each reference to the environment is explicitly backed-up by a 'scientific' study. The strategy thus shapes new policy knowledge, and places considerable attention on defining a methodology for decision making for the Environmental Water Reserve (Draft Strategy, p. 24; Final Strategy, p. 21) yet without reference to demographic, social and economic dimensions.

Our content analysis has identified how key assumptions and values reveal dominant cultural frames in the strategy. These assumptions are influenced by, and influence, the social context of water. Securing water, rather than achieving long term ecological sustainability, is

underpinned by a strong orientation to the economics of water with the social context of growth and development uncontested. Hence the strategy does little to acknowledge the socio-political factors driving water demand, let alone address these in a plan of action.

Significance of the Ecological Context

We paid attention to the significance of the ecological context in the strategy as the way in which the environment is framed in planning documents influences the achievement of ecological sustainability. Environmental flows, as a means of protecting and restoring key ecological functions of rivers, have been the subject of intense scientific and political debate in Australia since the 1990s (Arthington & Pusey, 2003). The strategy reflects the extent to which the science of environmental flows informs strategic water planning for the major river systems that feed the Melbourne's water supply reservoirs, providing a detailed scientific explanation and justification of environmental flows. These rivers include the Latrobe, Yarra and Thomson/Macalister. The western rivers of the Maribyrnong, Werribee and Moorabool are drawn upon for growing urban developments on Melbourne's urban fringe as well as the regional cities of Geelong and Ballarat.

Deploying the FLOWS method, the strategy conveys an ecologically meaningful understanding of river health. It frames rivers as more than just channels to deliver water; descriptions of different components of rivers, seasonal flow variations, wetlands, the status of iconic species, and connections to groundwater are present. The ecological story of the rivers in the Central Region is presented in a clear, upfront and unequivocal manner. Reduced biological diversity, population decline, loss of native fish species, and deteriorating water quality are all presented as symptoms of stress to largely human induced impacts. The most significant impact is identified as extraction of water for consumptive use and land use change for farming and urban development (Discussion, p. 17-18). Ecological stress is consistently supported by scientific

assessments. Tables of data summarise how much water is removed from rivers for consumptive use (Draft Strategy, p. 15); descriptions of river condition, threatened species, river channel modification and flow regime reduction fill a number of pages (Final Strategy, ch. 4).

Yet, despite recognition that the ecological integrity of rivers in the Central Region is compromised in ways that require an urgent response, the paradox is that this does not progressively drive the details of the water planning schema being developed for the next 50 years. The significance of the ecological context is acknowledged but the plan does not sufficiently detail activities to address this. Instead, issues of ecological integrity are moved to the background, fading from the planning detail, in stark contrast to the pursuit of options for securing water supply for consumptive use. For instance, environmental flow commitments beyond 2015 are to be met only *after* meeting the needs of consumptive users (Draft Strategy, ch. 4). Additionally, infrastructure works are planned to enhance and interconnect the region's catchments (*ibid*, Final Strategy, p. 37), without acknowledging associated ecological effects.

The strategy relies on a method of providing an Environmental Water Reserve through minimum passing flows, which has been criticized as an unreliable and reductionist tool (Ladson & Finlayson 2002; Forester 2006). In the case of the rivers west of Melbourne – Werribee and Maribyrnong - the strategy turns away from science by explicitly stating that the scientific studies' assessment of flow requirements are in excess of capacity to improve flows (Final Strategy, pp. 85-86). So, whilst the strategy acknowledges there are considerable outstanding information needs on environmental issues, the case of the western rivers demonstrates that even with quite enough scientific information to determine necessary actions, these decisions are not taken.

In keeping with the planning requirement to minimize uncertainty, specific quantities of water required to ensure healthy and functioning ecosystems were first estimated at 200,000 megalitres (ML) (Discussion, p.7), then subsequently reduced to 110,000ML (Draft Strategy,

p.10), with a final commitment to deliver 66,000ML by 2015 for environmental flows (Final Strategy, p. 6). This falls well short of requirements that are stated in the scientific studies underpinning the strategy itself. Chapter four (Final Strategy) provides details of how this amount of water is to be recovered (efficiencies, savings in delivery, uptake of alternative water sources) and made available for environmental purposes. Yet, as noted by the Independent Panel³ (Victorian Government 2006b, p.120), the strategy does not contain substantial planning details on *how* and *when* the water required for environmental purposes will be recovered. For example, the Final Strategy (p.26) does identify some of the possible sources of environmental water for the Moorabool, Werribee, Maribyrnong, Latrobe and Thomson/Macalister. However there are no detailed mechanisms, interim targets, or timelines against which these severely over-allocated rivers are to receive increased levels of water scientifically substantiated as necessary.

Our content analysis reveals how the strategy values rivers in a deeply utilitarian way - a characteristic of water resource management identified by Gibbs (2006) and Davidson & Stratford (2007) in other Australian contexts. Ecological goals are always noted in direct relationship with security of supply and gain prominence largely through scientific justification. Yet there is an inconsistent treatment of science. Rivers are rarely recognized and valued in and of themselves as non-human things. Diminished inflows into Melbourne's catchments in the last decade form a strong driver within the planning process, but this is connected to human needs to maintain security of supply. The significance of river ecologies disappear from the water planning process in crucial ways once this positioning is in place. So while there is increased sensitivity to and analysis of ecological issues in the strategy, historical traditions associated with supply oriented planning ('big water') remain strong.

³ The Independent Panel of experts was responsible for reviewing submissions and ensuring public opinion was addressed by the DSE.

Commitment to Social Equity

Recognising that environmental and social changes co-determine each other, an appreciation of the social context of water is central to water planning and realizing social equity. Our content analysis revealed that each version of the strategy was consistent in terms of having an absence of substantive analysis of social diversity (in terms of gender, age, ethnicity, location, socio-economic status, and disability) and the relations people have with water, and their vulnerability to water related threats (including health, safety, water hazards, climate change and costs).

The strategy provides limited reference to the social context of water planning through the inclusion of basic aggregated per capita water use figures and population growth rates.

Although there are references to ‘community’, the community remains an undefined entity, with the only obvious distinction made between Melbourne and rural water users. The uneven impact of water on different communities, including water restrictions, is unacknowledged. Moreover, there is little reference to the cultural value of water with three spurious references to the spiritual value of water to Indigenous people (Final Strategy, p.6, 11, 20) – neglecting the diverse interests Indigenous people have in water (Jackson 2006).

An implication of the supply-driven ethos is that society is often treated as an undifferentiated, aggregated mass (Shove 2003). The absence of any detailed social analysis occurs despite ‘conservation’ being identified as the first priority option (Final Strategy, p.36). For the target of reducing total per capita water usage by at least 25 per cent by 2015 (*ibid*, p.39) to be achieved, an appreciation of the social context of water is essential. There is no elaboration of how a water “conservation culture” can be supported to improve the success of the commendable demand management options promoted throughout the strategy.

A stated objective of the strategy is that it seeks to “maximise overall community benefits and ensure that no generation or group incurs unwarranted extra costs or receives additional benefits” (Victorian Government 2006b p.11). Such an objective acknowledges social equity as falling within the scope of water planning, yet there is no elaboration of how benefits and costs are to be addressed in an equitable way, even in the context of the current generation.

Following the economic framing of water there is much reference to pursuing the most cost-effective water planning options. This is largely considered in terms of investments in new infrastructure and technology, with little detailed discussion of the affordability of water and water pricing. The Final Strategy has just two references to affordability and less than half a page devoted to the issue of water prices (p. 110). The strategy concludes that water prices will increase and that this needs to occur in an ‘open and consultative manner,’ balanced with “the ability of all Victorians, particularly low income and vulnerable consumers, to afford essential water and sewerage services” (p. 110). Yet, there is no analysis of what options best minimise such impacts. The expectation is that the Essential Services Commission is the relevant authority for addressing such matters. This marginalises the consideration of equity issues within water planning. The Independent Panel assesses that the implementation plan should “explicitly provide for analysis of its socio-economic impacts on primary and secondary industries, and on low-income domestic users.” (Victorian Government, 2006b, p. 121).

Our content analysis reveals that the identification of the diverse social relations with water and equity is largely absent. As such, the strategy missed the opportunity to provide some analysis, or even identify priority areas for investigation, of how society relates to, benefits from, and is impacted by water use and planning. The absence of such analysis and action within the scope of long term water planning reinforces the cultural framing of ecological processes as separate from social processes, thus compromising ecologically sustainable development.

The Nature of Engagement Processes

Major water strategies have significant impacts on stakeholders and communities. Given this, the New Water Initiative (COAG 2006, p.1) requires state governments to undertake transparent water planning. The role of the strategy's Independent Panel was to ensure this. However, resources managers have tended to see community engagement rather narrowly (Sofoulis 2011), with the strategy being a case in point. The consultative committee formed around the strategy was composed of water utilities, catchment management authorities, and peak bodies such as the Australian Conservation Foundation, Victorian Farmers' Federation and Victorian Local Government Association (Discussion, p. 96). It is this audience which the foreword of the Discussion Paper invites to cooperate. The various documents provide little detail on the wider consultation process with government agencies or broader society.

Agencies that contributed to the strategy included the Department of Primary Industries, Treasury and the Department of Premier and Cabinet. However, the Departments of Planning and Community Development, Human Services and Health are not shown to have been involved, despite the relevance of their mandates. Numerous social groups are alluded to as being a part of the consultation but, again, their involvement is not explained. The power of major stakeholders is indicated in the strategy by speaking of 'consulting' with them, where what is actually sought from the broader community is merely 'feedback' (Draft Strategy, p.1), a superficial form of participation. Thus it seems there is a dominance of influence in the strategy by senior bureaucrats and those in the water industry such as engineering consultancies.

In our analysis of public submissions responding to the Discussion Paper and Draft Strategy versions of the strategy, a diverse range of views and knowledge bases was shown to be brought to the process. The number and detail of the submissions reveals the willingness of people to engage with water planning and their diverse interests in water. Such knowledge provides an alternative source of insight and authority to water planning than that provided by a reliance on

science alone. Although a diverse range of knowledge positions and perspectives underpin these public submissions, it is unclear how the submissions actually influenced the strategy and their relative weight vis-à-vis the views of representatives of the water utilities, engineering firms and other agencies.

A single public forum was held (19 May 2006) to consult with the broader community on the Draft Strategy. This appears to place the public's concern for the issues in the strategy as a low priority. This is despite research indicating that 94% of people in the region regard waterways as valuable and 63% see protecting the environment as the first priority for waterway management (Melbourne Water n.d.). Further, the public are given little opportunity to respond to the strategy's key assumption that market-based approaches to water are appropriate, due to the narrowly defined public consultation on planning options. Rather, the possible limitations of markets in addressing ecological and equity issues go unacknowledged. The positioning of water as a commodity that can be moved from place to place depending on market demand belies the fact water underpins the life and well-being of communities throughout the region.

The one action in the strategy that mentions 'community' is *2.1 Engage Aboriginal communities in developing Regional River Health Strategies*. Yet the values of Aboriginal people are located separately, placed in the chapter 'Protecting our Rivers' (Final Strategy, p.20), beneath ecosystems, native plant and animal species. By situating Indigenous issues in this chapter, designed in green to suggest environment, makes for an uncomfortable placement.

The documents pass over the crucial importance of the waters in the Central Region to Indigenous people. Yet, Aboriginal occupation of the region is increasingly recognized in Victorian public life, through the work of elders such as Joy Wandin-Murphy, Welcome to Country protocols, major museums such as Bunjalika and the Koori Heritage Trust, and the (re-)naming of public spaces. For example, the Wurrundjeri name for the Yarra River was formally adopted for the city's river bank Birrarung Marr. Aboriginal cultural heritage is associated with

numerous river localities in the metropolitan area, such as Merri Creek, the site of Victoria's first Aboriginal school, Bolin Bolin Billabong in Bulleen, and Brushy Creek, the birthplace of William Barak (Presland 1998). These sites all provide a specific grasp of Indigenous occupation of the region, which was not recognised in the strategy.⁴ The strategy thus fails, on the assessment of the Independent Panel, in regard to Indigenous issues (Victorian Government 2006b, p. 120).

Our analysis reveals that the strategy used stakeholder consultation as proxy for community. Overall, on the assessment of the Independent Panel (Victorian Government 2006b, pp. 120-121), the strategy fails to demonstrate transparent planning, thus threatening the achievement of long term ecological sustainability.

6. Conclusion

Through our analysis of how ecological sustainable development is identified and addressed in a strategic water plan for Melbourne, we uncover key assumptions and bring to the foreground neglected aspects of ecological sustainability. Through a consideration of the *influence of cultural frames* we found that the assumptions underpinning the language of water planning privileged certain knowledge and values over others, and assumed all actors have equal power. Economics and science, though valuable to water planning, were found to dominate in a way that excluded diverse social perspectives. Yet, on crucial questions such as environmental flows, science does not strongly inform policy details and on social equity considerations what would be useful economic analysis is absent. Sustainability is largely framed as balancing demands, with social equity little explored. People are positioned as customers according to a neoliberal managerial logic; the relationship with water is about security of supply in this relationship of service provider with consumer, with water largely valued as a scarce

⁴ Goodall and Cadzow's (2009) *Rivers and Resilience, Aboriginal People on Sydney's Georges River* provides guidance on a different way of considering affiliation to rivers.

commodity. This is in line with the core features of the Australian water reform agenda. Our analysis highlights the limits of these market-oriented reforms and the contradiction between meeting ecological commitments within water planning systems which privilege economically productive uses. Essentially what is to be sustained here is economic growth and urban development.

Our consideration of *the significance of the ecological context* has shown that despite the growing scientific evidence and acknowledgement of the declining ecological integrity of waterways in Australian water planning, ecological commitments continue to be delayed. So whilst the strategy does go some way towards identifying diverse options to meet future challenges, such as water conservation, it remains largely focused on technical solutions for securing future water supply. The subsequent decisions to approve major infrastructure projects such as the Wonthaggi desalination plant and the 'North South' water transfer pipeline and easing of water conservation measures, shows a re-emergence of a 'big water' approach, a reliance on big engineering, a neglect of ecological science, and a lack of appreciation of everyday relations with water. The primacy of human consumptive demands acts to contain competing ecological discourses, even when set in the language of science. So whilst the environment is now recognized in planning, the shift required to sustain ecological connections does not translate into detailed strategies, time commitments, targets and resource allocations. The absence of such planning detail partly explains the ease by which reversion to the familiar supply-oriented approach to water planning was able to occur so soon after the strategy's release.

The lack of attention to ecologically meaningful water planning strategies derives from the deeply utilitarian way rivers are valued in the strategy. It is also apparent that water scarcity is considered in terms of a failing nature, as documented elsewhere by Bakker (2000) and Kaika (2006), rather than being acknowledged as produced by humans. In this schema urban

development and demographic factors (such as social and health inequities) fall outside water planning, and attract little critical attention. What is instead required here is “a more comprehensive and integrated approach in which supply of water is integrated with health and sanitation policy, ecological considerations, socio-economic processes, and urban planning and governance systems” (Swyngedouw, Kaïka & Castro 2002, p.134).

Political ecology recognizes that social-ecological change is never neutral and as such ecological commitments require a consideration of the *social equity* implications of adjustments, especially in relation to future pricing. The neglect of diverse social relations with water prevents an examination of how changes in the trajectory of water management to achieve sustainability are to be distributed and negotiated between social groups over time and space. An examination of the uneven social and economic costs associated with adaptation to uncertain environmental futures is thus postponed.

A broadening of *the nature of engagement* in planning beyond stakeholder consultation in ways that better captures diverse relations, knowledge and values in water would unsettle the prevailing economic discourse and power relations. This partly explains why such engagement remains unrealised, and underlies why it is critical to shaping more sustainable water futures.

Our analysis identifies a number of factors that we consider critical in achieving greater ecological sustainability in future water planning.

- Conflicts between water needed for ecological purposes and the dominant utilitarian *framing* of rivers needs to be resolved by re-thinking our relations with water; re-regulation (Bakker 2000) is required in order to quarantine ecological water needs from the dictates of the market. Investment in non-supply approaches to water scarcity would support such re-thinking and re-regulation.

- Urban development, demographic and socio-economic change continuously shape the water context. Such issues need to be firmly brought within the scope of water planning to ensure it is informed by and informs wider regional and urban planning.
- For *ecological* requirements to translate into firm commitments detailed strategies, timelines, targets and resource allocations need to be in line with existing and emerging scientific evidence and other knowledge. Articulation of such firm commitments within water planning would prevent the dismissal of such ecological understandings and reversion to familiar ‘big water’ approaches, as occurred following the strategy’s release.
- *Social equity* considerations are central to water planning, especially options assessment, as the social adjustments required to address ecological requirements and future human water needs are considerable. Moreover, considering the advanced state of Australian urban water reforms, a comprehensive analysis of the social equity implications of neoliberal water management is required.
- More intensive *engagement processes* are required in order to provide greater transparency on how community consultations translate into specific commitments. Drawing upon readily accessible community engagement constituencies, such as community groups, ‘Friends of’ groups and Waterwatch groups as part of water planning would support more pluralistic approaches.

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