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THE PRESERVATION AND USE OF
AGRICULTURAL LAND : LAND USE
POLICIES AND THEIR IMPLEMENTATION,
A SURVEY

by

A.D. Meister

DISCUSSION PAPER IN NATURAL RESOURCE ECONOMICS NO. 5

Department of Agricultural Economics and Farm Management
Massey University, Palmerston North

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PREFACE

In a country so dependent on the export of agricultural products, land and its allocation to different uses is a topic of great importance. The fact that land is a finite resource has led to conflicts about its ultimate allocation and to conflicts about who should determine that allocation. Renewed talk about world food scarcity and the possibility of using land to grow energy crops has led to calls to preserve (i.e. protect from urban and other non-agricultural uses) agricultural land. Many countries around the world have acted on this call and have enacted legislation to preserve agricultural land. In New Zealand too, controls are put into place to stop unnecessary conversion of good agricultural land.

In this paper the case for and against preservation is raised as a discussion topic. No definitive answers are given but what is pointed out is that preservation at all cost may impose costs on society which are not always in the public interest. However, the paper points out that there is also a role for planning in land use allocation.

To perform this planning role, tools are needed. Many tools are available, some of which are already used in New Zealand. However, other countries have tackled the problem of land use planning, especially when directed to preserve agricultural land and to encourage the best use of land, in a different way. In this paper, some of these different ways are described and discussed.

The material for this paper was initially collected to serve as lecture material in a course on Natural Resource and Environmental Economics. Interest from people outside the university has prompted the author to present the material as a discussion paper. The paper therefore aims to raise discussion points and other information that can be used in the debate on how best to allocate agricultural land in New Zealand.

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INTRODUCTION

The use and misuse and the planning and control of land are topics that have received a large amount of attention ever since Thomas Malthus argued that:

"The rate according to which the production of the earth may be supposed to increase, it will not be so easy to determine. Of this, however, we may be perfectly certain that the ratio of their increase in a limited territory must be of a totally different nature from the ratio of the increase of population.... Man is necessarily confined in room. When acre has been added to acre till all the fertile land is occupied, the yearly increase of food must depend upon the melioration of the land already in possession. This is a fund which, from the nature of all soils, instead of increasing, must be gradually diminishing."1/

He therefore predicted that, because of the limit to the availability of land and because of the rapidly increasing populations, all mankind could look forward to was a subsistence level of living.

The fact that I am able to write this paper sitting in a comfortable office in a University and the fact that I will soon eat my lunch, shows that history has proven Malthus wrong. We all know the reasons:

1. Birth control,
2. Improved technology,
3. Vast amounts of new resources.

After Malthus, people were occasionally reinfested with the Malthusian bug, but on the whole, agricultural land was regarded as an inexhaustible reserve able to meet our needs for food production (i.e. using the services of land, the land resources) and our needs for cities and housing (i.e. using the space services of land).

Since the fifties however, land use has received a lot more attention. The very rapid economic expansion of many countries, the increasing levels of population and the greater awareness of environmental problems brought the realisation that land may not be as inexhaustible as we thought. The increasing loss of good agricultural land to urban sprawl, the rebirth of Malthusian thoughts in the shape of the Neo-Malthusian 'Doomsday' models,2/ the famines in South East Asia and the Sahelian Desert, the greater demand for natural environments and the more recent energy crisis, all have contributed to a renewed emphasis on preserving agricultural land.

In New Zealand there are 26.87 million ha of land and this, combined with approximately three million people, gives New Zealand one of the highest amounts of land per capita in the world. However, statistics deceive. Our land is far from homogeneous, the country is broken and corrugated, 50 per cent of New Zealand's land area is steep, another 30 per

per cent is hilly. Access to many areas is difficult and because of the geological nature of the underlying rock structure, soil erosion is widespread. We have only about 2.4 million ha of land suitable for arable farming, about 14.4 million ha suitable for pastoral farming and about 14.8 million ha suitable for forestry. Of the 2.4 million ha of cropping land, 800,000 ha comprise soils capable of sustaining high production over a wide range of crops. Only about 10,000 ha of these are elite soils, suitable for continuous cropping. More than one third of our best quality elite soils have been used for urban development.^{3/} Land in New Zealand can now no longer be considered an abundant resource. Most land suitable for cropping, pastoral, timber and urban purposes is being used. The balance either cannot be used or is being used for the conservation of water, for recreation and for amenity purposes. Further expansion of urban or recreational uses must mean more intensive use of land and more competition among the various uses of land.

It is the fact of greater competition that has increased our awareness of the need for land use planning. This is not to say that land use planning was not done in New Zealand, because that would ignore the 1941 and more recent legislation against soil erosion, and starting with the 1953 Town and Country Planning Act, legislation to preserve good agricultural land. The need however, is now for more comprehensive planning, not only critical area or problem planning, but planning for the 'best' use of all New Zealand's land. That there is a need for this has been clearly shown in the ineffectiveness of the Town and Country Planning legislation to stop urban sprawl and the rural/urban land conversion.

It is especially this latter trend that has forced many overseas countries to seriously start planning the use of the now scarce resource - agricultural land.

Of course one may disagree with the need to preserve good agricultural land - why should we? This is a legitimate question because land is not preserved for preservation's sake. Land use policies to preserve land are means towards ends. Such ends or objectives of the society may be:

- to preserve open spaces;
- to maintain productive soils in agricultural use;
- to control urban sprawl;
- to enhance the state of local or national economy;
- to improve air and water quality;
- to improve visual quality of the landscape;
- to protect or encourage local or national supply of food.

Take for example, the Assembly Bill No. 15 introduced in California during the 1975-76 legislative session:

"The legislature finds and declares that the preservation of agricultural land is of paramount interest to the welfare of the State of California in that the preservation of such land, especially prime agricultural land, is critically important in order to assure and to maximise the food, open space, and employment opportunities which are necessary for present and future generations of the state and the nation."^{5/}

Any one, or any group of these objectives would lead to a land use policy of preserving agricultural land.

Similarly, objectives about wilderness areas, intertemporal fairness, and the environment will have implications for land use policies for marginal lands, indigenous forests, high mountain lands, swamps etc. Identification of such objectives is not an easy task. In any society made up of individuals, there will be conflicting objectives. However, it is essential that a consensus be reached, because it is only against such a set of objectives that we can determine the best future use of our land resources. I would like to illustrate some of these points further.

Decisions about the use of land

At any point in time there are two dimensions to decisions about land, the intra-temporal and the intertemporal dimension.

The first dimension deals with decisions about current uses and changes in the uses of land, e.g. shall we use the land resources for:

- agriculture or forestry (King Country);
- urban development or rural (Auckland, Christchurch);
- energy (electricity) or agriculture (Clutha);
- recreation or preservation (Turoa);
- milling or preservation (indigenous forests);

or multiple purpose uses with combinations of the above.

Each of the uses mentioned are legitimate uses. Each of them can be assessed in terms of social desirability.

It is important to note that I use social, not economic, desirability. On economic criteria alone urban development outcompetes rural land use, forestry may do the same, and milling outcompetes preservation. Economic criteria, however important they may be in the opinion of some, are not the ultimate criteria. The optimal state of resource use is that state which maximises the social benefits (net of cost) to society. Assessment of alternative land uses should therefore be done using ecological, social and economic principles and criteria.

The second dimension associated with land use decisions, is the intertemporal dimension referring to the use of our land over time. This dimension is much more difficult to deal with because of the uncertainty of future events. We are required to make decisions now on behalf of those who follow us in the absence of knowledge of their wishes and the nature of future technology. Optimal land use over time refers to that use of our land that maximises the present value of social benefits net of cost. Now future costs and benefits are reduced to a common point in time (the present) by discounting at the 'appropriate' rate of interest. These discounted values are called present values and measure the value today of a cost or benefit which occurs in future time periods.

Many people will claim that today the market system does not work well in achieving the above objective of optimal land use. One of the areas that has received a lot of attention is the loss of good agricultural land to urban development at the urban fringe. These people would like to see a land use policy which would retain agricultural land in food production and which would force other uses on less productive land. Others however, disagree with the need for such policy. The following quote describes this dilemma well:

"On the one hand are those who proclaim it to be immoral to devote prime agricultural land to any other use while there are underfed people in the world; on the other hand are the defenders of market processes who insist that market prices indicate the socially efficient allocation of resources. Due to the dilemma of uncertainty about the present value of future demands for land in food production, a big grey area exists between these views. There is a growing suspicion that the market has overpriced non-agricultural demands relative to future food production."6/

What does the future require with respect to good agricultural land? In a recent report from the Worldwatch Institute on 'Urbanisation', Mr Lester Brown stated that:

"Already the rapid conversion of cropland to non-agricultural uses coupled with soil erosion and the expansion of deserts was causing a global shortage of farmland".

"Even a net expansion in the cropland base of 10% might not be possible without a substantial rise in food prices".

"Anything beyond that would require a dramatic rise in food prices, something the world's poor, who already spend two-thirds of their income on food, could not absorb".

"Avoiding such politically destabilizing rises in food prices may not be possible without a mammoth effort to protect cropland from non-farm uses, to improve the management of soils and, most importantly, to quickly reduce the rate of population growth".7/

We can accept this as one view but decide that technology will solve this food problem. Technology has proven Malthus wrong so why should it not do so in the future? Morrison and McArthur, in an article "The myth of world famine and its implications for New Zealand" (1973) had this to say:

"New Zealand's views about the use of land should be reassessed in the light of our new expectations. After a profligate adolescence, when our ancestors tended to exploit the land and to cause soil erosion by cutting down the bush and burning the tussock, we have now reached a cautious middle-age with attitudes towards land use which may be out of phase with the future needs of New Zealanders. For instance, our attitudes towards soil conservation and the use of good agricultural land for housing are partly due to the belief that we shall need all land for production and partly the belief that soil is a resource with an infinite production horizon.... If world starvation were imminent, it would be rational to preserve our limited first-class soils for food production only (But) The laying to rest of the myth of world famine and the myth of unlimited demand for food should stimulate us to greater efforts in the political, business and technical areas of marketing and production".^{8/}

These quotes highlight the uncertainty we are faced with in deciding about the inter-temporal use of our land. Different predictions show that the world's supply of farm land will run out, be adequate or even be abundant. Other predictions or actual data talk about famines and overabundance of food. What should be decided about the use of New Zealand's agricultural land? Will it make any difference to the world what we decide? Will it make any difference to New Zealand?

Answers will differ from person to person - but decisions regarding land use have to be made. To this uncertainty about future food requirements I would like to add two further observations.

Firstly, since 1973 a new factor has appeared that we need to take into consideration, namely energy. The once abundant sources of oil no longer seem to be so abundant and it appears now that a new alternative use of our land (preferably 'good' land) is to produce liquid fuel (i.e. energy farming). The energy crisis also has cast a shadow on some of the technological advances made in agricultural production. Agricultural technology has enabled us to produce more output per hectare and per labour unit. This has been achieved by substituting capital for labour (machines, pesticides) and capital for land (fertilisers, irrigation). With capital and fertiliser becoming more and more expensive due to the rising cost of energy we may have to reverse these trends or look for new technologies less capital intensive and more land and labour intensive.

Also, with the rapid increase in demand for recreational resources and open spaces, the competition for agricultural land will increase.

Both these trends provide arguments for preserving agricultural land.

Secondly, changing the use of our land from, for example, agricultural to hydro energy production (inundation), is for all intents and purposes an irreversible change. Keeping land in agriculture or as open space is a reversible choice. In making the latter choice we keep our options open. If say in 20-30 years, we realise that food production is not critical we then can proceed to reallocate land to other uses. The reverse of this process can only be accomplished at enormous expense.

The milling of native forests is only one of many alternative uses. Clear-felling excludes all others. Or quoting an article in the Sunday Tribune, "Native Forests and Animals - Who Really Cares":

"The decisions that committed irreplaceable natural assets to axe, saw and fire were commercial. They were based on short-term financial profit, not to long term environmental management. They were made without proper knowledge of our ability to supply the orders or replace the trees taken. They were certainly made by those ignorant or uncaring about long-term consequences for the environment, or our vanishing wildlife species. Our country even now suffers the economic effects of this kind of decision making. An uninformed public left it to the 'expert'."

Similarly, how about the use of our high country resources. Which use contributes most to our social welfare: farming, recreation, preservation, forestry or any combination? What about the current rate of erosion? Can we depend on the market system guided by the Present Value criterion or do we need some other criterion.

Whatever the decisions made, they all involve costs and benefits. But these costs and benefits can only be defined in terms of the goals or objectives of New Zealand society both now and in the future.

Decisions will have to be made now. Land use planning can serve as an aid to improve this decision making process.

Planning land use

To reduce some of the uncertainties that I have talked about, many countries (including New Zealand) have embarked on a planning process.¹

Such a process can be best summarised as a series of interdependent steps. Each step derives or collects information on which the next step builds. The final outcome of the process is a land-use plan.

Some of the information required to go through this process has already been mentioned. The first and most important set of information is the identification and specification of society's objectives with respect to land. It is only in the light of that information that we can identify 'misuse' or 'optimal' use of land. But as we saw, it is difficult to set objectives without specific information on resource supplies and demands. On the resource supply side New Zealand has moved a long way. Several organisations are working on resource inventory maps, detailing the resources available, their characteristics, limitations and potentials for agriculture, forestry, recreation and urban development. Moves are also at foot to coordinate the work of these agencies and to develop a computerised land information system.

¹ *The land-use planning process is described in detail in a previous discussion paper 9/.*

On the demand side we need to project future population levels, tastes and needs. This is difficult and this therefore implies that whatever decisions we make that they should be flexible so that we can cope with the unexpected without incurring too great a cost.

The next step in the planning process is the one in which we match supplies with present and future demands. There will be many different ways in which demand can be satisfied - i.e. many alternative land use patterns. Different land use patterns, however, will contribute differently to the stated objectives. Our aim is to choose the one that will contribute most, keeping in mind that the plan should be flexible and also keeping in mind the intertemporal dimension of our decisions, to our objectives.

In choosing between alternative plans we will be faced with having to make trade-offs between objectives. We may, for example, have to sacrifice some agricultural land to urban expansion (see for example the Palmerston North Urban Growth Study) or some wilderness area to timber or energy production. But, given a complete knowledge about the availability of other similar wilderness areas or the total amount of similar quality land we can make an informed decision while understanding the impacts of our choice. Studies like the King Country and some of the Urban Growth studies have attempted to do this.

In all such trade-off decisions regarding proposed land use changes, we should be sure that all costs and benefits (social, ecological as well as economic) have been assessed and analysed (in monetary values, indices or in a descriptive manner). This is also being done more and more with respect to large scale investment proposals which now require an economic cost-benefit analysis and an environmental impact statement.

It is not my purpose to describe the planning process any further. The point I want to make is that when we plan we need a comprehensive approach to land use planning. Such an approach would establish clear guidelines and criteria which are incorporated in a national land use policy and which can be applied at local and regional level.

Before going on however, I would like to sound a note of caution. Some of the reasons for moving towards planning are often stated as being the presence of externalities (uncompensated external effects), the collective good aspects of open space, and the myopic view or shortsightedness of the market compared with political processes. The planning process therefore is intended to complement the allocative decision of the market place. However, before we completely substitute planning for the working of the market system we should convince ourselves that planning can do a better job.

For planning to be able to improve on the workings of the market system, it will have to be thorough and comprehensive. Comprehensive in that it not only looks at land but also at water and environmental resources as these are closely interrelated, and

comprehensive also in that it not only looks at local conflicts but also that it views local conflicts in a regional and national context. Thorough planning implies that all costs and benefits are carefully evaluated (including private and social costs and benefits, as well as the cost of the administrative bureaucracy necessary to achieve all this).¹ A land use plan, based on the simple criterion that all prime agricultural land should be preserved, is neither thorough nor comprehensive, and can be very inefficient and inequitable in achieving the stated objectives.²

With these cautionary notes stored away in our memories, I now want to go on and assume that a national land use policy exists and that a land-use plan has been drawn up. The next step in the planning process is to implement this plan. Several alternative policy tools are available to implement such a land use plan. I intend to review the major ones and restrict my discussion very much to the implementation of a national land use policy, (a) aimed at retaining agricultural land in production; and (b) aimed at encouraging the best use of that land.

¹ *One of the difficult to measure costs in planning is the disutility of those who disagree of the plan - or who disapprove of planning per se. This is a problem any democratic society is faced with where decisions are made in accordance with majority or power. If planning is embarked on, the only way to partly overcome some of these costs is through communication to (explaining the process and its potential benefits) and involvement of (citizen participation) of the people.*

² *For a further discussion of this, see Appendix I where the inefficiency aspect of such a simple criterion is demonstrated by means of a hypothetical example.*

PRESERVATION AND 'BEST' USE OF AGRICULTURAL LAND

Before dealing with the actual policy tools, I would like to briefly introduce three aspects of land use which - depending on your background and opinion - are called problems:

1. rural/urban land conversion,
2. small rural holdings,
3. 'best' use of remaining agricultural land.

When people talk about the preservation of agricultural land the first of these three problems is often the one they refer to although the second is getting a lot more attention lately. Both these problems are not unique to New Zealand at all. We are actually late in calling them problems. Many European countries, the U.S.A., Japan and Canada have already struggled with them for years.

The rural/urban land conversion problem is the current trend for good farmland to be built upon by existing cities because:

- (a) the land is close to the city; and
- (b) because good farm land is also good land to build on (low cost, nice garden).

In New Zealand this conversion, as yet, is not so much a national as a local problem. The early settlers in their wisdom built cities on the best soils they could find (alluvial soils near rivers). New Zealand has very little of that type of soil and more and more is swallowed up by expanding cities (e.g. Auckland, Christchurch, Palmerston North and others). These soils are highly productive and are used for intensive horticultural enterprises supplying the adjacent city with fresh fruit and vegetables.

The loss of such soils affects the existing city in that urbanisation has a shunting effect. Horticulturalists and agriculturalists are flexible and can move as cities expand (although this is more difficult with, e.g. orchards). Resettlement is only partly dependent on the quality of soil types, but when cropping is undertaken on less fertile soils, income is lost and the community pays for this through higher prices for town-related agricultural products. At the same time however, houses in new subdivisions have gardens with good soils and some of the lost commercial production will be replaced by home production. Another effect of the ever expanding city is the loss of contact with open space - rural environment - for those living in the city.

There are also reverse effects, i.e. the effects of urban development on nearby agriculture and I will just enumerate some of these:

- (a) there is an ultimate incompatibility of urban activities and farming, e.g. air pollution leading to crop damage and yield reduction, or orchards getting a lot of blight from urban orchard trees which are not properly sprayed.
- (b) Uncertainty, leading to a reluctance of the farmer to make investments which, generally add little or nothing to the value of the farm for non-farm use, and often may lower this value if they must be removed before use conversion can be completed. Also, where expectations about the rapidity of urban development exceeds the actual fact, the decline in farm investment may result in greater decreases in farm productivity than necessary in the land conversion process.
- (c) As the surrounding area undergoes urbanisation this may lead to a loss of farm equipment suppliers and food processors - and this also can have a negative impact on productivity.
- (d) The farmer will be more restrained with respect to noise, odour and dirt creation ('nuisance activities' - piggery smells, driving tractors on road etc).
- (e) The prospect of expanding his operation to reap economies of size will have gone.
- (f) Increase in the value of his property - this will affect his rates and other land values, and his ability to buy a large property further out.
- (g) Vandalism, dog damage, thefts etc.

I could mention more effects and could trace the effects through on the rest of society, e.g. if land prices do rise because of urban sprawl and speculation, this will increase the difficulty to settle young farmers. Also decreasing farm numbers add to the problem of rural depopulation.

If however, our aim is to keep land in agriculture and to encourage orderly expansion of our cities, these are some of the factors that we will have to deal with.

The second 'problem' is the one of the ten acre blocks as they are commonly known, or small rural holdings. To show the extent of small holdings it is simplest to quote the Ministry of Works survey of 1974-75.

"There are about 27,000 rural holdings of between 2 and 25 acres in New Zealand, and these occupy about 1000,000 hectares of land. They occur most commonly in the more densely populated parts of the country in particular around Auckland and Christchurch".

"The most common use for such holdings is residential, followed by grazing, although many of the residential holdings are used for other purposes as well. About 2,200 of the properties, covering 7,000 ha of land, are not used at all".

"Some 15,000 of the properties may be classified as 'rural residential'. These holdings occur in clusters. Of rural residential properties, about 5% have some use other than residential. Somewhat under half of them are used as a source of income, but in most of these cases less than one quarter of the total household income was obtained from use of the land".10/

Small rural holdings are a genuine expression of many people for an alternative form of lifestyle. Their presence around the fringes can affect the accessibility to the rural environment for the community at large and strain the resources of local authorities.

However:

"If society expresses a preference for such a lifestyle rural planning is required which makes this alternative available, but not at the expense of agricultural production or the desirable qualities of the rural environment. Such small holdings can be a productive use of the land and satisfy many of the wants of modern society. A balance of all these objectives must be found in a new approach to rural planning".11/

The impact of these small holdings on agricultural production has been varied. The Ministry of Agriculture and Fisheries Survey Report (1974-75) states that only half of the holdings are actually used in a productive way when used for residential purposes.11/ Other studies, however, have shown that rural small holdings can make a worthwhile contribution to agricultural production. For instance, studies conducted in specific areas such as Taupo, Palmerston North, New Plymouth and Auckland all show that total production from small holdings is no less than if the holdings were part of a larger farm.12/ 13/ 44/ 45/

A survey of twenty studies on rural small holdings, which I did last year, led me to the overall conclusion that rural small holdings can be provided without necessarily having a detrimental effect on agricultural production, and that in many cases such small holdings (whether full-time or part-time) can lead to innovative changes, greater diversity in enterprises and to greater productivity.

Small rural holdings therefore, do not, as some people want us to believe, represent a loss of good agricultural land. The land is still there and can still produce agricultural produce, which, as shown in the above references, is being done in many cases. The loss some people are referring to is the production (not the land) that is lost when these small holdings are not used to their full potential. How great this loss is and how it compares with the gain in satisfaction people receive from being able to live on small holdings is unknown.

Not all small holdings are on highly productive soils. Some are on areas of land which are not used for anything (or at least not suitable to agriculture). The effort put into such small holdings to make them at all productive should be applauded. (An example of these are ten acre blocks in dense gorse country in the Takaka area).

Small rural holdings, also contribute to the rural development. They do not as such help the rural depopulation problem, but they do help some rural areas close to cities in providing extra economic activity for the schools and services.

A further development is a trend all over the country to growing highly valuable horticultural crops. With these there is often no doubt about their contribution to the nation. The problem however, lies in their effects on the whole area, e.g. such as areas where small holdings replace existing dairy farms creating a supply problem for existing dairy companies.

All these developments need to be recognized and provided for when we attempt to substitute the workings of market forces with planning regulations. If society's objectives clearly state that there is a need for small holdings then they should be provided (preferably in size parcels desired rather than arbitrary units of 10, 50 or 100 ha). If at the same time, society also wishes to encourage the 'best' use of agricultural land, then it will need policy tools at central and local government level to encourage this.

The third area of concern is the best use of the remaining agricultural land. Here we are concerned with best use, i.e. best in the light of society's objectives. We have now moved into the area of agricultural policy. There are two aspects of this best use - the first one is a resource aspect to choose the best enterprise taking into consideration all social, ecological and economic impacts, and the second is one of environment and motivation, i.e. how can we provide an environment in which an individual (e.g. the land owner) is motivated (or encouraged) to make his private decisions in such a way that they coincide with society's objectives.

I have outlined three areas of concern. All three are different but they have a common denominator in the resource, land. In particular I have concentrated on agricultural land and assumed that the land use plan made up, aims at retaining this land in agricultural production and aims at encouraging optimal use of this land. To achieve these aims, it was necessary to discuss some of the current problems and conflicts that have to be dealt with in the land use plan.

In the next section I will turn to the implementation stage of the planning process. To execute land use plans, several policy tools are available. Some of these have been used widely, others have hardly been used. I will review and evaluate the various tools that are available.

MEASURES TO GUIDE AND IMPLEMENT LAND USE POLICIES

"There is still a lack of understanding about the goals and means of land use planning. There is also a great deal of misunderstanding. People tend to fear what they do not understand".

John Kyl

When implementing land use plans we are up against the fear, lack of understanding and mistrust John Kyl talks about. People on the whole see planning as a taking away of certain of their rights, seldom do they see or are they made to see the potential benefit they will receive. Past planning efforts are partly to blame for this. Lack of communication between planners and those affected and lack of opportunities for the citizen to become involved also share part of the blame.

When no communication takes place and no-one has been involved except those people in the planning departments, the sudden presentation and implementation of a land use plan hits the people like a cold shower leading to the inevitable adverse reactions.

Planning therefore, should always be done with implementation in mind. At all stages the likely impact of the plan or plan alternatives should be clearly analysed in terms of who will be affected. The implementation of a plan can be done in several different ways, each of which will affect people differently. It is therefore essential that we understand the implications of each tool of implementation.

There exists quite a number of policy measures that are being proposed and are being used in New Zealand and all over the world. To simplify their presentation, I will discuss them under four headings:

1. agricultural zoning,
2. land banking,
3. taxation measures,
4. development rights manipulation.

This division into four separate topics does not imply that their implementation is always separate too. In many cases, the actual land use policy measures used are a combination of the four mentioned above. The reason for this is that any one of the four measures mentioned above often turns out not to be very effective by itself in achieving the objective of preserving or encouraging best use of agricultural land.

An important concept that should be mentioned at this stage is the concept of equity. Land use planning by definition implies that we intend to guide the use of our land into a different pattern than the pattern that would have resulted if we had relied solely on the use of the market or price system. We do this because we have agreed that the

allocation of land resources resulting from sole reliance on market prices, is not optimal with regard to society's objectives. In the particular case under study, we say that the rate of conversion of rural to urban land use and the use of the remaining agricultural land is not optimal. To correct for this, we plan the future allocation and use of our land, and use policy measures to implement such plans.

In doing this however, some people will benefit while others will lose out. People who under the market system would have gained substantial benefits, may under the planning system no longer receive these benefits. Such gains and losses will change the current distribution of income among people.

Land use policies therefore may be very efficient in preserving agricultural land and encouraging its best use but at the same time they could be very inequitable (judged by some criterion as set by society). It is this impact of land use plans and policies on the distribution of income that is one of the reasons for the different measures we will discuss. Some policy measures explicitly state that people should be compensated for any losses imposed while others state that people have no inherent right to the potential gains at all and no compensation should be paid. Therefore, land use planners should be aware of these issues and plan for them accordingly.

1. AGRICULTURAL ZONING

Zoning is the most popular policy measure from a global point of view. In New Zealand it is 'the' measure for land use control. The practical forms taken by zoning vary widely between countries. However, as a general definition, the one given by the OECD will be sufficient:

"Zoning consists in allocating the different types of land use among a number of zones, specifying the conditions of each use (planning stage) and implementing a number of restrictive or incentive measures for carrying out the plan (implementation state).^{14/}

The extent of the zoned area, the types of use considered, the period during which such zoning is to be enforced, organisational procedure, implementing instrument etc, all vary from country to country. For example, comprehensive zoning (i.e. the whole country zoned), was instituted in Hawaii in 1961 and Japan 1968/69. In both cases the total area was divided into specific zones of agricultural, urban, conservation and other uses. In other countries, zoning is restricted to urban areas or municipalities.

In New Zealand zoning takes place under the Town and Country Planning Act at municipal and regional levels. Up until very recently there was a reasonably clear distinction between town and country land uses, even if the edges between the two were somewhat blurred. Land outside the urban area was zoned rural and usually no clear policy was expressed on the development and use of the rural zone and a wide range of uses were allowed.

However, the conditions under which rural zoning has to operate today have changed radically. Some of these changes have led to the existing difficulties in coping with urban development in rural areas as well as apparently conflicting uses such as the alleged conflicts between forestry and farming. Other important changes that have occurred and will continue to occur are:

- changes in farming use as well as types of farm ownership;
- the increase in tourism and recreation and reservation of land for these purposes;
- increasing environmental concern about rural activities, including those related to exploitation of minerals;
- the greater involvement of local catchment authorities in regional planning in the rural sector; and
- the depopulation of rural areas.^{15/}

In land use planning and implementation these changes should be taken into account and should be catered for. The current problems and alleged problems in land use are a sign that rural zoning without specific policies for rural land use has been unable to cope with these developments.

"In the preparation, implementation, and administration of regional, district, and maritime schemes the following matters which are declared to be of national importance shall in particular be recognised and provided for:

- (a) The conservation, protection, and enhancement of the physical, cultural, and social environment.
- (b) The wise use and management of New Zealand's resources.
- (c) The avoidance of encroachment of urban development on, and the protection of, land having a high actual or potential value for the production of food.
- (d) The prevention of sporadic subdivision and urban development in rural areas.
- (e) The avoidance of unnecessary expansion of urban areas into rural areas in or adjoining cities."^{16/}

With the Town and Country Planning Act of 1977, the planning at the district and regional level has been more coordinated and the objectives of national importance have been spelled out in more detail. District and regional plans now have to state their objectives clearly, and:

Most parts of New Zealand now have operative planning schemes. Once a scheme is operative it has to be reviewed each ten (regional) or five (district) years, and no change of use indicated in the scheme may be made without consent and a fairly elaborate pattern of public notification of proposed changes is required so that objections may be made.

To achieve the stated objectives of national importance, district schemes have used rural 'A', 'B', ..., and 'residential' zones to divide up the area and control the use of agricultural land. Within each of these zones actual land use is controlled through the specification of which enterprises are allowed as of right and which are allowed conditionally. Further, other restraints such as 'economic unit' or the lack of building permits have been used to achieve the objectives of national importance. In some areas (Counties) this process has worked well, mainly because no great pressures for land use conversion were present. In other Counties this process has been less than successful in coping with change.46/

The Town and Country Planning Act as it stands allows a lot of freedom in how control at the District level can be exercised. But as long as councillors and planners stick religiously to zoning as the only tool to implement objectives, land use conflicts will always remain with us.47/ The tool of zoning is currently being used to overcome problems of equity, unemployment, land use changes, rural depopulation, preservation etc. It is my opinion that we are trying to achieve too much using a tool which is not suitable. Zoning suffers from several basic problems which I will enumerate below.

Some problems with zoning

1. The first problem with zoning is that it is a negative tool. It is by force of law that zones are established. Therefore, zoning an area rural 'A' will not ensure that it will be used for agriculture. All it does is to restrict other activities from using it. Zoning does not provide positive incentives to seek the best of the allowable uses within a zone. Therefore in terms of our objectives, zoning could achieve the preservation of land but does not encourage the best use of agricultural land. Even though zoning could achieve the objective of preservation of agricultural land, other practical problems make it not a very efficient tool.
2. Land use plans have to project the future and zone accordingly. Two dangers immediately arise at the peri-urban periphery - too much zoning, too little zoning. In the first instance, too much land is included in development zones. This may be done to reduce uncertainty and reduce the damaging effects of speculation, but is then achieved at a cost of unnecessary loss in agricultural production and provides too much land for development encouraging urban sprawl. In the second instance, if too little is zoned the five yearly revision will encourage speculation and increases the uncertainty farmers face at the urban fringe. The result will be reduced levels of investment and lower levels of production.
3. Where designations and rural open spaces are used, there is often a lot of ill feeling. These forms of control make the future use of land uncertain. These restrictions also create hard feeling with farmers who were intending to retire and for whom the sale of their farm is their primary security. Many farmers do

not see that they should have to protect their own land for the general public. They feel that if the area is required for the public then it should be purchased. Frequently these feelings arise because the purpose of the control is not clearly understood.

4. Another problem is the equity considerations. Do farmers on the peri-urban fringe have a right to the windfall gains of development? Under our zoning laws we say 'no' and no compensation is paid when the potential gains are wiped out by a change in the zone. In some overseas countries, especially the U.S.A., this issue has been strongly debated in the courts as 'the taking issue'.^{18/} No clear answer has surfaced. Some States compensate farmers for taking away their right, others don't. Whenever zoning is used, therefore, we have to fully understand that we are placing constraints on owners of land and consequently limit the rights of ownership. The fact that zoning costs the community as a whole nothing has certainly facilitated its being put into effect as far as governments are concerned, but pressures from economic interests arising as a result of zoning may seriously impede its operations beyond a certain point.

5. A last major problem is that zoning ordinances can be changed. As we saw, the economic incentives to owners of land to get zoning ordinances changed is great, and

"The temptation to bribery is overwhelming and too many developers and local government officials have yielded to the temptation".^{19/}

Conclusion

Because of the above problems, and others, zoning by itself has not been very effective in preserving agricultural land and in encouraging the best use of that land. In New Zealand zoning has been unable to cope with the immense pressure of urbanization and therefore has been unable to direct the growth of our cities.¹

Zoning in New Zealand, as implemented under the Town and Country Planning Act, is a physical scheme allocating areas to specific broad uses. The Act has limited power to prescribe better use of land and has therefore operated in a negative rather than positive way. It has prevented undesirable uses of land but has not encouraged 'best' uses.

With respect to peri-urban agriculture, zoning has been unable to reduce the uncertainty for farming at the urban fringe and neither has it been able to guide the desire of those wanting a house in the country or wanting to live an alternative lifestyle.

¹ *The recent out-migration of New Zealanders and the decrease in birthrates has taken away a lot of this urbanisation pressure (except in the Auckland area) and many cities have now plans on hand which show an overreaction projection in zoning land for development purposes.*

The matters of national importance that this tool is supposed to protect are difficult to achieve without more specific guidelines and criteria on "What is wise use?" or on "Should agricultural land be protected at all costs?", or "What is unnecessary urban expansion?" and on "What is in the public interest?" Even if the planners have been able to solve these questions, the district plans are still local plans, each one different from the other in terms of definitions and measures of implementation.

To further reduce the effectiveness of zoning is the fact that the Crown is not completely bound by the regulations. Hence the Crown, and all its relevant Departments dealing with land use (Transport, Ministry of Works, Health and Education etc.), can make decisions that override the local plan.¹

To decide on what, in the public interest, is the most suitable use of particular pieces of land is difficult. To bring private owners to use their land for the purpose stated in such schemes is even more difficult. The policy tool of zoning has not been an effective or equitable tool to achieve the above purposes.

Zoning in British Columbia

In recent years the tool of zoning has been used in some countries more specifically to preserve agricultural land not only on the urban fringe but all over the country. This of course is not much different from the complete zoning mentioned earlier (Japan, Hawaii). The difference is that it is not complete zoning but specifically refers only to agricultural land.

An example of this is the Province of British Columbia in Canada. The continuing loss of productive farm land to non-farm use posed a serious problem. The rapid disappearance of arable land forced the Provincial Government to place all remaining arable land (9.75 million acres) in an Agricultural Land Reserve (ALR) in 1973. This reserve was placed under the responsibility of a Land Commission.

All land owned by farmers was grouped into seven classes, and the land classification plans were submitted to regional governments for review before final Cabinet approval. Each class has a set of land use restrictions. A farmer wishing to sell his entire farm does not require an approval but the new owner becomes subject to the land-use restrictions.

Nothing in ALR regulations requires that land be farmed. The objective of the ALR system is to keep the remaining farmland from being irretrievably converted to non-farm uses.

¹ Although Government officials have at regular intervals stated that under the 1977 Act the Crown is bound by planning schemes, section 116 of the Act allows the Crown to override such schemes in terms of national interest or emergency (however defined).

Conceivably, farm land could be approved for development of a golf course, for example, on the basis that such use would not preclude its return to agriculture. The regulations also do not forbid non-farmers to buy small areas, e.g. ten acres for rural residences and not farming.

When the ALR was set up in 1972, many objections were raised by farmers and farm organisations. Farmers nearing retirement claimed the Government had deprived them of the retirement income to be received by selling to developers - an assumption based on the belief that farmland would command higher prices for its development potential than for its use in agriculture.

Beside the ALR programme, the Provincial programme hastened along the Farm Income Assistance programme (1973). The reason for this was that once a government says that your land must be farmed in perpetuity, the farmer can then expect to ask, "What about my income?" Participation in the income-assurance programme is voluntary.

The British Columbia example shows how a land classification programme (zoning), combined with an income-assurance programme, is used to control the use conversion of farmland to non-farm uses and stabilizes farm incomes to encourage family farming.

Many other examples can be quoted where zoning has been (or is) used in combination with another tool. One of these is the 'Agricultural District' to be discussed later. Other examples are in countries where building permits play an important role. In Germany, construction is only authorised on lots adjacent to land already built upon. In Norway all undeveloped zones are protected, and to be allowed to buy a property the purchaser must first cultivate it himself during at least five years.^{20/}

These examples all exemplify further that in many countries around the world zoning, by itself, has not been effective in retaining land in agriculture or preserving open spaces. The examples of zoning combined with other tools are all very recent legislations and their effectiveness still has to be shown.

2. LAND BANKING

The idea of land banking was first raised with respect to controlled urban development of large cities and the preservation of agricultural land around these cities. Between 1905 and 1923 the City Council of Stockholm, Sweden, bought up all the future development land around the city to be able to control orderly development. On quoting:

"The development of Stockholm in planned neighbourhoods may not be perfect, but in terms both of social and physical management it has aroused the interest of people throughout the world, and has been emulated in many places. Swedish land is leased - both for housing and industry - according to a complex system that has been developed".^{21/}

The city of Amsterdam has done the same. The city took into public ownership all development land, but then sold it to private builders, thus controlling the nature and direction of development and the price of land.

Land banking in these previous examples was done with several purposes in mind, such as:

1. To implement urban land-use plans and in this way to control the direction of town development. To achieve this, a public corporation would acquire land earmarked for development on the fringe areas round the cities. This would be done well ahead of any actual development needs.
2. To stabilize the price of land. Public acquisition of land might be expected to reduce the price of land for the following two reasons:
 - (a) "A public authority's holding costs are lower than a private owner's partly because it can borrow money at a lower interest rate. More fundamentally, it is less risky for a government authority to own land since it is in a better position to predict and to influence the direction of development".
 - (b) "If the public acquisition programme is sufficiently large it can increase the supply of land available for development and hence exert a downward pressure on its price. If it has sufficient resources at its disposal, a public authority can offer sites at prices which just cover its own acquisition and holding costs, and can act as a price leader in the market.
 - (c) "By holding and developing land itself, the authority can reap the 'windfall' gains of development on behalf of the public which then in turn could be used for public purposes. To achieve this, the land would have to be bought far enough in advance of expected development.^{22/}

A report by the Canadian Government, on a survey of factors involved in land costs, shows that public land banking by a local authority, when it is undertaken on a large enough scale to make the municipality in effect the only land developer, can lead to considerable savings in costs. Figures provided at "the World Settlements Conference on Urban Land and its Profits" showed the same:

Percentage annual increases in land costs in various cities (Since W.W.II):

Teheran	10%	Japan (av. 5 cities)	20%
Tel Aviv	21%	Jamaica	17%
Seoul	18%	Mexico	15%
Paris	18%	Madrid	27%
Milan	15%	Stockholm	7%
Amsterdam	6%		

Other countries in more recent years have used land banking as a measure to control urban development. Examples can be found in Australia^{23/} and in the U.K. In the U.K. the Community Land Act 1975 and the Development Land Tax Act 1976 give effect to the Government's proposals for the community ownership of development land as set out in the White Paper (1974):

1. to enable the community to control the development of land in accordance with its needs and priorities; and
2. to restore to the community the increase in value of land arising from its efforts.^{24/}

With the squeeze on local government finance over the last years, no money has been available to carry out the aims of the Act. Therefore we cannot evaluate the cost and effectiveness of this programme in the U.K.

Other countries involved in land banking are Finland, Sweden and France. Not enough information is available to evaluate how effective these programmes have been in relieving the pressure on peri-urban land.

To New Zealanders the concept of landbanking is not really very foreign. Government involvement in land exchange and ownership has always been high. Land Settlement schemes and State Housing schemes all represent some form of land banking. Other examples are the steps taken by the Manakau City Council in 1966 to acquire 2500 acres of rural land, and the acquisition of land at Rolleston under the Public Works Act.

Therefore:

"Land banking principles have been an important element in much social legislation in the nation's past, but a strong prevailing presumption in favour of the free market means that a wider appreciation of the purposes and benefits of general public land banking would be a prerequisite to its adoption on a comprehensive scale. This would also foster a suitable climate without which large social investment for long term objectives would be politically hazardous and socially costly".^{25/}

The Saskatchewan Land Bank: a land bank with a different aim

Although land banking was first envisaged to control urban development and in this way preserve agricultural land and keep prices down, the concept has moved on and is now applied to all agricultural land. Most of this further development in land banking has occurred in Canada. Several provinces have passed legislation to 'bank' land for urban development, and to generally direct land use in the provinces. The best example is the Saskatchewan Land Bank.

The aim of the Saskatchewan Land Bank is not primarily to retain land in agricultural production but to revitalize the rural area, i.e. to create an environment in which young farmers can afford to buy farms and in this way boost production and hence agricultural activity.

Even though this example deals therefore with quite a different problem from those discussed up till now, it deals with the creation of an environment in which the best use of agricultural land is achieved. It is for that reason that I will briefly discuss the programme.

The problem facing Saskatchewan in the early seventies was one common to most agricultural areas or quoting Gordon E. MacEachern, President of the Economic Research Council of Canada:

"If Canada is to survive, we must save the countryside. This is neither an idle nor purely emotional warning. The preservation of rural Canada is as essential to harmony of our lives as is the conservation of the blue whale or the whooping crane.

What's more, the flight from the countryside represents a serious social cost to Canada, for which we all pay If the trend continues, by 1980 rural people may not be able to pay for any of their roads and utilities. What then? Will rural Canada be abandoned completely?"26/

The aim of the Saskatchewan Land Bank programme is:

"To provide people now farming with a continuing opportunity for agricultural land sales, and allows other people to begin farming independent of substantial family assistance".

"The programme participates in maintaining rural communities by creating opportunities for people, who may not otherwise have had the chance to establish and operate an effective farm".

Hence a major aim of the programme is to revitalize rural Saskatchewan. The thrust of the Land Bank is leasing, the provision of long-term secure leases. These leases run uninterrupted to the lessee's age of 65, at which time (or at an earlier date on request of the lessee) the lease may be transferred to a direct descendant of the lessee or to his or her spouse.

The programme is voluntary and has been well received. There is a high degree of participation in most regions of the province. About 2000 lessees now share in the use of more than 700,000 acres of land.26/

The cost of administering the Land Bank Act is paid by a grant from the Department of Agriculture, appropriated by the Legislature for that purpose.

Funds required for the purchase of land and improvements are received directly from the Department of Finance in the form of long term loans.27/

Conclusion

Land banking as a tool to implement land-use plans seems to hold some promise. Conceptually the programme is attractive. If executed properly it can achieve some price stabilization (as the urban price evidence showed), it can control urban development, it can control speculation and if so desired it can appropriate community-created increments in land values in the public interest. As we saw in the Canadian case it can even be used to revitalize the rural area.

The tool however, has several drawbacks. In New Zealand one of the restraints to an extensive use of public land banking would be an ideological one. It has been said that a man's home is his castle; land in New Zealand is a very sacred castle.

Nevertheless, changing needs of society and the development of a greater national sense of land management for society's wellbeing may pave the way for a greater acceptance of such concepts as land banking.

A second major restraint would be finance. Very few local governments could afford to buy up land for land banking, even in the best of economic times. To control speculation a significant share of the land market needs to be in the hands of the controlling authority. Besides finance, this requires planning, which requires in turn a forecast of the need for land 10-15 years hence. This latter requirement of course is common to nearly all tools of implementation. But unless the finance is there and the forecasting is done and enough land is bought up to have a large share of the land market, the authority is not going to achieve price stability and speculation and development control.

The cost disadvantage of land banking has forced local governments to look for other tools which can achieve the same but will be less costly (such as Transferable Development Rights, to be discussed later).

3. TAXATION METHODS

In New Zealand, Western Europe and Canada, land-use plans have the force of law. Therefore to implement plans it was enough to enforce the regulations to attain the desired objectives. In the U.S.A., in contrast, incentives are being used and these are mainly tax incentives.

The largest category of methods developed for the preservation of farm lands, and other forms of 'open space', in the U.S.A., are real property tax adjustment strategies. The most popular of these programmes have taken the form of differential or use-value assessment adjustments. In such a system land is valued according to its current use rather than its market value in some other use. The underlying assumption behind this type of programme is that farmers require some form of tax relief because of pressures created by changing and unstable land markets. The more active the land market, the greater the uncertainty, leading to further speculative pressure, which artificially forces up the market value of land. It was thought that under a programme of tax relief the farmer will be able to resist selling his land or changing its use out of agriculture since his tax situation will now be pegged to his actual use condition and not to the unreal values created by speculation.

Under this programme of differential or use-value assessment, there are two types of tax system which are most common - preferential assessment programmes and deferred tax programmes.

The fact that in the U.S.A. land taxation plays a special role is on account of the fairly considerable amount of the tax, which is the main source of revenue for local authorities. Therefore, differential assessments for taxation purposes can involve substantial amounts of money.

Besides land taxes however, other fiscal measures are being employed such as changing transfer taxes, i.e. those taxes collected at the time of sale, or inheritance or collected when the land is given as a gift or changes its use. At the end of this section we will briefly deal with these.

A different type of differential assessment in New Zealand, is the much talked about, but not implemented, factor tax concept. This tax is held up as a policy measure to encourage 'best' use of land. This tax will also be described and discussed.

Preferential Assessment

This programme is a voluntary programme. Taxes are assessed on use-value. This assessment procedure continues for as long as the owner maintains the land in agricultural use. If the owner changes the use, he must inform the authority (adminstrating the programme). No penalties are assessed if a land conversion is completed.

The above programme has run for several years in many American States. Evaluation of the programme found it to be ineffective in maintaining land in agriculture on the urban/rural fringe. Most of the applicants were not on the verge of changing land use in the foreseeable future and therefore simply had a nice tax break. Because no penalties are involved speculators are not put in a jeopardy situation. On those farms on the verge of changing land use, the owners did not feel that the participation in the programme and even any penalties would have any effect on their future decisions to sell land or change its use - the reason being that the capital gains from other uses simply were too large to ignore and that they more than offset the tax advantage.28/

Another key issue is one of equity. In a system which reduces the tax burden to some by virtue of occupation and property ownership status, other citizens not in a similar situation are forced to pay higher taxes if the level and quality of services funded through property rates are to be maintained. It may be one thing for a community or country to aid farmers and quite another to subsidize any landowners who qualify under this loosely conceived programme.28/

Differential rating has only recently emerged as a major issue in New Zealand. The concept of differing rates within a given district has been recognised for almost 100 years and provisions for special rateable values and different ratings have in more recent years been included in the Valuation Land Act and Counties Act.29/

The purpose for which differential rating was designed was not to provide a positive incentive to stop land use conversion as in the U.S.A. but rather to correct an imbalance in rating proportions. Or:

"... a large proportion of differential rating schemes in counties are designed to ensure either that farming communities in the vicinity of urban centres are not called upon to provide a greater share of local taxation because of the urban potential reflected in their valuations, or to counteract the effects of land values as a substitute for unimproved values as a basis for local taxation".^{30/}

Differential rating is widespread in New Zealand both in counties and municipalities. In the Auckland area it was found that many farmers found that their rates are too high but in areas with an expectation of high resale values this was accepted. Many of the people were in favour of differential rating. Several farmers and orchardists, stated that if it were not for such relief (differential rating or rate postponement) they would not be able to operate a viable farm in such a location. Others expressed the opinion that these rating systems did not give enough relief to offset the pressures of near urban locations (Pers. Comm. Marlene Oliver, Planning Officer, ARA). The fact that rating systems are not uniform between local authorities leads to some anomalies at the boundaries.

There is little evidence, as yet, to show that differential rating schemes have made any significant impact on the retention of land in agricultural use and on the intensity of the use of the land.

Deferred Tax Programmes

Under this programme two tax assessments are made:

1. value as used; and
2. current market value.

The latter assessment is the key to any penalty applied to a landowner if conversion to a non-compatible use takes place. There are several variations in this programme. In California the programme contracts the land-owner to keep their land in agricultural use for a ten year period. The contract is reviewed annually for an additional year thus ensuring a ten year contract. In effect, land-owners are transferring their development right, for a fixed period of time, in exchange for a favourable assessment of taxes. If a cancellation or break of contract occurs, large fines and penalties are levied.¹

¹ *Deferred taxation is also not a new concept to New Zealand. It is extensively used for farm development programmes. Also, the 1965 Urban Farm Land Rating Amendment Act allows the postponement of rates on farm land adjacent to urban areas of counties. Under the Amendment, rates can be postponed for up to 5 years, after which time they are written off. On the sale of the property, the occupier is liable for up to five years' postponed rates.*

Evaluation of this programme has shown that it suffers from the same limitations as the preferential assessment programme. The authors of one of these studies concluded that ... therefore, use value taxation, by itself, offers little hope of reducing or controlling urban sprawl.^{31/}

The apparent failure of the use-value assessment programmes to achieve the objective of preserving prime agricultural land has led to the use of combinations of zoning and use-value assessment. One of the earliest examples of this is the New York State District Programme.

Agricultural Districts

This programme is a further extension of use-value assessment programmes. Under the programme, farmers in an area apply to be formed into an agricultural district. The creation of a district openly acknowledges the intention of local land owners and government to do what they can to preserve agricultural land in an area. This is especially important in areas where heavy commitment of land and resources to specific enterprises requires considerable capital investment which adds little to the value of land if sold off for development purposes. This programme is also committed to the concept of a 'critical mass' of land as being necessary for farming, services wise, and process wise. A minimum of say, for example, 500 acres is set.

Farmers in the district have their land assessed at use-value. If a farmer who has taken advantage of this does convert his land to a non-compatible use, he is subject to a five year rollback of all the taxes which were exempted. On top of the use value assessment the district enjoys several other advantages such as:

1. Local governments may not enact ordinances that would restrict or regulate farm structures or farm practices beyond the requirements of health and safety.
2. State agencies must modify administrative regulations and procedures to encourage the maintenance of commercial agriculture.
3. The right of public agencies to acquire farmland by eminent domain (i.e. New Zealand Public Works Act) is modified, though not removed. These agencies are required to give serious considerations to alternative areas before good farmland can be taken for public uses.
4. Restrict public funds for non-farm development.
5. Limit other special service tax assessments.

To date, districts have been formed throughout New York State, except in the immediate vicinity of New York City. Therefore, although it serves the purpose of preserving

agricultural land, it does not have much impact at all on the conversion of agricultural to non-agricultural uses at the urban/rural fringe.

Conklin and Leshner draw the following conclusion in an article that dealt with an evaluation of agricultural districts:

"The developments that have produced high farm taxes on the New York City fringe probably are not unique. While research repeatedly has concluded that farm taxes cannot be low enough to stop urban expansion, it is proposed here, with some evidence, that they can be high enough to destroy or debilitate agriculture far ahead of the advancing urban perimeter. If this proposition is correct, farm value assessment can be an important public policy instrument even if it cannot create a fence around urban growth".32/

Agricultural districts appear to be a measure where zoning, plus incentives, create an environment in which the landowners are encouraged to keep their land in agriculture. How good it is in retaining land at the rural/urban fringe in agriculture is not so clear. Conklin and Bryant state themselves that people who want to learn from the New York experience with agricultural districts,

"... need to recognize that there is a plentiful intermingling of farm and non-farm lands throughout most of New York. Agricultural districts may not be an effective mechanism for encouraging continued agricultural production in more urbanized areas where there is no nearby land available for non-farm uses. Experience with zoning in most parts of the U.S. suggest, however, that a non-authoritarian approach to land use guidance is more likely to be acceptable by farm people than an exercise of police power".33/

This then leaves agricultural districts very much as a measure to encourage a good agricultural production climate rather than a tool to retain land in agriculture at the rural/urban fringe.

In summary, these three types of taxation tools (preferential assessment, deferred taxation and agricultural districts) are mainly used in the U.S.A. By 1980, 48 states and more than 200 counties had enacted programmes to encourage owners to keep land in agriculture. Most state programmes include preferential property tax assessment for farmland. Some states, rather than utilizing differential assessments, give income tax credits for property tax payments. In Wisconsin for example, this is possible only if the farmer signs a preservation contract or if his land is included in an exclusive county agricultural preservation zone.48/

In the U.S.A. farming is being viewed increasingly as a special class of land use. By doing this, further steps can be taken to reflect the value to society of farm land retention and to redress policies (such as estate and capital gains tax provisions) that contribute to conversion to nonagricultural uses.

In most states the programmes are on a voluntary basis. However, in some states, the farmer can be included in the programme by involuntary inclusion via zoning. Increasingly, owners of agricultural land will choose or be required to assume new opportunities and obligations flowing from farmland preservation programmes.49/

Besides the taxation tools discussed above, another tax policy tool exists that has been suggested as suitable, not to preserve farmland but rather to encourage the best use of agricultural land. This tool, the land productivity or factor tax, will briefly be discussed.

A Land Productivity Tax

A different measure but one based on use value is a land productivity tax. The purpose of this tax is to encourage the best use of agricultural land rather than preserve it. The basic idea of this tax is very straightforward. The land productivity (or factor) tax would assign a tax to each farm based on the effective area of the farm. This fixed tax would be based on an assessed 'average' productivity for that farm and would replace a progressive income tax. Taxation therefore would be divorced from actual production on individual farms. Any farmer operating below the assumed average level of efficiency would be taxed as if he has average production. Those farmers producing above the average would receive what amounts to a tax free income on that production that was in excess of the average. With the tax burden being more or less fixed, the above average farmer would find that if he increased production, all the additional income would stay in his pocket and the disincentive effect of taxes on production would be reduced.

This form of tax would provide an incentive to farm the land more intensively. The factor tax idea is still only a theoretical idea. It is however, a very appealing one. Before it can be tried however, it needs to be further developed. More research is needed on its effect on recently settled farmers and on setting the average efficiency level. It also raises a distributional question by introducing a system of taxation for agriculture which is different from that applying to the rest of the economy. This however, cannot be too serious as most subsidies and taxation treatment are already different from sector to sector.

Several variants have been suggested to implement a factor tax programme.^{34/}

Other Fiscal Measures

It is outside the scope and the topic of this paper to discuss the many other fiscal measures used to retain land in agricultural production and to encourage the best use of this land. These measures range from land price manipulations, land taxes, death duties, capital gains taxes to subsidies.

Price manipulations are often actions by public authorities on the price level through forced purchase and pre-emption procedures. In Norway land prices were frozen for a long time and after 1975 a maximum authorised price was determined on the basis of use value.

Land taxes play an important role in many countries. Their effect on the retention of land in agricultural production is not clear however.

Capital gain taxes are also levied in many European countries. This tax aims at reducing land speculation. Within the agricultural sector itself it encourages farmers to invest in productive assets rather than to purchase more land.

New Zealand has had a short fling with an attempt to tax short term speculation (the Property Speculation Tax). A capital-gains tax as such does not exist.

Death duties can also influence the transfer of assets between agricultural and non-agricultural uses. When death duties are high (and when they have to be paid in cash), often the best option open to the people involved is to convert the farm assets to a more liquid form. When this is the only way out, the farm is often subdivided and will go to the highest bidder, which at the rural/urban fringe is often the developer.

When death duties are too low, farmland will become an attractive purchase for people from other sectors who are looking for an investment which will ensure that the greatest possible proportion of their estate will be transferred to their heirs. With land bought as a death duty dodge, it becomes increasingly expensive and further out of reach of the young man who is looking for a farm.

In New Zealand many other tax incentives exist which affect agriculture. For a detailed description of them see 35/.

Each of these measures warrants further study. By themselves they may have no significant impact on the preservation and best use of agricultural land. Together as a policy set, they could be very important.

4. DEVELOPMENT RIGHTS MANIPULATION

The basic idea underlying this policy tool is that ownership of land is like having a bundle of rights and that certain rights of ownership in property can be separated from the rest and transferred to other owners.¹

¹ *This of course is basically no different from zoning where certain rights are transferred to a local authority. The difference, however, lies in the transfer of the rights and the compensation paid for this.*

The Taking or Purchase of Development Rights

Under this programme, an agency of government separates the right to develop property from the other rights of ownership, and purchases the ability to develop the land from the owner. The right to transform the land use of a parcel of land from agriculture to some other non-agricultural use is now 'retired' by the new owner, the government.

The British Experience

The concept of separating the developing rights (DR's) from the other rights associated with holding a property is not new. Almost three decades of British experimentation in land-use control has been based upon this concept. Under the Town and Country Planning Act of 1947, the British government took over the development rights of all undeveloped land. This left the owners of land with all other rights of ownership, except the right to develop. When an owner wanted to develop his land, he had to buy back the right to develop from the government by paying a development charge.

The 1947 Act provides for compensation to landowners for the value of the DR at the time of the taking in 1947. The amount of the compensation was set at the value of the land in excess of 'existing uses' as defined in the statute. A 300 million pound revolving fund was created from which compensation would be paid and into which the development charges would be deposited.^{36/}

In the Acts of 1953 and 1957 the development charge was abolished. The DR's remained separated from the rest of the rights of land ownership.

In 1967 the development charge was reinstated at 40 per cent of the 'development value' (not unlike a capital gains tax) and was abolished again in 1971 and reinstated in 1976.

The British experience with DR's has been something less than a resounding success. The change in Acts with every new government created a large amount of uncertainty in land use planning. The development rights are still separated from the balance of the title and have been retained by the British government. Thus far, the British have been unable to devise an effective system by which the separation and marketability of DR's may be used as a land use control device.

The American Experience

In America a DR programme was first initiated in Suffolk County (NY). In Suffolk County, agriculture is a major but declining industry. Over the past two decades, farm acreage has decreased by 50 per cent. One of the reasons for the continuing decline in farm acreage is the non-farm demand for land. Reflective of this is the \$7,500 average per acre price being paid for farmland that has an estimated agricultural value of \$1,500. About 60 per cent of the farmland is owned by non-farmers.

For many years Suffolk County farmland has been assessed at use value which has helped maintain low taxes on farmland relative to taxes on other types of property. Currently property taxes on farmland average \$25 per acre. While \$25 per acre does not seem unreasonable based upon the land's agricultural value, it is far below the \$375 per acre which might result if it were assessed at its full market value.^{37/}

The large difference between market value and use value resulted in many farmers being unwilling to participate in any programme that might inhibit their ability to sell the land for non-agricultural uses.

In 1972 the Suffolk County came up with a new farmland preservation programme based on the purchase of development rights. The programme is voluntary. Farmers can submit offers, and emphasis is placed on parcels of land of 200 or more contiguous acres with high quality soils. Also, those farms under great development pressure are given priority. When an owner of farmland sells the development right, property taxes will be reduced by about 80 per cent since development rights constitute about 80 per cent of farm land's value in Suffolk County. Farm operators can use the extra cash to expand their operation and make other investment. The farmer still is the owner of the land for farming purposes, he has not been reduced to a 'tenant'.

The programme is very expensive (it is paid for through the purchase of 30 year municipal bonds). While some say that it is effective, others find that:

"While it seems the programme cannot be justified on an economic basis, the unique island geography limiting accessibility of alternative open space, the continuing concern about overpopulation, and the relative affluence of the residents may help explain local support for the programme.

Considering the uniqueness of the Suffolk County situation and its relatively long struggle to implement a purchase of development rights programme of modest size, one might very well question whether such a policy instrument will be useful".^{37/}

Transfer of Development Rights

Transfer of development rights (TDR), like purchase of development rights, is a proposed land use policy tool designed to overcome the windfall/wipeout dilemma and the perverse economic incentives created by traditional zoning. The TDR programme begins (like all programmes discussed up till now) with a masterplan identifying zones for development and preservation. Since under the plan certain portions of the area will lose their development potential completely, landowners in these areas will be assigned development rights (DR's). In areas where development will be allowed to occur the densities of development are made higher so as to absorb the growth being deflected from one area to another. In essence the programme transfers "building permits" from one area to another.

To build on the development area beyond the early specified density requires a number of development rights. These rights can be either purchased directly from restricted land-owners or from an intermediary agency. Thus, it is argued that preservation zone land-owners will be compensated for their 'wipeout losses' by sale of DR to development zone landowners wishing to develop.

Advantages of this programme, beside eliminating wipeout losses, are that the programme allows local communities to pursue planning and zoning in their own interest; land remains in agriculture; compensation takes place; ownership of land remains in the hands of the original owner.

The development of this policy tool for the preservation of agricultural land and open spaces is still at an early stage. Many practical aspects still have to be researched. For example, the DR market must function in a reasonable manner in order for restricted owners to be compensated. The supply side is determined by the zoning authority but the demand side may be highly unpredictable. If no strong demand exists, DR's are not transferred and restricted owners are not, or only partly, compensated. A thorough analysis of some of these practical aspects is given by Barrows and Pregel 38/ and Swartz and Hansen. 31/

Although the application of TDR's to agricultural land is still very much a theoretical idea, the concept of TDR's for other purposes is not new. Several cities, overseas and in New Zealand, have experimented with the transfer of development rights as a means of preserving urban landmarks. The basis of the programme here is the fact that the value of real estate in many parts of the city depends upon the intensity of development permitted under the zoning law and the fact that historic urban landmarks usually have an excess of authorized but unbuilt floor area ratio (FAR) provisions. To preserve the historic site, the site owner is permitted to sell the authorised but unused floor area of the site to lot owners in other designated areas. Or to quote the Palmerston North District Plan:

"Floor Area Ratio from historical places can be transferred to other sites."

"The amount of development right that may be transferred shall equal the sum floor space that could be obtained upon the site using the base FAR permitted, plus amenity bonuses, minus the existing floor space."

"The transfer of these development rights shall be permanent and shall be registered as a caveat against the titles of both the vending and purchasing sites".39/

Conclusion

Manipulation of development rights is still very recent. Although the purchase of DR's has been incorporated in actual working land use programmes, the programme of TDR's is still a theoretical concept.

While removing development rights from land reduces the financial incentives to convert land to urban uses, it does not eliminate the disincentives to agricultural production, which are likely to exist because of regulations stemming from conflicts between agricultural and urban land uses. Thus, establishment of the same protections that are provided for in the agricultural districts programme would also be an important component in the strategy for maintaining agriculture in the urbanized zone. In fact, once development rights have been removed from the land, farmers presumably would welcome, rather than oppose, the establishment of agricultural districts.

Purchasing development rights is an expensive option that not many local government (except only the very rich as some of those in New York State) can afford to embark on. Transfer of development rights eliminates this need for large money outlays.

A more fundamental question regarding development right manipulation concerns the impact on the distribution of income. With zoning, we are concerned about the windfall gains and wipe-out losses. The losses we argue away by stating that such losses represent 'unearned' increments to land values and that the owner of the land, lucky to own this land needed for development, has no basic right to it. With development rights, however, the converse is stated and now the owner is seen as having a right to this development value and therefore should be compensated for the taking away of it. Compensation takes place when developers buy this DR and it is the consumer (the buyer of the houses) who ultimately pays the compensation in higher prices.

It is important that this distributional aspect of DR's and TDR's is carefully spelled out to the public before such a programme is adapted.

Transferable development rights are permanent and this is a strong point of the programme. Once the DR's have been transferred the uncertainty about the use of the land has disappeared.

SUMMARY AND CONCLUSION

In this paper I have introduced the topics of agricultural land preservation and of 'best' use. The paper has only been able to introduce these topics and much more could have been written.

In the first part of the paper I dealt with reasons for and against the retention of land in agricultural production. The aim of this part of the paper was to stimulate discussion rather than to give definitive answers. I pointed out that preservation is not an objective in itself but a means of achieving goals. It is only in the light of these latter goals that we can decide whether or not to preserve agricultural land. Frequently statements appear in papers or journals that land is the ultimate scarce resource and that it should be preserved at all costs. I hope that the early discussion in this paper has shown that such emotional statements are irrelevant to an informed debate on preservation of agricultural land.

With respect to agricultural land in New Zealand, I discussed a few of the current trends in land use changes (rural/urban, small holdings) and land use (efficient or inefficient?). I stated that it was because of these trends and the conflicts (or alleged conflicts) they cause, that New Zealand is also looking at ways and means to control the use and changes in the use of land.

At the end of the first section, I made the assumption that the retention of land in agricultural production is desirable. This assumption led then into the second part of this paper on how to execute the task we set ourselves. I briefly introduced the planning process for land use planning and then concentrated on measures of implementation. The discussion of the various policy tools that followed, dealing with

agricultural zoning,
land banking,
taxation,
development rights manipulation,

has to be seen as a survey. My main purpose here was:

- (a) to introduce the wide variety of tools available.
- (b) to show how each of them is used; and
- (c) to briefly evaluate how effective each one has been in achieving stated objectives.

The discussion was in no way exhaustive, but it did cover the major tools used at present. Since this paper was written in early 1980, new programmes for agricultural land preservation have been developed all over the world. But even though they are new programmes, and some are very innovative, the actual tools used are still very much the ones discussed in this paper.

The discussion of alternative policy tools has shown clearly that no one single tool can achieve the two major objectives I set for the land use plan. These objectives were:

- (a) the retention of 'good' land in agricultural production; and
- (b) the best use of agricultural land.

All the tools discussed could contribute to these objectives but all of them from zoning to use value taxation to land banking and development rights manipulation, have displayed weaknesses. In the end it appears that only a combination of some of them would enable the achievement of objectives.

This conclusion is not very new, but that was not the aim of this paper. What I have tried to achieve here is to discuss some of the basic principles and shortcomings of each of the tools and discuss how effectively they have been used. In my opinion, much can be learned from overseas failures and successes.

Finally, this paper was written to provide information. It was not written to advocate more planning and more control. Land use planning is costly and bureaucratic planning institutions are often inflexible. This inflexibility can sometimes lead to too much control and a cost to society in terms of sub-optimal allocation and use of land.^{47/} However, I hasten to say that there are at the same time good arguments for planning. It is this balance between too much and not enough control that often is so hard to achieve.

In this paper I have shown that tools are available to guide land use according to society's objectives. But before implementing any one tool the costs and the benefits (including the cost of the institutional system) should be carefully analysed. If this is not done we may find that the controls implemented will do no better (or perhaps do worse) than the market system in allocating land.

"Before legislating paradise in the area of private land use, it would seem that we should first make some attempt to ascertain the costs in terms of federal-state rights, economic impact, and personal freedoms".^{41/}

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APPENDIX I

The following example and discussion are taken from an article by Delworth Gardner^{5/}. The thesis of his paper is that the efficiency cost of prime land retention proposals will not be inconsequential.

Consider a hypothetical example. Suppose that land parcel A yields an annual surplus (revenue minus non land costs) of \$100 per acre in the developed use and \$50 in agricultural production.

Table 1: Hypothetical Surplus

<u>Value yielded in developed and agricultural uses</u>				
<u>Use</u>	<u>Parcel</u>	<u>A</u>	<u>B</u>	<u>C</u>
Developed		100	150	101
Agricultural		50	90	90

An alternative parcel B has an annual surplus of \$150 in developed use and \$90 in agriculture. If the relevant capitalization rate is 10%, parcel A would be worth \$500 per acre to agricultural owners and \$1000 per acre to developers. Developers must pay at least \$500 to get \$1000 and would capture a potential maximum wealth gain of \$500 per acre. In the case of parcel B, they are willing to pay the agricultural value of \$900 in order to get a capitalized value of \$1500, a difference of \$600 per acre.

The competitive land market will allocate B for development if there is sufficient demand for only one of the competing parcels. This market solution is socially optimal, assuming no Pareto relevant external effects, as society captures a larger rent in foregoing agricultural production on parcel B (\$60 per annum) than it would have in the case of parcel A (\$50 per annum).

Consider a third parcel C that has comparable agricultural value with parcel B (annual surplus in agriculture of \$90) but is only slightly better for developed purposes (say, \$101 annual surplus) than the poorer agricultural land, Parcel A. Let us now compare parcels A and C as this comparison prompts the question usually asked by prime land advocates, namely, why allow good agricultural land to go to developed uses when poor agricultural land will do nearly as well? Will the market now take the better agricultural land C when the poorer land A would do nearly as well in the developed use?

Clearly not! Developers would have to pay \$900 to get parcel C, which would be worth \$1010 to them, and they stand to get a gain of \$110. If they can get A, they would gain \$500 as has already been demonstrated. As before, in the absence of externalities, the perfectly competitive market produces a socially efficient allocation of land.

The same can hardly be said for a land planning council guided by agricultural productivity criteria as described above. Comparing A and C, they would direct that A should be developed, which would be the efficient choice. But in choosing between A and B, they would select parcel B to remain in agriculture every time unless they succumb to the pressures (if not bribes) of the developers. If they do, the prime land retention scheme is innocuous in its allocation effects anyway. But society would have to carry the burden of an administrative agency that is in the business of passing out windfall gains and/or wipe-out losses, most often with adverse equity consequences.

If the effective instrument for revealing scarcity is replaced by the prime land retention schemes proposed, in which inadequate economic or political criteria dictate resource allocation, there is no reliable way of knowing whether agricultural land is becoming scarcer or more plentiful.

If the objective of preserving agricultural land is to provide more open spaces, then the criteria should be an open space selection criteria rather than the criteria of prime agricultural land.

For example, use-value assessment or zoning, has had only limited success. For any given area, a combination of land use control techniques, chosen in consideration of the degree of urban pressure, can greatly enhance the effectiveness of efforts to maintain agricultural open space.^{23/}

APPENDIX II

Estimating Agricultural Use-Value.

Throughout this discussion paper much emphasis has been placed on the use-value of agricultural land. It was first mentioned in connection with taxation measures 'use-value rating or taxation', we will also meet it with land acquisition when compensation is paid according to use-value and with price stabilization.

The purpose of this appendix is to briefly outline alternative ways to estimate use value. Most procedures for estimating use-value are based on one of two methods: the market value approach or the income-capitalization approach.

With the market value approach, the conditions and prices associated with the sale of similar properties are studied, and the appraiser assigns a value consistent with what he thinks the property would bring in the current market. Barlowe argues that:

"This approach finds its rationale in the economic principles of substitution. Informed buyers and renters will not pay more for given properties than it costs them to buy or rent comparable substitute properties".^{42/}

The income-capitalization approach is based on the logic that the market value of the piece of land should equal the present value of the stream of all future incomes. In its most simple form (where income is assumed to accrue in perpetuity), market value, V , involves the formula $V = I/z$, where I is the average yearly return to land, and z is the discount or capitalization rate. There are a number of refinements one can make in this procedure to account for changes in the income stream or discount rate, property taxes, or other changes which may affect the income generated from a parcel of land over time. While these refinements are not difficult to deal with conceptually, empirical implementation requires knowledge of the future income streams and other changes affecting use value.

Failure to incorporate these changes by capitalizing current rather than future income streams certainly has an impact on estimates of use value. However, for administrative purposes, one can argue that use values based on recent performance may be the only acceptable alternative. For comparing these use-value estimates with those developed through a market approach, one can argue that market participants setting land market values have just as much difficulty in perceiving the future as any researcher. They too may have only crude estimates of the future income potential of land and they may rely most heavily on the recent performance of land as their basis for appraising its future productivity.

Four different methods:

1. rental income,
2. residual value,
3. marginal value product,
4. budgeting,

can be used in estimating yearly income.

To use rental income, one needs an active rental market and one must assume that rents accurately reflect the agricultural value or quality of the land resources. Often this is not so and using information from the rental market is likely to be an unreliable base from which to calculate agricultural use-values.

Residual value approach. The approach capitalizes the residual return to land (i.e. residual after all other resources are paid their market value). Production Economic theory shows that this is only possible under two conditions:

- (a) we are dealing with a production function homogeneous to degree 1 and the marginal value products of the factors other than land equal their market prices (use Euler's theory); or
- (b) the economy is in long run equilibrium and profits are equal to zero.

As either of these two conditions is not very likely to hold, we have to be very careful using this approach.

Marginal Value Product Approach. This third alternative is the capitalization of marginal value productivities for land inputs. To obtain these marginal productivities a whole farm production function needs to be derived. This involves many difficulties, as any text on the estimation of production functions will point out.

Budgeting. Here, budgets are prepared for the farm as a whole and its yearly income calculated. This income is then capitalized.

For a further discussion on this and a comparison in an actual application see 43/.

A last point to be mentioned in this context is the choice of capitalization rate. Some people have suggested that this rate should reflect the rate of return, on other farm inputs thus representing the opportunity cost of investing in farmland. Others argue that one should employ rates of interest or rates of return on non-farm investments which represent the opportunity cost of investing in any farm input.

Whatever the choice of capitalization rate, it is important that we understand the reasons why we have chosen the rate we will use. Different rates will make significant differences in the ultimate value we come up with.

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