



knowledge for managing Australian landscapes

Change and Continuity in Peri-urban Australia

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Project Team

Change and Continuity in Peri-urban Australia is a collaborative research project between researchers from Griffith University's Urban Research Program, Griffith School of Environment and RMIT University's School of Global Studies, Social Science and Planning.

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1. Introduction

The non-urban areas within 150 kilometres of Australian metropolitan centres are undergoing rapid change and fragmentation, and in many cases, intense conflict. They are the sites of all outer urban expansion; are important sources of environmental, natural and human resources; produce over one quarter of the value of agricultural production; are the locations of much urban water; and contain 50 per cent of threatened biodiversity.

The research project, 'Change and Continuity in Peri-urban Australia' aimed to investigate the current state and future possibilities of peri-urban regions in Australia and to contribute to the growing international literature in this area.

Peri-urban regions are those areas on the urban periphery into which cities expand or which cities influence. They are usually not homogenous and often contain a disorderly jumble of residential, commercial and rural-residential land uses, often interspersed without apparent order.

These fringe areas are the fastest growing regions in many countries and they inevitably involve conflicts between land uses. It is important to understand and predict the changes that are occurring to enable proper planning of these regions and to minimise negative social, economic or environmental impacts that may result.

2. Characteristics of the Peri-urban Environment

Rapid population growth is perhaps the most common characteristic of peri-urban regions. Growing populations may be characterised as 'forced relocators' or 'free agents'.

In Australia, forced relocators are residents whose low incomes lead to their relocation to less expensive housing on the urban fringe.

Free agents include retirees, professionals and alternative life-stylers. The residential preferences of these groups drive a trend known as counter-urbanisation which is characterised by higher growth rates in peripheral rural regions and small and medium sized settlements at the expense of core urban regions.





Peri-urban areas are significant agricultural producers in most countries. The Port Phillip region around Melbourne, for example, is the second highest producer of agricultural products in Victoria, and its agricultural output per hectare is four times the state average.

Australia's peri-urban regions comprise less than three per cent of the land used for agriculture, but account for at least 20-25 per cent of the gross value of agricultural production in the five mainland Australian states.

Peri-urban regions operate at multiple scales. The patterns of relationships between the different governance, institutional arrangements and land management systems are complex and varied. Time is also important because ideas change over time with implications for other scales. The relationship between the global and the local is mediated through national, regional and local environmental, economic, social and cultural factors, institutions and land management systems.

3. Policy Responses for Peri-urban Areas

A wide range of policy responses is available to control land-use in peri-urban areas. These responses can be classified broadly as regulatory, market based, and voluntary.

The level of government involvement can be high, as in the case of regulation; low as in the case of voluntary measures, or somewhere in between. Many different measures can be used in each type of policy response. Strong regulatory measures control and may even drive down the value of land.

The effectiveness of these measures can be graded in a continuum from strong to weak, although many factors influence effectiveness.

As long as sufficient urban land is made available and progressively released, regulatory controls over peri-urban land should not lead to undue urban land price increases. The most common regulatory tools are zoning and legislation.

In Europe, where national, state or regional, and local decision-making has traditionally been integrated, the countryside is protected not by conserving farmland but by containing urban

growth. The extensive use of green belts and urban growth boundaries has successfully limited the expansion of towns and cities. There is no national policy in Australia to protect peri-urban farmland and other peri-urban land from development.

Two of the most widely used strategies to protect non-urban land are the urban growth boundary and the green belt. An urban growth boundary is a defined and enforced limit to urban growth, while a green belt is a defined non-urban or rural belt of land extending around the periphery of an urban area between the urban growth boundary and a defined outer boundary. The success of urban growth boundaries can be evaluated according to whether they reduce the market value of rural land and increase the demand for urban land without unduly increasing its price. The most common means of implementing green belts is through regulatory policy or legislation, land purchase programs and the purchase of development rights.

Reliance on agricultural policy and the designation of agricultural areas alone will not prevent the conversion of farming land to urban purposes. Designation of agricultural production areas linked with strong limitations on development, coupled with the designation of urban growth areas and lower density development outside these areas, is more likely to be effective.

4. Biodiversity in Peri-urban Regions

The growth of urban areas has resulted in the loss of natural habitats and fragmentation of the landscape so that urbanisation is now considered one of the greatest current threats to Australia's biodiversity.

Urbanisation has affected and continues to affect biodiversity, principally through the spread of exotic species, pollution and the destruction of natural habitat.

Conservation planning requires a long-term perspective and the integration of ecological knowledge into planning processes rather than reactive, ad hoc decision-making.



5. Land-use Planning and Agriculture

Land-use planning measures are an important factor in influencing land-use and demand in peri-urban areas. By controlling subdivision and urban related uses, regulatory controls can achieve a range of social, environmental and economic objectives in peri-urban areas, including assisting the maintenance of agricultural production.

5.1 Water Use and Management in Peri-urban Regions

Water efficient appliances can reduce urban water-use by half, and the use of rain water tanks can lead to water savings from mains of 45 per cent. Residential block size is another major factor in determining levels of water consumption. Distribution of population is also important.

Much of Australia's future growth is anticipated to occur in places where water availability is already inadequate, such as in peri-urban areas where there are many competing demands for water.

Traditionally, intensive agricultural areas in peri-urban Australia have been comparatively lower users of water, but demands are now increasing. This trend is leading to interest in recycling urban waste-water for agriculture and other purposes. Urban water savings have only become noticeable in Australia as governments have strengthened regulatory measures.

5.2 Implications of Climate Change for Peri-urban Regions

It is now clear that climate change will have major implications for peri-urban areas in Australia. Lower precipitation and soil moisture, changes in rainfall patterns, increased temperatures and incidence of extreme events will all lead to changes in cultivation and other forms of land-use. The regional implications of climate change for land-use, water supply and biodiversity, as well as the social and economic implications, need to be further evaluated.

6. Peri-urban Case Studies

Case studies of the Bendigo regional corridor in Victoria and the south-east Queensland growth corridor were used to identify and analyse spatial, land-use, environmental, natural resource, social and economic trends; identify governance, institutional, policy and management arrangements and evaluate their adequacy; and examine the implications of change for future land-use and land management.

There are many differences between the Victorian and Queensland case study areas, between parts of the Melbourne peri-urban region, and across Australian peri-urban areas generally. However, many similarities exist in the sectoral trends and in the inadequacy of institutional responses to these trends.

7. Melbourne's Peri-urban Zone

Melbourne's peri-urban area consists of inner and outer peri-urban belts. The inner belt comprises Melbourne's green wedges and a broader green belt situated between the urban growth boundary at the metropolitan edge and the outer rural boundary of 17 fringe area metropolitan councils.

Melbourne's outer peri-urban zone is defined as a belt of land between the outer boundary of the green belt and an outer limit defined structurally by such factors as population density, or functionally by processes such as commuting distance to the city.

Widespread commuting is occurring from peri-urban coastal and inland locations to the Melbourne metropolitan area and to regional urban centres. High population growth is occurring in Melbourne's peri-urban area with some local government areas amongst the fastest growing areas in the state.

This growth is being driven largely by people moving from Melbourne attracted by landscape, cultural, lifestyle and amenity factors, more affordable housing, changed employment arrangements, and improved infrastructure allowing a combination of telecommuting and commuting. The study area seems to have adjusted successfully to some recent drivers of change such as global economic restructuring.

Globalisation and associated policy responses are influencing the practice of agriculture in peri-urban areas by leading to increased farm sizes to ensure viability, and the need for increased productivity and, often, off-farm income. Manufacturing has been reduced.

Changes in the nature of work and the growth of knowledge and information based economies are also influencing peri-urban development. Much new economy employment, such as business and financial services, and part-time work, is compatible with peri-urban locations.

7.1 Key Findings

Extensive spatial fragmentation has occurred in the study area. Most of the rural areas have been subdivided into smaller rural lots of varying sizes, jointly owned as part of larger properties, each lot able to be developed. This potential will lead to extensive incremental development of dwellings and other uses over time with significant implications for servicing costs to local government, the provision of social services, landscape quality, water use, agriculture and biodiversity.

A significant area remains in lots over 40 and 100 hectares in size. The subdivision of these lots will lead to further spatial fragmentation. The possibility of lot excisions will exacerbate this trend significantly.



Agriculture remains an important economic activity in the study area. Extensive grazing is the predominant agricultural use but investment in intensive high capital forms of agriculture is increasing. The retention of larger lots is a significant factor supporting the retention of agricultural businesses and future options for agricultural diversification and production.

Demand for water is increasing but development is not being adequately integrated with water availability or cost. Environmental allocations have borne a disproportionate reduction in water availability as supply has diminished.

The study area retains important natural resources including an extensive area of public land and a range of remnant values on private land. These have significant implications for tourism, although recreation and tourist activity can diminish the values originally prized.

The study area contains important biodiversity values but there is a mismatch between planning tools and sectoral characteristics, particularly for the protection of biodiversity.

Stronger regulatory land-use planning tools and practices can exert a significant influence on the integrated planning for the region, including the protection of biodiversity and retaining some conditions suitable for the continuing practice of agriculture. They can assist the protection of biodiversity by preventing the removal of vegetation and wetlands and by ensuring that development approvals require improved ongoing management of vegetation and water resources.

7.2 Land-use Planning

Spatial land-use planning can act as a powerful independent factor influencing change in peri-urban areas. Land-use planning can influence conditions which affect land uses, such as controlling lot fragmentation to assist the retention of agriculture, by limiting speculative land price rises, and retaining larger lots.

In developing planning schemes, councils must select from provisions, such as zones and overlays, or include discretionary tools within provisions, such as subdivision schedules to zones.

The potential scale of rural housing development could seriously diminish the tourism and agricultural potential of the Bendigo corridor while leading to major infrastructure costs and detrimental environmental impacts. To prevent these detrimental impacts, additional planning measures will need to be introduced, such as rural tenement controls, the restructuring of inappropriately subdivided rural lots, and the deletion of provisions that allow even further fragmentation such as house excisions and additional rural houses.

7.3 Biodiversity

Substantial biodiversity values exist within the peri-urban zone from Melbourne to Bendigo, with important areas of endangered, vulnerable or depleted ecological vegetation classes. The region contains 105 threatened fauna species and 176 threatened plant species. The rate at which species are being listed under threatened species legislation is not declining, which could be interpreted to mean that the level of threat in the region is also not declining. Efforts to restore vegetation through Landcare and similar programs have not made substantial inroads to restoring vegetation in the region, suggesting that additional approaches are required to achieve significant vegetation restoration.

The nature of agricultural change in this corridor is typical of changes in other regions within a major urban influence. Change has been associated with broad structural changes in Victorian and Australian agriculture, with more specific geographic pressures associated with expanding urban and urban-generated settlement and population growth.

7.4 Water Resources

Demand for water by a rising population and for development is increasing markedly in the corridor while annual rainfall, stream flows and storage levels have fallen. Large-scale diversions through farm dams are continuing. The greatest impacts on reduced water availability have been on environmental allocations. Inter-basin transfers of water will augment town supplies, but environmental impacts of reduced water availability are likely to continue.

All future planning for the corridor must relate water use, diversions and supply to land-use and development. Water availability may become a major inhibitor to development, but equally importantly, minimum stream flows need to be maintained for environmental purposes. Planning will require an unprecedented level of integration of water, natural resource and land-use planning through improved institutional interaction and cross-sectoral policy development. This will need to involve State, regional and local government agencies.

The need for caution is reinforced by the potential for climate change to reduce surface flows in the catchments by between five per cent and 30 per cent by 2030.

Increasing population growth, tourist and industry development, and urban and rural-residential development in the study area is leading to increased demand for water.

Peri-urban developments outside the major townships will mean more farm dams constructed for stock and domestic purposes.

River health is under threat from factors other than low flows, in particular, the loss of riparian vegetation, introduction of exotic species and poor water quality.

7.5 Socio-demographic Trends

Population growth in the corridor has accelerated since the year 2000, with population growth for the four-year period 2001–2005 equal to or greater than that of the previous decade. The non urban areas experienced higher growth rates than the urban areas.

This strong growth in population and dwellings in non-urban areas of the corridor, the high in-migration rates from the Melbourne metropolitan area, particularly at the Melbourne end of the corridor, and the age, income and employment profiles of incoming residents are typical of many peri-urban areas on the fringes of cities in developed countries.

When related to the rural subdivision pattern, and pressures on natural resources and the environment of the corridor, these demographic trends reinforce the need for a new level of integrated planning for this peri-urban region.

7.6 Integration

There is insufficient coordination between local councils, regional management authorities and state government, and insufficient integration between state government agencies.

Land-use planning is not performing an integrative role in the region. The separation between land-use planning and natural resource management is part of the institutional fragmentation. The failure to achieve policy integration arises in large part from a reduction in the role of government and reliance on market decision making. The adoption of cross-sectoral policy responses requires planning and intervention from the appropriate levels of government.

Much investment has occurred in sectoral policy development and management. But sectoral decision making cannot anticipate or adequately respond to emerging strategic challenges. The impact of external influences such as climate change could exacerbate current trends and increase uncertainty. Such factors increase the importance of long-term integrated strategic planning for the corridor.

8. South-East Queensland Case Study

The south-east Queensland region is the fastest growing metropolitan region in Australia and one of the largest planning regions in the world. It extends 250 kilometres north-south and 160 kilometres east-west, and comprises an area of 2.2 million hectares (23,700 km²).

The region has been dominated by sustained urban growth over the past two to three decades with a large proportion of that growth associated with the metropolitan core centred on the city of Brisbane and its immediate hinterland.

The area experienced strong population growth during the 1980s and early 1990s which led to dynamic social and environmental changes.

8.1 Land-use Aspects

Rural residential development and primary production are the dominant land uses in the case study area.

A diverse range of agricultural activities exist across the area. Agricultural establishments in general have been decreasing in size and number, whilst production of crops, including lettuce, has increased and a shift towards crops suitable for intensive farming is taking place.

The emergence of lifestyle horticulture, including turf farms, cut flowers and nurseries is a trend in the area, with the industry becoming one of Queensland's fastest growing. The growth in this industry is consistent with the continued and sustained population growth occurring in south-east Queensland.

However, future growth is potentially threatened by urban encroachment into the peri-urban area and by the severe water shortages associated with the recent drought in the region.



8.2 Biophysical Threats

Land previously not viable for agriculture and left undeveloped coincides largely with elevated ridgelines which now function as biodiversity corridors. These regionally significant pockets of remnant vegetation also represent some of the area's highest biodiversity values. These areas are under serious threat due to their attractiveness for rural residential purposes.

Fragmentation of remnant vegetation and loss of habitat and wildlife corridors is a result of vegetation clearing for settlement throughout the area. Many rare, vulnerable or endangered species inhabit the peri-urban area and further land fragmentation as well as increasing densities of residential development may result in further biodiversity losses.

The strong population growth and continued urbanisation has resulted in the region's limited water resources being assigned for urban consumption at the expense of agricultural uses. Identified impacts of peri-urbanisation in the case study area include an altered hydrological regime, over-extraction of groundwater and poor water quality.

The study identified a range of peri-urban challenges and presents a focus for future priorities in terms of land management. The following challenges can be expected to confront the management of other peri-urban areas in the south-east Queensland region and beyond.

8.3 Landscape Management Challenges

- Loss of biodiversity - the subdivision and resulting fragmentation of land has resulted in loss of wildlife corridors throughout the case study area.
- Pests and weed infestation - a large number of pests are becoming more widespread.
- Loss of scenic amenity - scenic amenity has the potential to be reduced by increasing fragmentation of the landscape through increasing subdivision and urban related development.
- Water quality decline
- Changes to hydrological regime - the Lockyer Valley has been recognised as a stressed groundwater system where extraction of water has exceeded a sustainable rate. Significant quantities of surface water have been captured in an increasing number of farm dams across the rural residential landscape, thus depriving the natural hydrological system of its usual flows.
- Impacts on groundwater resources - over extraction of groundwater has resulted in salinity and long-term impacts such as falling water tables.
- Landscape management capacity - urban newcomers may have capacity in terms of time to devote to their properties but they may lack the knowledge, skills, educational background or surplus resources to devote to landscape management.

8.4 Social and Economic Challenges

Anecdotal evidence suggests that conflicts exist between incoming urban lifestyle and traditional farming community. Some of the problems are a loss of a 'sense of community,' skewed population and the emergence of new local and regional economies.

8.5 Management Arrangements

Governance and institutional arrangements for land-use and environmental planning and NRM across south-east Queensland are highly fragmented.

Improved coordination is required to ensure that planning is consistent, avoids duplication and involves greater integration of planning and management functions.

9. A New Peri-urban Landscape

Trends observed in this south-east Queensland case study are consistent with overseas experience which suggests that peri-urban areas may be evolving into a new form of settlement – distinct from traditional forms of rural and urban settlements.

The study has also highlighted the significant demographic changes experienced in the area. These changes have led to a wave of new settlers now being largely responsible for the management of these freehold landscapes. Future management initiatives, especially in the NRM area, will have to engage this raft of new actors on the peri-urban stage who now have stewardship responsibilities for increasing proportions of the areas.

The continued fragmentation and peri-urbanisation that is potentially possible through future sales of multi-titled farms to non farmers is perhaps the most pressing issue that requires urgent attention by the State and local governments.

Future management initiatives should focus on the process of peri-urbanisation and not solely on its spatial dimensions. These initiatives can be focused through the employment of the recommended peri-urbanisation cycles which highlight the critical linkages between the drivers of change, the peri-urban process and its resulting management challenges, and the new actors on the scene.

Effectively addressing these challenges demands a new approach different from past practices that were based on traditional urban and growth management approaches. These peri-urban landscapes display certain urban like characteristics, however, they may never become fully urbanised.

New approaches are required to address the management challenges in these evolving peri-urban landscapes.

10. Peri-urban Futures and Sustainable Development

An assessment of the performance of strategies and plans within a number of possible scenarios suggests that whilst the peri-urbanisation process will continue, the context in which it will do so could vary greatly from circumstances exemplified by an 'agriculturally declining' scenario through to an 'agricultural revival' scenario.

Two findings stand out in both case studies. Firstly, the past spatial fragmentation of these landscapes will continue in the near future and be dominated by activities associated with ongoing peri-urbanisation processes. This study has shown that existing statutory planning attempts to prevent continued fragmentation will not be sufficient to address future peri-urbanisation resulting from the sale and split up of multi-titled farms comprised of a number of small lots.

Both case study regions have experienced increasing investment in intensive high-capital forms of agricultural production along with the increasing dominance of non urban industries, including the equine industry, and related activities of a growing 'horse community'.

These emergent trends of spatial fragmentation and land-use intensification within the peri-urbanisation process present a quandary for current planning and landscape management efforts which must strive to maintain flexibility to support future regional needs whilst responding to community aspirations within a context of ensuring a sustainable landscape.



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The full Monographs 1, 2, 3 and 4 can be downloaded from the project's website at: <http://www.griffith.edu.au/environment-planning/urban-research-program/publications/research-monographs>

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