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REGIONAL AUSTRALIA - PLANNING, PARTICIPATION AND PROGRESS

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Australian Legal Education in Context of the Broader Social, Economic and Cultural Needs of Regional, Rural and Remote Communities

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Australian Legal Education in Context of the Broader Social, Economic and Cultural Needs of Regional, Rural and Remote Communities

**ABSTRACT:** Non-metropolitan areas offer lawyers excellent opportunities for advancement and job satisfaction; however, Australia is experiencing a decline in the number of lawyers working in regional, rural and remote localities. As increasing numbers of legal practitioners are relocating to capital cities or coastal centres, many dynamics come into play in country communities regarding the delivery of professional legal services. The purpose of this article is to highlight issues which members of regional, rural and very remote communities face when they seek to access legal and related services, as well as to identify challenges confronting lawyers working in non-metropolitan areas. The second motivation for this paper is to consider whether Australian law schools, through innovative curriculum development, can provide a solution to the increasing rural exodus of the legal profession. This paper recommends the inclusion of compulsory ‘rural’ capstone subjects in undergraduate law courses as a means to counter the ‘city-focused’ bias of Australian legal education. Furthermore, the inclusion of compulsory rural-themed subjects in the law curricula will provide law graduates with an appreciation of the social and cultural diversity of regional, rural and remote communities, as well as allow them to gain a greater empathy towards Indigenous cultural perspectives and insightfulness into social justice issues. Collectively, these changes will help to inform graduates of the opportunities that exist in regional areas and remote settlements while equipping them with both the psychological understanding and practical skills together with the confidence to work in remote parts of the Australian continent.

**Keywords:** Law graduates; access to justice; rural, regional and remote communities; legal curriculum

**Introduction**

A community, in sociological discourse, is a spatial place or configuration where social institutions reside and social interactions are generated between people (Edgar 2001; Black 2005: 21). In this article, I explore the role of legal education within the broader context of the social, economic and cultural requirements of rural communities. In particular, my interest is in how to ensure that all communities, irrespective of their spatial location on a map, are able to access legal advice and related specialist services.
In simple terms there are two categories of legal consumers in rural areas: individuals and businesses. Many individuals living outside the city limits require access to legal services in order to enforce their rights, obtain a remedy and respond to civil or criminal charges. However, rural businesses are also an important consumer of legal services. The mining, farming and agriculture sectors all must operate in complex legislative environments. Many small businesses must adhere to increasing regulatory requirements pertaining to environmental protection and management, zoning and planning, and water trading regulations, to name just a few (Coverdale et al. 2012a). In other words, access to legal information is essential for many rural businesses, including individuals, who own and work with livestock and professional partnerships involved in commercial undertakings governed by strict industry standards like mining and the production of genetically modified crops.

However, research findings indicate that the ratio of residents to solicitors (public and private) increases with remoteness (Forell et al., 2010: viii). This means that for some Australian communities, in particular remote Indigenous settlements, access to justice is a real concern (Legal and Constitutional Affairs References Committee 2009: 152). This paper’s primary focus is on remote and small outback communities like Bourke, Cobar, Moree and Walgett, all located in New South Wales, together with Indigenous settlements situated in very remote regions of the Northern Territory and Western Australia. In other words, large regional centres like Albury-Wodonga, Cairns, Dubbo, Townsville, Wagga-Wagga, as well as cities and towns with a population of 30,000 or more, are not the focal point of this discussion.

Non-metropolitan areas display a wide population variance, depending on the degree of remoteness and economic function. However, many rural communities have experienced sharp increases in the number of urban migrants (Miles 2006). The focus of this paper is on the rural exodus of legal practitioners to the cities and coastal hubs and the corresponding recruitment
and retention difficulties that this poses. The loss of skilled workers and professional staff can contribute to significant economic, social and environmental costs for all levels of government and the private sector (McKenzie 2007: 3). Additionally, the recruitment and retention of professional staff to regional areas is critical if these small communities and remote settlements are to remain self-sufficient (McKenzie 2007: 3).

McKenzie (2005) explains that attracting and retaining skilled and professional staff is a problem not unique to remote, or even regional areas in Australia (2007: 1). Indeed, McKenzie maintains that the rural exodus is a global phenomenon that has impacted on most nations to varying degrees (2007: 1). Undoubtedly, the globalisation of many services over the last three decades has contributed to the urban concentration of workers across many nations. For instance, in respect to the rise of global law firms like Baker and McKenzie, with offices in 39 countries, these corporate entities’ respective labour demands require staff to be in capital cities and major financial hubs (Flood, 2011). Also, the data held by legal accrediting bodies, such as the New South Wales Law Society, indicate that the spatial distribution of the legal profession is similar across western nations. In other words, Australia’s legal landscape is not dissimilar to other nations.

Most lawyers around the world work in large law firms, in-house corporate department and government agencies (Parker et al. 2008: 159). Secondly, many lawyers around the globe are migrating to major cities. For instance, in 2006, Franklin and Lee undertook a survey of rural practitioners in Wales (Franklin & Lee, 2007). Consistent with McKenzie’s (2005) findings regarding the global trend of migration of professional workers from regional areas to the cities, the survey’s results found a higher ratio of lawyers per the total percentage of the population residing in major cities (Franklin & Lee, 2007). Additional concerns identified by legal practitioners from rural Wales included court closures, excessive workloads, recruitment, retention and
succession planning difficulties (Franklin & Lee, 2007). Franklin and Lee’s survey also found that a number of rural legal firms had ceased to cover publicly funded advocacy work and most firms declined to offer specialist advice (2007: 225–226). Similar findings in respect to recruitment and retention of rural lawyers exist in Australia (Law Council of Australia, July 2009: 19).

More than half the world’s population lives within cities (Deslatte 2015: 58). This means that geographically, large nation-States like Australia encounter substantial difficulties in servicing the legal needs of their population (Kennedy et al. 2014). Where populations are inadequate to meet the span and threshold perquisites to maintain local legal services, clients have to travel long distances to larger regional service hubs or depend on visiting practitioners and infrequent court sittings convened by fly-in/fly-out magistrates (Siegal 2002: 2). Alternatively, many individuals forgo legal representation and specialist advice (Dracup & Coverdale, 2015:127), while others will attempt to secure advice from business specialists like accountants. In respect to rural businesses, Coverdale’s 2012 study of small businesses in rural Victoria indicates that some businesses are electing to access legal services from the major cities (Coverdale, et al. 2012a; Coverdale, et al. 2012b).

The lack of legal services in some rural communities has the potential, in some instances, to impact on the level of economic development and the overall financial health of an area (Coverdale 2011: 31), thereby making the community less attractive to the remaining residents (Law Council of Australia, July 2009: 6). Indeed, Foster, found that there is a direct association between the level of economic activity (judged by retail sales) and the number of legal practitioners (Foster, 1973: 161–162). This paper contends that legal education, through its ability to increase residents access to justice, contributes to the economic development of many local communities.
The delivery of legal services to rural communities is one step towards reducing the urban / rural imbalance that currently dominates the Australian legal landscape (Scrinivasan and Hans, 2000: 235–236). Official reports and state survey results indicate that access to justice remains a pressing concern for many Australians living beyond the city limits. Thus, how should the legal profession respond to this urban / rural imbalance? This paper contends that adding compulsory rural-themed subjects to the Australian legal curriculum will help strengthen the provision of legal services in outback communities. Additionally, as Coverdale suggests, university law schools which have a regional presence may like to consider prioritising emerging areas of law within their curriculum (Coverdale et al. 2012a: 3). In other words, universities can help counter the city-orientated view of law by raising an awareness of social justice and promoting contemporary rural issues like fracking, live exports, water licenses and succession planning in their law school curricula. Furthermore, by including contemporary rural legal issues relevant to regional businesses, such as environmental management, succession planning and water trading, these will allow rural practitioners to provide localised specialist advice to many rural businesses (Coverdale et al., 2012b: 306).

**Defining regional, rural and remote**

Rural and remote Australia refers to those areas outside of major cities defined by a number of different official geographical classifications. However, the concept of ‘rurality’ may mean different things to different people (Gregory 2009: 51). In particular, Gregory warns against merely equating rural with agricultural settlements (Gregory 2009: 51). Indeed, areas outside of major cities are made up of many diverse communities including pastoral, farming, mining, tourism and Aboriginal and Torres Strait Islander settlements. Accordingly, each community, due to its unique social, cultural and economic
circumstances, will have their own specific legal needs together with varying levels of access to justice.

Today, there are a number of classification systems purporting to define terms like rural, regional and remote. Most of the current classification systems exist simply to provide guidance for the distribution of government funds and goods and services to communities outside the capital cities. There are several different official classification systems, including the *Australian Standard Geographical Classifications* and the *Accessibility / Remoteness Index of Australia*, which have been developed to define remoteness and rurality (Black, 2005: 23; Taylor 2003: 358).

Each system attempts to define ‘regional’ and ‘rural’ in terms of the size of a community, distance from large urban centres, including access to services and rural economy specialisations (Deavers 1992: 184); while ‘remote’ is often defined in respect to road distance from major regional centres (Taylor 2003: 358). The problem in defining ‘regional’, ‘rural’ and ‘remote’ by reference to specific attributes is that these features exist on a continuum and may vary between different classification systems (Hewitt 1989: 1). This paper uses the concepts of rural and regional interchangeably unless stipulated otherwise. In other words, the terms ‘rural’ and ‘regional’ in this paper refer to areas located outside of capital cities and major metropolitan suburbs. The term remote on the other hand is confined to communities like Alice Springs that is located a great distance from a major city.

**The Urban - Rural Imbalance**

Irrespective of the term used to distinguish country areas from the city, people living beyond the city limits often face disadvantages in respect to ‘the lack of availability and high cost of facilities, goods and services, both public and private, including health, housing, education, policing, law and justice’ (Chief Justice French, 2011: 2; Coverdale, 2011:16; Legal and Constitutional Affairs
References Committee, 2009). Furthermore, smaller communities are more likely to experience a greater degree of disadvantage than metropolitan and larger regional centres (Coverdale, 2011: 20, 23). The focus of this discussion is on restricted access to legal services and how legal education can play a vital role in boosting the numbers of country lawyers, including increasing businesses’ access to specialist advice without the need for referrals to legal conglomerates in the major cities.

In recent years, the Australian legal profession have raised concern about the future of legal practice beyond metropolitan areas (Kennedy, 2014: 7; Forell et al. 2010: 13). In 2009, the Law Council conducted the nationwide ‘Rural, Regional and Remote Areas Lawyers Survey’ (Law Council, July 2009). The main finding of the survey is that an alarming number of practices did not have enough lawyers to service their client base and that the problem would increase over time as experienced country lawyers retire. In response, the federal government funded a range of projects seeking to create solutions to the issue of recruitment and retention of regional lawyers (Law Council, September 2009). However, many of these initiatives are at a post-graduate level. Others involve taxation incentives designed to encourage law graduates to relocate from the city to rural and regional communities.

In October 2014, there were 66,211 practising solicitors in Australia (Urbis 2014). Despite the exponential increase in the number of law graduates, together with federal and state governments’ initiatives, there is an overall decline in legal practitioners in rural areas. Urbis’ 2014 Law Society National Profile Report prepared on behalf of the NSW Law Society provides an overview of statistical data pertaining to the distribution of practicing solicitors across Australia. In 2014, ‘over half (53.6%) of all solicitors were practising within the capital city of their jurisdiction, with a further third (30.6%) practising in a suburban location, and 12.5% working in a country or rural area’ (Urbis 2014). The 2014 data indicates that there continues to be a
steady decline in the proportion of solicitors practising in rural communities in Australia (Mundy, 2014: 482). The decline in rural practitioners has created a critical shortage in many small country towns of skilled legal professionals (Mundy, 2014). However, research by Forell, Cain and Gray indicates that the rural exodus varies from region to region (2010: 16–17).

**Challenges and rewards of legal practice in rural, regional communities and remote settlements**

Rural practice is characterised by unique professional and personal challenges, yet it also presents a broad range of opportunities rarely experienced in cities (Coverdale et al., 2012; Franklin & Lee, 2007: 227–228). Presently, there are opportunities for existing firms to specialise in new and emerging areas of law. The growth in state and federal laws surrounding agriculture, water and planning regulations, to name just a few, are opening potential opportunities for many firms to consolidate knowledge within strategic areas of resource and environmental law (Coverdale et al, 2012: 300).

Irrespective of whether rural practitioners elect to offer generalist or specialist advice, they must on a daily basis work with a socially, culturally and economically diverse clientele base. As lawyers in very remote areas of Australia are the primary legal professionals, they need to be able to deliver comprehensive and culturally sensitive advice to clients, many of whom are Indigenous (Legal and Constitutional Affairs References Committee, 2009: 151–153). Australia’s multi-cultural landscape is evident in many small town’s unique cultural values, traditions and customs, together with institutions of ethnic and religious groups, including the communication styles and beliefs of certain social groups (Lee 2003: 385). As rural and remote Australia is not homogenous, both adequate and specific training for rural practice is important to the quality of services delivered, especially to Indigenous Australians and other socially marginalised groups. In other words, it is vital that law graduates are introduced to the cultural diversity of rural,
regional and remote Australia. This will ensure that graduates are well prepared and able to engage with clients in culturally appropriate communication and deliver culturally inclusive services to a diverse social and economic clientele.

A 2014 report by the Centre for Rural Regional Law and Justice at Deakin University suggests that lawyers practicing in rural Australia are required to be conversant in many facets of the law (Kyle et al. 2014: 46). This means that there is less opportunity for many rural lawyers to specialise which can reduce the burden of high volume workflow. Accordingly, there is the risk that some rural lawyers will simply burnout due to the need to stay up-to-date across wide areas of practice, along with adverse work environments and challenging clients (Kennedy, 2012: 12). Others may elect to leave rural practice due to the excessive work demands placed on them. Other challenges working in rural communities may include conflicts of interest, professional isolation and remotesness of supervision, geographic isolation, inadequate preparation, inadequate housing, extreme weather conditions, highly disadvantage client base and challenging clients, and lack of resources, infrastructure and services (Kennedy et al. 2013: 318). The impact becomes more severe as the road distance from the capital cities and large coastal towns increase [Giddings et al., 2001: 61]. Therefore, as the practice of law is not experienced uniformly by all legal practitioners due to geographical location and related matters of restricted access to technology, information and infrastructure (Hart, 2012: 12), the law school curriculum should reflect how location can shape the experience of legal practice (Mundy 2012).

**Working Solutions**

Having established the wider significance of legal services for rural and regional communities, we next identify potential solutions to the declining numbers of rural practitioners.
There are already a number of financial initiatives available to help keep lawyers in rural areas (Law Council of Australia, 2009: 9). However, economic benefits alone will not guarantee long term employee tenure, in particular in remote communities (McKenzie 2007: 2). There are also formal and informal education related programmes like the New South Wales’ Regional Solicitor Programme and Regional Outreach Clinic Programme (Law Council of Australia, 2009: 15–16). However, my particular interest is in the role that undergraduate legal training can play in remedying the urban – rural imbalance, while also helping to provide graduates with an understanding of the cultural and social makeup of many rural, regional and remote communities.

Firstly, if we permit our law schools to focus on the teaching of the skills and knowledge required to work in rural communities there is a potential to reduce the recruitment and retention difficulties currently facing many rural law firms. In attracting ‘new blood’ to rural areas, it will help ensure that residents of these remote communities are not without access to justice. Secondly, curriculum design that is focused on new and emerging areas of law represents an untapped potential for law schools to contribute to the economic growth of rural towns. In training law graduates in contemporary rural law, it will afford many rural law firms the opportunity to provide not only generalist but specialist legal services to small businesses. Thirdly, in respect to remote Indigenous settlements, there is the opportunity for law schools to lead the way in cultural competency training for lawyers (Burns 2013). Importantly, in redesigning the law curricula with an emphasis on Indigenous perspectives towards the Australian legal system and related substantive and procedural needs of Indigenous clients, there is an opportunity for law school curricula to reflect the diversity of Australian legal landscape. Furthermore, by integrating customs, beliefs and traditions of culturally and linguistically diverse social groups into the curriculum, law schools can help highlight the diverse ethnic and religious social groups that call rural and regional Australia home.
Conclusions

In preparing this paper on the role of legal education in reducing the rural / urban imbalance in respect to access to justice, I have drawn on my experience as a Lawyer within a rural community together with my professional experience in legal education and academic curriculum design.

Throughout this paper, I have suggested that lawyers delivering services to rural clients need to aware of the cultural, economic and social diversity of rural towns. If lawyers are to actively participate and contribute to local communities, it is important that they understand the needs of clients in rural and regional areas and be aware of the cultural diversity among remote and outback Australia. A further challenge, albeit also an opportunity, for many future lawyers will be navigating the new and emerging legislative landscape in respect to strategic industries relating to farming, energy, resources and agriculture. As was discussed, the ability to specialise in these emerging areas provides an opportunity for existing rural practitioners to fulfil the needs of many small businesses and related community stakeholders.

An exclusive emphasis on metropolitan doctrinal precedents and preparing graduates for urban engagement, usually in commercial and corporate law firms, not only impoverishes the discipline of law, but society more generally, while contributing to the urban / rural divide. It is important to remember that the country and the city are cultural as well as geographic locations on a map (Brett, 2011: 3; Reid et al, 2010: 263, 268). This means that legal practice within non-metropolitan areas is not experienced uniformly by all legal practitioners. Therefore, it is important that law graduates are instructed in the social diversity between the city and the bush and equipped with such skills that will be relevant to practice in remote Australian communities. Hence, as Mundy (2012) maintains, it is vital that law schools address the challenge of rural inclusiveness in their curriculum. Importantly, research in the areas of medical curriculum development has drawn an important link between rural
inclusiveness of studies and rural service (Beatel et al, 2011; Bell, 2005). Indeed, evidence from the discipline of medicine indicates that the undergraduate curriculum can be actively engaged to improve student preparedness for employment in rural and regional contexts (Bell, 2005). Importantly, undergraduate rural exposure can be beneficial in improving students’ perception towards the bush and thus increase their willingness to work rurally (Mundy, 2012).

This paper’s focus was primarily on educational strategies to overcome the recruitment and retention of lawyers in rural and regional areas in order to ensure that individuals, irrespective of their postcode, are able to access legal services. Importantly, an additional advantage of integrating compulsory rural themed subjects into Australian law schools is the potential to foster an ethos of professional service among law students beyond the stereotypical confines of practice in city based legal offices, corporations and international conglomerates.

This paper identified how universities, in particular regionally based law schools, can contribute to tackling the urban / rural divide by incorporating new and emerging areas of law relevant to rural Australia into their law programmes. From the position of rural Australia, the role of universities in constructing legal studies is important due to the potential economic links between the numbers of lawyers in a region to that of economic development. Indeed, as we saw, there are new and emerging opportunities to explore in respect to the link between law school curricula and rural economic development including the wider issue of access to justice.

Finally, in training law graduates with the skills and knowledge pertinent to rural practice, it is envisioned that this will help reduce the rural exodus of lawyers to larger regional areas, cities and coastal hubs. Importantly, it provides the intellectual rigour for the growth of regional law specialists who
are able to provide legal expertise unique to their respective geographical and cultural clientele base.

References


Who Fenced the Dogs Out? Collaborative Area Management: Working Together to Support the Grazing Industries of South West Queensland

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Who Fenced the Dogs Out? Collaborative Area Management: Working Together to Support the Grazing Industries of South West Queensland

**ABSTRACT:** The Collaborative Area Management (CAM) project, more commonly referred to as ‘cluster fencing’, is a cost-efficient, pest exclusion and total grazing pressure management model developed by South West NRM. This innovative concept involves land managers working cooperatively to build and maintain an exclusion fence surrounding a group of rural properties. Through a collaborative approach that presents strong economies of scale, projects can be implemented with significantly less private and public investment compared to individual property fencing. Following fence construction, land managers continue to work as a group to manage invasive pest animals inside the cluster. The project produces significant environmental, economic, and social benefits, including a reduction in the environmental and economic impacts of pest animals, and an improvement in livestock production and profitability. A decrease in predation provides land managers an opportunity to return to, or continue working in the sheep industry, a class of production closely correlated with the viability of rural townships. A decrease in total grazing pressure, through a reduction in wild herbivore populations, enables land managers to implement pasture management practices resulting in improved pasture health.

**Keywords:** Predation, Grazing, Fencing, Economic impacts, Livestock

**Introduction**

Rangelands grazing is the major economic agricultural industry for south west Queensland and historically, sheep and wool production have been the main contributors to this industry. South west Queensland has traditionally been identified as one of the leading sheep and wool production areas in the state, and of this, the Mulga lands bioregion was identified as one of the principal districts. For the period 1985 to 1988 this region represented 25% of Queensland’s sheep population, with wool production in the area accounting for approximately 25% of the state’s total output (Queensland Department of Primary Industries, 1990). Today however, as a result of severe external grazing pressure and predation by wild dogs; the region, like many other parts of Australia has largely reverted to cattle grazing as a means of sustaining an agricultural industry (Australian
Government, 2013). Graphs 1-3 highlight the progressive change in the Australian primary production industry.

Graph 1: Total cattle (milk and meat) numbers in Australia from 1890–2010.

Graph 2: Total sheep and lamb numbers in Australia from 1890 to 2010.

Graph 3: Total wool production for the years 1911 to 1973 and then shorn wool production from 1974 onwards.
This change from sheep and wool production to the cattle industry is affecting local communities, as the sheep and wool industry is closely correlated with the population and economic stability of rural townships. Economic analysis conducted in the Balonne shire indicates the current production shift away from sheep and wool, has resulted in a loss of approximately 110 full time jobs, and deterred between 86-97 families from being located in the shire. Consequently, it is estimated communities throughout the shire are losing more than $9.7 million annually (Grant, 2015a).

Predation on livestock and uncontrolled total grazing pressure (TGP) imposes significant negative impacts on the management of pastoral enterprises in south west Queensland, as well as other agricultural regions throughout Australia. Whilst there are a range of methods currently in place to control wild dog populations; the economic, social and environmental impacts of predation are forcing land managers to shift away from using solely traditional control methods. Methods including baiting, trapping, shooting, and the use of ‘guardian’ dogs are now being used in conjunction with exclusion fencing, and more specifically, Collaborative Area Management.

Although the use of exclusion fencing for wild dog control at the individual property scale is not considered a new concept; Collaborative Area Management, or cluster fencing, is an innovative and novel approach that land managers are now exploring in the time consuming, high cost fight against invasive pest animals. By working as a group to construct and maintain an exclusion fence surrounding a cluster of properties, landholders can erect a high standard fence with reduced financial and labor input. Following the construction of the fence, landholders continue to work together to manage pest animal populations within the cluster, with confidence that entry of new pest animals is significantly limited.

**Predation**

Wild dogs are a declared pest animal and have been regulated under Queensland legislation since 1885 (Perkins, 2013). As such, landholders and local and state government agencies have a legal responsibility to control them. Despite this obligation and the high financial input and ongoing maintenance to control programs such as the wild dog barrier fence, wild dogs continue to increase
their distribution and establish new populations in previously unpopulated areas (Pest Smart, 2010. The expansion of this pest animal comes at a significant financial cost to graziers.

In 2009 the major economic costs associated with wild dogs for the Queensland grazing industry were estimated to be in excess of $67 million (Hewitt, 2009). Recently, industry sources revised this figure and estimate that costs are likely to be much greater, running into hundreds of millions of dollars annually (National Project Steering Committee, 2014).

Predation by wild dogs causes financial stress to land managers but also has ongoing social impacts. A physiological impact study by Wicks, Mazur, Please, Ecker, and Buetre (2014) identified that graziers feel a sense of disempowerment and uselessness in the face of the problem. Reduced farm income and a loss of genetically improved stock that has been developed over years of breeding can lead to psychological stress, leading land managers away from sheep farming and into cattle (Thompson et al., 2013).

**Total grazing pressure**

Additional impacts on grazing businesses include an increase in total grazing pressure, preventing land managers from undertaking appropriate pasture management practices including rotational grazing. Such impacts are heavily exacerbated in arid and semi-arid environments where feed and natural water availability is limited.

Total grazing pressure consists of pressure applied by domestic livestock combined with that applied by wild stock, including native macropods and feral species such as wild goats and pigs. Animals such as wild goats and kangaroos are able to maintain large populations across pastoral lands where artificial water points are readily available and are thought to contribute approximately 50% increase in grazing intensity (Fisher et al., 2004; Waters et al., 2012).

Fisher et al. (2004) argues that managing grazing pressure from feral and native animals is more difficult than for domestic stock due to the size and extent of wild stock populations, the mobility of some species, the expense of ongoing control activities, and the lack of directly obvious economic and ecological benefits. Exclusion fencing is one possible way to manage the additional grazing pressure applied by wild stock across pastoral lands.
Studies by McGaw and Mitchell (1998) estimate feral pigs can cause crop yield reductions of 1%-5%, with an average reduction of 3.67% across a range of crop species. Analysis conducted in multiple studies by Grant (2015a, 2015b) estimates feral pigs account for approximately $15.8 million and $9.8 million in lost production annually for the Balonne and Goondiwindi cropping and horticultural industries, respectively. Such losses equate to between $19.65 and $40.56 per hectare.

Comparatively, increased macropod populations are considered by many land managers as the primary cause of excessive grazing pressure in the rangelands. A conservative analysis of sustainable kangaroo populations (based on the prescribed harvest quota trigger points in the Queensland Wildlife Trade Management Plan for Export) estimates Queensland’s central south macropod harvesting region (encompassing the Bulloo, Murweh, Paroo, and Quilpie shires) contains an excessive population of 3,848,351 commercially harvestable macropod species. Dawson and Munn (2007) estimate kangaroos have the competitive grazing impact of 0.4 dry sheep equivalents (DSE), and therefore during the 2015 period, the overpopulation of kangaroo species equates to a lost production of 1,539,340 DSE, approximately $123 million annually to the region’s agricultural industry.

Whilst intense grazing pressure and predation are impacting heavily on grazing businesses, biodiversity in the south west region of Queensland is also degrading. Unmanaged total grazing pressure can have a negative impact on ground cover, soil erosion, weed invasion and fouled water supplies. These impacts can effect small native animals that use ground cover as refuge from predation, and may ultimately affect the biodiversity values within an area (Fisher et al 2004). Wild dogs are considered to be a threat to many endangered animals, specifically small and medium-sized animals such as bandicoots, wallabies and native mice (Thompson et al, 2013). Predation by wild dogs is thought to be impacting on koala populations both through direct predation and through altering koala behaviour. By restricting the amount of time koalas spend on the ground, wild dogs may be forcing koalas to remain in trees during times of high heat, as well as, preventing them from moving between habitat trees, resulting in starvation (Environment and Communications References Committee, 2011).
Collaborative Area Management

The Collaborative Area Management (CAM) concept embraces a holistic approach to pest exclusion and total grazing pressure management at a sub-regional level. By working cooperatively to build and maintain an exclusion fence surrounding a group of rural properties, land managers can restrict pest animal movement into the protected area, and regain the ability to implement best practice management strategies. Traditional pest management methods including baiting, trapping, and shooting continue to be strategically implemented at both the individual property and cluster levels.

Exclusion fencing at the cluster extent rather than an individual property, provides significant cost and time efficiencies. Estimated at approximately $7,500 per kilometre including materials and labour; high integrity exclusion fencing, for most part, is beyond the financial capacity of land managers, particularly in times of significant drought and reduced productivity and profitability. At a cluster level, projects can exhibit substantial economies of scale; reducing costs per hectare by 64.5%, from $26.54/ha to $9.95/ha in a scenario of eight uniform rectangular 13,000 hectare properties – totaling 103,000ha as a cluster (Grant, 2015a). Decreased investment costs, as well as the strong performance of the project, has resulted in a significant return on investment; demonstrating the concept’s strong efficiency compared to other sustainable agriculture investments.

Figure 4: Total project cost and cost per hectare comparison between individual property fencing and cluster fencing at scenario of 103,000 hectares
It is important to note, as the scale of a cluster increases, the potential for administrative and land management conflicts also increase. The CAM concept utilises a variation of the most productive scale size (MPSS) model to guide cluster scale decisions based on various land types.

Since the concept’s implementation in 2013, seven clusters have been established throughout south west Queensland. Through funding provided by the Australian and Queensland Governments as part of the Queensland Feral Pest Initiative, South West NRM is extending the project to see a further 15 clusters developed within the next 18 months. The CAM project, in its entirety, will see approximately 3,532,690 hectares of agricultural land in the south west of the state enclosed by more than 4,066 km of high integrity exclusion fencing.

Under the current model, public funding contributes approximately 50% of the cost of fencing materials, with the remaining 50% of materials and all construction and labour costs funded by the landholders. Factoring in market rates for fencing construction, public investment accounts for approximately one-third of the total project costs; thus ensuring strong accountability and risk management by landholders.

**Funding processes**

The two phases of the project have been subject to rigorous analysis by South West NRM, who undertake a robust process of assessment to determine those clusters which have the strongest potential to produce environmental, economic, and social benefits. This process incorporates a multi-stage submission process as identified in Table 6, and an assessment panel of economic, industry and government advisors to measure impact factors, cost-effectiveness, industry and land types.

**Table 6: Multi-stage submission process of Collaborative Area Management**

<table>
<thead>
<tr>
<th>Process</th>
<th>Purpose</th>
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<tbody>
<tr>
<td>Expression of Interest</td>
<td>• Facilitate discussion between likeminded landholders.</td>
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<tr>
<td></td>
<td>• Identify potential cluster groups throughout region</td>
</tr>
<tr>
<td>Phase</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Initiate finance opportunities with private and concessional lenders.</strong></td>
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</tbody>
</table>
| **Formal Application** | • Cluster group refinement & identification of additional economies of scale benefits.  
• Negotiations between cluster landholders and adjoining landholders for dividing fence support  
• Collation of environmental and economic impact data for assessment. |
| **Application Assessment** | • Project feasibility and economic impact assessments to determine level of current and potential impacts, cost-effectiveness, and potential return on investment to government funding.  
• Biodiversity assessment to review biodiversity impacts, cluster implementation benefits, and regional and sub-regional areas of concern.  
• Implementation and process review to ensure clusters present strong understanding of project objectives, timeframes and reporting obligations.  
• Holistic region reflection to consider medium and long term project implementation advantages. |

Phase two of the project received significant interest from landholders throughout the region, indicating a strong understanding and agreement of the value of the project. South West NRM received 39 expressions of interest from groups of landholders, and of these, 28 groups were invited to submit full applications. These cluster groups represented 160 landholders across 193 rural properties. Following the assessment process, 16 clusters were approved for funding, with 15 clusters contracted, to which represents 96 landholders across 116 rural properties.
The second phase of the CAM project focuses on areas greatly impacted by wild dog populations and those properties which currently produce, or have a strong ability to return to the sheep industry in the near future.

**Cluster governance**

As a method of reducing project risk and ensuring longevity to both public and private investment, clusters established under the CAM project are contractually obligated to be managed for a minimum period of 20 years. Clusters are required to establish and maintain an appropriate legal entity (such as an incorporated association or company limited by guarantee) and carry out the complete maintenance of the fence through a levied fund (similar to a body corporate sinking fund).

The sale of any property, or part thereof, is subject to the new owner accepting the legal and financial obligations of the cluster.
Monitoring and Evaluation

The Collaborative Area Management project is a unique approach to exclusion fencing, and as such, needs to be strategically monitored to measure the environmental, economic, and social impacts of the fence’s application. South West NRM and Queensland Department of Agriculture and Fisheries, in partnership, are undertaking a range of on-ground monitoring techniques within the clusters established under phase one of the project. This monitoring includes measuring wild dog and kangaroo populations; land and pasture condition; primary production productivity and profitability; and regional change.

Population density estimates for many animal species can often be difficult and expensive to obtain. A methodology called the Passive Tracking Index is being used in measuring the abundance of wild dogs inside and outside the clusters (Engeman and Allen, 2000; Engeman, 2005). Tracking plots are positioned on multiple transects along low-use dirt roads at intervals of approximately 1km, and examined after 24 hours for spoor, resurfaced, and repeated for a period of 3-4 days. Monitoring is conducted during mating season to maximise wild dog activity, with the mean of the daily mean used for statistical analysis. Additionally, population densities of kangaroos are measured using a distance sampling methodology, incorporating line transects and spotlighting (Thomas et al., 2002). The process collates the sighting and distances of each sighting from the observer to provide a density estimate. This density is then extrapolated over a larger area of similar habitat to determine expected animal abundance.

Enhanced remote sensing technology has provided an increased ability to analyse and monitor land condition from the desktop with a high degree of accuracy. South West NRM uses a combination of both satellite imagery analysis tools and on ground assessment sites to determine improvements to land and pasture condition across multiple land types. These analysis tools consider changes to ground cover, perennial and undesirable grass species, grazing pressure and utilisation, soil condition, as well as weed presence and spread.

In contrast; the private and social economic impacts of the project are measured through analysis of productivity and profitability change, as well as regional economic and infrastructure change. Table 8 highlights (but not limited to) the economic data collected for project monitoring and evaluation:
Environmental and economic monitoring has been conducted on existing clusters since their establishment; however due to severe drought conditions and the short timeframe since inception (3 years), only a small data set has been collated to date. Extrapolating meaningful conclusions from this data is therefore not possible at this stage. It is expected that data collection will be required for a minimum of 5 years before conclusions with high statistical confidence can be made.

Anecdotal evidence from land managers in one cluster indicates lambing rates have increased from 7% to 70% following the closure of the exclusion fence. Based on stocking 8,000 ewes, the exclusion fence has facilitated an additional 5,040 lambs as a result of decreased predation and improved livestock health. At a value of approximately $100 (AUD) per lamb, the project translates to an increased production revenue of $504,000 annually. Sightings of native
wildlife have also increased in one cluster where land managers report seeing a return in small mammals, and a recent survey found koalas in one cluster where they haven’t been seen for many years.

A key finding in feasibility studies conducted by Grant (2015a, 2015b), was that many cluster projects exhibit such significant returns on investment for rural landholders which may provide an opportunity for implementation without government assistance. This statement greatly depends on the financeability of grazing businesses; however, the reports suggest project payback periods ranging between 0.72 and 7.18 years without funding assistance, reducing to between 0.54 and 5.39 years should 25% funding be sourced (Grant, 2015a). Landholders currently involved, or have the aspiration to return to sheep production, demonstrate the strongest capacity to reduce payback periods given the current impact of invasive animals, and the potential productivity and profitability of the exclusion fence.

The studies by Grant (2015a) also identify that gross margins, on average, have the potential to increase by 27% and 48% for cattle and sheep businesses, respectively.

Conclusion

The grazing industry in south west Queensland continues to shift from sheep and wool production to cattle; a change which is producing significant negative impacts to rural townships. This change, or the inability to restore the existing sheep industry, is now strongly recognised as one caused by livestock predation from wild dogs, with the economic costs estimated in the hundreds of millions of dollars annually.

In an attempt to reduce predation and control total grazing pressure, land managers are working collaboratively to construct and maintain exclusion fences around groups of properties. Through a concept developed and first implemented by South West NRM, the Collaborative Area Management project is now providing protection to 3,532,690 hectares of agricultural land in south west Queensland. Through economies of scale and collaboration, the project has reduced capital investment by as much as 64.5%.
Project monitoring and evaluation should still be recognised as being in the early stages; however, anecdotal evidence of on-ground change clearly demonstrates a significant return on investment, particularly in increased productivity and profitability. Although once considered an unorthodox method of pest and grazing pressure management, the Collaborative Area Management project illustrates that through strategic planning, governance, and collaboration, small injections of public and private investment can deliver positive outcomes to regional Australia.

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Rethinking Climate Adaptation Planning: From awareness to action

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Rethinking Climate Adaptation Planning:
From awareness to action

ABSTRACT: This paper provides reflections from experienced climate adaptation planners based on their experiences, reading and conversations. It summarises features of climate adaptation planning, particularly in an NRM regional context, presents learnings from early attempts, and it suggests priorities for future efforts.

Planning for the future is always uncertain and often complex. Planning for adaptation to climate change is no different, but it also has some additional characteristics to manage. These include the uncertainty about future emissions, the uncertain consequences of any given future climates, and the fickleness of public attitudes, values and beliefs about climate change.

Effective planning for adaptation to a changing climate requires a suite of traditional, modified and new approaches. Foundation recommendations include:

- the need to consider a range of different futures and plan a number of alternative pathways,
- the need to be clear on what to monitor to determine when key decision points are approaching, and
- take action now on matters requiring an immediate response.

Ancillary recommendations include:

- Build the capacity to make transformational changes, if and when required.
- Understand the limited role of climate vulnerability assessments.
- Focus engagement on key decision-makers and their advisers.
- Focus the scope on strategic responses for high-priority themes, within a triple bottom-line, regional landscape, context.
- Ensure plans are rooted in the values of regional communities and reflect the things that matter most to them.
- Identify actions that are needed immediately, others that should occur to build the capacity and some that lie ‘dormant’ until situations arise when they may be enacted promptly.
- Challenge people with transformational changes to long running programs.
- Recognise that adaptation plans must be agile, full of ‘action now’ as well as plans for how to respond should specified futures unfold.
Introduction

The challenge

Planning how to adapt to climate change draws on many traditional planning tools, but has some special nuances as well. Three aspects must be accommodated:

- There are still a range of views about climate change within society. Some justification for planning may be needed and engaging a broad, representative community cross-section may be difficult, especially given the long time frames involved.

- Climate change is a chronic issue – slow and insidious within a highly variable system – and the exact nature of future climate remains uncertain. Different models generate different projections, based on various assumptions about how global climate functions and the extent to which future human activity will change the atmosphere and climate (IPCC 2014).

- The specific consequences of any nominated change in climate are uncertain. There is good understanding of many likely effects (e.g. bio-physical models of crop and pasture growth can predict the effect of specified changes in climate on production), but the inter-related and cascading consequences, especially in natural environments, are unknown. We don’t understand the dependent interactions of ecology and landscapes well enough to boldly predict what future ecosystems will look like.

Yet, we must plan for the future – regardless of how uncertain it may be.

New tools, analysis and frameworks are evolving to help meet the challenges of planning for climate adaptation (e.g. Wells & McLean, 2013; Meyer et al. 2016), and they work best when coupled with traditional strategic planning tools.

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**Planning tools**

The concept of a Climate Vulnerability Assessment (Schneider et al. 2007) was introduced to address, and to make risk assessment more finely tuned to, climate issues. The conceptual framework helps in thinking through likely effects, consequences and potential adaptations. It brings attention to questions of ‘adaptive capacity’ – how well systems are placed to deal with climate change. It may be supported by methodologies ranging from hi-tech (complex modelling) to low-tech (workshops and whiteboards), and may be spatial or non-spatial.

‘Pathways’ (Stafford Smith et al. 2011) have also been promoted as an option to assist with planning around uncertainty; and have proven very useful in graphically documenting planned contingencies. The approach encourages plans styled as ‘if this happens, then we do .., but if that happens, then we do ..’. It also encourages the documentation of decision points and consideration of the precursors to any action. What needs to happen now so that if a nominated threshold, i.e. a decision point, is reached then immediate action may be taken?
Example: Preferred Pathways for vegetation management

Legend:
- A solid, dark green line indicates the time period over which an option could usefully address the relevant key decision.
- A lighter green line indicates time before an action occurs where preparatory work is required;
- A dashed, thick dark green line indicates that the option contributes to the adaptation solution but only in part;
- A solid dark grey line indicates an option that was not favoured in these discussions.
- A lighter grey line indicates time where preparatory work would be required if such an option was to be pursued;
- Circles indicate a decision point, such as when decision makers may need to choose between different options;
- Yellow lines with arrows indicate emerging pathways that need to be further assessed in most instances with each sector;

Figure 2. An example of a preferred pathways roadmap.

There is also a rapidly evolving array of frameworks and analysis tools being developed to help assess the consequences of climate change. Tools like Landscape Futures Analysis (Summers et al. 2015, Meyer et al. 2016) and platforms such as EnSym (Ha et al. 2011) have
helped provide insights into the implications of nominated changes in climate. The information coming from such aids is very useful input to adaptation planning, but the tools and their outputs are not sufficient on their own.

Traditional planning approaches - such as futuring or scenario planning (Kahn & Wiener 1967, Bennett et al. 2003, Roxburgh 2009) to counter uncertainty about the future, conceptual models to deal with complexity, Driver-Pressure-State-Impact-Response models (OECD, 1993) to drill into causal links and unearth response options, and even role-playing to better comprehend the likely social aspect of change – can also be very useful in the context of planning for climate change.

**Reflections**

This paper presents reflections from climate adaptation planners based on their experiences, reading and conversations. It summarises some features of climate adaption planning, presents learnings from early attempts to put theory into practice, and suggests priorities for future efforts. It provides insight to enable climate adaptation planning to move from a theoretical realm to one of urgent practicality.

Landscapes are the focus for this work, working primarily with local governments or regional natural resource management bodies, but the principles espoused will be equally applicable down to the enterprise level. A triple-bottom-line (social, economic and environmental) approach is advocated, but the principles may also be applied in a narrower context if required.

The authors of this paper have applied a range of approaches to climate adaptation planning, using new and traditional planning and engagement techniques, vulnerability assessments, and both hi and low-tech approaches. Reflecting on the outcomes of the planning exercises there is a sense that insights into likely effects and planning priorities have been generated, that useful tools and frameworks have been developed, and that awareness of relevant issues has been substantially increased. However, there is also a sense that the exercises have not been as influential as they may have been.

Assessments have been completed and plans may have been documented, but hard decisions and action are still pending. Transformational changes are yet to happen.
It may be that adaptive tinkering to existing approaches is all that is required at present, and that transformations will occur when needed to face bigger changes in climate. Or it may be that significant changes are slowly, incrementally occurring without being noticed as the adoption of new approaches creeps through a community. It may also be that we are yet to master adaptation planning and need to rethink how we proceed, in order to gain more traction and move from awareness to action.

**Insights and advice**

Testing and applying the concepts behind climate adaptation planning have provided numerous insights and subsequent advice. They are grouped below in line with some common phases in adaptation planning: scoping, assessment or analysis, and planning.

<table>
<thead>
<tr>
<th>Scoping</th>
<th>Assessment</th>
<th>Planning</th>
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</thead>
<tbody>
<tr>
<td>• Scope</td>
<td>• Vulnerability assessment</td>
<td>• Style of plans</td>
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<tr>
<td>• Engagement</td>
<td>• Literature and expertise</td>
<td>• Transformational</td>
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<td>• Values</td>
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<td>• Response ready</td>
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<tr>
<td>• Complex systems</td>
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<td>• Adaptation action</td>
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<td></td>
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<td>• Broad review</td>
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**Scope**

Changes in climate will trigger a cascade of inter-linked changes across environmental, social and economic spheres. Technology, land use, management practices and communities will also change due to other factors. Trying to plan for a limited sector, in isolation of other sectors, is fraught with difficulty. At the same time, the challenge is complex enough by nature without compounding it with too many ancillary issues.

**Example: Farmland fires.**

The shocking Wanilla and Pinery fires in South Australia are recent phenomena in the speed and ferocity of fire in agricultural landscapes. Climate change may be part of the reason they have happened, along with changes in land use where large areas of cropland abut, without breaks due to grazed pastures or fallow land. Considering climate change in isolation of management changes could result in an impractical adaptation plan.
The test is to recognise that social, environmental and economic aspects must be covered, especially with regard to adaptive capacity, but to keep the analysis pointed to big ticket issues – which may not all be ‘high level’. Sometimes quite detailed analysis will be required of some issues, but those issues must be ones that are crucial with wide ranging ramifications. The issues, or themes, of importance will be those associated with high vulnerability and considerable ‘triple-bottom-line’ consequence, such as the inundation of low-lying coastal areas or changes in primary production systems due to hotter, drier conditions.

Because changes occurring due to shifts in climate, and the capability of communities to respond, will also be affected by other factors, climate adaptation must be considered in the context of a world with ongoing change in social, technical and economic features. Using ‘futuring’ techniques to contemplate a range of alternative future scenarios can assist - with climate included as one aspect among other influential features. It can help stimulate ideas on transformational responses and highlight likely key decision points, and the factors driving them.

**Engagement**

The varied, sometimes antagonistic, attitude of people to climate adaptation planning, coupled with the complexity and uncertainty which underlie it, and some long lead-times for actions and responses, calls for different engagement strategies to the norm for strategic climate-related planning. Rather than trying to bring whole communities along and develop thorough regional action plans, it is biser to be more strategic in terms of engagement and the depth of planning.

This not to say that community engagement isn’t important – it is, especially when getting closer to the ‘doing’ stage of events. Rather the timeframes, breadth, complexity, uncertainty, and in some cases the urgency needed, suggest a more immediate and focused approach to break the shackles of existing norms. Broader engagement can follow later, when individual issues need attention and operational aspects become important.

The prime initial audience should be key decision makers and their advisers, and the focus should be on identifying likely future scenarios and decision points – not on trying to forecast events and planning in detail now for actions to occur in the future. The plans should include:
- Guidance on how to act and plan - who to engage and how to develop agreed action plans - at key future decision points, and
- Actions to take now in order to have the capacity to respond in the future, alleviate greenhouse gas emissions, or respond to identified changes.

Good plans will have an emphasis on monitoring specified features for early warning of when key decision points are approaching. Pathways plans can be built around those points and focus on ‘big ticket’ changes that may be needed.

**Values**

Community values, the things that communities and people hold important - whether it be aspects of the environment, favourite activities or lifestyles, or beloved traditions or industries – must underlie any adaptation plan. Without a broad engagement program, planners must strive to draw insights on community values from other planning exercises or surveys, or through pointed engagement with key decision makers gifted with an intimate understanding of local values.

**Complex systems**

Landscapes - natural features, the uses to which those resources are applied, the communities inhabiting them and the economies they are part of - are complex systems. They are a network of dynamic elements which interact across different scales and collectively have emergent properties, but their future is not precisely predictable.

Complex systems may be influenced, but not controlled. Buffers within the systems give them resilience. Climate change and adaptation planning must be undertaken within the context of landscapes as complex systems.

**Vulnerability assessments**

The vulnerability assessment framework provides a useful construct for contemplating climate change and vulnerability. Used well, it generates insight and understanding.

However, it can become an exercise in generating scores (for which there is little substantiation) and an end in its own right – not a step toward the desired outcome of planned action to better adapt to changes in climate.
Using the framework to focus on ‘systems thinking’ is more useful than generating scores of assessed vulnerability. The climate vulnerability assessment process itself is subjective and scoring, even with rules to govern assessments, is also subjective. The allure of chasing more detail must be kept in check and outputs considered along with other insights and information as inputs to a planning phase.

Conceptual models (even simple mind-maps) can help explore vulnerability – especially impacts on ‘systems’ as a consequence of climate change. Traditional planning tools, such as Driver-Pressure-State-Impact-Response (DPSIR) models, can also assist, especially in helping to generate novel, or transformational, responses to climate change. Used in conjunction with other tools, the DPSIR framework can be powerful in highlighting major issues and risks, as well as options to improve adaptive capacity.

Vulnerability assessments and the identification of possible responses also highlight where additional information or understanding is required, helping to direct future investigations to matters of most priority.

**Literature and expertise**

In most cases there will now be at least some analysis of climate related issues and vulnerabilities, as well as projections for future climate. Climate adaptation planning should start with a thorough review of literature and consultation with those currently working on relevant projects across communities, private enterprise and governments. Rather than starting with a blank canvas it is more a case of collating and synthesising what is already understood. Preparing information or discussion papers is a great way to report findings in a manner that feeds into scoping, analysis and planning phases. Having that endpoint in mind also helps to put boundaries around the literature and modelling to be reviewed.

**Style of plans**

Climate adaptation plans must be strategic over the long term, but also contain actionable elements for the short term. They should be a mix of plans of how to develop operational plans if and when needed, and of operational plans for the here and now. They will deal with things such as:

- ‘If we see *xyz* happening, then we’ll need to do *abc* – and to be prepared for that possibility we should be doing *mno* right now.’ and
• ‘We need to move to a policy of \textit{abc} within the next ten years – and should be prepared to move swiftly as soon as an opportunity, such as \textit{efg}, arises’.

\textbf{Examples: Adaptation policies.}
• A ‘bushfire-ready regulatory and planning package’ to be tabled for immediate consideration if the incidence and impact of catastrophic fire increases, or
• Assistance with the re-location of houses rather than supporting rebuilding in flood-affected areas.

The ‘Pathways’ approach to planning is about understanding what changes in climate may occur (and how to detect them), and being ready with well-considered options for action in the event that the nominated changes, or trends, do occur. It permits decision makers to document things such as:
• ‘If we see \textit{xyz} happening, then we’ll need to do \textit{abc} – but if \textit{rst} happens, then we’ll need to do \textit{lmn}. In either event, we will then need to engage and plan with \textit{opq} and we can do that by \textit{uvz}.

The pathways approach does not assume to see the future with precision, but anticipates possible futures and contemplating how different scenarios may be best managed, or avoided in the first place. The pathways and crossroads style of contingency planning demands attention to the indicators that a trigger point is approaching.

Documenting what to monitor and look out for should be an important part of an adaptation plan. It may include facets of the climate, and climate related matters like bushfires and coastal erosion. Unprecedented climate related events, such as wildfire in previously unburnt ecosystems, may be the evidence of climate change needed to stimulate transformational changes.

\textbf{Transformational, not ‘same old, same old’}
A common feature of climate adaptation plans is to reinforce the importance of good basic operations. In the natural resources arena it can come down to aspects such as pest and weed control, fire management, vegetation corridors and soil and water quality conservation. Water use efficiency and the reuse or recycling of water is also a common theme.
Management bodies can easily sweep them aside as ‘we’re already doing that’ – but they may not be at the standard that will be required. Stresses in the future are likely to require absolute excellence in these fields, not ‘business as usual’ with hopes pinned on maintaining status quos or continual, incremental improvement. The real challenge for managers is to transform their traditional programs for much better outcomes.

**Examples: Transformational NRM**

- If the norm is pest control, what would it take to eradicate rabbits, cats and foxes?
- If the norm is best on-farm management for nutrients, what would it take to halve nutrient losses in floods and storms?

There should be a challenging of norms, rather than seeing adaptation plans as reinforcement for norms. A whole of landscape approach is needed to build resilience and managers should be challenged to rethink their modes of operation – what iconic reformations are needed to take things to a higher level, and what could trigger such transformational actions? Organisational change may be necessary.

**Response ready**

Transformational change often occurs in response to a trigger of some form. Adaptation may occur through large, spasmodic (event driven) steps, rather than a smooth, ongoing transition. Exceptional, catastrophic events that are linked with climate change, e.g. extreme flooding, bushfire or erosion, are examples of possible triggers for change. Communities which have planned pathways and are ready to respond at such critical times (adaptation moments) will perform better in the future than those who don’t. They will have anticipated and prepared for climate-driven changes.

**Example: Foreshore development.**

A foreshore erosion event may jeopardise public infrastructure. Rather than seeking an immediate engineering solution (that will fail under continually rising sea levels), the event is recognised as a key decision point. Prior (response ready) work will have identified possible relocation sites for the facility and a discussion paper will be ready for release to initiate a conversation about changes to foreshore development guidelines.

Climate adaptation planning should help community leaders anticipate likely future scenarios and be ready and able to take decisive action as opportunities arise and situations demand.
This does not abrogate the responsibility of planners to consult and negotiate, it simply ensures that action can be taken as promptly as possible when opportunities arise – and there is less risk of failing to change as circumstances require.

**Climate adaptation action**

Adaptation plans must result in action. They cannot be allowed to be ‘just another plan’ where the process of planning is the end-point rather than the beginning of action. High-level decision makers and their advisers must be engaged and committed. They should commit to a plan, rather than just endorse it, and be ready to act in accord with agreed responsibilities assigned by the plan.

**Example: Operational plans.**

Engineers and asset managers may align the climate adaptation plan and their risk assessment and infrastructure planning data-bases and processes.

The action leaders for climate adaptation should be instilling a culture of adaptation planning within their organisations. In the same way that a quick risk assessment may be common place, so to should be a quick climate vulnerability assessment for activities at all levels of operations. Plans for how to achieve that cultural shift may be part of an adaptation plan, sculpted as input by Managing Directors or Chief Executive Officers.

**Broad review**

The field of climate adaptation planning is a very dynamic one. New information and ideas are continually coming forward. In that context, reviews should take parties back to basics to ensure the fundamental assumptions of a current plan are still valid. Reviews will need to be more than a quick check and tune-up, referring to new scientific information as well as evaluating performance, relevance and learnings.

Monitoring and reporting on the implementation of a plan, and its effectiveness, is as important as environmental monitoring to detect approaching triggers, or decision points. A thorough process of reviewing what has been learnt and done before, and the reasons for actions, is very important. Transformational changes may be needed, but they may be a mix of major initiatives and small (though influential) incremental steps (such as changes in culture). A record of these steps will help determine if the plan is working or not.
Documentation and review has become more vital now because ‘corporate memory’ is much more volatile through staff turnover and also because of the volume of material that is generated. Just because a plan or report was generated a few years ago, does not mean that incumbents know or understand the context or content. Recognition of the value of review will bring additional focus to the indicators and measures of change, and reduce the risk that perspectives are based only on that which exists within the current time frame.

Conclusions

Main lessons
The main lessons from regional climate adaptation planning have been the importance of:

- Using climate adaptation planning to install a new way of thinking within the culture of organisations, and
- Thinking through what to monitor as thresholds and triggers for change.

Assessments and plans based on reams of data, statistical models and analysis can be impersonal and uninspiring. Adding social aspects and personal perspectives will enhance their content and their chances of adoption. Engaging leaders and decision-makers in the process to change their understanding and way of thinking is a most important outcome.

Example: Social aspects
Involving people in mapping out conceptual models or exploring scenarios, instead of (or as well as) things like vulnerability scoring, enhances the prospect of enabling people to get a real feel for the issues and options and to inject fresh, relevant ideas into adaptation planning.

Climate change and its effects can be chronic and incremental. In variable environments it is hard to recognise when changes have occurred. Planning and actions should be about avoiding ‘tipping points’, when change is sudden and often practically irreversible – but identifying thresholds and trigger points is not straight forward. It is not simple to determine:

- Which aspects and parameters to monitor – and how.
- What statistics to analyse and report to identify changes within highly variable data.
- How much change to accept.
A mix of ‘hard’ and ‘soft’ tools and techniques can be used to help and inform decision-making.

**Example: Flood threshold**
- ‘Hard’ technique – data on rainfall (e.g. incidence of intense storms), run-off (e.g. frequency of exceeding decile 10 run-off) and water-level (e.g. frequency of exceeding a specified height).
- ‘Soft’ technique – focus group advice that action should be taken if the main shopping street was flooded more than twice per decade.

**Looking forward**

There are now a number of examples available of techniques and frameworks that may be applied in climate adaptation planning, as well as those developed for strategic planning of any sort.

Regardless of which elements are used, for an adaptation plan to have good prospects of leading to action and the sorts of outcomes required, plans should focus on:

- **Pathways and crossroads.** Plan to act upon defined triggers, or as soon as opportunities arise. Have a range of options to cater for different climatic futures and socio-environmental situations.
- **Situational monitoring.** Define likely trigger points, the data required to see them, and the monitoring and reporting regime to provide the data.
- **Action, as and when needed.** Take action now on matters requiring an immediate response and build the capacity to make transformational changes, if and when they are required.
- **Regular revision.** Climate, and other socio-economic and environmental factors, can change slowly and subtly. Periodically review what has changed, what has been learnt and what communities want, to update plans and keep them relevant and vital.

Climate adaptation plans may be separate documents, but they must be integral to the operations of relevant organisations. Components of a climate adaptation plan should be embedded in other plans, such as those for infrastructure replacement, land use zoning, and natural resource management.
**Tips & Tricks**

Climate adaptation planning is not a way to predict future climate and plan future actions in detail. Rather it is a means to understand the range of future climates that may occur and their likely consequences, and to contemplate the changes needed now and possibly in the future – dependent upon how climate does change. Some action will be needed urgently, some will be preparatory and some actions may be planned as fall-back positions, if needed.

Climate adaptation planning can be undertaken in three phases:
- Scoping.
- Vulnerability assessment.
- Adaptation planning.

**Scoping.** It is likely that there is already a lot known about potential changes in climate and possible repercussions. What is likely to be missing is the linkages between different changes and all the social, economic and environmental aspects of a landscape. The main task in this phase is to identify key assets and the issues affecting them. Relevant reports and climate projections, or models, may be assembled and background papers may be prepared summarising what is known.

Techniques like ‘futuring’ (exploring alternative future scenarios) can be used to explore linkages and consequences, and conceptual models may be drawn to record understandings. Key stakeholders can also be identified and invited to become involved.

**Vulnerability assessment.** The vulnerability assessment framework can be applied in ways ranging from informal discussion, through subjective scoring, to the development of models and objective scoring. In the latter cases, rules and ranges must be set for scoring to be consistent and experts may be invited to review any models constructed for the assessment.

**Example: Rules and ranges**

Rule: Sensitivity to increased soil erosion = slope + soil erodibility + surface cover (evenly weighted).

Ranges: Slope – 0-5° (score = 1), 6-10° (score = 2), 11-15° (3), 16-25° (4), >25° (5), etc.
The main task is to refine a list of important assets at risk from climate change, with significant consequences for the landscapes under consideration – and to understand why they are valuable and at risk.

**Adaptation planning.** Develop some leading questions (e.g. ‘How will we protect Asset A from increased fire frequency and intensity?’) and develop potential mitigation or adaptation options, with reference to thresholds and trigger values. The DPSIR framework is useful in teasing out possible responses, which may then be assessed for feasibility and cost effectiveness. Role playing could also be used to explore response options.

Pathways plans can document the possible responses, their order of preference, and their triggers.

Responsibilities for monitoring and response actions may be documented and agreements reached on how the plan will be implemented. New partnerships and programs, even organisational change, may be needed – especially in the long term.

**Summary**

Planning for the future is always uncertain and often complex. Planning for adaptation to climate change is no different in that sense, but it has some additional characteristics to manage as well:

- Future climates are uncertain, and are further confounded by uncertainty about how mankind will influence them through emissions or mitigation.
- The consequences of any given future climates for societies, economies and the environment are uncertain and complex.
- The range of public attitudes, values and beliefs about climate change, and the time-frames involved, further complicate planning and engagement.

Effective planning for adaptation to a changing climate requires a suite of traditional, modified and new approaches.

No matter how planning is undertaken, it is important to:

- Consider a range of different futures and plan a number of alternative pathways,
• Be clear on what to monitor to determine when key decision points are approaching,
• Take action now on matters requiring an immediate response and build the capacity to make transformational changes, if and when they are required, and
• Revise plans regularly (say every five years) to keep them relevant and vital.

More specific advice to assist regional climate adaptation planning follows:
• Scope. Focus on strategic responses for high-priority themes. A triple bottom-line, landscape context is best for regional planning.
• Engagement. Given the complexity and uncertainty of climate change, and the long time-frames to be considered, focus on key decision-makers and their advisers as the primary audience for engagement and get them planning how they will manage for the future.
• Values. Ensure plans are rooted in the values of regional communities and reflect the things that matter most to them.
• Complex systems. Landscapes are dynamic, complex systems driven by interactions that are not precisely predictable and which may be influenced but not controlled. Approach climate planning in that context.
• Climate vulnerability assessments. Focus more on understanding potential consequences and adaptive responses, e.g. by using conceptual models, rather than scoring vulnerability alone.
• Literature. Start with a synthesis of what is already known, not a blank sheet.
• Style of planning. Adaptation is an agile activity. Adaptation plans must be agile, full of ‘action now’ as well as less prescriptive strategies for how to respond should specified futures unfold.
• Transformational versus same old, same old. Resilience may rest upon doing basic things very well. Avoid the trap of sticking with ‘business as usual’ by challenging people to contemplate the transformational changes needed for a higher level outcome.
• Response ready. There will be actions that are needed immediately, others that should occur to build the capacity to respond at a future date, and some that lie ‘dormant’ until situations arise when they may be enacted promptly.
• Adaptation action. Plan for action and get commitment to it. Bind decision-makers and leaders to their role in instilling adaptation planning throughout organisations and communities, and engage them in driving any necessary cultural change in their organisations.
• Regular review. Consider the latest science on climate change, how local landscapes are changing, how the adaptation plan is going, and whether community aspirations have changed.

Summary roadmap
The main recommendations and supporting tips are summarised below.

Main Recommendations

- Alternative Futures & Pathways
- Monitor for Decision Points
- Act Now & Build Capacity
- Revise & Update Regularly

Supporting Recommendations

- Context
  - Scope
  - Engagement
  - Values
  - Complexity
- Assessment
  - Vulnerability Assessment
  - Literature & Expertise
- Planning
  - Style
  - Transformational
  - Response Ready
  - Adaptation Action
  - Review

Figure 3. Graphic summary of key points.
References


Improving Planning Outcomes in Small Coastal Towns

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Paper presented at the
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Canberra (ACT) 5-6 September 2016.
ABSTRACT: The interconnections between built and natural environments visually characterise and define coastal towns, especially those with significant heritage values. Residents’ perceptions have a significant impact on these interconnections. Over the past decade, coastal towns close to Australian cities have become very attractive to retirees, sea-changers and second-home buyers, drawn by their blend of environmental and historic settings. The resultant changes in the demography of these coastal towns have drawn attention to the urgency of addressing their relationships with place, in particular the interconnections between their built and natural environments. Many new owners have aspirations involving change and development, which has not only led to conflicts with long-established residents but has placed a great deal of pressure on local government authorities to clearly define the existing (and/or preferred) character of these places.

The paper stems from research undertaken as part of an ARC Linkage project, “Sea change communities: intergenerational perception and sense of place”. The researchers have quantified change; documented perceptions of these towns across generations; evaluated the effectiveness of planning scheme provisions in achieving stated objectives and policies; and created tools for communities, councillors and planners. The research team has established a rigorous methodology of evaluating the physical and perceived impact of the sea change process on sense of place, specifically on the built and natural environments of coastal settlements, using both quantitative and qualitative measures. This methodology has been developed to assist communities to implement effective, place-sensitive sustainable planning and associated development practices. The paper presents one of the significant outcomes of the research: a handbook for communities. The research has concluded that achieving better planning outcomes requires a multi-pronged approach. The key areas can be summarised as better education, improved processes and clearer planning provisions. Sections in the booklet address these areas, firstly from the standpoint of the various ‘players’ in the planning process and secondly from the various instruments involved, particularly the planning scheme itself.

Keywords: place-sensitive planning, sea-change communities, Continental Hotel Sorrento
Introduction

Over the past decade, changes in the demography of coastal towns close to metropolitan centres and changes in the interconnections between their built and natural environments, highlight an urgent need to address human relationships with place (Green, 2010). Coastal towns close to Australian cities have become very attractive to retirees, sea changers, second-home buyers, developers and investors, all drawn by their blend of environmental and historic settings. Many new property owners have aspirations involving change and development. This has not only led to conflicts with long-established residents but has placed a great deal of pressure on local government authorities to clearly define the existing (and/or preferred) character of their coastal towns’ built and natural environment (Gurran et al, 2006).

Contextualising the research

This paper stems from research undertaken as part of the ARC Linkage project, Sea change communities: intergenerational perception and sense of place (de Jong et al, 2011-2016) which has documented change in the Australian historic coastal towns of Sorrento and Queenscliff, located either side of Port Phillip Heads in Victoria. The researchers have asked questions around shared values and identified these in both towns through cross-generational focus groups and intensive interviews. They have also identified and reviewed the strategic and statutory frameworks and decision-making guidelines that have enabled the protection of heritage and/or have facilitated development – good and bad, particularly in more recent years. The researchers have created an interactive web application inviting residents and visitors alike, to walk, wander and ponder the streetscape transformations and transgressions in the main streets of these two towns over a period of some 180 years. This app provides a window into these towns through time, inviting reflection not only on the physical fabric of place, but on what was, what is and what is still to come (http://www.nepeanconservationgroup.org.au/).

Change is inevitable, and arguably, essential to sustaining heritage places, enabling them to meet the demands of new uses and evolving expectations, goals and requirements. Local government visions for Sorrento and Queenscliff have also evolved and changed over time. The Borough of Queenscliffe, the oldest and smallest
municipal authority in Victoria, has undertaken various conservation studies which have documented the historic and heritage values of Queenscliff, and resulted in clear heritage overlays over much of the town. As the provisions are not mandatory however, questions around interpretation constantly arise (BoQ, 1984, 2009). Local government authorities have not been so stable for Sorrento. In the 1970s the Flinders Shire (1980) argued that strict guidelines needed to be put in place to allow Sorrento to age ‘graciously’. These aspirations vanished once the state shire amalgamations took place in the 1990s. Nowhere in current government documents is it clear what the vision for Sorrento’s future actually is. The Mornington Peninsula Shire, now the largest municipal authority in the state, has been in no hurry to protect its heritage assets, and has been proactive in encouraging development, particularly in recent years (MPSC 1992, 2012). This is evident in the incremental destruction of the fabric of this historic coastal town, which has itself been the drawcard for new residents, visitors, tourists, investors and developers alike.

The critical question for debate surely is the balance between heritage values of the historic coastal towns of Sorrento and Queenscliff and the possible contribution development can/will make to the values integral to these towns (Taylor 2016b). Historical settings can gain deeper meaning through appropriate development, adaptive reuse and thoughtful contemporary design. Contemporary design can in turn be enriched by a rigorous dialogue and engagement with the historical environs of these towns. These ideas may be considered fundamental to contemporary heritage planning, yet they remain highly controversial in the realms of both conservation and design. It has become clear from this research that place, character and heritage are not integral to planning frameworks. Yet, if the values embedded in historic towns are to be recognised and protected, these must be carefully considered. Sense of place and neighbourhood character must be clearly articulated, significant precincts recorded, and heritage values and fabric identified and given a level of protection (Conroy, 2012). Individual listings and heritage overlays must be integrated into the specific planning documents pertaining to these towns so that a holistic approach can be implemented. Throughout the study, much discussion between researchers and respondents has been about the appropriateness or lack of appropriateness of development in Sorrento and Queenscliff. This discussion has led to the question of how heritage overlays, policy guidelines and planning frameworks can establish clear
expectations without stifling appropriate development or creating predictable design outcomes. This includes debates around mock-historic infill building, adaptive reuse and other contemporary responses to heritage places. These debates raise further questions around how literal or abstract design references to the building or context can be before they disrupt the integrity of individual buildings, precincts or entire historic towns.

The interconnections between the built and natural environments visually characterise and define these two coastal towns. This research has sought to analyse and document the character-defining features of Sorrento and Queenscliff, and to articulate their heritage settings. The researchers have critiqued planning schemes, processes and practice and sought to encourage local government authorities to foster regulations that promote sensitive yet organic growth and development in these significant historic towns located in the uniquely beautiful natural land and seascape settings on either side of Port Phillip Heads.

Towards protecting distinctive places

The research team prepared a comprehensive planning document arising from the case study analyses (residential and commercial); the focus group results; the in-depth interviews; and the scrutiny of the planning schemes of the Borough of Queenscliffe and the Mornington Peninsula Shire. The research makes clear that achieving better outcomes requires a multi-pronged approach. The key areas can be summarised as better education, improved processes and clearer planning provisions. To that end two tools were developed. The researchers produced a small booklet for use by community groups: *Improving Planning Outcomes in Small Coastal Towns* (de Jong et al 2016). This looks at the players (residents; architects, building designers, clients, developers; local councils) and the instruments (planning schemes; the Victorian Civil and Administrative Tribunal [VCAT]; and Heritage Victoria [HV]). The document has been prepared for use by communities in small coastal towns across Victoria to improve planning outcomes in their townships (and could be adapted for use by communities in other towns and suburban jurisdictions across Australia).

The second document, “Protecting Distinctive places”, was developed as a tool for councillors and strategic planners in assessing their local planning scheme, as well as
a guide for statutory planners in implementing the planning scheme. The researchers are mindful that shires, and wards within shires, are not homogeneous. Councillors are answerable to wards of varying and distinctive characteristics, and strategic planners need to be aware of these differences, so statutory planners can implement plans with sensitivity to them. Planners are encouraged to complete the questionnaire for their own distinctive places rather than provide generalised responses. Communities will find this document useful as a checklist complementing their *Improving Planning* booklet, just as councillors and planners will find the *Improving Planning* booklet helpful if used in conjunction with their tool, “Protecting Distinctive Places”.

The booklet *Improving Planning Outcomes in Small Coastal Towns* was put together to assist local communities to implement effective, place-sensitive sustainable planning and associated development practices. This paper considers this handbook for communities in light of the proposed development for one of the research case studies: the Continental Hotel in Sorrento (VHR H1896). It examines the handbook recommendations against the decision-making practices and the planning processes as they have been applied to this site, critiquing the outcomes as they impact on the integrity of the building, the precinct and the meaning of place.

**The Continental Hotel, Sorrento**

The research has documented considerable issues surrounding the nineteenth-century hotels in Queenscliff (the Ozone, the Vue Grand, the Royal) and Sorrento (the Koonya, the Sorrento and the Continental) (VHR). These hotels are clear reminders of the rise of these seaside towns as major holiday resorts serving the early populations of Melbourne and Geelong (Inglis, 1999). After a long period of relative stasis, the rediscovery of these towns as destinations in the late twentieth-century has brought with it new challenges and opportunities. The balance between future economic viability and preserving the significant heritage fabric and values of these large buildings has tested their owners, communities, local government authorities, State heritage bodies and developers.
The 1875 Continental Hotel is a four-storey locally quarried limestone building with tower and mansard roof. It is listed on the Victorian Heritage Register for historic and architectural significance (Victorian Heritage Register H1896). It sits high on the ridgeline of a naturally formed amphitheatre leading up to Sorrento’s main street from the bay. It is an iconic landmark building, clearly visible from the surrounding district. It forms the gateway to the town and an introduction to the character of Ocean Beach Road, a wide tree-lined street which traverses the Mornington Peninsula from Port Phillip Bay to Bass Strait, with resulting views to both the Bay and the back beach sand dunes. It is in a precinct of mainly one and two storey commercial premises of high historical significance. The ‘Conti’ itself has had a chequered history from the late nineteenth-century when it was the centre of a thriving middle class seaside resort. Like the rest of Sorrento, the hotel has survived economic swings and roundabouts. It was revamped in the Moderne style in the 1930s, and updated again in the 1950s and 1980s. Today, while it remains as the physical and symbolic fulcrum of
the historic coastal village of Sorrento, it is in need of restoration and refurbishment to make it once more a vibrant going concern.

The ARC linkage research has documented development proposals involving the Continental Hotel in 1995-98, 2002-2004 and currently 2015-2016. In 1998 a change of zoning to permit intensive mixed-use commercial/residential development was proposed by the Mornington Peninsula Shire Council [MPSC] (The lure of the local – community activism and place” (book chapter) MPSC 1998a). Then a proposal to expand and redevelop the Continental Hotel was lodged in July 2002 and MPSC determined not to support the application in April 2004. Given the high heritage and place values of this site, and the lack of a robust community and stakeholder consultation at that time, MPSC was caught between idealistically wishing to enable redevelopment but at the same time needing to respect the philosophy and intent of their historic character policies and guidelines for the precinct (The lure of the local – community activism and place” (book chapter) MPSC 1998a). VCAT overturned the Council decision and granted a permit with conditions, but eventually the proposal lapsed.

A decade later, the shire planning officers and the community worked on developing and implementing a heritage policy to protect Sorrento’s main street from inappropriate development. The resultant The Ocean Beach Road Commercial Precinct Sorrento Heritage Policy was prepared for the MPS Council by HLCD P/L
in May 2015. It includes sub-policies for the East, Central, North West and South West precincts, necessitated by incremental development over time. This carefully researched and considered piece of work was adopted as policy by the MPSC on 2 October 2015. It provided guidance for the future conservation and development of Ocean Beach Road to “protect the cultural heritage significance of the Ocean Beach Road Commercial Heritage Precinct” (MPSC Council meeting agenda, Monday 25 July 2016, p.83). It has yet to be incorporated into the Planning Scheme, where statutory weight can be given to its provisions.

In the meantime, in 2015 the Continental Hotel was advertised for sale and a new proposal put forward: “for the development of alterations and additions (including demolition) to the existing building, develop 24 new hotel rooms, a four story building comprising 16 dwellings with communal rooftop area, use and development of the site for a restricted recreation facility (wellness centre), which includes gym, café, change rooms, offices and terrace lap pool, development of a two storey level basement car park with 58 spaces, a public car park with 25 car spaces. …” (MPSC Planning application P15/2392).

On 25 July 2016 the MPSC endorsed the

- approval of Amendment C203 to the Mornington Peninsula Planning Scheme pursuant to Section 20(4) of the Planning and Environment Act 1987 by the Minister for Planning to insert an interim control to Clause 43.02 Design and Development Overlay (Schedule 28 – Ocean Beach Road Commercial Precinct); and endorsed the
  - Shire to seek authorisation from the Minister for Planning to prepare Amendment C204 to introduce Clause 43.02 Design and Development Overlay (Schedule 28 – Ocean Beach Road Commercial Precinct) into the Mornington Peninsula Planning Scheme.

At the same Council meeting, the MPSC sold the public carpark in Constitution Hill Road, adjoining the Continental Hotel, to the owner of the Continental Hotel, and approved the planning permit for the new development of the Continental Hotel site (MPSC, 25 July 2016). The papers noted explicitly that “As the Continental Hotel is listed on the Victorian Heritage Register, the assessment of the demolition and
proposed works to the Continental Hotel will be undertaken by Heritage Victoria and will not form part of this approval” (MPSC, 25 July 2016). The heritage overlay which applies to the entire site was also set aside, pending the HV decision. The HV permit decision is not yet available.

**Improving Planning Outcomes: the players (residents; architects, developers; and local councils)**

The booklet *Improving Planning Outcomes in Small Coastal Towns* suggests to residents that they need to: “develop a vision of what the community, both long established and newly arrived, actually wants for themselves and future generations. The question of ‘what are we trying to achieve’ should be addressed through various forums”; “align the vision between the community and its municipality” so that “there should be no imposition of the latter’s view on the community”; and “address and balance community attitudes and the local economy with the development of ‘place’ both natural and built”. The *Ocean Beach Road Commercial Precinct Sorrento Heritage Policy* had considerable input from the wider community, its implementation was discussed at a number of forums and agreed. While the decision to apply for an interim planning amendment has been applauded and welcomed by the community (SPN Newspaper 2016), the process of finalising and implementing this agreed vision for Sorrento’s main street has been very slow. In proposing the planning amendments on 25 July 2016, the strategic planners highlighted that:

> Whilst the entire township of Sorrento is protected under the Planning Scheme via a Heritage Overlay (HO1), there is a lack of appropriate built form controls to retain the low scale heart of the town centre.

There has been increasing development pressure along Ocean Beach Road in recent years. This is particularly the case with multi-storey apartment buildings, some reaching up to five stories above natural ground level. These multi-storey developments are not consistent with the low scale character of Sorrento and there is concern from both Council and the community that without clearer development controls, these developments could become more prevalent and this would erode the valued historical character and built form aesthetics of the Sorrento village (MPSC papers 25 July 2016, p.38).

The discretionary nature of the current planning controls creates uncertainty and decisions can be challenged at VCAT, whereby Council’s decision can either be
varied or set aside. Other recent examples of a similar process in Sorrento can be seen in the cases of Osmosis, 77 Ocean Beach Road, and Carmel developments.

The decision also on 25 July by the MPSC to grant a planning permit (albeit with conditions) for the Continental Hotel redevelopment is contrary to the Ocean Beach Road policy (adopted in November 2015) and the intent of the endorsed planning amendment. The MPS undertook extensive consultation with all parties, except those most affected by the decision: the community. The community could only participate once the planning permit was advertised though all other parties had been in discussion over a previous period of fifteen to eighteen months. This decision-making process is an example of the adversarial system that currently exists in many planning situations, rather than encouraging and enabling a round table discussion with all stakeholders from the outset, which could allow for a more considered outcome.

The Continental Hotel is one of several residential and commercial case studies which underpin this ARC Linkage research. These cases have revealed, in almost all cases that proposed developments, large and small, come from existing property owners, either living within the community or outside of it. The aim of a proposed development can be to improve amenity, increase capital value, or both. Substantial development proposals, whether residential or commercial, will usually involve an architect or building designer. Their client (individual, family or commercial developer) will have ideas or ‘a vision’ for their property. The architect’s role is to interpret and translate that vision into a suitable development outcome. Depending on the project, the roles of these ‘players’ may overlap.

The *Improving Planning Outcomes in Small Coastal Towns* booklet suggests that architects need to develop a clear understanding of the sense of place and neighbourhood character relevant to particular sites. This relates not only to what Planning Schemes are trying to achieve, but also to their ‘spirit’. This involves a careful consideration of the architectural, cultural and environmental characteristics of the locality. Architects should understand that the above needs to be inclusive of heritage and engaged with community/council in developing clear design guidelines that correlate with the sense of place and neighbourhood character. From this process,
they can produce architectural designs and planning applications that respect and enhance this sense of place and the neighbourhood character. They need the ability to mediate between client or developer desires/demands and the local sense of place and neighbourhood character in order to convince clients or developers to act within this spirit. For their part, clients need to develop a clear understanding of the sense of place and neighbourhood character relevant to particular sites and select an architect/designer/builder who shares this understanding and is willing to act in accordance with it. They should consider their own needs (aesthetic, functional, economic) in relation to respecting this local place character. In particular, they need to think carefully about what they value about the locality, and how what they want to build would impact positively and avoid impacting negatively on it as a place. Developers also need to understand the sense of place and neighbourhood character, recognising that clarity around these values aids certainty in developments, and assists profitability in the development process by avoiding VCAT and other conflicts. They should engage with the local community proactively and openly early in the process.

In their submission for a planning permit for the Continental Hotel redevelopment, Six Degrees Architects state that:

The refurbishment of the existing heritage Continental Hotel structure is intended to restore the building to a condition worthy of its iconic landmark status … The proposed new development has been designed so as to minimise visual impact on the heritage hotel building.” In regards to the concept Six Degrees Architects argue that “As the hinge point of the proposed development, the existing heritage hotel will be retained and celebrated. … A new hotel wing and services building will wrap around the existing courtyard to the south of the structure. Clad in simple, unobtrusive materials, these new buildings will form a subdued backdrop to the iconic Continental Hotel silhouette.

The proposed mixed-use development requires the Council owned public carpark on Constitution Hill Road for access to the site (as Ocean Beach Road provides only a service laneway), as well as part of the development itself. This large-scale urban design is inserted into an historic coastal village precinct, wrapped around the landmark heritage listed hotel. The sense of place of this distinctive seaside holiday resort between the ocean and the bay is to be subsumed into a new urban place. The neighbourhood character of Sorrento’s Ocean Beach Road has not been addressed. Indeed the drawings suggest that the architects and their client and developer have little regard for the iconic status of the Continental Hotel and its ridge-top site in the township of Sorrento, nor any appreciation of the historic and architectural heritage values espoused by the hotel. The drawings (P24867 Part 1 pp 15-19) give the impression that the entire development is lower than the Continental Hotel. Only part 2 Section A p.9, reveals the private terrace on the roof level. It shows the height of the new building, well above the ‘Conti’ roofline, at the base of tower parapet. Section D p.12 reveals how the proposed seven level (two below ground) building’s massing and bulk totally overwhelm the ‘Conti’ Hotel. At no time did the architects engage with the broader community in developing their future vision for the site. The proposal is at odds with The Ocean Beach Road Commercial Precinct Sorrento
Heritage Policy adopted by the MPSC in 2015. At the MPSC meeting on 25 July the developer revealed that he could get “$16.5 million” for the top apartment alone.

Figure 4 Artist’s impression: a sketch by Nepean Historical Society member Gary Naughton of how the redeveloped Continental Hotel would appear along Ocean Beach Road

This is just one example where the ARC Linkage research makes clear that economics should not be the sole driver of development in historic coastal towns. However expecting developers to wholeheartedly take this into account may be a little naive. This is why the role of the local council is pivotal in improving planning outcomes.

Clause 10.04 Integrated Decision Making is a standard statewide clause in the Victorian State Planning Policy Framework, within which councils operate. While the emphasis is on ‘net community benefit’, deciding what this ‘benefit’ might be seems a matter for municipal planning authorities coordinating with their neighbours and other public bodies. The clause does not state that the community will have an active say in decisions made for its ‘benefit’. The demands on council are often not recognised or acknowledged by individual players in the planning process, whether they be applicants, developers, architects or potential objectors. Time and resources are often limited, and communications between players sometimes suffers because of this.

There are, however, some steps that can be taken to improve planning outcomes. The local council needs to facilitate the vision of what the local community actually wants their town to look like by organising a dialogue with all residents and they need to clearly share knowledge so that the vision is informed with key information. The Council should mediate between different groups of residents, and facilitate local businesses/commercial interests to be part of developing this vision, ensuring that the spirit of this agreed vision informs planning applications and the decisions made by council. Council should clearly and definitively reject early in the process those applications which go beyond or ignore the local character, insert the vision into the
local planning scheme as local policy and as development controls in a clear, consistent and unambiguous way and ensure that their staff and councillors are adequately informed of this vision and fully understand its implications. Councils must be pro-active, rather than just being reactive to potential development applications, and insist on inclusive pre-design discussions.

The Continental Hotel site is covered by Commercial Zone 1 and Heritage overlays, HO1 and HO257, and the Sorrento Historic precinct Policy. Urbis, the urban design firm engaged to bring the proposal for the Continental Hotel together, shapes cities and communities (https://urbis.com.au/). Urbis told the MPSC that the proposed adaptive restoration of the Continental Hotel and development of the vacant land is considered to present an opportunity to consolidate an existing successful use, contribute to housing diversity and celebrate an important Sorrento landmark. The uses proposed for the site are as-of-right under the provisions of the Commercial Zone 1 and the design is considered to have a high level of consistency with the relevant clauses of the Mornington Peninsula Planning Scheme, particularly in relation to heritage and amenity. The proposed design preserves the visual prominence of the heritage building through the thoughtful siting of new additions, a contemporary form and choice of materials and will enable the building to meet the needs of a contemporary hotel. The design for the site also achieves an improved interface to Constitution Hill Road by introducing activity other than car parking and a new landscaped setback. The Council papers for the 25 July MPSC meeting state that the proposal has a greater than 90% site coverage. The reports from Shire officers laud the new proposal, and make no mention of heritage values, or impact on the VHR listed hotel, the precinct, Ocean Beach Road or the wider district. Under the MPS Planning scheme, that part of the land not on the Victorian Heritage Register, has a heritage overlay and is subject to assessment by Council. However, Council abrogated its authority to deal with any heritage matters pertaining to the site.

The MPSC approved the permit application with conditions, though these have little impact on the overall development. For example the Council approval altered the
original upper parapet RL level of 39,700 to 37,050. The lift overrun and roof recreation area is excluded from this height limit. The actual RL levels are unclear and the estimate is between 1.55m and 2.65m. Council has previously made such “design decisions” on the run, resulting in the developer taking the MPSC to the VCAT. In their latest decision, VCAT reinstated the original height limit and the original setback without regard to heritage overlays or policies (Kato Group Pty Ltd v Mornington Peninsula SC [2016] VCAT 1252). Community groups have 21 days in which to consider the Continental Hotel decision and lodge an appeal to VCAT should they wish to do so. The developer has 60 days in which to do so.

Improving Planning Outcomes: the instruments (planning schemes; VCAT; and Heritage Victoria).

Each of these planning instruments has already been referred to in the previous discussion around the players: the residents, architects, developers and local councils. Nonetheless, the Improving Planning Outcomes booklet makes some relevant observations and recommendations, which pertain to the case of the Continental Hotel. All planning applications must adhere to the requirements of a planning scheme, whether this is a local or state-based provision. The local sections of the planning scheme, in particular, are powerful tools to achieve desired outcomes if they are worded clearly, explicit and, where possible, mandated. It is an area over which the local authority has significant control to enable the community vision to be implemented. Neighbourhoods are usually small and therefore more likely to be protected and enhanced through overlays, rather than guidelines which can be variously interpreted and disputed. Choice of zones is also important in determining, encouraging or discouraging particular land uses. The booklet documents State planning provisions and articulates local planning provisions. In particular it notes that places of local significance may be protected by listing on a schedule to the Heritage Overlay, under the local council's planning scheme. The relevant dot points that pertain to this case are clearly defining and conserving the local area’s buildings, streetscapes and landscapes of architectural, cultural, scientific and historic value; considering the boundaries and reasons for applying an HO, considering the impact of new development adjacent to, or opposite the street from a HO; considering the impact of a change of use on heritage buildings; encouraging sympathetic
development, and having a clear understanding of how council’s responsibilities/jurisdiction under an HO relate to those of Heritage Victoria.

The role of Heritage Victoria is also critical in this case as HV has enforcement provisions under the Victorian Heritage Act (1995). HV determines permit applications for works to places on the State Register to help protect the important features of Heritage Registered places and objects. Some issues include their advertising permit applications, to which responses are required within a specified time frame; their policy of dealing with only one permit application at a time; and of not publishing their ‘reasons’ for permit decisions; and their aim of balancing protection with giving place(s) a future, which means that economic viability may be considered when considering substantial changes to Registered sites.

In the case of the Continental Hotel it now appears that that site could fall between the two jurisdictions of local and State heritage controls. The whole property is under a MPS PS Heritage Overlay (H01), the hotel is covered by Schedule 257, and is also listed on the Victorian Heritage Register - for which HV is responsible. When considering the application for development of this heritage place, the Shire Council acknowledged the citation on the Register which states inter alia "The Continental Hotel ... is important for Sorrento as a landmark building" (MPS Council meeting papers, 25/8/2016, item 4.1). Those papers also show that, because of the property's inclusion on the Heritage Register the Council would be relying on an assessment by HV of the proposal's effect on it as a registered heritage place. The Council had before it a report from its Heritage Planner, stating that "the prime responsibility for dealing with the heritage considerations of this proposal belongs to Heritage Victoria", and his substantive comments were correspondingly restricted to certain aspects of design quality. Yet, the Council proceeded to determine the proposal for development without any permit or other report from HV. And indeed, in the papers presented by Council officers for consideration of this item, it was revealed that no referral of this proposal had been made to HV.

HV has not yet made a determination on the permit application. It has however made clear that the proposed mixed-use development which is to the south of the Hotel, is on vacant land that is not part of the land that is registered on the VHR for the
Continental Hotel. Further it has commented that the MPSC is the responsible authority for this aspect of the proposed development (personal communication, 4 August 2016).

The evidence suggests that the MPS Council has abrogated its responsibilities in regards to the Continental Hotel, its site, its precinct, and the historic place and the village of Sorrento and this leaves the decision open to appeal, with all parties able to take their disputed case to VCAT. However, the new fees introduced at VCAT on 1 July 2016 for a review of a Council Planning decision have become prohibitive for NFP community groups. The further requirement to sign a statement acknowledging that they may have to pay the developer compensation for any delay caused, is too onerous for them to contemplate. While communities, objectors and developers can appeal a Council decision at VCAT – the outcome is not guaranteed. Generally, VCAT can review a municipal council’s decision to refuse to grant a planning permit; impose conditions on a planning permit that the council granted; grant a planning permit; or refuse more time to start or complete a development. VCAT can also enforce a planning permit or a planning scheme; amend or cancel a planning permit; review a municipal council’s failure to decide a planning permit application within time. Clause 10.04 “Integrated Decision making” is important for understanding the context of how VCAT deals with cases. As well it should be recognised that VCAT balances lots of different issues.

The ARC Linkage research case studies have shown that VCAT decisions highlight ambiguities and lack of clarity around design objectives in the planning system and its application; and reflect differences in interpretation (leaving decisions open to interpretation by the parties and the tribunal). VCAT may take precedents into account in its decision-making but VCAT’s interpretation may differ from that of the community or developer. For instance, in determining the nature of neighbourhood character within a particular area, VCAT may use any existing buildings as evidence of character (not just those that the community or developer may wish to be emulated).

Conclusion
In conclusion, clear agreement about neighbourhood character needs to be placed within the local planning scheme as much as possible. This means that the issue of guiding change to a site such as the Continental Hotel, or more broadly to Sorrento, Queenscliff or any vulnerable coastal town, requires all local residents and property owners to carefully consider what they value about their town as a place. In particular for councils who have to balance many contrasting views, as well as economic and demographic forces, this consideration will involve much reflection and consultation with their local communities.

Essentially, the tools produced by this research project are to assist both councils and communities in this aim. They give communities ways to articulate the qualities they perceive in these historic coastal towns, and ways for council planners to more precisely state these in local planning schemes. Only a combination of more precise regulations/processes and the collective will to preserve essential aspects of a town’s character will prevent further controversy over cases like the current Continental Hotel development in Sorrento, and lead to a sustainable balance between economic development and preservation of the character of unique places.

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Mornington Peninsula Shire Council Planning Application P15/2392 – Cnr Constitution Hill Rd and Ocean Beach Road.


The Ocean Beach Road Commercial Precinct Sorrento Heritage Policy (2015) prepared for the MPS Council by HLCD P/L in May; adopted as policy by MPSC in October.


Victorian Heritage Register: the Continental Hotel, Sorrento VHR: H1896; the Ozone Hotel Queenscliff 1881, VHR: H1142; the Vue Grand, Queenscliff rebuilt after 1927 fire is of local significance; the Royal, Queenscliff, 1881, is of local significance; the Koonya, previously the Mornington Hotel, Sorrento of local significance; the Sorrento Hotel Sorrento, is a Heritage inventory site H7821-0135 and of regional significance.
Exploring local food sustainability potential and ‘Agrarian Urbanism’ in the regional city of Dubbo

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Exploring local food sustainability potential and ‘Agrarian Urbanism’ in the regional city of Dubbo

ABSTRACT

Rapid urbanisation as a consequence of population growth is likely to reduce the availability of valuable agricultural land areas for food production. Two-thirds of the world’s population will be living in urban areas by 2030. Cities around the world are integrating local food production capabilities within built environments to create food secure and environmentally sustainable habitats. Regional cities with comparatively less population have a significant potential and distinct advantage to incorporate these measures early on in planning for the urban areas. In this paper, a review is conducted on local food production policies and practices in relevant cities. ‘Agrarian Urbanism’ approach to the master planning of new developments can protect valuable agricultural land and natural areas. A real-world case study that applies ‘Agrarian Urbanism’ principles is analysed. Dubbo, one of the most important regional cities of Orana region in New South Wales in Australia is selected as a case study for research analysis. Using Australian Bureau of Statistics (ABS) data and Geographic Information Systems (GIS) methods, current local food production potential, and its capacity to meet the annual food (vegetable) demand of Dubbo City are estimated and examined through four scenarios. The local food production typologies that could be embedded in the urban fabric are explored, and recommendations are formulated. Research outcomes suggest that Dubbo city has a reasonable prospect to grow into a sustainable regional city of future. Collaborative efforts of governments, private, non-profit and farming organisations, industries and residents would be important for the uptake.

Keywords: local food; sustainability; agrarian urbanism; regional city; food security

Introduction

Human settlements grow spatially over a temporal scale through dynamic processes of growth consuming valuable agricultural land areas essential for supplying food demand. Two-thirds of the world’s population will be living in urban areas by 2030 (Population Reference Bureau, 2011). Fifty percent more food would be required to be produced to feed nine billion people on earth by 2050 (World Bank 2016). Regional cities would have an important role to play in this urbanisation process. Therefore, building an efficient and secured food system in regional cities should be critical priorities for future. Cities around the world are integrating local food production capabilities within built environments to create food secure and environmentally sustainable habitats.

Local food production potential within built environments is noteworthy in many cities of the world. In London, the UK, allotment gardens produced 232,000 tonnes of fruit and vegetables in 1999 capable of supplying 18% of the population’s daily intake as per World Health Organisations (WHO) recommendations (Garnett 1999). Food and Agricultural Organisation of United Nations (FAO) reported that urban growers in the Republic of Congo produced annually a total of 330,000 tonnes of vegetables, equivalent to a market value of over $400 million dollars (FAO 2011). Local food production in Congo supplied nutritional food to 11.5
million people and improved enormously the food security (FAO 2011). A significant amount of open spaces is locked within millions of private and public outdoor spaces in the cities and suburbs of the world. If these land areas could be put to productive uses, cumulatively these spaces could work as an alternative local food production network and supply a considerable share of population’s food demand (Ghosh 2014).

In this paper, Dubbo, the largest city of Orana region in New South Wales, is the focus of this research. Dubbo City is strategically placed at a location conveniently accessed from Sydney and on the route from Brisbane to Melbourne. The larger Dubbo Local Government Area (LGA) covers an area of 3426 square kilometres (sq. km) and contains two Statistical Local Areas (SLAs): Dubbo SLA Point A and Dubbo SLA Point B. Dubbo SLA Point A, covers 330 sq. km. with a population of 36,184 people (ABS 2011a). This paper focuses on Dubbo SLA Point A (Fig 1) and mainly the built up areas of the Dubbo City is located within this SLA.

Fig 1: Dubbo Statistical Local Area (SLA) Point A
(Data Sources: ABS 2011 Census; Prepared by: Sumita Ghosh)

Aims and objectives of the research

The main aims of this research are to: estimate the total available productive land within built environments of a small regional city Dubbo and local food production potential of these productive land areas to supply the annual food demand of the City for self-sufficiency. This research focuses only on calculating the total vegetable demand of the population considering vegetables as an important part of the total dietary requirement of the population. The five objectives of this research study follow.

- To review briefly local food production approaches in selected cities of the world;
- To comprehend emerging theories and approaches on ‘Agrarian Urbanism’ and ‘The Transect;
- To calculate total vegetable demand of the Dubbo City;
- To estimate total available productive land within built environments of the Dubbo City;
- To calculate to what extent this available productive land area could supply the annual vegetable demand of the resident population;
Research methodology

This paper focuses on determining the local food production potential of the Dubbo City to supply the total vegetable demand as an important part of daily diet of a healthy population. The vegetable production could be easily integrated within new and existing built areas. The research methodology consists the following six main steps to achieving the objectives of this research.

(a) To conduct a review of selected cities; an analysis on an ‘Agrarian Urbanism’ case study and to investigate ‘The Transect’ concept in the context of the Dubbo City;
(b) To determine and measure areas under urban developments in the Dubbo city that could integrate local food production;
(c) To estimate annual vegetable demand of the total population in the Dubbo SLA Point A;
(d) To calculate total available productive land within the urban areas of the Dubbo City using a scenario-based approach;
(e) To calculate annual local vegetable production potential of available productive land within built environments to supply the total annual vegetable demand using four scenarios;
(f) To formulate recommendations based on the outcomes from the above analyses;

A review of selected cities, an Agrarian Urbanism case study and ‘The Transect’ in Dubbo

A brief review was conducted in selected cities that have incorporated local food production within built environments and have formulated relevant planning policies and practices. ‘Agrarian Urbanism’ as an emerging food urbanism theory (Duany, A and Duany Plater-Zyberk & Company (DPZ) 2010; DPZ 2016) is discussed. A real-world ‘Agrarian Urbanism’ case study: Prairie Crossing that applies ‘Agrarian Urbanism’ principles of master planning was analysed. This case study showcases how urban growth could protect agricultural and natural areas effectively in new urban developments in peri-urban and rural zones of the city through ‘Agrarian Urbanism’ approach to master planning. These strategies are significantly important in Dubbo context. ‘The Transect’ is a broader concept of systematically exploring varying physical or natural of human environments along a cross section through the settlement (City of Miami 2016). Using ‘The Transect’ approach (Duany, 2002; Duany et al. 2010; City of Miami 2016), land uses/land cover patterns, Dubbo City Transect land use zones, typical morphological characteristics of these zones were examined from the aerial imagery. The food typologies such as home gardens and farms, etc. that could be integrated along the different transect zones were investigated.

Determining urban areas for integrating local food production within built environments

Data on basic community profile such as population, average household size, total family households and dwelling types, numbers, and the number of bed rooms in the dwellings and spatial boundaries at the SLA and SA1 levels under Australian Statistical Geography Standard (ASGS) classification were collected from Australian Bureau of Statistics (ABS) 2011 Census. ASGS is the new geographical framework for ABS data from ABS 2011 Census onwards. The SLAs are defined as Local Government Areas (LGAs) or part thereof (ABS 2011b) and SA1 as the smallest data release unit built from whole mesh blocks and contains a population of
approximately 200 to 800 persons according to the ABS 2011 Census (ABS 2011c). Data was also collected from relevant reports and academic literature. There are altogether eighty-nine SA1s within Dubbo SLA Point A boundary. Dwelling density and building footprints are indicators of available productive spaces within neighbourhoods. The number of bedrooms in the separate houses assisted in estimating the built up footprints of dwellings. Dwelling density, population density, percentages of dwelling types such as separate houses, townhouses and apartments, and total land areas in hectares under separate houses for each of the total eighty-nine SA1s were calculated using GIS methods. The morphologies of areas are cross checked using the Dubbo Transect. The SA1 boundaries that have very low population densities and dwelling densities were excluded as these SA1s represent the areas where land may already have been allocated to crop and livestock farming. A total of sixty-three SA1s selected which could be categorised as urban development areas within Dubbo SLA Point A boundary.

*Estimating total annual vegetable demand the Dubbo SLA Point A population*

The Department of Health and Ageing, Australian Government (2006) recommends daily on average five servings of vegetables from three different groups of vegetables: starchy, deep green and legumes and other vegetables. It is calculated that the average energy required daily from the vegetables approximately ranges from 12% to 20% of the recommended daily average food energy intake per person of 2150 kcal (Haug et al. 2007). According to Australian Government’s ‘Healthy Eating’ recommendations on daily vegetable servings and intake distribution in the three groups of vegetables, 425 kcal to 255 kcal energy from vegetables is required daily for an average person. The total vegetable demand is calculated to be equal to an average value of 330 kcal of the total daily diet for an average person in Australia (Ghosh 2011). This value is multiplied by the total population Dubbo SLA Point A to calculate the total annual vegetable demand.

*Estimating available productive land and annual local vegetables production potential*

The percentages of separate houses are significantly higher than the other dwelling types in Dubbo and this dwelling type has opportunities to integrate localised production in home and community gardens. Therefore, it is assumed that mainly the local food production would be integrated into the neighbourhoods where these separate houses are located. The total building footprints of separate houses in hectares for each of the sixty-three selected SA1s were calculated considering approximate ground coverage of standard one bedroom, two bedrooms, three bedrooms, four bedrooms and five and more bedrooms houses. It is assumed that 20% of the area would be devoted to impervious uses such as roads and paved surfaces. The total available productive land was calculated by subtracting total building footprints of separate houses, impervious surfaces and land areas under other dwelling types and other uses for the selected area of Dubbo City. Four productive land utilisation scenarios were examined. Scenario 1 (Maximum) includes 100% utilisation of available productive land while Scenario 2 (High) focuses on 80% utilisation of total available productive land. Scenario 3 (Medium) includes 50% utilisation of total available productive land and in Scenario 4 (Low) only 25% utilisation of total available productive land were done. All the four scenarios were spatially mapped and available productive land areas for sixty-three selected SA1s were calculated.
Ghosh (2014) developed a local food energy model that assessed local food production potential of low to medium density residential urban form case studies at a community scale in Australia and New Zealand. The annual vegetable productive capacity of land is calculated to be equal to 5.94 kg/m². The vegetable productivity in energy units is calculated to be equal to 0.007 GJ/m² or 70 GJ/ha considering New Zealand and Australian case studies (Ghosh 2014). The energy unit makes a useful connection and a calculation between dietary energy intake and local food production was done. Total vegetable productivity in energy units for the selected SA1 were calculated for these four scenarios. Four local production potential scenarios were compared to understand to what extent local production of vegetables could supply the vegetable demand of the city. Recommendations were developed considering outcomes form the above analyses for the Dubbo City.

Research analysis and results

A brief review of local food planning policies and practices in selected cities

The City of Vancouver in Canada promotes urban agriculture through its public policy initiatives, such as ‘Food Policy Council’ and planning policy connecting the regional scale to local planning policies. Metro Vancouver’s ‘Regional Growth Strategy’, and the ‘Agricultural Land Reserve’ (Mullinix, Fallick and Henderson 2009) regional policies show an excellent policy alignment with city and local scale policies such as ‘Vancouver Food Strategy’, ‘Greenest City Action Plan’, ‘Urban agriculture design guidelines for the private realm’ and ‘Edible Landscaping Guide’ (City of Vancouver 2016; City of Vancouver 2013; NYC Global Partners 2012). ‘Toward a Bright Green Future’ aims to create Vancouver as a globally leading city in urban food systems by 2020 (NYC Global Partners 2012). The initiatives ‘2010 Garden Plots by 2010’, and ‘Tree Keepers Program’ provide significant supports to creating community gardens in neighbourhoods and parks and home gardens for local food production within built environments. An increase in community participation up to 21,750 people was achieved in 2014-2015 (City of Vancouver 2016). Vancouver takes a holistic approach to the development of a complete sustainable food system.

In the low-density City of Detroit in the USA, integrating local food production methods include adaptive reuse of vacant lands, establishing rooftops, home and community gardens for local food production using traditional and new gardening practices. Keep Growing Detroit (KGD) has a strategic mission of re-creating Detroit as a ‘food sovereign’ city and emphasises a ‘production-focused model’ of local food production (KGD 2011). Under Garden Resource Program (GRP) program, up to 20,000 Detroit residents have decided to grow food in the home, community and schools gardens and urban farms and have received resources and assistance with gardening (KGD 2011). Institutional environments for local food production are noteworthy in the post-industrial city of Detroit as significant progress has been made in establishing collaborative partnerships between public and private companies and developing new economic practices around urban agriculture. Local food production practices and approaches within built environments of Detroit provide exemplary evidence on how growing local food within urban areas could shape and revive a shrinking city’s economy, culture, community engagement to offer a new way life for its residents.
Singapore is a very high density, and 100% urbanised wealthy island country or city–state in southeast Asia (Lee and Tan 2011). Due to lack of productive land, Singapore’s integration of local food production within built environments is focussed on innovation and technology adoption for hi-tech, and hi-yield methods of local food production. ‘Sky Greens’ is a vertical farm in a multi-storied building grows high-quality vegetables hydroponically in rotating tiers of growing racks mounted on ‘A’ shaped vertical frames (Sky Greens 2014). The social importance of growing food locally promotes social networking and community engagement. ‘Community In Bloom (CIB)’ program to facilitate a socially networked community with a gardening culture, civic ownership and community participation in Singapore. Up to 20,000 residents have participated in the CIB program; 1000 community gardens have been added and 60 hectares of sky rise greenery at rooftop level have been added (Chiew 2013; National Parks, Singapore 2016).

In Australia, City of Sydney and City of Melbourne have recognised importance local food production. These two cities have adopted community garden policies to establish the frameworks for managing new and existing community gardens to provide social, cultural, economic and environmental benefits to residents. The City of Sydney has thirteen community gardens within its Local Government Area (LGA) and numbers are significantly on the rise to support and achieve the goals of the major policy ‘Sustainable Sydney 2030’ (City of Sydney 2014). The City of Melbourne’s Community Garden Policy address two goals: a city for people and an eco-city from the City of Melbourne Council Plan 2013–2017. ‘Street Gardens Policy’, ‘Growing green guide for Melbourne’, ‘We Need To Talk About Food – a Sustainable Food Information Tool’ and ‘Sustainable gardening in the City of Melbourne’ documents establish the importance of local food production within the City of Melbourne (City of Melbourne 2016). Many other Australian cities are already recognising the importance of local food production.

The examples of cities presented above provide evidence that cities at different development stages and with different densities are making provisions for improved food security for future. Regional cities with comparatively less population have a significant potential and distinct advantage to incorporate these measures early on in planning for their urban areas. ‘Agrarian Urbanism’ principles for master planning of new developments to protect agricultural land and natural areas are explained later in this paper. These aspects could improve sustainability and public health and wellbeing; increase property values and create a thriving local economy. The regional cities could evolve as innovative food efficient larger cities of future considering these sustainability aspects of urban planning.

‘The Transect’ of the Dubbo City and Agrarian Urbanism international case study

Duany et al. (2010) conceptualised that four models of food urbanism: ‘Agricultural Retention’, ‘Urban Agriculture’, ‘Agricultural Urbanism’ and ‘Agrarian Urbanism’ could be integrated within cities and towns. ‘Agricultural Retention’ relates to the protection of farmlands at regional and macroeconomic scales and ‘green belts’ protecting farmlands is an example of this. ‘Urban Agriculture’ model refers to local food production within built environments on any available land such as vacant land, community and home gardens, rooftops and planter boxes etc. The ‘Agricultural Urbanism’ model links to a working farm on
which the community may be economically associated (such as buying from the farm or managing through Community Supported Agriculture (CSA)) but not socially connected to the farm (Duany et al. 2010). Developing food based societies and designing the liveable places are fundamental to ‘Agrarian Urbanism’ model and links to new urbanism principles of planning and designing places (DPZ, 2016).

Prairie Crossing, Illinois in the USA is selected as the Agrarian Urbanism case study. It is developed by Vicky and George Ranney and is built on 270 hectares of land area (Ranney, Kirley, and Sands 2010). The design and planning process of this development provide prime importance to the protection of agricultural or productive land; preservation of natural areas and creating a sustainable community and society around farming as the primary activity following ‘Agrarian Urbanism’ principles of design and planning. In this development, a total of 40.5 hectares are devoted to organic farming for three separate farming organisations and 67 hectares of land have been restored as native prairies. Altogether 60% of the total site is open space consisting of lakes and ponds, natural areas and farming land areas. Environmental and ecological benefits are achieved through carbon and stormwater benefits of natural vegetation (Prairie Crossing 2014; Ranney et al. 2010). New urbanist planning is reflected through the diversity of different dwelling and mixed use building types, transit-oriented development, communal gathering spaces, sixteen kilometres of walking and cycling trails promoting active transport through natural prairies and food farms. Food production and nature conservation become the fundamental basis for structuring the places. All these successfully create better public health and social wellbeing through working and living in a food based community. This spatial planning allows continuation of life style patterns of communities in peri-urban and rural locations. The property values are increased to a greater extent due to the proximity of dwellings to nature and availability of options for preferred life style choices. This pattern of development is highly relevant for Dubbo context as still most of its peripheral areas are under rural or peri-urban uses. Future urban growth in Dubbo following ‘Agrarian Urbanism principles could accommodate the urbanisation more sustainably.

**Fig 2: Master Plan of Prairie Crossing, Illinois, USA**
‘Agrarian Urbanism’ approach to designing developments is intrinsically linked to ‘The Transect’ concept. In this paper, ‘The Transect’ is defined to contain varying morphological characteristics human environments along an urban to rural continuum; ‘an index of diversity’ (Duany, 2002: 257) and ‘contemporary ways of envisioning’ (Bohl and Plater-Zyberk, 2006: 5) the development patterns. Emerging theory in food urbanism and planning recognises its importance as a planning strategy (Talen 2002). ‘The Transect’ has six broadly classified land use zones: Natural (T1), Rural (T2), Sub-urban (T3), General Urban (T4), Urban Centre (T5) and Urban Core (T6) including districts (Duany et al. 2010; City of Miami 2016). Following this concept a form-based zoning code Miami 21 developed and is adopted and operative since April 2012 in the City of Miami (City of Miami 2016). ‘The Transect’ characteristics of a city vary with different cities depending on their population, spatial extent, activities, morphologies and many other interrelated factors.

A transect passes through the central section of the Dubbo City. Four land use zones: T1 Natural, T2 Rural, T3 Sub-urban, and T4 General Urban are identified in the Dubbo City. According to City of Miami (2016) in ‘T1 Natural zone’ natural areas or conservation areas are included while the ‘T2 Rural zone’ land areas include both open and cultivated land areas such as woodland, grassland, and agricultural land. ‘T3 Sub-urban zone’ is the low density transition zone between urban and rural zones with predominant residential land use patterns. ‘T4 General Urban zone’ includes primarily residential land use although could include mixed-use developments. The main purpose of this analysis to identify the morphological characteristics and food typologies for the Dubbo City. The Dubbo City Transect is dominated by the ‘T2 Rural zone’ and urban areas still maintain suburban morphologies. Agrarian Urbanism planning applications are possible in rural agriculture and peri-urban areas where communities are transitioning or still continuing with their lifestyles rural or agrarian societies. As discussed in the case study, master planning of the communities could be done in a way that it accommodates urbanisation with minimal impacts on the existing communities’ lifestyles. This analysis reinforces that there are significant areas within Dubbo that could apply ‘Agrarian Urbanism’ principles of planning. Different food typologies such as community gardens, home gardens, small and large urban farms could be integrated within the area linking to the residential density patterns. Dubbo community garden is already operating within the city as shown in Fig 3. Dubbo City Transect, local food typologies and ‘Agrarian Urbanism’ application areas are detailed in Fig 4.

Fig 3: Dubbo Community Garden producing vegetables and herbs (Photos by Sumita Ghosh)
Fig 4: Dubbo City Transect, Local food production typologies and Agrarian Urbanism Planning Application areas
(Data Sources: Google maps 2016; ABS 2011 Census; Drawn by: Sumita Ghosh)
Basic community profile and density analysis on the Dubbo City

The Dubbo City has a traditional Australian suburban society with a median age 36 years, and 62.5% of the population are employed full time. The highest number of people are employed in health care and social assistance followed by retail trade. The other employment is administrative and support services, public administration and safety and construction and manufacturing. 89.6% of the population is born in Australia. The household car ownership is high, and a higher share of people travel to work by car. Dubbo has a total population of 36,184 people in ABS 2011 Census. Dubbo is the centre of grain production and livestock farming although data on production of vegetables in the region are not available. The following Table 1 presents basic community profile data for the Dubbo SLA Point A.

Table 1: Basic community Profile of Dubbo SLA Point A

<table>
<thead>
<tr>
<th>Variables</th>
<th>Data</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population</td>
<td>36,184</td>
<td>-</td>
</tr>
<tr>
<td>Occupied private dwellings</td>
<td>12,886</td>
<td>91.9%</td>
</tr>
<tr>
<td>Unoccupied private dwelling</td>
<td>1,137</td>
<td>8.1%</td>
</tr>
<tr>
<td>Average people per household</td>
<td>2.5</td>
<td>-</td>
</tr>
<tr>
<td>Couple family with children</td>
<td>3850</td>
<td>41.6%</td>
</tr>
<tr>
<td>Couple family without children</td>
<td>3403</td>
<td>36.8%</td>
</tr>
<tr>
<td>Median Age</td>
<td>36</td>
<td>-</td>
</tr>
<tr>
<td>Median weekly rent</td>
<td>$200</td>
<td>-</td>
</tr>
<tr>
<td>Median weekly household income</td>
<td>$1,086</td>
<td>-</td>
</tr>
<tr>
<td>Worked full time (15 years or over)</td>
<td>10,954</td>
<td>62.5%</td>
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<tr>
<td>Worked part-time (15 years or over)</td>
<td>4,792</td>
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</tr>
<tr>
<td>Country of Birth (Australia)</td>
<td>32,421</td>
<td>89.6%</td>
</tr>
<tr>
<td>Average motor vehicles per dwelling</td>
<td>1.7</td>
<td>-</td>
</tr>
<tr>
<td>Travel to work by car as driver</td>
<td>11,701</td>
<td>70.3%</td>
</tr>
<tr>
<td>Aboriginal and Torres strait Islander population</td>
<td>4,817</td>
<td>13.3%</td>
</tr>
</tbody>
</table>

Data source: ABS 2011 Census

Table 2 presents spatial distribution, and areas and SA1s in each of the five categories of dwelling density distribution. Using the ABS 2011 Census data, population density (Fig 5) and dwelling density (Fig 6) for the Dubbo City are mapped.

Table 2: Spatial distribution of residential dwellings in Dubbo Point A - SLA

<table>
<thead>
<tr>
<th>Dwelling density per hectare (dw/ha)</th>
<th>No. Of SA1s (nos.)</th>
<th>Total area (ha)</th>
<th>Total population (people)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>26</td>
<td>31108</td>
<td>9931</td>
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<td>2-5</td>
<td>22</td>
<td>1135</td>
<td>8966</td>
</tr>
<tr>
<td>6-8</td>
<td>22</td>
<td>511</td>
<td>9031</td>
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<tr>
<td>9-11</td>
<td>17</td>
<td>315</td>
<td>7454</td>
</tr>
<tr>
<td>12-16</td>
<td>2</td>
<td>31</td>
<td>802</td>
</tr>
</tbody>
</table>

Note: Dwellings include all residential dwelling types such as separate houses, townhouses and apartments etc.
The analysis clearly indicates that the city is still in its formative stage with the urban areas concentrated at its centre with green areas surrounding the urban areas which have natural and rural zones. ‘The Transect’ analysis also confirmed these aspects. There is significant potential to protect natural areas and agricultural land in these areas. Approximately 94% or 31108 hectares of land areas cover these areas while the built up urban area at the centre covers only 6% or 1991 hectares of land.
Estimating total vegetable demand, available productive land and local food potential

Considering the total population of Dubbo SLA Point A equal to 36,184 people, total annual vegetable demand of the population was calculated to be equal to 18,248 gigajoules or GJ per year. The building footprint was estimated for each SA1s within the selected areas of Dubbo considering the number of bedrooms in the separate houses. Except other dwellings types, separate houses cover approximately 1501 hectares of land, and total building footprint was equal to 85 hectares within the selected areas. It is assumed that up to 20% or 300 ha of land was devoted to impervious uses such as paved surfaces, roads, and others. The total available productive land for vegetable production is 1116 ha.

Four scenarios were assessed for their abilities to supply the total annual vegetable demand. The Scenario 1 (100% use of the available productive land), Scenario 2 (80% use of the available productive land) and Scenario 3 (50% use of the available productive land) when put to cultivation and production of vegetables, then surplus vegetables would be produced in these three scenarios compared to total vegetable demand of the population. Scenario 1 would produce four times the required demand while the Scenario 2 and the Scenario 3 would produce three and two times of the required demand respectively. In Scenario 4 with 25% use of the available productive land would be just able to meet the total vegetable demand of the population with a minimal surplus amount of vegetables. With the increase in the population of City of Dubbo, the total vegetable demand would also escalate. If the urban morphologies or structure of the City remains same, Dubbo would be able to grow all its vegetable demand within the city. Fig 7 presents the maps for four scenarios showing the spatial distributions of available productive land areas in SA1s within the built environments of the Dubbo City. Table 3 presents the local vegetable production potential of the Dubbo City to meet the total vegetable demand of the population in four scenarios.

Table 3: Vegetables production potential of Dubbo within built developments (separate houses) for Dubbo SLA population

<table>
<thead>
<tr>
<th></th>
<th>Scenario 1: 100% utilisation of available productive land (ha)</th>
<th>Scenario 2: 80% utilisation of available productive land (ha)</th>
<th>Scenario 3: 50% utilisation of available productive land (ha)</th>
<th>Scenario 4: 25% utilisation of available productive land (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available productive land in the selected Dubbo SA1s (ha)</td>
<td>1116</td>
<td>893</td>
<td>558</td>
<td>278</td>
</tr>
<tr>
<td>Energy equivalent of vegetable production potential from available productive land in the selected SA1s (GJ)</td>
<td>78120</td>
<td>62510</td>
<td>39060</td>
<td>19460</td>
</tr>
<tr>
<td>Vegetable production potential surplus/deficient/sufficient of Dubbo Pt. A SLA population (GJ)</td>
<td>59872</td>
<td>44248</td>
<td>20812</td>
<td>1282</td>
</tr>
<tr>
<td>Dubbo Pt. A SLA vegetables demand supplied (times of required vegetables demand)</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Fig 7: Available Productive Land in hectares in four scenarios: maximum, high, medium and low
Currently, the Local Environmental Plan (LEP) in Dubbo City permits horticulture under Agricultural activities only in Primary Production (RU1), Rural Landscape (RU2), Primary Production Small Lots (RU4), Village (RU5) and Large Lot Residential (R5). Horticulture is prohibited in General Residential (R1) and Low Density Residential (R2) and Recreational and Business zones (Dubbo City Council 2011). Significant work needs to be done in Dubbo to align the food and planning policies. As an important regional city of NSW, this City will be accommodating more population in future. Generating community awareness, and skills and establishing collaborative partnerships would be most important for the uptake of local food.

**Recommendations and Conclusion**

An ABS household survey conducted in 1992 on backyard production of vegetables in New South Wales (NSW). Households in NSW grew 28% of their total home production of vegetables which included tomatoes, potatoes, cabbages, capsicum, cauliflower, carrots and beetroot, lettuce and peas (ABS 1992). According to this survey, an Australian backyard grew, 70.4 kg vegetables on average, and tomatoes were the most popular vegetable (ABS 1992). The outcomes of the research support that the Dubbo City has a significant area of productive land available within its existing built environments that could potentially grow the significant surplus amount of vegetables, up to four times more than the required annual vegetable demand of the resident population. Current estimation shows that only the 25% of this available productive land area could supply the vegetable demand of the city. These productive areas could be fitted with appropriate food production typologies such as front and backyard gardens, community and allotment gardens and small urban farms for producing local food. The surpluses could be supplied to the surrounding smaller towns and cities to create a thriving local economy.

As the city grows, its structure could change, and densities could increase. As seen in the City of Vancouver, Detroit, and Singapore, these cities have evolved over time and require to accommodate different local food production typologies to become food secure. For example, food production typologies in Singapore is technically driven, and hi-tech hydroponic vegetable production due its high-density development pattern but Detroit could accommodate urban farm, community garden and home gardens typologies due its low-density development pattern. The Dubbo Transect and analysis of ABS data confirmed that built/urban environments located at the centre of the Dubbo SLA Point A. These areas are surrounded by very low density primarily green spaces. The morphology of the Dubbo City demonstrates that it is in that life stage of a city where hinterland and primarily suburban development patterns are currently retained. Future urban growth processes in the Dubbo City could be accommodated in a sustainable manner through appropriate planning policy formulation and informed decision making. Urban food production policies should be aligned well with planning policies similar to the City of Vancouver in Canada. Long term planning horizon for the policies and regional influences on the city must be considered. The conventional lifestyles of people could be protected using an appropriate method of designing and planning such as ‘Agrarian Urbanism’ approach in peri-urban and rural locations. Incorporating these aspects would lead to sustainable food system planning and a resilient food secure city and a self-sufficient community development. Onsite production of food would also generate co-benefits of reduced
carbon emissions by reducing transport distances of vegetables from offsite locations and carbon storage and sequestration and stormwater benefits of vegetation.

Generating community awareness and developing skills are important for the uptake of local food production. For example, ‘Community In Bloom (CIB)’ program in Singapore, Garden Resource Program (GRP)’ in Detroit and the initiatives such as ‘2010 Garden Plots by 2010’, and ‘Tree Keepers Program’ in the City of Vancouver generated increased community participation and also established notable numbers of new food producing gardens. Grants, incentives and training programmes and skill development workshops would be essential to provide knowledge and understanding on the importance of local food production to the city residents. Establishing useful partnerships between local council, farming organisations, government and private organisations and communities could generate new enterprises and successes in implementing local food production initiatives.

Dubbo City has a reasonable prospect to grow into a sustainable regional city of future. This research highlighted the important roles of regional cities to consider local food production as an important aspect of sustainable urban development. Regional cities with comparatively less population have a significant potential and distinct advantage to incorporate these measures in planning policies for these urban areas.

Acknowledgements

The author would like to thank to all who provided help for this research. The author would like to thank the anonymous referee for suggestions.

References


The challenges of regional development: 
In pursuit of a way forward

Dr. Igor Martek
School of Architecture and Built Environment
Deakin University

Paper presented at the
Australian Regional Development Conference
Canberra (ACT), 5th - 6th September, 2016
Abstract

The general consensus held by successive governments has been that regional development is a good thing that should be encouraged and promoted. Nevertheless, despite Australia's wealth, regional areas within Australia experience some of the greatest disparities and inequalities in living conditions observed in the developed world. Over successive administrations government has vacillated between two broad approaches in dealing with the problem; 1) the fostering of isolated regional economic development projects, and, 2) the payout of compensation when regional economies fail. A wide range of regional developmental theories exist which attempt to explain the dynamics of regional development, the pitfalls, and the causes of failure. These are predicated on the many definitions of regions themselves and the role of government. This paper explores these theories. However, it is Hotelling's modelling of the economic benefits of close proximity between parties to transactions that offers a powerful insight into the dilemma faced by Australian regions. On the one hand, Australia, as a country with the fastest growing population in the developed world, is tipping the vast majority of its resources into the big cities, and by so doing ensuring that cities continue to outpace regions in terms of income and opportunities, and ultimately attractiveness as a place to live. Moreover, given that Australia's prosperity is increasingly associated with its ability to connect with global trade, communication and logistics linkages, this paper warns that the economic imperative to further enmesh our big cities into the global economy risks alienating our regions even more. Ultimately, any long-term solution to regional prosperity must be integrated with the growth policies of our cities, and Australia's vision to compete globally.

Keywords

Regional development, regional planning, urbanisation, connectivity, Hotelling, globalisation, infrastructure, Australia.
Theories of regional development

In Australia, regional development is an aspiration pursued apart from other social agendas. That which exists beyond the outer boundaries of the metropolitan and urban vibrancy of our cities are the regions. Within this dichotomous framework, regions are held as the poorer unfortunate cousins of cities and, given their special problems, are seen to need special attention if they are to be brought up to speed. While the idea of the 'country' and 'country life' carries with it a nostalgic sense of the idyllic, successive Australian governments have lamented that over a majority of measurable indicators, the well-being of regional Australians hovers chronically under par when compared to the well-being of urban-dwellers (Beer, 2010). Consider that in 2015, in the ACT, 88.1% of the labour force had a secondary education, while, in regional Tasmania the figure was 65.6%. This gap of 22.5% represents a larger spread than experienced in other OECD countries (OECD, 2016). Household income in the ACT is more than double that in Tasmania, while Tasmania also suffers double the unemployment rate experienced in Sydney or Melbourne. Regional inequalities in Australia are greater than observed in countries with recognized wildly diverse regions, such as the USA. In fact, Australia holds the dubious distinction of carrying the widest spreads in regional inequality over most well-being indicators. (This is even before considering the extreme levels of under-privilege experienced by a majority of indigenous Australians.) See Figure 1.

Figure 1. Comparative well-being: Intra regional Australia vs. OECD

Though the term 'region' is loosely used, it needs to be clarified if it is to respond effectively to policy formulation. The term does not enjoy a consensus of agreement in academic circles. An early definition of 'region' was provided by Christaller (Christaller, 1933, reprinted 1966), later developed by Losch (Losch, 1954), in which a region is conceptualized as a hierarchical space centred on a city, and where lower order communities engage with that city and each other through a network of trades and transactions. More recently, the term region has been defined as a spatially interdependent labour market, where labour flows are more common between nodes within the region than across to nodes outside (Hoover & Giarratani, 1985). Richardson extended the concept to accommodate polycentric and contiguous areas (Richardson, 1979). Fox refined the nodal approach, observing that while there may be complex spatial exchanges of labour, a regional network will owe its
existence to a dominant employment centre (Fox & Kumar, 1994). Regions may also be defined according to differential (skills based) characteristics within the labour force, or by the shared homogeneity of other factors, or even to reflect operational characteristics, such as transportation and commuting patterns, right down to the banality of political boundaries (Fox & Kumar, 1994; Hoover & Giarratani, 1985; Richardson, 1979). Regions may also be delineated according to natural endowments, such as resources, ecologies or geographical features, or, cultural and ethnic identities (Markusen, 1985). At a colloquial level, regions may be defined simply in terms of spatially contiguous populations (Dawkins, 2003). Yet from a policy perspective, what is worth noting is that the choice of parameter by which a region is defined - demographic, geographic, resource, or economic - becomes a choice of lens through which the region is to be seen. This choice will inform political policy objectives and ultimately frame subsequent assessments of regional developmental success.

For all the possibilities that exist in defining a region, there are at least as many theories that speak to the challenge of how best to effect the development of a region. Some of the key concepts that describe the dynamic by which regional development is effected and moderated are as follows. 'Staples theory' contends that a dominant, locally ubiquitous (though otherwise scarce), economically tradeable commodity inevitably lies at the core of a viable region. This theory emerged from the work on Harold Innis's studies of the Canadian fur trade, and is recognizable in Australia's past wool industry and more recent mining boom (Dow & Dow, 2013). 'Core-periphery theory' recognizes a dependent relationship between an industrialized core that is sustained by the supply of raw inputs from a less developed periphery. According to 'trickle-down economics,' such a relationship will result in differential development with the periphery lagging behind the core. The Noble Laureate, Gunnar Myrdal, however, argues that economic flows can be strong both ways, with skills and capital ultimately repatriating back from the periphery to the core. This eventual 'backwash' may exacerbate regional economic decline by hollowing out implanted competitive advantages (Duhs, 1999). Myrdal's work accords with Australia's experience of unrelenting long-term urbanization, despite the many and varied regional investment initiatives.

Wallestein's 'World systems theory' describes regional relocation as arising out of the impetus to exploit labour, capital or resources arbitrage opportunities: Companies move their business to where things are cheaper (Robinson, 2011). Here, Australia's experience is in the loss of whole industries (such as car manufacturing) to off-shore markets. Empire economies, such as in the case of the British Empire, dismantled the complex self-sufficiencies of local colonies and imposed single commodity production quotas that served the demands of the far-off ruling domain. India was forced to manufacture cotton and tea, South Africa, gold and diamonds, and China provided porcelain and silk. The sugar industry of Northern Queensland was modelled after the single commodity sugar industry of the Bahamas; Sugar from the Caribbean supplied England as CSR supplied Australia. And, in times when the commodity price of sugar dropped, the local economies slipped instantly into recession. The practice of internalizing colonial economics within a nation, as has been historically experienced throughout much of regional Australia, was articulated by Hechter (Hechter, 1975). Under this view, regionalism is ultimately the practice of identifying and exploiting resource rich areas for the benefit of the urban core.

'Dependency theory' extends the analysis. When regional economies fail, as described above, governments may step in to provide direct financial assistance, or to otherwise artificially buoy the market on which the region is dependent. While this alleviates the
problem short-term, it may well magnify the suffering over the longer-term by negating the need to find structural solutions, killing motivation to effect a transition to a viable alternate economic base, and entrenching the expectation for indefinite government help. Akin to this is 'Developmental theory,' which describes the mechanisms by which government intervenes in regional markets to artificially inject growth through project funding or infrastructure initiatives. An extreme variation of this, as developed by Francois Perroux, is 'Growth pole theory' (Mønsted, 1974). Here, the aim is not just to create economic stimulus through government funded projects, but rather to 'seed' an area with a whole plethora of developments until a critical mass of economic activity is reached, beyond which government intervention can be withdrawn and the region becomes economically self-sustaining and self-growing. This theory was popular in Australia through the 1970's and manifested in major civic projects such as Elizabeth in South Australia, and Albury - Wodonga on the NSW - Victoria border. Over time, these developments have ultimately been assessed to have been more costly and less self-sustaining than hoped (McCall, 2013).

**Appraising the Australian government's record of regional development**

The approach to regional development a government takes will be informed by the persuasiveness of these development theories. But it will also be shaped largely by its own political agenda. Historically, the Australian government has vacillated between two general strategies. At times, its role has proven contradictory. The first strategy has been to lead and direct regional economic growth. The second strategy has been to compensate communities and ameliorate damage resulting from disruptions to regional status quo as and when local economies and markets fail (McCall, 2013). Much of the discussion in the developmental field focuses on the elusiveness of a universal panacea to the problem; there is no singular voice to follow. Less discussed is the resolve of government to deal with regional issues. Does government represent the will of the people in marginal communities? People are more cynical about government today than a generation ago, but it may surprise some to learn that democracy itself is no longer, nor for some time now, seen as the ultimate virtuous manifestation of right and proper government. This year's Lowy Institute poll on Australian attitudes again confirms the trend that only six out of ten citizens have an unconditional belief in democracy (Oliver, 2016). See Table 1.

**Table 1. Australian attitudes to democracy**

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<tbody>
<tr>
<td>Democracy is preferable to any other kind of government</td>
<td>60%</td>
<td>59%</td>
<td>60%</td>
<td>65%</td>
<td>63%</td>
</tr>
<tr>
<td>In some circumstances, a non-democratic government can be preferable</td>
<td>23%</td>
<td>26%</td>
<td>24%</td>
<td>18%</td>
<td>24%</td>
</tr>
<tr>
<td>For someone like me, it doesn't matter what kind of government we have</td>
<td>15%</td>
<td>13%</td>
<td>15%</td>
<td>15%</td>
<td>12%</td>
</tr>
<tr>
<td>Don't know</td>
<td>1%</td>
<td>2%</td>
<td>3%</td>
<td>2%</td>
<td>3%</td>
</tr>
</tbody>
</table>
Stein Ringen makes the case that government policies, for any government, emerge as a consequence of internal belief systems, of which there are only three (Ringen, 2016). The first rationalization for governmental actions is the 'Welfare hypothesis. Here, the aim of government is to advance and protect the interests of (certain) citizens. Second, the 'Power hypothesis' purports that government works towards a higher purpose or ideology, and citizen interests are subordinated to that purpose. (Think socialism, free-market capitalism, or libertarianism.) The third motivation for government is the 'Triviality hypothesis.' Here, the purpose of government is simply to perpetuate its hold on power; all other actions, whether in the interests of the people or not, are initiated to serve that ultimate aim alone. (Hence the term, triviality.) Do governments pursue economic growth for the good of the people, or, do governments grow the economy to obtain electoral legitimacy to rule? It is easy to make the case that our democratically elected government falls squarely within the first hypothesis; responding to the will of the people and protecting the electorates interests. However, it might be more accurate to concede that any particular government, in practice, will be some mixture of all three motivations. Australia has a highly developed democracy; no doubt. Nevertheless, there are occasions when an ideological agenda, as in the Whitlam years, or the survival agenda, as witnessed in the leadership spills in both the Labour and Liberal administrations in recent history, do manifest. These motivators of government action provide insight in the effort to interpret shifts in policy and the resolve shown in commitment to those policies, as they have unfolded over time with respect to Australia's regional development.

Today, the prevailing paradigm is that development options should be appraised as one would assess business opportunities. This sensibility is a manifestation of the 'scientific government' movement in which good government delivers greater efficiencies. The 2016 Australian Infrastructure Plan is guided by four aspirations: productivity, efficiency, sustainability, and improved delivery (Infrastructure Australia, 2016). The Australian government's response to the findings of the Productivity Commission affirms this dictum:

"The government considers that cost-benefit analysis is the most appropriate tool to determine the merit of ...projects." (Federal Government, 2016a) [Emphasis added]

The difficulty of resorting to market led solutions in a regional context is that the perennial candidates for improving profitability and productivity are always only the existing primary industries: mining and agriculture. Regional development outside these spheres is effectively ignored. Government tends to shun involvement in other forms of development, deflecting non show-case initiatives to local community groups who are afforded minimal federal or state support. Contrast the Australian approach to that in Ireland. There, the aim is not to only support the competitiveness of a champion industry, but to ensure the socio-cultural viability of a high-quality life in the countryside more generally (Tonts, 2012). These aims - industry profitability and rural liveability - are not axiomatically mutually exclusive. They are in fact co-dependent; but the short-sighted pursuit of industry productivity can kill off the community on which the industry depends, and for which it was nurtured. Consider the common crop farm. In order to boost productivity farms are being amalgamated into larger and larger holdings. Relatively high labour costs are being supplanted by the use of synthetic fertilizers, chemical weed control and larger machinery. Thus, as farms become more cost effective, populations drop, and consequently the supporting services in regional townships wither away. Farm profits may be retained in the short-term, but overall, communities die (Malan & Wright, 2015).
Of course, government is aware of this criticism. For that reason, and in response to calls by two rural, independent, 2010 election incumbents to involve local communities in shaping their own destinies, the federal government set up Regional Development Australia Committees (RDACs). There are now 55 in total, spread across the country. See Figure 2. Their promotional literature provides a description of their function:

"Regional Development Australia is a national network... comprising local leaders with broad and diverse skills and experience, who understand the challenges, opportunities and priorities in their local community. They are the local people developing local solutions to local issues." (Federal Government, 2016c)

Nevertheless, there is little evidence of the effectiveness of RDACs. A workshop study conducted by the Southern Cross Business School found endemic dysfunction: Regional leaders could not establish authority or legitimacy, participant roles were unclear, RDACs found it difficult to navigate multiple layers of government departments and jurisdictions, and energies were dissipated in meaningless reporting and administrative duties (Buultjens, Ambrosoli, & Dollery, 2012). Moreover, budgets were inadequate and none of the initiatives that wormed through the bureaucracy was funded (Beer, 2010). While government might acknowledge that a bottom-up approach to regional development would be
more sensitive to local hopes, federal government simply shies from political engagement at the community level.

Matters are different, however, when stories of regional community collapse makes it into the headlines. When that happens, it is not just the local communities that need to be appeased, but the broader population seeks reassurance that government can take care of its own. In a number of high-profile factory closures, in Northern Adelaide, from 2005 to 2008, involving General Motors, Mitsubishi and Electrolux, government injected some $90 million to support employee transition to alternate work. While the gesture might have curried favour in the electorate, there is no evidence that this use of taxpayers' dollars made any difference to the local unemployment rate; which remained relatively high. See Figure 3. The case is instructive, and is evidence of a singular policy failure. But the greater difficulty, as observed by the Auditors-General, is that data on such 'rescue programs' is rarely collected. There is no way of assessing the cost-benefit, or knowing whether government policy works (Daley, 2012).

The allure of the big cities

The real challenge before government is in managing the exponential growth going on in the major cities; regional development remains a side show. To be sure, regional population has fallen from over 50% at federation to a mere 15% today (Federal Government, 2015).
However, this fall is deemed less a concern than the parallel bloating of urban centres, and the pressures on infrastructure, service provision and productivity that rapid population growth brings. Two out of every three Australians lives in a capital city; Australia's population growth rate is the highest in the developed world, and Australia, despite its relatively small total population to land mass area, is now one of the most urbanized countries on the planet (Daley, 2012). See Figure 4.

**Figure 4. Australian population distribution: 1911 - 2010**

The associated drop in quality of life experienced by Australians has surfaced as a major political issue. For most of Sydney's suburbs, the median work commute travel distance is twenty kilometres. Further out, the distance approaches forty kilometres (Federal Government, 2015). In the past, people were lured to the outer suburbs by the manufacturing industries that set up there. As manufacturing dries up, with the economy transitioning to services, the outer suburbs are losing their high-paying jobs and people have reverted to travelling to the CBD for work. Public transport infrastructure, however, has not kept pace with this shift. People are more reliant on cars than ever, roads are rapidly congesting, and travel times are increasing at a faster rate than travel distances (Federal Government, 2015). See Figure 5. Left unaddressed, it is projected that the cost of congestion will increase from $13.7 billion, in 2011, to $53.3 billion by 2031 (Federal Government, 2016b). This is without factoring in the associated loss of productivity.

Ideally, people wish to live close to where they work. But while big city populations grow and jobs in the suburbs disappear, moving closer to the city's centre to live is becoming increasingly impossible for most people. A generation ago, buying a house almost anywhere in Melbourne was an affordable proposition for even low income families. As quickly as a
decade ago, this dream had vanished. If a house is to be purchased at all, it will be located on the outer margins of the suburbs (Federal Government, 2015). See Figure 6. These are the areas of our cities with no jobs, under-resourced services, and increasing rates of crime and social instability (Australian Bureau of Statistics, 2013).

Figure 5. Transportation demand, by usage type: 1945 - 2013

Figure 6. Proportion of houses affordable to low to moderate income purchasers (Melbourne): 1981 & 2006
Whether in regional Australia, or within its urban areas, the gravity of economic pull is to the large city centres. The regional development theories discussed above vie to explain the phenomenon. However, the work of the statistician, game-theorist and economist, Harold Hotelling, provides a particularly simple and accessible analysis of the problem (Hotelling, 1929; Irmen, 1998). Consider a stretch of beach, say 400 metres long. Imagine also that it is a summer's day and that there are throngs of beach-goers uniformly distributed along the beach front. An ice-cream vendor wants to set up on the beach; his aim being to sell as many ice-creams as he can. Where along the beach should he position himself? Assuming that people are motivated to buy an ice-cream in inverse proportion to how far they have to walk along the beach before reaching the vendor, the best place for the vendor to position himself is in the middle; 200 metres from either end of the beach. Here, he will attract the most customers possible. To locate elsewhere may place him closer to some customers, but will, on average, impose an overall greater distance beach-goers would have to walk in order to reach the vendor and his ice-creams.

What happens when a second ice-cream vendor arrives on the beach? A simple calculation will show that each vendor would do best for their customers by positioning themselves 100 metres from each end of the beach. In this way, the maximum distance anybody would have to walk to buy an ice-cream is 100 metres. See Figure 7, stage 1. But the aim of the vendors is not to convenience customers, but rather to sell the most ice-creams. By repositioning himself closer to the middle of the beach, vendor A can steal customers from vendor B. Sure, some customers may now have to walk further to buy an ice-cream; those at the end of the beach on vendor A's side. However, this loss is more than made up by the extra customers garnered from vendor B's former catchment, near the middle of the beach. See Figure 7, stage 2.

Noting the loss of customers, and in order to win them back, now vendor B begins to creep towards the middle of the beach. Ultimately, by degrees, both vendors will find themselves back to back at the middle of the beach. See Figure 7, stage 3. In the absence of enforceable rules by which this ice-cream trade is to be conducted, the inevitable equilibrium outcome is for vendors to gather at the beach centre. This is all the more true as the number of vendors increases and cooperation becomes increasingly difficult to manage. So it is that shops selling similar items tend to congregate within the same location; car yards, restaurants and clothing boutiques. It is also why political parties frequently take on similar policies; jostling to appeal to a majority of people. And it is also why companies and businesses converge in the heart of cities. Yet while the tendency for commerce and people to concentrate in one dominant location is nicely explained by this story, Hotelling's 'principle of minimum differentiation,' predicts an unhappy ending. With the vendors now both in the centre of the beach, neither the beach-goers nor the vendors are as well off as they could be. Customers at the ends of the beach would have to walk 200 metres to get an ice-cream; and given that motivation to purchase falls off as distance increases, this scenario leaves people purchasing fewer ice-creams than they otherwise might, and the vendors making less money than they otherwise could.
Does it happen like this in the real world? Deakin University was brought into existence by the 'Deakin University Act 1974' and declared "the first university in regional Victoria." ("Deakin University Act," 2009) It's mandate was to provide education to the Geelong area, and by means of distant education, throughout Victoria and beyond. The pull to serve regional Victoria led to the opening of the Warrnambool Campus (by amalgamation with the Warrnambool Institute of Advanced Education), in 1990. But Deakin also established itself in Melbourne, in Burwood, (by amalgamation with the Victoria College), in 1991. The enrolment numbers for the various campuses are telling: Of Deakin's four campuses, in 2015, Burwood had 27,115 students, or 68% of the 39,767 total (Deakin University, 2015). In fact, with only 2.6% of enrolments, the Warrnambool campus is being considered for closure. Deakin's Vice Chancellor is reported as stating: "Warrnambool doesn't really want courses leading to undergraduate and postgraduate degrees." (Wright, 2016) Indeed, higher education participation rates are lower in areas with lower populations (Daley, 2012).
Moreover, while capital city residents earn an average of 33% more than non-capital dwellers, the average lifetime earnings of a Geelong educated person is as much as 13% less than other Australians of equivalent education (Federal Government, 2015). Perhaps the most striking trend is that the focus of education has been shifting away from Australians altogether. 46% of RMIT University's enrolments are international students (Australian Education Network, 2016). See Table 2. The fees they pay are higher, and in a market that struggles to grow, offering education to foreigners is good business. Universities attract foreign students not only by reputation but by the lifestyle they offer, and in this regard city campuses are preferred.

<table>
<thead>
<tr>
<th>University</th>
<th>Total*</th>
<th>Int**</th>
<th>Int %</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMIT University (VIC)</td>
<td>57,433</td>
<td>26,590</td>
<td>46.3</td>
</tr>
<tr>
<td>Monash University (VIC)</td>
<td>64,479</td>
<td>22,140</td>
<td>34.3</td>
</tr>
<tr>
<td>Curtin University of Technology (WA)</td>
<td>48,263</td>
<td>15,598</td>
<td>32.3</td>
</tr>
<tr>
<td>University of Melbourne (VIC)</td>
<td>52,257</td>
<td>14,166</td>
<td>27.1</td>
</tr>
<tr>
<td>La Trobe University (VIC)</td>
<td>38,682</td>
<td>7,029</td>
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<td>Deakin University (VIC)</td>
<td>45,900</td>
<td>7,468</td>
<td>16.3</td>
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<td>University of South Australia (SA)</td>
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<td>7,428</td>
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</table>

Global connectivity

As the experience of Australian universities reveals, the view out the front window to the rest of the world may be more attractive than the view into Australia's own regional backyard. It is at this point that Hotelling's ice-cream vendors tale can again help. Not only is regional Australia suffering under greater and greater economic pull to the big capital cities, but those cities are themselves being enticed into the even bigger flow of world commercial activity; the vendors have come to see that the beach stretches out far beyond what they thought, with an endless possibility of customers out there to sell ice-creams to.

In his most recent book, Parag Khanna argues that future global competitiveness will lie in the degree to which one is connected to word markets: supply chains, finance, logistics, knowledge and information flows. In such a future, national boundaries will give way to 'connectivity hubs.' To prosper, states, regions, and businesses must plug themselves into those hubs. Under this scenario, Australian cities should promote a pride of place within this global connectivity project, and regional areas should then be connected through our cities out into the world. Perhaps such a view does not speak to the nostalgic sentiments of a country life, but given the clear mood of government to prioritise cities and their economic performance, it is prudent to accommodate regional development as practically as possible into the vision of Australia's response at positioning itself globally.
An explosion of infrastructure projects are rolling out across Asia, crossing borders and straddling the entire continent as they link far flung regions, drawing in their resources of oil and minerals like never before. See Figure 8. Indeed, China is responsible for a full third of world trade, and growing. China is Australia's largest trading partner and biggest consumer of Australian regional produce. If our position is to be retained, Australia, too, needs to keep up with China's increasing connectivity with its neighbours; our competitors. China, is also vigorously expanding off-shore in the form of multi-national companies, as are other developing nations. Certainly Australia, including regional Australia, should keep sight of its own ability to compete internationally on equal terms.

GDP remains the most widely accepted measure of economic and national performance. Australia, historically, fairs well. Notwithstanding, international trade is an increasingly important contributor to overall GDP. Global trade has increased significantly from the 1980's, as have trade links. And, as international markets continue to grow in importance, it will be those cities that have positioned themselves as transit points for trade that will benefit. Sydney is a world class financial centre, as Melbourne is a transportation hub. However, the most affluent cities in the world are those which act as conduits over an range of international flows. These are the cities of New York, Los Angeles, San Francisco, London, Singapore, Hong Kong, Shanghai and Dubai. See Table 3. Overall, however, Australia's informational connectivity with the world remains extremely low; lower than China, Russia or even Saudi Arabia, and certainly lower than in the developed world. See Figure 9. Ultimately, if Australia's regions are to be developed, the challenge should not be seen as a competition for funds and attention between the big cities and the country, but rather as a collaboration to bring all of Australia into comfortable integration with the world in which everybody now depends.
Table 3. World city participation in major trade and exchange flows: 2014
(Source: Lloyd’s List; Containerisation International; Airports Council International; Global Financial Centers Index; Migration Policy Institute; TeleGeography; McKinsey GI analysis)

Only eight of the world’s major cities are hubs for at least four of the five major flows

City participation in major flows by rank and change over previous year in each flow¹

<table>
<thead>
<tr>
<th>Rank</th>
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<th>Goods, services, people</th>
<th>Financial</th>
<th>People</th>
<th>Data and communication</th>
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<td>Tel Aviv</td>
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¹ Metropolitan areas with at least 1 million foreign-born residents. Exact foreign-born population of Jeddah not known, so it is included at the bottom of the list.


Figure 9. Country comparisons of GDP vs. global connectedness: 2014
(Source: https://infrastructure.gov.au/infrastructure/pab/soac/)
Conclusion

Though a rich nation, Australia suffers some of the greatest regional disparities, across a wide range of quality of life indicators, in the developed world. This paper has sought to explore why this is so.

The dominant paradigm dictating Australian development policy is 'economic cost benefit.' This is now so entrenched it has become difficult for government to recognize alternative measures of regional development. A more fundamental difficulty of this paradigm is that a dollar invested in the big cities will be more productive than any dollar invested in the country. Thus, the paradigm itself argues for limited prioritization of regional growth. Nevertheless, government has paid Australia's regions some attention as a matter of political expediency. One the one hand, government has sought to foster those regional economic programs that promise the greatest economic rewards, while on the other hand ameliorating regional communities with bailout packages where such programs fail. More recent federal administrations, have sought to off-load the burden of regional development to the fifty-five 'regional development committees' that now exist around the country. These committees, however, have not received the required support, training, policy infrastructure or funding necessary to make them effective. There are of course regional success stories, but overall Australia's regional development has not kept pace with the growth and development experienced in the big cities.

Largely, the various regional development theories provide sufficient explanations as to why regional development should lag. Embedded in most of them is the simple presumption that regions cater to a 'hub' of some description, are subservient to them, and therefore benefit economically in smaller measure. The practice of regional development has therefore been broadly a matter of identifying and developing commodities and services that augment the economic activities of nearby city hubs, and, in looking for ways to extract the highest rents for those provisions. However, the challenge for Australia in finding an effective response for regions is exacerbated by three strong features endemic to the Australian condition. First, Australia is large, distances to regions are greater and populations are smaller. Consequently, logistics costs are greater, economies of scale harder to achieve, and benefits accrued dissipated over smaller communities.

Second, Australia has the fastest growing population in the developed world. This population growth is occurring in the major cities. Consequently, there is huge pressure on urban infrastructure, services and other provisions, which necessarily attract the bulk of political energy and investment. Nevertheless, it is the increasing concentration of competitive skills and abundant resources experienced by cities that adds to their productivity. Thus ironically, while quality of life is under pressure in big cities, they still offer the highest wages, the widest opportunities and provide the best services. For this reason they also attract people and investment out of the regions, further depleting the countryside as cities swell. Third, Australia's pursuit of economic prosperity requires it to respond to global benchmarks in connectivity, responsiveness, productivity and competitiveness. Thus while regions may look for ways to be increasingly relevant to cities and foster development by augmenting city
economies, our key cities are compelled to reach out to global markets for growth opportunities. Regions need to learn about improvements in logistics, communications and technology connectivity that might bring them close to the cities, as our cities are finding ways to bring them closer to the markets of the world.

In the end, those that fashion regional development policy must recognize certain truths. If regional destinies are to be charted by their local communities, as envisioned by the regional development committee initiative, those committees must be given the requisite autonomy, resources, training and funding. Moreover, since cost-benefit economic modelling has long been equated with labour reduction and consequent community erosion, efforts to rebuild regional communities into vibrant, culturally rich, desirable places to live that are able to attract population growth, must recognize alternative performance measures. In this regard there are a number of European precedents that have worked well and that could serve as a model. Finally, if indeed however the aim of development overall in Australia is to remain predicated on economic performance, regions must find ways to streamline themselves into the global economy. Our big cities sustain themselves increasingly by competing within a global network of products and services exchange. The national emphasis of growing our cities is based on making them gateways of trade to the world. Under this scenario, if regions are to prosper into the future, they must position themselves to find niche markets world-wide, be it minerals, agriculture or tourism, and to be able to trade to the world through our ever widening big city gateways.

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Beyond the boundary: integrating public input into local Council policy making

Honorary Adjunct Teaching Fellow, Susanne Taylor, Faculty of Society and Design, Bond University, Robina Queensland and Matthew Zenkteler, Strategic Planner, Tweed Shire Council, Murwillumbah, New South Wales.

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Beyond the boundary: integrating public input into local Council policy making

ABSTRACT: In Australia’s peri-urban regions, communities on the boundary between rural and urban seek to influence government policies relating to land use, development, changing settlement patterns, farming, youth employment and social services. In response, local Councils use a wide array of deliberative consultation techniques to provide input to the policy process. Yet, the use of community data in local government policy-making is largely informal that is, it does not undergo formal processes to guide the selection of consultation techniques, and statutory guidelines are limited to assist local government planners to use consultation data once gathered. This paper focuses on a case study of local government planners in the Tweed Valley region of northern New South Wales where there is considerable pressure on land use regulation to change due to increased population and its proximity to the expanding Gold Coast. This study analyses the consultation process from design to data integration and the use of regenerative development as a framework to influence the delivery of collaborative strategic policy making in land use planning.

Key words: collaboration; peri-urban land use; regenerative development; participative planning, Tweed Valley.
Introduction

Peri-urban communities that lie on the fringe of urban regions are described as ‘amongst the most contested spaces on earth’ (Buxton et al, 2006). The factors which contribute to this contestation include; new settlement patterns and housing development, declining agricultural industries, ageing rural populations, high youth unemployment, and a lack of investment in transport, health and social infrastructure (Iaquinta & Drescher, 2000). This contestation inherent in peri-urban regions reflects conflicting processes at work which make them unique. Firstly, the pressure to urbanise as ‘fringe’ and ‘boundary’ settlements through absorption into a greater urban periphery; and secondly, the desire to maintain rural lifestyles, spaces and landscapes to retain the unique identity which defines a rural region as a distinct ‘place’ with a separate identity from urban areas (Healey, 1997).

These regions have suffered much the same fate as rural areas across Australia with a decline in traditional farm size and farming incomes as a result of the consolidation and shrinkage of primary agricultural industries from the 1970s onwards resulting in labour force adjustments, coupled with regional infrastructure decline (Tonts and Jones, 1997). This decline has led to a diversification of regional economies and an increase in service-based industries, small-scale horticulture, and ‘dormitory’ populations travelling and working in urban centres. Peri-urban regions can be described as ‘many rurals’ (Argent, 2011); different communities, lifestyles, employment patterns and changing demographics within a formerly, mainly agricultural region.

As a result, peri-urban land use planning is particularly sensitive to a variety of complex and inter-related issues which, local councils responsible for delivering land use planning policies, seek to balance by accommodating rural and agricultural heritage with residential growth pressures. The resulting effect upon the peri-urban community can be profound (Herbert-Cheshire 2000) leading communities to take part in ‘active citizenship’ (Kearns, 1995) exhibiting high levels of participation, involvement and partnership in the legislative and planning process.

This study analyses land use policy in the Tweed Valley region of northern New South Wales, a peri-urban region bordering the Gold Coast urban region. In 2007, the New South Wales state government released the Far North Coast Regional Strategy (‘the regional strategy’) to drive and manage population growth in the state’s most northerly shires including, Tweed, Lismore, Kyogle, Byron, Ballina and the Clarence Valley (Far North Coast
Regional Strategy, 2006), predicting a two-fold increase in population in the Northern Rivers region by 2031 from approximately 30,000 residents in the early 2000s to a predicted 60,000 residents by 2031.

The Tweed Shire Council’s response to the regional strategy includes the *Tweed Rural Villages Strategy* (‘the villages strategy’) released in 2016, as the basis for further planning policy. The strategy has extensively engaged the village communities in development options for nine rural villages in the Tweed Valley. The villages strategy is offered here as a case study of land use planning in peri-urban regions, using the regenerative development methodology as the adopted community engagement approach to create collaborative land use planning with rural communities. This article represents a summary of the first stage of a two-year research project that will latterly include interview data from planners and community members reflecting on the application of regenerative development as an emerging peri-urban planning framework.

**The Tweed Shire Region**

The Tweed Shire Council is the most north-easterly shire in New South Wales, approximately 800 kilometres from the state government administrative centre of Sydney and adjacent to the fast-growing urban region of the Gold Coast, Queensland. In the past decade, Tweed Shire and the neighbouring Gold Coast have witnessed significant residential growth at 2.4% per annum; higher than the regional New South Wales average growth rate of 0.6% (Tweed Shire Council, 2013). Growth has been driven, in part, by the proximity of the City of the Gold Coast and population increases in south east Queensland placing land use pressure on the neighbouring Northern Rivers region resulting in over 7,000 new dwellings in the past decade (Tweed Shire Council, 2013). Other factors which have influenced population growth include the upgrade of the Pacific Motorway in 2004 and a shift in the economic base from timber and agricultural activities to tourism, healthcare, social services, retail and construction (Tweed Shire Council, 2013).
In summary, the factors changing the economic and demographic context in the Tweed Shire region includes:

- The region’s location adjacent to the Queensland border and access to employment in Gold Coast City and Brisbane City;
- State government planning forecasts which indicate continued high residential growth in the region;
- In-migration to the region that has stimulated the emergence of new industries, representing a shift from the traditional agricultural industries of broad acre farming and timber, to service industries including; tourism, health care, social services, retail and construction;
- Tweed Shire is well-placed to benefit from emerging Asian markets for agricultural produce with easy access to the Gold Coast Airport and the Port of Brisbane;
Despite the growth of service industries, the horticultural and sugarcane industries are still significant economic drivers in the region;

The rural landscape of the Tweed Shire is a drawcard for sea- and tree-changers seeking a rural lifestyle (Tweed Shire Council, 2013).

State government research indicates that the majority of future residential growth will be concentrated on the Tweed Coast and the border between New South Wales and Queensland in the Tweed Heads urban area, with large residential developments in Cobaki Lakes, Kings Forest and Kielvale anticipated to absorb a majority of new residents (Department of Planning and Infrastructure, 2014).

However, the high growth rates predicted in the state government’s regional strategy is significant; 60,400 more people, 51,000 new homes, 32,500 new jobs and 3 major centres (Department of Planning and Infrastructure, 2014) and it has prompted the Tweed Shire Council to review residential settlement patterns to incorporate growing populations throughout the Tweed Shire, focussing on land use configurations and options to accommodate residents in established village settlements across the rural heartland of the region.

The Tweed villages

The Tweed Valley has a pre-dominantly rural history with the first wave of ‘soldier settlers’ post World War I, developing the main rural industries incorporating timber getting, broad acre cropping, bananas, sugar and a profitable dairy industry (Tweed Link, 2015). The nine villages reviewed under the scope of the villages strategy include; Uki, Stokers Siding, Tyalgum, Tumbulgum, Burringbar, Chillingham, Crabbes Creek, Bilambil and Mooball. Historically, these villages have developed as a result of the region’s agrarian past becoming community ‘hubs’ providing healthcare, education, leisure activities, machinery repairs and retail shopping (Tweed Shire Council, 2016).

The North Coast Urban Design Framework (‘the design framework’) recognises village identity in a series of characteristics which go beyond the physical definition of the village, its demographics, jurisdictional boundaries and land use. These characteristics include; compact development patterns with an obvious centre, informal edges that interface the village and the surrounding natural or rural environment, close proximity to a waterway, highway or rail line, surrounded by farmland, generally of walkable size, strong visual connections with the environment setting, a range of functions including dwellings,
community facilities, public open space and a commercial area, and a formal street grid based on a central main street (NSW Government, 2016). The villages have evolved in different ways to take advantage of their natural and built assets. For example, Tumbulgum on the Tweed River has a thriving leisure boating and water skiing industry, Tyalgum has a cult community of Hermes Far East Shining members that operates expanding small tourist businesses on the main street and Uki’s access to the world heritage Mount Warning Park attracts tourists to the Tweed’s rural heartland. Figure 2 illustrates the location of the Tweed villages in the Tweed Shire region.

Figure 2: Tweed villages in the Tweed Shire region (Tweed Shire Council, 2016).
Control plans for residential development have been overseen by state and local government planning agencies. The tools that provide directives and master planning for the Shire are termed Development Control Plans (DCPs) where land use activities are predetermined and regulated through local government policy. The expansion of residential land around the villages is determined through the DCP. For example, the village of Burringbar has land already identified for future development within the boundaries of its urban footprint. Areas designated for expansion of that footprint are known as ‘emerging communities’ and require community-based planning and engagement before consent for development approvals are given. Strategies such as the villages strategy provide the research basis for further planning policy development as it informs regulatory land use controls based on community input.

The Tweed village communities have been active in shaping their own future; Tyalgum Uki, Chillingham and Stokers Siding have created a series of action plans from the early 2000s, co-funded by state and local government to identify the vision statements, values aspirations and hierarchy of planning priorities relevant to each village. The action plan developed by the Uki community represents the ambitions and aspirations of one of the most vibrant and diverse village communities.

*Case Study: Village of Uki*

Uki is situated in the heart of the Mt Warning Caldera and has high ecological values due to the bio-diversity in the region and it is identified in the Tweed Local Environmental Plan (LEP) as a Heritage Conservation Area. The village attracts high tourist numbers of 5,000 visitors per annum providing a welcome injection of tourist dollars into retail, hospitality and accommodation in the village and assisting in a seasonal boost to the low weekly median income level (NSW Industry and Development, 2009). The high ecological value landscape has attracted an eclectic mix of residents from families of early agricultural settlers to alternative ‘lifestylers’ and as at 2010, Uki had a population of 1,900 people (NSW Industry and Development, 2009). The demographics of the village are different to the rest of the Tweed Shire region and include: a higher youth demographic (25-54) and a relatively low median income level of $160 per week (Tweed Shire Council, 2013).

Uki’s plan identified ‘sustainability’ as the overriding community planning interest and this is reflected in associated planning documents including; the Uki Development Control Plan (2004), the Uki Strategic Plan (2000) and the Uki Locality Plan (2004) (Tweed Shire Council, 2016). The planning framework developed in collaboration with the community
includes 7 Key Focus Areas (KFAs) to guide local planning policies and regulations, including the village's strategy. The 7 KFA’s include: 1) food growing distribution and consumption; 2) community information, education and resilience; 3) community infrastructure and essential services; 4) ‘Green Enterprise’ and the local economy; 5) natural environment; 6) transport; 7) housing and shelter. Taking the example of KFA 1, initiatives recommended indicate a community with a high degree of social capital and community cohesion to achieve self-help outcomes which include:

Local food growing through home gardens and community gardens, local production of seeds, localised food exchange systems such as local barter trade, local shops stocking locally grown produce and farmers markets (NSW Industry and Development, 2009).

Despite its small population size, the village has 25 community organisations; including church groups, School of Arts, a garden club, RSL and local residents’ associations, local churches and the schools creatings community hubs and the village has a well-attended growers and craft market; the Butter Factory. Uki presents the profile of a village community with a commitment to localism and self-help as a core asset of the community to build the village’s economic and social capacity, reflective of its history and traditions. It also suggests a community which is confident in its identity and place in the region and a desire to collaborative actively in new planning regimes affecting the village.

**Public participation in planning policy**

Planners ‘have wrestled with the concept of sustainability as it applies to the built environment and the role of their professions in creating the world …increasingly they are recognising that a new paradigm is needed, that the old ways of thinking are not up to the task’ (Hoxie et al., 2012, p. 66). Certainly, in the context of planning theory, new and novel approaches to methods and frameworks to incorporate social and environmental sustainability have become more pronounced in planning regimes, including: measures of community social capital to represent the social sustainability of policy-making (Forrest and Kearns, 2001; Brooks, 2006); natural resource management via adaptive management, as a policy framework to achieve environmental sustainability in regions with high natural and ecological values (Swanson et al, 2010); and the cultural significance of place, reflecting community values invested in settlements which foster community heritage, community ‘spirit’, belonging and a distinct cultural ethos (Greble, 1979).
Planners are thus confronted with the specific and unique planning challenges in rural and regional communities, struggling under structural changes created by major economic and labour force changes witnessed since the decline of agricultural industries from the 1980s onwards (Cheshire and Lawrence, 2005). From this period of economic rationalism and the ‘rolling back’ (Rhodes, 1996) of state resources, regional communities have adjusted to the new realities of the global marketplace and a decline in protective tariffs and administrative support for agricultural economies (Bertucci and Alberti, 2001). These fundamental changes have prompted reflection on the nature of regionalism based on recognition of the declining social equity of regional communities in comparison with Australia’s urbanised centres (McManus and Pritchard, 2000). With rural communities seemingly ‘disenfranchised’ (Everingham, Cheshire and Lawrence, 2006) by the withdrawal of state resources, the new regionalism movement for example, has attempted to redress the imbalance of urban vs rural to create legislation and planning regimes which reflect Australia’s regional places and community aspirations (Spindler, 2002).

Statutory provisions for community participation, as outlined in the state government’s Environmental Planning and Assessment Act (1979) (‘the Act’) are broad and non-specific; and the Act does not provide a guide to the process of engagement or a framework to manage and treat data which emerges from consultation. Section 57 of the Act outlines the state government’s community consultation guidelines; ‘The relevant planning authority must consult the community in accordance with the community consultation requirements for the proposed instrument’ (s 1) and includes provision for written public submissions which must be publicly available as required, including a public hearing if requested and, if the submission is deemed ‘significant’ (s 3-4). In Section 58, ‘The relevant planning authority may vary the proposal or not proceed’ as a consequence of consideration of any submission or report during consultation (s 1).

In response, consultation practitioners and planners continue to grapple with tools and methodologies which best represent the myriad and often intractable issues which emerge from rural and regional consultation, using ‘boundary scanning’ (Voets and De Rynck, 2008), to select the consultation process and tools relevant to each community. The gap between consultation practice, planning theories and statutory guidelines has created a multi-faceted approach to consultation which has led some commentators to note: ‘Academia has not yet connected its knowledge and understanding of the both the ideals and realities of government
and political leadership and public input, to make the process of public input an effective part of modern governance’ (Lees-Marshment, 2015, p.3).

**Regenerative development in the Tweed Rural Villages Strategy**

Responding to the challenge of modern governance and effective public input, the villages strategy adopted regenerative development as the central policy development framework describing it in these terms; ‘regenerative development leads to improved environmental and social outcomes…based upon the understanding that each development site is a ‘living system’ into which the new development must integrate’ (Tweed Shire Council, 2016, p.17). This approach recognises the critical importance of ‘regeneration’ ‘rebirth and ‘renewal’ (Cole, 2011) offering the opportunity to use planning policy as, ‘a catalyst for positive change within the unique place in which is it situated’ (Cole, 2011, p.2) and strives for net-positive impacts on human and environmental health rather than simply causing less damage.

To achieve this objective, the strategy identifies key systems which require integration into a holistic planning policy, based on initial consultation with the community in 2013 and summarised in the resulting Discussion Paper. The Discussion Paper identified; energy, buildings, transport, ecosystems, people and infrastructure, water and waste (Tweed Shire Council, 2014, p. 16) as the key systems requiring regulation and reflects regenerative development methodology as ‘systems thinking …(to) tie together differing systems in one place in a cogent manner’ (Gladwin et al, 1997, p. 245).

Regenerative development has been used previously in the United States as the framework to assist in developing appropriate planning for communities in towns including North Charleston, Greenberg and Tuscaloosa, all of which faced opportunities to renew and regenerate (Hoxie et al, 2012). The planning process used an array of engagement techniques, focussing on face-to-face communication with the critical aspects being; on-going dialogue, partnership with the planning team, storytelling and identification of ‘place’, leading to consensus-building through ‘honest’ and open communication in the policy development phase (Hoxie et al, 2012). By developing shared goals and strategies, the regenerative development process allows for the management of differing goals and aspirations through dialogue (Hoxie et al, 2012).

The villages strategy notes that the regenerative development framework, ‘does not have a statutory role’ (p.18) but applies the framework to ensure that ‘future development occurring in the rural settlements is consistent with the community’s visions and aspirations’ (p.19).
This emphasises the role of community participation in the development of policy incorporating the beliefs and assumptions of a particular community’s ‘worldview’, which operate to:

Channel attention filter information, categorise experience, anchor interpretation, orient learning, establish moods, secrete norms and legitimate narrative, ideologies and power structures (Gladwin et al, 1997, p. 246).

The villages strategy was developed using community feedback as the basis for community aspirations, recommendations, planning framework/existing policies and proposals, both region-wide and specific to each village.

Figure 3: Community feedback in the development of the Rural Villages Strategy (Tweed Shire Council, 2016).

Figure 3 represents how community feedback during consultation resulted in topics and recommendations for further discussion from the engagement process and demonstrates the role of engagement in the policy process.

In this sense, the villages strategy creates a direct correlation between community feedback and the proposals from the strategy which include three main policy components; 1) locality plans specific to each village, 2) proposals to manage ‘bread
and butter’ issues like pavements and waste management and 3) region-wide initiatives, common to all villages in the region. (Tweed Shire Council, 2016).

The villages strategy community engagement process was extensive and continued from October 2013 to September 2015. The activities during this period included:

1) Initial community meetings, launch of a website specific to the strategy;
2) Appointment of a 17 member reference panel;
3) Publication of a Discussion Paper summarising the initial engagement;
4) Second round of community meetings in each village;
5) Policy drafting and release of draft strategy for comment;
6) Initial review, Councillors workshop;
7) Public exhibition (Tweed Shire Council, 2016).

The community took part in two rounds of workshops in each village; the initial community meetings and a second round after the publication of the Discussion Paper. In total, the community engagement process resulted in approximately 2,000 hits on the council’s website following the community discussions in the villages. Proposals and ideas were developed and discussed in a reference panel comprising a representative group of community members (Tweed Shire Council, 2014) and via emails, letters, emails and phone calls.

The community engagement process reflects the Tweed Shire Council’s adoption of the five stage IAP participation ladder as the basis of the council’s Community Strategic Plan (2011) that includes: inform, consult, involve collaborate, empower (Tweed Shire Council, 2014) and reflects the trend towards ‘upfront’ engagement, that is, consulting with communities about their aspirations and concerns in the conceptual stages of planning before the statutory requirement to exhibit the Local Environment Plan (LEP) which establishes the building codes, exemptions and requirements for different land uses throughout a region. Research by Local Government NSW which documented engagement practices of 20 councils in different regions in New South Wales found:

All councils interviewed strongly agreed that councils have shifted their focus to varying degrees, from end stage engagement strategies, required by legislation, to earlier methods of engagement on more conceptual and formative plans (Stage 1) and preliminary Planning Studies (Stage 2) that lay the foundations of the emerging planning instrument. Everyone interviewed agreed that this is not only
developing practice, but is considered to be best practice (Local Government NSW, 2014, p. 3).

This suggests collaboration as part of community engagement in policy development is increasingly understood by local councils responsible for land use planning as, ‘a diverse range of people working together for a common purpose not just participating in the decision-making process, but also actively committing themselves to achieving the best outcome’ (Aslin and Brown, 2004).

In summary, the villages strategy set out with a specific goal to create a holistic land use planning strategy that incorporates existing policies, developed by community, state and council agencies while linking new data through the use of regenerative development as an on-going dialogue with the Tweed communities to develop their villages.

**Applying the regenerative development framework**

The villages strategy policy proposals are subject to the objectives defined in the Village Zoning (RU5 Village) in the *Tweed Shire Local Environment Plan* (2014) which states:

- To provide for a range of land uses, services and facilities that are associated with a rural village; and
- To ensure that new development responds to and respects the character of the village (LEP, Zone RU5, ss 1 p11). (emphasis added).

Under the LEP, development consent is required for anything other than environmental facilities, environmental protection works and home occupations (LEP, Zone RU5 ss 2, p11). Permitted development (with consent) includes; commercial premises, community facilities, dwelling houses, educational establishments, exhibition homes, education facilities, places of worship, recreational facilities, registered clubs, residential accommodation, respite day care centres, veterinary hospitals (LEP, RU5 ss 3 p11). With such a broad range of development available under the LEP, appropriate built form, codes and guidelines to create sympathetic development, requires careful consideration of the character of the affected village.
The villages strategy uses community feedback to pre-determine appropriate development in the villages within these constraints. For example, whether the villages should expand in response to population growth or maintain the status quo and provide a roadmap of how, why and where development should occur in the villages based on the ‘character of the village’, as stated in the LEP. In this respect the villages strategy is not prescriptive, it is a strategic form of ‘upfront’ engagement to consult on community opinions and concerns on a wide range of social and economic issues which may affect not just the built form but the lifestyle and viability of village communities into the future.

The villages strategy and discussion paper identifies 55 proposals at two levels; actions specific to individual villages and region-wide initiatives based on questions to provoke further discussion. A representative group of community comments/interests in the villages strategy have been identified below alongside two elements of the regenerative development framework adopted for the villages strategy; regenerative capacity and place and potential (Tweed Shire Council, 2016, p.14).

**Regenerative capacity**

‘Regenerative capacity relates to new development, strives for net-positive impacts on human and environmental health. It considers restoration and maintenance of the ecological capacity, ecosystems and the social fabric of communities’ (Tweed Shire Council, 2016, p.17

**Planning Context**

A number of the village communities have already been active in generating community plans which considers the regenerative capacity of their village. This approach is particularly important given that some of the villages have suffered a drop in density and overall population. In Uki for example, the average household was 4.5 people in 1911 and dropped to 2.5 members in 2011 and the number of residents per hectare is now 12 compared to 23 at the turn of the twentieth century (Tweed Shire Council, 2014). Hence, for the villages to thrive and grow the villages require better connections to the regional hub of Murwillumbah for key services, greater economic opportunities to encourage young people to stay in the village and a vibrant community life to build community connectedness. Partnerships between Council and local village communities to support applications for new markets, road-side stalls and public spaces
are recognised as important to the villages continued viability. For example, the Tyalgum District Plan is specific in its recommendations to enhance the public spaces in Tyalgum via management strategies with council which will support new car parking applications, passive recreation spaces for tourists, new pedestrian and cycle linkages between the village and surrounding areas (Tweed Shire Council, 2009).

Village-specific actions

- Prepare a masterplan for the Integrated Rail Trail network, using the dis-used rail line identifying potential connections between the villages, key regional attractions and linkages to the Northern Rivers Rail Trail (Figure 4).
- Support the community’s initiative in Chillingham to create the riparian Gondwana rainforest walk connecting the Chillingham Hall to Chillingham Community Centre.
- Document and recognise historical aspects of each village that contribute to local identity and include these historical attractions in future Tweed tourism marketing strategies (Tweed Shire Council, 2016).
- Adopt strategies to encourage home-based workers, supported by local business groups to attract different industries into the region for example, creative professionals.
Place and potential

‘This element links new development to the specific characteristics and assets of place to establish a relationship between people and the natural environment. It focuses on identification of the natural, social and economic benefits that can be created through a project with specific initiatives, for example; the demand for housing by different age groups and income levels’ (NSW Government, 2016, p. 17)

Planning context

This comment from a community member in Burringbar during engagement sums up the concerns of many village community members; ‘it is important my village stays small, isn’t over-run and retains its village atmosphere’ (Tweed Shire Council, 2014)
One of the key recommendations from the villages strategy is to create locality plans for each village using the regenerative development framework, to encourage locals to voice differing opinions relating to development. Some of the villages, for example, Bilambil and Uki have demonstrated support for development especially to encourage young families into the area to boost population, drive the economy and build student numbers in local schools. This will place pressure on the built environment of existing villages and in response, one of the central recommendations is to retain the compact form of the rural villages to provide an obvious centre for social interaction, development boundaries that do not impact on surrounding farmland, public open space, community facilities and mixed housing to provide housing for all age ranges including the elderly.

**Village-specific actions**

- Protection of the built environment via new development controls which enhance the defined character of each village and provide specific guidelines for alterations addition, infill development and landscape works (Figure 5).

- Consider listing the village of Chillingham as a heritage conservation area under the LEP to ensure new development or redevelopment is sympathetic to its surroundings and current built form.

- Consider the option to allow co-housing and eco-housing designs as part of the development controls in the LEP in villages such as Uki which has a number of such developments and different housing reflective of alternative lifestyles.

- Prepare a locality plan for Dungay and consider re-classifying it as a village to stem uncontrolled growth as dispersed settlement on the edges of the village, provide basic infrastructure such as water and sewage reticulation and allow for planned growth under the LEP and development codes.

- Consider specific housing options for the elderly in rural villages using the example of the retirement village in Bilambil for the 55+ age range (Tweed Shire Council, 2014).
The regenerative development strategy created a range of interest, opinions and options which stimulated dialogue and conversation relating to the sustained viability of each village. As is frequently the case, planning policy creates community dialogue which goes beyond the specific topic of land use and identifies a range of inter-connected issues which may support new development or mitigate against it. In this respect, adopting the regenerative development framework for discussion allows the community to take part in a broader strategic discussion about the future of villages in the region and for the council planners to access local opinions and knowledge in shaping development proposals.
Conclusion

Regenerative development is built on dialogue, story-telling and collaboration with planning teams to ensure community engagement drives strategic planning, based on community feedback (Hoxie et al, 2012). The process loop in regenerative development assists planners and the community to develop plans at the conceptual, strategic and practical levels and to incorporate existing policies to build a complete picture of the myriad issues which face communities. This is particularly pertinent in peri-urban regions where communities face a number of economic and social issues affecting the viability of rural villages. The Tweed Shire villages strategy has incorporated a range of issues which go beyond ‘top down’ planning and technical land use planning, to encourage communities in finding solutions to create vibrant and viable communities. Some of the villages, for example Uki, Chillingham and Stokers Siding have demonstrated a clear interest in self-help and localism by developing local plans for their village. The social connectedness of communities across the Tweed region suggest that regenerative development is an appropriate planning strategy framework to tease out the opportunities to renew and build future village communities with appropriate development, interfaces to the natural environment, economic opportunities and practical infrastructure solutions.

The villages strategy released in 2016, has been approved by Council and the next stage of planning will occur in the coming months through a detailed implementation plan which will consider the costs of each proposal, incorporating Council staff time and community-led actions which may qualify for grants. It is also anticipated that the regenerative development approach will assist in managing development costs by addressing community interests and concerns in advance of the lodgement of a development proposal. In this manner, a shorter approval process will occur by prior identification of potential community objections. The next stage of planning also provides the opportunity to refine, investigate and understand how regenerative development can assist in delivering land use changes and new development as it occurs in the village communities. The recommendations from this first phase of research include further analysis of the regenerative development framework via interviews and focus groups with planners and the community to investigate; the perceived value of the framework, its application in cases of conflict or difference of opinion and its application in statutory land use guidelines, for example, the Tweed
Shire LEP and DCP’s. Regenerative development is a powerful tool to encourage ‘bottom up’ development and to engage the Tweed Shire village communities in the change and renewal which is required to maintain thriving and unique Tweed villages.
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Challenging the Sustainable Regional Tourism Development Cost Paradigm

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ABSTRACT: This paper undertakes a critical literature and case study review of sustainable development methods outside of the regional tourism industry that have successfully provided both capital and operating cost reductions together with improved social and environmental outcomes. It then presents a new integrated sustainable design (ISD) protocol that has been utilised in recent international regional tourism development projects as part of the strategic master planning process to create a new “SymbioResort” development protocol for future sustainable regional tourism development projects in Australia.

Keywords: eISD, Integrated, Master planning, Sustainable, SymbioResort
Introduction

Historically the regional tourism industry has been a negative force in terms of social impacts on the host region with high physical and emotional workloads being placed on local employees coupled with the low social status of tourism related jobs, poor remuneration and unsocial working hours (Kusluva et al, 2010). In addition, many regional tourism facilities have opportunistically switched environmental certification schemes in order to optimise the way they can highlight their specific positive environmental attributes in order to attract potential customers whilst glossing over areas of poor environmental performance where local natural capital has deteriorated (Kim & Han, 2010). Although sustainable regional tourism began life as a negative and reactive concept, it has now become more positive and proactive in identifying ways to deliver tangible “restorative” benefits (Bramwell & Lane, 2012), largely in response to a range of key drivers including:

- Regulatory compliance with a local building sustainability rating system such as LEED, Green Star, NABERS etc for development approval
- Stock market pressure from ethical investors using the Global Reporting Initiative (GRI) or other respected ethical investment rating system to assign a sustainability rating to a proposed development
- Competitive pressure to meet industry association standards for sustainable development such as Green Globe and a myriad of others from the tourism sector
- Alignment with staff values to help improve recruitment and retention rates as part of the operating company’s Corporate Social Responsibility (CSR) charter
- Insurance company pressure whereby reduced premiums are offered for higher sustainability ratings on tourism facilities

Whilst the life cycle operating cost benefits plus the improved social and environmental outcomes of developing sustainable regional tourism facilities have been readily acknowledged by government regulators, academia and industry practitioners alike, very few genuine sustainable regional tourism
facilities have been developed in Australia due to capital cost premiums of up to 15%. In response to these conflicting issues facing developers and operators of sustainable regional tourism facilities, the Queensland University of Technology (QUT) partnered with the Karlsruhe Institute of Technology (KIT), together with industry practitioner Paul Ma Design (PMD) to identify best practice in sustainable project development methods outside of the regional tourism industry that has produced both reduced capital and operating costs as well as improved social and environmental outcomes for the host region in accordance with the GRI imperative.

Case studies and literature review

Initial case study of over fifty (50) “5 star” building sustainability rated projects developed using the Australian Green Building Fund (GBF) identified the fact that many of these projects used the purchase of “green” power to mask poor design and actually cost more to run than lower rated facilities. Numerous stories of “piecemeal” sustainable design projects also emerged whereby additional capital expenditure on window glazing resulted in increased annual air conditioning costs due to a failure to model the impact of winter sunlight ingress in reducing the draw on the heating cycle of the air conditioning system (AusIndustry, 2010).

A desktop literature study of best practice in sustainable development was then undertaken in order to identify methods that have delivered reduced capital and operating costs whilst providing improved social and environmental outcomes. For example, significant life cycle cost benefits can be achieved through strong passive building design (Chaturvedi, 2008).

Research into the impact of best practice passive design using cross-ventilation has shown a reduction in energy usage of 50% when compared with “business as usual” per capita energy usage (Miller, 2007). “Green urbanism” is another sustainable design concept that has been developed to combat rapid utilities cost growth through the move towards closed-loop, rather than linear utilities infrastructure metabolisms for new developments (Codoban & Kennedy, 2008). Examples such as integrated rainwater harvesting and storm-water management systems have provided capital cost savings of up to 50% and ongoing potable water operating cost reductions of up to 75%
In Europe, study of closed-loop design philosophies has been undertaken at developments such as “EVA Lanxmeer” at Culemborg in The Netherlands. The interconnection of different city cycles, such as sanitation, energy and food production, has demonstrated how the built environment can act as a “parasite” to harvest effluent to create low cost energy for the inhabitants and safer fertilizer for growing crops. (Timmeren & Sidler, 2007). Additional first capital and life cycle cost benefits have been achieved through the use of virtual design technologies. These allow building designers to develop and test building solutions with confidence in building constructability and long term operational performance (Bailey & Brodkin, 2008). Information and Communication Technology (ICT) has improved construction industry productivity, bridged gaps in communication between stakeholders and encouraged the implementation of new processes resulting in reductions of up to 25% in design time (Isaa et al, 2007). This Building Information Modelling (BIM) process allows project teams to quickly and accurately assess green building credentials for various material, equipment and systems selections (Barnes, 2009). By using this BIM data in conjunction with advanced analytics incorporated into the building management system (BMS), facilities can also move from the traditional reactive and preventative maintenance modes to a “predictive” maintenance regime based on real time conditions of plant thus saving up to 20% on annual facilities management (FM) costs whilst normalizing the predictive to reactive maintenance expenditures ratio to a best practice unity state (Hemmerdinger, 2010). Additional initial construction cost reductions are offered through linking BIM techniques to building prefabrication. This involves constructing building structures and key sub-components in a controlled factory environment before transferring them to their final destination for assembly. The benefits of this off-site manufacturing (OSM) process include a reduction in embodied energy and material waste, together with reduced construction costs of up to 12%, through improved constructability and reduced costs for major sub-components such as heating, ventilation and air-conditioning (HVAC) systems (Blismas & Wakefield, 2009).
Incorporating these best practice sustainable design principles into new developments can also attract new funding models to help reduce first capital and ongoing debt servicing costs. Increased use of distributed utility systems in accordance with preceding “green urbanism” principles, such as combined rainwater harvesting and storm-water management systems, has also provided opportunities for deployment of the Design, Build, Operate and Maintain (DBOM) method of project delivery and financing. A single contract is awarded for the design, construction, operation and maintenance of discrete items of utility plant in return for a defined user-pays fee over a fixed period (Dahl et al, 2005). This mechanism has been used by developers to remove capital equipment purchase costs from the development’s initial selling price for items such as hot water systems, air-conditioning, water treatment systems, electrical switchboards and utility meters (Warnken, 2009). One of the key life cycle cost benefits observed in medium to high density developments is the ability of the Owner’s Association or Body Corporate to purchase and on-supply wholesale services to both the common areas of the community and individual residents. These services have ranged from provision of utilities such as electricity, gas, water and broadband communications through to maintenance of the grounds or provision of a community recreation centre. By aggregating demand for these services across the entire community, savings of at least 20% have been achieved when compared with retail provision of the same services to individual residents and owners in common (Tucker, 2004). This model has also provided transport services via community- owned boats in coastal developments and community-owned shuttle vehicles at strata resorts, industrial parks and retirement villages. The resident manager or volunteer driver assists residents, guests and staff with airport transfers and connection with public transport nodes. This concept of community vehicle pooling and/or sharing has successfully demonstrated a reduction in private vehicle ownership costs for residents at The Waterfront apartment development in Sydney, Australia (The Waterfront, 2010). The integration of technologies such as building power systems and sustainable transport equipment using hydrogen fuel cells has also reduced utilities and transport costs. The Honda Clarity vehicle is powered by
hydrogen gas which is converted into electricity to drive electric motors with zero emissions. A “Home Energy Station” uses sunlight to produce hydrogen for the Clarity vehicle from rain water with surplus hydrogen being used in a stationary fuel cell to produce electricity and hot water for the home (AHMCI, 2009). Another example of such technology integration is The Hammarby Sjöstad development in Sweden which consists of 11,000 apartments and 3500 work places with 25,000 inhabitants, where the wastewater system collects biosolids to produce biogas for home heating, cooking and powering local compressed biogas shuttle buses and car pool vehicles. Approximately one third of the town’s residents are members of the car pool which is booked via the internet and supplemented by public transport options such as tram, bus and water taxi. Hammarby is used as the model example of the Swedish “SymbioCity” concept which promotes holistic and sustainable urban development through finding synergies in urban functions and unlocking their efficiency and profitability (Kenter, 2007). The final example of the Fairfield Multi-Modal Transportation (MMT) Centre in the USA has solar photovoltaic (PV) panels on the façade to assist with building energy use whilst providing charging facilities for private and community owned electric vehicles and acting as a node for public bus services. The MMT concept is based on commuters taking their battery electric vehicle (BEV) from home to the centre where they can then take the public bus service to work whilst their vehicles are recharged from the solar PV system during the day (McDonald, 2009). The “TracTile” integrated solar photovoltaic (PV) and solar hot water system is another example of integrated technology whereby the tile is used as the roofing material and when supplied on a DBOM contract has demonstrated potential for eliminating the first capital cost of roof cladding whilst providing up to an 80% reduction in ongoing electricity and hot water costs (IP Australia, 2010). Use of locally recycled building materials can also be considered for integration with new materials during the design process together with re-use of de/construction materials recovered from the work site in accordance with best practice zero waste protocols developed by the Karlsruhe Institute of Technology which have shown to reduce new construction costs by up to 10% and reduce environmental impact on the host
community through decreased transport of new construction materials to the work site (Schultmann et al, 2001).

**Development of an integrated sustainable design protocol**

Based on analysis of the preceding case studies and desktop review, it was subsequently hypothesised that best practice in integrated sustainable design from other verticals provided the ability to deliver complex engineering projects such as sustainable regional tourism facilities with reduced capital and operating costs together with improved social and environmental outcomes for the host region. The Integrated Project Delivery (IPD) method provides the opportunity to design, build and operate new sustainable regional tourism facilities as cost-effectively as possible through formation of collaborative and productive teams from all sections of the design and construction supply chain (AIA, 2007). Study of infrastructure projects such as bridges in Sweden has found that cross-functional project team integration with shared remuneration in accordance with the IPD method resulted in a 20% reduction in project delivery time together with over 50% reduction in labour costs (Simonsson, P. & Emborg, M., 2007). At the same time, “lean” construction methods using value stream mapping (VSM) and process mapping (PM) techniques have been used to support the IPD method by reducing design waste and delivering first capital cost savings of up to 18% (Goldstein, 2003). These combined methods were therefore suggested as the central control mechanism for combining each of the preceding individual best practice sustainable design elements in order to provide a new integrated sustainable design (ISD) protocol as shown in Figure 1 for application in the development of sustainable regional tourism facilities:
Application to new sustainable regional tourism projects in Asia

Early application of this integrated sustainable design protocol at the strategic master planning stage of new regional tourism facilities being designed by Paul Ma Design (PMD) throughout the APAC region including Japan, Indonesia, Thailand and Myanmar has highlighted the potential for significant economic, social and environmental benefits for host regions. This process normally commences with gathering of cultural data such as stories, artwork, costumes, festivals, belief systems and other heritage items for storage in the virtual realm for collimation into a unique storyline which guides design of the sustainable regional tourism facility. In Paul’s words “every project has a story – design is the telling of that story” (PMD, 2014). An “inside-out” approach to design as shown in Figure 2 is used whereby the guest experience is first scripted in response to this regional cultural data so as to help guide interior form followed by design of exterior form. This approach challenges the traditional “outside-in” design methodology which often results in exterior architecture being optimized to the detriment of interior functionality and guest experience (Hensel, 2013).
In order to aid this initial “inside-out” design process, interviews and meetings are conducted with pertinent service staff, executive management and sample target guest groups using an approach inspired by “pattern language” as shown in Figure 3, whereby non-architects can describe the desired functionality and experience within the new facility so as to further inform the initial spatial relationships and flows within the new facility (Alexander, 1979).

In the case of the resort developments in Hokkaido, the developer, Blue Waves, engaged Paul and his team to document the story of the local gold mining and agricultural history and how it influences all
aspects of village life in the region via a series of video episodes that have been stored in the “Q Vault” for use in a targeted social media campaign to be released ahead of the construction phase so as to create advance bookings for the sustainable regional tourism facility. Failure to effectively link with the global tourism economy via e-commerce tools as shown in Figure 4 has been identified as one of the key weaknesses of most regional tourism developments hence this early stage promotion is critical for the project if forecast revenue targets are to be realized (Braun, 2012).

Figure 4 – E-commerce linkage with global tourism economy

The end result of this process is a detailed guest experience storyline as shown in Figure 5 that informs the interior spatial requirements of the development that in turn feeds the next stage of the design process.
Next, a site specific study of ecology and topography is undertaken so as to optimise the location, orientation, massing and capacity of the proposed sustainable regional tourism facilities in terms of access to natural capital such as solar, wind and water resources whilst preserving or conserving ecologically sensitive areas. The historical tendency of nature to limit human population growth through shortages of water and nutrients together with disease provides evidence of “environmental resistance” which is quantified for a specific region and used to inform this initial carrying capacity study (McConnell & Abel, 2008). Furthermore, adoption of proven zoning models from successful national park planning schemes then guides sub-division of this initial carrying capacity study into five key zones: Resource protection zone; native low-use zone; extensive recreation zone; tourist zone and service community zone (Gunn, 1988). In the case of the Blue Waves resort developments, this has resulted in over 80% of the development parcels being allocated for protection or low-use with the remaining areas allocated for development of approximately 40 hotel rooms in Stage I together with a signature restaurant.
facility as shown in Figure 6.

Figure 6 – Spatial orientation of Stage 1 Blue Waves Resort

The next stage of the process involves subjecting the proposed built-form and associated support infrastructure to the integrated sustainable design lens using the preceding optimum carrying capacity estimates including:

- Daylight and thermal modelling to minimise the need for artificial lighting and air conditioning

- Use of smart, integrated building materials such as building integrated photovoltaic – thermal (BIPV-T) roofing tiles, daylight tubes, phase change insulation and smart electrochromic and/or solar PV glass

- Low energy solar thermal and/or geothermal air conditioning systems and biogas / solar thermal hot water plant

- High efficiency hydrogen storage vessels and electricity storage batteries and local renewable energy generation from biomass, solar, wind, water and / or geothermal resources

- Underground storm-water collection cells and rainwater harvest tanks together with biological retention ponds and grey water treatment units together with hydrogen electrolyzers
- Vacuum operated underground waste recovery units for removal of organic solid waste for combination with effluent and landscaping waste in anaerobic biodigesters to produce biomethane for water heating, cooking and operation of Organic Rankine Cycle generators.

- Integrated building utilities and transport power systems such as “SolaDrive” which combines solar PV electricity with plug-in hybrid or range extended electric vehicles

The end result of this process is a high level value stream map (VSM) as shown in Figure 7 that defines the initial concept design of the integrated, closed-loop clean technology infrastructure (CTI) system that will provide for reduced and fixed operating costs for the future hotel operator across the key utilities, transport and facilities management cost metrics:

![Figure 7– VSM showing CTI concept design](image)

At the same time, the external visitor attractions and experience program is developed in response to the stories documented in the “Q Vault” with a view to determining their potential impact on the utilities and transport infrastructure required for the sustainable regional tourism facility. In the case of the Blue Waves projects, this process has resulted in the development of key visitor attraction themes including:

- Water (Onsen experience)
- Food (Cooking lessons)
- Nature (Forest tour)
- Health (Meditation training)
- Beauty (Restorative treatments)
- Culture (Festival participation)
- Learning (Origami)
- Touch (Reflexology treatment)

The final integrated sustainable concept design for the new regional tourism facility is then costed using local quantity surveyor (QS) data and taken through the Global Report Initiative (GRI) rating system so that prospective ethical investors can then rank the projected economic, social and environmental benefits of the proposed sustainable regional tourism facility against other competing projects with a view to offering the developer Design, Build, Operate and Maintain (DBOM) contracts for selected utilities and transport CTI via the Energy/Utilities Services Company (E/USCO) model as shown in Figure 8 thus reducing the up-front capital cost and ongoing operating costs of the project.

![Diagram](image_url)

Figure 8 – E/USCO funding model for CTI
In the case of the Blue Waves projects, the owner intends to provide the local villages a shareholding in the resultant utilities and transport infrastructure trust so that an annuity income can be provided for investment in local cultural restoration, preservation and development projects. Once the infrastructure funding scan has been completed, the detail design and construction team is then selected and signed up to the project using the American Institute of Architects (AIA) Integrated Project Delivery (IPD) format contracts in accordance with the central philosophy of the ISD protocol so as to ensure that the original vision of the concept master plan is realised in the final “as built” facility at up to 20% below the original QS “business as usual” capital cost estimate with up to 80% lower than projected utilities, facilities management and transport operating costs together with improved social outcomes such as preserved culture, reduced health problems and secure / dignified employment together with improved environmental outcomes such as reduced waste and air pollution with preserved local flora and fauna.

Application to new sustainable regional tourism projects in the Australian context

To date, few genuine sustainable regional tourism projects have been developed in Australia where lower operating costs have been simultaneously achieved alongside lower capital costs together with improved social and environmental outcomes. High profile failures of regional tourism projects such as the Couran Cove resort on the Gold Coast as shown in Figure 9 have in fact been linked in part to high operating costs resulting from a linear, open-loop design approach that used expensive LPG for power generation together with costly disposal of effluent back to the mainland via boat (Bartsch, 2011).
Use of the ISD protocol may have seen a different outcome for the project with use of suitable CTI such as anaerobic bio-digesters avoiding the cost of disposing effluent to the mainland whilst providing an ongoing source of bio-methane for power generation, water heating boost and local transport systems in accordance with Federal best practice integrated, closed-loop design recommendations (Department of Infrastructure and Transport, 2011). Recent regional sustainable tourism projects undertaken by PMD in Western Australia have applied the lessons of the Blue Waves projects in Japan via an initial scan of local cultural data in the regions surrounding Geraldton on the coast of Western Australia to uncover a rich history of shipwrecks, white sandy beaches, Mediterranean climate and lifestyles, world heritage listed geographic formations and an abundance of fresh local produce and seafood for collimation into a unique storyline which has informed the updating of the “Coral Coast” regional tourism strategy in conjunction with the State Government whilst guiding the redevelopment of the Broadwater Resort Hotel as shown in Figures 10 and 11 respectively.
The detailed guest experience and engagement storyline was then developed using this local cultural data in order to arrive at the new Resort Extraordinary Arts Program (REAP) that comprises five experiential realms in visual design and hospitality protocols as follows:

- Graphics & Environmental Arts
- Decorative & Ornamental Arts (including landscaping)
- Uniforms (including operating supplies)
- Amenities & Merchandise
- Digital Storytelling & Placemaking

The enhancements of the REAP expanded both real and virtual guest engagements and experiences at the Broadwater Resort Hotel and now provide an improved regional relevance through modified sourcing and procurement procedures that firmly root the hospitality offerings in the authenticity of regional context and content.
The “inside-out” design process for the refurbishment program was then guided by the REAP strategy via interviews and meetings with the existing Broadwater Resort Hotel staff and sample guest groups so as to further inform the initial spatial relationships and flows within the re-furbished facility so as to arrive at three key thematic hospitality zones within the refurbished facility as shown in Figure 12:

The next stage of the design process involved subjecting the proposed refurbished built-form and associated support infrastructure to the integrated sustainable design lens which determined that use of geothermal air conditioning as shown in Figure 13 for the interior areas of the Sports Bar and Cellar 28 zones together with roof integrated PV / thermal tiles (BIPV-T) as shown in Figure 14 on the Sunset Bar area roof would have the maximum impact on capital cost reduction of at least 10% with the maximum impact on ongoing operating cost reduction of at east 60%.
Both of these CTI products were designed and made in Australia using Federal AusIndustry R&D grants and are funded via a ten year off-balance sheet contract with the Federal Clean Energy Finance Corporation (CEFC) and a Tier 1 bank as shown in Figure 15 so as not to impact the client’s borrowing capacity for the “bricks and mortar” refurbishment program.

One of the other key ISD review process outcomes was the problem being experienced by visitors from Perth during their typical 4.5 hour drive to Geraldton with a lack of mobile communications signals due to poor or non-existent telephony infrastructure together with a paucity of tourist information at the main points of interest and view sheds along the coast. Accordingly it was determined that a self-drive option will be offered to tourists arriving in Perth via an electric or plug-in hybrid electric (EV/PHEV)
rental vehicle fleet with built-in satellite communications for improved connectivity and safety during the long drive together with a series of solar PV shade structures with EV/PHEV charging stations as shown in Figure 16 at each of the key nodes along the coast including Guilderton, Lancelin, Cervantes, Jurien Bay and Port Denison. These EV/PHEV charging stations will also be fitted with detailed infographics that highlight the salient points of interest at each stop together with background information on the history of the local region via CEFC funding of a community infrastructure trust.

![Solar PV shade structure with EV/PHEV charger](image)

Figure 16 – Solar PV shade structure with EV/PHEV charger

**Conclusion**

Review of the preceding case studies and desktop literature study in conjunction with results to date from live sustainable regional tourism projects such as the Kuchan-Niseko Resort in Japan and the Broadwater Resort Hotel in Western Australia has shown that early application of the ISD protocol in conjunction with the PMD strategic master planning process (ISD+PMD = eISD) can provide significant capital and operating cost benefits whilst providing the host community with improved social and environmental outcomes together with a share of ongoing economic returns from the sustainable regional tourism facility via a stake in the utilities and transport infrastructure trust.

At the same time, this “SymbioResort” development process puts hotel operators back in control of their social media presence whilst improving their profitability and delivering a new level of
sustainable luxury experience to guests. The overall process for developing genuine sustainable regional tourism facilities is summarised in Figure 17 which can be used as a template for new regional tourism developments throughout Australia:

Figure 17 – “SymbioResort” development process
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“A Change in approach - Meeting Regional Bulk Water Customer Needs through Appropriate Infrastructure Planning and Investment”

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A Change in Approach - Meeting Regional Bulk Water Customer Needs through Appropriate Infrastructure Planning and Investment

**ABSTRACT:** This paper outlines how WaterNSW sees the future of bulk water infrastructure planning and investment being delivered in regional NSW, having regard for institutional market reform, an understanding of who ultimately pays for the infrastructure, and all within the context of various regulatory and environmental constraints.

WaterNSW is a relatively new (1 year old) State Owned Corporation that supplies bulk water to the Rural NSW and Greater Sydney customers. Our new established place in the water market provides some very exciting opportunities for regional water supply customers.

As part of the ongoing NSW Water Market reforms, WaterNSW was provided the legislated objective on 1 January 2015 to provide for the planning, design, modelling and construction of water storages and other water management works. Our infrastructure plans are price regulated by the Independent Pricing and Regulatory Tribunal (IPART).

To achieve this objective, and to ensure our customers are advocates of any proposed infrastructure development, WaterNSW is implementing a customer focussed ‘Levels of Service’ approach to better identify customer needs and where performance in the bulk water supply system can be enhanced to reflect modern day challenges. As this approach matures, opportunities to improve regional and local levels of service through construction or augmentation of appropriate infrastructure, or changes to system operations, will be identified and priced for consultation.

This approach is seen as providing the missing link between the Government’s policy framework and regional growth strategies, local government integrated water cycle management planning and customer choice. An important consideration often overlooked at the policy level when deciding on what is often expensive water supply infrastructure, is the willingness or ability of customers to pay.

The paper will explore the challenges and opportunities with implementing such customer focussed improvements in an evolving regulatory environment, including the NSW Government’s water market reform agenda and implementation of the Murray Darling Basin Plan, to name a few.

This paper will outline a forward plan which WaterNSW will implement in delivering a customer focussed approach to modernise the NSW bulk water supply system to reflect modern day challenges.

**Key Words:** Bulk Water, Infrastructure planning investment, customer levels of service, NSW water market reform
Introduction

Recent water market reforms in NSW have created new opportunities to modernise bulk water management in NSW. This paper describes a new approach by WaterNSW to design and implement a customer focussed water infrastructure strategy for the State, and the context within which it will be developed.

WaterNSW established

WaterNSW was formed on 1 January 2015 under the Water NSW Act 2014, giving effect to stage 1 of the NSW Government’s water market reforms and the merger of the former Sydney Catchment Authority and State Water Corporation.

WaterNSW is Australia’s largest bulk water supplier and is the major supplier of raw water in NSW, delivering raw water from 42 large dams, pipelines and the State’s rivers.

In rural NSW, WaterNSW maintains, manages and operates major infrastructure to deliver raw water to licensed water users on the State’s regulated rivers. There are about 6,300 regulated water customers in 14 regulated river systems. WaterNSW owns and operates 20 dams and more than 280 weirs and regulators across rural NSW to deliver water for town water supplies, industry, irrigation, stock and domestic use, riparian and environmental flows.

In contrast to its formative organisations, WaterNSW now has a legislated mandate to plan, investigate, model and design water infrastructure solutions to address water security and reliability issues; and to then develop, operate and maintain that infrastructure.

Groundwater and Unregulated Surface Water Management - Context

On 31 May 2016 the Water NSW Amendment (Staff Transfers) Bill 2016 passed the NSW Parliament facilitating Stage 2 of the NSW Government’s Water market reform agenda, and the transfer of ~220 full time equivalent positions from the Department of Primary Industries, Water (DPI Water) to WaterNSW. From 1 July 2016, the Minister for Lands and Water enabled the delegation of operational functions from DPI Water to WaterNSW in relation to delivering water, all customer transactional dealings and all in-field services relating to groundwater and surface water. These functions of DPI Water were delegated functions of the Water Administration Ministerial Corporation (WAMC) and are currently subject to IPART price determinations.

The transferring of operational functions from DPI Water to WaterNSW clearly established DPI Water as the resource regulator and established WNSW as the resource and systems operator for surface water and ground water operations and the “one stop shop” for all rural customers.
How the water market works in NSW, and the Institutional arrangements for infrastructure planning:

Regulatory Complexity

WaterNSW operates within a regulatory context that includes key relationships with numerous regulators and Government instrumentalities, principally the DPI Water, DPI Fisheries, Infrastructure NSW (INSW), the NSW Dams Safety Committee, Murray Darling Basin Authority, Independent Pricing and Regulatory Tribunal (IPART) and the Australian Competition and Consumer Commission (ACCC).

The separation of operations (WaterNSW) from regulation (DPI Water) was an important step achieved in the reform agenda, and continued development of the State’s water market.

Despite this recent change, the NSW ‘water market’ remains relatively immature in NSW when compared to say Victoria or even other utility industries, such as electricity. What is common nationally however is that State water markets remain complicated by a vast amount of additional inter-state, intra-state and National legislation, regulation and policy settings, and inter-governmental arrangements (such as Memorandums of Understanding etc.). This situation is no better illustrated than for the Murray Darling Basin, which continues to be at the centre of more than a decade of national water reform.

A new approach to affordable water infrastructure investment

An important consideration often overlooked at the policy level when deciding on what is often expensive water supply infrastructure, is the willingness or ability of customers to pay.

In the myriad of regulation and policy that sets the frame for Infrastructure planning and investment, WaterNSW has observed a missing link between the NSW Government’s policy frameworks and regional growth strategies, local government Integrated Water Cycle Management Planning and customer choice.

As a result, and whilst WaterNSW is implementing a number of other complimentary customer centric strategies that address pricing and market reform, in relation to water infrastructure planning and investment, WaterNSW is putting the customer at the centre by implementing a 3 part strategy. This is approach has been designed to ensure that water infrastructure solutions are identified before they are needed, are supported by end use customers and can be sustainably funded over the asset life-cycle. The three pillars of our approach include:

- A customer defined Levels of Service framework;
- An alternative “Regulated Asset Base (RAB) funded” approach for sustainable Infrastructure investment and cost recovery; and
- A comprehensive 20 year Infrastructure Strategy.

To set the context for how water Infrastructure planning and development operates in NSW, a simplified map from the utility’s perspective, based on the authors’ experience, is illustrated in Figure 1 below.

Figure 1 – The Institutional arrangements Government has established for Top Down and Bottom Up Water Infrastructure Delivery
The nexus between water scarcity and regional economic growth:

A significant barrier to regional growth in the Murray-Darling Basin is the lack of long term water security, and an inability to extract more ‘new’ water from the system to support regional economic growth.

Additionally, some WaterNSW customers in Rural NSW are subsidised by the NSW Government, with there also being significant variability in bulk water charges between valleys, and in particular between the north and south of the state. By way of example, in its 2010-14 Price Determination for State Water Corporation (now WaterNSW), IPART determined to limit price increases in the North Coast and South Coast valleys by 10 per cent per annum in real terms to mitigate the price impact that would result from an immediate shift to full cost recovery (IPART, June 2010). The ACCC made the same determination for the Nari Peel valley in its decision on State Water’s Pricing Application for 2014-15 – 2016-17 (ACCC, 2014).

Put simply, from a regional economic perspective customers in these valleys would argue that they are already contributing what’s within their ‘capacity to pay’ to fund the life-cycle costs of existing bulk water infrastructure, let alone new infrastructure the subject of State or Federal policy agenda’s.

The dichotomy here is that in our view, regional growth supported by the right infrastructure would in most cases relieve the pricing and economic issues that exist in price stressed valleys, by virtue of both:
a) The expected increase in water usage on a long term average basis, which has a positive impact on the 20 year average used to inform variable water charges; and
b) The larger customer (user) base to share in the fixed cost components of water charges.

In order for water usage to increase within the various water sharing plan ‘rules’ and the Murray-Darling Basin cap, then only infrastructure that improves water security (i.e. that which makes the existing available consumptive raw water last longer), and/or encourages more active use of available water entitlements is likely to be considered acceptable.

It’s at this point in the policy framework that a disjoint appears between Government’s regional growth strategies and bulk water infrastructure planning and investment. This was in part acknowledged in INSW’s 2014 State Infrastructure Strategy Update, where they observed:

“...there is a disconnect between the prices in the traded water market and new major capital investment decisions for the NSW Government. ...The issue of who should pay for water security over the next 20 years warrants review as part of considering the best mix of infrastructure investments to achieve water security for regional NSW”.

Governments’ response to promoting infrastructure development and regional growth has historically been to Grant fund the often large upfront capital cost of the infrastructure, however the ongoing ‘life-cycle’ cost of operating and maintaining the infrastructure has often been forgotten. This on-going lifecycle cost for water supply infrastructure is however required to be borne by end use customers under the principles of ‘user-pays’, as laid out in the Basin Water Charging Objectives and Principles (BWCOP), contained in Schedule 2 of the Water Act, 2007. The BWCOP are based on clauses 64 to 77 of the National Water Initiative endorsed by Coalition of Australian Governments (COAG), and are therefore considered to constitute Australian Government policy.

It is this ongoing ‘life-cycle’ cost of operating and maintaining the water supply infrastructure, built by Governments during the irrigation boom of the 1970’s and 80’s, that has led to higher water charges in some rural valleys.

The option for Governments wanting to lead investment in large water supply infrastructure initiatives is to determine whether:

a) A net benefit to the State exists, and therefore the infrastructure should be funded by the broader tax base; or
b) a benefit only exists for end users, and so costs should be recovered by end users through the relevant utility’s regulated water charges.

Governments are unlikely to continue to fund the ongoing cost of bulk water infrastructure when WaterNSW and other like utilities, as State Owned Corporations (SOC’s), exist with the legislated mandate and ability to recover such costs. The upfront capital costs and ongoing lifecycle costs can however be sustainably managed in either scenario, without placing a cost burden on regulated customers or Governments.
An Alternative Approach for Sustainable Infrastructure Investment and Cost Recovery:

Generally speaking, new monopoly (regulated) infrastructure can be financed through either:

(a) Ordinary (debt and equity) capital sources (either user/beneficiary or taxpayer funded); or
(b) Grant funding from government (100% taxpayer funded).

Ordinary Capital Sources / RAB funding

Under this model, prudent and efficient capital expenditure on new natural monopoly infrastructure assets enter a “regulatory asset base” (RAB) which earns a notional regulated efficient rate. This model offers several advantages:

- No upfront capital investment is required on the part of either users or Government – as the investments is financed by debt markets and internal / equity injections from owners
- Transparency and cost-reflective price signals as the regulated revenue comprises the true economic costs of the infrastructure over its asset life:
  - an allowance for operational and maintenance expenditure
  - an allowance for a return of capital (depreciation)
  - a notional allowance for efficient debt financing costs
  - a notional allowance for efficient equity financing costs
  - an allowance for tax and working capital
- Assurance that only prudent and efficient costs are passed on to customers as an independent economic regulator reviews the expenditure for prudency and efficiency before allowing it to enter the utility’s RAB.
- Flexibility for the true economic costs to be shared between Government (taxpayers), where a wider economic benefit exists or a subsidy is determined to be appropriate under Government policy, and beneficiaries / users through separate “Government RAB” and “User RABs”. This arrangement is already in place for WaterNSW, where there are separate user RABs and Government RABs in each of the Rural Valleys.
- RAB funding offers additional benefits for Governments, in the form of no upfront headline Budget impact. That is, where infrastructure is financed from debt and equity sources, and that infrastructure earns an economic return, as occurs under RAB funding, the infrastructure is an investment, and “below the line” under Government Finance Statistics (GFS) accounting. This does not occur under grant funding.

Government Grant funding

Under this model, capital expenditure on new infrastructure assets is funded by a direct capital grant payment from Government to the regulated utility. Grant funding offers several disadvantages:

- Government is required to fund the entire upfront capital cost and receives no return ‘of’ or ‘on’ its investment.
- An upfront tax liability is incurred by the utility upon receiving the grant (which reverses over the asset life), resulting in either a need for Government to either “gross-up” the up-front grant for tax, or add the cost of working capital of the tax liability to the utility in the grant.
- An up-front capital grant does not consider the operating and maintenance costs associated with the new infrastructure – often required to be left to the utility’s regulated customer base to cover.
- No future revenues are receivable on grant funded capital, resulting in the assets being impaired to $nil following completion.
Government incurs costs in administering grant revenues, attempting to audit the expenditure for prudence and efficiency and monitoring project progress – much of which duplicates the roles and functions of pre-existing independent pricing regulators.

It is therefore clear that “RAB” funding is superior to grant funding, for the reasons outlined above, and when structured appropriately with the utility, can lead to a sustainable long-term investment.

**Customer focused approach & Customer Choice – the Customer Levels of Service Framework**

The Levels of Service framework is but one of a number of customer pricing strategies being implemented by WaterNSW.

Conceptually, the Customer Levels of Service framework is illustrated in Figure 2 below. The diagram attempts to depict the framework as a dashboard, where a customer group can, for each of the ‘criteria’, dial up or down their desired Levels of Service.

This concept is a paradigm shift for WaterNSW (and possibly for other Australian water utilities more broadly), from being an ‘engineering’ company that managed asset capability solely from an inward focused, standards based approach; to one that evaluates current and future asset capability required to meet customer needs and priorities; and their capacity and willingness to pay.

WaterNSW is developing a framework which enables our infrastructure investment to directly relate to that which adds value to our customers. In this new approach, the ‘customer’ comes first in the definition of ‘Asset Capability’. That’s what this framework is all about – defining and quantifying that customer desired capability.

What flows from this is our ability to then transparently demonstrate that our capital proposals and investment plans are intricately linked to the customer defined need.

This framework and approach to asset management shows a flexibility on the behalf of WaterNSW in our dealings with the customer, and in particular with regards to our service offerings and prices. In doing so, we move away from the monopolistic organisation which directs capital investment and cost on our customers, to being a commercial supplier of services and product offerings that meet customer demand and willingness to pay.

This customer Levels of Service framework has been the centrepiece of our consultation with customer’s to-date, and has been extremely well received due to its transparency and ability to promote engagement with the customer on what adds value to them, not what we (or Governments) think they want.

The framework will be used to inform the customer of their baseline Levels of Service, and discuss the problems they face. For example, if their problem is that they run out of water allocations every 3 years, which is not an acceptable level of service, then WaterNSW may suggest looking at ‘Water Security’ and ‘vulnerability/resilience’ criteria.

In doing so, we may suggest the construction of a new in-line storage which can make better, more efficient use of available water so as to increase the calculated supply system yield, and therefore increase ‘Water Security’ and the system’s ‘Resilience’ to drought on a long term average basis.

This in-line storage can be developed to a feasibility level of detail, costed and fed into our hydro-economic models, resulting in a proposed cost to customer and expected bill impact (viz: $/ML).

This additional cost for an increased ‘level of service’ can then be discussed and agreed, and form the basis of customer funded capital works (i.e. RAB adding activity) in the subsequent pricing submission, for which we’ll have customer support.
The objectives of the Levels of Service Framework are to:

1. To direct our dialogue with our customers; away from the day to day running of our business, and towards focusing on the services we provide and those which they can control (Customer Discretionary costs);

2. To start driving a change in culture with our customer interactions, whereby we define and discuss their problems, leaving WaterNSW to identify the most prudent and efficient solution, instead of customers or Government’s coming to us with solutions (historically in the form of discretionary projects), which are often sub-optimal;

3. To complement and drive our long term strategic planning, and in particular the 20 year infrastructure strategy, ensuring efficiency in our asset planning approach;

4. To provide a consistent and clear platform for engaging all customer groups on our infrastructure strategy, and to provide a simplified strategy for future pricing submissions;

5. To bring to the fore the actual problems within a valley, be they pricing, costs, system, or rules; and engage in the right discussions with a model framework for resolving them.

Historically, “discretionary” projects were undertaken at the request of customers and/or government in the absence of risk based investment prioritisation across our portfolio. This model therefore represents a new paradigm about how we think about our interaction with customers, the assets and water supply systems.

The model will, for the first time, quantify the current levels of service our customers receive and will then provide a platform for negotiating how we bridge the gap between what they want and what they are prepared to pay for.

WaterNSW is introducing this new framework to interact with and deliver customer value add products, and is introducing this model as part of our building blocks for our next IPART regulated pricing submission due in 2020.
The customer decisions in using this framework will dictate to some extent the degree to which we invest in activities, conduct our maintenance regime and broader asset strategies.

WaterNSW is currently proceeding with a trial of the Customer Levels of Service Framework in the North Coast regulated valley, which represents one of the most price stressed and heavily subsidised regulated valleys in the state.

**20 Year Infrastructure Strategy**

The Customer Levels of Service Framework is a key input to WaterNSW’s 20 year infrastructure strategy.

This strategy provides clarity for the long-term operation and development of water supply infrastructure. The core outcome of this strategy is a context for investment and broader decision making on the state’s existing major water assets, as well as for guiding future supply system augmentation, water security and water efficiency (savings) and drought resilience strategies. Such a comprehensive approach has not been seen in NSW since the late 1980’s.

The 20 year Infrastructure Strategy brings together the complex Regulatory and policy frameworks of all Governments, including the legal obligations for WaterNSW as determined by the various statutory instruments; as well as the customer Levels of Service, represented as quantified delivery standards or needs defined by water users.

This infrastructure strategy will therefore bridge the gap between ‘bottom up’ end use customer driven needs, and ‘top down’ State or regional strategies that form the centre of Government policy and their respective forward strategic plans.

In looking at performance gaps that are identified between what is desired and what exists, WaterNSW is then able to take a more informed, strategic view in scoping and developing funded infrastructure and operating solutions to address system opportunities and deficiencies.

**Conclusion**

*How Regional Customers and Government stand to benefit*

The NSW Government’s water market reforms and the intended benefits to customers is driven by a desire to move away from a monopolistic asset-driven market to one that places an increased focus on customers, customer responsiveness and commercial thinking.

As the new approach by WaterNSW matures over the next 3 years it is expected that infrastructure investment proposals and development will become much more focussed on achieving the desires of our customers and government’s policy agenda.

The engagement with customers to ensure their willingness to pay for existing or improved levels of service will ensure that infrastructure decision making will be more prudent and efficient, driven by a bottom up approach which can lead to Government water policies and infrastructure agendas.
which are better aligned to customer and stakeholder needs, and a sustainable life-cycle cost recovery over the life of any new infrastructure.

This forward plan will be implemented to deliver a customer focussed approach to modernise the NSW bulk water supply system, and to reflect modern day challenges. In doing so, WaterNSW aims to achieve sustainable outcomes for customers and Governments by achieving the following targets:

- For each water supply system/valley, Water NSW has a prioritised 20 year water infrastructure strategy and plan of infrastructure solution options that address current and future water security and infrastructure gaps, and with reference to our customers’ desired ‘Levels of Service’;
- Government policy or customer enquiries for infrastructure solutions are sourced from our 20 year Infrastructure strategy and funding models; and
- We achieve regulator endorsement through pricing determinations.

References:
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3. Water Act 2007 (Commonwealth) – Schedule 2 (Basin Water Charging Objectives and Principles)
If you build it they will come. A story of one regional community’s vision for a sustainable economic future.

Gary Rush
Mayor of Bathurst
Australian Regional Development Conference
Canberra, September 4-5, 2016

1. In 1930’s Australia, there was a real divide between city and country. Bathurst was a quiet rural town, conservative, the pace of life was slow. The people were friendly and everyone knew each other from church, school or from the Friday night dances at the Trocadero. Not too many would have been able to envisage, that big bald hill that sat on the southern outskirts of the town would well one day put this town on the map. Long before then however, the Wiradjuri people knew the true magic of the Mountain, they called it Wahluu. It was an important site for male initiation and from where the tribe would watch over the vast plains below. For Waradjuri today it is still a place of significance. It’s spirituality goes well beyond the call of the red and blue, the Holden and Ford.

2. In 1938 everything changed. Mayor Martin Griffin could see so much more for this place than a scenic drive and with support from the NSW New South Wales Light Car Club, the Auto Cycle Union and the Federal Government, through a national employment relief scheme, saw this vision become a reality. On 16 April 1938, Mount Panorama attracted an overwhelming 20,000 spectators to its first race, The Australian Tourist Trophy and people have been coming back in their thousands every year since. What was really exceptional about that vision, was not just the ability to see into motor sport future, but that the ownership of what was to become this multi billion dollar asset, was to be owned by the people of Bathurst. It was and remains under the control of Bathurst Council. With great success comes great responsibility… what is the roar of the mighty Mountain stopped calling?

3. There are many who have described The Bathurst 1000 as perhaps one of the two major sporting events that literally stop a nation. With the exception of perhaps the Melbourne Cup– a trip to Mount Panorama for the Bathurst 1000 is a right of passage for many. Over 198,000 people attended the Super Cheap Auto Bathurst 1000 in 2016.

4. This event alone injects $25 million a year into the local economy but is well supported by four other major motor sport events run on the circuit including the internationally renowned Liqui-Molly Bathurst 12 Hour and hundreds of circuit hire activities a year from sporting shooting to cycle races, car club events and so much more.

5. (Fact Facts about local economy – What we know about our performance)

   • In Bathurst Regional Council area, Education and Training is the largest employer, generating 2,282 local jobs in 2014/15.
In Bathurst Regional Council area, Manufacturing is the most productive industry, generating $242 million in 2014/15.

In Bathurst Regional Council area, Manufacturing had the largest total exports by industry, generating $566 million in 2014/15.

In Bathurst Regional Council area, Construction had the highest local sales, generating $455 million in 2014/15.

6. But even that’s not enough to sustain a growing economy into the future.

7. In 2016 Bathurst Regional Council is launching the next generation of growth for Mount Panorama – Velocity Park. As much as motor sport has underpinned the growth of the local economy, there are no guarantees this will be its future.

8. Velocity Park will expand on the city’s reputation and experience for managing this world class motor racing circuit into a broad-based business, research and industry hub. An initial Economic Impact report conducted by the Western Research Institute supports this grand vision with a cost benefit analysis that will result in an estimated to generate over $18 million in the construction phase alone. Long term the impacts are conservatively estimated at an annual benefit of $11.8 million to the local economy.

9. Although he may not have described it in such contemporary terms back in 1938 Mayor Griffin was establishing a framework that would set up this city for a long and prosperous future. That entrepreneurial attitude enabled this Council to over the years develop a depth of expertise in major event management and in building relationships that are unlike many other Councils have had the chance to develop.

10. Not every city or town has a Mount Panorama. Indeed this asset alone is not the only ingredient to success in creating a long terms sustainable economic advantage. It makes smart economic sense to leverage such a valuable commodity by expanding on what other offerings make a place like Bathurst attractive to investment and visitors into the future.

11. Can this model of long term sustainable economic prosperity be applied to other regional cities and towns? Case studies from around the world indicate that this may be the case.

12. The Tamworth Country Music Festival in NSW now recognised as one of the Top 10 music festivals in the world had its origins in a unique partnership between Tamworth Council local radio station Radio 2MT and the Country Music Association of Australia in 1973 that placed as its clear vision to create a reputation as Australia’s Country Music Capital and now attracts over 50,000 visitors in one week and generated $55 million into the local economy.
13. On May 4, 2007, an EF-5 tornado estimated to be 1.7 miles wide with 205 mph winds struck the City of Greensburg and Kiowa County, Kansas. Damage to Greensburg was significant, with more than 90% of the structures in the community severely damaged or destroyed. With Federal agency support, this community has literally turned disaster into opportunity in creating a model for sustainable communities. The community joined the local council in identifying a very clear vision for to establish literally from the ground up a reputation as the eco-tourism capital of the world. The 900 residents joined with government and industry support to build something out of nothing having now become a model for innovation and sustainable development around the world.

14. Rock Hill USA has created a growing reputation as the BMX capital of the world with construction of a state of the art world class BMW track. This city of 68,000 people, 27 miles south of Charlotte, North Carolina is now home to the first municipally-funded, publicly-accessible, dual-hill BMX track in North America. Opening up the area to a growth sport and major tourist attraction.

15. So what does all this mean for the future in Bathurst? Our hope is for long term sustained economic growth and prosperity. We have the history, the experience, the industry and government support behind us. The most important ingredient now is conviction and commitment and a determination to continue to be the best community we can be now and into the future.

References


Western Research Institute, August 2016, Velocity Park Economic Appraisal.

INTRODUCTION

Areas play a fundamental role in all development including regional development. Lot size maps attached to local environmental plans in New South Wales define the minimum lot sizes permitted in various zones. Gross floor area definitions and applications are included in development control plans of many, if not all, local councils, and areas based on Property Council Guidelines are used in leasing negotiations. The area of a property can influence its value.

International trade has resulted in foreign investors showing an increased interest in acquiring and dealing in property in Australia. The globalisation of the property market has meant that international investors and developers seek to understand the value of properties around the world, and part of this understanding is discovering the size of parcels of land or buildings available for sale or development. Due to many different definitions of property areas around the world and International Coalition has been formed to formulate international standards for property area measurements. This paper discusses these standards and the implications thereof in Australia.

As a result of the commitments of nations at United Nations Climate Change Conferences there is a need for a common benchmark for building sustainability performance. Having a common method of area measurements contributes to the provision of this benchmark.

AREAS

Some of the areas which used in Australia include:

- Parcel areas defined according to cadastral surveying legislation on parcel creation plans lodged in Land Titles offices.
- Areas of easement or restriction or a particular use.
- Areas of units in strata or units plans according to surveying legislation.
- Gross Floor Areas for planning purposes according to definitions in planning legislation.
- Net Lettable Areas or similar for lease purposes.
- Net Lettable Areas or other areas for environmental assessment such as Nabers.

In this paper I will focus on the areas associated with buildings and especially office buildings.
1. Unit/Strata Plan areas

Areas are intended to reflect the plan area component of the cubic space of units to be owned by unit owners. They are therefore generally measured to the inner face of walls and space which is to be common property is excluded. Surveyors may be pressured into showing architects design areas which may not always be to the same surfaces as that intended for units plans. This is to make unit areas consistent with sales contracts which have been drawn up based on architectural plans. Similarly control planners have been known to use unit title areas to make assessment of GFA compliance on the basis of unit plan areas.

2. Gross Floor Areas (GFA)

GFA is generally a planning standard used to set the limits for densities in zones within cities, towns or specified parts thereof. In jurisdictions like the ACT there can be a variety of definitions. In the ACT Canberra has a dual set of planning legislation with parts of the city under Territory Government legislation, while others fall under Federal Government (National Capital Authority). In addition some buildings are limit within the Crown Lease document of individual properties by independent GFA definitions. Whilst similar, difference exist in the definitions and exclusions associated therewith. Court cases have resulted from different interpretations and applications of the definitions. GFA in the ACT is measured to the outside face of walls, and the total GFA is the sum of the areas of the floors less the permitted exclusions.

3. Nett Lettable Areas (NLA)

NLA is generally used for leasing purposes. However lease areas may be defined by an agreement between the owner and tenant and not be fully consistent with NLA definitions. In Australia the recognized method for determining NLA (and other similar areas for retail and warehouse buildings) has been established by the Property Council of Australia which consulted with the Institution of Surveyors in formulating their “method of measurement”. NLA is also used for environmental purpose such as NABERS or Green Star ratings. NLA is now included in legislation (Building Energy Efficiency Disclosure Regulations 2010) and due to the disclosure requirements the need for area determinations by surveyors has increased.

The “method of measurements” whilst describing in general how office space should be measured, leaves some items up to individual interpretation with respect to what should be included and excluded. The document prefaces its description with a statement that it “aims to promote consistency by providing a simple approach to floor space measurement that is both practical and cost effective.” The Property Council recommends that an owner and tenant should agree on the methods to be used, agree on the measurements obtained, and finally negotiate the rental rates. The Council declines to provide any advice regarding the “Method of Measurement” to avoid becoming involved in disputes. This can lead to the surveyor being left in the firing line as he is left to interpret the document with respect to the specific features of the building being measured.

Due to the high cost of inner city rental values which are often based on a square metre basis, measurement of net lettable areas can be fraught with danger, as errors can cause significant losses and damages claims. Interestingly the PCA recommends that “all measurements should be to one decimal point”. I suggest that while relying on measurements to one decimal point to determine area calculations, may maintain relative consistency in dimensions between surveyors, it could also lead to significant variations from the true area of the building being measured. My preference is to
measure as accurately as possible, do my calculations on the basis of my measurements and provide my final area to a rounded one decimal.

Whilst Nett Lettable Areas is described and defined in detail in the Property Council “Method of Measurement” it is also more explicitly, but very simply defined in West Australian Town Planning Regulations 1967:

“net lettable area (NLA)” means the area of all floors within the internal finished surfaces of permanent walls but excludes the following areas —

(a) all stairs, toilets, cleaner’s cupboards, lift shafts and motor rooms, escalators, tea rooms and plant rooms, and other service areas;

(b) lobbies between lifts facing other lifts serving the same floor;

(c) areas set aside as public space or thoroughfares and not for the exclusive use of occupiers of the floor or building;

(d) areas set aside for the provision of facilities or services to the floor or building where such facilities are not for the exclusive use of occupiers of the floor or building;

**VARIATIONS**

Area definitions within Australia have generally fallen under State based legislation, although there is some Commonwealth legislation which refer to areas. Consequently there is little consistency across the country with respect to area definitions. A classic example is in the difference in the definition of Gross Floor Area (GFA) between the ACT and New South Wales (NSW). In NSW GFA is measured to the internal faces of external walls, while in the ACT it is measured to the external face of external walls. Thus if I were to measure the GFA of a building in the suburb Beard in ACT and another building about 100 m from it in neighbouring Queanbeyan, I would need to measure to different criteria. It is clearly difficult to make an assessment of value based on area when different criteria are so prevalent.

In the ACT where development is subject to both the Territory and Federal planning laws, one needs to take care that the correct definition is applied in each circumstance as the Territory Plan and National Capital plan definitions are not the same. Furthermore, individual lease documents may themselves provide a definition differing from both the Territory Plan and National Capital Plan definitions.

Definitions invariably have “grey” areas subject to interpretation. Hence a developer may interpret a definition one way, while a development control planner interprets a different way. This further complicates the life of those who are charged with measuring the areas!!

Internationally it has been claimed that variations of up to 24% exist in the methods of measurements across various countries.
INTERNATIONAL PROPERTY MEASUREMENT STANDARDS COALITION (IPMSC)

An International Property Measurement Standards Coalition has been established with the aim of developing international standards for property measurement and hence reducing or eliminating the variations between countries.

The coalition is a group of at least 70 professional and not-for-profit organisations from around the world. The coalition includes the Australian Property Institute and Property Council of Australia, and Australia has representation on the Board of Trustees and Standards Setting Committee. It appears therefore that there should be a commitment to the standards within Australia. The coalition also includes representation from the International Monetary Fund.

The IPMSC has adopted and published the IPMS for office buildings in November 1994. A draft publication of the standard for residential buildings has been published for public consultation. It is hoped that this standard will be adopted in September 216. A first draft of the Standards for Industrial buildings is also out for comment and a standard for Retail buildings will follow.

The Royal Institute of Chartered Surveyors (RICS) has adopted the IPMS for measurements by its members. In Europe existing standards have been adapted to be IPMS compliant. In Australia the Property Council has stated,

“There is no need for Australian companies to change their practices as a result of this release. The Method of Measurement will remain Australia’s preeminent guide for measuring commercial premises. However owners of commercial property who wish to compare buildings across international borders will now be able to convert this entrenched Australian standard readily into an internationally accepted common terminology and reporting framework through the IPMS for Offices.”
THE INTERNATIONAL PROPERTY MEASUREMENT STANDARD FOR OFFICE BUILDINGS

Three standards were established for different office measurement purposes:

IPMS1 which is similar to the ACT GFA and is used for planning purposes. Its definition is

*The sum of the areas of each floor level of a building measured to the outer perimeter of external construction features and reported on a floor-by-floor basis*

IPMS2 is similar to PCA NLA, and is similar to IPMS3 with the difference relating to its proposed use and reporting. Its definition is

*The sum of the areas of each floor level of an office Building measured to the Internal Dominant Face and reported on a Component-by Component basis for each floor of a building*

IPMS3 is also similar to PCA NLA used for lease purposes. Its definition is

*The floor area available on an exclusive basis to an occupier, but excluding Standard Facilities, and calculated on an occupier-by-occupier or floor-by-floor basis for each building*

As with the Property Council Guidelines, exclusions and inclusions, and the term “dominant face” are described. There is thus not too much difference between Australian definitions and standards.

The publication includes numerous diagrams and tables illustrating the standard and required measurement methods.
MEASURING AREAS

Buildings designs are lodged for approval with authorities based on the requirement of the relevant planning instrument. Areas are provided by architects to the developer and the authorities for sales contract and approvals purposes respectively. Areas in contracts may not be defined and are causes for conflict when specifically defined areas are found to be different from that in sales contracts.

Areas are generally measured at later stages by a surveyor who measures the as-built area of the building which may have been modified since its design. Purposes may include due diligence investigations for sales, lease area requirements for lease plans, pre-redevelopment investigations to ensure compliance, areas for nabers or green star rating applications.

Measurements were historically undertaken by a simple measuring tape. Complicated buildings may have also required the use of a theodolite. As technology developed the laser “disto” and reflectorless total station replaced the tape and theodolite and enabled much quicker and more accurate measurement to be achieved. The latest innovation is the laser scanner which enables a vast amount of data about a building to be accurately collected in a very short time thus also minimising disruptions when offices are occupied. Laser scanning also enables a record to be kept of all features on the walls easily enabling negotiation between adopted wall faces without re-measurement.

With the measurements taken, the challenge in establishing the area is determining which face of walls to use, and the exclusions and inclusions based on the relevant legislation, policies of authorities and purpose of the measurement. Areas of buildings can be complex and difficult, especially if access is not available and sometimes assumptions based on design plans have to be made. Areas are further complicated when walls are sloping and irregular, and when internal offices are occupied. The high value of commercial office space and the environmental requirements of buildings based on areas have increased the need for accurate measurement and precise area determination.
**PROPERTY MEASUREMENT AND VALUE**

It is claimed that 70% of global wealth is in real estate (Hartenberger). Consistency in valuation around the country has been provided by International Valuation Standards which are used globally for financial reporting. International Financial Reporting are used in 120 countries, providing a common global language for business. International Property Measurement Standards have been seen as the missing link in providing consistency around the world.

While today’s property profession is considered to be international, measurement standards are currently localised. The IPMS aims to rectify this bringing measurement onto the international stage as well.

Property measurement is considered important as it is a fundamental basis for valuation, it underpins decisions made by property users, and it provides a tool for comparison.

**ENERGY EFFICIENCY AND AREAS**

Australia was one of over 160 countries which signed the Paris Climate Agreement earlier this year. As a result, climate change control measures will be a central issue in political debate in the country, and Australia will be under pressure to reach targets committed to in the agreement. One of the issues raised with respect to the agreement is the lack of and need for contributions to be verified and compared in a transparent manner to build mutual trust over time.

Commonwealth Legislation requires the disclosure of efficiency of office buildings under the Building Energy Efficiency Disclosure Act 2010 and associated regulations. The legislation has recently been amended reducing the mandatory disclosure threshold required on commercial office buildings from 2000 square metres to 1000 square metres. The Commercial Building Disclosure (CBD) Program with the reduction of the mandatory disclosure threshold is projected to provide a reduction in end use energy consumption of 17,395 TJ, abatement of over 3.5 million tonnes of greenhouse gases and deliver around $60 million in benefits over the period from 2015 to 2019.

The built environment is considered to be responsible for a large part of the energy consumption in Europe and around 30 per cent of its carbon emissions. Studies show that 80 per cent of a building’s energy use occurs during its occupation (manufacture and erection account for less than 16 per cent) and that 80 per cent of a building’s lifetime energy consumption is influenced by its design, with user behaviour influencing just 20 per cent. As building efficiency is seen as a measure of improving global warming control, methods of measuring such efficiency become relevant in the debate. As area is a critical factor in measuring building efficiency, the International Property Measurement Standard is seen as an element which can provide consistency around the world.

*The New South Wales Government in Australia has today (13 May 2016) endorsed the need for the International Property Measurement Standard (IPMS) to drive the global roll-out of the National Australian Built Environment Rating System (NABERS) energy efficiency rating system.* ... *In a keynote address at a breakfast launching a post-COP21 environmentally sustainable real estate investment framework, the Hon Shayne Mallard MLC, representing the Minister for the Environment, endorsed the need for the IPMS.* ... *“The International Property Measurement Standard will ensure that property assets are measured in a consistent way, creating a more transparent marketplace, greater public trust, stronger investor confidence, and increased market stability. “It will also address a major barrier to creating an international benchmark for building sustainability performance.” Mr Mallard went further, saying that the New South Wales Government had a “strong interest in making sure*
that NABERS keeps expanding globally, and that’s why we’re actively exploring the IPMS standard, and will be working with our partners in NABERS to consider it”.

https://ipmsc.org/news/

The statement on behalf of the New South Wales Government appears to be the only public endorsement of government relating to the adoption of the IPMS.

This endorsement came at the same time as an Australian Sustainable Built Environment Council report into the economic potential of low-carbon buildings, finding that green rating schemes such as NABERS had reduced built environment emissions in Australia by 180 megatonnes.

THE ADOPTION OF IPMS IN AUSTRALIA

While Australia has representation on the Board of Trustees and Standards setting committee there appears to have been muted support for IPMS since the publication of the Standard for office buildings. The bodies represented on the board, the Australian Property Institute and Property Council of Australia have issued statements welcoming the publication, but have done little, if anything to promote the adoption in Australia. Organisations representing surveyors, the Surveying and Spatial Sciences Institute (SSSI) and Institutions of Surveyors, have been similarly quiet. This is in contrast with the London based Royal Institution of Chartered Surveyors who promote themselves as “the world’s leading professional status in land, real estate, infrastructure and construction”. RICS have adopted IPMS as the standard to be used by its members. As mentioned earlier only the NSW government appears to have shown any interest in IPMS.

There does appear to be a vested interest in the continuation of the current area measurement regime in Australia with the Property Council’s Method of Measurement being the current standard adopted for most applications of office building measurement. As mentioned earlier, in the Property Council’s welcoming statement, it added, “there is no need for Australian companies to change their practices as a result of this release. The Method of Measurement will remain Australia’s preeminent guide for measuring commercial premises.” (Property Council of Australia)
Implications of moving towards the adoption of IPMS include:

- **Training**
  Measurers of buildings such as surveyors will need to learn the new standard and its applications to be able to apply it. Users of the standards including property owners, developers, valuers, planners and Real Estate agents will also need to understand the applications and the differences from existing standards. Currently RICS offers on-line training webinars. I have not come across any training in IPMS by Australian professional organisations or education institutions.

- **Changes to legislation and policies**
  Existing definitions are provided in a range of acts, regulations and policies. The adoption of IPMS will eventually require the amendment of these statutes and policies, which can often be a difficult and expensive process. From the NSW government statement, it appears that global commitments relating to environmental policies as a result of international pressure may eventually be the trigger for the commencement of a transition or joint adoption with existing standards.

As one of the Office measurement methods includes an apparent GFA equivalent, local Councils may eventually be encouraged to adopt the IPMS thus bringing uniformity to the GFA understanding around the country.

- **Breaking resistance to change**
  As the current standards in Australia have been in operation for a very long time there obviously will be a resistance to change, especially from the older generation, which will require retraining. It may require forward thinking leaders to implement changes, but it is likely that the younger more mobile generation will be more adaptable to change and to learn the new standards from an early stage.

**CONCLUSIONS**

In my view, the measurement of areas with respect to buildings is in a very confused state, with a wide array of variations and interpretations, and IPMS offers the opportunity of not only rectifying this, but also bringing Australia into line with the rest of the world. However, the entrenched views and existing legislation enforcing existing standards will probably result in the uptake of the new standard being slow. It may need some international and political pressure to encourage the adoption of IPMS.
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Collaborating in the face of uncertainty: Sea level rise adaptation planning in the Marks Point and Belmont South Communities

Sustainable development in coastal urban areas is often complicated by the need to manage the risk to existing communities from rising sea levels. The task of planning for climate change and potential sea level rise is a challenge for many regional communities. With its large coastal lake surrounded by densely developed residential and commercial suburbs on an often low-lying shore, the challenge is particularly acute for the Lake Macquarie community.

This paper will tell the story of a unique collaboration between a group of residents from a flood-exposed area and Council. It will describe how the application of a collaborative governance approach supported all parties to come together across barriers of low trust, uncertain data and high anxiety to co-create an 85-year adaptation plan.

By tapping into the capabilities of residents, by inviting everyone to explore the dilemma and by sharing information and exploring solutions together, Council and the community have built a plan that is owned by all and which all can champion.

The outcome is an adaptation plan that provides planning certainty for Council, while giving current and future homeowners in the area a high level of confidence about their future.

Introduction

Lake Macquarie City, located in the Hunter region, NSW, is home to more than 204,000 people and contains one of the largest coastal lagoons in Australia, known as Lake Macquarie which covers 110km².

The Lake is linked to the ocean through Swansea Channel and is therefore subject to the same long-term rises in sea levels as the ocean. Heavy rain in the lake’s catchments causes the lake to rise, flooding low-lying foreshores and homes. There are 7,500 properties around the lake that would be affected by a major flood, and this rises to 9,500 with 0.90metres rise in sea level. Homes affected by over-floor flooding would increase from about 875 to more than 4000. This makes Lake Macquarie City one of the most exposed in NSW to the risks from rising sea levels – a wicked problem that the community and Council needs to solve together.

The Lake Macquarie Waterway flood risk management study and plan was prepared for the Lake in 2012. It recognised these current and future problems and recommended that Lake Macquarie City Council “undertake a detailed assessment (Local Area Adaptation Plans) for each foreshore management area, in consultation with each affected community, of the implications and adaptation measures available to plan for and mitigate the effects of sea level rise (flooding and tidal inundation)".
Methods

Over the past three years, Council has prepared the City's first adaptation plan at Marks Point and Belmont South, two low-lying suburbs on the eastern shore of Lake Macquarie. It was developed in close collaboration with local residents, meaning that Council partnered with the public in each aspect of the decision-making related to adaptation plan preparation, including the manner in which the collaboration would take place.

The process began whereby 350 residents and property owners who had participated in the preparation of the 2012 Flood Study workshops were invited to attend a workshop to design the collaborative engagement process. Sixty residents from across the City participated in this workshop and additional ideas and feedback obtained through pop-up information booths at local shopping centres and online engagement through a purpose-built Have Your Say project website enhanced this process.

Responses from these activities gave answers to questions such as who should be involved, what were the main concerns, what level of engagement was preferred, and what a successful adaptation plan would look like. The community wanted to “collaborate” with Council, be “empowered” to make decisions and develop and implement the plans.

The initial community workshops sought community agreement on the principles and process for adaptation planning. The workshops agreed that an adaptation plan should:

- acknowledge that risks are location specific and are best addressed at the local level;
- recognise that being prepared requires input from landowners, business owners, residents, special interest groups, community organisations, Council, and state government agencies;
- be timed so the actions are implemented when they are required to accommodate increases in risk;
- identify the criteria for a successful outcome (economic, social, environmental); and
- provide a level of certainty about how and when future actions will be required, yet be flexible enough to change with changing information.

The participants adopted a four-step program for the development of the plan and the collaboration process. In practice, the program was more iterative in its application than the linear flow in Figure 1 indicates, with the participants later in the process often revisiting and revising actions taken earlier on.
Following this initial phase of engagement activity, about 30 people volunteered to be on a Community Working Group. That Group would take the community suggestions and begin to prepare a plan to adapt to sea level rise and flooding in the area. The community group quickly discovered the complexity of the issues associated with flooding and sea level rise and that careful consideration would require a smaller, more focused group. The Group formed a sub-committee of 11 volunteers.

Using the community’s feedback gathered from workshops, Council’s Have Your Say project website and community “drop-in” sessions, Council developed a draft set of objectives to assess the 39 possible hazard management options.

The sub-committee became a valuable consultative panel, joining forces with Council to work as a collaborative team. They worked together to assess the 39 ideas put forward by the community, ensuring the solutions struck the right balance between meeting public needs and keeping within requirements of the City’s legislative planning framework.

An external consultant conducted a peer review before Council released the draft objectives for further feedback from the community.

These objectives were reported back to the community and promoted through social media, posters, advertising and published in a series of community newsletters distributed to 1300 households and property owners in Marks Point and Belmont South.

The community indicated a need to “simplify” the objectives, and Council’s list of seven objectives became four “show-stopper” criteria to assess the 39 management actions proposed by the community:

- Will it work to reduce the risk from flooding and inundation?
- Will it help maintain community lifestyle?
- Are the environmental effects manageable?
- Do the benefits outweigh the costs?

Any decisions and actions included in the local adaptation plan needed to meet these criteria.

**The Hard Work**

Community volunteers worked for nearly a year to review the options against these criteria. In some cases, specialist external advice was requested, or additional studies were commissioned. Twenty-two of the proposed options were assessed as “warranting further consideration”, with the remaining 17 failing to meet the showstopper criteria.

Mitigating lake flooding is impractical, so three main management strategies were considered:

- **Retreat** – relocate or abandon assets as they become affected by rising water levels
- **Protect** – prevent the land from becoming inundated by building levees, dykes or filling land
- **Accommodate** – by adapting buildings and services to function even when they are sitting above water

The Protect strategy was preferred. It met, in particular, the criteria to maintain community lifestyle and wellbeing, and that benefits should exceed costs. The business as usual/retreat option was disruptive to lifestyle and the costs outweighed benefits due to the high value of land and assets abandoned or damaged.

Figure 2 summarises the collective collaboration that informed the preparation of the plan and the communication methods that were used.
What is the Plan?

The Marks Point and Belmont South Local Adaptation Plan addresses two main hazards as lake levels rise: lake flooding, which will increase in frequency and severity; and the permanent inundation of low-lying land and assets.

Managing the increased flood risk is 'business as usual', using measures already adopted for flood-affected communities around the lake including:
• construction levels for new assets based on the increased flood hazard over the life of the asset;
• avoid placing new assets in high hazard areas; and
• encourage innovative, adaptable, and flood-resistant asset design.

Permanent inundation is managed by the 'protect and raise' strategy (Figure 3), designed to raise land levels and infrastructure roughly in step with, but ahead of, increases in mean lake levels, ensuring there is no increase in risk despite the progressive increase in hazard.

Actions to manage the risks from changing lake and flood levels are best delayed until they are required — 'plan for the worst, but only act when necessary'. This has the added advantage of addressing some of the uncertainty, and even disbelief, around the threat from sea level rise — if levels don't rise as fast or as far as projected, then the actions won't be necessary.

The other trigger for implementing adaptation actions is the scheduled renovation or renewal of existing assets. Homes, roads, schools, drains, revetments, and playing fields have asset lives of between 30 and 100 years. Over the planning period of the adaptation plan — 85 years — most of the assets in Marks Point and Belmont South are likely to be replaced or upgraded, and the new asset will be built with the increased construction standards required to protect against or accommodate the increasing hazard.
Evaluating the Pilot

Council was committed to evaluating the Marks Point and Belmont South local adaptation planning process from its commencement, to apply lessons learned when preparing local adaptation plans for other low-lying areas around the Lake. A collaborative approach was applied to the evaluation, which resulted in the following key lessons learned.

1. Building trusting relationships between council and the community is critical.
2. Boundaries need to be clear, but all positive suggestions need to be considered
3. The planning process needs to be flexible enough to respond to the community needs, but firm enough to progress.
4. Agree on objectives of the plan and clear criteria to determine most appropriate management options.
5. Collaboration does not stop when Plans are finalised, adopted and implemented
6. Improved understanding and ownership of plans will aid implementation. Give thought to cumulative impacts, the transfer of knowledge and coordination of concurrent adaptation planning activities.

Out of these lessons learned, ten actions were identified to improve the preparation of any future adaptation plan. These actions included:

1. Prepare and adopt a governance framework to guide future local adaptation planning, including terms of reference for a Steering Committee.
2. Prepare and adopt project plans to guide the preparation of local adaptation plans in line with a governance framework.
3. Couple the introduction of the dilemma with on-the-ground efforts to listen and build relationships with the community. Invest in co-defining the scope, vision and dilemma up front to build plan and process ownership. Clarify and communicate relationships between local adaptation plans and other plans and policies.
4. Mirror key community collaboration activities internally to build ownership and understanding of hazards and solutions across the organisation.
5. Build trust with the community using independent or subject experts. Explain decisions made on the basis of technical assessments, such as engineering constraints or cost-benefit considerations, using plain language and images.
6. Prepare simple and highly visual information to assist understanding. Greater detail may be necessary in workshops.
7. When engaging externally, always revisit context, objectives and key concepts.
8. Explore options for working with smaller groups to solve complex problems, whilst maximising opportunities for involving all.
9. Report all significant information and decisions coming from working groups to the whole community and provide regular opportunities for feedback.
10. For community working groups, clarify roles and the scope of inquiry - but expect and respect an iterative learning process.

**Conclusion**

Wicked problems are often described as problems that are difficult or impossible to solve because of incomplete or contradictory knowledge. There are many opinions from many people on how to solve the problem. There are also large economic burdens, and there is an interconnected nature of these problems with other problems.

Whether the Marks Point and Belmont South Local Adaptation Plan is a good or bad solution to the wicked problem of rising sea levels will not become clear for many years. However, reflecting on the experience of preparing the adaptation plan may provide some useful guidance for others. From the experience of the Marks Point and Belmont South Local Adaptation Plan, good adaptation planning and the ability to solve wicked problems requires:
• close collaboration with those affected;
• good planning frameworks and decision-making frameworks;
• consistent political support;
• good science, hazard and risk information – although this is not sufficient on its own;
• flexibility and patience; and
• new knowledge and new planning and financial frameworks.

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Economic Adaptation in NE America - Case studies of relevance to regional Australia.

Conference Stream – Employment

This presentation draws on findings from a recent visit to the north east region of the USA. It will focus on case studies of Portland (Maine), Providence (Rhode Island) and Nantucket Island (Massachusetts) including adaptation to changing economic circumstances, and implications for similar towns and areas in regional Australia.

The US Economy

*The USA is the World’s largest economy, deriving its strength and resilience from its geographic diversity...Economically at least, America is not a single country. It is a collection of seven nations and three quasi-independent city states.*

One if these “nations” is the Great NorthEast, which even excluding the city state of New York, has been the country’s brain centre since before the American revolution.

This presentation focusses on the New England area in the north eastern corner of USA. It comprises the states of:

- Connecticut
- Maine
- Massachusetts
- New Hampshire
- Rhode Island (which is not actually an Island); and
- Vermont.

The New England Area is bordered by the state of New York to the west and south, Canada to the north and the Atlantic Ocean to the east.

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The New England Region

The New England Region was historically a centre for industrial manufacturing, and a supplier of natural resource products, including granite, lobster and codfish.

The economy of this region has been described by the US Department of Commerce as a microcosm for the entire US economy\(^2\).

The New England region was the birthplace of the industrial revolution in the USA, and was also one of the first regions to experience deindustrialisation.

It is therefore a good place to look for post-manufacturing adjustment case studies.

In the first half of the 20th century the region began a long period of adjustment to changes in the manufacturing sector, as companies relocated to the Midwest and South of the USA. From the latter part of the 20th century many of these manufacturing activities were relocated offshore.

By the late 20th century, an increasing proportion of the regional economy was focussed on high technology manufacturing such as computers, electronics and military industries. There were also high levels of employment in the finance and insurance sectors, as well as health and education.

Granite is still produced and exported from the area. Food exports include lobsters, other seafood, potatoes and cranberries. Higher education is also an important source of export earnings.

The Impact of the Global Financial Crisis (GFC) of 2008

While the focus of the GFC may have been on the financial markets of New York, the adverse impact was widely felt across the USA, and was generally far more significant than the impact in Australia. This is shown by the sharp drop in employment across the New England Region across 2008-09.
Since 2009 employment levels have generally improved across most of the New England region, and unemployment is generally lower than for USA as a whole. The unemployment rate in Maine is currently lower than for New England region as a whole, but it is higher in Rhode Island.

Unemployment Rates – 2015-16 New England Region and USA

Case Studies

This presentation focusses on three case studies, all within 1.5 to 3 hours travel time from Boston, the largest city in the New England Region.

Boston

The Boston greater metropolitan area has a population of around 5 million people. It has been included in a list of the 30 most economically powerful cities in the world.

Boston’s universities and colleges – including Harvard University, Massachusetts Institute of Technology and Tufts University - are significant contributors to the economy of the city and the surrounding region. Boston attracts more than 350,000 college students from around the world, who contribute more than $US 4.8 billion annually to the city’s economy\(^3\).

\(^3\) The prominence of Boston’s area colleges and universities, Denis M McSweeney, 2014
The city is also home to a number of technology and biotechnology companies. Innovation is supported by the presence of highly-regarded universities, a well-qualified workforce and access to venture capital.

Over 21 million domestic and international tourists visit Boston each year, spending over $US8 billion.  

Boston is also a major centre for finance industries, and a cultural and sporting hub.

Case Study 1 - Portland, Maine

Portland, Maine (not to be confused with Portland, Oregon, on the US West Coast), is a coastal city around the same size as Launceston, although its greater metropolitan area is home to around half a million people.

Portland is around 180 km north of Boston and easily accessible by rail or road from Boston.

Portland is currently transitioning from an economy highly dependent on port-related activities and shipbuilding to an area where increased employment is now being generated by strong promotion of local food, artisan activities and nature-based tourism.

Greater Boston Convention and Visitors Bureau.
The downtown area of Portland, including the Old Port, have a high concentration of eating and drinking establishments, including micro-breweries, bakeries and seafood restaurants.

There has been a growing interest in organic food and farmers markets. Portland also hosts a number of food and beverage festivals and has been named as the *Foodiest Small Town in America* by *Bon Appetit* magazine.

It has also been Ranked No. 1 city in the world for craft beer by the independent travel company, The Matador Network.
Portland’s Arts District includes museums, art galleries and performance spaces. Portland is also home to a concentration of publishing and web design companies, photographic and film studios. In addition, it is the tourist gateway for access to the islands and scenic coast of Maine, as well as to the Mt Washington ski fields.
Portland has a low unemployment level when compared to state and national averages – 2.9% in October 2015.

**Case Study 2 - Nantucket Island**

Nantucket Island is located off the East Coast of mainland USA, close to Hyannis on Cape Cod. It has a year-round population of around 10,000 – 12,000, which swells to around 50,000 – 60,000 during the peak summer season. The economy of Nantucket Island, once driven by the whaling industry is now focussed on tourism and service industries.
NANTUCKET
AND THE WORLD

From this tiny island in the North Atlantic, connections were made with far-flung locales across the globe. Oceans, seas, islands, and ports were the territory of Nantucket mariners, who “conquered the watery world like so many Alexanders,” as Herman Melville writes in *Moby-Dick*. A Nantucket diaspora to places as diverse as Nova Scotia, France, Wales, and San Francisco was equally impressive, extending the island’s influence to a multitude of points on the compass.

MAP CREATED BY MARY EMERY
A particular feature of the Nantucket economy is that in the historic township where most activity occurs, a zoning ordinance has effectively excluded “Formula Businesses”. “Formula Businesses” are identified as retail sales establishments, restaurants, bars or take-out food establishments that are under common ownership or are franchises where there are 14 or more similar businesses worldwide, with features such as standardized menus, merchandise, trademarks, colour schemes or uniforms.

The effective prohibition of “Formula Businesses” reduces completion that might otherwise make small scale local businesses uneconomic, and protects historic streetscapes. While this adds to the charm of the Island, it does also add to everyday living costs.

The attraction of the Island to tourists and retirees, and relative proximity to both Boston and New York means that construction activity is currently generating significant employment opportunities for residents, and for workers who travel to and from Nantucket Island each day by ferry. The fact that people commute daily from Hyannis (the nearest mainland settlement one hour away by express ferry) reflects the very high cost of housing and general living costs on Nantucket Island.
For people who own property on Nantucket Island, there are many opportunities for employment in service industries, particularly during the peak tourist season.

**Case Study 3 – Providence, Rhode Island**

Providence, Rhode Island is situated around 70 km south of Boston, on the main rail line between Boston and New York.

It is one of the oldest cities in the US, and was once a thriving port and industrial hub. It was previously a major centre for the production of textiles, silverware and jewellery. Many immigrants arrived to take up the employment opportunities generated by these industries.
In the decades following World War II, Providence was significantly impacted by a decline in employment in manufacturing industries. Between the 1950s and 1980s its population was reduced by around 40%, and the city became a centre for organised crime\textsuperscript{5}.

Today many former industrial buildings are still empty, although Providence does retain some manufacturing activity. Providence is increasingly becoming a service industry hub with eight hospitals and seven institutions of higher learning in its broader catchment.

\textsuperscript{5} All About the Providence Mob, Allan May, 2007.
Brown University, an Ivy League university is one of the largest employers in Providence, and exerts a considerable influence on the city’s politics and economy.

Poverty, however, is still a problem. Around 30% of the population live below the poverty line\(^6\). A significant number of Providence residents commute to Boston, which takes around an hour each way by train.

\(^6\) US Census Bureau.
Implications for Regional Australia

The case studies discussed above, show how different cities, towns and communities have adapted to changing economic circumstances.

The three case study locations have all been impacted by proximity to the large and prosperous city of Boston, and to some extent by proximity to New York. The impacts have varied.

- Portland, Maine, has adapted to focus more on cultural activities, niche food production and tourism. There are many similarities with Hobart.
- Nantucket Island has evolved from its former role as the centre of the world’s whaling industry, through a phase where it became a mecca for people who wished to live simple lifestyles. It has now become an enclave for well-off older people for most of the year, and an expensive holiday destination during the peak summer season.
- Many of the residents of Providence, Rhode Island, are still being adversely impacted by reduced employment in the manufacturing industries of last century. While the area of the city near Brown University is prospering, other parts of the city are run down and feel unsafe. The low wages paid to people working in some service industries and the lack of job security, will make it difficult for many of the residents of Providence to improve their living standards.

Economic prospects for all residents of the NE of the US, will also continue to reflect to some extent the success or otherwise of the major cities of Boston and New York.