# Economic Benefits of Open Space in South East Queensland

A Discussion Paper Prepared by

Regional Landscape Strategy Advisory Committee

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## Introduction

The urban areas of South East Queensland are embedded in a region of farms, bushland, forests and water bodies. Although these open space lands are generally accepted as important, open space benefits, other than industry output, are difficult to measure. Benefits to the environment, the community and future generations do not generally have a market price so are not reflected in land values. In this situation, the measurable benefits of changed land use often win out over the unmeasured values of unchanged use.

Open space benefits include:

- Individual – recreation, self-discovery and spirituality, scenic amenity, environmental appreciation
- Community – life-based ethos, social bonding, reduced behavioural problems, community and cultural identity, communal responsibility for landscape outcomes
- Production – agriculture, livestock, quarry materials, eco-tourism
- Ecosystem Services – water, air, soil, pollination, flood mitigation
- Ecosystem Amenity – support for human and other communities
- Planning system – separated urban areas, future opportunities, reduced developmental impacts, community boundaries.

All of these benefits may be available from the same parcel of land at the same time. The challenge for the community is to manage the benefits so that none is lost needlessly.

This paper provides an overview of the last four open space benefits for South-East Queensland (SEQ), which are those more easily assessed in economic terms. Community and individual benefits are not targeted in the following discussion.

Many of the above benefits are well recognised but progress in assessment methodologies has been slow. This has resulted in inadequate recognition and limited advocacy of open space in local government planning processes. In practice, open space advocacy is mainly based on ecological values with little focus on economic and social values.

This situation is starting to change. Experience in both Australia and the USA is that poorly controlled development has led to unnecessary loss of farm production, rapid reduction in quality of life and high costs in servicing urban sprawl.

The estimates detailed below are drawn from Australian and US sources and demonstrate the order of magnitude of the economic benefit of open space in SEQ. No source data could be found for some benefits. Further work is required.

## Production

The agricultural production of SEQ is around $800 million annually, much of which is not at immediate risk from urban expansion. Specific agricultural uses at risk are those in coastal areas, including market gardens, flower production, poultry and sugar cane.

Local market gardens and poultry farms reduce food and flower costs for the population, ensure freshness of produce, and reduce road transport volumes. No estimate of benefits external to the landholder is available.

Maintaining SEQ sugar cane lands above a critical mass provides for the viability of local crushing mills, and thereby the continuation of the local industry. While the economic value of sugar production is not large, the loss of the local industry would lead to loss of rural character and loss of open space currently separating urban areas on the coast. Conventional subdivision of sugar cane lands would affect negatively Moreton Bay ecology. No estimate of value of the external benefits is available.

These industries also provide significant jobs in local communities.

## Ecosystem Services

Benefits that result from the health of the open space, rather than from exploitation, generally can be described as ecosystem services. Open space lands support natural ecosystem functions that provide benefits such as:

- Ground water recharge
- Climate moderation
- Flood mitigation
- Abatement of air and water pollution
- Reduced silting of waterways
- Water table control (including salinity).

These benefits can be maintained in developed open space lands such as farms and parks when properly managed.

### Flooding and Wetlands

Some of these ecosystem benefits have been measured particularly in the US where many areas suffer record levels of flood damage through development of wetlands and building on flood plains.

In Illinois, an experimental wetland was reclaimed from farms. The marsh was able to handle the run-off from 70 times its own area and reduce pollution by up to 99%. (*Restoring Wetlands Could Ease the Threat of Mississippi Floods,* New York Times, 8/08/1995.)

In Massachusetts, 8500 acres of wetlands were acquired for flood mitigation. The cost-benefit ratio was 10 to 1 when compared with the alternative of dam building. (*Beyond the Ark: A new approach to US floodplain management.* Environment 35(5), J Kusler & L Larson 1993.)

While parts of the Gold Coast and some Brisbane suburbs are thought to be at particular risk from flooding, no estimates are known for flood mitigation benefits to SEQ from undeveloped wetlands and floodplains.

### Salinity

Increasing salinity, mainly from inappropriate farm practices and excessive land clearing, e.g. in the Lockyer Valley, reduces the choice of viable crops. Current understanding of salinity processes indicates no short-term solutions are available.

Salinity can also damage roads and buildings, but there are no reports known in South East Queensland at present.

### Air Pollution

South-East Queensland has a significant ozone problem because of the nature of the airshed. There is also a problem with particulate levels. Although estimates of the health cost of SEQ air pollution are scarce, Brisbane City Council funded a study that estimated public health costs to be around $400 million annually. The bulk of the costs came from the modelled 46 to 82 deaths per year from increased particulate levels. (*An Economic Evaluation of the Health Impacts of Air Pollution in the BCC Area*, Griffith University 1995, R Simpson and J London.)

Open space lands are valuable for trees that remove pollutants from the air, including nitrogen dioxide, sulphur dioxide, ozone, carbon monoxide, and particulate matter of 10 microns or less. (Some tree species may emit compounds that contribute to smog.) Also, open space buffers can separate urban areas so that peak pollution levels are reduced.

### Water Supply

The public provision of water in SEQ is valued at cost, about $400 million annually. The value of that water to the users must be much greater, perhaps $2000 million. This is a large consumer surplus of value over cost, directly from the current state of the open space in the catchment. Failure to manage the open space would increase water treatment costs and water rates, thereby reducing the consumer surplus. US experience has demonstrated that it is far cheaper to manage the open space than to treat the water.

### Valuing SEQ Ecosystem Services

Given the large user valuation that can be placed on water alone, the value of ecosystem services in SEQ must run into some billions of dollars annually. Further substantial loss of ecosystem services would reduce quality of life, increase living costs and eventually lead to loss of population with attendant social problems, as can be seen in the decline of some US cities.

## Ecosystem Amenity

Regional ecosystems provide a range of more subtle benefits to the community. The open space combined with relatively natural ecosystems provides many opportunities for de-stressing, self-discovery and re-creation of individuals and families. These benefits can be considered as contributing to life fulfilment and community wellbeing.

### Outdoor Recreation

Outdoor recreation is a major contribution to the economy and quality of life. Sport and Recreation Queensland surveys estimate about 40 million person-activities in outdoor recreation annually in SEQ. Expenditure on travel for those outdoor recreation activities may exceed $500 million annually in SEQ. Associated expenditures on equipment, supplies and accommodation may be a similar amount, much of it going to creating jobs in rural areas.

The Regional Trails Framework initiative and the development of Regional Parks have potential to increase the outdoor recreation market substantially.

In addition, the Commonwealth Department of Health and Aged Care and Australian Sports Commission have estimated about $400 million nationally in direct health costs is attributable to lack of physical activity. The SEQ share of that would be about $50 million with some proportion resulting from inadequate community access to open space. While only a small proportion of those people currently insufficiently active might respond to increased access to open space, perhaps $2 million annually could be saved in direct health costs.

### Attraction of Business

Attraction of business to lifestyle environments is considered an important aspect of SEQ. A large survey of new or expanded businesses in Colorado found that recreation, parks and open space constituted the primary quality-of-life issue for small businesses. (*An Empirical Study of the Role of Recreation, Parks and Open Space in Companies' (Re)Location Decisions,* Crompton, Love, and More, Journal of Park and Recreation Administration 1997.) No estimate of value for SEQ is available but the importance of attractiveness was recognised in the draft SEQ Economic Development Strategy.

### Nature-based Tourism

Nature-based tourism activities arguably are the greatest attraction for tourists in SEQ, beaches being a recognised component of open space. Domestic and international visitor expenditure in SEQ amounts to about $8 billion annually (*International and Domestic Visitor Expenditure in Queensland Regions :1985 to 1999,* Office of Economic and Statistical Research) of which almost half is tourism (*National Visitor Survey)*. Arguably, of that tourism expenditure, at least half, about $2 billion, is based on access to the region's relatively natural open spaces – beaches, waterways, parks, bushland and farmland.

The Scenic Amenity methodology developed by the Regional Landscape Strategy Advisory Committee is increasing knowledge of how the community and visitors value places and scenery.

## Planning System

The continued existence of open space lands can provide benefits by preventing loss of particular open space benefits.

## Containment of Urban Sprawl

Protected open space can reduce urban sprawl, saving infrastructure costs and transport congestion, and be used to form community-sized urban localities. In the US, initiatives to reduce sprawl are often referred to as "Growing Smart".

US studies have found urban sprawl generates higher infrastructure and operating costs for government. A comparison of three major studies found compact development saved an average of 25% on local roads, 20% on water and sewerage, and 5% on schools. (*Economic and Fiscal Costs (and Benefits) of Sprawl* in *Urban Lawyer* 159, R Burchell (1997).)

In SEQ, where local government spends more than $600 million annually on roads and water, a moderate reduction in urban sprawl could save $10 million annually in reduced capital costs in new developments. Operational savings would increase over a decade to a similar magnitude.

Education Queensland spends more than $1.5 billion in SEQ annually and a moderate reduction in urban sprawl could save $40 million annually within a decade through more efficient use of educational establishments.

*(Assumptions include: population growth rate of 2%, savings percentages from Burchell 1997, reduced by half to allow for incomplete containment by open space, no savings possible in existing urban areas. Expenditure figures are indicative based on 2001-02 budgets.)*

Urban sprawl also generates substantial increases in private vehicle use. A 1994 study of 28 California communities, controlling for levels of transit service and vehicle ownership, found a doubling of residential density was associated with a 16% reduction in vehicle-miles of travel. (*Using Residential Patterns and Transit to Decrease Automobile Dependence and Costs*, 1994 NRDC, J Holtzclaw.) This has the corollary of increased economic viability of public transport systems.

The Bureau of Transport Economics estimates current road congestion costs for Brisbane at around $2.6 billion annually. Australia-wide trends are for a five-fold increase by 2015. Congestion costs include allowance for time lost by commercial and private road users. Increased congestion is also a major contributor to air pollution with a greater proportion of travel under stop-start conditions.

Preliminary estimates for SEQ indicate that a moderate reduction in urban sprawl (increased urban density) could save $70 million annually in congestion costs within 15 years. The protection of regional open space has a key role if this saving is to be achieved.

*(Assumptions include: population growth rate of 2%, traffic growth of 5%, 16% reduction in vehicle-km for doubled density, savings reduced by half to allow for incomplete containment by open space, no savings possible in existing urban areas, BTE forecasts of Australian congestion apply to SEQ, fixed relationship between traffic growth and congestion costs.)*

There is some evidence that controlling sprawl increases the likelihood that inner-city areas will be rehabilitated. Rehabilitation of inner city areas reduces demand for public infrastructure and reduces vehicle congestion. No savings estimate is available.

Containment of urban sprawl by open-space separation of developed areas provides for cost-effective provision of communications, infrastructure and public services. No savings estimate is available.

Use of open space to produce closure of urban areas promotes community identity and communal responsibility leading to improved social and economic outcomes. No estimate is available.

US studies of compact versus sprawl development have shown savings in agricultural land of 17% to 50%. (Burchell – various studies 1992, 1995, 1997, *Improving Land Use Futures-Applying the California Futures* Model, J Landis 1995.) No savings estimate is available for SEQ.

Technical studies by Burchell et al for the *Governor's Commission on Growth in Chesapeake Bay Region* (1991) showed that concentrated development (protection of open space) to 2020 would reduce cumulative impact of development by 2.3 million tons of sedimentation, 1.6 million pounds of nitrous oxide, and 31 billion gallons of water. No estimate is available for SEQ.

**Future Options**

Retention of open space allows for wiser choices in the future and provides scope for unforeseen uses. In some cases, the open space is retained for infrastructure corridors or government services. Open space lands also preserve natural systems and community benefits that may not be properly valued at present.

In the Sydney region, a major open space corridor has been secured to provide for parkland and future infrastructure corridors. The Sydney Region Development Fund operates to provide "areas of open space for the people of the Sydney Region" and to secure "land for a wide variety of planning purposes".

In South East Queensland, there are many examples of open space reserved for roads that in retrospect were grossly inadequate. The cost of resumption far exceeds the cost of reserving the open space. In addition, the political cost of later development of open space for public purposes is much less than the political cost of resuming properties from unwilling landholders. In some cases, local objections have resulted in regionally significant roads not being developed.

Partial benefits of infrastructure corridors can be estimated for individual cases based on resumption costs.

In other cases, large areas of open space may provide scope for unimagined options. For example, a multi-function polis was only considered because of the existence of large parcels of undeveloped land close to the Gold Coast.

Future option benefits are difficult to quantify until a possible use has been identified so that no estimate for SEQ is available.

### Full Community Benefit Valuation

As far as is known, no valuations have been made in SEQ that cover all known community benefits flowing from areas of land.

The total annual benefit of the Dutch Wadden Sea coastal wetlands was estimated at US $6200 per hectare per year in 1994. This included flood prevention, recycling of human waste, aquatic nursery, aquaculture, recreation, food production, education and scientific uses. (*Environmental Functions and the economic value of natural ecosystems.* Investing in natural capital: The ecological economics approach to sustainability. Island Press, Washington DC 1994.)

Applying this hectare value, adjusting for currencies and inflation and capitalising the benefit at 6%, gives a community benefit price of around $300 000 per hectare for SEQ coastal wetlands. In practice, such lands often sell for development at lower prices suggesting there is a loss in community wealth substantially greater than the gain in private wealth.

## Summary

Indicative estimates suggest effective protection of open space in SEQ could generate annual savings of:

- $20 million for local government roads and water
- $40 million for State education
- $70 million for road congestion
- $2 million for direct health costs.

Indicative estimates for annual benefits from the regional landscape as it currently exists are:

- $1000 million for outdoor recreation
- $2000 million for tourism
- $800 million for agriculture
- $2000 million for water production.

Uncosted benefits of protecting and managing open space include:

- Quality of life and life-fulfilment for individuals
- Attraction of businesses
- Avoidance of significant land resumption
- Reduced pollution
- Avoidance of salinity damage to roads and buildings
- Avoidance of loss of agricultural production from salinity
- Avoidance of flood mitigation works and flood damage
- Unforeseen economic opportunities dependent on land availability.

The uncosted benefits must necessarily run into billions of dollars in the long term.