



GARDENING AS AGRICULTURE

The original version of this paper was written as part of the Orange Agricultural College Sustainable Agriculture course material in 1991. In reviewing the reasons why so much emphasis was given to gardening in permaculture I was also aiming to demonstrate the difference between permaculture as a conceptual framework for sustainable development and gardening as a sustainable system of food production.

In this updated version I refer to important new statistics on the scale of household food production and also make the link to the sustainable cities debate in which food production has been largely ignored.



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Implicit in permaculture literature and action is the belief that gardening is central to a sustainable land use and culture. Gardening is an important form of agriculture right across the globe and I believe sustainable land use in a low energy future will involve more gardening and less broad acre and commercial farming. For a person raised in the culture of Australian farming and committed to broad acre sustainability this may appear a silly proposition. A superficial understanding of permaculture and its applications has led some people to conclude that permaculture is essentially about gardening and is irrelevant to commercial agriculture. I would dispute this but in this article I will concentrate on showing why gardening is important and I will identify the major impediments to the rise of gardening as agriculture in Australia.

By ***garden agriculture*** I mean small scale intensive production systems associated with homes and primarily providing for household needs, although tradable surpluses may be produced. Human labour rather than machines provide the major power input. In permaculture site design language we are talking about Zones 1&2 which rarely involve more than 1/2 acre.

This definition covers a diverse range of systems, varying according to climate, landscape, culture and economy but productive and ecologically sustainable gardens tend to reflect permaculture principles such as:

Biodiversity

Large number of crop species and varieties plus associated species including weeds

Complexity of physical design

Integration with housing and extensive infrastructure (water supply, fencing, trellising, greenhouses etc)

High nutrient absorption capacity

High levels of organic matter, perennial crops and/or continuous cover crops. Composting, mulching and animal forage system to return crop, household and other wastes.

Information Rich [observation]

High inputs of information and management, mostly informal, and generated from within the system.

Gardening has been a central focus for permaculture for the following reasons:

- Gardens are the most energy and resource efficient forms of agriculture particularly in the production of perishable food.
- There are methods suitable to all climate zones and land types which can be practised on a sustainable basis

- Gardening is very democratic, being available to almost all people as a way of providing some of their needs without much dependence on technology or financial resources.
- Gardening is a simple way to increase awareness of the processes of nature and our ultimate dependence on them.

In many parts of the world, garden agriculture continues to produce much of the food, particularly in tropical areas where gardens are ideally suited to production of traditional staples (carbohydrate foods) as well as fruit and vegetables. Small livestock, especially poultry are often an integral part of garden agriculture. In most cultures gardening is done by women within the household economy. Documentation of this non-monetary production is very poor so it is difficult to quantify, but there is evidence that it remains central to household nutrition for perhaps a majority of the world's people¹.

Produce markets absorb surplus from home gardens which form a continuum with fully fledged commercial farms of one hectare and less providing a livelihood for families.

AUSTRALIAN PROSPECTS

In affluent countries including Australia several generations of cheap food prices relative to wages has resulted in a decline household production. Gardening remains the most important recreational activity for Australians ahead of sport. Most gardeners concentrate on ornamentals and in general, gardening may be regarded as consuming more resources than it produces.

But recent Australian statistics² show that 6% of vegetable production is from home gardens and that despite our large fruit production for export, home gardens produce 4% of Australia's fruit crops. Egg production by domestic hens is 16% of total production although deregulation of egg production may show that some of this yield was previously illegal small scale commercial production.

The relatively low density of Australian cities and towns and high levels of sunshine (a limiting factor in the productivity of intensive garden agriculture) combined with cheap reticulated water means Australia has substantial natural and infrastructure capacity for garden agriculture within urban areas where the majority of the population live.

The substantial rural resettlement occurring around urban areas with its associated development of water supply, shelter and fencing is generating capacity for slightly larger scale systems able to supply households and local markets.

Gardens can provide a complete human diet, but are most resource efficient in the provision of fruit and vegetables as well as small livestock protein. It is in the production

¹ Vandana Shiva, the Indian eco-feminist has discussed this issue in *Staying Alive: Women Ecology and Development* 1989

² *Home Production of Selected Foodstuffs, Australia year ended April 1992* Australian Bureau of Statistics

of these more perishable and nutritionally important foods rather than grain staples that garden agriculture has a major role in any future sustainable Australian agriculture.

HORTICULTURE AS FARMING

Part of the problem for those involved in broad acre agriculture in taking gardening seriously as a form of agriculture, stems from the failure to comprehend the importance of horticultural industries generally. The value of commercial horticulture in Australia including vegetables, flowers, fruit and nut production is approximately equal to that for wheat, our most important broad acre crop³.

Horticulture occupies only a small proportion of agricultural land but the inputs of non-renewable resources are very high. Fruit and vegetable production is a major source of environmental and food toxins especially in Australia where broad acre agriculture does not make use of as many pesticides as in Europe or North America.

Water use in commercial horticulture is very high, with South Australian Riverland vegetable production requiring 13 megalitres per hectare (compared to 2-4Mlit/ha for typical home food gardens). Much of the market gardening around population centres in Australia can be considered as a form of "shifting cultivation" which degrades prime arable land before conversion to residential, commercial and industrial development. In general, commercial production of fruit and vegetables in Australia can be considered as some of the most unsustainable farming.

Intensive poultry production for meat and eggs is even worse in terms of energy and resource consumption, pollution and toxins as well as being undesirable in terms of animal welfare.

While development of more sustainable systems of commercial horticulture and poultry husbandry are essential, the relative ease with which it is possible to produce fruit, vegetables, eggs and meat in the home garden without the use of chemical and other non-renewable inputs suggest garden agriculture needs more careful consideration in the debates over sustainable agriculture as well as sustainable urban development.

PRODUCTIVITY: GARDENS vs COMMERCIAL FIELD HORTICULTURE

Net productivity (in terms of demand for resource inputs, land area and even labour) of garden agriculture can easily exceed that of commercial systems for the following reasons:

1. Utilisation of already collected or concentrated sources of organic wastes associated with settlements (eg garden waste, food processing and catering waste, animal and human manures). Although these can be potentially recycled to intensive commercial agriculture clustered

³ ABARE '88 cited in *ESD Agriculture Working Group Report* 1991

around population centres, many of these resources are too diffuse or difficult to efficiently collect and transport. Food processing and catering waste in our affluent society includes large amounts of valuable protein which is a very valuable supplementary feed for domestic poultry. Human waste, the most valuable source of plant nutrients generated by settlements, remains problematic because of water borne centralised sewerage systems, but newer site-based composting toilets are less costly, as safe, and recycle the nutrients to gardens. The high inputs of nutrient rich organic matter can develop mature humus soils with water and nutrient holding capacities, with an ease of management unknown in field agriculture.

2. Very low levels of crop wastage due to ability to use less than perfect produce which would not survive transportation or appeal to purchase based on appearance. The home gardener will generally accept less than cosmetically perfect produce. (In the case of tree ripened fruit, salad greens and sweet corn, the quality is generally superior that which can be provided by the centralised market system). Use of continuous cropping vegetables such as celery, use of seedlings for salads, small and over-sized fruit gives very high yields of usable food.
3. Self sown vegetables in mature gardens can provide a substantial yield with very low labour input. The use of gardens as informal nurseries to produce tree seedling and other plant materials for expansion can be achieved without significant reduction in primary production.
4. The built environment of houses, fences, walls and trellises substantially increase the potential productivity and microclimate diversity of gardens compared to field agriculture. While this infrastructure may be costly if considered only as a part of the production system, in well-designed gardens all these elements have a diversity of functions including amenity, climate control and security.
5. The hard surfaces of roofs and pavements provide opportunities for water harvesting either directly or via tanks which are not available to field agriculture.
6. Gardens are amenable living and working environments which naturally foster levels of observation and intervention not possible in field production.
7. It is frequently noted how easy it is to garden organically while commercial production can be much more difficult and require less than ideal compromises. Complex integrated systems of crop rotations

and combinations which are quite manageable at the garden scale are usually unmanageable in field conditions. If integrated systems and bio diversity are essential characteristics of sustainable systems then gardens will have a decided advantage over field agriculture in this regard.

THE FOOD SUPPLY CHAIN

The efficiency and easy development of sustainable garden agriculture are significant enough to justify its consideration in any serious discussion of sustainable agriculture. However, it is in the rest of the food supply chain where gardening has the potential to dramatically reduce the resources currently devoted to transport, processing, marketing and preparation of perishable food and therefore make a major contribution to sustainability. Large scale centralised market systems can never achieve such efficiencies.

“Intermediation” is the provision of additional services by middle men which increases when an economy expands and has been a major factor in the development of modern industrialised agriculture. “Disintermediation” occurs during periods of economic contraction⁴. Garden agriculture can be thought of as a radical form of disintermediation where whole sectors of the economy are bypassed.

While the disintermediation of industrial forms of transport, processing and marketing by gardening are clearly resource savings for society, they also show the fundamental conflict between the push for sustainability and the conventional commitment to economic growth. In the same way that the agricultural input industries will never contribute to their own contraction⁵ the sectors which take the output of commercial agriculture to the consumer have a necessary interest in maintaining the centralised marketing system.

GASTRONOMY

Culture and lifestyle factors are integral to any future expansion of garden agriculture.

A sophisticated garden-based cuisine using in-season, fresh produce with minimal processing requires very different domestic habits and skills to the fridge-based, processed, year round food culture common in Australian and other affluent countries. It is only with the development of a social and seasonal food culture that the extraordinary potential productivity and resource efficiency of garden agriculture will be realised.

4 Described by Paul Hawkin in *Co-evolution Quarterly* 1981 as a positive expression of economic adaptation to emerging ecological realities

5 For a discussion of this issue see Reeve, I. *Sustainable Agriculture: Ecological Imperative or Economic Impossibility Rural Development Centre* UNE 1990

Some affluent countries with a strong peasant tradition such as Italy have not lost these seasonal and local priorities in their gastronomic culture, despite their affluent urban lifestyle. In Australia there are signs of an emerging gastronomy⁶ more concerned with local, fresh, in season ingredients from sustainable sources for use in simple and healthy but refined dishes rather than the pastiche of food combinations overloaded with flavours and protein-rich ingredients which characterise the Australian mainstream.

FUTURE SCENARIOS

If the dominant powers in the global economy can keep commodity prices down (especially energy) and financial resources concentrated on so-called 'productive investment' to give "sustained economic growth" and relative affluence, and if ecological debt including global climate change can be avoided then garden agriculture can be expected to remain a marginal part of food production in western countries including Australia. However, the increasing status of home grown and local fresh produce will result in the more affluent, employing food gardeners and buying from boutique organic local producers.

If on the other hand;

- commodity prices rise substantially in response to environmental, political or other constraints on supply, or
- economic contraction, high unemployment and declining living standards become entrenched

then garden agriculture can be expected to expand rapidly.

The major impediment to expansion of garden agriculture remain:

1. **Cheap food:** relative to wages, the price of fresh food in Australia continues to be very low while the diversity and quality of produce is generally good despite some problems with low nutrient value and residual pesticides.
2. **Lack of skills:** although gardening continues to be a major recreational activity, skills required for efficient garden production of fruit and vegetable are at a low level following several generations of affluence.

GRASS ROOTS ECONOMIC DEVELOPMENT

Conventional economic analysis suggests that the lack of economies of scale will prevent garden agriculture enterprises from ever affecting mainstream agriculture. The minimum size of "viable economic units" continues to grow to an extent that our grandfathers would have thought incredible. Agricultural economics is so focused on this necessary expansion of farm size in response to technological and economic forces that it fails to consider the developing niche at the other extreme.

⁶ Discussed by Graham Pont in *Acres Australia* no.4 1991 and elsewhere

Observation of markets and industries undergoing progressive concentration and expansion of unit size suggest that this very process leaves vacant niches providing new opportunities for very small scale, even micro, technologies and enterprises which emerge out of new attitudes, values and participants. Rather than seeing a swing back to more modest scales of production, this polarisation of the scale of production is the common pattern. The successes of boutique breweries and natural bakeries has occurred at the very time that increasing conglomeration and standardisation dominate the brewing and baking industries.

Health and environmental concerns have resulted in a resurgence of interest in home garden production and an increase in existing gardeners scaling up their activities to provide some surplus for sale through local markets, roadside stalls etc. Use of this surplus through barter, LETS systems and monetary sale can provide a testing ground for development of genuine commercial production.

It can be argued that much of the small scale sub-commercial production from gardens and hobby farms is subsidised (by the operators) and is often very inefficient in use of resources. Alternatively, small scale production can be seen as the ad hoc first stages of research and development from which will emerge new commercial crops, land use systems and skills. This research and development would inevitably involve refinement and simplification of methods plus additional investment in equipment and development of marketing strategies for it to generate viable and efficient commercial enterprises.

It has long been argued⁷ that small businesses are the real source of economic renewal but the notion of the household as an even broader wellspring from which enterprises emerge has been largely ignored by economists and planners. Economic analysis by Marilyn Waring on the unpaid work of women⁸ confirms that even in western countries, the household economy is still the foundation on which the monetary economy is built. If Australian agriculture is to ever be truly sustainable then it needs a foundation which is a post-industrial equivalent of peasant culture in which large numbers of people have the experience and skills of garden agriculture.

SOCIAL CHANGE / SOCIAL REVOLUTION

Clearly the transformation of gardening from a leisure activity for affluent Australians which consumes resources and creates pollution to an efficient and productive form of agriculture will involve a social and economic revolution which most commentators would dismiss as highly unlikely in the foreseeable future. However several important factors tend to be ignored in these sorts of dismissals of radical social change:

⁷ See Jane Jacobs classic urban planning treatise *Life and Death of Great American Cities* written in the early 1960's

⁸ Waring, M. *Counting For Nothing*

- Firstly, the duration of the “foreseeable future” continues to contract despite the exponentially expanding human resources being devoted to predicting, planning for and adapting to assumed futures. The future horizon is certainly shorter than the time take for someone to become a expert food gardener and probably shorter than the time for many tree crop species to come into full production.
- Secondly, when the problems of undesirable environmental change (eg. the greenhouse effect / climatic change) become severe and the total failure to deliver “sustained economic growth” becomes accepted then truly efficient ways to occupy the burgeoning unemployed may be more readily accepted and supported by policy makers.
- Most importantly, the changes proposed do not depend on institutions, governments or corporations, but primarily involve changes in the lives of individuals and families. The capacity of individuals for cathartic change means people can adapt very rapidly when the need arises.

SUBURBAN RENEWAL

The Australian suburbs with their generous private and public open space, sunlight and water supply could become edible landscapes productively employing large numbers of people in providing for the needs of their households and generating surplus for trading.

It is interesting to note most planners promoting the sustainable city concept ignore the great potential of the Australian backyard to be a part of a sustainable future. Instead the backyard is viewed as a land and resource consuming anachronism in the environmentally conscious 1990's. Nothing could be further from the truth. The fact that the current suburban landscapes are not sustainable is less to do with their density or even design than it is to unfavourable social and economic conditions. A change in those conditions will see a very flexible adaption of the suburbs despite the inevitable frustrations about how it would have been so much easier if we had **planned** for a low energy sustainable future. The problem of how to retrofit higher density cities for a low energy sustainable future will be much more problematic.

AGRICULTURAL RENEWAL

If the proposition that garden agriculture based on the household economy is a significant issue in the sustainable agriculture debate, then the natural reaction of those involved in existing horticultural and small livestock industries may be to see it as yet another threat to their survival.

However if we recognise the household as the foundation and wellspring for the formal economy then we can see that garden agriculture will in the long term reinvigorate

commercial agriculture with new farmers, locally adapted methods and integrated production systems to meet the severe challenges of sustainability in the low energy future. Most importantly, a nation of gardeners will, through their common experience of the joy and pain of food production, provide a cultural context in which farming for a living will be seen as a form of stewardship of the highest order demanding respect and a fair price.