Peri-urban horticulture and land use planning: Literature Review & 'Tool-kit'

Luke Jewell
GHD

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Level 7
179 Elizabeth Street
Sydney NSW 2000
Telephone: (02) 8295 2300
Fax: (02) 8295 2399
E-Mail: horticulture@horticulture.com.au

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Literature review

Peri-urban horticulture and land use planning

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1. Background

1.1 Purpose of the literature review

GHD Hassall has been engaged by Horticulture Australia Limited (HAL) to carry out a review of the literature in relation to peri-urban horticulture and land use planning in Australia. The HAL Industry Management Committee (IMC), which is responsible for the identification of issues which have broad impact across all horticulture industries, has identified peri-urban horticulture and land use planning as an area requiring further investigation.

1.2 Definition of peri-urban

There is no universally accepted definition of peri-urban areas, which neatly encompasses this diverse area of planning thought. A simple definition by Buxton et al (2006) provides a starting point for the purposes of this review:

"A peri-urban area can be defined simply as land adjacent to the edge of an urban area, that area of land extending from the built up edge of the city to the rural hinterland"(p1).

1.3 Definition of the issue

Land use planning and its impacts on horticulture in Australia have for many years been identified by farming organisations around Australia as being in the 'top 5' policy issues facing the sector. The issue is important to many intensive agricultural industries and has been on the government planning 'radar' as a result of the increasing incidence of land use conflict in peri-urban areas as competition for finite land and water resources continues to intensify over time.

Industry associations, state farming organisations and a wide range of affected stakeholders have struggled to come to grips with the issues surrounding land use planning and conflict, and agreement on how to address them is rare, often due to the conflicting aims and priorities associated with individual land ownership. IMC considered that a fresh review of the literature, which avoids a pre-determined policy outcome, was required. The aim is for the review to present an analysis of peri-urban land use options, which can be applied into the local context in an informed and reasoned manner.

1.4 Project outputs

The IMC is seeking to provide horticulture industry stakeholders with two major outputs from the project:

- A literature review which provides an overview of the peri-urban planning context in Australia and analysis of current international and domestic policy responses and their potential application to the Australian situation; and
- A 'tool-kit' for horticulture industry stakeholders which will provide a road map through the planning and legislative maze and some policy options worth considering depending on the local context.

2. Peri-urban horticulture and agriculture

2.1 Importance of peri-urban horticulture and agriculture

Horticulture production and the land use planning issues associated with this peri-urban 'space' is the specific focus of this project. Accurate data on the size and economic significance of horticultural production in peri-urban areas of Australia is not readily available. In fact many authors of studies on peri-urban issues report the paucity of quality data and the perils of relying on ABS Census data alone (Gillespie and Mason 2003). This is particularly true of horticultural crops produced in the peri-urban fringe. In some cases the disparity between ABS reported volumes of production and actual wholesale market receivals, as recorded in levy collection processes, has been as high as 30-50 percent, demonstrating the significant under-estimation of actual production in these areas.

The Victorian Department of Sustainability and Environment states that Victoria's peri-urban region accounts for around one quarter of the State's land area but half of the agricultural production value. Houston (2005) cites publications which show under-reporting for flower, nursery and wine grape industries, as well as fruit production and vegetables.

A small number of regional studies on agriculture in peri-urban areas have been carried out in Australia with varying degrees of reported accuracy. Kelleher, Chant and Johnson (1998) and Kelleher (2001) conducted studies which specifically set out to address the paucity of data by combining a number of data collection methods with remote sensing technology in three specific Local Government Areas (LGA).

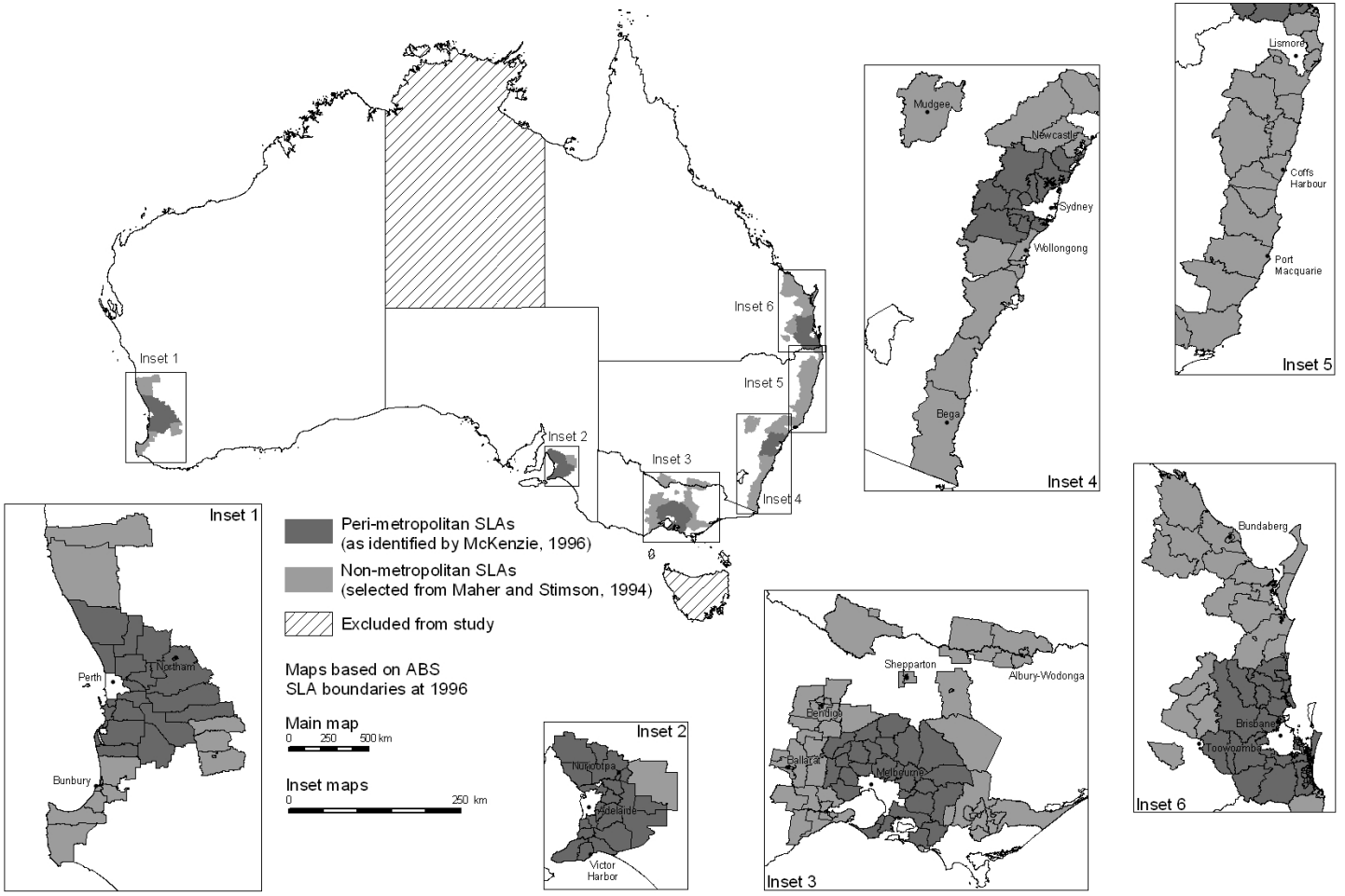
Gillespie and Mason (2003) used a combination of Rural Lands Protection Board, local government, NSW DPI and ABS figures to estimate that in the Sydney Region up to 12% of total agricultural production in NSW occurred on less than 1% of the State's agricultural land. This represents $1 billion in value based on farm gate prices. This land is also the most productive agricultural land, demonstrated by the average returns of more than $5,000 per hectare in the Sydney Region compared to NSW's average value of agricultural production of $136 per hectare.

According to Queensland DPI and Southeast Queensland Regional Organisation of Councils (as cited in Buxton et al 2006) the southeast Queensland region constitutes only 1.3 per cent of Queensland yet accounts for 14 per cent of the State's total 'farm gate' turnover. As the hub for Queensland's agricultural manufacturing and processing industries, it generates a turnover of $6.24 billon per annum.

This pattern of intensive high value production is repeated in various peri-urban agriculture and horticulture regions around Australia. In recent years the emergence of a thriving soil-less horticulture industry, particularly in the south-eastern states, has also significantly increased the value of production per hectare, or as is commonly measured in protected cropping, yield per square metre. This trend towards production which is largely independent of soil type or agricultural suitability classes which are commonly used in Australia raises questions about the appropriate basis for assessing the potential of peri-urban land for economically sustainable production.

A United States review of rural policy issues in the early 1990s revealed that 'farming in and near 12 of the nation's major metropolitan areas comprised only 5 per cent of America's farmland yet generated 17 per cent of all agricultural sales'. It also noted that 'while these areas account for only 20 per cent of the nation's population, they contain 40 per cent of its population growth' (Houston 2005).

Figure 1 Peri-urban areas in Australia[1]



[1] Source – Houston (2005)

The most comprehensive study of the value of peri-urban agriculture in Australia to date is the work done by Houston (2005), which firstly established a methodology to identify the peri-urban zones in Australia, and secondly attributed a value of agricultural production to those zones.

Houston (2005) has pointed out that 'peri-urban' usually means "peri- metropolitan", as the term is most commonly applied to the fringes of large metropolitan centres, but the term can also be applied to large regional centres and, "in theory at least, all but the smallest urban centres have a discernible peri-urban sphere of influence". Australian regional centres, particularly in the fringe zones of Melbourne and Sydney, are exerting their own influence on smaller towns in their periphery.

These peri-urban areas of 'influence' are mapped by Houston (2005) in Figure 1. Houston combined results from various peri-metropolitan and non-metropolitan studies to enable the peri-urban phenomenon in the mainland States of Australia to be mapped on a provisional basis. Specifically, Figure 1 does this using the following key references:

- *McKenzie (1996) in Beyond the Suburbs*. The former Bureau of Immigration, Multicultural and Population Research (BIMPR) commissioned this special study in 1996 on population growth in peri-urban or, as its author described them, exurban regions. The report examined the causes, dimensions and characteristics of population growth in the exurban regions of the five mainland capital cities. It found that the peri-urban phenomenon, defined according to ABS journey-to-work data, extends up to 100 kilometres from the central business district (CBD) of each city (McKenzie, 1996, 6). On this basis, the study identified and mapped the Local Government Areas (LGAs) that comprise the five major exurban regions.
- *Maher and Stimson (1994).* This study identified high amenity areas 'all along the eastern and south-eastern coasts, as well as … on the south-western coast,' as being significant sites of population expansion (1994, 37–39). Houston incorporated those non-metropolitan statistical local areas (SLA) identified in the study which had population growth rates greater than 10% over the period 1986–1991, and which broadly corresponded with maps of national population distribution and changing density (ABS, 1996, 232).

The resulting map, whilst providing a useful starting point, is therefore only indicative of the likely extent of the peri-urban phenomenon in Australia (Houston 2005). Houston has indicated that updated mapping and statistical data is being compiled as part of the ongoing RIRDC project titled 'National Audit of Peri-urban Agriculture'.

Using the zones identified in the mapping exercise, Houston (2005) summed the average area and gross value of agricultural production ('GVAP') figures for all peri urban SLAs. The totals were calculated based on three scenarios as follows:

- **Scenario A** describes agriculture in peri-metropolitan regions using only those SLAs identified by McKenzie (1996) in Beyond the Suburbs.
- **Scenario B,** a second peri-metropolitan version, was also calculated due to the fact that Scenario A leaves a residual component of metropolitan fringe agriculture unaccounted for. This uses total area and GVAP data for the Metropolitan Statistical Division (MSD) in each State, plus any SLAs identified in Beyond the Suburbs that lie outside the MSD.
- **Scenario C** describes total agricultural production in peri-urban regions in each state on the basis of Scenario B plus all selected *non-metropolitan* SLAs, as per the Maher and Stimson (1994) study. These scenarios are summarised on a State-by-State basis in Table 1.

Despite the difficulties of establishing a rigorous basis for the data, the results for Scenario C show that 25% of the GVAP in Australia is produced on 3% of the total land base used for agriculture. These percentages are significantly higher than comparable data for the US as reported by Lapping above, and

contrast with conventional wisdom about agriculture in Australia's peri-urban regions. ABARE's Farm Survey Report series, an annual survey of mainly broadacre industries which is commonly referred to as a statistical authority on Australian agriculture, has generally not covered the 'small' and intensive industries situated close to major population centres. The figures in Table 1 suggest these areas could be worthy of closer scrutiny (Houston 2005).

Table 1 Average area and value of agricultural production in peri-urban regions, Australia (excluding Tasmania, Northern Territory and Australian Capital Territory), 1992/93–1994/95[1]

Scenario	**A**. Peri-metropolitan agriculture #1[2]		**B**. Peri-metropolitan agriculture #2[3]		**C**. Total agriculture in peri-urban regions[4]	
	Area (ha.)	Value ($,000)	Area (ha.)	Value ($,000)	Area (ha.)	Value ($,000)
NSW	60,293,384	6,040,741	60,293,384	6,040,741	60,293,384	6,040,741
Peri-Urban	89,472	426,426	90,537	448,625	2,932,413	1,351,697
% of total	**0.15**	**7.07**	**0.15**	**7.44**	**4.86**	**22.40**
Qld	150,592,494	5,144,540	150,592,494	5,144,540	150,592,494	5,144,540
Peri-Urban	970,377	664,398	975,393	718,962	2,760,785	1,235,243
% of total	**0.64**	**12.91**	**0.65**	**13.97**	**1.71**	**22.10**
SA	56,640,670	2,317,913	56,640,670	2,317,913	56,640,670	2,317,913
Peri-Urban	1,199,104	571,791	1,204,502	598,586	1,204,502	598,586
% of total	**2.12**	**24.69**	**2.13**	**25.81**	**2.13**	**25.81**
Vic	12,669,270	5,297,131	12,669,270	5,297,131	12,669,270	5,297,131
Peri-Urban	735,050	819,817	743,184	855,047	2,005,878	1,464,887
% of total	**5.56**	**15.34**	**5.63**	**16.01**	**13.34**	**25.50**
WA	112,995,537	3,453,006	112,995,537	3,453,006	112,995,537	3,453,006
Peri-Urban	1,263,706	459,320	1,266,554	493,347	2,703,068	860,996
% of total	**1.05**	**12.91**	**1.06**	**13.90**	**2.20**	**23.58**
TOTAL	393,191,355	22,253,331	393,191,355	22,253,331	393,191,355	22,253,331
Peri-Urban	4,257,710	2,941,752	4,280,169	3,114,566	11,606,646	5,511,408
% of total	**1.08**	**13.22**	**1.09**	**14.00**	**2.95**	**24.77**

Source: Australian Bureau of Statistics (1996). AGSTATS (v 2.2) [CD-ROM]. Canberra, ABS. Cat.No.7117.0
Australian Bureau of Statistics (1996). IRDB96i (Integrated Regional Data Base) [CD-ROM]. Canberra, ABS. Cat.No.1353.0

Whilst work by Houston and others to attempt to quantify the economic value and importance of Australia's peri-urban regions is important to policy makers at a regional and State level, locally ground-truthed data compiled into an 'agricultural profile' is an essential tool for planning at the local and regional levels.

2.2 Changes in land use intensity in Australia

A number of authors state that arable agricultural land is a limited resource, which is seriously under threat both in Australia and internationally due to a range of factors. Nix (cited in Sinclair 2003) states that only 10% of Australia's land mass is arable land suitable for soil-based agriculture and livestock production, with much of this being marginal with respect to water and nutrient regimes. Sinclair (2003) argues that most of this land is coastal and hence in direct competition with the demands of Australia's heavily concentrated coastal urban centres.

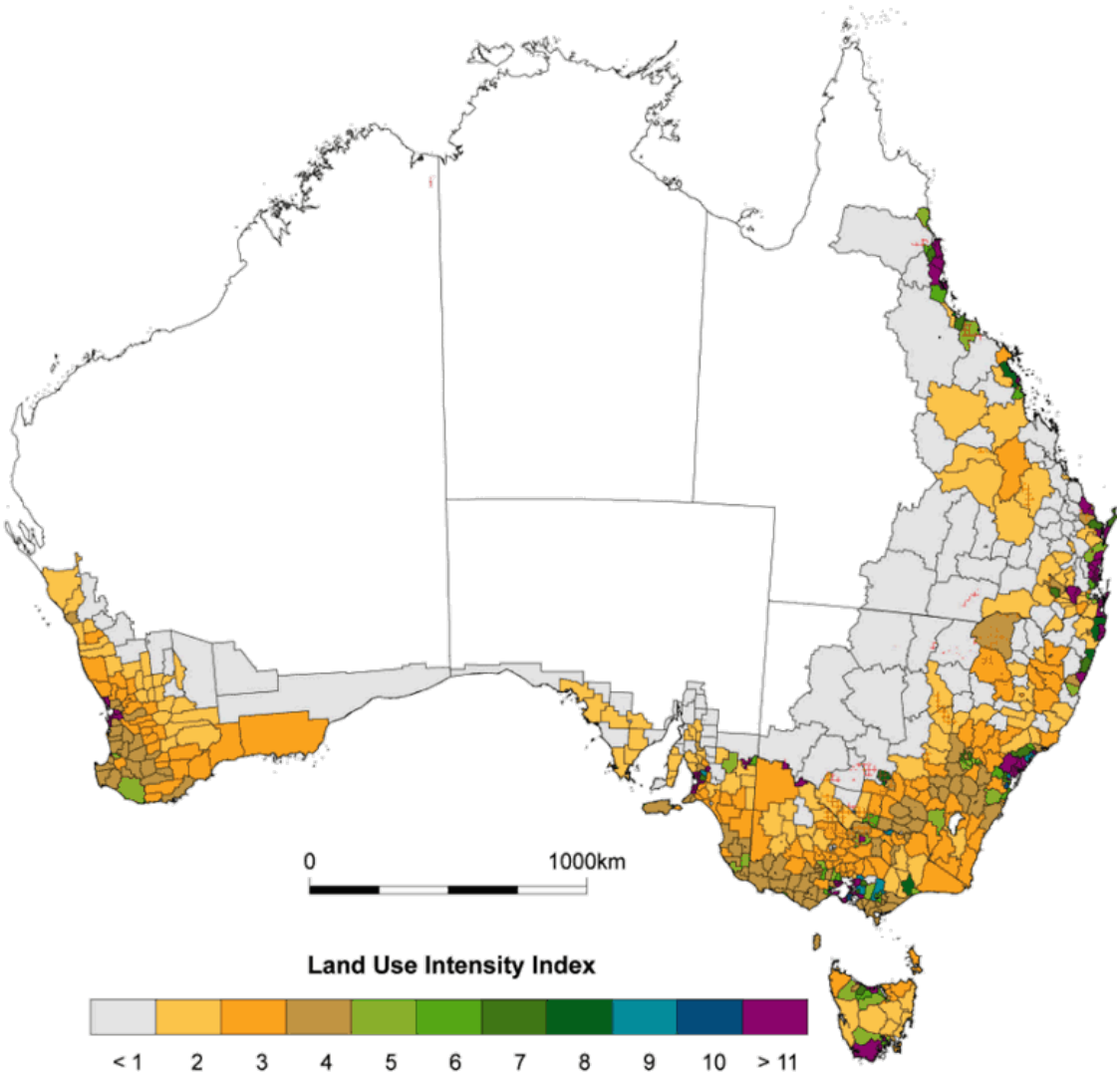
According to Australian Natural Resource Atlas (ANRA) data, in 2001/02 the total area of land used for primary production (livestock grazing, dryland and irrigated agriculture) was nearly 4.7 million square kilometres or 61% of the continent. Horticulture (both irrigated and dryland) accounted for approximately .08% of this. The most intensive use of land occurs in the built environment, with 0.2% being utilised for urban, peri-urban and open-cut mines. It is within this built environment that more than 80 percent of Australia's population reside (ANRA 2007- data set as at June 30, 1999).

Declining terms of trade, which have resulted in producers seeking to secure greater economic yield from each hectare, along with increasing population, have resulted in intensified land use. Over the period from 1983 to 1997, ANRA mapped the change in intensity in land use which occurred across Australia. This was calculated for each year and Statistical Local Area ('SLA') based on the proportions of the total agricultural area in each region, and the average cost of production for 1991-1994 taken from the ABS Farm Financial Survey (ANRA 2007).

The greatest changes in agricultural land use intensity occured in a broad crescent that curves around inside the east coast, around the south coast to the southern part of the west coast of Australia and including Tasmania (see Figure 2). The areas of greatest change surround large population centres and often occur near irrigation and thus most likely reflect the changes in semi-intensive cropping and horticulture over the period.

The implications of these trends in intensification of land use around population centres are significant, as urban sprawl and growth juxtaposed against increasing intensity of peri-urban agriculture and horticulture is causing stress to the overall resource base, and producing a range of attendant planning and policy challenges.

Figure 2 Land use intensity changes 1983 to 1997.



Red hatching indicates irrigation areas.

Land use intensity index was calculated from Australian Bureau of Statistics AgStats as the product of proportion of total land use by intensity factor (see text).

Range calculated as difference between maximum and minimum land use intensity value during the period 1982-83 to 1996-97.

Prepared for NLWRA by Bureau of Bureau of Rural Sciences, Agriculture, Fisheries & Forestry - Australia.

2.3 Typical impacts at the peri-urban interface

The principal areas of impact in the peri-urban interface fall into the following two broad areas:

- loss of peri-urban agricultural land; and
- land use conflict

2.3.1 Loss of peri-urban agricultural land

There is an abundance of international studies, from developed countries in particular, which show the historical decrease of agriculture (as measured by area) in peri-urban regions. Kelleher (2001) states that loss of agricultural land does not necessarily equate to loss of agricultural industry, as land productivity is irrelevant in intensive industries such as poultry and mushrooms. However a number of Australian authors have expressed strong concern that good quality agricultural land is rapidly being converted, mostly irreversibly, to urban non-agricultural uses (Sinclair 2003).

Studies estimating loss of agricultural land conducted in the United States, state that one third of all farms are in peri-urban areas (Buxton et al 2006). Nelson (1990 as cited by Buxton et al 2006) estimated that one fifth of prime agricultural land in the US was located within 50 miles of the 100 largest urban areas. He showed that between 1982 and 1992 nearly 10 million acres (over four million hectares) of cropland were lost in the US and total sales of farm produce fell by over $42 billion. In exurban (peri-urban) areas sales of farm produce fell by $19 billion. Nelson claims that most of this reduced production was due to losses of cropland, and estimates that each new household on former farmland costs the nation's agricultural economy $100,000 in lifetime sales.

A review of Australian literature does not provide a clear indication of loss of actual agricultural land areas to urban uses, with the only clear conclusion indicating a rapidly changing mix of uses in these regions. Although Australia's peri-urban areas still produce between 20 and 25 per cent of the value of Australia's agricultural output, there has been a progressive shift away from the traditional production-based land uses associated with full time agriculture to a new multi-functional land use pattern featuring a significant growth in rural residential settlement.

Lennon (2003) cites a number of studies which indicate that rural residential settlement has contributed directly and indirectly to the loss of agricultural land as a result of:

- fragmentation;
- 'loss of critical mass' leading to a decline in agricultural services and their viability;
- alienation of land for future agricultural production; and
- excision of land from future expansion of agricultural enterprises.

It can be argued that the loss of agricultural land has a negative impact on regional economies in terms of:

- reducing the value of production and therefore the viability of local government areas (LGAs); and
- decreasing employment in the agricultural sector.

The counter argument is that rural residential development (where occupied) can result in diversification within the economy and increase the skills base within a region. There are conflicting results within the studies as to whether rural settlement has a positive or negative impact on agriculture and the regional economy, and these are discussed more fully below.

Several attempts have been made by the ABS to estimate the loss of agricultural land in Australia as a result of rural settlement. However, the ABS can only calculate the present net change in the area of agricultural holdings, and these changes are subject to a number of factors, only one of which is

subdivision. In addition, the ABS has regularly changed the basis on which statistics are collected, and this variation makes it almost impossible to estimate the changes in the number and area of smallholdings over time. Wills (1992) concluded, "that there are no reliable estimates of the losses of agricultural land to non-agricultural uses in Australia".

In an attempt to overcome the problem identified above, Young (1996) used GIS mapping to estimate land use changes and the resultant loss of agricultural land as a result of rural subdivision in the Dubbo and Coffs Harbour local government areas. For Dubbo, between 1969 and 1992, a total of 7,000 ha of rural land were subdivided into small holdings of less than 10 ha in area, and almost 27,000 ha were subdivided into holdings up to 100 ha.

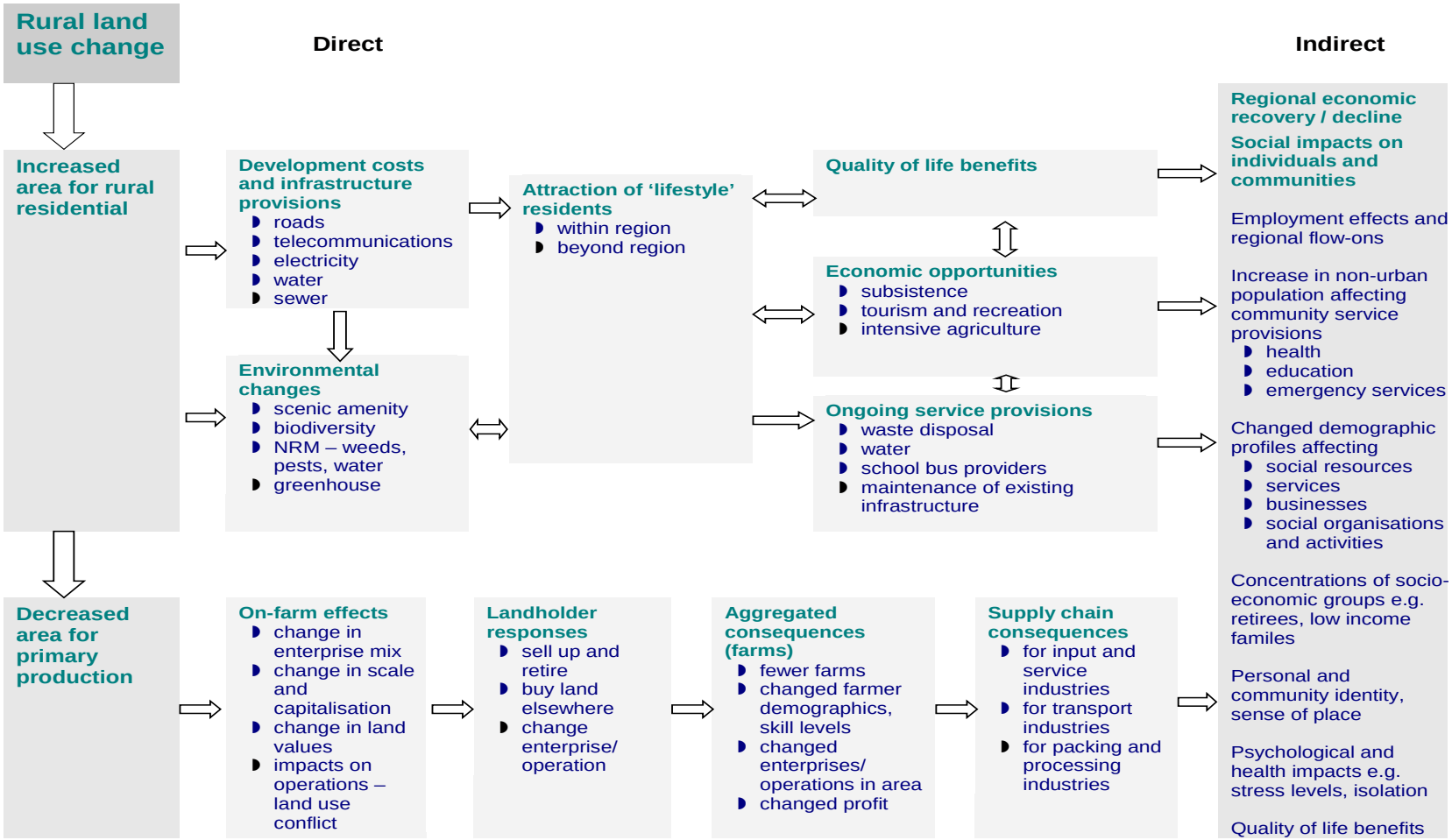
Based on the assumption of this loss continuing at the same rate, Lennon (2003) calculated that between 1967 and 2003 a total of 39,542 ha would have been lost from agricultural production in the Dubbo area. Using an ABS estimate of $138 per ha as the value of agricultural production, she calculated that the loss equated to approximately $5.5 million per year.

It should be noted, however, that to estimate the net loss to regional agricultural production, any analysis would need to consider the output associated with any changed land use as the subdivision of land does not necessarily mean that land is lost from agriculture or some other form of production. For example, Hawkins (1986) estimated that between 1970 and 1979, 95% of subdivided rural land was used for hobby farming, while just 4% was lost to urban development and 1 percent to mining. On the other hand, Cleland (2004) states that the subdivision of land for rural settlement results in the irreversible removal of land from agricultural production.

In the Yarra valley, farmers reported that the biggest threat to their $648 million industry was urban encroachment (Swinbourne, 2000:27). Their concerns included a lack of appreciation by all levels of government of the value of regional agriculture, the potential loss of farming land, the impact of lifestyle farmers, poor land management practices, restriction on agricultural farming practices and increasing price of land. These issues ranked higher in importance than declining terms of trade, water issues, climate change, soil degradation, infrastructure decline, and threats from diseases and weeds.

Figure 3 presents a generic influence diagram of the social, economic and environmental impacts which typically result from changes brought about by conversion of agricultural uses in peri-urban areas. The diagram shows that interactions and trade-offs between rural residential or agricultural peri-urban land use are multi-faceted and can be both positive and negative. Planning and policy responses from both government and industry therefore need to take into account this complexity and acknowledge that peri-urban zones are by nature complex and dynamic with no set or immovable boundary between urban and rural.

Figure 3 **A generic influence diagram of the social, economic and environmental impacts as a result of changes brought about by conversion of agricultural uses in peri-urban areas**[2]



[2] Source: Adapted from Hassall & Associates, Ross, H., and Mary Maher & Associates (2003) Scoping Study: Social Impact Assessment of Possible Increased Environmental Flow Allocations to the River Murray System, Stage 1, Volumes 1 and 2. Report prepared for the Murray Darling Basin Commission.

2.3.2 Land use conflict

Whilst the loss of peri-urban agricultural land to urban use is a major theme of the literature, land use conflict probably concerns the widest range of stakeholders at the peri-urban interface. The change in the mixture of landholders as described above by Buxton et al is the source of a range of conflicts - between the traditional, and the 'newly peri-urban'.

Sinclair (2003) suggests conflict occurs most often where there is no separation between incompatible uses, especially when this is combined with a lack of understanding of the traditional character and land use of an area. Table 2 lists some of the potential points of conflict between agriculture and adjoining land uses. The resolution of land use conflict issues does not always prove to be simple and local government authorities in particular expend significant resources in reactively dealing with disputes between their constituents which possibly may have been avoided through better planning policy and educational programs.

The Wollondilly Shire Council in NSW has adapted its policies to accommodate the change in mix of landholders and land use in its region. Prospective purchasers of land in the Shire are required to obtain a S149 Certificate which specifically details existing agricultural uses adjacent to the lot in question. This is intended to alert buyers of the potential for conflict before they commit to the purchase (Sinclair 2003).

Land use conflict does not result exclusively from non-rural buyers moving into an agricultural area. There are also many cases of agricultural land users who subdivide their properties in order to capitalise on increased land values associated with urban sprawl, and then live on the 'house block' of the original property with a small parcel of land still left in production, often managed by the succeeding relative. When the original owner sells the house block to a lifestyle buyer conflicts result when the new entrant sees normal agricultural activity as a nuisance.

Table 2 Potential points of conflict between agriculture and adjoining land uses

Conflict	Description
Noise	Dogs, livestock
	Farming equipment, pumps, spray machines, transport, frost fans, hail cannons
	Ancillary equipment associated with on- farm processing
Odour	Agricultural fertilisers (particularly manures) and chemicals
	Intensive animal industries
	Application of effluent to pasture
Health concerns	Chemicals
	Spray drift
	Smoke
Water	Access
	Pumping
	Quantity

Smoke and ash	Burning of pasture, stubble or “rubbish”
Visual intrusion	Hail netting Polyhouses
Nuisance	Stray dogs Vandalism Trespass Noxious and environmental weeds

Source: Department of Primary Industries NSW 2004.

2.4 Understanding the role of planning

Peri-urban planning, as with rural land planning in Australia, has not generally received the same level of attention as urban planning. The overall planning regulatory and policy framework tends to result in fragmented approaches to the issues associated with peri-urban growth and development. The responsibility for assessing development and subdivision proposals generally falls on local government who by their own admission are in many cases under resourced and not well placed to address these issues.

Land use planning has a significant impact on the peri-urban space in that it influences land use and demand in these areas. Controls on subdivision and urban related uses can result in achieving a range of positive environmental and economic objectives, including the maintenance of productive agriculture in the region (Buxton et al 2006). Policy responses to address the shortfalls of traditional rural land planning approaches are being developed in Australia and overseas – these will be covered in detail in Chapter 5.

3 Drivers of change in peri-urban areas in Australia

The drivers of change in peri-urban areas have been given a range of labels by various authors. For the purposes of this review the following five major categories proposed by Buxton et al (2006) will be discussed:

- political
- socio-economic
- natural (environmental)
- technological; and
- cultural.

These drivers often operate in combination and will have varying impacts depending on the local context and the scale of the area concerned.

3.1 Political

The political process in Australia is responsible for the generation of policy and legislation which impacts on planning decisions at Federal, State and Local Government levels. The mechanics of these processes and their impacts on planning are discussed in the following chapter. Politics drives change in peri-urban areas in a number of ways, most of which are linked closely with economic policy, and in a more global sense trade policy.

Globalisation of trade, and the resulting influence on Australia's trade policy, has resulted in a movement away from protection of domestic producers and moved toward a market-based economy, which is open to global competitive forces. The end result for Australian farmers has been a steady pressure to increase productivity and efficiency simultaneously, which is not always possible, especially where costs of inputs rise significantly and terms of trade worsen.

A widely held view in the literature posits that the indirect result of Competition Policy reform and globalisation of trade has been a steady exodus from rural areas to cities, and increased pressure on peri-urban producers to sell off land assets as the pressure of urban growth and reduced profitability induces them to exit farming. Horticulture producers in particular have seen reductions in the numbers of enterprises which have traditionally been clustered around metropolitan areas (Kelleher 1999).

In contrast to this are the findings of a national inquiry titled 'Impact of Competition Policy Reforms on Rural and Regional Australia' (Banks, 2000). The three findings identified as most significant were:

- the forces driving change have had quite varied effects on Australia's regions, with some faring a lot better than others;
- long-term forces — largely beyond the control of governments — have been the main drivers of change; and
- competition policy reforms have been a lesser influence, but on the whole have brought net benefits to regional as well as urban Australia.

The complexity of political and economic policy and its impact on regional Australia are not within the scope of this review. However, more detail follows on the other major drivers of change in peri-urban areas.

3.2 Socio-economic

3.2.1. Economic restructuring

Economic restructuring in Australia has had a strong influence on the character of peri-urban change. The nature of this restructure has taken a number of forms namely:

- shift to knowledge based industries;
- globalisation;
- changing rural land owner demographics;
- the changing nature of work practices; and
- increased demand for improved lifestyle and leisure facilities.

Shift to knowledge based industry

A shift from the traditional industrial economies to more knowledge and information based economies has seen the growth of the tertiary sector which focuses on services, including financial and insurance, business, tourism, cultural and education. Whilst numbers employed in these industries have grown, employment in manufacturing and agriculture has stagnated or declined. These new industries have also shown greater locational flexibility leading to more peri-urban home-based workers.

Globalisation

The process of globalisation itself can be considered a form of restructuring. Globalisation has increased linkages between national economies and intensified economic competition for more efficient production, whatever the level of output. This transformation is often characterised in terms of increased international trade, advanced communications, floating international monetary exchange systems and volatile currency flows.

Terms of trade have continued to move against agriculture, in many cases driving increased farm sizes to ensure farm viability. Banks (2000) states that, over the last four decades, world prices for many agricultural commodities have declined significantly in real terms, whereas the prices farmers pay for their inputs have been rising. The upshot has been that farmers' terms of trade have declined over this period by more than 60 per cent.

Changing rural land owner demographics

A recent study by Mendham and Curtis (2007) focused on the changing nature of the ownership of rural land and sought to identify existing mixes of and behavioural characteristics of rural land owners as well as predicting future turnover rates of ownership. The paper focuses on data drawn from a case study of the Corangamite watershed of Victoria, and also discusses findings from innovative Australian research that analysed property sales records and spatially-referenced rural landholder survey data.

Large scale and increasing rates of turnover were identified with 50% of properties in the case study predicted to change ownership in the next decade, double the previous rate. New property owners were shown to be significantly different from longer-term landholders in that they owned smaller properties; were less likely to be farmers by

occupation; self-report lower levels of knowledge of land management; were more likely to value conservation over agricultural production; and were less likely to adopt recommended sustainability practices. The study concludes that the overall attraction of rural amenity has driven the trend of much higher turnover in rural property ownership.

A recent report by Land and Water Australia (2005) examined trends in the demographic structure of Australia's farmer population for the period 1976 to 2001. The report notes that:

- after a long-term trend of declining farmer numbers through much of the 20th century, in the past two intercensal periods (1991-2001) this decline has slowed and then almost stopped;
- since 1981 the average farmer age has been steadily increasing; and
- the average age of new entrants to farming has risen from 34 to 39.

These trends in the shedding of young people from agriculture are not expected to be reversed in the foreseeable future. Modelling of the continuation of current behaviour suggests the increasing average age of farmers will peak between 2011 and 2015. Beyond this period there may be a small and gradual reduction in median farmer age as baby boomers leave farming. Farm populations continue to decline in broadacre farming regions, however this trend is not always reflected in horticulture intensive regions with some evidence pointing to increases in recent years[3]. In high amenity regions (most likely to be peri-urban areas) the future of the farm population is less clear, with evidence that farm populations have already begun to increase in some locations.

The changing nature of work practices

Governments and businesses now outsource work that was previously conducted in-house to new firms of specialists and consultants, and employment has become more short term and precarious. A significant proportion of the full-time workforce is now on contracts. Most people no longer hold 'a job for life' and people now move jobs and careers more frequently than previous generations. Changes in employment have also been characterised by an increasing trend towards part-time and casual labour, as well as contract consultancies. In many rural businesses hired farm labour has either been replaced by family labour or improved technology, and some farms are relying on non-agricultural income to remain viable (Tonts, 1999; McKenzie, 1997 as cited by Buxton et al 2006).

Increased demand for improved lifestyle and leisure facilities

Economic growth and rising affluence, due in some part to Competition Policy reforms (Banks 2000), have meant that higher individual disposable incomes are driving an increased demand for leisure and recreation often in the form of increased demand for second homes and weekenders. In addition to development pressures, these demands create pressures on land prices with flow-on impacts on property rates and taxes (Buxton et al 2006).

[3] J. Davis (2008) Pers. Comm..

3.3 Environmental

The attraction of 'rural character' referred to by Sinclair (2003) in areas of visual amenity and resources, which is inherent in the natural environment of an area, has been a driver of change and growth in peri-urban areas for many years. Technological advances amongst other factors have increased this attraction in recent times.

Historically, this 'organic growth' in peri-urban communities of this nature led to increased subdivision and environmental impacts and conflicts. This in turn led to governments introducing stronger controls e.g. Dandenongs near Melbourne; Adelaide Hills in South Australia and so on (Buxton et al 2006). Strong growth in the coastal strips surrounding Brisbane and Sydney is now placing development pressures on hinterland areas also.

The competition for resources such as water continues to drive change, particularly since the introduction of water trading in Australia. In recent drought conditions southeast Queensland's peri-urban areas have struggled and agricultural users have lost out to urban users when water became a scarce resource. This scarcity can act as a constraint on peri-urban growth and will be a source of further conflict in the immediate future.

Soil characteristics such as salinity and soil erosion also impact on the growth capacity of regions. The overall drain on catchment water resources by peri-urban farming combined with rural residential and extractive industries is impacting on the sustainability of peri-urban areas (Buxton et al 2006).

3.4 Technological

Technological advances have served to produce a new class of worker which Buxton et al (2006) refer to as 'telecommuters' i.e. 'a person who, on a part time or full time basis, works from a home office and dials into a workplace or many work places'. Telecommuting from high amenity peri-urban areas is most attractive to home-based businesses and data shows growth is significant. Such businesses have grown by some 400 percent in the last decade in Victoria, and that growth has been strongest in high amenity parts of the peri-urban area (RPD Group, 2004 as cited by Buxton et al 2006).

Home based businesses make up a very large proportion of the total small business population in Australia, to the extent that in June 2004, it was estimated that 67.5% of all small businesses were home based, compared to 58.3% in February 1997. These businesses were operated by 1,040,000 people, representing 62.6% of all small business operators (Ali and Zeidan, 2007).

Technological advances have also transformed manufacturing, which has resulted in greater productivity with no increase in employment. Technology has generated demand for new types of employment which are linked to the new technologies (Beed 1981:153 as cited in Buxton et al 2006). Hence the manual labour aspect of work has been replaced to a great degree with process and packing line jobs.

3.5 Cultural

Murphy (2005) cites a recent paper by Freestone, Murphy and Jenner (2003) which reports among other things that the number of small urban places increased by 409 between 1954 and 1996, urban centres became more functionally diverse, and places orientated to tourism, leisure and lifestyle became more important. The increase in numbers of centres reflects growth in the peripheries of metropolitan and regional centres,

coastal growth, and new resource developments. Numerous localities with populations too small to be defined as urban centres have grown to a level where they are so classified. The traditional view held in Australia and elsewhere had previously been that migration was driven by job opportunities or relocations.

Rudzidis (1999 as cited by Budge 2005) found that in the USA, employment was the driver for relocation in only 23% of the cases that he surveyed. Social and environmental factors accounted for 42% of the cases and the physical environment the remaining 35%.

Other cultural drivers of significance in the literature, which are linked together under this theme of non-economic migration, are lifestyle and 'downshifting'. Downshifting is actually defined more by its reduced income characteristic, which is chosen in favour of family time and a generally more relaxed lifestyle (Breakspear and Hamilton 2004).

3.5.1. Languages other than English (LOTE) communities

An area of significant influence on growth and change in horticulture production in peri-urban areas, particularly those in peri-metropolitan contexts, is intake of migrants into Australia. A number of studies have been done on various aspects of Language Other Than English (LOTE) communities in Australia. Data from these studies suggests that up to 80% of vegetable producers in peri-urban NSW are from LOTE backgrounds, with 39% of the estimated 4,390 growers across Australia falling into the LOTE category (Step Communications 2005).

The vegetable industry has attracted migrants in large numbers throughout Australia's history, and this trend continues today. There was a rapid increase in Australia's population after the Second World War, with many Greek, Italian, Maltese and Macedonian migrants entering the horticulture industry. Communities that remain strongly established today include growers of Italian background in Melbourne, Shepparton and the Burdekin.

From the late 1970s up until the late 1980s, Australia's migrant intake shifted to Asian and Middle Eastern countries, with large intakes of refugees from countries including Vietnam, China, Cambodia and Lebanon. This pattern was again reflected in the vegetable industry with large numbers from each of these countries present today (Step Communications 2005).

The Rural Industries Research and Development Corporation (RIRDC) Asian Foods Program estimates that the gross value of production of this sector alone is $150 million, with more than 1,500 growers around Australia and is growing at over 10% per annum. RIRDC also reports that 'the majority of this production occurs in peri-urban areas and many small-scale market gardens are operating within metropolitan areas giving rise to peri-urban issues such as farm noise, spray drift, urban encroachment & biosecurity' (RIRDC, 2007).

The interaction between the urban migration population made up of 'downshifters', 'telecommuters' and the like with the peri-urban horticulture grower who may be from a LOTE community gives rise to some major challenges for planning and policy makers, not the least of which is effective communication across these disparate groups.

4 Australian legislative and policy context

Legislative control of planning and development of land in Australia rests with the three levels of government: federal, state and local. Generally, the major legislative control is at the state government level and is administered by the various state departments of planning (or similar) but with many of the functions of the legislation performed by local governments.

In addition to planning legislation per se, there are various other pieces of legislation and numerous policies and guidelines which guide planning and development. Each state has differing legislation, policies and guidelines which add to the complexity of understanding peri-urban planning.

Buxton et al (2006) state that there is no coherent or co-ordinated planning framework between the differing government authorities for peri-urban regions and that this results in insufficient strategic thinking on spatial matters, inadequate policy development and failure to act on key concerns (p. 233).

The following provides an overview of the legislation, policies and guidelines of each level of government, with emphasis on peri-urban planning.

4.1 Federal legislation

The major areas of Federal government legislation that impact on the planning process concern the protection and conservation of natural resources and heritage that are considered to be of national importance. The key federal acts relating to natural resources are shown in **Table 3**

Table 3 Federal legislation

Legislation	Issues to consider
Australian Heritage Council Act 2003	If regions have National Heritage, Commonwealth heritage and National Estate listed properties they need to comply with the Act.
Environmental Protection and Biodiversity Conservation Act 1999	The seven matters of national environmental significance to which the EPBC Act applies are: ▪ world heritage sites; ▪ national heritage places; ▪ wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed); ▪ nationally threatened species and ecological communities; ▪ migratory species; ▪ Commonwealth marine areas; and ▪ nuclear actions.

Buxton et al (2006) state there are three ways that the Federal Government can affect land and land use: by direct legislation (as above); by co-operation and agreement with the states (and local government), and by using its funding powers. An example of a means for co-operation and agreement in land use planning is the establishment of the Local Government and Planning Ministers Council (LGPMC). The Council has agreed to a number of key strategic planning priorities relevant to peri-urban regions, including the need to:

- work towards more economically, socially and environmentally sustainable towns and cities;
- address the implications of population and demographic change for infrastructure supply and demand; and
- promote integrated land use and transport planning.

4.2 State legislation

Each state and territory in Australia has overriding legislation governing the planning process for that state and territory. The name of the instruments may vary in each state, but the objectives with respect to land use planning are generally similar. There are numerous other state laws covering other aspects of land use (native vegetation, water management, national parks and wildlife, protection of the environment, pesticide use) but these are too numerous to list within the scope of this document.

The states also have a range of policies, strategies and guidelines regarding land use planning that have been developed as a requirement under the planning legislation or to assist local governments to complete their responsibilities.

Table 4 lists the relevant planning legislation for each state plus the objectives of the legislation that relates to peri-urban land use.

Table 4 State legislation

Legislation	Objects related to peri-urban planning
NSW ***Environmental Planning and Assessment Act 1979***	To ensure, promote or coordinate: ▪ the proper management, development and conservation of natural and artificial resources, including agricultural land, for the purpose of promoting the social and economic welfare of the community and a better environment; ▪ the orderly and economic use and development of land; ▪ the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats; ▪ ecologically sustainable development; and ▪ the sharing of the responsibility for environmental planning between the different levels of government in the State.
Queensland ***Integrated Planning Act 1997***	To seek to achieve ecological sustainability by: ▪ coordinating and integrating planning at the local, regional and State levels; ▪ managing the process by which development occurs; and ▪ managing the effects of development on the environment.
Victoria ***Planning and Environment Act 1987***	To provide for: ▪ the fair, orderly, economic and sustainable use, and development of land; ▪ to provide for the protection of natural and man-made resources and the maintenance of ecological processes and genetic diversity; ▪ to balance the present and future interests of all Victorians; ▪ to ensure sound, strategic planning and co-ordinated action at State, regional and municipal levels; and ▪ to establish a system of planning schemes based on municipal districts to be the principal way of setting out objectives, policies and controls for the use, development and protection of land.

Legislation	Objects related to peri-urban planning
South Australia ***Development Act 1993***	To provide for proper, orderly and efficient planning and development in the State and, for that purpose: ▪ to establish objectives and principles of planning and development; ▪ to establish a system of strategic planning governing development; ▪ to facilitate sustainable development and the protection of the environment; and ▪ to advance the social and economic interests and goals of the community.
Tasmania ***Land Use Planning and Approvals Act 1993***	The Act requires: ▪ sound strategic planning and co-ordinated action by State and local government; ▪ a system of planning instruments to be the principal way of setting objectives, policies and controls for the use, development and protection of land; ▪ that the effects on the environment are considered and provide for explicit consideration of social and economic effects when decisions are made about the use and development of land; ▪ that land use and development planning and policy to be easily integrated with environmental, social, economic, conservation and resource management policies at State, regional and municipal levels; and ▪ a planning framework which fully considers land capability.
Western Australia ***Planning and Development Act 2005***	The Act establishes the Western Australian Planning Commission to advise on: ▪ the coordination and promotion of land use, transport planning and land development in the State in a sustainable manner; ▪ regional and local planning schemes, and amendments to those schemes, made or proposed to be made for any part of the State; and ▪ assistance to any body or person on land use planning and land development and in particular to local governments in relation to local planning schemes and their planning and development functions.

Although the individual objectives of each of the above Acts differ, they have similar overall objectives that could be summarised as follows:

- promotion of ecologically sustainable development;
- a strategic planning approach (at regional and local levels) that considers a combination of economic, social and environmental issues; and

- integration of the planning process between the responsible agencies (especially local government).

The legislation generally allows for both regional and local environmental land use plans to be developed. The planning of peri-urban land is guided by a range of instruments within the legislation including:

- zoning of land, including rural lands;
- subdivision and development in rural zones; and
- minimum residential allotment sizes within zones.

While the various state land planning Acts provide what appear to be suitable directions to enable the orderly planning of peri-urban land, the implementation of the legislation is complex because of the many policies and guidelines which form part of the legislation.

For example, in NSW the legislation provides for numerous policies known as State Environmental Planning Policies (SEPP) on a range of issues. The most pertinent with respect to peri-urban lands is the newly created SEPP (Rural Lands) 2008. The principles (abridged) of this Rural Lands SEPP are as follows:

- the promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas;
- recognition of the importance of rural lands and agriculture in the area, region or State;
- in planning for rural lands, to balance the social, economic and environmental interests of the community;
- the identification and protection of natural resources and having regard to maintaining biodiversity;
- the provision of opportunities for rural lifestyle, settlement and housing;
- the consideration of impacts on services and infrastructure; and
- ensuring consistency with regional and local strategies.

The principles of this SEPP align well with the NSW Department of Primary Industries' Policy for Protection of Agricultural Land (2004) which states that environmental planning instruments should be structured to:

- promote the continued use of agricultural land, particularly prime crop and pasture land, for commercial agricultural purposes, where that form of land use is sustainable in the long term;
- avoid land use conflicts;
- protect natural resources used by agriculture;
- protect other values associated with agricultural land that are of importance to local communities, such as heritage and visual amenity;
- provide diversity of agriculture opportunities, including specialised agricultural developments, at appropriate locations to provide scope for development in rural areas; and
- allow for value adding and integration of agricultural industries into regional economies.

State planning legislation generally allows for the development of regional plans which enable a cross-sectoral approach to planning and development. This enables policy development and implementation to be undertaken as close as possible to local communities, but consistent with agreed objectives at the regional, state and national levels (Spiller, 2004).

An example of a regional approach is the South East Queensland Regional Plan 2005-2025[4], the first statutory regional plan for the state, which is binding on all local governments in the region and on all state government agencies.

4.3 Local Government

Within each state there are many local governments (also known as local councils) that have a range of responsibilities, including land use planning. There are 579 rural or regional local councils in Australia (Buxton et al 2006), with the powers of the local governments defined by their respective state (N.B. Queensland reduced the number of local councils from 156 to 72 in 2008 by a process of amalgamation).

From a planning perspective, local governments are responsible for preparing plans which determine land use within their boundaries. These local plans are named differently in each state, for example Local Environmental Plans in NSW, Planning Schemes in Queensland and Victoria, and Development Plans in South Australia. Local plans guide planning decisions through zoning and development controls which then allow councils to supervise the ways in which land is used. Development control plans provide specific, comprehensive requirements for certain types of development or locations (www.planning.nsw.gov.au).

Zoning is the main tool used in land use planning within the local plans. All land in a local government area is designated as a specific zone such as rural, residential, industrial, business or environmental. The plan provides a description of land use within each zone including:

- objectives of the zone;
- permitted (with or without consent) or prohibited development within the zone; and
- subdivision, including minimum lot size for a dwelling.

With respect to preserving land for agricultural or horticultural purposes, zoning and minimum lot size are two important policy tools. Any changes to existing local plan provisions need to be subject to community consultation and be approved by the relevant state minister.

The preparation of plans by local governments enables specific local elements to be considered in the planning process. However, the proliferation of relatively small local government units leads to fragmentation, inefficiency and uncoordinated development (Forster, 1999).

[4] The draft rural strategy component was released in 2008 (J. Davis pers.comm.)

5 Policy responses

The literature on peri-urban planning in Australia points to a cumulative decline in the capacity of the various levels of government, government agencies, and the landholders themselves, to deal with the complexity and rapid rate of change in the peri-urban regions. Buxton et al (2006) address the issue in strong terms:

> *Governments at all levels in Australia have not recognised the need to integrate natural resource management and land use planning institutional arrangements and policy responses to issues. Even the various natural resource management institutional elements often operate in isolation from each other within the same government. Water, forestry, agriculture, public land, catchment management, land protection and land use legislation is not well integrated and is administered in a disconnected manner. Inadequate linkages exist between local government and state government decision-making processes. Governance arrangements do not respond adequately to needs. The progressive impacts of small decisions from inadequately related sectoral agencies is now exerting serious consequences (p215)*.

This fragmented institutional situation is also a factor in planning policy responses to agriculture in the peri-urban regions as the traditional approach of separate, and sometimes unrelated, planning policy for rural and urban uses adds further complexity. The concept of agricultural land 'awaiting urban development' via an ad hoc process of conversion is often regarded as an inevitable outcome of population and economic growth (Sinclair 2003, Daniels, 1999; Mattingly, 1999a, 1999b; Bunker and Houston, 2003 as cited in Buxton et al 2006).

As a result of this uneven approach a contingent of planners, agriculture departmental staff and farm and conservation organisations have been calling attention to what they see as the ad hoc depletion of a 'scarce resource' which may ultimately result in a food security issue for consumers in Australia (Houston 2005). Not surprisingly, much of the literature that specifically addresses policy responses to peri-urban issues and agriculture tends to carry an overarching assumption that the protection of agricultural production should be the guiding principle behind the policy. However the Centre for Rural and Regional Innovation – Queensland ('CRRIQ') suggests that the policy approach used in achieving this outcome diverges into two major streams of thought:

- *preservation and environmental conservation programs*. These have the support of the greater population because they promote environmental best-management practices and maintain scenic amenity; and
- *increased profitability of farming* is required to attract new farmers, induce investment and encourage established farmers not to abandon their existing operations. This implies increasing the intensity of the farming enterprise, thereby potentially decreasing the visual amenity of the landscape (Gardner, 2002 as cited by Armstrong et al 2005).

This section of the review will initially present an overview of each of the major policy options followed by an analysis to assess and compare these tools in an Australian context.

5.1 Australian policy options

The formation of land use planning and policy in peri-urban Australia emanates to a great degree from the legislative and governance arrangements in place, which were outlined in Chapter 4 of this review. The responsibilities for land use policy making and regulatory controls that apply between the various government jurisdictions in Australia are essentially in the hands of each of the six Australian States and are largely delegated for administration and implementation purposes to a myriad of local government authorities. The approaches to planning, management and policy development in the peri-urban area, as undertaken by each of the State jurisdictions, have largely been reactive measures centring on land use conflict resolution and single purpose resource management (Buxton et al 2006).

Buxton et al (2006) suggest that the focus by the states has generally been on strategic and statutory land use planning initiatives within the framework of state-wide resource management and metropolitan growth management policies. The peri-urban area has not been seen as an issue prompting its own specific planning and policy responses.

Peri-urban areas in Australia are mainly adjacent to the metropolitan centres and as such, metropolitan planning approaches impact heavily on these areas. Table 5 summarises the various state government approaches to planning with specific reference to their treatment of agricultural land in the 'peri-metropolitan' fringe.

Table 5 State government approaches to protecting productive agricultural land around each of the major metropolitan areas

City & population	Planning approach used
Sydney 4.5m	Strategic plan for sustainable agriculture in the Sydney region. Sydney metropolitan strategy commenced. No specific recognition of agricultural areas to date. Sydney - Canberra Corridor Strategy also now commenced.
Melbourne 3.5m	Green Wedges Legislation as part of Melbourne 2030 Strategy defines urban growth boundary with restrictive zones outside the boundary
Brisbane & S.E. Qld 1.8m	South East Queensland Strategy provides for agricultural land protection through state policy
Perth 1.4m	Metropolitan Strategy - agricultural priority management areas established
Adelaide 1.2m	Metropolitan strategy provides for restrictions on urban encroachment into agricultural areas

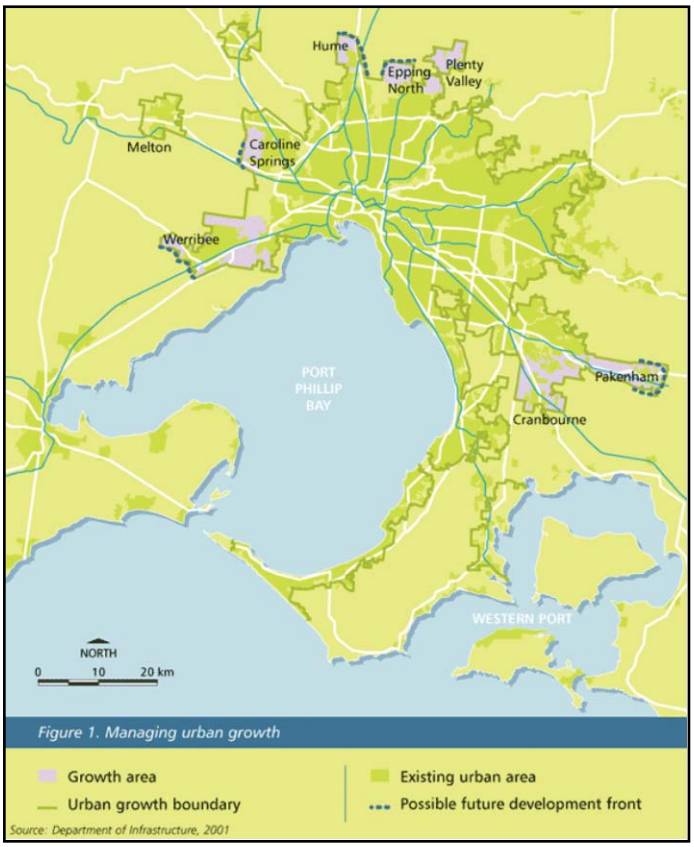
Source: Budge (2007)

An example of a state government approach to addressing peri-urban issues in the metropolitan context is the Melbourne Urban Growth Boundary (UGB). Figure 4 presents the urban growth boundary set for Melbourne, which indicates the long-term limits of urban development and where non-urban values and land uses should prevail. The boundary essentially follows the existing boundary defined by urban zones and growth

strategies for the majority of the urban areas in metropolitan Melbourne. There will be some potential for it to be altered in designated growth areas (Armstrong et al 2005).

This is viewed as a tool to manage the city's outward growth better, by channelling development into designated growth areas and away from areas that need to be protected. Future growth on Melbourne's edges will be channelled into these growth areas (Department of Sustainability and Environment, 2003 as cited by Armstrong et al 2005). Once the UGB has been settled by the Minister, it will be permanent. Modifications will only be considered in designated growth areas following an assessment of housing needs and a review of growth area plans or, if applied to smaller towns and settlements.

Figure 4 Melbourne's Urban Growth Boundary



Source: Armstrong et al (2005)

The three most common approaches to managing land use in peri-urban Australia are legislation, zoning and compulsory government acquisition of land for preservation reasons. These will be covered in the following sub-sections.

5.1.1 Legislation

Legislative approaches in Australia range from strongly regulatory, with high levels of government involvement ('right to farm' for example) through to weak and advisory in nature with low-level government intervention (advisory policies on protection of agricultural land use). In areas where tight regulations are introduced there is often a backlash from constituents, and for this reason many regulatory authorities avoid the use of such tools. Not surprisingly, the most persistent opponents to use of regulatory

mechanisms tend to be farmers and owners of large lots with development potential (Buxton et al 2006).

Not all legislation achieves a slowing in the rate of conversion of agricultural land, some legislation actually facilitates development and is therefore considered permissive and a weak form of control. Even so called strong legislation such as 'right to farm' can result in the demise of farming in peri-urban areas because of weak guidelines or ineffective zoning controls e.g. 'right to farm' legislation which codifies the use of elements such as subdivisional rights over portions of farms (Buxton et al 2006).

Sinclair (2003) questions the effectiveness of 'right to farm' legislation because, in his view it does not address the overall issue of incompatible land uses in a proactive way and fails to address 'both sides of the problem' i.e. the farmer is able to continue operating due to his 'protected status' under the legislation, but the other landholders have not solved their amenity issue.

5.1.2 Zoning

Zoning is used to divide local government areas into different sectors with restrictions on types of use. Land use zoning entails placing restrictions on the use of the land by way of statute. This is the principal method for controlling the development of land in Australia. Land is designated for a principal use and uses not considered to be suitable or compatible with the principal use are prohibited (Sinclair, 2003).

Many zones are of a weaker nature in that they contain few prohibitions and allow a wide range of uses without the need for permits, or allow uses to be considered by a planning authority. Often zones are written intentionally to promote development. Other zones can be highly regulatory, such as those which restrict land uses and subdivision. Zones may be inclusionary or exclusionary. Exclusive farmland zoning and zoning for large lot sizes have commonly been used in attempts to protect agricultural land from development. Such zoning measures highlight the limitations of this form of regulation. Zoning is reactionary, that is, it can prevent or even facilitate uses, but cannot make them occur. Zoning can, however, prevent perceived undesirable land uses and in this way can be used to retain the possibility of alternative future options in keeping with the precautionary principle and the principle of intergenerational equity. This is an often-underestimated advantage of zoning (Buxton et al 2006).

5.1.3 Compulsory land acquisition

Compulsory land purchase for open space and other purposes, and the compulsory transfer of financial gains from one source to a different outcome are also used for land use development controls. Governments occasionally compulsorily purchase future urban land at rural prices to prevent private profit accruing from the rezoning of land to a more intensive use, and to transfer the increase in value to public purposes. An example of this is the City of Canberra, which was developed using this model (Buxton et al 2006).

Table 6 presents a summary of some of the more common policy tools used in Australia with some specific local examples listed. Some of the tools such as transfer of development rights, conservation of agricultural easements and urban growth boundaries are referred to in more detail in the following 'International policy options' section. Appendix 'A' presents an analysis and comparison of these and all international policy options that are referred to in this review.

Table 6 Summary of policy tools currently used in Australia*

Approach	Policy tool	Examples of Australian usage
Financial incentive	Rating concessions to keep agricultural land in production	Beaudesert, Kilcoy, Moreton municipalities (near Brisbane)
	Land value concessions where the basis for rates etc. is the market value of land.	
Legislative protection	Urban growth boundary	Melbourne; Brisbane
	'Right to farm' – removes common law right of neighbours to sue farmer for farming activities	Tasmania (Primary Industry Activities Protection Act 1995)
	Dispute resolution process for conflicts over adjacent land uses	WA – Agricultural Practices (Disputes) Act 1995
	Regional plans or planning authorities to protect environmental and amenity character	Swan Valley Planning Act (1995) in WA; Upper Yarra and Dandenong Ranges Strategy Plan (Melbourne) in Planning and Environment Act (1987)
	Conservation/agricultural conservation easements	Victorian Conservation Trust Act (1972)
Community title (Multiple Occupancy)	Alternative subdivision allowing for clustering of residences with the remaining land used for agriculture etc.	In ACT and WA policy documents but implementation more controversial
Tradeable or transferable development rights	'Title rights' – created to encourage consolidation of rural allotments (and subdivision in targeted area)	Mount Lofty Ranges, South Australia
	Dwelling Application Transfer Scheme – to limit residential development in rural areas (and allow it in designated area)	Adelaide Hills, South Australia
Service funding Arrangements	Development contribution plans	Melbourne; Sydney

*Adapted from Buxton et al (2006)

5.2 International policy options

In the international planning and policy arena much work has been done in developing approaches to manage peri-urban land use, much of this being in North America. A variety of planning responses to urban growth pressures and land management issues in peri-urban areas has been developed involving a mixture of land use planning, policy, and institutional and legislative initiatives. Options include market approaches, intervention, voluntary and community based measures, or a mixture of these. Within each option an array of responses is possible (Buxton et al 2006). The main planning interventions are through the use of statutory and strategic tools which will be outlined under the following broad categories:

- regulatory mechanisms;
- market based mechanisms; and
- voluntary mechanisms.

The intention of this section of the review is to summarise a few selected options, which are more widely used in the international arena, and then to follow this with an analysis and comparison of these.

5.2.4 Regulatory mechanisms

The major regulatory options used in the international arena are:

- 'right to farm' laws;
- urban growth boundaries;
- agriculture protection zoning; and
- executive orders.

International evidence suggests that properly applied, they do work to achieve their main objectives, such as the separation of rural from urban land uses, the containment of urban areas and the orderly release of urban land.

Four common criticisms of regulatory policies for urban growth boundaries and green belts are that: they do not achieve stated outcomes (Rydin and Myerson, 1989 as cited by Buxton et al 2006); market forces are a more efficient method of allocating land use (Gordon and Richardson,1997 as cited by Buxton et al 2006); they lead to undesirable effects, such as land price increases and lower housing affordability; and their inflexibility prevents adaptive management of land.

'Right to farm' laws

In response to a National Agricultural Land Study, which found high rates of farmland conversion across the country, the US implemented the Farmland Protection Policy Act which contained 'right to farm' laws. This Act was designed to minimize the impact Federal programs have on the conversion of farmland to non-agricultural uses (Armstrong et al 2005). 'Right to farm' laws are designed to accomplish one or both of the following objectives:

- to strengthen the legal position of farmers when neighbours sue them for private nuisance; and
- to protect farmers from anti-nuisance ordinances and unreasonable controls on farming operations (American Farmland Trust 1998).

The US has a plethora of 'right to farm' laws which are enacted at state and local government level, some of which are based on state agriculture agency policy statements which detail the importance of agriculture to the region (American Farmland Trust 2008). Some of the local ordinances require that a notice be placed on the deed to all properties in agricultural areas, cautioning potential buyers that they may experience noise, dust, odours and other inconveniences due to farming and ranching operations.

Urban growth boundaries

Urban growth boundaries are a form of urban containment policy that are designed to control urban development beyond a well-defined limit. UGBs are a planning tool that can be combined with other mechanisms such as designated zones (Dawkins, 2002 as cited by Armstrong et al 2005). If established in a proper manner, an urban boundary will lead to certainty in the minds of decision-makers and landholders. There will be greater predictability and direction in planning at the local and regional levels, and most importantly, protection of agricultural/rural land (Armstrong et al 2005).

The two main factors influencing this differentiation between urban and non-urban land are clarity in prohibiting urban related uses on rural land, and the supply of land reserved for urban purposes. The clearer the demarcation between urban and rural land, and the more land available for urban purposes within the UGB or elsewhere (such as satellite towns or regional centres), the more successful a UGB is likely to be in preventing the conversion of rural land for urban purposes (Buxton et al 2006).

Agriculture protection zoning

Agricultural Protection Zoning ('APZ') is used in the US to designate areas where farming is the primary land use, and discourages other land uses in those areas. This type of zoning refers to county and municipal zoning ordinances that support and protect farming by stabilizing the agricultural land base. APZ limits the activities that are permitted in agricultural zones. The most restrictive regulations prohibit any uses that might be incompatible with commercial farming (American Farmland Trust, 2008).

In most states, APZ is implemented at the county level, although towns and townships may also have APZ ordinances. Zoning can be modified through the local political process. Generally, the enactment of an APZ ordinance results in a reduction of permitted residential densities in the new zone (American Farmland Trust 2008).

APZ differs from the Australian zoning model only with respect to the degree of legislative strength, and prescriptiveness regarding the definition of agricultural use.

Executive orders

US State executive orders are policy statements issued by governors to accomplish specific purposes. They may be advisory or carry the full force and effect of law, depending on the state. Governors from at least nine US states have issued executive orders directing state agencies to avoid contributing to the conversion of agricultural land.

State executive orders are used to build public and institutional support for other farmland protection programs in the US. By restricting the use of state funds for projects that would result in the loss of agricultural land, executive orders also can influence the actions of local governments. These appear to be similar in nature to a State Government policy statement e.g. 'Protection of agricultural land', NSW DPI 2004.

5.2.5 Market based mechanisms

Proponents of the market-based approach to planning in the US are highly critical of current systems. Staley and Scarlett (1997) refer to surveys of the impact of zoning and other land-use controls which suggest local regulations add 20 to 30 percent to the cost of housing. They also state that planners are so absorbed by process and implementation that they spend little time on larger, strategic issues. A survey of 178 California cities, for example, found that land-use permit-processing and rezonings account for almost 60 percent of planners' time. They go on to say:

> *Planning that relies on end-state prescriptions and unbounded political intervention into landowner choices, even where tangible impacts are not apparent, is both costly and incompatible with dynamic economies. Market-oriented planning offers both greater predictability and greater flexibility so that communities can evolve as economies and consumer preferences change over time (Executive Summary).*

Some key examples of market-based tools are:

- transfer of development rights;
- purchase of development rights; and
- taxation relief.

Transfer of development rights

Transfer of development rights ('TDR') programs allow landowners to transfer the right to develop one parcel of land to a different parcel of land. Generally established through local zoning ordinances, TDR programs can protect farmland by shifting development from agricultural areas to areas planned for growth.

Successful TDR programs have been established where:

- there is a supply of development rights from donor sites and a demand for the transferred right. (This demand may be at a specifically identified recipient site such as an adjacent lot owned by the donor or a wider transfer area);
- the donor and recipient sites or areas are clearly identified;
- there is no bias towards recipients or donors through unfair valuation of TDRs;
- the scheme is simple to administer and are legally supported; and
- the scheme recognises the self-interest of all parties involved such that market transfers are encouraged (Brockhoff, 1996 as cited by Armstrong et al 2005).

Purchase of development rights

Purchase of development rights (PDR) is interchangeable with the term 'purchase of agricultural conservation easements'. PDR programs pay farmers to protect their land from development. Landowners voluntarily sell agricultural conservation easements to a government agency or private conservation organization. The agency or organization usually pays them the difference between the value of the land for agriculture and the value of the land for its "highest and best use", which is generally residential or commercial development (American Farmland Trust 2008).

This means that the landowner has the opportunity to realize the economic benefits accrued from the development potential of the land, whilst being able to retain the land for agricultural production (Armstrong et al 2005). PDR is voluntary and non-regulatory.

Taxation relief

Taxation is used as both an incentive and a deterrent in various countries in the management of land in peri-urban areas. In the US, tax is often used as a type of incentive and is linked with other planning tools such as TDR, PDR and so on. The two major forms of tax relief are:

- circuit breaker; and
- differential assessment.

Circuit breaker - tax programs offer tax credits to offset farmers' property tax bills. Like differential assessment laws, circuit breaker tax relief credits reduce the amount farmers are required to pay in taxes. This could be compared to Australian rate rebates or tax deductions in return for entering into conservation covenants on a property. In Michigan, Wisconsin and New York, farmers may receive state income tax credits based on the amount of their real property tax bill and their income. The key differences between the programs are that most circuit breaker programs are based on farmer income and are funded by state governments (American Farmland Trust 2008).

Differential assessment - laws direct local governments to assess agricultural land at its value for agriculture, instead of its full fair market value, which is generally higher. Differential assessment laws are enacted by states and implemented at the local level. With a few exceptions, the cost is borne at the local level. Every state in the US except Michigan has a differential assessment law. Differential assessment is also known as current use assessment, current use valuation, farm use valuation, use assessment and use value assessment (American Farmland Trust 2008). This is similar to the principle employed by local governments in Australia which assess rates based on either use or zoning of land i.e. in Western Australia 'rural use land' is assessed at unimproved value whereas 'non-rural use land' is assessed at rental value.

5.2.6 Voluntary mechanisms

The major policy options reported in the literature, which are of a voluntary nature, are:

- agricultural district programs;
- community supported agriculture; and
- industry-driven strategic planning approaches.

Agricultural districts

Agricultural district programs allow farmers to form special areas where commercial agriculture is encouraged and protected. Typically, programs are authorised by state law and implemented at the local level. Enrolment in agricultural district programs is voluntary. In exchange for enrolment, farmers receive a package of benefits, which varies from state to state (American Farmland Trust 2008) and can include:

- lower property rates
- exemption from local regulations that restrict farming practices
- eligibility for agricultural conservation easement purchase programs
- limitation on compulsory acquisitions of land for infrastructure, and
- limits to non-farm developments (Rechenberg-Dupe, 2000 as cited by Armstrong et al 2005).

Community supported agriculture

The community supported agriculture ('CSA') concept originated in the 1960s in Switzerland and Japan, where consumers interested in safe food and farmers seeking stable markets for their crops joined together in economic partnerships. Called "teikei" in Japan, it translates to "putting the farmers' face on food".

CSA is a partnership of mutual commitment between a farm (producer) and a community of supporters (consumers) which provides a direct economic and social link between the production and consumption of food. Although CSA's take many forms, the essence is that supporters cover all, or part of a farm's yearly operating budget by committing to purchasing a share of the season's harvest in advance (Food Connect 2008).

Usually a CSA enterprise has one producer. However, it is possible to have several farmers involved. There are over 1,000 CSA enterprises in the USA and numbers of customers vary between 10 and 700. In Australia the concept is not well known, and only a few CSAs exist (Victoria DPI 2007). However, interest in this concept is increasing.

CSAs create a direct economic and social partnership between food producers and local community members. This form of agriculture strengthens connections between people in the community and between people and the land and as a result has the potential to address land use conflict issues in peri-urban areas.

Industry driven strategic planning approaches

In some areas of Australia, horticultural organisations have played a key role in initiating proactive strategic planning exercises which have involved the key stakeholders in the land use planning sector as well as the State primary industries agency. A recent example of this is the "Development of Horticulture Industries on the Adelaide Plains - A Blueprint for 2030", a 2007 project which involved local and regional council groups, the Primary Industry and Resources South Australia (PIRSA) and the Virginia Horticulture Centre which is an industry organisation which has a core representative role for Adelaide Plains growers and beyond.

The document clearly sets out the value and importance of the horticulture industry to the region and establishes a vision and strategic goals for expansion and ongoing viability whilst acknowledging the need to account for the pressures of urban encroachment. The rationale for the plan is clear:

> *"The Adelaide Plains needs a plan. This plan needs to be driven by a body that has an overview of the entire region, and of all industries. The plan must have strong planning guidelines that provide confidence for the horticulture industry to invest in the future, as well as provide guidance for other industries or competing land uses. It must identify and provide for infrastructure needs. The absence of a plan will see sporadic, uncoordinated investment and inefficient use of resources continue while the horticulture industry slowly retracts under pressure from urban development" (p8).*

The plan also makes specific recommendations with regard to development and land use planning:

> *"Coordinated development*
>
> *R1 The SA Government, local councils, Regional Development Boards and other stakeholders must support the existence and growth of the horticulture industry on*

the Adelaide Plains as a viable, valuable industry that contributes to the State's economy.

R2 A regional body is required to oversee the coordinated development of all industries within the region. This body needs to closely examine other successful examples of horticulture development such as the Salinas Valley, Netherlands and Werribee.

Land Use Planning

R3 The Virginia horticulture cluster should be preserved and expanded where production, packing, processing and support industries are located in close proximity.

R4 Land use zones must resist development of non-complying activities and all rezoning should be coordinated in line with the Planning Strategy.

R5 Planning for future horticulture zones and review of existing horticulture zones need to include consideration of allotment sizes for various types of horticulture businesses."(p9)

The value of a horticulturally focused approach relates to the need to differentiate the specific nature and characteristics of intensive horticulture from the traditional 'land area based' approaches to minimum lot size and zoning rationale. Enterprises involved in soilless hydroponic production or other non-land dependant production need to be treated quite differently to traditional extensive or even intensive agriculture.

Another example of strategic planning approach is the "Vision for Werribee Plains – the next step action plan 2004" which was produced by the Victorian Government Department of Sustainability and Environment in collaboration with Regional Development Victoria and the Werribee Plains Consultative Panel.

5.3 Analysis of policy options in an Australian context

Appendix A assesses the policy options presented in this review in order to provide the reader with some basis for a comparison of each and a basic guide as to where the option/s may fit in various contexts. It is vital for the reader to understand that there are a range of factors which will affect the relative suitability and applicability of these options to a specific situation. It is not realistic to expect policy options used in the USA for example to translate neatly into an Australian context.

6 Case studies

6.1 Australian examples

6.1.1 Peri-urban case study from South East Queensland

The School of Global Studies, Social Science and Planning, RMIT University is undertaking long term research into peri-urban areas in Australia together with a number of project partners. This research aims to help redress the relative lack of data and policy for Australia's peri-urban regions. Part of this program is a joint project between RMIT and Griffith University's School of the Environment funded by Land and Water Australia titled 'Change and Continuity in Peri-urban Australia'. This project has produced four monographs on peri-urban areas.

One of the monographs is a case study of the SE Queensland (SEQ) region which focused on the growth corridor to the west of the Brisbane-Ipswich metropolitan area towards the regional centre of Toowoomba. This area was once considered the 'salad bowl' of SEQ with significant areas of fresh lettuce, tomatoes, sweetcorn, potatoes and onions, as well as processing beetroot and fruit crops such as citrus. This study area contains some characteristics which are very relevant to many horticultural intensive areas in Australia and provides a depth of analysis which is not commonly available in the literature.

Major findings

Population dynamics

- The case study area experienced strong population growth (3.75% pa) in the 1980s which slowed (1.2% pa) in the 1990s, with recent data suggesting a resurgence in growth through the early to mid part of the 2000s.
- The population mix has changed with young adults exiting, the nature of employment moving away from purely manual labour to retail and manufacturing, and overall levels of disadvantage decreasing over the past 20 years.

Land use

- Residential (19%) and primary production (34%) are the two major land uses.
- Smallest group of lot sizes was less than 1 hectare (5.7%), and the largest group was greater than 40 hectares (36%). The vast majority is freehold land managed by private landholders, which will have a strong bearing on potential fragmentation of the area in future years.

Agriculture

- Number and size of agricultural establishments has been declining, whilst intensification of uses has led to greater production per hectare. The overall area of agricultural holding dropped as a percentage of SEQ from 39.8% to 26.4% during the 1990s. Crops such as lettuce have shown significant increases in yields, and highly intensive enterprises such as mushroom growing have increased by up to 98% in early half of the 90s.

- Other intensive uses such as turf and ornamental production have also increased. However, recent water shortages and urban encroachment have stemmed much of this growth.
- The location of the case study area in a rural region yet in close proximity to urban centres has brought new opportunities for equine lifestyle businesses as well as boutique wineries.

Biodiversity and biosecurity challenges

- Significant losses of habitat via clearing for pasture and subdivision has resulted in reduction in wildlife corridors in the region.
- Pests and weeds have become more widespread with pest animals including feral cat and dogs on the increase – continued peri-urbanisation by rural residential landholders will increase this trend.

Water quality

- Water quality has continued to be poor in the early half of the 2000s . The effects of increased rural residential development which relies on on-site sewage disposal is still to be clarified.
- The groundwater system has been long recognised as being over extracted and under stress. Again increasing housing densities especially where developments are sited over recharge areas has a negative impact on the system.

Land management skills of landholders

- Survey work has shown that whilst urban newcomers may have more time to manage natural resources on their properties their skills and experience may be lacking.

Key lessons from the SEQ case study

The key lessons from the case study include:

- Some specific agricultural industries have 'escaped' the attention of planners in the region e.g. the equine industry.
- The continued fragmentation and peri-urbanisation, which is likely to occur if multi-titled farms continue to be sold to non-farmers.
- The ability of the new ex-urbanites to manage the natural resource issues in the region is of concern.
- The cost, especially to the community, associated with the provision of infrastructure to peri-urban areas, specifically rural residential, needs urgent attention.

The study concludes that this 'peri-urban zone' has gradually stabilised to form a new style of community which overall has lifted the quality of life in the region, whilst at the same time presents some significant challenges for natural resource management and social integration for the future.

6.1.2 Case study – minimum lot sizes and subdivision for dwellings in rural areas

This case study has largely been extracted from a report titled “Review of Certain Planning Matters – Cowra Shire (2006). Report to the Honourable Frank Sartor MP Minister for Planning by an Independent Review Panel”.

In December 2005, the NSW Minister for Planning appointed an Independent Review Panel to review certain rural planning matters in Cowra Shire. The Shire is in the Central West region of NSW and relies heavily on agriculture as its main economic activity, but there is intense competition for the land resource upon which agriculture depends, including urbanisation, settlement, mining, forestry and other specialist primary production uses.

The review was prompted by concerns about management of agricultural land in the Shire which included:

- exclusion of class 3 land from the definition of prime agricultural land (contrary to state-wide practice);
- low subdivision standards for rural dwellings (40 ha) with high potential for land use conflict, loss/fragmentation of prime agricultural land, servicing costs and cumulative impacts;
- little practical distinction for subdivision controls between rural zoned land and rural small holding zoned land; and
- objectives of the rural zone were inherently in conflict as they were supposed to protect agriculture yet facilitated unplanned rural residential development.

It is considered that the above concerns had arisen from an earlier 1973 policy when the NSW State Government established a temporary State-wide subdivision minimum for rural land of 40 ha for a dwelling entitlement. The policy was in response to growing concerns about the fragmentation of agricultural land and the spread of lifestyle blocks in rural areas. It was recognised at the time that the 40 ha minimum had little practical relevance to commercial, sustainable agricultural enterprises or the degree of geographic, climatic or biophysical variability across NSW.

Despite the relatively low subdivision minimum of 40 ha, the Government felt that the new policy required ‘promotion’ and therefore the then State Planning Authority offered the opportunity for farmers to excise ‘concessional’ lots from larger holdings with the aim of providing dwelling entitlements to family members and farm workers.

Despite the NSW Department of Primary Industries recommending 400 ha as the minimum lot size for a dwelling in the rural zone, the 1990 Cowra LEP was gazetted with a subdivision standard of 40 ha on prime agricultural land, 2 ha on non-prime agricultural land, and one concessional lot per 40 ha of existing holding on prime agricultural land.

The Review found that subdivision of rural land had occurred in excess of demand for rural lifestyle development. At the time there were about 600 subdivided lots on Rural zoned land and about 700 lots available on lands zoned for rural lifestyle purposes, with the average uptake of these lots being less than six lots per year.

The submission to the Review by the Council’s Director – Environmental Services stated that rural residential development in the rural zone, particularly in areas removed from community centres, may lead to:

- irreversible loss of agricultural land;

- mounting conflicts between rural activities and rural residential dwellers;
- inadequate and costly servicing of rural residential subdivisions;
- loss of the rural landscape and its scenic appeal;
- poor property management;
- environmental degradation through loss of habitat, pollution and erosion;
- social problems including isolation from health, education and community services; and
- negative influence on agricultural productivity and employment; and higher and potentially non-viable agricultural land prices (p. 10).

The same submission also acknowledged there may also be positive aspects of subdivision including financial benefits to the owners and developers of the land, improved real estate markets, provision for wider appreciation of a country lifestyle, increased council rates and additional employment in service industries.

It should be noted that the submission by the Director – Environmental Services did not provide evidence of the above negative outcomes. In addition, many submissions from the community did not accept that harsh subdivision rules would lead to appropriate outcomes but would instead stifle development within the Shire, remove current 'rights' to which landholders are entitled, and preclude equitable succession planning for farming families.

The Review found that the large number of residents supporting the maintenance of a maximum lot size of 40 ha**:**

- did not fully acknowledge the extent of land use conflict with the current relatively uncontrolled subdivision of rural zoned land;
- did not fully acknowledge the high service costs of dispersed rural settlement;
- had an unrealistic understanding of Council's ability to control rural residential subdivision under the provisions of the then current Cowra LEP;
- did not offer solutions which are feasible to apply in the legal and social contexts of the relevant planning controls; and
- substantially downplayed the relevance of State Government policy.

As a result, the Review recommended to the Minister that the minimum lot area for a dwelling entitlement in the rural zone be set at 400 ha, and supported a 40 ha minimum lot size for intensive agriculture.

Although not stated in the Review at the time it was conducted, the minimum lot size for dwelling entitlements in rural zones in NSW was based on guidelines prepared by the NSW Department of Primary Industries. The guidelines recommended that minimum lot sizes for a dwelling take account of the size for a commercial agricultural holding for a locality based on an economic assessment of agricultural enterprises.

The application of these guidelines for determining minimum lot sizes was the subject of a further review – 'Review of Land Use Planning in the Central West'. The August 2007 recommendations from this review resulted in the SEPP (Rural Lands) 2008 that was discussed in Section 4.

Key lessons from the Cowra experience

The key lessons from the above case study include:

- zoning of land will not in itself guarantee that the objectives of the zone are achieved;
- minimum lot size for a dwelling depended on the definition of prime agricultural land which was open to interpretation;
- a generous provision for concessional lots resulted in fragmentation of agricultural land with the increased risk of land use conflict; and
- the approvals for subdivision were not based on an analysis of supply and demand for allotments.

6.2 International examples

6.2.1 Transfer of development rights - lessons from the United States

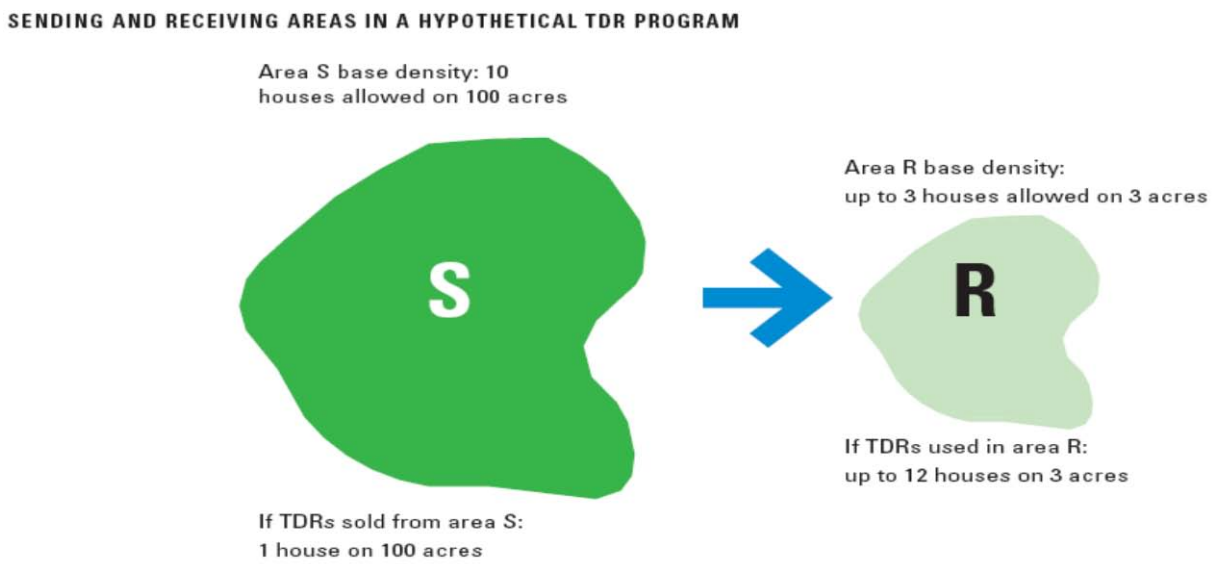
The task of regulating private land uses in the United States generally falls to local governments. Local governments in the United States regulate in a variety of ways, but the main tool used is zoning laws, which establish the allowable uses on particular parcels of land and the intensity of those uses. One planning tool that is used in combination with zoning is a system of transferable development rights (TDR). Figure 5 illustrates a basic TDR program, which is representative of the majority of such programs, used in the United States.

TDRs appear relatively simple, development is transferred from one location to another, but they have often been hard to apply in practice. Among the approximately 140 TDR programs in existence in the United States, program designs differ greatly, and the results have varied from virtually no transfers at all to preservation of 20,000 hectares (Walls and McConnell 2007).

Walls and McConnell (2007) conducted an evaluation of ten TDR s operating in the United States looking at design, implementation and outcomes from these programs. The programs included five in Maryland (Calvert, Montgomery, Queen Anne's, St. Mary's, and Charles counties), two in Florida (Collier and Sarasota counties), and programs in Malibu, California; King County, Washington; and Chesterfield Township, New Jersey. The programs focused on a range of land use goals, including farmland preservation, prevention of development on environmentally sensitive lands, and curtailing of sprawl.

Some have been effective and have preserved or protected land as intended, but others have not lived up to expectations. Their experience to date and the evolution of programs and innovative ideas provide useful lessons for other jurisdictions (including Australian areas) considering the use of TDRs. Walls and McConnell analyse each program, and describe its genesis, features, and outcomes, and evaluate the program design and assess reasons for success or failure.

Figure 5 Sending and receiving areas in a hypothetical TDR program



Source: Walls and McConnell (2007)

The two programs rated as being the most successful were in Calvert County and Montgomery County, Maryland. Both were initiated around 1980 and were designed to permanently preserve prime farmland, but they differ in important ways. Calvert County defined receiving areas very broadly to include residential and many rural areas across the county. In contrast, Montgomery County designated small receiving areas in residential areas over time to create demand for TDRs. Calvert's sending areas are all prime farmland in the county, and there was no initial downzoning[5] of these lands. Montgomery, by contrast, downzoned one large area in the north-western section to very low density but set a high TDR allocation rate. In Calvert, the entire parcel is placed under a conservation easement when the first TDR is sold; in Montgomery, landowners retain some residual development rights at the baseline density. This latter policy, which is typical of many TDR programs, has created problems in Montgomery County in recent years because the value of the retained development right is now quite high.

Key lessons from the TDR Program study

Walls and McConnell considered successful TDRs to share certain characteristics:

- receiving areas are broadly designated and use of TDRs is "by right"— no special approval by the board of county commissioners is required—tends to ward off complaints from existing residents over additional density;
- properties in the rural community districts (i.e. areas that contains a mixture of rural and low density rural residential zones) can be receiving areas; this bolstered demand for TDRs. Many TDR programs around the United States have willing sellers who cannot find buyers for their development rights because only high-density urban zones are eligible to be receiving areas. And

[5] 'Downzoning' is a US planning term which refers to lowering the allowable number of dwellings per hectare/acre i.e. development density.

hence the prospect of increasing this density does not appeal to local government and the existing urban community;

- the relevant county played an active role in providing information about the program and participating directly in the market to purchase and retire development rights. TDR sales data showed clearly that prices stabilized when the county began to participate in the market. Stable prices are critical to a well-functioning program; and
- the downzonings and changes in density bonuses that allowed developers to get back to pre-downzoning density limits by purchasing TDRs were very successful in bolstering demand. Also, because the downzonings were across the board, the county avoided creating winners and losers.

Walls and McConnell also report that, whilst TDR programs like the Montgomery County program have preserved significant areas of land in the United States, these programs can struggle to achieve their original aims over time because:

- there may be insufficient numbers of receiving areas. Individual planning areas have a great deal of latitude in determining the number and location for TDRs. Jurisdictions can be reluctant to absorb additional density.
- TDR buyers cannot use them by 'right'. The establishment of TDR receiving areas in planning areas and then the number of TDRs used by developers in each subdivision must be negotiated with planners and in public hearings. This takes time and resources and likely inhibits demand.
- prices for TDRs have failed to rise over time, in keeping with the return on alternative assets, and therefore potential buyers and sellers are not attracted to this as an investment. Prices can fluctuate primarily because of the uneven availability of receiving areas and the unwillingness of developers to use TDRs. A related problem with prices is the lack of information in some cases on both prices and TDR supply.

7 Conclusion

This literature review presents a broad coverage of the available data concerning peri-urban horticulture and the planning and policy approaches which are, or could potentially, be used both in Australia and overseas. As a literature review this paper does not seek to present recommendations on policy, but rather to outline the available options, in order to assist decision makers to arrive at well-informed and well-reasoned positions.

This review is designed to be used in conjunction with a 'tool kit' which will provide a series of short fact sheets outlining the key issues associated with peri-urban for those involved in policy making, as well as other interested stakeholders.

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Analysis of policy options presented in this review

Adapted from Buxton et al (2006), Armstrong et al (2005) and American Farmland Trust Fact Sheets (1998,2002,2008)

Tool	Characteristics	Advantages	Disadvantages
State, regional and local Strategic plans/ statements of planning policy	▪ Areas may be designated for future development, or for preservation, based on an assessment of trends and community needs.	▪ Effective for future land use and development can be outlined. ▪ Objectives can be clearly explained, analysed, options weighed up. ▪ Can give long term perspectives and aims. ▪ Can reflect community wishes where consultative process is undertaken. ▪ Low cost	▪ Quality can vary. Implementation processes and effectiveness can vary. ▪ Quality of data and analysis can vary. ▪ Tend to be advisory and lack regulatory 'teeth' to enhance implementation if not converted to LEP. ▪ Lack of resourcing of local government
Zoning	▪ Land is designated for a certain use (e.g. agriculture, rural residential, conservation) and planning scheme provision. ▪ Outlines land use objectives, permitted and prohibited development and conditions of performance criteria which must be met by those using the land.	▪ Comprehensive -administration is generally straightforward. ▪ Fits in with existing land use legislative frameworks. ▪ Can easily be used in combination with other policy tools ▪ Low cost.	▪ Consistency over the long term can be difficult, especially with changing governments and political agendas and commercial pressures. ▪ Can restrict rural enterprise flexibility. May reduce land values because development potential is lowered. ▪ Does not ensure farm viability.
Minimum subdivision size*	▪ Subdivision of land is not allowed below a certain minimum size, for example 40 hectares.	▪ Easy to administer. Clear and unambiguous	▪ If demand for rural residential development is high, exurbanites may buy larger block than needed and 'rural sprawl' can ensue. ▪ Doesn't ensure farm viability so can therefore lead to rigid broad acre pattern and sometimes contributes to environmental degradation.

Tool	Characteristics	Advantages	Disadvantages
Community title	▪ Land titles legislation can allow various forms of group ownership over land whereby housing allotments remain and clustered while the remainder of the land is held in common property.	▪ Efficient for servicing and infrastructure. ▪ Retains rural productivity by reducing fragmentation.	▪ Needs long-term commitment by landowners in relation to management of the common property. ▪ Experience to date suggests little community interest in such approaches to rural living ▪ Determination of minimum lot/subdivision size is not uniform or consistent. ▪ Basis for determination does not always account for off-farm income or non-soil based industries such as mushroom cultivation, hydroponics, and nursery production
Service funding arrangements	▪ Developers or purchasers of land contribute to costs of Infrastructure servicing or environmental protection.	▪ Can ensure adequate servicing of development. ▪ Market price of land can better reflect full costs of development.	▪ Difficult to assess or predict all environmental costs. ▪ Problems of long-term or cumulative costs of development.

Tool	Characteristics	Advantages	Disadvantages
Right-to-farm laws	▪ Local government equivalent of right-to-farm laws ▪ May be in form of notice to purchases of rural-residential land	▪ Simple and inexpensive to implement	▪ Does not ameliorate concerns of rural residential landholders – i.e. nuisance persists ▪ Does not remove financial gain to be had from developing land ▪ Unclear how effective tool is at local government level (no statutory force to prevent litigation between landholders) ▪ May place dispute resolution burden on councils rather than courts
Urban Growth Boundaries	▪ Utilises well defined limit to contain urban development	▪ Establishes certainty for planners and landholders ▪ Minimises need for other resource intensive land protection mechanisms ▪ Provides opportunity for infill development	▪ Complexity ▪ Need for cooperation between local governments ▪ Housing price impacts ▪ Transport congestion ▪ Lack of mapping data ▪ Community resistance to high-density housing

Tool	Characteristics	Advantages	Disadvantages
Agricultural Protection Zoning	▪ Utilises zoning mechanisms to designate areas where farming is the primary land use	▪ Certainty ▪ Minimal expense	▪ Inflexible ▪ Restricts innovation ▪ Requires accurate data for effective planning ▪ Restricts landowner ability to capitalise on their asset ▪ Affects land values
Executive Orders	▪ Form of policy instrument issued by the State government that directs state agency policies and funding ▪ May result in funding being withheld from activities resulting in farmland conversion	▪ Simple and inexpensive means of directing government focus	▪ Practical outcome questionable ▪ Variable in terms of carrying force of law i.e. may only be advisory.
Transfer of Development Rights (TDR)	▪ Development rights of agricultural landowners are sold to developers who wish to gain an increase in the development potential of land in designated growth zones ▪ The agricultural land is then placed under a conservation easement	▪ Funded by the profits of development ▪ Addresses the self interest of all stakeholders	▪ May be slow to be effective - Trends towards lower densities work against the scheme ▪ The complexity of the program and the lack of understanding by landowners ▪ Lack of effectiveness where non-TDR land is available for development

Tool	Characteristics	Advantages	Disadvantages
Purchase Development Rights (PDR) or Purchase of Agricultural Easements (PACE)	▪ Farmer sells development rights to government or non-government organisation. ▪ Generally this is the difference between agricultural production value and development value. ▪ Alternatively may receive tax relief ▪ Voluntary	▪ One of few mechanisms that adequately compensates landowners for not realising the development potential of the land	▪ Restrictions placed on farm in return for money may restrict innovative capacity ▪ Prohibitive costs involved may require a financing initiative. In the US this has extended to lottery revenues and taxes ▪ Costs involved ▪ Requires enabling legislation at the state level
Tax relief	▪ Tax incentives are widely used to maintain the economic viability of farming. All of the US states have at least one program designed to reduce the amount of money farmers are required to pay in local real property taxes.	▪ Agricultural tax programs help farmers stay in business by lowering their expenses. ▪ Agricultural tax programs help correct inequities in the tax system. ▪ Differential taxes and taxation concessions can encourage desirable land uses by providing rebates or lower land rates and taxes for land covenanted for farming or land used for conservation purposes	▪ Rarely overcome the power of an unregulated market to increase the value of land ▪ Agricultural tax programs do not ensure long-term protection of farmland. ▪ Differential assessment programs often provide a subsidy to real estate speculators, who are keeping their land in agriculture pending development. ▪ Requires changes to Federal tax legislation

Tool	Characteristics	Advantages	Disadvantages
Agricultural Districts	▪ Voluntary agreements between landholders and government to form special areas where commercial agricultural land is protected ▪ Farmers in return receive benefits such as rate rebates	▪ Stabilise land base for agriculture at low cost ▪ Multiple benefits for farmers ▪ Community based initiatives proven successful in Australia (i.e. IPM)	▪ Requires farmers to cooperate in order to form districts ▪ Incentives may not be enough to retain land under development pressure ▪ Long-term role in protecting agricultural land questionable due to short-term agreements
Community Supported Agriculture (CSA)	▪ Supporters cover all, or part of a farm's yearly operating budget by committing to purchasing a share of the season's harvest - up front	▪ Creates a direct economic and social partnership between food producers and local community	▪ Requires a majority of community support to establish momentum ▪ Commitment may be too high/rigid for typical independent western lifestyle values ▪ Existing investment in fresh produce marketing chain/infrastructure in Australia

GHD

10 Bond Street Sydney NSW 2000

T: 2 9239 7100

F: 2 9239 7199

E: sydmail@ghd.com.au

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		Name	Signature	Name	Signature	Date
1	J. Lane	L. Jewell				
2	L. Jewell	K. Hammond	*K. Hammond*	L. Jewell		16/10/08

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Tool Kit

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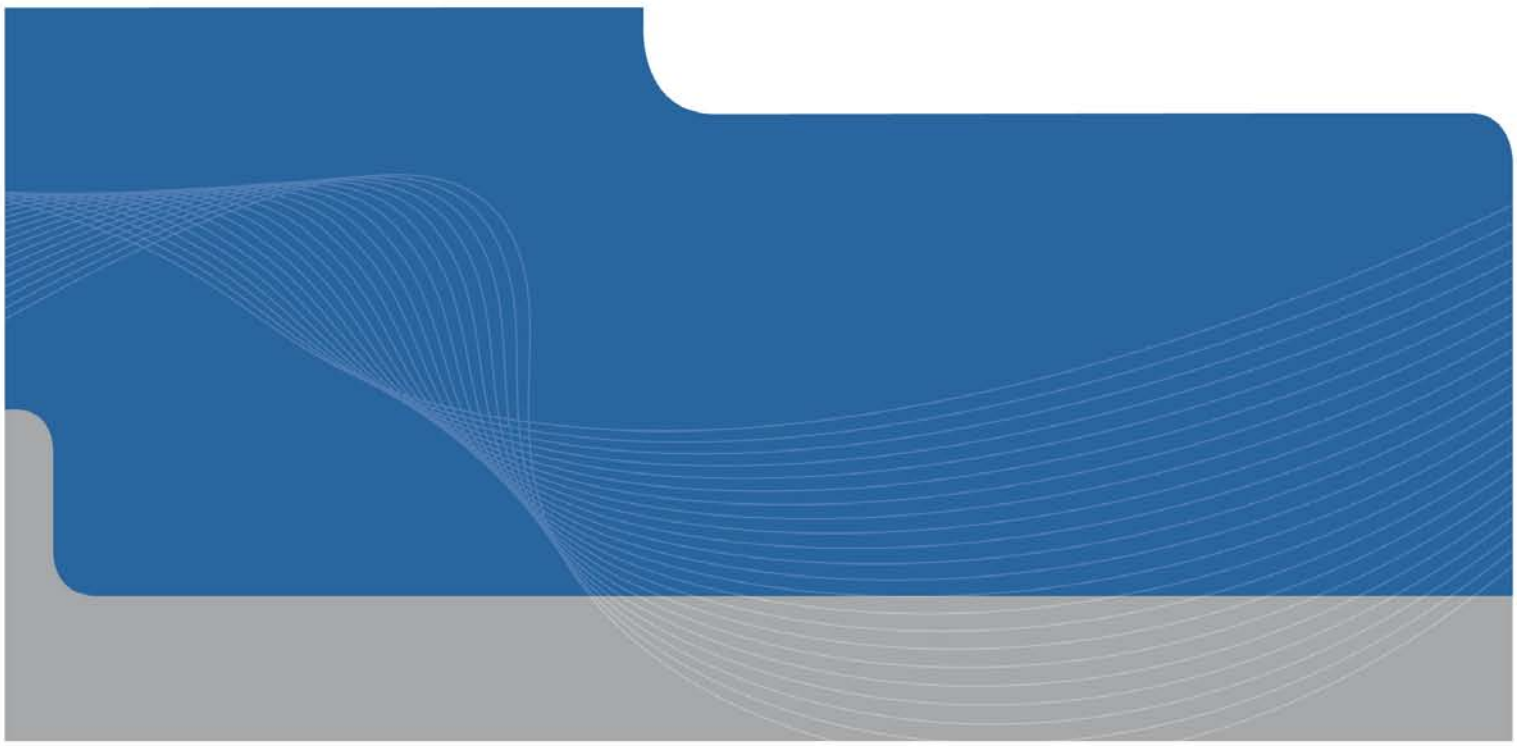

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Tool kit Guide

Why does industry need this tool kit?

Land use planning and its impacts on horticulture in Australia have for many years been identified by farming organisations around Australia as being in the 'top 5' policy issues facing the sector. The issue is important to many intensive agricultural industries and has been on the government planning 'radar' as a result of the increasing incidence of land use conflict in peri-urban areas as competition for finite land and water resources continues to intensify over time.

Industry associations, state farming organisations and a wide range of affected stakeholders have struggled to come to grips with the issues surrounding land use planning and conflict, and agreement on how to address them is rare, often due to the conflicting aims and priorities associated with individual land ownership. The Industry Management Committee of Horticulture Australia Limited considered that a fresh review of the literature, and the production of a toolkit consisting of short and informative fact sheets was required.

How to best utilise this tool kit

This tool kit provides a series of fact sheets which each address a specific issue of importance to anyone seeking to understand and deal with land use planning in the peri-urban regions of Australia. The different tools are presented *not as recommendations for action* but rather as information to improve understanding of the planning process and provide a basis for involvement at the local level to ensure horticultural issues have been properly considered.

What is included[1]?

The tool kit contains a fact sheet on each of the following topic areas:

A. The basics of peri-urban land use planning in its current form in Australia

1. **Understanding the land use planning system –** a quick guide to the Australian planning system which outlines the various levels of legislation and how this affects peri-urban stakeholders.
2. **Zoning –** anyone seeking to develop their land or preserve it for agricultural use needs to understand how governments use zoning controls and the limitations of the current system.

B. The challenges for peri-urban horticulturalists and typical sources of conflict

3. **Land use conflict** – an outline of some of the sources of disputes between neighbours in peri-urban areas and some possible practical and broad policy approaches through which these can be proactively addressed
4. **Buffers –** the pros and cons of using buffers as one of the practical ways to reduce conflict

[1] To assist the reader to gain full understanding and benefit from the tool kit, two glossaries of terms (international and domestic) are included.

C. What options does industry have to address these challenges?

5. **Urban Growth Boundaries** - an urban containment policy designed to control urban development within well-defined limits and thus protect peri-urban horticulture
6. **Transfer of Development Rights -** allows landowners to transfer the right to develop one parcel of land to a different parcel of land thus allowing horticulture production while protecting investment opportunities
7. **'Right to farm' –** outlines a legislative approach used in the United States to deal with conflicts with neighbours and discusses the pros and cons of this option.

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Understanding the land use planning system in Australia

Introduction:

Legislative control of planning and development of land in Australia rests with the three levels of government: federal, state and local. Generally, the major legislative control is at the state government level and is administered by the various state Departments of Planning (or similar) but with many of the functions of the legislation performed by local governments.

In addition to planning legislation per se, there are various other pieces of legislation and numerous policies and guidelines which guide planning and development. Each state has differing legislation, policies and guidelines which add to the complexity of understanding peri-urban planning.

The following provides an overview of the legislation, policies and guidelines of each level of government, with emphasis on peri-urban planning.

Federal legislation

The major areas of Federal Government legislation that impact on the planning process concern the protection and conservation of natural resources and heritage that are considered to be of national importance. The key federal acts requiring consideration in the planning process are:

Australian Heritage Council Act 2003

Environmental Protection and Biodiversity Conservation Act 1999

Apart from the direct legislative approach, the Federal Government can affect land use planning by:

- co-operation and agreement with the states (and local government); and
- by using its funding powers.

Funding powers extend to provision of infrastructure including major roads which influence land use in peri-urban areas.

State legislation

Each state and territory in Australia has overriding legislation governing the planning process for that state and territory. The name of the instruments may vary in each state, but the objectives with respect to land use planning are generally similar.

The states also have a range of policies, strategies and guidelines regarding land use planning that have been developed as a requirement under the planning legislation or to assist local governments to complete their responsibilities.

The relevant planning legislation for each state is shown below: plus the objectives of the legislation that relates to peri-urban land use.

Table 1 State legislation

State	Legislation
NSW	***Environmental Planning and Assessment Act 1979***
Queensland	***Integrated Planning Act 1997***
Victoria	***Planning and Environment Act 1987***
South Australia	***Development Act 1993***
Tasmania	***Land Use Planning and Approvals Act 1993***
Western Australia	***Planning and Development Act 2005***

Although the individual objectives of each of the above Acts differ, they have similar overall objectives that could be summarised as follows:

1. promotion of ecologically sustainable development;
2. a strategic planning approach (at regional and local levels) that considers a combination of economic, social and environmental issues; and
3. integration of the planning process between the responsible agencies (especially local government).

The legislation generally allows for both regional and local environmental land use plans to be developed. The planning of peri-urban land is guided by a range of instruments within the legislation including:

- zoning of land, including rural lands;
- subdivision and development in rural zones; and
- minimum residential allotment sizes within zones.

While the various state land planning Acts provide what appear to be suitable directions to enable the orderly planning of peri-urban land, the implementation of the legislation is complex because of the many policies and guidelines which form part of the legislation.

For example, in NSW the legislation provides for numerous policies known as State Environmental Planning Policies (SEPP) on a range of issues. The most pertinent with respect to peri-urban lands is the newly created SEPP (Rural Lands) 2008. The principles of the SEPP in turn align with the NSW Department of Primary Industries' Policy for Protection of Agricultural Land (2004)

State planning legislation generally allows for the development of regional plans which enable a cross-sectoral approach to planning and development. This enables policy development and implementation to

be undertaken as close as possible to local communities, but consistent with agreed objectives at the regional, state and national levels.

An example of a regional approach is the South East Queensland Regional Plan 2005-2025, the first statutory regional plan for the State, which is binding on all local governments in the region and on all state government agencies.

Local Government

Within each state there are many local governments (also known as local councils) that have a range of responsibilities, including land use planning. From a planning perspective, local governments are responsible for preparing plans which determine land use within their boundaries. These local plans are named differently in each state, for example Local Environmental Plans in NSW, Planning Schemes in Queensland and Victoria, and Development Plans in South Australia. Local plans guide planning decisions through zoning and development controls which then allow councils to supervise the ways in which land is used. Development control plans provide specific, comprehensive requirements for certain types of development or locations.

Zoning is the main tool used in land use planning within the local plans and is further described in Toolkit Number X.

Further reading:

Detailed treatment of policy approaches including zoning and minimum lot size is included in the accompanying Tool Kit. Other useful references are as follows:

American Farmland Trust (2002) *The Farmland Protection Toolbox* http://www.farmlandinfo.org/documents/27761/fp_toolbox_02-2008.pdf

Armstrong. H, Squires, W and Emtage, N. (2005) *The Protection of Production on Rural Lands: A review of tools and techniques for rural planning,* Centre for Rural and Regional Innovation Queensland (CRRIQ)

Buxton, M, Tieman, G, Bekessy, S, Budge, T, Mercer, D, Coote, M, and Morcombe, J, (2006) *Change and Continuity in Peri-urban Australia, State of the Peri-urban Regions: A Review of the Literature*, RMIT University, Melbourne.

Sinclair, I. (2003) *Growth Management and Rural Land*, University of NSW Faculty of the Built Environment Planning Law and Practice Short Course.Buxton et al 2006)

Forster, C. A. (1999) Australian Cities: Continuity and Change, (2nd Edition) Oxford University Press, Oxford.

Spiller, M. (2004) "Liveable Communities:How the Commonwealth can Foster Sustainable Cities and Regions", in 2004 National Congress of the Planning Institute of Australia

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Zoning controls and minimum lot size

Background:

Zoning is used to divide a local government area into zones determined by restrictions on types of use. Land use zoning entails placing restrictions on the use of the land by way of statute. This is the principal method for controlling the development of land in Australia. Land is designated for a principal use and uses not considered to be suitable or compatible with the principal use are prohibited. In the US, Agricultural Protection Zoning designates areas where farming is the primary land use, and discourages other land uses in those areas.

Zoning is the main tool that local governments use for land use planning. All land in a local government area is designated as a specific zone such as rural or primary production, residential, industrial, business or environmental. The plan provides a description of land use within each zone including:

- objectives of the zone;
- permitted (with or without consent) or prohibited development within the zone; and
- subdivision in rural areas, including minimum lot size for a dwelling.

The table below is an extract of zone descriptions for NSW related to rural and peri-urban areas.

Zone	Objectives of zone	Permitted w/o consent	Permitted w consent
RU1 Primary Production	To encourage sustainable primary industry production by maintaining and enhancing the natural resource base. To encourage diversity in primary industry enterprises and systems appropriate for the area. To minimise the fragmentation and alienation of resource lands. To minimise conflict between land uses within the zone and with adjoining zones.	Extensive agriculture	Dwelling houses; Extractive activities; Mining
RU2 Rural Landscape	To maintain the rural landscape character of the land. To provide for a range of compatible land uses, including extensive agriculture	Extensive agriculture	Dwelling houses
RU4 Rural Small Holdings	To enable small-scale sustainable primary industry and other compatible land uses. To maintain the rural and scenic character of the land. To ensure that development does not unreasonably increase the demand for public services or public facilities. To minimise conflict between land uses within the zone and adjoining zones		Dwelling houses

RU6 Transition	To protect and maintain land that provides a transition between rural and other land uses of varying intensities or environmental sensitivities. To minimise conflict between land uses within the zone and adjoining zones	Dwelling houses
R5 Large Lot Residential	To provide residential housing in a rural setting while preserving environmentally sensitive locations and scenic quality To ensure that large residential allotments do not hinder the proper and orderly development of urban areas in the future To ensure that development in the area does not unreasonably increase the demand for public services or public facilities To minimise conflict between land uses within the zone and adjoining zones	Dwelling houses

The preparation of plans by local governments enables specific local elements to be considered in the planning process. However, the existence of many, relatively small local government units can potentially lead to fragmentation, inefficiency and uncoordinated development.

Advantages:

- allows local governments to plan for land use with minimal expense; and
- provides certainty for future development

Disadvantages:

- inflexible, detaches similar land uses and limits interaction between them;
- potentially restricts innovation (i.e. restricts densities of projects that may have a market for a greater density, prevents mixed land uses);
- requires accurate and relevant data about the relevant land and community prior to designating an area as an agricultural zone. Such information includes physical constraints, land use (tenure, size, cover, quality) and social and economic factors;
- zoning tools suitable for one region will not necessarily be suitable for others;
- zoning has been used for an extensive period and has not always proven to be an effective mechanism for protection of a land base/use;
- restricts landowner ability to capitalise on their asset;
- requires forecast into future of region to determine best use of land (does not take into account dynamic nature of land use and communities); and
- may increase property values for some landowners but adversely affect others.

Issues to address:

The United States has been using zoning as a means of maintaining rural land for decades. It has been found that zoning's effectiveness is limited, however, by legal and political challenges from landowners who wish to use their land for more intensive and profitable purposes. The effectiveness of zoning is additionally limited by the data that it is founded upon. A useful foundation for rural land protection is not provided by the ad hoc designation of zones, and the disregard of land attributes, land uses and socio-economic considerations.

Local Government traditionally use zoning to control the subdivision of rural land and the expansion of urban land use. This may be via minimum lot size or prohibition of subdivision in some areas. Many landholders view such regulation as an infringement of their rights to profit from their asset. As high population pressure and demand for new residential land drives peri-urban farmland prices well beyond the agricultural land price, community conflict arises from anti-subdivision regulations.

Landholders nearing retirement age regard such legislation as discriminatory, preventing them from receiving the perceived equivalent of the superannuation lump sum. It is also argued by some that limiting subdivision of agricultural land could inhibit the emergence of new forms of agriculture, (i.e. intensification), that may contribute to regional economic development. In contrast to this view, other stakeholders believe that there is an excessively high degree of subdivision which renders productive agricultural land unviable.

Another concern is that land division based on minimum lot size fails to take into account the dynamic interplay between economic and social forces that contribute to a constantly evolving and transforming agricultural sector.

Barriers to adoption and/or possible alternatives:

The approach taken by the Wollondilly Shire Council (south-western Sydney) in the development of its 'Rural Living Zones' is worth noting. Following a review of Wollondilly Shire Council's Local Environmental Plan and Development Control Plans, three new zones were introduced: Agriculture Zone, Agricultural Landscape Zone and Rural Living Zone. The zone names recognise use rather than character (i.e. agriculture is use, rural is character). The zone boundaries are delineated by physical boundaries rather than a road boundary to reduce the incidence of rural land use conflict. The rationale for the new zones is outlined below:

Agriculture Zone: The primary objective of this zone is to preserve agricultural production and to allow for new agricultural production in appropriate locations. A secondary objective of the zone is to reduce the incidence of rural land use conflict. New dwelling houses within the zone are permitted only in conjunction with a legitimate and sustainable agricultural enterprise. Likewise, any agricultural enterprise which is proposed for land adjacent to an existing dwelling house, which is used for residential use, will have to take into consideration the use of the land for residential purposes and provide steps to reduce potential conflict. The minimum subdivision size is 20 hectares within the zone. Subdivisions must also undergo a Total Farm Management Assessment, which includes a Property Plan, and an Agricultural Sustainability Assessment.

Agricultural Landscape Zone: The primary objective of this zone is to preserve the agricultural landscape of Wollondilly area whilst also providing for agricultural production. Existing productive agricultural enterprises will be encouraged to continue within this zone, however it is not anticipated that a great deal of intensive agriculture will be carried out. The areas set aside are generally areas which

have a fair amount of extensive agriculture practised in the form of grazing and dairying. The minimum subdivision size for this zone is 40 hectares.

Environmental Protection Rural Living Zone: The primary objective of this zone is to provide for rural living opportunities whilst having regard to the preservation of the landscape character as well as the constraints of the land. Rural Urban Fringe: development is within the servicing catchments and in close proximity to the urban centre. The lot size is generally between 4000 square metres – 1 hectare.

Rural Living: Residential use development within a rural environment. Lots are generally around 4 hectares. Any subdivision must be carried out having due regard to the constraints of the land.

Council is currently in the process of reviewing the implementation of this plan as a result of the NSW Government's introduction of standard zones in the state as shown in the Table above.

Further reading

American Farmland Trust (2002) *The Farmland Protection Toolbox* http://www.farmlandinfo.org/documents/27761/fp_toolbox_02-2008.pdf

Armstrong. H, Squires, W and Emtage, N. (2005) *The Protection of Production on Rural Lands: A review of tools and techniques for rural planning,* Centre for Rural and Regional Innovation Queensland (Crii.q)

Buxton, M, Tieman, G, Bekessy, S, Budge, T, Mercer, D, Coote, M, and Morcombe, J, (2006) *Change and Continuity in Peri-urban Australia, State of the Peri-urban Regions: A Review of the Literature*, RMIT University, Melbourne.

Sinclair, I. (2003) *Growth Management and Rural Land*, University of NSW Faculty of the Built Environment Planning Law and Practice Short Course.

Land use conflict

Background:

There is a continuing trend in Australia for urban dwellers to 'downshift' and move to outer metropolitan fringe areas to seek an improved lifestyle. At the same time, agricultural producers in these areas are seeing land values increase and are subdividing their properties, in many cases to fund a well-earned retirement. The resulting mix of lifestyle and commercial agriculture can sometimes produce land use conflict around issues of smell, noise, visual amenity and so on and if not resolved quickly can result in legal action between the parties involved. Table 2 lists some of the typical areas of conflict which occur.

Table 2 Potential points of conflict between agriculture and adjoining land uses

Conflict	Description
Noise	Dogs, livestock Farming equipment, pumps, spray machines, transport, frost fans, hail cannons Ancillary equipment associated with on- farm processing
Odour	Agricultural fertilisers (particularly manures) and chemicals Intensive animal industries Application of effluent to pasture
Health concerns	Chemicals Spray drift Smoke
Water	Access Pumping Quantity
Smoke and ash	Burning of pasture, stubble or "rubbish"
Visual intrusion	Hail netting Polyhouses
Nuisance	Stray dogs Vandalism Trespass Noxious and environmental weeds

Source: NSW DPI (2004)

Policy approaches:

Failure to effectively mitigate land use conflict can be extremely costly to landholders, the community and government. It is preferable to avoid land use conflict in the first instance by effective forward planning and development control, rather than attempting to resolve land use planning problems via litigation after

development has taken place and disputes arise. A suggested hierarchy of actions for mitigating and managing conflict is listed below. Note that the financial and social costs of mitigating conflict tends to increase down the hierarchy:

1. Strategic planning. Involves the analysis of conflict when assessing future development, settlement options and zoning of lands.
2. Statutory control. Development control mechanisms, including buffer distances, which reduce the potential for conflict and allow for approaches that suit local circumstances.
3. Best management and practice. Government support and farmer adoption of best practice which reduces the environmental impact of agriculture.
4. Education. Increasing the awareness of residents who live in a rural area, or in a residential area which adjoins a rural area, as to the typical agricultural practices that may impact on residential amenity. An example is for Goulburn Mulwaree Council in NSW which has produced “The Rural Living Handbook 2007 – 2009: A guide for rural residential landholders”. This lets rural residents know about the many resources available as well as their responsibilities (particularly legislative requirements).
5. Mediation and negotiation. Bringing conflicting parties together to share concerns and information in order to find solutions.
6. Litigation. Seeking legal intervention by utilising either environmental or common law actions.

Some of the policy approaches which could be used to pre-emptively address and minimise the occurrence of land use conflict are outlined below.

Transfer of development rights (TDR)

Transfer of Development Rights, or ‘TDRs’, allow landowners to transfer the right to develop one parcel of land to a different parcel of land. Generally established through local zoning ordinances, TDR programs can protect farmland by shifting development from agricultural areas to areas planned for growth. When the development rights are transferred from a piece of property, the land is typically restricted with a permanent agricultural conservation easement.

Under the US model, buying development rights generally allows landowners to build at a higher density than ordinarily permitted by the base zoning in designated receiving areas. Counties, cities, towns and townships use TDR. Local governments approve transactions and monitor easements. A few jurisdictions have created “TDR banks” that buy development rights with public funds and sell them to developers and other private landowners.

Urban Growth Boundaries (UGB)

Studies have shown that there is a definite link between increased population density and farmland loss. This may be the reason why strategies for containment of urban growth have proven successful in the protection of agricultural land in Europe as they ensure the population density is restrained to a particular area and cannot move into surrounding lands.

Strategies widely employed include urban growth boundaries, urban service area declaration and land zoning restrictions.

Urban growth boundaries are a form of urban containment policy that are designed to control urban development beyond a well-defined limit. They are a form of planning tool that can be combined with other mechanisms such as designated zones.

If established in a proper manner, an urban boundary will lead to certainty in the minds of decision-makers and landholders. There will be greater predictability and direction in planning at the local and regional levels, and most importantly, protection of agricultural/rural land.

A growth boundary must be open to review and modification at certain intervals, in order to accommodate urban growth and changes in the use of the land. Modification should only occur however, once there has been a complete assessment of housing demand, conservation requirements, resource use and implications for urban services.

Zoning

From a planning perspective, local governments are responsible for preparing plans which determine land use within their boundaries. These local plans are named differently in each state, for example Local Environmental Plans in NSW, Planning Schemes in Queensland and Victoria, and Development Plans in South Australia. Local plans guide planning decisions through zoning and development controls which then allow councils to supervise the ways in which land is used. Development control plans provide specific, comprehensive requirements for certain types of development or locations .

Zoning is the main tool used in land use planning within the local plans. All land in a local government area is designated as a specific zone such as rural, residential, industrial, business or environmental. The plan provides a description of land use within each zone including:

- objectives of the zone;
- permitted (with or without consent) or prohibited development within the zone; and
- subdivision, including minimum lot size for a dwelling.

The preparation of plans by local governments enables specific local elements to be considered in the planning process.

‘Right to farm’

Right-to-farm laws are generally designed to accomplish one or both of the following objectives:

- to strengthen the legal position of farmers when neighbours sue them for private nuisance; and
- to protect farmers from anti-nuisance ordinances and unreasonable controls on farming operations.

‘Right to farm’ laws are strongly embedded in the United States approach to farmland protection and are in force in all 50 States, with locally enforced provisions also in many regions. Right-to-farm laws are intended to discourage neighbours from suing farmers.

‘Right to farm’ laws are not in force in Australia excepting for Tasmania, which has very low rates of population growth and its productive farmland is under much lower levels of threat from urban development than in other States.

Further reading:

Detailed fact sheets on each of the policy approaches outlined here are presented in the accompanying Tool Kit. Other references include the following:

American Farmland Trust (2002) *The Farmland Protection Toolbox* http://www.farmlandinfo.org/documents/27761/fp_toolbox_02-2008.pdf

Armstrong. H, Squires, W and Emtage, N. (2005) *The Protection of Production on Rural Lands: A review of tools and techniques for rural planning,* Centre for Rural and Regional Innovation Queensland (Crii.q).

Buxton, M, Tieman, G, Bekessy, S, Budge, T, Mercer, D, Coote, M, and Morcombe, J, (2006) *Change and Continuity in Peri-urban Australia, State of the Peri-urban Regions: A Review of the Literature*, RMIT University, Melbourne

Goulburn Mulwaree Council (2006) The Rural Living Handbook 2007 – 2009. http://www.goulburn.nsw.gov.au

NSW DPI (2004) *Buffers - planning for sustainable agriculture* http://www.dpi.nsw.gov.au/agriculture/resources/land/planning/buffers

Queensland Government Natural Resources and Water (2006*) Buffer areas -minimising conflict between agricultural and residential areas* http://www.nrw.qld.gov.au/factsheets/pdf/land/l49.pdf

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Buffers

Background:

The occurrence of agriculture and non-rural land use in close proximity can sometimes lead to conflict due to their potential incompatibility. Agricultural activities such as crop spraying, dust or odurs can affect adjoining small rural lots which are used essentially for residential purposes. The presence of small rural lots can also create an adverse influence on the continued operation of the agricultural enterprise. The potential for conflict is heightened where there is no separation between incompatible uses.

One method that is used extensively to separate potentially conflicting agricultural activities and residential land uses is the use of buffers. While buffer areas can be an effective method of separating conflicting land uses, they will not eliminate all impacts of activities.

Why use buffers?

The Queensland Government's guidelines on the use of buffers are acknowledged as the most detailed and relevant for planning purposes. The objectives for the use of buffers listed are:

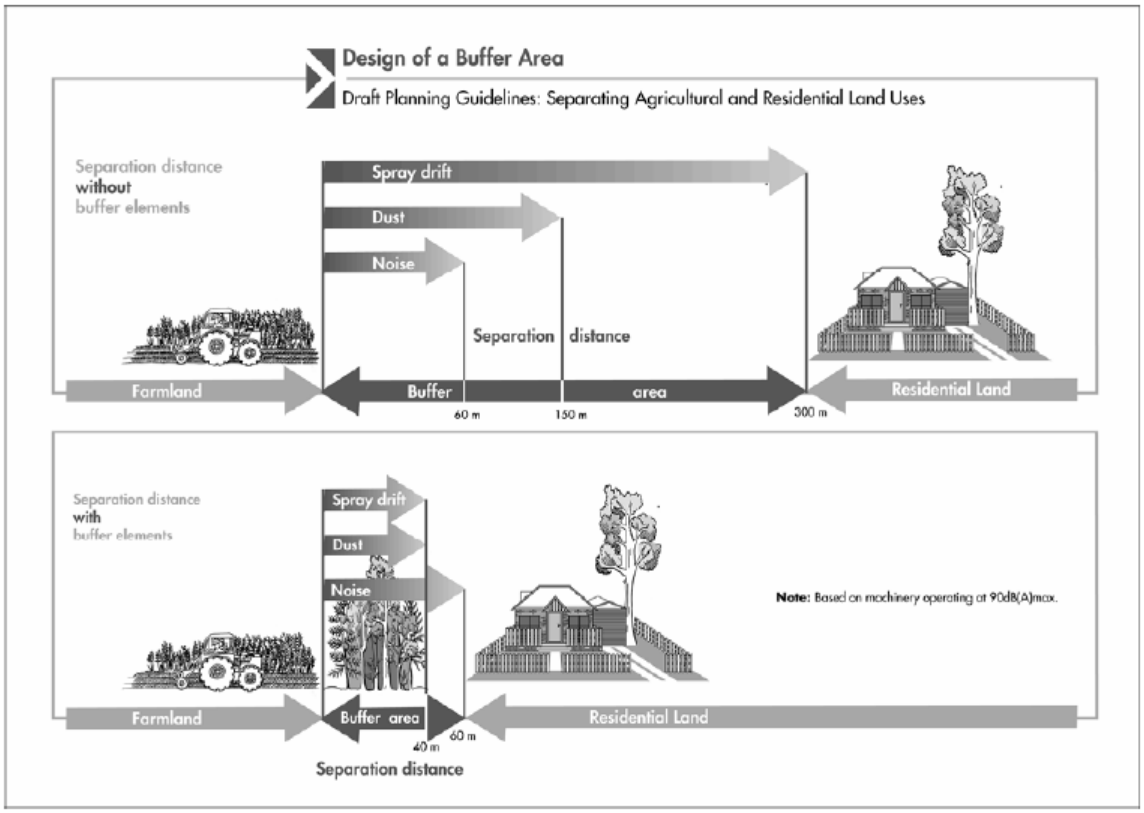
1. To protect the use of reasonable and practicable farming measures that are practised in accordance with the Environmental Code of Practice for Agriculture (Queensland) and associated industry-specific guidelines.
2. To minimise scope for conflict by developing, where possible, a well-defined boundary between agricultural and residential areas as opposed to interspersing agricultural and residential areas.
3. To minimise the impacts of residential development on agricultural production activities and land resources.
4. To minimise the potential for complaints about agricultural activities from residential areas.
5. To provide residents with acceptable environmental conditions in residential areas that are located adjacent to agricultural production areas.

Issues to consider when assessing the need for buffers

- Determine the farming activity with the potential to cause most problems for adjacent residential uses and which is reasonably likely to occur on the subject land
- Identify the elements (e.g. spray drift, odour, noise, dust, sediment and stormwater runoff) that may cause conflict and the extent of the conflict
- Where possible, quantify the elements in terms of frequency and duration of activities to determine their impact
- Consider residential area design, size of lots, separation widths, tree planting, acoustic barriers etc. to minimise land use conflict
- Propose the means by which the proposed measures will be monitored and maintained.

Figure 1 illustrates designs of buffer areas appropriate for a range of activities that may cause conflict.

Figure 1 Design of buffer areas



Source: Queensland Natural Resources and Water (2006)

The limitations of buffers in addressing land use conflict

Buffers should not be expected to eliminate all problems or risks. Realistically, buffers are a safety measure in land use planning and do not take the place of proper and strategic planning or application of best management practice. Buffers assist to minimise risk and protect the interests of all parties. In most cases, the width and design of the buffer is a compromise between the needs and aspirations of the adjoining land users, and the cost.

To provide the necessary separation and 'protection' where a real risk is likely, the buffer design should take into account:

- site-specific details;
- the nature of operations;
- the sensitivity of neighbours and adjacent land uses rather than relying on a generalised design and a 'minimum width' criterion.

There is no single or 'magical' buffer distance or design that will eliminate all chance of conflict or complaint without also being economically or physically unfeasible.

Further reading:

The detailed listing of buffer distances and types, and the various State requirements are not covered in this fact sheet. The publications listed here provide greater detail on these issues; otherwise it is recommended that you contact the relevant agency in your local area.

NSW DPI (2004) *Buffers - planning for sustainable agriculture* http://www.dpi.nsw.gov.au/agriculture/resources/land/planning/buffers

Queensland Natural Resources and Water (2006) *Minimising conflict between agricultural and residential areas* http://www.nrw.qld.gov.au/factsheets/pdf/land/l49.pdf

Urban Growth Boundaries (UGB)

Background:

Studies have shown that there is a definite link between increased population density and farmland loss. This may be the reason why strategies for containment of urban growth have proven successful in the protection of agricultural land in Europe as they ensure the population density is restrained to a particular area and cannot move into surrounding lands.

Strategies widely employed include urban growth boundaries, urban service area declarations and land zoning restrictions.

Urban growth boundaries are a form of urban containment policy that are designed to control urban development within a well-defined limit. They are a form of planning tool that can be combined with other mechanisms such as zoning.

If established in a proper manner, an urban boundary will lead to certainty in the minds of decision-makers and landholders. There will be greater predictability and direction in planning at the local and regional levels, and most importantly, protection of agricultural/rural land is likely to be an outcome.

A growth boundary must be open to review and modification at certain intervals, in order to accommodate urban growth and changes in the use of the land. Modification should only occur however, once there has been a complete assessment of housing demand, conservation requirements, resource use and implications for urban services.

Advantages:

- establishes certainty for future land use;
- minimises necessity for other resource intensive rural land protection programs; and
- provides opportunities for infill development (development of unused or abandoned sites in urban areas).

Disadvantages:

- potential for political agendas and influences;
- need for coordination between multiple local governments;
- housing price impacts;
- have been observed to slow economic growth by deflecting it to regional growth centres;
- urban transit congestion increases as densities increase; and
- residential development of open spaces within the urban centre.

Issues to address:

The issue of prime importance arising from urban growth boundaries is delineating where the boundary lies. An additional issue exists where potential boundaries straddle multiple Local Governments. It should also be noted that urban growth boundaries result in housing price inflation in areas where they are

imposed, regardless of the method used to implement them. Planners play a significant role in determining the severity of housing price inflation. What may be needed is a land supply monitoring system.

An additional issue observed in the US is the emergence of “hobby farmers” who circumvent restrictions by buying ‘farming’ properties outside the boundary while their primary purpose is for residential use. There is also a general community resistance to high-density housing.

Barriers to adoption and/or possible alternatives:

- inflexibility leading to lack of ability to adapt to changing operating environments;
- complexity;
- lack of mapping data;
- collaboration between local governments; and
- the need for state control and monitoring;

Further reading

American Farmland Trust (2002) *The Farmland Protection Toolbox* http://www.farmlandinfo.org/documents/27761/fp_toolbox_02-2008.pdf

Armstrong. H, Squires, W and Emtage, N. (2005) *The Protection of Production on Rural Lands: A review of tools and techniques for rural planning,* Centre for Rural and Regional Innovation Queensland (Crii.q).

Buxton, M, Tieman, G, Bekessy, S, Budge, T, Mercer, D, Coote, M, and Morcombe, J, (2006) *Change and Continuity in Peri-urban Australia, State of the Peri-urban Regions: A Review of the Literature*, RMIT University, Melbourne

Transfer of Development Rights (TDR)

Background:

The movement of urban dwellers into peri-urban areas in Australia continues to increase as does demand for rural lifestyle properties. At the same time agricultural producers in these areas are seeing land values increase and are sub-dividing their properties, in many cases to fund their retirement. However, minimum lot size provisions that restrict subdivision may limit producers from capitalising on the demand for sub-division.

One option, which is fairly widely used in the US, is Transfer of Development Rights or 'TDRs'. TDRs allow landowners to transfer the right to develop one parcel of land to a different parcel of land. Generally established through local zoning ordinances, TDR programs can protect farmland by shifting development from agricultural areas to areas planned for growth. When the development rights are transferred from a piece of property, the land is typically restricted with a permanent agricultural conservation easement.

Under the US model, buying development rights generally allows landowners to build at a higher density than ordinarily permitted by the base zoning in designated receiving areas. Counties, cities, towns and townships use TDR. Local governments approve transactions and monitor easements. A few jurisdictions have created "TDR banks" that buy development rights with public funds and sell them to developers and other private landowners.

Advantages:

- TDR protects farmland permanently, while keeping it in private ownership.
- Participation in TDR programs is voluntary - landowners are never required to sell their development rights.
- TDR promotes orderly growth by concentrating development in areas with adequate public services.
- TDR programs allow landowners in agricultural protection zones to retain their equity without developing their land.
- TDR programs are market-driven - private parties pay to protect farmland, and more land is protected when development pressure is high.
- TDR programs can accomplish multiple goals, including farmland protection, protection of environmentally sensitive areas, the development of compact urban areas, the promotion of downtown commercial growth and the preservation of historic landmarks.

Disadvantages:

- TDR programs are technically complicated and require a significant investment of time and staff resources to implement.
- TDR is an unfamiliar concept. A lengthy and extensive public education campaign is generally required to explain TDR to citizens.

- The pace of transactions depends on the private market for development rights. If the real estate market is depressed, few rights will be sold, and little land will be protected.

Issues to address:

The complexity of the program and the lack of understanding by landowners, and the lack of effectiveness where non-TDR land is available for development are two major issues which need to be addressed in order for TDRs to have any chance of success. There also needs to be sufficient development pressure and the capacity for the local government to absorb additional densities to drive the program's success.

Barriers to adoption and/or possible alternatives:

The majority of development processes and approvals in Australia are currently administered by local governments which have limited resources and which are already stretched in assessing development approvals under the zoning and lot size approach used in the majority of cases. The added complexity of TDRs and the significant community education requirement in the start up phase may prohibit its introduction under the current system.

Further reading

American Farmland Trust (2002) The Farmland Protection Toolbox
http://www.farmlandinfo.org/documents/27761/fp_toolbox_02-2008.pdf

Armstrong. H, Squires, W and Emtage, N. (2005) The Protection of Production on Rural Lands: A review of tools and techniques for rural planning, Centre for Rural and Regional Innovation Queensland (Crii.q)

Buxton, M, Tieman, G, Bekessy, S, Budge, T, Mercer, D, Coote, M, and Morcombe, J, (2006) Change and Continuity in Peri-urban Australia, State of the Peri-urban Regions: A Review of the Literature, RMIT University, Melbourne.

Walls, M & McConnell, V.(2007) Transfer of Development Rights in U.S. Communities evaluating program design, implementation, and outcomes
http://www.rff.org/documents/Walls_McConnell_Sep_07_TDR_Report.pdf

‘Right to farm’ laws

Background:

The mix of lifestyle and commercial agriculture often found in peri-urban areas can sometimes produce land use conflict around issues of smell, noise, visual amenity and so on and if not resolved quickly can result in legal action between the parties involved. The United States has a long established federal and state legislative approach to addressing some of the issues around this conflict which is often referred to under the blanket description of ‘right to farm’.

Right-to-farm laws are generally designed to accomplish one or both of the following objectives:

- to strengthen the legal position of farmers when neighbours sue them for private nuisance; and
- to protect farmers from anti-nuisance ordinances and unreasonable controls on farming operations.

‘Right to farm’ laws are strongly embedded in the United States approach to farmland protection and are in force in all 50 States, with locally enforced provisions also in many regions. Right-to-farm laws are intended to discourage neighbours from suing farmers.

‘Right to farm’ laws are not in force in Australia except for Tasmania, which has very low rates of population growth and its productive farmland is under much lower levels of threat from urban development than in other States.

Advantages:

- help established farmers who use good management practices prevail in private nuisance lawsuits.
- document the importance of farming to the state or locality and put rural residents on notice that generally accepted agricultural practices are reasonable activities to expect in farming areas.
- reduce the burden on the legal system, by removing disputes between agricultural and residential landholders from the courts; and
- provide landholders with a degree of certainty

Disadvantages:

- place administrative burden on local councils in resolving disputes that cannot be litigated;
- do not address the concerns of residential landholders; and
- do not directly protect agricultural land.

Issues to address:

There is a need to formulate the legislation in a way that allows farms to adopt and develop new technologies and advanced farming techniques while not allowing the legislation to be a shield or protection for those not acting responsibly. Additionally, the US experience has been that more challenges are being seen against ‘right-to-farm’ legislation from farmers with conflicting farming

enterprises than rural-urban conflicts. It follows that there is a need to legislate in a way that does not allow farmers to use the provisions as a shield against other farmers or, alternatively, for policy makers to promote the use of non-regulatory policy tools.

Barriers to adoption and/or possible alternatives:

'Right to farm' legislation in the US form is not likely to be adopted in Australia as most planning authorities see it as being ineffective and unsuited to the highly concentrated urbanised population of Australia. Most state governments have been reluctant to prevent major development proposals that affect the agricultural value of land.

The Western Australian State Government introduced an alternative to 'right to farm' laws in the form of the ***Agricultural Practices (Disputes) Act 1995 (WA).*** This is an alternative process involving dispute resolution which attempts to achieve the same result as 'right to farm' legislation without the removal of common law rights. This Act endeavours to resolve land use conflict between farmers and rural residents through:

- mediation
- tribunal hearings; and
- an Agricultural Disputes Board which rules on normal farming practices.

The Act does not represent ''right to farm'' legislation as disputing parties do not lose the right to pursue litigation. This right is merely postponed while mediation occurs. By providing such a formal arena for dispute resolution mediators may be able to direct participants to identify possible solutions or make participants aware of modern farming practices, including increasing intensification and vertical integration.

The Act's stated object is to ensure that any normal farm practice which is alleged to create a nuisance, or otherwise to be detrimental to the interests of persons nearby, by reason merely of the carrying out or management of that farm practice, shall not be impeded by avoidable litigation. The Act established the Agricultural Practices Board, to which disputes arising from allegations of nuisance are referred. Mediation is adopted where appropriate in an attempt to solve the dispute.

This process has been adopted in order to prevent premature litigation over normal farm practices, due to a lack of understanding or because of unwillingness on the part of the farmer to modify such practice. Normal farm practices refer to practices that are carried out in a manner consistent with proper and accepted customs and standards or in compliance with the requirements of a Code of Practice approved by the relevant government department. Complaints related to odour, noise, dust, smoke and spray drift are encompassed by the Act.

Further reading:

American Farmland Trust (2002) The Farmland Protection Toolbox
http://www.farmlandinfo.org/documents/27761/fp_toolbox_02-2008.pdf

Armstrong. H, Squires, W and Emtage, N. (2005) The Protection of Production on Rural Lands: A review of tools and techniques for rural planning, Centre for Rural and Regional Innovation Queensland (Crii.q)

Buxton, M, Tieman, G, Bekessy, S, Budge, T, Mercer, D, Coote, M, and Morcombe, J, (2006) Change and Continuity in Peri-urban Australia, State of the Peri-urban Regions: A Review of the Literature, RMIT University, Melbourne.

NSW DPI (2004) Buffers - planning for sustainable agriculture
http://www.dpi.nsw.gov.au/agriculture/resources/land/planning/buffers

GHD Hassall

Glossary of land use planning terms used in Australia

Agricultural zoning. Some local governments have specified 'agriculture zones' as part of their local planning instruments. Very few of these zones in Australia are designed to preserve the agricultural use, but are often land 'awaiting development' in future. These zones are primarily used to limit subdivision and fragmentation of land by using minimum lot sizes.

Buffer. The purpose of a buffer is to separate conflicting land use activities and thereby lessen the potential impact of one activity or series of activities on an adjoining activity or land user.

In land use planning, 'activities' are typically land uses of one form or another and the manner in which those land uses are undertaken. Agriculture is a series of industries and activities that can be in conflict with adjoining land uses:

- the common 'clash' between residential use and agriculture;
- conflict between agricultural enterprises (e.g. 'organic' versus 'non-organic');
- conflict between agriculture and sensitive environments such as waterways, native habitats, wetlands, schools and public places

Building Code of Australia: The national technical document which sets the standards for building work within Australia

Community Supported Agriculture (CSA). A form of direct marketing of farm products that involves customers paying the farmer in advance for a weekly share of the harvest. Customers are often called shareholders. In some cases, shareholders may participate in farm work and farm decisions. Farms that use this marketing strategy are called "CSA farms" or "CSAs." CSA is also known as subscription farming.

Community Title: A community title divides land into lots (of which there must be a least two) and common property. Community Title can be a community scheme or a community strata scheme.

Conservation easement. A conservation easement is a voluntary agreement between a private landowner and a municipal agency or qualified not-for-profit corporation to restrict the development, management, or use of the land. In return for conservation of the land rate rebates and/or tax concessions are available in some parts of Australia.

Differential tax regimes**. Farmland is taxed on the basis of its value for farming or conservation rather than its potential value for urban development.**

Easement. An easement involves the right to use a parcel of land to benefit an adjacent parcel of land, such as to provide vehicular or pedestrian access to a road or sidewalk.

Environmental Impact Statements (EIS). An EIS provides a means for agencies, project sponsors, and the public to systematically consider significant adverse environmental impacts, alternatives, and mitigation strategies. An EIS facilitates the weighing of social, economic, and environmental factors in the planning and decision-making process.

Land use conflict. The mix of lifestyle rural residential land owners and commercial agriculture in the peri-urban zone can sometimes produce land use conflict around issues of smell, noise, visual amenity and so on and if not resolved quickly can result in legal action between the parties involved.

Lot. A lot is a portion of a subdivision, plat, tract, or other parcel of land considered as a unit for the purpose of transferring legal title from one person or entity to another.

Minimum lot size. The minimum size of lot as determined by local councils (in most cases) which is determined to be appropriate for a particular zoning use e.g. in parts of NSW, 40 hectares is the minimum lot size for intensive agriculture (including horticulture).

Non – Complying: Non-Complying developments are listed in the Development Plan and are land uses which are not envisaged or encouraged within a particular area.

Peri-urban. Land adjacent to the edge of an urban area, extending from the built up edge of the city to the rural hinterland.

Rezoning. An act of the local legislature that changes the principal uses permitted on one or more parcels of land or throughout one or more zoning districts. Rezoning includes the amendment of the zoning map, as well as the use provisions in the district regulations applicable to the land that is rezoned.

Right to farm. A state law or local ordinance that protects farmers and farm operations from public and private nuisance lawsuits. A private nuisance interferes with an individual's use and enjoyment of his or her property. Public nuisances involve actions that injure the public at large. Tasmania is the only Australian state to have this legislation in place.

Service funding arrangements. Development contribution plans, which require developers to subsidise infrastructure to support the community.

Strata Title: A sub division involving at least two units and a common area.

Subdivision. The subdivision of land involves the legal division of a parcel into a number of lots for the purpose of development and sale. The subdivision and development of individual parcels must conform to the provisions of local zoning which contain use and dimensional requirements for land development.

Torrens Title: An example of Torrens Title is a home on its own block of land. There is a separate Certificate of Title for each separate piece of land.

Transfer of development rights (TDR). Provisions in a zoning law that allow for the purchase of the right to develop land located in a sending area and the transfer of these rights to land located in a receiving area.

Urban Growth Boundary (UGB) A theoretical line drawn around a community that defines an area to accommodate anticipated growth for a given period of time, generally 20 years. Urban growth boundaries are a growth management technique designed to prevent sprawl. They are often used to guide decisions on infrastructure development, such as the construction of roads and the extension of municipal water and sewer services.

Zoning. Zoning is used to divide a city into areas determined by restrictions on types of use. Land use zoning entails placing restrictions on the use of the land by way of statute. This is the principal method for controlling the development of land in Australia. Land is designated for a principal use and uses not considered to be suitable or compatible with the principal use are prohibited (Sinclair, 2003).

Further reading

Land Use Law Center Pace University School of Law (1998) *Universal Glossary of Land Use Terms and Phrases* http://www.nymir.org/zoning/Glossary.html

NSW DPI (2004) *Buffers - planning for sustainable agriculture* http://www.dpi.nsw.gov.au/agriculture/resources/land/planning/buffers

Planning Institute of Australia SA Division *Fact Sheets Glossary key terms used in the planning process* http://www.planning.org.au/index.php?option=com_content&task=view&id=68&Itemid=630

Glossary of land use planning terms used in other countries

Agricultural district. A legally recognized geographic area formed by one or more landowners and approved by one or more government agencies, designed to keep land in agriculture. Agricultural districts are created for fixed, renewable terms. Enrolment is voluntary; landowners receive a variety of benefits that may include eligibility for differential assessment, limits on annexation and eminent domain, protection against unreasonable government regulation and private nuisance lawsuits, and eligibility for purchase of agricultural conservation easement programs. Also known as agricultural preserves, agricultural security areas, agricultural preservation districts, agricultural areas, agricultural incentive areas, agricultural development areas and agricultural protection areas.

Buffer. A buffer is a designated area of land that is controlled by local regulations to protect an adjacent area from the impacts of development

Cluster Subdivision. A cluster subdivision is the modification of the arrangement of lots, buildings, and infrastructure permitted by the zoning law to be placed on a parcel of land to be subdivided. This modification results in the placement of buildings and improvements on a part of the land to be subdivided in order to preserve the natural and scenic quality of the remainder of the land.

Community Supported Agriculture (CSA). A form of direct marketing of farm products that involves customers paying the farmer in advance for a weekly share of the harvest. Customers are often called shareholders. In some cases, shareholders may participate in farm work and farm decisions. Farms that use this marketing strategy are called “CSA farms” or “CSAs.” CSA is also known as subscription farming.

Conservation Easement. A conservation easement is a voluntary agreement between a private landowner and a municipal agency or qualified not-for-profit corporation to restrict the development, management, or use of the land. That agency holds the interest and is empowered to enforce its restrictions against the current landowner and all subsequent owners of the land.

Cost of Community Services (COCS) Study. A case study method of allocating local revenues and expenditures to different land use categories. COCS studies reveal the net contribution of residential, commercial, industrial, forest and agricultural lands to local budgets.

Circuit breaker tax relief . A tax abatement program that permits eligible landowners to take some or all of the property tax they pay on farmland and farm buildings as a credit to offset their state income tax. Generally, farmers are eligible for a credit when property taxes exceed a set percentage of their income.

Differential tax regimes. Farmland is taxed on the basis of its value for farming or conservation rather than its potential value for urban development.

Downzoning. A change in the zoning for a particular area that results in lower residential densities. For example, a change from a zoning ordinance that requires 4 hectares per dwelling to an ordinance that requires 20 hectares per dwelling is a downzoning.

Dwelling Units. This is defined as the measure of development density under the US zoning system e.g. the number of dwelling units per unit area is limited for each zone. Transfer of Development Rights

allows developers to increase the number of dwellings in an area by transferring the rights from a low density area ('sending area' - see definition further into this document).

Easement. An easement involves the right to use a parcel of land to benefit an adjacent parcel of land, such as to provide vehicular or pedestrian access to a road or sidewalk. Technically known as an easement appurtenant.

Environmental Impact Statements (EIS). An EIS provides a means for agencies, project sponsors, and the public to systematically consider significant adverse environmental impacts, alternatives, and mitigation strategies. An EIS facilitates the weighing of social, economic, and environmental factors in the planning and decision-making process.

Farm link. A program that matches retiring farmers who want to keep their land in agriculture with beginning farmers who want to buy a farm. Farm Link programs are designed to facilitate farm transfer, usually between farmers who are not related to each other. Also known as Land Link.

Lot. A lot is a portion of a subdivision, plot, tract, or other parcel of land considered as a unit for the purpose of transferring legal title from one person or entity to another.

Receiving area. Areas designated to accommodate development transferred from agricultural or natural areas through a transfer of development rights program.

Rezoning. An act of the local legislature that changes the principal uses permitted on one or more parcels of land or throughout one or more zoning districts. Rezoning includes the amendment of the zoning map, as well as the use provisions in the district regulations applicable to the land that is rezoned.

Right to farm. A state law or local ordinance that protects farmers and farm operations from public and private nuisance lawsuits. A private nuisance interferes with an individual's use and enjoyment of his or her property. Public nuisances involve actions that injure the public at large. Tasmania is the only Australian state to have this legislation in place.

Sending area. Area to be protected through a transfer of development rights program. Landowners may sell their development rights to private individuals or a public agency; the rights are used to build homes in a designated receiving area**.**

Subdivision. The subdivision of land involves the legal division of a parcel into a number of lots for the purpose of development and sale. The subdivision and development of individual parcels must conform to the provisions of local zoning which contain use and dimensional requirements for land development.

Transfer of Development Rights ("TDR"). Provisions in a zoning law that allow for the purchase of the right to develop land located in a sending area and the transfer of these rights to land located in a receiving area.

Urban Growth Boundary. A theoretical line drawn around a community that defines an area to accommodate anticipated growth for a given period of time, generally 20 years. Urban growth boundaries are a growth management technique designed to prevent sprawl. They are often used to guide decisions on infrastructure development, such as the construction of roads and the extension of municipal water and sewer services.

Zoning. Zoning is used to divide a city into areas determined by restrictions on types of use. Land use zoning entails placing restrictions on the use of the land by way of statute. This is the principal method for controlling the development of land in Australia. Land is designated for a principal use and uses not considered to be suitable or compatible with the principal use are prohibited (Sinclair, 2003).

Further reading:

American Farmland Trust (2002) The Farmland Protection Toolbox http://www.farmlandinfo.org/documents/27761/fp_toolbox_02-2008.pdf

American Farmland Trust (1998). Glossary .http://www.farmlandinfo.org/documents/37109/Glossary_11-02.pdf

Land Use Law Center Pace University School of Law (1998) Universal Glossary of Land Use Terms and Phrases http://www.nymir.org/zoning/Glossary.html

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GHD Hassall

GHD

10 Bond Street Sydney NSW 2000

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T: 2 9239 7100 F: 2 9239 7199 E: sydmail@ghd.com.au

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1	L. Jewell	J. Lane	*J. Lane*	L. Jewell	*L. Jewell*	4/11/08