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THE RELATIVE PROFITABILITY OF  
FORESTRY AND AGRICULTURE  
ON THE MANAWATU-RANGITIKEI SAND COUNTRY

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A Thesis Presented in Partial Fulfilment  
of the Requirements for the Degree  
of  
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in the  
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by

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P R E F A C E

This Discussion Paper is aimed at making Anthony Chisholm's Master's thesis more widely available than would otherwise be possible. The thesis is reproduced as originally presented, except for the transfer of a technical description of the sand country soils from the main text to Appendix XII.

The explicit findings of Chisholm's study (summarized in Chapter VII) are that approximately 39,000 acres of the poorest sand country soil types should be developed for forestry rather than sheep farming. At present only 15,000 acres of this land has been allocated to forestry. The author has calculated that the development of the remaining 24,000 acres into forests would yield revenue with a present value £400,000 greater than that to be attained by continuing its development for farming.

The land use recommendations made by Chisholm are tabulated in this preface. More important, in my view, than the explicit recommendations, is the example which this study provides of the objective evaluation of the profitability of alternative land uses. The expected yields, development costs, and returns from both forestry and farming have been carefully laid out, and the present value of land used for farming and forestry has then been calculated.

Three types of objection can be raised in connection with this study. These are:

(i) The Wrong Technical and Price Assumptions May Have Been Used

This is undoubtedly a valid objection, though as the reader will be able to see, Chisholm has been at great pains to collect as much pertinent information as possible before making his assumptions as to prices, yields and the like. The really important point, however, is that the study provides a framework into which other assumptions may readily be fitted. It is quite possible for the protagonists of agricultural development to claim that, say, fencing and

(iii)

initial cultivation costs have been over estimated. If they can show how land could be satisfactorily developed with a lower expenditure, then the increased present value of agricultural development can be easily calculated. From one point of view the study shows "what sheep farming has to be able to achieve to be able to compete with forestry," and from the other point of view, "how far the stumpage value could decline before forestry ceased to be the most profitable development."

The important point is that the study states explicitly what forestry and farming are expected to achieve in the way of costs and yields, and hence converts any "emotional" arguments about land use into technical arguments about what can and cannot be expected from different uses.

(ii) The Analysis Ignores Effects on the Balance of Payments

Some feel that account should have been taken of the effect on New Zealand's balance of payments. There are two difficulties here. Firstly, it would have been necessary to trace out, fairly exactly, the inputs and outputs from all enterprises to see whether they came from or were destined to go overseas. Worse still, the result of not growing trees, or the alternative use of labour and capital freed from the processing of forest products would have had to be considered. This would have been a vast task. Secondly, even if we knew that, say, farming would result in £1M more of exports each year, what allowance should have been made for this? So far as I am aware, there is no official estimate of the value of earning an extra £ of foreign exchange. Hence we would not know whether to allow 20/-, 25/- or 30/- for each extra pound sterling earned. It may be argued that it is not until the value of extra overseas exchange is decided that we can usefully replace the official exchange rate in the calculations illustrated in this Discussion Paper.

(iii) The Analysis Stops "at the Farm Gate"

Some believe that account should be taken of the use which is made of the agricultural or forest products before final sale. This argument really reduces to accepting the projected market prices assumed in the study but then arguing that, say, "forest products are really worth more than their market price, because of the value added in processing." Just as for the previous objection on the value of overseas exchange, this "processing" objection would require a separate study to see whether processing was exceptionally profitable, and an estimate of the "real value" of forest products would have to be provided before an allowance could have been made in this study. In economists' terms, this argument relies on farm or forest processing industries earning more than their transfer earnings, or on some element of monopoly profits in these activities. To establish this would be a major undertaking.

The original thesis explained Chisholm's reasons for tackling the study in the way he did. Despite the criticisms which have been made of certain aspects of the study, no attempt has been made to add to the original arguments in the thesis. This is because such arguments would further lengthen the discussion paper and, however convincing the arguments appeared to their author, they would undoubtedly be felt to be unsatisfactory by at least some readers.

I hope that most readers will agree that this thesis gives us a much better picture of the relative profitability of farming and forestry development of the poorer classes of sand country than was available previously. It illustrates a factual framework within which arguments about land use can be discussed objectively.

At the same time, it is certainly true that if Chisholm had had more than eighteen months to conduct the study, and if the terms of reference had been widened, still more useful and pertinent information could have been presented.

I would like to express my thanks to Mr J.D. Cowie of the Soil Bureau, D.S.I.R., members of the N.Z. Forest Service including the Forest Research Institute, the Valuation Department, the Lands and Survey Department, the Department of Agriculture and N.Z. Forest Products Ltd. for the very helpful way they assisted in providing the information required to carry out this analysis.

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11 January 1965

EXISTING AND RECOMMENDED LAND USE ON THE POORER SAND COUNTRY

Younger Dune Complex:								
Tenure	Protective Coastal Strip	Large Scale Forest	Preparation for Forestry	Dairy Farms	Sheep-Beef Farming	Run Off	Undeveloped and extensive grazing	Total Area
Crown	5,000	4,400	8,000	-	3,218	-	3,000	23,618
Private	1,500	1,000	800	2,661	512	-	13,909	20,382
Total (Actual)	6,500	5,400	8,800	2,661	3,730	-	16,909	44,000
Total (Recommended)	6,500	29,000	-	8,500	-	-	-	44,000
Himatangi - Foxton Land Class:								
Total (Actual)		700		4,500	15,000	9,800		30,000
Total (Recommended)		10,500	-	4,500	-	15,000		30,000

Source: Tables 4.1 and 4.2 and Chapter VII.

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## INTRODUCTION

This study is an attempt to evaluate the relative profitability of agriculture, large scale forestry and farm forestry, on the lower producing soil classes of the Manawatu-Rangitikei sand country.

The study has been motivated by three related considerations:

(a) There has recently been a considerable intensification of competition for the use of the sand country as both forestry and agriculture attempt to expand.

(b) The competition for land between these uses is not, in general, resolved through a perfect pricing mechanism.

(c) The author was interested in economic models appropriate for the analysis of long term investment problems.

In the absence of an impartial economic analysis, the allocation of land between farming and forestry has necessarily been a matter of rule of thumb and common sense negotiations. It is hoped that this procedure can be improved upon.

In this study an endeavour is made to select and apply a suitable economic model to the above problem.