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THE USE OF A COMPUTER
FOR THE ANALYSIS AND EVALUATION
OF FARM DEVELOPMENT PLANS

by

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CHAPTER 1INTRODUCTION AND GUIDE TO THE THESISIntroduction - The Agricultural Development Conference

New Zealand's economy has always been heavily dependent upon the farming industry to provide export income. Foreign exchange has been required mainly to finance the import of raw materials for secondary industry which provides employment for much of New Zealand's labour force.

In the early 1960's the population was increasing rapidly. More export income was required to pay for additional raw materials needed for the expanding secondary industry labour force. It was apparent, however, that export income could be appreciably increased only by raising the volume of agricultural exports. This led to suggestions in 1963 that a conference be organised to inquire into further agricultural development. Following these suggestions, the Government that same year convened the Agricultural Development Conference¹ with the Order of Reference "to indicate what increases in the production of meat, wool and dairy produce were practicable and desirable over the next two, five and ten years and to recommend measures for achieving them".²

At its first meeting in October 1963, the Conference confirmed the setting up of a Targets Committee to advise on a tentative production programme for meat, wool and dairy produce. The Targets Committee recommended that the Conference indicate to Government its view that the target for livestock numbers should be tentatively set at 111 million ewe equivalents, to be

1. Hereinafter referred to as Conference.

2. "Report: Agricultural Development Conference 1963-64", Government Printer, Wellington, February 1966.

reached by the beginning of the 1972-73 farming season.³ This was an average compound rate of increase of 3.5 percent per annum from the base year, 1962-63. This recommendation by the Targets Committee was accepted by the Conference.

The Order of Reference of the Conference required it not only to indicate desirable production increases, but also to recommend measures for achieving them. To decide on the measures necessary to meet the production targets, the Conference established several Working Parties to advise on finance, taxation, farm costs, manpower, scale of farming, land valuation, noxious weeds, noxious animals and farm pests.

The public and interested organisations were invited to make submissions to each Working Party. Some Working Parties invited expert witnesses to address them. Each Working Party then considered the submissions and any evidence from expert witnesses before making recommendations to the Conference. The Conference was free either to accept, modify, or reject each Working Party's recommendations.

The Finance Working Party

In order to illustrate in greater detail the working of the Conference, the Terms of Reference, procedure and the recommendations of the Finance Working Party are examined.

The Terms of Reference of the Finance Working Party were:

- "1. To consider and report on sources and terms of finance to the farming industry:
 - (a) for seasonal expenditure

3. "Report of the Targets Committee of the Agricultural Development Conference", Government Printer, Wellington, March 1964, p.15.

- (b) for capital investment for
increasing production
- (c) for farm development.

2. To indicate whether (and, if so, what) changes are desirable to provide adequate finance on reasonable terms for attainment of the production targets and to assist its efficient utilisation."

The Working Party circulated a questionnaire on all aspects of agricultural finance to lending institutions in this field. A survey on farm finance undertaken by the Department of Agriculture was made available to the Working Party.

The Working Party initially considered the problem of the likely capital investment needed to yield the livestock targets. Three different methods were used:

- (1) Capital Output Ratios.

This method attempted to measure the marginal output for each additional \$1 of new farm investment. One major problem with the method was the inadequate statistics on farm investment.

- (2) Government Statistician's Estimates.

The Government Statistician estimated the capital investment on farms in recent years largely from changes in Government Valuations. However, the Government Statistician stated that the estimates could not be relied upon.

- (3) Farm Cost Approach.

In this approach, a direct estimate was made of the likely cost of increasing production on a ewe equivalent basis.

The belief of the Working Party was that -

"it is not possible to obtain precise figures of

the extra capital required and even if an agreed figure could be reached, it would still not be possible to ascertain what proportion could become available from farm incomes and what would need to be borrowed."

The Working Party concluded that its main objective was to ensure the availability of loan finance for suitable development projects.

The Working Party reviewed the sources of finance for farmers. Included in the review was a consideration of the availability and terms for seasonal, medium, and long term finance (the latter included development finance). The conclusion of the Working Party was that it did not appear likely that there would be any serious difficulty in the provision of adequate seasonal and medium term finance in the next decade.

In considering the problem of finance for farm development the Working Party attempted to define the necessary attributes of sound development finance. The Working Party felt that, assuming a development plan could not be financed out of income, these were:

- (1) The farmer must be assured that finance would always be made available to enable a sound development plan, once initiated, to be completed. Even if export prices should fall or a credit squeeze eventuate, the farmer must know that credit would not be restricted part way through the development plan.
- (2) The farmer should make the best use of technical advisory services to ensure that the development plan was technically sound and that capital would not be wasted.
- (3) The Working Party noted that during the initial phase of development, usually expenditure increased and income fell. They considered that special loan terms were required to assist farmers during this period and felt that initially interest only should be paid on a development loan. When development became profitable,

the loan should be repaid on a table mortgage basis.

- (4) The Working Party stressed the need, in lending, to consider the borrower's capacity to service his total debt. It was noted that a farmer may become discouraged, and the development plan might fail, if his financial obligations were too great. On the other hand, it was argued that in considering how much could safely be lent to a farmer, allowance should be made for the added capital value of the farm following development.
- (5) There should be no arbitrary upper limit on the amount which can be lent on any one property.

A consideration of the necessary attributes of sound development finance together with the review of existing lending policies for development, provided the basis for the Working Party's recommendations on development finance.

The Finance Working Party made 22 recommendations to the Conference. The general theme of the recommendations was that lending for farm development (principally by the State Advances Corporation and the Marginal Lands Board), be accorded first priority.

The Recommendations of The Conference

The Conference made a number of recommendations to the Government designed to encourage farm development to try to ensure that the livestock targets were reached. Since the conclusion of the Conference, Government has enacted legislation implementing many of these recommendations. In general terms, the implementation of the Conference recommendations affected farmers in two major ways. These were:

- (1) The supply of certain resources either essential for, or

likely to promote farm development, was increased. In particular the supply of finance, essential for farm development, was increased.⁵ The number of farm advisers⁶ was also increased. This action can be viewed as increasing the supply of a resource which would be likely to encourage farm development.

- (2) The introduction of various incentives, designed to raise the profitability of farm development. These generally took the form of reducing the farmer's taxation liability. Examples of incentives introduced include the Nil Standard Value Scheme for Livestock and the Special Depreciation allowance on new machinery.⁷

Outcome of The Conference

The implementation of the Conference recommendations stimulated interest in farm development amongst the farming community. On those farms where development was already taking place, the development process tended to accelerate. Where production was virtually static, farmers were encouraged to favourably consider some farm development.

Thus, following the Conference, significant numbers of farmers began to either consider some development or the acceleration of present development plans. This in turn led to increased demands on farm advisers for advice

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5. See "Report : Agricultural Development Conference", op. cit., p.319.
 6. The term farm adviser or adviser means farm management adviser in this thesis and includes Farm Advisory Officers of the Department of Agriculture, Farm Management Consultants and Dairy Board Consulting Officers.
 7. Details of the incentives can be found in "Farmers Tax Guide", Inland Revenue Department, Wellington, November 1969.

on all problems associated with development. In particular, farm advisers received many requests for advice on the budgeting and evaluation of development proposals.

Concurrently with the upsurge in demand for management advice on farm development, there existed a shortage of farm advisers capable of advising farmers on this problem.

Much of the work involved in the formulation and budgeting of development plans fell upon Farm Advisory Officers of the Department of Agriculture. The work was found to be time-consuming, especially the detailed budgeting. It was noted that in budgeting a development proposal, considerable time was often spent in relatively trivial calculations, for example, the calculation of taxable income to determine taxation liability. Furthermore, a farm adviser was required to make assumptions with regard to future prices. The difficulty in forecasting future prices was recognised, but whilst it was considered desirable to budget a development plan using a range of prices, time usually did not permit this.

The Department of Agriculture was aware of the role of the computer in reducing time-consuming trivial calculations. Consequently, in view of the increased demand for advice on development problems and the shortage of farm advisers, the Department considered it possible that a computer could be helpful to advisers working on farm development. Specifically it was suggested that the computer might:

- (1) be helpful in reducing the number of 'trivial' calculations performed by farm advisers in budgeting a proposed development plan.
- (2) enable farm advisers to examine the financial implications of variation in some of the 'crucial parameters' in a development plan. For example, rather than simply budgeting a development

plan for a sheep farm at one wool price, it was considered that by using the computer it should be possible to budget a development plan using a range of wool prices. This would enable the financial implications of variation in wool prices to be examined and accordingly assist the farmer in deciding whether to adopt or reject a development proposition.

In 1966, the Department of Agriculture decided to provide funds for research into the above two possibilities. The results of the investigation are reported in this thesis.

Guide To The Thesis

Chapters 2, 3 and 4 are introductory Chapters to the main body of the work which is presented in Chapters 5 and 6.

Chapter 2 is concerned with the nature and the tasks of management. In Chapter 3, budgeting as an aid to management is discussed while Chapter 4 reviews the problem of evaluating a farm development plan.

Chapter 5 describes a computer program that analyses and evaluates a development plan for a sheep farm. A flow diagram showing the logic of the program is given. An example is included in the Chapter of a development plan analysed by the program. The program input (information supplied by the adviser about the development plan) and output (the analysis and evaluation of the development plan), are shown.

Chapter 6 is similar in principle to Chapter 5. It describes a computer program that analyses and evaluates a development plan for a dairy farm. An example is also included in this Chapter.

Chapter 7 discusses the role of computers in Farm Management extension and research.

The summary and conclusions are presented in Chapter 8.