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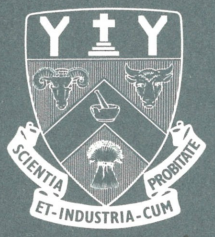

Lincoln College

PROGRAMMING FARM DEVELOPMENT

by

G. A. G. Frengley, R. H. M. Tonkin
and R. W. M. Johnson

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P R O G R A M M I N G F A R M D E V E L O P M E N T

TWO CASE STUDIES OF HILL COUNTRY FARMS IN NORTH CANTERBURY

by

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THE AGRICULTURAL ECONOMICS RESEARCH UNIT

THE Unit was established in 1962 at Lincoln College with an annual grant from the Department of Scientific and Industrial Research. This general grant has been supplemented by grants from the Wool Research Organisation, the Nuffield Foundation and the New Zealand Forest Service for specific research projects.

The Unit has on hand a long-term programme of research in the fields of agricultural marketing and agricultural production, resource economics, and the relationship between agriculture and the general economy. The results of these research studies will be published as Unit reports from time to time as projects are completed. In addition, it is intended to produce other bulletins which may range from discussion papers outlining proposed studies to reprints of papers published or delivered elsewhere. All publications will be available to the public on request.

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P R E F A C E

In July 1964, the Cheviot Farm Improvement Club held a field day near Cheviot on the theme of hill country development. As its contribution, the Department of Farm Management at Lincoln College, which services the Club, drew up detailed development programmes for two farms prior to their being inspected by a large gathering of farmers and professional men, including senior Government officials. The objective of these programmes was to trace in detail the physical and financial implications of a development procedure which was considered technically possible under the current state of knowledge, and financially possible under the existing financial structure of the two properties. In addition the development implications of refinancing one of the farms were explored.

Soon after the field day a further evening meeting was held in the district at which another large gathering of farmers in small groups discussed, in detail, their attitudes to the development programmes which had been presented.

Although the development budgeting procedure used is largely routine in the Department of Farm Management's work, there has been considerable outside interest in the methods used. It was intended at the time to write up the programmes for distribution to students, farm advisers, departmental field officers, and others with similar interests. However, the material was left for two years due to urgency of other work, and only this year has it proved possible to edit the original manuscripts and to check the calculations of rates of return.

The lapse of two years allows a retrospective look at the first stages of the proposed programmes. Two significant factors during this period were a fall in wool prices, and a severe drought in the 1964/65 spring and summer. The impact of these factors on the programmes and the necessary adjustments are reviewed in postscripts.

It is not suggested that in this sort of work, planning horizons of five or more years are necessary. Indeed, the level of technical and economic uncertainty, the need for flexibility, and farmers' personal planning horizons, are

such that programmes of three years are usually adequate. However, the longer programmes outlined here were designed to illustrate particular points, such as the effect of indivisibilities (buildings) on the profitability of development.

It may also be emphasised that apart from the attempt in the second case study to analyse the effect of refinancing on the development programme, the whole exercise had no objectives of a normative nature. That is, no attempt was made to explore alternative methods of development from the standpoint of economic and management criteria. While there is clearly a need for such analysis this particular work was directed toward extension rather than research.

Mr Frengley was responsible for the first case study, Mr Tonkin for the second. The original analysis of results was carried out by Dr J.T. Ward and Mr E.D. Parkes; Mr Johnson being responsible for revising the analysis, co-ordinating and reviewing the results, and editing the whole publication.

Thanks are due to the two farmers who allowed their farms and their personal financial affairs to be the subject of close and critical scrutiny.

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C O N T E N T S

1. INTRODUCTION AND SUMMARY

The objective of this investigation was to explore the physical and economic problems of developing North Canterbury hill country to a high carrying capacity. The two properties were chosen from the Cheviot Farm Improvement Club, which had shortly before joined the Lincoln College Farm Advisory Service. The technique employed was to forward budget, year by year, a suitable development programme for each property, with the present plans and aspirations of the owners being fully taken into account. On the second property, two development programmes were prepared, the second to allow a more rapid rate of development through borrowing additional development capital. Full details of the physical requirements and financial results of the programmes are shown in the respective case studies.

The general technique of improving this class of country is fairly clearly established. It basically involves the replacement of the existing low producing hill pastures by higher producing species, through a sharp improvement in the level of soil fertility. This is achieved on unploughable country by aerial topdressing and oversowing, while, on ploughable country, the crawler tractor may be brought in to establish higher producing pastures, and at the same time provide fodder crops which balance seasonal feed supply for increasing stock numbers. In all methods of development, rapid increases in stock numbers are vital to economic success. This can only be achieved by judicious sub-division of existing paddocks, the cost of which must be carefully worked into the overall financial plan, together with augmentation of water supply, improvement of access, and often improvement to stock handling facilities.

The speed and direction of a development programme is subject to the financial resources of the individual farmer. Many farmers have a preference for developing their farms out of current income rather than through further borrowing. Other farmers may not be in a position to approach lending institutions for more credit. By planning ahead, the best use of available financial resources can be obtained within

the stated preferences of the farmer. Thus the value of forward budgeting is that the possible results of the development programme are worked out in advance with the best present knowledge available. The developing farm can be constantly related to a specific set of objectives, and to an unfolding financial situation.

The actual technique of budgeting employed was to prepare a pre-development budget of the farm, showing the current costs of maintaining the farm as a going concern.* This calculation does not give the farmer's actual income before development but what it would be if the prices chosen for the development budgets are used and no further development at all was occurring. Next, the set of development budgets was prepared showing the year by year phasing of development expenditure to match the physical programme of development. As the programme proceeds, the effect of tax deductible expenditure can be included and the cash resources thus set free can be used to finance further development expenditure. The budgeting procedure was completed when a post-development budget was drawn up showing the stable income which would result if the assumed prices continued to apply and farm expenditure was adjusted to maintaining the higher level of production.

At this stage the whole development programme can be subjected to a close scrutiny. The individual farmer is clearly going to be highly interested in the effect of the programme on his income position. He is also going to be interested in the appearance of his property, the changes in his net capital position, and the views of his neighbours. Not all of these can be put down in a precise set of figures but the budgeting procedure should allow the fairly accurate estimation of future income before and after tax, and the calculation of the possible value of capital increase or equity in the property over the period concerned.

The country as a whole is also interested in farm development as future increases in overseas exchange earnings are most likely to come from this source. It is thus of

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* Sometimes called a static budget, or a "status quo" budget. It must be emphasised that the actual income of the farmer is distorted by this method.

considerable interest to policy-makers, lending institutions, research institutions and the advisory services to know what value they are getting for the additional resources that farm development draws from the rest of the community. One target for national agricultural growth in New Zealand is that set by the Agricultural Development Conference. To maintain essential imports in the 1970's the Conference recommended an increase in gross agricultural production over the next decade of 4 per cent per annum. It is thus important to know whether individual farms measure up to the national target for farm development.

The individual return and the return to the nation can be expressed in a fairly simple way by calculating the rate of interest earned on development capital. An example might make the type of calculation involved clear. If a farmer puts £1,000 out of income back into his farm for each of five years and succeeds in raising his after-tax income from £1,500 per year to £2,000 per year in the process, then the extra annual income of £500, after five years have elapsed, may be regarded as the delayed interest on the £5,000 invested in farm development. Now, by means of compound interest tables it can be found that the flow of £500 extra in future years is equivalent to about an 8 per cent return on income ploughed back on farm development.*

From the nation's point of view, the calculation is slightly different. In particular, the deduction of income tax from net returns is irrelevant for national decisions. Here the additional resources drawn in from the rest of the community must be compared with the additional income generated. Over a five year development programme for an individual farm, the investment situation might work out as follows:

Year	Additional Expenditure	Additional Revenue
1	1,000	100
2	1,200	400
3	1,400	800
4	1,200	1,000
5	1,000	1,200
Future years	£1,000	£1,400

* Throughout this bulletin all discounted rates of return are calculated on the "internal rate of return" principle.

Here the use of the nation's resources totals some £5,800 over the five year period, of which £3,500 is returned during the development programme, and the balance is returned as future net earnings of £400 per year. Again, with the use of compound interest tables, it can be shown that this pattern of investment expenditure and income is equivalent to interest on investment at a rate of 11½ per cent per year. This kind of result should indicate whether farm development has a high priority over other forms of investment in the community, if calculated on a similar basis.

This approach to the farm development problem has a number of advantages. The forward budgeting techniques make it possible to estimate future profitability at the present time, thus helping directly in decisions on the allocation of capital to agriculture. This is to be contrasted with the analysis of past development results which only give an investment return on past farm improvement and may not provide reliable guides to the future. The budgeting technique also forces the analyst to take into account all the possible factors which might affect the profitability of farm improvement, and helps to isolate those factors, such as prices, which cannot be predicted in advance with any great certainty. The technique is of considerable help to the farm adviser and his client. Actual results can be compared with those that were planned and the reasons for any discrepancies carefully analysed and corrected. Needless to say, lending institutions will show more interest if the development plan is suitably budgeted and corrected from time to time. In general, the future cannot be predicted with great accuracy, but forward budgeting of the kind set out in this publication, makes the best use of the available information, enables a number of people to contribute to the final plan by cross-checking, and provides a year to year basis of budgetary control for farm advisers and credit institutions.

The broad results of the analysis of these two case studies can be summarised under three headings, growth of total production, taxation and income implications, and rate of return on capital invested.

Comparing the growth of output with the Agricultural Development Conference target of a 4 per cent increase per year, the first case farm achieves an annual rate of increase

of 6.4 per cent over the seven year period concerned. In point of fact, the rate of increase is much greater than this in the early years of development, but the consolidation of the farmer's financial position takes the full period of seven years. The second farm achieves a growth rate of 5.1 per cent in programme A (development out of income) and a rate of 8.3 per cent with programme B (development with some re-financing).

Personal income before tax rose very rapidly on the first farm from £2,425 to £4,210, and if income is then stabilised without further tax deductible expenditure, taxable income rose to nearly £5,000. But when the delayed effects of tax payments were taken into account a different picture emerged. Pre-development available income was £2,560, but during development available income fell to the living allowance budgeted, although tax payments must continue; the full effect of taxation is felt in the post-development year when nearly £2,000 must be paid on a taxable income of £5,000, leaving the farmer's available income steady at about £3,185 per year, only £600 better-off personally than he was before.

In the second case study, the farmer falls in a lower income tax bracket. Taxable income varies from £1,045 to £1,800 and the tax payment during development never exceeds £280. However, if the farmer stopped further development after carrying out programme B, his tax commitment would rise to £500 per year. In fact, a great amount of further development will be possible on this property and the benefits of tax-deductible development expenditure will be available for a long time to come.

The personal investment of the farmer in development is represented by the income he ploughs back into the farm. In both case studies this investment takes place at a rate of about £1,000 per year. Now the return on this investment can take two forms. The future extra income of the farmer after tax is one form of reward; the other will be in the increased selling value of the farm property itself. Since personal income is calculated after tax and capitalisation of property on net returns before tax, the rate of return calculated on an increase in net worth is likely to be very much higher than that based on increased income. For both case studies these percentage returns on personal investment worked out as follows:

		Reward based on future income	Reward based on increase in net worth
		Per cent	Per cent
1st farm		6½	27½
2nd farm	A	1¼	6¾
	B	4¼	31½

Thus neither farmer can expect high personal investment rewards from future income. Programme A in the second case study only just gets the development process started. However, if present property values are maintained then the first farm and programme B of the second farm, will bring considerable returns to the farmer's investment in the form of capital values. It will then be up to them to choose whether to sell their properties, sub-divide, or re-finance into a more favourable position.

The country as a whole is not concerned with the individual's tax position, of course. The rate of return on the national investment in farm development was measured by the extra farm products produced compared with the real resources used up in producing them. On the first property, the percentage return works out at 12½ per cent per year, and 2½ and 5½ per cent for programmes A and B respectively on the second property. The reader should be warned against comparing these rates of return with conventional investment returns unless they have been calculated in a similar manner. But these results do show that the national rate of return on the first farm and programme B of the second, are both worthwhile, although one is still considerably better than the other.

The reasons for this divergence between the two farms can be found in the speed and cost of development permitted in each case. The first farm starts from a reasonable equity position and sufficient finance can be mobilised from personal saving, tax reductions and a stock firm overdraft to increase carrying capacity from 2,034 ewe equivalents to 2,915 ewe equivalents in the first three years, rising ultimately to 3,330 ewe equivalents by the fifth year. The second farm rises from 1,901 to 2,591 ewe equivalents over five years in programme A, and from 1,901 to 3,336 ewe equivalents in programme B. Stock numbers have thus been increased by the

greatest percentage in programme B - this also shows up in the rate of investment return on equity increase - but at considerable cost as farm income does not increase in proportion. The second farm started from a weak equity position, and the inability to finance quick development was thus a material factor in the poorer economic record shown.

The divergence in profitability between the two farms would probably have been greater if wool prices could have been more accurately predicted. Both farm budgets were based on a wool price of 48d. per lb. of greasy wool. Since 1964, neither farm has actually received this price for its wool, but the first case farm has had a margin of about 3d over the second. The lower quality of Corriedale wool coming forward from the second farm could have been brought into the budgets independently of the absolute level of prices chosen.

The general implications of these results (corrected in some details since) were discussed with farmers at the field day on July 24th 1964, and subsequently at an evening meeting. Some 57 farmers present at the latter meeting were asked if they would develop their farms along the lines of the programme in the first case study. The majority, some 53, said they would, though probably not so fast. Many said they would develop for three years only, and then review the situation before embarking on the final four years of the programme. The four farmers who said they would not develop their properties along these lines gave reasons of age, ill-health and the heavy demands of education on income, for this decision.

The farmers were then questioned about their personal objectives in wanting to undertake farm development on such a scale. Would they develop for capital gain, additional income, a feeling of achievement or for other reasons? Some 25 per cent of the farmers said they would develop for all three of the specific reasons given; this group were mostly in the 20-40 year age group, with two or less children. Some 20 per cent of the farmers coupled capital gain and sense of achievement; and another 18 per cent isolated capital gain alone as their main objective. This latter group was again in the 20-40 age group but with three or more

children in most cases. This would be consistent with a desire to eventually sub-divide larger properties for the settlement of sons or the mortgaging of a developed farm to finance a son on an undeveloped property. Income by itself was not a dominant objective among the farmers present and only 9 per cent submitted this as their sole reason for development.

Finally the farmers discussed the kind of incentives needed to initiate intensive development in their area. Considerable emphasis was placed on tax relief at upper income levels so that farmers already on satisfactory incomes would still get some personal reward out of development. It was felt that the extra personal income gained was a meagre reward for the extra risks, worry, work and capital involved in a development programme. For farmers not in the income tax paying bracket, some form of subsidy on fertiliser and other inputs was suggested. More liberal credit was suggested. The farmers would have liked to have seen productive potential brought into a man's credit rating rather than the security he could offer. Longer repayment periods on loans would also help to build up income more quickly. Other factors mentioned were the shortage of competent farm labour, the lack of stability that was expected with future wool prices and the expense and distance away of good secondary schooling.

2. CASE STUDY I

2.1 Description of Property (as at 1st May 1964)

This 952 acre North Canterbury store sheep and cattle hill country property is situated 9 miles west of Cheviot (population 500 approximately). The property was released from the Crown in 1959 and is farmed as a renewable leasehold block with an annual rental of £300.

The rainfall averages 35-40" per year, evenly spread, but the whole district is subject to periodic strong Nor-West winds from November till March, resulting in severe summer droughts in most years over this period. Growth is negligible for from 8-12 weeks during the winter and usually up to three snow falls per year lie for two or more days. Feed shortages are most acute during August and early September and supplementary feeding with saved blocks is necessary for up to three months each winter.

The natural cover of the farm was silver tussock (Poa Caespitosa) with some matagouri (Discaria Toumatou), tutu (Corieria Sarmentosa) and fern (Pteridium Esculentum) on shady faces and less accessible gullies. Approximately 250 acres have been cultivated and sown down in English grasses and varying degrees of reversion back to tussock have occurred over one-third of this area. There are few weeds of any consequence and the cover of the property is quite typical of "clean" North Canterbury hill country.

A small permanent stream bisects the property into two major areas, 300 acres completely undeveloped, and 650 acres which is partly developed. The 650 acre area is further divided by four more gullies, including one which cuts right across the property. Approximately 100 acres are ploughable, a further 250 acres discable, and the balance is steep to moderately steep hill country, two-thirds facing S.E. and one-third N.W. This tends to offset the severe drying effects of the N.W. winds during the summer. The property lies between 600 and 1,350' above sea level with the bulk of the hill country between 700'and 900'. The soils are basically Gower Hill soils, subject to erosion if reasonable cover is not maintained. An area of approximately 80 acres of limestone derived soils and limestone outcrops

is also present. Both soil types are deficient in sulphur and phosphate. The initial pH of the unimproved areas is 5.5 to 5.8.

Improvements to the property are of average standard. The farm is inadequately subdivided into twelve paddocks and five large native blocks. Water supply is from streams, springs and dams, the latter being unreliable in severe droughts, leaving barely half the property adequately watered. The house is a 1,500 square feet, 10 year old bungalow in good condition. The woolshed and yards are in poor condition and could not be expected to last more than 15 years. Other general farm buildings are in fair condition. There are no hay barns on the property.

2.2 The Farmer

The present owner is 44 years old, married, with five children. Apart from a full period of war service, most of his farming experience has been obtained on this property. In 1952, with an ex-serviceman's loan, he took over the farm from his father and has been developing the property at a rate determined by seasonal and financial considerations. He is eager to develop the farm at a faster rate and to explore its full potentialities.

He is skilful as a farm manager which ensures that the proposed development programme will be followed as closely as seasonal variations will permit.

2.3 Present Production and Income

In 1964 the property wintered approximately 2.1 ewe equivalents per acre, being:-

1,196 Corriedale ewes	87 Aberdeen Angus cows
410 Ewe hoggets	2 Aberdeen Angus bulls
136 Wether hoggets	
28 Corriedale rams	

Since 1952 ewe numbers have increased by over 300. All stock are well managed and in excellent condition.

The property is producing mainly store sheep and cattle with an early draft of up to 40% of the Corriedale wether lambs fat off mother before weaning in early January, the remainder being sold as stores. The lambing percentage varies from 100-110%. Ewes are culled for age and sold as 5 year olds, bringing good average prices in the local ewe fair. A few surplus two-tooth ewes are also sold annually.

The cattle policy is simple. Young in-calf cows are purchased from the same source each year and are retained in the herd for 6-7 years. All calves are sold as weaners except for occasional smaller calves sold in the spring. Calving is approximately 95%.

Wool is the most important product, providing approximately half the total income. The wool produced is excellent, the count, 56's, and the prices for some years have been equal to the top prices received for similar wool in the Christchurch sales. All lambs retained are shorn in January and clip approximately 3 lb per head. Hoggets are shorn in October and clip 5½-6 lb. Ewes for some years were shorn pre-lambing but are now shorn in January and clip 10½-12 lb per head. Wool production per head is generally above the district average and output at 18 lb/acre also slightly better than average.

Overall stock performance figures and prices received for sale stock have been above the district average. Deaths are comparatively low.

Occasional winter forage crops have been grown as part of a re-grassing policy, followed by mediocre rape crops or wheat in more fertile paddocks, yielding up to 48 bushels. Minimal hay reserves of 200-400 bales (usually bought in) are carried and fed to the breeding cows in late winter. Basically, ewes rely on saved blocks of grass to carry them over the winter-early spring period.

On a <u>status quo</u> basis the gross income of the property is estimated at £7,275 or £7.13/- per acre. This is made up of 35% from sheep sales (£2.13/- per acre), 13% from cattle sales (£1.6/- per acre) and 48% from wool sales (£3.14/- per acre).

Total non-taxable farm expenditure is estimated at £3,620, leaving a taxable gross income of £3,655 on this basis. After allowing for wages of management, life insurance premiums, taxation and principal repayments, approximately £1,160 cash surplus is available to finance further development or alternatively to be invested or spent outside the farm. These details are shown in the pre-development budget in Table I.

2.4 Capital

This farmer's capital position as at 30 June 1964 is summarized as follows:

Assets	Stock			£ 6,000
	Plant			1,200
	Land and Buildings: Capital Value		£26,150	
	Less: Crown Interest		9,150	
	Lessee's interest		17,000	17,000
				24,200
Liabilities				
	Current: Overdraft	3,000		
	Long Term: Mortgages	3,000		6,000
			Net Worth	£18,200

The Mortgages are State Advances ex Servicemen's A and B loans of £880 and £2,120 respectively and the annual repayment of interest and principal amounts to £312 annually. The loans will be fully repaid in 1977. The overdraft is unsecured and used as the only source of working capital. The stock firm has not set an upper limit to the overdraft but this £3,000 credit level is rarely exceeded. The net worth position gives a sufficiently sound basis for the development to proceed.

2.5 The Development Programme

Basically the whole development is to be financed from income. The £1,160 annual cash surplus is sufficient to plan a development programme which allows development to proceed at the probable optimum rate.

TABLE I

	Pre-development Year 1		Cash	Taxn	Post-development Year 3		Cash	Taxn	Post-development Year 7		Cash	Taxn
Income												
Sheep	2520				2325				1965			
Cattle	1250				2075				2076			
Wool	3480				6130				7140			
Skins	25				30				40			
Total Cash Income			7275				10560				11220	
Non Cash Income												
Gross Income				7275				10560	11220			11220
Other Non Taxable Income												
Expenditure												
Stock Purchases	615				1140				1140			
Standing Charges	840				875				630			
Administration Charges	110				110				110			
Wages	260				965				1350			
Animal Health	60				110				125			
Electricity	80				80				80			
Freight	80				90				95			
Feed	100				155				165			
Fertiliser and Lime	550				900				980			
Seed	65				110				130			
Weeds and Pest	25				25				25			
Woolshed	50				95				100			
General	85				145				160			
Vehicles	230				330				360			
Repairs & Maintenance	230				290				300			
Development(Deductible)	-				-				-			
Total Farm Expenditure		3380				5420				5750		
Depreciation	240				250				260			
Total Non Taxable Expenditure				3620				5670				6010
Personal and Capital Expenditure												
Wages of Management	1400				1600				1650			
Life Insurance	245				245				245			
Tax	940				1680				1890			
Principal Repayments	150				150				150			
Capital Expenditure (Non Deductible)	-	2735			-	3675			-	3935		
Total Cash Expenditure			6115				9095				9685	
Cash Gain or Deficit			+1160				+1465				+1535	
Bank Balance												
Tax Assessment												
Taxable Gross Income				3655				4890				5210
Less: Life Insurance Premium				245				245				245
Taxable Income				3410				4645				4975
Available Income (Cash)			2560				3065				3185	

The inter-relationship of available capital, stock reproduction and available labour is such that if the rate of development is increased above the planned programme which uses £1,160 as the initial capital outlay, it is doubtful whether sufficient sheep could be bred to cope with the extra feed becoming available later in the programme. Any further retention of stock would reduce income further in the third, fourth and fifth years, resulting in an increase in the overdraft over this period. On top of this, labour would have to be increased more rapidly and a heavy capital expenditure for extra housing would have to be met after 4-5 years.

Thus the rate of the proposed development was determined initially by these factors. Development has been attempted from income only, although the overdraft is £800 higher in the 4th and 5th years. The ewes carried, at the start of the development, are sufficient to provide the required stock increases for the whole development, and the available housing is sufficient to accommodate the increased labour until the 7th year when a second house has been built.

The components of the development programme are:

2.5.1 Subdivision

The larger blocks have been subdivided according to contour and shape into areas of approximately 60 acres. Subdivision has been restricted to the area to be topdressed and oversown the following year. Initially, to increase the amount of feed available in the winter period (the most restrictive period), sunny faces have to be fenced off to be topdressed and oversown. Subsequently, shady faces are treated similarly though with different seed mixtures to promote improved summer growth. Most new subdivision is completed by the end of the third year.

The type of fencing is mainly electric, with alternate live and earthed wires powered by a mains unit close to the homestead. A cost of approximately £170 per mile for materials, has been allowed for these fences.

2.5.2 Oversowing

On the sunny faces 4 lbs. subterranean clover per acre has been allowed and on the shady faces 4 lbs. white clover,

2 lbs. Broad Red Clover, or Alsike, 1 lb. Montgomery Red Clover and in some paddocks, 1-2 lbs. subterranean clover. Cocksfoot is plentiful over the whole farm. No allowance has been made to oversow with grass seed.

2.5.3 Topdressing

Initial topdressing rates of 4 cwt of superphosphate per acre (including 2 cwt of granulated DDT super), have been allowed. The following year 3 cwt of sulphurized super (200 lb/ton) is applied and reapplied in alternate years. Trial work on this soil has indicated that alternate yearly dressings of 3 cwt of suphurized superphosphate give as high a yield of dry matter per acre as comparable annual dressings of 1½ cwt.

This biennial year application of superphosphate enables indivisible capital items - plant and buildings particularly - to be dovetailed into the development without appreciably altering the annual gross expenditure. This has the advantage of maintaining a comparatively constant overdraft requirement between years, until the development starts to make a cash profit. If constant topdressing was maintained, overdraft requirements would have fluctuated widely between years.

2.5.4 Water Supply, Tracks and Dams

Dams, tracks and improvements to the existing water supply have been planned in relation to the paddocks developed, and the extra stock carried.

2.5.5 Cultivation

A general policy of building up feed reserves approximately 50% faster than the increase in stock numbers, has been implemented. To achieve this an area of approximately 25-30 acres of swedes and choumoellier or autumn sown turnips has been sown each year, employing agricultural contractors. In the first two years the cropped area is sown down in lucerne. Subsequently the areas cultivated were all sown in pasture.

Hay reserves are planned to increase from the 200-400 bales held on hand at present to approximately 2,000 bales going into each winter - approximately 75% of this is lucerne hay.

2.5.6 Stock

In order to allow for flexibility of stock feed requirements, and to minimize the labour requirements for the extra stock carried, all sheep increases have been made in dry sheep. The basic ewe flock of 1,200 has been maintained at this level and the progeny retained in relation to the increasing feed supplies until almost all lambs are retained on the property. Subsequently surplus ewe lambs are sold as 2 tooth ewes and wether lambs as 6 tooth wethers out of the wool to the freezing works in the autumn.

The high proportion of dry stock makes it possible to restrict feed intake in the late winter period and allow the ewe flock preferential grazing. This also enables stock to be sold at any time of the year if severe feed shortages should occur. Another major effect resulting from the increase in the proportion of dry sheep is to restrict the output of lamb meat through retention of lambs and increase the reliance on wool as the major source of income, from half the total income at the start, to two-thirds at the end of the development programme. Wool output rises from 17,000 lb. (18 lb/acre) to 36,000 lb (37.8 lb/acre) whereas meat production rises only slightly.

The cattle policy remains unchanged. The herd is maintained through buying in-calf cows, though the total numbers are lifted from 87 to 125. All calves are sold at weaning. The cow numbers have been increased over the period to obtain better control of roughage in gully bottoms and on rough faces. However, a considerable proportion of the hay reserve is to be fed to the breeding cows over the late winter period.

By the end of the programme, carrying capacity has risen from 2.2 ewe equivalents per acre to 3.5 per acre, and at this level the farm would be stocked at a similar level to the more highly productive farms in the area.

The estimates of the cumulative increase in feed supply, and actual requirements, over the development period, are shown in the following table:

The unit of measurement is the "ewe equivalent".

	1964/5	65/6	66/7	67/8	68/9	69/70
Estimated increase in stock requirements	275	470	881	1297	1297	1297
Estimated increase in available feed	604	885	1459	1859	1939	2075
Annual transfer to reserves	329	415	578	562	642	778

2.5.7 Plant

The purchase of a wheel tractor and all the necessary haymaking equipment, except a baler in the third year, is planned. There is a crawler tractor on the property but this is not satisfactory for haymaking.

2.5.8 Buildings and Yards

The existing buildings and yards are not sufficient to cope with the increased stock numbers. In the second year a haybarn is required. In the third and fourth years some woolshed repairs and an allowance of £800 in the fifth year for major alterations is provided. Sheep yards are extensively repaired in the fifth year and cattle yards built in the sixth. In the seventh year an allowance of £3,000 for a married man's house has been made.

2.5.9 Management and Labour

To 1964 the only permanent labour on the property has been the owner, while approximately £200-£250 per year has been spent annually on general wages - shearing, crutching, and a small amount of casual labour. For the year 1964/65 an allowance of £450 has been made for labour, followed by £500, £870, £880, £950 in succeeding years, stabilising at £1000 in the year 1969/70. Managerial allowance in the first year is £1,200 plus £245 life insurance, £150 principal repayment, and £700 taxation (based on the previous year).

In 1970/71 an allowance of £1650 drawings plus £245 life insurance, £150 principal repayments and £1260 taxation has been assessed. The intermediate years are based on a rising scale between these two end years.

2.5.10 Prices

Fat lamb prices of 45/- per head have been expected to decline to 40/- after two years through a gradual recession of the national prices and retention of the best lambs to increase stock numbers. Cull 2-tooth prices have been assessed at 65/- and c.f.a. 5 year ewes at 40/-.

Initially weaner steers have been sold at £18 per head declining to £16 after two years. Weaner heifers decline from £13 to £12 per head. Cull cows have been sold at £20 per head throughout.

The wool price adopted is based on the returns from wool received over the previous six years but not including the high wool price received in 1963/64. The price adopted is 4/- per pound net, which is slightly below the average net price for that period. It must be emphasized that the clip is a very good line of top grade Corriedale wool, on a par with the best lines from North Canterbury.

2.5.11 Summary

The physical and financial components of this programme are summarised in Table II, on the following page.

The composition of the flock over the seven years, based on the policy outlined in 2.5.6, would be as follows:

Winter	1964	1965	1966	1967	1968	1969	1970
Ewes	1196	1200	1200	1200	1200	1200	1200
Ewe hoggets	410	410	410	600	600	600	600
Wether hoggets	136	350	350	350	600	600	600
Wethers			330	660	960	960	960
Cows	87	98	113	120	125	125	125
Bulls	2	3	3	4	4	4	4
Ewe Equivalents	2034	2209	2504	2915	3330	3330	3330
Annual Increase (ewe equivs.)	-	175	295	411	415	-	-

TABLE II

Year	Stock (extra ewe equivalents)	Fencing (chains)	Oversowing (acres)	Topdressing Lime (tons)	Topdressing Fertiliser (tons)	Contract Bull-dozing (days)	Contract Cultivation (acres)	Plant and Buildings (items)
PHYSICAL								
1964/5	-	140	150	76	40	4	25	
1965/6	175	90	64	80	93	3	30	Haybarn
1966/7	295	40	125	60	39	3	30	Tractor & plant
1967/8	411	160 (replaced)	130	60	70	1	30	
1968/9	415	-	71	55	26	1	30	Woolshed
1969/70	-	-	-	155	69	1	25	Yards
1970/1	-	-	-	150	26	-	25	House
		430 chns	540 acs				195 acs	
FINANCIAL		£	£	£	£	£		£
1964/5		270	80	152	690	200		
1965/6		205	65	160	1645	175		200
1966/7		90	130	120	680	180		900
1967/8		360	135	120	1250	130		
1968/9		-	75	110	450	105		1000
1969/70		-	-	310	1235	75		400
1970/1		-	-	300	450	50		3000
		925	485	1272	4400	915		5500

2.6 Results

2.6.1 Production

The broad results of this programme are illustrated in Figure 1. Figure 1a shows the expected movements in stock production. It will be noted that mature sheep sales have increased from 300 to 850 by 1968/69. At the same time, lamb sales have dropped from 845 to 50 as lambs have been retained to increase the hogget and wether flocks. Weaner cattle sales have increased from 63 to 114 over the same period, reflecting breeding cow numbers.

The major gain in output has been in wool production. The emphasis on dry sheep has resulted in an estimated increase in wool production from 17,000 lbs. (18 lb/acre) to 36,000 lbs. (37.8 lb/acre). This is reached by 1969.

2.6.2 Income

The broad financial results are demonstrated in Figures 1b and 1c and details are set out in Table III. The product prices on which these results are based have been reviewed in 5.10. The costs of farm inputs are based on those ruling in 1964. In Figure 1b it will be observed that gross farm expenditure rises from below £4,000 at the start of the development to a peak of £8,550 in the year 1970/71, when another house is added to the property. Subsequently gross farm expenditure* drops to a stable level of approximately £6,000. By comparison, gross farm income rises from £7,275 to £11,220 and stabilises at this level by 1968/69. Production emphasis changes from approximately 48% to 64% income from wool. The rise in expenditure has occurred through increases in most items, but above all through the increased expenditure on fertiliser from approximately £500 basic at the start of the development to £1,400 subsequently.

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* Gross farm expenditure includes all cash expenditure, current and capital development.

TABLE III

	Development 1964/65	Cash	Taxn	Development 1965/66	Cash	Taxn	Development 1966/67	Cash	Taxn	Development 1967/68	Cash	Taxn	Development 1968/69	Cash	Taxn	Development 1969/70	Cash	Taxn	Development 1970/71	Cash	Taxn
Income																					
Sheep	1840			1840			1340			1390			1965			1965			1965		
Cattle	1570			1710			1785			1895			2075			2075			2075		
Wool	3890			3855			4720			5910			7140			7140			7140		
Skins	40			40			40			40			40			40			40		
Total Cash Income		7340	7340		7445			7885			9235			11220			11220			11220	
Non Cash Income	450			545			860			875			-			-					
Gross Income			7790			7990			8745			10110			11220			11220			11220
Other Non Taxable Income	350	7690																			
Expenditure																					
Stock Purchases	990			1140			1140			1140			1140			1140			1140		
Standing Charges	840			800			860			895			895			760			670		
Administration Charges	110			110			110			110			110			110			110		
Wages	450			500			870			880			950			1000			1000		
Animal Health	80			90			110			125			125			125			125		
Electricity	80			80			80			80			80			80			80		
Freight	60			70			80			85			90			95			95		
Feed	110			110			165			165			165			165			165		
Fertiliser and Lime	845			1805			800			1810			1140			1740			1090		
Seed	140			230			275			285			210			130			130		
Weeds and Pest	25			25			25			25			20			25			25		
Woolshed	50			55			80			90			95			100			100		
General	80			80			90			80			110			110			110		
Vehicles	300			320			360			360			360			360			360		
Repairs & Maintenance	160			230			270			600			230			355			300		
Development(Deductible)	470			380			270			100			1075			450			1050		
Total Farm Expenditure		4800			6025			5585			6830			6795			6745			6550	
Depreciation	320			270			380			320			265			235			215		
Total Non Taxable Expenditure			5120			6295			5965			7150			7060			6980			6765
Personal and Capital Expenditure																					
Wages of Management	1200			1250			1400			1450			1500			1550			1650		
Life Insurance	245			245			245			245			245			245			245		
Tax	700			485			175			530			610			1215			1260		
Principal Repayment	150			150			150			150			150			150			150		
Capital Expenditure (Non Deductible)		2295		200	2330		800	2770		-	2370		-	2505			3160		2000	5305	
Total Cash Expenditure			7095			8355			8355			9200			9300			9905			11855
Cash Gain or Deficit			+595			-910			-470			+ 35			+1920			+1315			- 635
Bank Balance			-2405			-3315			-3785			-3750			-1830			- 515			-1150
Tax Assessment																					
Taxable Gross Income			2670			1695			2780			2960			4160			4240			4455
Less: Life Insurance Premium			245			245			245			245			245			245			245
Taxable Income			2425			1450			2535			2715			3915			3995			4210

FIGURE 1

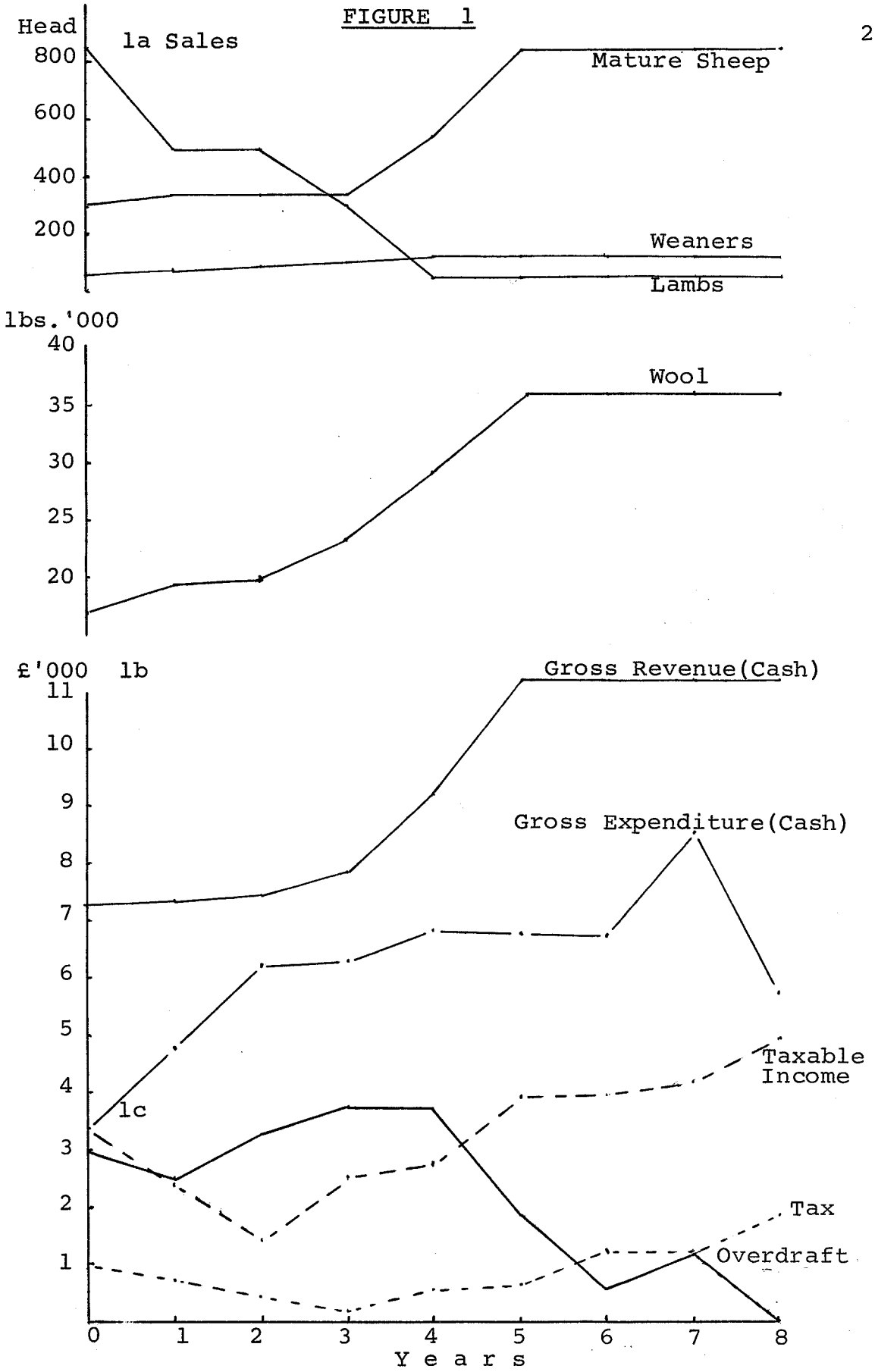
Head
1a Sales
800
600
400
200
Mature Sheep
Weaners
Lambs
lbs.'000
40
35
30
25
20
Wool
£'000
1b
11
10
9
8
7
6
5
4
3
2
1
Gross Revenue(Cash)
Gross Expenditure(Cash)
Taxable Income
1c
Tax
Overdraft
0
1
2
3
4
5
6
7
8
Years

Figure 1c illustrates the financial results of direct interest to the farmer. Initially the overdraft drops from £3,000 to £2,500 but rises during the next three years to a peak of £3,780. Subsequently it falls to £515 in 1969/70, rises to £1,150 in 1970/71 when the new house is built out of income. Thereafter profits are sufficient to enable a credit to be maintained. Taxable income is first depressed by the impact of development expenditure, and then steadily increases to a stable level of £4,975 after development. As a result, the tax paid each year on the previous year's taxable income, follows a similar pattern, though delayed one year in each case. At the end of development, the tax payment is expected to level off at £1,890 per year.

2.6.3 Net Worth

A considerable gain in net worth results from development but this will only become available to the farmer as liquid cash if the property is mortgaged or sold, or alternatively he may use this equity as the basis for expanding his holding for settlement of his family.

The prospective balance sheet at the conclusion of the programme of development is as follows:

Assets:		
Stock		11,000
Plant		2,000
Land and Buildings C.V.	37,150	
Less Crown's Interest	9,150	28,000
Lessee's Interest		41,000
Less Liabilities:		
Current - Overdraft	1,150	
Long Term - Mortgage	1,950	3,100
Net Worth		37,900

The final valuation of land and buildings was determined by an assessment of the value of the property, including the improvements made during the development, by an independent valuer familiar with the proposed development and the property. Stock are assessed at market value and plant at its depreciated value. At the start of development the owner's net worth was £18,200; this has now risen to £37,900 - a rise of £19,700 for the 7 year development.

2.7 Growth of Production, Net Worth and Income*

From the national point of view, the growth of production indicates the real volume of goods available to earn overseas exchange or contribute to national income. The farmer's point of view, on the other hand, is represented by the increase in personal income plus changes in net worth. These two points of view can diverge quite considerably when taxation is taken into account.

The starting point, from the national point of view, is the growth target set by the Agricultural Development Conference: an increase in gross production over the next decade at the compound rate of 4 per cent per annum. In this case study, the value of annual production, at constant prices, is estimated to increase by £3,945 from £7,275 to £11,220 per year. This is equivalent to a compound increase of production of 6½ per cent per year, compared with the national target of 4 per cent.

Such an increase in production is achieved by ploughing back profits as outlined earlier, and at the end of the seven year development period the farmer has increased his equity in the property from £18,200 to £37,900, an increase of £19,700 representing a compound rate of growth of capital of 11 per cent per annum.

But while the value of production is expected to increase by £3,945, the farmer's available income after tax, is estimated to rise by only £625 from £2,560 to £3,185 per annum. This is equivalent to an annual growth rate of 3.2 per cent per annum. Farming income before tax rises at a much faster rate than this, but tax payments are estimated to change from £940 to £1,890. Thus, from the national point of view, the development programme has contributed a great deal, but the change in farm costs and taxation payments allows a much smaller increase in personal income and incentive.

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* This section is based on Dr J.T. Ward's notes for the field day.

The "Cost" to the Farmer:*

As the development programme is financed out of revenue with moderate drawings on an overdraft, the farmer is being asked to give up some of his present income for the whole of the development period. After development levels off, a greater income than before is his reward for giving up something now. The pre-development budget shows that his expected cash income before development was £2,560 (£1,400 wages of management and £1,160 cash surplus). During the development period, the farmer is being asked to live on wages of management alone. The "cost" of development to the farmer is thus the income of £1,160 which he gives up. In 1970/71 wages of management have been allowed to rise to £1,650 per annum, and in 1971/72 he will be able to claim his wages of management of £1,650 plus the cash surplus of £1,535.

The exact sequence of the farmer's sacrifice is made clear in the following year by year calculation of income given up:

Year	Basic Income	Wages of Management	Income Foregone
Pre-development	£2,560	£1,400	£1,160
1964/65	"	1,200	1,360
1965/66	"	1,250	1,310
1966/67	"	1,400	1,160
1967/68	"	1,450	1,110
1968/69	"	1,500	1,060
1969/70	"	1,550	1,010
1970/71	"	1,650	910
Post-development	"	3,185	625 better-off.

As already outlined in the introduction, these sums invested back in the farm can be regarded as an investment where the interest payment comes in the 8th year and thereafter.

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* This and the following section were briefly discussed at the evening meeting of the Cheviot Farm Improvement Club.

The technical question is what rate of return on these savings put aside in each of the seven years, will the payment of £625 bring in future years? Thus nearly £8,000 is invested in the farm out of income for a yearly return of £625 thereafter.

It can be shown that the rate of interest earned this way is just over 6 per cent per annum. If the farmer could find investment opportunities elsewhere greater than 6 per cent he could consider whether the farm development programme was the best way of using the money. On the other hand, if the development of the farm gives him great satisfaction and a 6 per cent return, the alternative investment may have to give a return very much higher than 6 per cent.

This way of looking at farm development from the farmer's point of view can also be applied to the phases of the development programme in this case study. In each phase it is necessary to establish the new level of cash income after tax. The income foregone for the period can then be compared with the gain achieved at the end.

(1) An intrinsic feature of this development programme is the alternation of capital investment between fertiliser application and other improvements. In this way, the necessary funds for building a house for a married couple are not made available until the 7th year. If the farmer were to do without a married shepherd he would have to work harder himself but his cash income would be higher. If this cash income after tax is put at £3,300 in the 7th year, then the extra income of £740 could be regarded as the new return on income foregone. The rate of interest works out at 7.9 per cent, about 1.8 per cent higher than the 7 year programme as a whole.

(2) Another feature of the programme is the rapid increase in livestock carried in the first 3 years. At the planning stage it was thought that carrying capacity would level off after 3 years but this was probably being unduly pessimistic. But the post-development budget for year 3 shows a cash return after tax of £3,065, or an increase over pre-development of £505. If this new level of income can be maintained with the inputs of the 3rd year static budget, then it is the reward for investing out of income for the first three years of the programme. The rate of interest earned in this way is considerably higher at 10.7 per cent.

(3) If the rest of the development programme is now considered separately, the income foregone is higher than in the first 3 years and the increase in final income is lower. The actual figures are as follows:

	£	£
3rd year, Base Income	3,065	
4th year, Wages of management	1,450	1,615 foregone
5th year, " " "	1,500	1,565 "
6th year, " " "	1,550	1,515 "
7th year, " " "	1,650	1,415 "
8th year, Final Income	3,185	120 gain

The investment out of income of some £1,500 for four years to obtain a permanent increase of income of £120 is equivalent to an interest return of 1.9 per cent.

(4) If the house building in the 7th year were omitted, and income stabilised at £3,300 at the end of the 6th year, then this second phase of the development programme would earn interest of 4.6 per cent. The calculation of the rate of return thus helps the farm adviser and the farmer to choose among various alternative approaches to the development programme at an early stage.

Finally, the reward for waiting can be considered in terms of future increases in the net worth of the farm, instead of increases in cash income. It will be recalled (page 22) that the owner's capital rises from £18,200 at the 30th June 1964, to £37,900 at 30th June 1971. Thus, when the £8,000 investment out of income spread over 7 years is compared with a lump sum reward of £19,700 in 1971, the rate of return is 27.8 per cent. This comparatively high reward can only be realised, of course, if the property is mortgaged or sold.

Thus the main reward for development arises out of capital appreciation at the present time. The increase in the value of the property is based on the farm's capacity to carry more livestock and takes no account of the income tax position of the owner. Toward the end of their farming life, some farmers may feel that estate duty would be just as heavy as the income tax they have paid on personal income in the past, and that the above lump sum is not fully available. Nevertheless, if farmers took advantage of the

high net worths of their farms later in life by borrowing up to 50 per cent of valuation, considerable sums could be made available for alternative investment such as undeveloped farms for their sons.

The Return to the Nation:

The investment interest concept can be applied to the increase in actual production of goods as well as to the farmer's income gains as above. In this case, the rate of return is calculated by comparing the increase in value of goods produced with the cost of the goods, that is, the returns to the nation are compared with the actual resources the nation provides for the development programme.

From the budgets the following actual costs and returns and additional costs and returns can be isolated:

Year	Actual Costs	Actual Returns	Additional Costs	Additional Returns
	£	£	£	£
Pre-development	3,380	7,275	-	-
1964/65	4,800	7,340	1,420	65
1965/66	6,225	7,225	2,845	170
1966/67	6,385	7,885	3,005	610
1967.68	6,830	9,235	3,450	1,960
1968/69	6,795	11,220	3,415	3,945
1969/70	6,745	11,220	3,365	3,945
1970/71	8,550	11,220	5,170	3,945
Post-development	5,750	11,220	2,370	3,945

It should be noted that the budget for 1964/65 includes non-farm income of £350 which is not a gain to the nation although it helps towards the financing of the development programme in a tight year. Actual costs include both farm expenditure and the capital expenditure item in the budgets.

Thus up to the end of June 1971, additional development expenditure will have amounted to £22,400, while additional income at that stage will only have amounted to £14,500. The return to the country is completed by £1,575 earned in every year after 1971. The calculation of the rate of return is made on the additional expenditure not covered by current

income compared with the return or surplus earned each year after the development programme is completed. The actual rate in this case is 12½ per cent per annum. The investment of the nation's resources in agricultural development over this seven year programme results in an investment return to the nation of 12½ per cent. Clearly, such individual farm programmes are highly worth encouraging.

2.8 Postscript, June 1966

Two years have elapsed since the completion of the original budgets and it is now possible to compare the actual and predicted progress to date.

A major deviation from the original plan was conceived at the end of the first year of operation. £6,800 was borrowed from State Advances to increase the rate of development, and to prevent the current account debit from increasing excessively, as prices and costs had altered from the planned level. In the first year, as predicted in the budgets, drawings were restricted but through being unable to do so to the degree anticipated, the total cash expenditure was slightly in excess of the expected figure. This effect, combined with the general fall in wool prices in the 1964/65 season, and the drop in stock values with the severe summer drought that year, resulted in an increase in the current account deficit. The overdraft rose approximately £1,500 more than the anticipated figure.

The summer drought of the 1964/65 season was particularly severe. Stock water became extremely short and as a result a further policy change was made to hold the cattle numbers at a constant level or even decrease their number until such time as a more permanent water supply had been assured.

Feed reserves for the 1965 winter were very limited - 15 acres of turnips, 10 acres of H1 ryegrass, a small amount of autumn saved pasture. Despite this, stock wintered well, largely due to the strong winter growth of the area oversown and topdressed.

Topdressing, oversowing and fencing has proceeded faster than originally planned through using the development loan to accomplish this. £1,000 worth of tractor and cultivation equipment was purchased and three haybarns to hold 5,400 bales built.

The spring of 1965 produced strong pasture growth with the result that 5,000 bales of hay were made and all stock were particularly well fed. To control feed, all possible stock were retained.

The 1966 winter is commencing with 35 acres of Turnips and Hl ryegrass, 20 acres of turnips, 10 acres of regrowth Hl, approximately 300 acres of autumn saved pasture at various stages of growth, some roughage in the remaining paddocks, and 5,000 bales of hay in the barns. This is in complete contrast with the very limited feed reserves on hand the previous winter.

From the data gathered so far, it would appear that the increase in productivity of the tussock blocks following top-dressing and oversowing, may be higher than planned. The expected rise was 1½ ewe equivalents over the succeeding 18 months, but this may be exceeded.

Stock numbers were kept below the planned number in the first year following the drought but in the second were increased to the highest possible level without buying stock. Because of the high prices for lambs and the comparatively lower returns from dry sheep, a further policy change was made to increase the breeding ewe flock as rapidly as possible in the future. Per head production figures have been higher than planned and total wool production figures exceeded in the second year.

1965 Winter				1966 Winter	
Predicted		Actual		Predicted	Actual
1,196	Ewes	1,230		1,200	1,413
410	Ewe hoggets	586		410	660
350	Wether "	60		350	660
-	Wethers	94		330	86
98	Cows	71	cows	113	69
3	Bulls	2	bulls	3	2
		18	rising 1 yr		30
		4	rising 2 yr		6
2,209	ewe equivalents	2,165	E.E.'s	2,504 E.E.'s	2,845 E.E.'s

Total increase in stock since commencement of the programme amounts to 815 ewe equivalents, i.e. 40% compared with the 20% budgeted. The wool figures are as follows:-

1964/65		1965/66	
Predicted	Actual	Predicted	Actual
19,480	17,636	19,500	23,700

This represents an increase of 39% since commencement. Wool production per head has increased slightly.

Thus, despite the severe drought encountered in the first year and the smaller increase in production than planned, the good 1965/66 season, plus the £6,800 development loan raised (of which £5,200 has been spent), has enabled the planned production figures to be exceeded by a good margin by the end of the second year.

The outlook for the third year is now very good and it is felt that the predicted wool clip may be exceeded by 6,000 lb.

3. CASE STUDY II

3.1 Description of Property

Typical of large tracts of virtually unimproved North Canterbury hill country, this 1,487-acre leasehold property produces store sheep and cattle. It is near the first property and has a similar climate. The altitude is 500 ft to 1,374 ft. The property consists of approximately 100 acres of flats, 350 acres discable hills, and 1000 acres of easy to steep unploughable hills. The aspect of the farm is reasonably well balanced. Because of an unbridged stream dissecting the front flats from the tussock country and a steep front face rising 800 ft from the stream, access to the tussock country is difficult, especially during winter. Tracks have eased the problem and now most of the farm is reasonably accessible by suitable vehicles.

The cover consists of 80 acres permanent pasture and 20 acres of lucerne on the flats, 350 acres of recently oversown and topdressed tussock, and 1000 acres of clean, unimproved hill country. The only weeds of importance are nassella tussock which is controlled by a fortnight's grubbing annually, and matagouri. Apart from the flats, subdivision is four tussock blocks varying in size from 120 acres to 750 acres. With this degree of subdivision, stock water from creeks and springs is adequate. Tenure is a 33 year Crown Renewable Lease, with an annual rental of £530 per annum. The present term expires in 1992.

3.2 The Farmer

An energetic man of 35, married and with three preschool children, the present farmer has worked on the property under his father since 1948, and on his own account since 1960. He is eager to develop the farm. He has undertaken a limited amount of development, by oversowing and topdressing two tussock blocks, but his rate of advance has been restricted by shortage of development capital.

3.3 Present Production and Income

Sheep numbers have been lifted during the past two years from 980 Corriedale ewes and 550 hoggets, producing 8.6 lb. of medium halfbred wool per acre, to 1,140 ewes and 500 ewe hoggets in the 1964 winter. There are, in addition, 75 rams and wethers and 40 cows. This represents a total of 1.3 ewe equivalents per acre and it is estimated that wool output in the 1964/65 season will be 9.8 lb. per acre.

Lambing survival has averaged 92%, calving 95%. All surplus lambs are sold as stores. The mortality rate averages 4% annually in ewes and 5% in hoggets. Cattle losses have been negligible.

The present financial position on the farm is shown in the pre-development budget for 1963/64 in Table IV. Net farm profit is measured on the basis of no development or capital expenditure being undertaken and all liabilities, except family loans, being charged existing or current rates of interest. Thus gross farm revenue works out at £5,500 or £3.7 per acre, and total farm expenditure £3,140 or £2.1 per acre. Net farm profit amounts to £2,360 or £1.6 per acre which is available to meet wages of management, taxation demands, and development needs. If interest on family loans is charged, farm expenditure rises to £3,410 and net farm profit drops to £2,090. In the development programme this interest is actually available for development expenditure.

Based on past requirements, wages of management have been maintained at £1,050 per annum after tax, throughout both the ensuing development programmes. The effect of cash surplus or deficit on the year's trading is reflected in a movement of the overdraft held by a stock firm which requires the limit of £1,000 to be adhered to, within reason.

3.4 Capital

A summary of this farmer's capital position as at 30th June, 1964 is as follows:

TABLE IV

	Pre-development 1963/64	Cash	Taxn	Post-development Programme A 1969/70	Cash	Taxn	Post-development Programme B 1969/70	Cash	Taxn
Income									
Sheep	2010			2180			2075		
Cattle	525			850			850		
Wool	2925			3960			5240		
Skins	40			40			40		
Total Cash Income		5500			7030			8205	
Non Cash Income	-			-			-		
Gross Income			5500			7030			8205
Other Non Taxable Income	-			-			-		
Gifts (interest not paid)	270			190			160		
Expenditure									
Stock Purchases	250			520			520		
Standing Charges	1240			1240			1240		
Administration Charges	75			75			75		
Wages	150			380			730		
Animal Health	140			170			180		
Electricity	25			50			45		
Freight	50			75			80		
Feed	45			60			310		
Fertiliser and Lime	360			1030			1280		
Seed	-			-			-		
Weeds and Pest	10			15			10		
Woolshed	40			50			65		
General	55			70			75		
Vehicles	350			400			420		
Repairs & Maintenance	350			400			400		
Total Farm Expenditure		3140			4535			5430	
Depreciation	230			180			200		
Total Non Taxable Expenditure			3370			4715			5630
Other Expenditure									
Wages of Management) Life Insurance)	1050			1050			1050		
Tax	310			290			500		
Capital Expenditure	-			-			-		
		1360			1440			1550	
Total Cash Expenditure		4500			5975			6980	
Cash Gain or Deficit		+1000			+1055			+1225	
Bank Balance	-			-			-		
Taxable Gross Income			2130			2315			2575
Tax Allowances			-			-			-
Life Insurance			85			85			85
Taxable Income			2045			2230			2490
Net Farm Income (Cash)		2360			2495			2775	
Available Income		2050			2105			2275	

			£	£
Assets:	Stock			5,380
	Plant			1,640
	Property:	Capital Value*	24,200	
		Crown's Interest	12,260	
		Lessee's Interest		11,940
				18,960
Liabilities:				
Current Liabilities:				
	Overdraft	1,000		
	Loan (unsecured)	900	1,900	
Term Liabilities:				
	1st Mortgage	1,350		
	2nd Mortgage	9,950	11,300	13,200
	Net Worth			5,760

While this represents an equity of less than 20%, the mortgages and loan are family financed, so that the financial stability is greater than it appears. Nevertheless the servicing of this debt is a severe impediment to development. Furthermore, the situation is not a credit-worthy one for normal commercial lenders. Hence any additional loan capital for triggering off and sustaining a substantial development programme would have to be on the basis of potential productivity rather than present security.

3.5 The Development Programme

Two programmes have been drawn up to show the effect upon the rate of development of developing out of income and of refinancing. The first, Programme A, has been based on development out of revenue without external financial assistance in any way, working on an overdraft balancing out at approximately £1,000. Principal repayments to the extent of £200 per annum must be met, and in the fourth year an "on demand" commitment of £500 must be paid.

The policy envisaged for Programme B has been to refinance the enterprise into a more stable position releasing the obligation of principal repayments on mortgages and loans

* At Government valuation.

by refinancing them. The £10,000 second mortgage could be converted to a first mortgage, and interest and principal repayments deferred to the end of the five year development period. In addition, to boost surplus cash available for development a £200 per annum development loan is secured on stock for each of the first four years, again with deferred interest and principal to the end of the development period. In practice, the scope for refinancing of this nature would be limited, but because unstable financial structures of this nature are often an impediment to development, it has been assumed that it is possible, so that the effect of such refinancing can be fully explored.

3.5.1 Development out of Income (Programme A)

When finance is limited to the cash surplus available after paying taxes and mortgage commitments, and meeting wages of management, the rate of development is likely to be greatly impeded. The approach to development adopted here was to concentrate on closer subdivision on the hill country with oversowing and topdressing the better tussock areas followed by increased stocking. With regard to the latter, an element of conservatism has been maintained throughout by planning for feed reserves, as, at its present level of fertility, this property is vulnerable to drought.

Initially, fencing into 100 to 150 acre blocks is confined to those areas requiring closer subdivision ahead of the oversowing and topdressing. After concentrated stocking, oversowing is carried out at the rate of 4 lb subterranean clover during April-May, plus 3 lb. white clover and 4 cwt DDT molybdic super the following July on the sunny faces, or on the darker faces 4 lb. white clover and 3 lb. broad red clover, plus the same rate of manure, also in July. Clover seed is inoculated and flown on separately. Thereafter, the maintenance topdressing is at the rate of 3 cwt DDT sulphur super (400 lb. rate per ton) in alternate years.

The rate of stocking up is critical. The cumulative feed increase, due to this oversowing and topdressing, has been assessed at $^{1}/_{3}$, $^{2}/_{3}$ and $^{1}/_{4}$ ewe equivalents respectively in the three years following the initial treatment. This raises carrying capacity from 1.3 to 2.5 ewe equivalents per acre on the improved area.

Full details of the cost of development under Programme A are shown in Table V. Little or no allowance has been made for major unforeseen expenses which can hinder development expenditure. It could be that the rate of progress budgeted is somewhat optimistic, but reasonable allowances based on past trends have been made for repairs and maintenance, together with an undefined general expense based on 1 per cent of the gross annual income.

Table VI summarises the physical and financial development envisaged.

Total direct expenditure would be £6,255. Other expenditure items would increase by small amounts as the budgets show.

As a result of this investment, subdivision has been increased to 10 blocks on the tussock country, and of this area approximately 590 acres have been oversown and topdressed.

Consequently, carrying capacity is raised to 1.7 ewe equivalents per acre as represented by 1,200 breeding ewes, 550 ewe hoggets, 170 wether hoggets, 320 mixed aged wethers and 75 other sheep, plus 52 run cows and 7 other cattle carried during the winter of 1968. Wool production at 9 lb. per sheep is lifted to 13.3 lb. per acre, which represents an increase of 36 per cent, roughly comparable to the 37 per cent increase in carrying capacity. This is the result of placing some emphasis on dry sheep, which permits a high degree of flexibility in management and minimises the increase in work load.

In terms of gross proceeds from the various enterprises, wool income increases over the 5 year period from £2,925 to £3,960, cattle from £515 to £840 and sheep sales from £1,655 to £1,805 per annum.

At this stage the property is still in an active phase of development. Farm expenditure per annum increases from £3,655 to £4,905 over the period involved, the major increases being in stock purchases, wages to include a youth employed for five months, and fertiliser. Taxable income increases by £315 from £1,405 to £1,702 and the overdraft falls from £1,000 to £930 by the end. Wages of management remain constant at £1,050.

TABLE V - PROGRAMME A

	1964/65	Cash	Taxn	1965/66	Cash	Taxn	1966/67	Cash	Taxn	1967/68	Cash	Taxn	1968/69	Cash	Taxn
Income															
Sheep	1655			1660			1805			2300			1805		
Cattle	515			560			630			720			840		
Wool	2925			3195			3535			3870			3960		
Skins	40			40			40			40			40		
Total Cash Income		5135			5455			6010			6930			6645	
Non Cash Income	320			380			290			5			245		
Gross Income			5365			5835			6300			6935			6890
Gifts(interest not paid)	270			270			270			270			270		
Expenditure															
Stock Purchases	220			400			430			400			520		
Standing Charges	1240			1240			1240			1240			1240		
Administration	75			75			75			75			75		
Wages	150			160			175			385			385		
Animal Health	140			150			160			170			170		
Electricity	25			35			40			45			50		
Freight	50			60			65			70			75		
Feed	45			60			60			60			60		
Fertiliser and Lime	360			645			855			1165			895		
Seed	140			145			155			195			-		
Weeds and Pest	10			10			10			10			15		
Woolshed	40			40			45			45			50		
General	55			60			65			70			70		
Vehicles	350			350			350			350			400		
Repairs & Maintenance	350			350			350			350			750		
Development (Deductible)	405			370			300			335			150		
Total Farm Expenditure		3655			4150			4375			4965			4905	
Depreciation	220			205			190			180			180		
Total Expenditure (non taxable)			3875			4355			4565			5145			5085
Personal and CapitaT Expenditure															
Wages of Management (inc.Life Insurance)	1050			1050			1050			1050			1050		
Tax	160			190			190			260			280		
Principal Repayment	200			200			200			700			200		
Capital Development (non-deductible)	-	1410		-	1440		-	1440		200	2210		-	1530	
Total Cash Expenditure			5065			5590			5815			7175			6435
Cash Gain or Deficit			70			-135			195			-245			210
Bank Balance	-1000		-930	-930		-1065	-1065		-870	-870		-1115	-1115		-905
Tax Assessment															
Taxable Gross Income			1490			1480			1735			1790			1805
Less: Life Ins.Prem.			85			85			85			85			85
Taxable Income			1405			1395			1650			1705			1720

TABLE VI

Year	Fencing	Oversowing	Topdressing			Bulldozing	Buildings	Total Stock
PHYSICAL:	(miles)	(acres)	Initial	Maintenance (acres)	Total			(E.E.)
1963/64	-	-	-	-	-	-		1,901
1964/65	1¼	120	120	100	220	1 dam, tracks		2,017
1965/66	1	170	170	100	270	2 dams		2,252
1966/67	1	130	250	100	350	2 dams	Single men's quarters	2,440
1967/68	¾	170	340	100	440	2 dams		2,428
1968/69	½		130	220	350	1 dam		2,591

FINANCIAL:	Fencing	Seed	Topdressing				Bulldozing	Buildings	Stock*
			Initial	Maintenance	Total	Extra			
	£	£	£	£	£	£	£	£	£
1964/65	330	140	265	95	360	-	75	-	345
1965/66	320	145	550	95	645	+285	50	-	560
1966/67	250	155	760	95	855	+495	50	-	430
1967/68	185	195	1,070	95	1,165	+805	50	300	15
1968/69	125	-	420	475	895	+535	25	-	390
	1,210	635				2,120	250	300	1,740

* Stock Increases valued at market prices, i.e. "the foregone cash to increase numbers".

The post-development budget at the end of this phase is shown in Table IV, and the capital position of the farmer as at 30th June 1969, might be as follows:

			£	£
Assets:	Stock			7,280
	Plant			1,060
	Land & Buildings, Capital Value*		27,000	
		Less Crown's interest	12,260	
		Lessee's interest		14,740
				23,080
Less Current Liabilities: Overdraft			905	
	Term Liabilities:			
	1st Mortgage	850		
	2nd Mortgage	9,950	10,700	11,605
	Net Worth			11,475

This represents an increase in net worth from £5,760 to £11,475 or £5,715 in five years.

3.5.2 Development with Refinancing (Programme B)

As previously outlined, the objective here was to refinance part of the present mortgages allowing deferred interest and principal on the refinanced moneys for the 5 year development period.

Thus, the adjusted original balance sheet as at 30th June 1964, would be as follows:

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* Estimated Government valuation, at present-day costs and prices. No account is taken of changes in unimproved value or capital appreciation.

			£	£
Assets:	Stock			5,380
	Plant			1,640
	Land & Buildings:	Capital Value	24,200	
		Less Crown's Interest	12,260	
		Lessee's Interest		11,940
				18,960
Less Current Liabilities:	Overdraft		1,000	
	Term Liabilities:			
	1st Mortgage	10,000		
	2nd Mortgage (secured on stock with deferred interest)	2,200	12,200	13,200
	Net Worth			5,760

In addition, a £200 per annum development loan for the first four years was also provided, with security over stock and deferred interest and principal repayment until the end of the development programme.

The immediate need for increased subdivision as described in Programme A is again first consideration, but in addition to the programme of oversowing and topdressing, some cultivation has been undertaken on the best of the soils for winter fodder supplement, followed by sowing down to new grass or lucerne for hay production. This would provide a more balanced feed supply to meet the demands of an increased rate of stocking increase.

With cultivation, closer subdivision into 40 acre paddocks is envisaged; the bulk of the cultivation being carried out by contract. Swedes sown the first winter with 4 cwt fertiliser per acre, will winter 20 ewes per acre for about 90 days. Then, the following February, new pasture and turnips would be drilled, supporting 8 ewes over the winter and subsequently stocking 3 ewes per acre.

Table VII summarises the development of this alternative programme.

TABLE VII

Year	Fencing	Swedes	New Grass or Lucerne	Oversown	Topdressing			Culti-vation	Bldgs & Plant	Stock
					Initial	Maint-enance	Total			
	(miles)	(acres)	(acres)	(acres)	(acres)			(acres)		(E.E.)
PHYSICAL:										
1964/65	5/6	40		120	160	100	260	40		2,130
1965/66	1	30	40 N.G.	140	210	70	280	70	harrows	2,400
1966/67	2½	40	30 Luc.		190	110	300	70	whare	2,695
1967/68	¾		40 N.G.	170	350	140	490	40	haybarn	3,052
1968/69	1	40		100	140	300	440	40	discs	3,336

Year	Fencing	Seed	Lime	Topdressing				Culti-vation	Bldgs & Plant	Stock
				Initial	Maint-enance	Total	Extra			
	£	£	£	£	£	£	£	£	£	£
FINANCIAL:										
1964/65	200	150		365	100	465	+105	325		610
1965/66	250	225		650	70	720	+360	180	30	700
1966/67	625	140	120	530	135	665	+305	230	300	775
1967/68	180	290		1,260	185	1,445	+1,085	200	200	870
1968/69	250	125		545	570	1,115	+755	200	300	660
	1,505	930	120				2,610	1,135	830	3,615

Total direct development expenditure = £10,745

Carrying capacity is thus lifted to 2.2 ewe equivalents per acre, again with the increase being taken up in dry sheep. Stock wintered in 1968 would be 1,200 breeding ewes, 550 ewe hoggets, 406 wether hoggets, 794 mixed age wethers and 51 run cows plus 5 other cattle. Carrying capacity has thus been increased 75 per cent and total wool production by 80 per cent over the five year period. Wool is estimated to yield 17.6 lbs. of medium-halfbred per acre.

Budget details for this programme are shown in Table VIII.

Gross income would increase in the following way:-

wool from £2,925 to £5,240, cattle from £515 to £840 and sheep sales from £1,370 to £1,400 per annum over the same period.

The property is again still in an active phase of development, and development expenditure will be required beyond the period covered by these budgets. Total farm expenditure under this policy is estimated to have moved from £3,910 to £5,880 per annum; the major increases being in stock purchases, wages to include a youth for 12 months, feed expenses with the increased area of lucerne, and fertiliser expenses. Taxable income will increase from £1,045 to £1,800, and the overdraft will have increased by £100 on the original £1,000 over the five year period. Figure 2 shows these main trends for both development programmes.

The post-development budget for 1969/70 is shown in Table IV, giving a cash surplus of £1,225, and available income for the farmer of £2,275. The balance sheet as at 30th June 1969, might then read as follows:

		£	£
Assets:	Stock		9,000
	Plant		1,160
	Land & Buildings: Capital Value*	32,200	
	Less Crown's Interest	12,260	
	Lessee's Interest		19,940
			30,100
Less Current Liabilities:			
	Overdraft	1,100	
	Development Loan (£800 + compound interest @ 5% per annum)	940	
	Total Current Liabilities	2,040	
Term Liabilities:			
	1st Mortgage 10,000		
	2nd Mortgage (£2,200 + deferred interest compounded @ 5% per annum) 2,810		
	Total term Liabilities	12,810	14,850
	Net Worth		15,250

While total liabilities have increased by £1,650, net worth has increased by £9,490 over the five year period.

3.6 Comparison of the Programmes

Table IX sets out several physical and financial indicators of the changes budgeted in the two development programmes. Per acre results are derived from the respective budgets and supporting detail, while average rates of return are worked out from net farm income adjusted for interest charges.

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* Estimated Government valuation. As a rough guide the increased value of improvements works out at about £5 per ewe equivalent.

TABLE VIII - PROGRAMME B

	1964/65	Cash	Taxn	1965/66	Cash	Taxn	1966/67	Cash	Taxn	1967/68	Cash	Taxn	1968/69	Cash	Taxn
Income															
Sheep	1370			1570			1540			1390			1400		
Cattle	515			560			630			720			840		
Wool	2925			3420			4070			4570			5240		
Skins	40			40			40			40			40		
Total Cash Income		4850			5590			6280			6720			7520	
Non Cash Income	410			435			500			580			445		
Gross Income			5260			6025			6780			7300			7965
Gifts(interest not paid)	310			310			310			310			310		
Expenditure															
Stock Purchases	220			430			400			400			520		
Standing Charges	1200			1200			1200			1200			1200		
Administration	75			75			75			75			75		
Wages	150			290			380			405			730		
Animal Health	140			150			160			170			180		
Electricity	25			30			30			40			45		
Freight	50			60			60			70			80		
Feed	60			60			60			310			310		
Fertiliser and Lime	465			720			785			1445			1115		
Seed	150			225			140			290			125		
Weeds and Pest	10			10			10			10			10		
Woolshed	40			45			50			55			65		
General	50			55			65			70			75		
Vehicles	400			420			420			420			420		
Repairs & Maintenance	350			350			350			450			400		
Development (deductible)	525			460			955			390			530		
Total Farm Expenditure		3910			4580			5140			5800			5880	
Depreciation	220			205			190			180			200		
Total Expenditure (non taxable)			4130			4785			5330			5980			6080
Personal and Capital Expenditure															
Wages of Management (inc.Life Insurance)	1050			1050			1050			1050			1050		
Tax	160			105			130			175			150		
Principal Repayments	-			-			-			-			-		
Capital Development (non-deductible)	-			-			200			140			240		
		1210			1155			1380			1365			1440	
Total Cash Expenditure		5120			5735			6520			7165			7320	
Cash Gain or Deficit		-270			-145			-240			-445			200	
Development Loan		+200			+200			+200			+200			-	
Bank Balance	-1000	-1070			-1015			-1055			-1300			-1100	
Tax Assessment															
Taxable Gross Income			1130			1240			1450			1320			1885
Less: Life Ins.Prem.			85			85			85			85			85
Taxable Income			1045			1155			1365			1235			1800

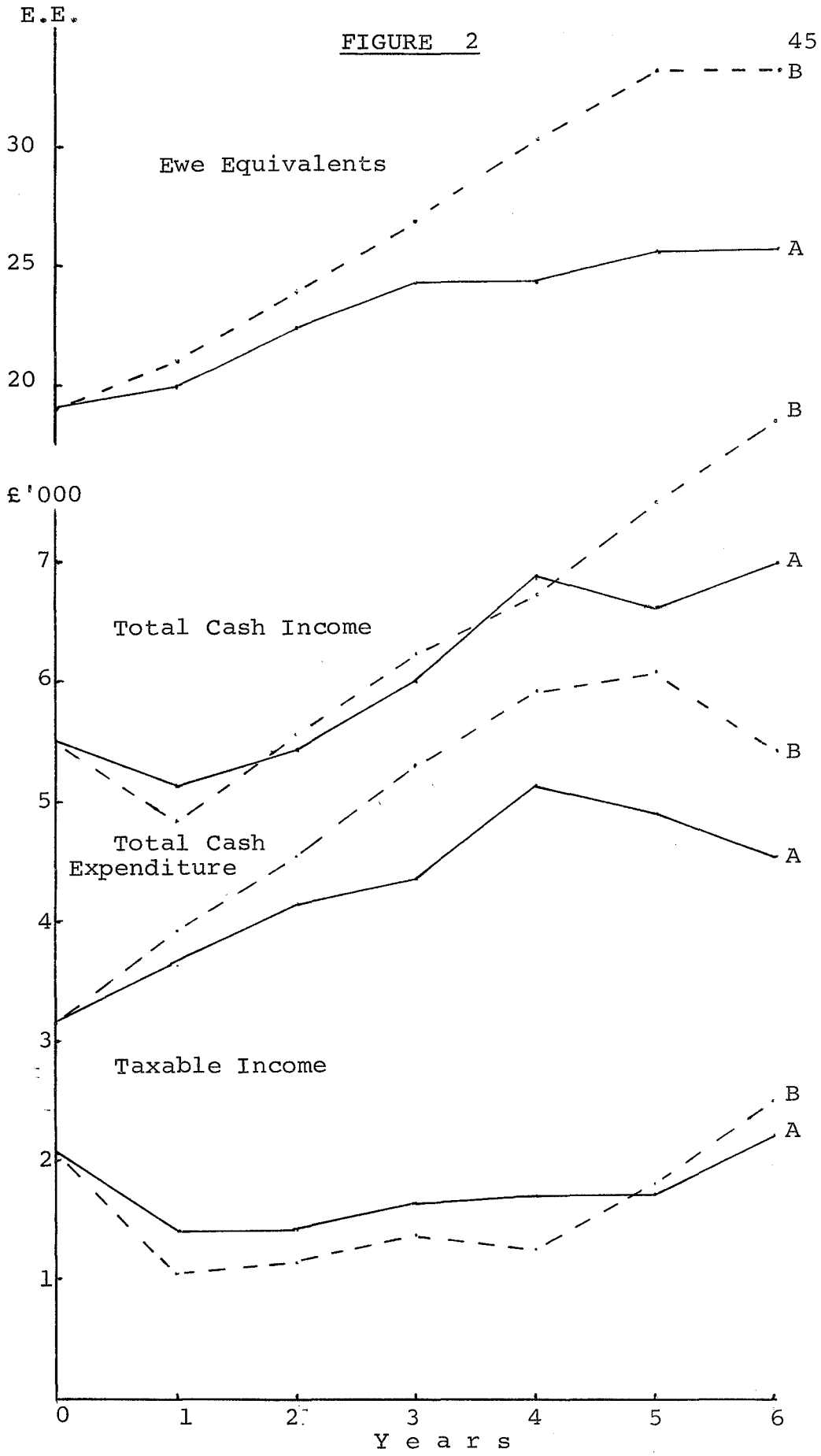
FIGURE 2
E.E.
45
B
30
Ewe Equivalents
25
A
20
B
£'000
7
A
Total Cash Income
6
B
5
Total Cash
Expenditure
A
4
3
Taxable Income
B
A
2
1
0
1
2
3
4
5
6
Years

TABLE IX

	Base year 1963/64	Programme A 1969/70	Programme B 1969/70
Physical Indicators			
Ewe equivalents per acre	1.3	1.6	1.9
Wool per acre (lbs)	9.8	13.3	17.6
Financial Indicators			
Sheep income per acre (£)	1.3	1.5	1.4
Wool income per acre	2.0	2.7	3.6
Cattle income per acre	0.4	0.6	0.6
Total	3.7	4.8	5.6
Expenditure per acre	2.3	3.2	3.8
Net profit per acre	1.4	1.6	1.8
Capital Indicators*			
(a) Government Valuation:			
Total lessee's Interest (£)	18,960	23,080	30,100
Lessee's Net Worth	5,760	11,475	15,250
(b) Fair Sale Value:			
Total lessee's Interest	22,760	27,080	31,900
Net Worth	9,560	15,475	17,050
Average Rates of Return** (before tax)			
Lessee's capital at G.V.(%)	9.6	9.4	8.0
Lessee's capital at F.S.V.	8.1	8.0	7.6
Lessee's net worth at F.S.V.	10.8	8.1	9.2

* Government valuation as previously defined. Fair sale value is roughly 10 per cent higher on value of improvements alone.

** Ratios of net returns to capital valuation concepts; not to be confused with interest rates of return used elsewhere.

Both development programmes increase the size of the farm asset considerably, but apparently to a point where the average return on capital invested declines slightly. In general, the farm in this case study was earning a favourable return on capital before development, but the urgent need to increase the farmer's share of the farm capital and reduce his liabilities could only be achieved through further development.

3.7 Growth of Production, Income and Net Worth*

As in the first case study, the national interest is represented by the growth of production over the development period, while the individual's interest is represented by the growth of personal income and equity in the farm. In this case study, however, income will not have stabilised by 1969/70, hence the growth of income is not considered further.

In Programme A, the increase in production over the five year period is worth £1,530, which is equivalent to an annual rate of increase of 5.1 per cent, thus exceeding by a small margin the target set by the Agricultural Development Conference. Taking the fair sale values indicated on the previous page, the growth in the farmer's net worth is at an annual rate of 10.2 per cent. Part of this is represented by the increased stock on the property, and part by the higher productivity of the land.

In the refinancing programme (B), the increase in value of production is £2,705, giving an annual rate of increase of 8.3 per cent. The national target is well exceeded. The fair sale value of the farmer's equity would rise by £7,550, a rate of increase of 12.3 per cent per annum. The need for a sound financial basis before substantial rates of growth can be achieved, is emphasised by this example.

The Cost of Development to the Farmer:

As can be seen in the pre-development budget for the base year 1963/64, the estimated income of the farmer before development was reasonably high. Part of the high income

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* This section is based on Dr J.T. Ward's notes.

budgeted is explained by the waiving of interest on family loans and part by the rather high wool price assumed. By deducting the family interest payment from net farm income, and allowing £1,050 as wages of management, the residual amount falls to £1,040 before tax. On book values this is 18 per cent of the farmer's equity, and on fair sale value of the property it is 10.8 per cent of the farmer's equity in that year. At wool prices of 36d per lb. the residual amount before tax falls to £195, a far lower return on the farmer's equity.

The take-home income shown in the budgets is net farm income less tax. As this farmer was budgeted to live on wages of management of £1,050 throughout the development period, it is estimated that £1,000 is released for development expenditure. The farmer thus foregoes £1,000 of his possible present income for the sake of the extra income he will receive after development is complete.* After five years with development along the lines of Programme A, available income increases to £2,105 in 1969/70. He therefore foregoes £1,000 per year for 5 years, for the sake of £55 extra in the years after 1969/70. Such a small return is equivalent to an interest return of only 1¼ per cent per annum. However, it is emphasised that this property would still be at an early stage of development in 5 years.

At the same time, however, the value of the property has increased considerably, owing to its increased carrying capacity, and most of this increase is shown in higher net worth. Thus, if the farmer could release the funds indicated by the valuation increase (by possibly selling up or re-financing on his government valuation), the £5,715 increase in equity would be equivalent to a rate of savings interest of 6¾ per cent on the £1,000 of income foregone for 5 years.

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* It should be noted that this farmer was in fact carrying out a small development programme before this analysis was carried out and his available income in 1963/64 was somewhat less than the basic pre-development budget indicates.

With Programme B, available income increases from £2,050 to £2,275, an increase of £225, which is equivalent to an interest return of 4¼ per cent per annum. Again the income rewards, after taxes are paid, are not high. But Programme B does increase the property value very considerably. An increase in the owner's equity of £9,490 occurs. Such a return is equivalent to interest of 32 per cent on the £1,000 of income given up, and makes Programme B a proposition likely to interest most of the farming community in a similar position.

The Return to the Nation:

As already set out in the first case study, the return to the nation is calculated from the value of extra goods produced by the development plan. Taking the base year level of expenditure as £3,140 and gross income as £5,500, the following table shows the extra costs and returns associated with Programme A.

Year	Additional Costs	Additional Returns	Net Cost of Development
	£	£	£
1964/65	715	-365	1,080
1965/66	1,210	- 45	1,255
1966/67	1,435	510	925
1967/68	1,725	1,430	1,295
1968/69	1,965	1,145	820
Post-development	1,395	1,530	- 135

Gross farm income falls below the base year level for the first two years as stock are held back. As wages of management will be drawn by the farmer, this shortfall in revenue is an additional cost of the development plan. As revenue improves development expenditure can be stepped up, leaving approximately £1,000 per annum to be financed from income. In 1969/70 additional returns exceed additional costs, and in fact the farm is expected to be operating with a net farm income of £135 more than in the base year. Assuming that this level of net farm income can at least be reached in all years after 1969/70, the interest return to the nation on the additional development investment is of the order of 2½ per cent per annum. This result is thus

consistent with the farmer's point of view on Programme A, that is, the additional income to be gained by the individual or nation is not particularly attractive at this stage of development.

The corresponding trends in costs and returns for Programme B are as follows:

Year	Additional Costs	Additional Returns	Net Cost of Development
	£	£	£
1964/65	770	-650	1,420
1965/66	1,440	90	1,350
1966/67	2,200	780	1,420
1967/68	2,800	1,220	1,580
1968/69	2,980	2,020	960
Post-development	2,290	2,705	-415

The additional costs of cultivation have made Programme B more expensive to implement and increased revenue is only just beginning to result by 1968/69. The net cost of development thus approaches £1,500 in most years. By 1969/70 net farm income is expected to be £415 higher than in the base year. The return to the nation in the form of interest is 5½ per cent per annum for this plan. This result thus falls somewhat short of the rate of return of 12½ per cent earned by the development programme in the first case study.

3.8 Postscript

Since the budgets for this case study were drawn up in early 1964, nearly two years of the development plan have passed. The actual development programme chosen has followed B rather than A. In 1964/65, 30 acres on the flat were ploughed in preparation for lucerne and 300 acres were top-dressed (first oversown and topdressed in 1963/64). A loan of £1,000 was obtained from the State Advances Corporation in March 1965. In 1965/66, a summer crop was taken from the 30 acres but no new cultivation was initiated and the original 300 acres was again topdressed. In 1966/67 it is planned to open up 50 acres on the top plateau for turnips and new grass and to postpone the topdressing programme for one year. The next year, 1967/68, will see competition

between the cultivation of another 40-50 acres and topdressing, but it is hoped finance will be available by then to do both. In general the development policy being followed is to produce high carrying capacity pastures through cultivation, partly because the direct improvement in pastures is greater and partly because of the winter feed thus provided. To achieve the benefits of wider oversowing and topdressing, considerable subdivision fencing would be required.

In the 1965/66 season, carrying capacity was increased by 136 ewe equivalents, mostly through an increase of 100 ewes and 10 head of cattle. In 1966/67, a further increase of 292 ewe equivalents is already planned (210 ewes and 60 ewe hoggets), while it is projected that in 1967/68 the increase will be 206 ewe equivalents (200 ewes and another 60 ewe hoggets). The lambing percentage at tailing was down to 84 per cent in 1965/66 as against the expected level of 90 per cent. The wool weight was 13,474 lbs. in 1964/65 against 14,620 lbs. budgeted. Average price realised was 40½d. Details are not complete for 1965/66, but some 13,635 lbs. of wool is anticipated.

A P P E N D I X

4. NOTES ON THE BUDGETS

1. Standard values for sales off farm (1964):

Wool	48d	Hereford steers	£14
Forward lambs	35/-	Heifer calves	£10
2-tooth ewes	60/-	Cull cows	£20
Cull ewes	40/-	Skins and hides	20/-
Wethers	50/-		

2. Standard Values for Tax purposes:

Ewes	30/-	Cows & other cattle	£10
Wether lambs	30/-		
Ewe lambs	30/-		
Wethers	25/-		

3. Standard Values for Final Balance Sheet (1964):

Ewes	50/-
Hoggets	40/-
Wethers	45/-
Rams	£5
Killers	30/-
Cows	£25
Bulls	£40
House Cows	£30

4. Standard Basis for Ewe Equivalents:

Ewes	1	Cows and bulls	6
Rams & killers	1	Heifers	2
Hoggets	2/3	Other cattle	7

5. Survival and Mortality:

	Case I	Case II
Lambing	100%	92%
Calving	95%	95%
Adult sheep	3%	4% mortality
Ewe hoggets	4%	5% "
Cattle	2%	2% "

6. Stock Purchases: rams at 16 guineas, bulls at £120, cows at £30

7. Standing Charges:

Case I - Rent at £310, rates and land tax £310, overdraft interest at 7%, mortgage instalment £312;

Case II - Rent at £530, rates and land tax £155, overdraft interest at £85, insurance at £30. Mortgage interest paid as cash. Family mortgage interest a gift.

8. Expenditure: As detailed for development or extrapolated from pre-development budget in base year.

9. General Expenses: One per cent of gross income.

10. Depreciation: 2½ per cent on ¼ of dwelling, 2½ per cent on buildings, 20 per cent on tractor and trailer, 10 per cent on ½ of car, 10 per cent on other plant.

11. Taxation: Current payment based on previous year's income, calculated from standard income tax tables. The first year of development is based on income in the pre-development budget, or actual income.

12. Overdraft: End of financial year level.

13. Net farm income: Cash return after farm costs but before depreciation.

14. Available income: Net farm income less tax. It should be emphasised that this is a cash flow concept and not a tax return concept.

15. Taxable Gross Income: Gross farm income less farm expenses and depreciation.

16. Taxable income: Net farm income less depreciation and listed tax exemptions.

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