1-1-1996

Land use planning for agriculture and sustainable rural development

Ian Kininmonth
Andrew Bathgate
Ross George
Dennis van Gool

Follow this and additional works at: http://researchlibrary.agric.wa.gov.au/journal_agriculture4
Part of the Environmental Health and Protection Commons, Environmental Monitoring Commons, Natural Resources Management and Policy Commons, and the Urban Studies and Planning Commons

Recommended Citation

This article is brought to you for free and open access by Research Library. It has been accepted for inclusion in Journal of the Department of Agriculture, Western Australia, Series 4 by an authorized administrator of Research Library. For more information, please contact jennifer.heathcote@agric.wa.gov.au, sandra.papenfus@agric.wa.gov.au.
IMPORTANT DISCLAIMER

This document has been obtained from DAFWA's research library website (researchlibrary.agric.wa.gov.au) which hosts DAFWA's archival research publications. Although reasonable care was taken to make the information in the document accurate at the time it was first published, DAFWA does not make any representations or warranties about its accuracy, reliability, currency, completeness or suitability for any particular purpose. It may be out of date, inaccurate or misleading or conflict with current laws, polices or practices. DAFWA has not reviewed or revised the information before making the document available from its research library website. Before using the information, you should carefully evaluate its accuracy, currency, completeness and relevance for your purposes. We recommend you also search for more recent information on DAFWA's research library website, DAFWA's main website (https://www.agric.wa.gov.au) and other appropriate websites and sources.

Information in, or referred to in, documents on DAFWA's research library website is not tailored to the circumstances of individual farms, people or businesses, and does not constitute legal, business, scientific, agricultural or farm management advice. We recommend before making any significant decisions, you obtain advice from appropriate professionals who have taken into account your individual circumstances and objectives.

The Chief Executive Officer of the Department of Agriculture and Food and the State of Western Australia and their employees and agents (collectively and individually referred to below as DAFWA) accept no liability whatsoever, by reason of negligence or otherwise, arising from any use or release of information in, or referred to in, this document, or any error, inaccuracy or omission in the information.
Land use planning for agriculture and sustainable rural development

Agriculture provides a valuable contribution to the economic and social well being of the State and its regional and local communities. At the same time, the benefits provided by agriculture have come at a cost to the environment that is becoming less acceptable to the community.

Changes are required to the methods of land use planning to adequately assess the impact of planning decisions on agriculture and other stakeholders if sustainable rural development is to be achieved.

Economic and social benefits
Nationally, almost five per cent of the workforce is directly employed in agriculture while a further 27 per cent is indirectly reliant on agriculture. Agriculture also adds to the quality and range of goods available to a community. This reduces the reliance on imports, improves the viability of communities and contributes to a diversified economic and social base which is particularly significant for regional and local development.

In 1995/1996 agriculture in Western Australia is expected to have gross value of production worth $4.3 billion. Of this figure, about 80 per cent will be exported, forming around 20 per cent of total exports. Only mining generates more export income for the State.

Decision makers need to realise that agriculture is an industry and that planning needs to be undertaken in a similar way as occurs for other industries. This means providing agriculture with access to those resources and conditions which enable it to efficiently meet market and community needs. Planning should also contribute to maintaining or enhancing environmental quality.

An important goal for agriculture will be to achieve sustainable land use patterns and management systems. Land use planning has a role to play in helping agriculture achieve this goal. Ian Kininmonth, Andrew Bathgate, Ross George and Dennis Van Gool discuss the directions land use planning could follow.
Resource management considerations

With a growing domestic and international population, the markets for agricultural products are assured. Our ability to competitively meet market needs will be achieved by:

- using and managing existing land resources more efficiently;
- improvements in technology;
- supplying products demanded by markets.

While there must be a balance between these the focus of this article is on the first. Land resources that are suitable for long term agricultural production are finite and mismanagement of these resources will lead to reduced agricultural profitability through increased production costs and decreased competitiveness.

Agriculture must increasingly compete for access to resources for production. Competition is increased by the deterioration in the quantity and condition of these resources as a result of:

- land degradation and offsite environmental impacts including salinity, soil erosion, declining fertility, loss of remnant vegetation, eutrophication and other forms of water pollution;
- loss or reduced access to strategically located, high quality land resources because of competition with urban, industrial, mining and other land uses, water management requirements or environmental constraints;
- fragmentation of productive agricultural land into land units that are too small. For example, small lots for rural residential and other non agricultural purposes;
- land use conflict with agricultural and allied industries, especially more intensive types of agriculture on the urban fringe. However, there is also increasing conflict between different types of agriculture occurring in many rural areas.

Resource allocation

The right to use particular land resources is generally determined through the land use planning process, by the Western Australian Planning Commission and local government.

Current approaches to allocating rural land resources are biased towards providing land for urban and rural residential purposes at the cheapest cost. Broader principles necessary for the ecologically sustainable management of resources do not appear to be adequately considered.

This is because the existing planning system largely reacts to market demands and operates on relatively short-term time frames of five to ten years. Little consideration is given to the following:
MAP 1: Irrigated agriculture areas in the northern half of the South - West Sustainable Rural Development Region. (Boxed area enlarged in Map 2).

- the long-term cost of permanently removing high quality land resources from existing or potential production; or
- the costs incurred by stakeholders that are external

Costs are external when they are not expressed in the market by prices of "goods", for example, the attractiveness of vineyards in the Swan Valley to tourists.

Compared with other land uses agriculture has been unable to explicitly identify its long term resource requirements, generally expecting the planning system to know what these are.

At times the "Right to Farm" argument has been used to justify the need for resource protection. This argument tends to be forgotten by individuals when the commercial advantages of subdividing the farm for non farming purposes outweigh the advantages of continuing in agriculture.

Agriculture competes with other uses for land resources and cannot claim an overriding right to these resources. Therefore, it needs to clearly identify those resources and conditions that are important for sustainable production and agricultural development and secure them through proper planning. Once access has been granted to these
Success in achieving the sustainable use and management of natural resources will initially depend on the identification of suitable areas for different land uses. The situation today, is that instead of undertaking proactive planning to zone the most appropriate locations for different types of agriculture, environmental controls are often used to determine where agriculture may not go. An example of this is in the Peel Harvey Catchment where environmental regulations are used to exclude or strictly control new intensive agricultural developments, without considering where these developments can take place.

Initially, land capability information should be used to identify areas in a catchment or region that are physically capable of supporting the range of land uses. Within any region or catchment there will be areas that are capable of sustaining intensive land uses, some of which are only able to sustain more extensive uses and some that should be retained in their natural state. Not only do these areas need to be identified, but assessment needs to be undertaken using a scale of mapping that is compatible with the level of planning. An example of very broad scale mapping is shown in Map 1 on the previous page. These areas will be recognised in the proposed State Planning Strategy by the Western Australian Planning Commission. Map 2 is an example of medium scale land and groundwater information over the Seabird groundwater sub-area, near Guilderton in the Shire of Gingin, north of Perth. This information is suitable for local government planning.

The suitability of the land resource for alternative land uses then needs to be assessed. While the land resource may be physically capable of supporting a land use, factors such as an inadequate water supply or climatic conditions may preclude its development for that use.

reserves, it needs to ensure they are managed responsibly for the long-term benefit of the community.

Land use planning goals
The specific objectives of land use planning for agriculture are to enable agriculture to continue to be an important sector of the economy by ensuring that existing and future agricultural industries:

- are developed and managed in an ecologically sustainable manner;
- have access to quality resources and conditions that are secured through appropriate zoning and land use controls.

Our ability to achieve these objectives will depend on the creation of community developed visions for agriculture. The visions developed will provide a basis for decision making that will set a firm strategic direction for agricultural development in the community. Actions to help achieve the preceding objectives are discussed in the following sections.

Achieving sustainable land use patterns
Sustainable land use can only be sensibly determined in the context of specific objectives. Land use will be sustainable when it results in a balance between these objectives.
Table 1: Comparative suitability of areas for irrigated annual horticulture (Multi criteria analysis of areas shown on map 1)

<table>
<thead>
<tr>
<th>Extent to which the assessment criteria is satisfied</th>
<th>WEST GININ</th>
<th>GINGIN</th>
<th>DANDARAGAN</th>
<th>BINDOON</th>
<th>CHITTERING</th>
</tr>
</thead>
<tbody>
<tr>
<td>High degree</td>
<td>15</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Moderate degree</td>
<td>20</td>
<td>20</td>
<td>10</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Low degree</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Not currently</td>
<td>10</td>
<td>7.5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Not at all</td>
<td></td>
<td>7.5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRODUCTIVITY FACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLIMATIC CONDITIONS (1)</td>
</tr>
<tr>
<td>WATER QUANTITY (1)</td>
</tr>
<tr>
<td>WATER QUALITY (1)</td>
</tr>
<tr>
<td>WATER ACCESSIBILITY (2)</td>
</tr>
<tr>
<td>LANDFORM/SOILS (2)</td>
</tr>
<tr>
<td>(Sub total)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONSERVATION FACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAND DEGRADATION (2)</td>
</tr>
<tr>
<td>ENVIRONMENTAL IMPACTS (2)</td>
</tr>
<tr>
<td>(Sub total)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DEVELOPMENT FACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RANGE OF CROPS (2)</td>
</tr>
<tr>
<td>EXPORT SIGNIFICANCE (2)</td>
</tr>
<tr>
<td>PROCESSING FACILITIES (3)</td>
</tr>
<tr>
<td>TRANS. INFRASTRUCTURE (2)</td>
</tr>
<tr>
<td>EXPORT (3)</td>
</tr>
<tr>
<td>SERVICES AND FACILITIES (3)</td>
</tr>
<tr>
<td>LAND FOR EXPANSION (3)</td>
</tr>
<tr>
<td>LABOUR REQUIREMENTS (3)</td>
</tr>
<tr>
<td>(Sub total)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>128.5</td>
</tr>
<tr>
<td>129.0</td>
</tr>
<tr>
<td>79.5</td>
</tr>
<tr>
<td>84.5</td>
</tr>
<tr>
<td>94.5</td>
</tr>
</tbody>
</table>

In addition, broader economic, social and environmental factors need to be assessed to determine those uses which result in the greatest benefit to the community. When considering these factors, planners must recognise that there is a diversity of stakeholders interested in planning decisions, and these various stakeholders will have different objectives.

These vary widely and include individual and community objectives. Objectives may be technical, and easily measurable such as minimising nutrient loading in streams, or they may be less easily measurable such as maximising recreation value.

In order to adequately assess the best use of the land resource, the extent to which different objectives of stakeholders can be met under different land uses needs to be determined. This enables plans to be formulated which have the appropriate balance between the competing objectives.

Achieving this balance will ensure that the costs and benefits of planning options which are external to the market and those which are intangible, will be considered in the planning process. This will be a significant development in the current planning process, which often focuses only on those benefits and costs which are immediate, and reflected in the market.

The table above is an example of multi criteria analysis. This approach can also be used to estimate the impact of proposed strategies and to determine trade-offs which exist between objectives. This method can also be used to determine optimum strategies by weighting each of the defined objectives according to their importance.

Once these are determined, then land use controls may be used to focus land uses in those areas that are most appropriate for those uses.

Justifying resource security

Linked to the achievement of sustainable land use patterns is the identification of resources that are important for long-term agricultural production.

A number of factors may need to be considered when identifying areas of agricultural significance and the need for resource security. These include:

- the size of the planning region (e.g. State, regional or local);
- the relative importance of different agricultural land uses to the region (e.g. horticulture, dairying, noodle wheat);
- resource requirements of the land uses;
- alternative locations where the land uses may be conducted and their relative suitability for future production;
- future production and resource requirements;
- existing infrastructure (e.g. irrigation district).

Considering the preceding factors, it may be determined that the Ord River Irrigation Area represents an
Farm forestry in the south-west, also competes for rural land.

area of State and probably national agricultural significance because of the high level of public investment in infrastructure, the value of agricultural production generated from the scheme, the area's ability to supply out of season horticultural produce and the potential for expansion.

Other areas, such as the Hills Orchard Area in the Shire of Kalamunda may be considered an area of regional and possibly State significance because it produces about 60 per cent of Perth's stone fruit crop. If the area was to be converted to another use, such as rural residential, it may be unlikely that the same level of production could be generated elsewhere in the region, possibly necessitating imports from interstate or overseas.

Social and environmental factors may also determine areas of agricultural significance. While 35 per cent of the States grape production is generated from the Shire of Swan, it may be argued that decisions to protect the historic Swan Valley from urbanisation have been based mainly on the cultural and tourism value of the area. Similarly, the decision by the Shire of Serpentine Jarrahdale to develop an Agricultural Protection Zone has been partly influenced by the need to focus intensive agricultural activities away from the environmentally sensitive catchment of the Peel-Harvey inlet.

A lack of knowledge about the value of agriculture to a particular area could result in poor decision making which adversely or irreversibly affects the entire community and have broader implications for the economy. Intensive agricultural areas in east Wanneroo have been earmarked for future urban expansion despite the fact that Wanneroo has the third highest gross value of agricultural production in the State. (Source 94/95 ABS).

Preventing land use conflict

Land use conflict involving agriculture and its allied industries is a problem that affects most rural communities, leading to community confrontation and pressure to convert high quality agricultural land to non-agricultural uses. Existing conflicts may in the future be dealt with by the recently proclaimed Agricultural Disputes (Resolution) Act, however, appropriate land use planning is necessary to identify and manage conflict before it occurs.

A number of issues are affecting rural areas and particular guidelines may be required to address these. Some of these issues relate to:

- managing intensive agriculture such as horticulture, cattle feedlots, piggeries and poultry farms, especially on the urban fringe;
- developing alternative patterns of rural settlement, such as rural villages and enclaves, cluster and group farms;
• integration of farming and plantation forestry;
• harmonising vineyard and tourism development;
• developing new industries, such as aquaculture in traditional agricultural areas.

To some degree, focusing agriculture and allied industries into specialised agricultural zones and developing buffers around these areas will address the problem. In the majority of areas though, other approaches will be required including tighter controls on land use, subdivision and development.

Assisting structural reform
Commonly, high quality agricultural land is included in areas zoned 'Rural' which in land use planning terms are generally considered to be areas waiting to be developed.

As agriculture diversifies and intensifies to take advantage of changing or developing market demands, appropriate policies must be developed which allow emerging opportunities to be met while preserving environmental quality and future options for agriculture.

Approaches that may assist structural adjustment may include:
• developing a greater range of specialist agricultural zones in rural areas to reflect the intended and suitable uses for that area;
• developing more appropriate definitions for the range of agricultural land uses in town planning schemes;
• permitting tourist chalets as incidental uses in farming areas;
• permitting subdivision of lots containing areas suitable for intensive uses such as horticulture or aquaculture from land used for grazing.

A major constraint to achieving structural reform is the assumed right to develop a dwelling house that comes with each subdivided lot. Traditionally, planning has

It is important to identify areas that are of special significance for agriculture and to protect these areas for future production.

addressed this problem by limiting subdivision which in turn has limited the potential for farm build-up and diversification. An alternative approach is therefore to separate the right to subdivide from the right to develop a dwelling house.

Environmental repair and management
Developing agricultural land use patterns based on suitability assessment and a proper consideration of alternative uses will be a significant step towards achieving sustainability and appropriate land management. Other measures will also need to be implemented to help arrest degradation and prevent offsite pollution of natural resources.

For example, when planning for the development of intensive agriculture in extensive agricultural areas, it may be important to look for opportunities to retain remnant vegetation, revegetate environmentally sensitive areas or to construct biological filters in drainage lines.

Integration with land use planning
Agriculture Western Australia has been working with the Western Australian Planning Commission to establish a framework for identifying and planning for productive agricultural land. This has involved identifying areas of potential and existing agricultural significance in the State Planning Strategy (refer to Map 1) and establishing broad policies that require these areas to be planned for.

However, long before Agriculture areas were considered in the State Planning Strategy, local communities, such as the Shire of Gingin, have recognised the significant role agriculture plays in economic and social development. At the same time they have

recognised that there are environmental concerns associated with land degradation and offsite environmental impacts that need to be managed.

At Gingin - areas containing land resources that are suitable for horticulture have been identified through the Shire's rural strategy and are being progressively included in a new 'Horticulture' zone. (The Shire used the same information as shown in Map 2).

To enable management of environmental impacts, 'irrigated agriculture' has been made a use that requires Council approval throughout the district. When considering applications for 'irrigated agriculture', Council takes into account detailed land capability, impacts on adjacent land, setbacks from waterways and waterbodies, protection of remnant vegetation, the provision of revegetation, the provision of reclamation and windbreaks, fertiliser use and water management.

The value of horticulture in the Shire of Gingin is expected to continue growing rapidly having increased by over fifty per cent from a value of $13 million in 1991/92 to $19 million in 1993/94. Using national figures this equates to about 500 jobs being created.

Agricultural industries are growing rapidly and require secure access to scarce high quality land resources. For example, on the Swan Coastal Plain up to 18,000 hectares of land with access to suitable water supplies may be required for horticultural use by the year 2015. By taking an approach similar to the Shire of Gingin, regional and local communities can facilitate horticultural development that achieves economic, social and environmental objectives as well as broader State objectives for sustainable rural development.

Ian Kininmonth, Project Manager with Technology Transfer and Communications, can be contacted on (09) 368 3408