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LABOUR AS A CONSTRAINT TO INCREASES  
IN AGRICULTURAL PRODUCTION

A Comparative Study Of Three Distinctive Farming  
Environments Within One Agricultural  
System

A Thesis Presented In Partial Fulfilment Of The Requirements  
for the Degree of Master of Arts in Geography  
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### ABSTRACT

A critical question facing economic policymakers today is whether agriculture will be able to play its traditional role in lifting export earnings through increases in the volume of production. One factor which is thought to have constrained agricultural development is the availability and price of farm labour. The following study examines the dimensions of the "labour problem" and attempts to assess the impact of this problem on an expansion of agricultural output.

The research draws extensively on geographical principles for the spatial design. One farming system is selected, and within this, the farm labour problem is examined in three distinctive environments, differentiated by topographical criteria and a gradient of isolation from a major urban area.

The labour problem, conceptualised in the four dimensions of cost, availability, retention and efficiency, is assessed within these environments. From the empirical research, the labour problem appears to be of greater magnitude in the hill country farm environment, which is considered by recent agricultural appraisals as having the potential for immediate, sustainable and sizable production increases. This raises implications for future policy formulation.

The study arrives at two principal conclusions. Firstly, the cost of the labour unit is the major inhibiting factor to increased employment on farms. Secondly, the on-farm shortage of skilled labour does not appear to have a limiting impact on production levels between farms, but it does elicit a certain management response towards less labour-intensive systems of production. The short and long term production consequences of this are as yet uncertain, and should provide a major focus for research in the 1980's.

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CHAPTER 1  
NEW ZEALAND AGRICULTURE AND NATIONAL  
DEVELOPMENT IN THE 1980's.

New Zealand in the late 1970's is experiencing its most serious balance of payments deficit since the 1930's (Department of Statistics, 1977c; International Monetary Fund, 1978; N.R.A.C., 1978; New Zealand Bureau of Importers and Exporters Inc., 1978; O.E.C.D.<sup>1</sup>, 1977; United Nations, 1977). There is a pressing need to generate increased export earnings to stem the decline in the terms of trade and so avoid a desperate economic situation. A substantial body of economists and professionals strongly advocate the expansion of the agricultural industry as one solution to New Zealand's economic difficulties<sup>2</sup> (Anon., 1975a; Cumberland, 1968; Johnson, 1977; Johnston, 1965; King, 1965; Maughan, 1977a; Morton, 1975; O.E.C.D., 1977; Philpott, 1977; Ross, 1976; Sears, 1962; Willis, 1976). The 1978 Budget warned that 'if our overseas earnings are to increase at the rate required to provide a basis for sound economic growth, agricultural production must play a key role' (Muldoon, 1978, 14).

Since 1970, however, the volume of agricultural output has failed to expand (Holmes, 1976; Hussey and Philpott, 1969; Maughan, 1977a; Meat and Wool Board Economic Service, 1971, 1973, 1974; M.A.F.<sup>3</sup>, 1976a, 1976e, 1977d). The National Development Conference target of an annual average rate of growth for agricultural production of 2.5 percent was never achieved: in fact, between 1970 and 1976, a negative rate of growth occurred (Franklin, 1978; McLean, 1978). Since the 1968/69 season, sheep numbers have stabilised and dairy cattle numbers have declined. Beef cattle numbers continued to increase up to the 1974/75 season, but have since also stabilised (M.A.F., 1976a, 1976e, 1977d). In terms of value added to the Gross National Product by the agricultural sector, the period 1960-61 to 1972-73 has shown a steady decline (O.E.C.D., 1974).

## REASONS FOR THE DECLINE IN FARM OUTPUT EXPANSION

At the farm level, the constraints to agricultural growth have been generally identified as adverse climatic conditions over several seasons (a physical restraint) and low agricultural incomes<sup>4</sup> (a human restraint), which have created a discouraging economic environment within which farmers' confidence has declined (McLean, 1978; Maughan, 1977a; M.A.F., 1976e; Taylor, 1978). Philpott (1977), probing the causes of agricultural stagnation, argued that this motivational interpretation may not represent the entire picture - higher prices and good seasons alone may not result in an expansion of output, and in fact the blame goes much deeper to an assessment of levels of on-farm investment, diminishing capital per output returns and a virtual cessation of technical progress (Johnson and McClatchy, 1970; McLean, 1978; M.A.F., 1977d).

At a national level, government's handling of industrial problems, especially concerning the freezing works, has been cited as a major reason why many farmers are not prepared to risk increasing their livestock production (Holmes, 1976; Pryde, 1977a). The rapid rise in the price of land over the last ten to fifteen years has also contributed to the stagnation of agricultural output. Maughan (1977a) established that between 1970 and 1976 the compound per annum rate of increase in land prices was of the order of 17 percent. Land is therefore taking on a speculative value, above its productive value (Holmes, 1976; Hussey, 1970; Maughan, 1977a; Ward, 1973).

For people entering the industry, this is a deterrent, and money that might have gone towards farm development is being directed towards farm purchase. From a production angle, it kindles concern from older established farmers about death duties and gift tax rather than development and capital gain. The net effect has been a move in the pastoral sector towards extensive rather than intensive farming. Governments in recent years have on occasion recognised the seriousness of the agricultural situation and have introduced various types of assistance<sup>5</sup>.



In an international context, the state of New Zealand's overseas markets, more effectively coined "E.E.C. gloom", is regarded as an impediment to agricultural growth (Maughan, 1977a; Pryde, 1977a; Ward 1973). The traditional market Britain, which once assisted the growth of agricultural exports and determined the main direction of that trade, has joined the E.E.C. and effectively terminated New Zealand's unlimited access to its markets, creating a psychological barrier.

British preference has now all but ended, and in a world which is itself undergoing major economic and social changes, New Zealand is being cast adrift. It is faring badly, with a continuing balance of payments deficit, a stagnant economy, a high rate of inflation, and a net loss of population to the rest of the world.

(Maughan, 1977a, 1)

Agricultural production is a critical requirement for long-term economic growth (Johnston and Kilby, 1974; Kuznets, 1965; Lewis, 1956; Mellor, 1967; Tennant, 1978) and the constraints in New Zealand have been identified and considered in recent years (Hussey, 1970; Maughan, 1977a; Philpott, 1977). The empirical evidence is, however, as yet highly tentative (McLean, 1978; Philpott, 1977) and the ineffectiveness of research and policy efforts to date to create real growth in the agricultural sector has left the issue of output expansion as controversial and open as ever. The search for those measures which will accrue the greatest returns has produced quite radical recommendations, such as the introduction of a subsidy/tax to eliminate the inefficient farmer (Sears, 1963; Philpott, 1976). A major concern has been to identify the environments from which the greatest production increases can most easily be attained (Brougham, 1973; Hight, 1976; N.R.A.C., 1978). The search continues, and this thesis directs an examination at one of the factors of production - farm labour - in an attempt to assess the extent to which the well-publicised but little measured farm labour problem is limiting production on the farm.

## FARMING ENVIRONMENTS WITH THE GREATEST AGRICULTURAL POTENTIAL

New Zealand's 13 million hectares of pastoral land (Department of Statistics, 1977b) can be broadly classified into four main categories: flat and rolling country, hill country (both wet and dry), high country and the warm temperate regions (Brougham, 1973; Cumberland, 1948). A key feature in this classification is the physical characteristics of each environment, controlled by soil, slope and climate (Pohlen, 1956; Tennant, 1978). The National Research Advisory Council (1978) identified hill country as 'predominately non-ploughable land', such that slope is seen as the critical exponent.

The varying spatial patterns of the physical environments' related practices are largely due to the production possibilities and stage of development of the areas. The flat and rolling country typifies intensive farming practices, with a carrying capacity of close to 15 ewe equivalents per hectare (Brougham, 1973; M.A.F., 1976e). Some protagonists argue that the New Zealand lowland is approximating maximum levels of output and that substantial changes in the traditional pastoral farming systems will be required to greater use the potential of the area (Curry, 1962; Moran, 1974). Expansion of cropping is particularly advocated (Forbes, 1970; Gibbs, 1974; M.A.F., 1977f; Moran, 1974). Brougham (1973), however, claims that further increases in pastoral productivity are well within the scope of the region. He indicates that substantial lowland areas of Southland, Manawatu, Taranaki and Waikato have a potential to carry and sustain about twice as many animals as at present, under present farming systems.

Undoubtedly, however, the most sizable and easily attainable production increases will come from the hill country. The average carrying capacity is about 7 ewe equivalents per hectare<sup>6</sup> (M.A.F., 1976e). Recent appraisals (Brougham, 1973; N.R.A.C., 1978; Tripe, 1965) advocate a realistic increase of production of 50 percent. Hight (1976) recognises that there is a potential to increase carrying capacity by at least 200 percent above present levels, or by an additional 40 million ewe equivalents.

These figures suggest that the hill country regions are grossly underfarmed. To improve the situation substantially, present attitudes of farmers and policy makers must change (Brougham, 1973; N.R.A.C., 1978) from traditional extensive farming practices to an awareness of the production potential and stocking rates attainable on the hill country through improved resource management.

Proposed alternative systems of production necessitate an examination of the present farm labour situation in these areas, as changed production patterns will require additional labour and/or a different level of appropriate farm skills. This thesis examines the patterns and problems of the labour supply apparent in the two farming classifications of hill country and lowland.

#### FOCUS AT THE FARM LEVEL: ON LABOUR

The economic significance of any one production factor cannot be evaluated without at least an appreciation of the wide arena of factors which have an impact on agricultural output<sup>7</sup>. Alternative factors at the farm, national and international level influence the farmer's attitude, willingness and/or ability to go ahead with development. The labour problem, however, may be considered separately as a valid constraint to agricultural production because a direct relationship can be drawn between production and labour, independent of the farming system or environment. Farm labour as it relates to this research is defined as the element which performs the physical work on the farm. It is separate from management (decision-making) although on most farms the two factors, labour and management, are combined in the person of the farmer.

Increased output, either through higher stock numbers or higher stock performance or both, requires additional work (Holden, 1965a), and the farmer must have the physical capacity to meet this demand, or respond by adjustments in management and capital inputs. There is a limit, which varies considerably between management systems and farm policies, to the number of livestock one man can handle (Holden, 1965a; Franklin, 1978; Milne, 1969; Moran, 1974), beyond

which he must employ either permanent or occasional labour<sup>8</sup>. An additional permanent worker can only be economically justified if he is fully committed on the farm. An estimated minimum 1000 ewes extra, for instance, is required in order to just break even to pay for an extra man and his housing, although present levels of production and efficiency would allow flexibility in this figure (Holden, 1965a; Koller, 1972).

If there is uncertainty associated with the availability and efficiency of this additional labour or the impossibility of obtaining reasonably priced labour, the rational decision<sup>9</sup> for the farmer is to utilise the existing labour input to its maximum effectiveness and limit stock numbers to a size he can cope with. It is the converse which is the challenge because the influences which appear to dictate the 'holding' stance may not be critical in the evaluation of whether to move to some new level of production or productivity. The ramifications for national production are thus considerable.

The labour problem is therefore a national development problem. The farm labour question is analysed in relation to its impact on the volume of farm output, fluctuations in which have ramifications for national economic growth. Consequently, the thesis must draw on a wider range of literature, beyond the geographical perspective, to ensure a satisfactory coverage of the complexities and interdependencies operating on the issue. The research is problem-orientated and its examination should not be rigidly compartmentalised by discipline barriers. Common ground must be established between the forces operating on the research issue. Consequently, the literature review does not limit itself to a discussion of the geography of agriculture. The thesis does draw extensively, however, on geographical principles for the spatial design of the research, the policy implications discussed, and the geographical themes which have been isolated in New Zealand's agricultural development.

## THE RESEARCH DESIGN

The labour problem is examined in relation to the farming system and the farming environment, upon both of which labour is dependent<sup>10</sup>. Agriculture can be conceptualised as a system composed of a set of interrelated or "nested" elements (Ackerman, 1963; Candler, 1964b; Harris, 1969; Isard et al, 1968; Rutherford, 1970). The farming system possesses the basic properties common to all systems: structure, function, equilibrium and change. The structure is determined by the management policy, thus different farm types (e.g. dairy and sheep operations, and within the sheep industry, intensive fattening and breeding policies) incorporate dissimilar flows of energy and money through the system. Consequently, the labour requirements will vary among farming types, from milking duty twice daily through July to March to seasonal stock husbandry operations on conventional sheep farming systems such as mustering, crutching and lambing (Hagan, 1966; Milne, 1969; Dairy Board, 1972; Willis, 1973).

The nature of the labour problem exhibits a locational dimension when the labour requirements are viewed within different farming environments. Aggregation of farms into environments is based on topographical criteria, such that areas are assigned environmental classifications as hill country or lowland. Basically, the farming type (i.e. fattening, mixed cropping or breeding) is closely related to the topographical categories. In the North Island, dairy and fat lamb farms tend to occupy the flat and ploughable recent gravels, silts and plains, whereas the sheep breeding farms are associated with the predominately non-ploughable land (Brougham, 1973; Forbes, 1970; Franklin, 1978; Ministry of Works, 1971). Appraisals of production potential cite the hill country environment as an area for sustained and sizeable production increases (Brougham, 1973; Hight, 1976; N.R.A.C., 1978; Tripe, 1965). It is therefore appropriate to examine the labour commitment in terms of availability and cost within the farming environments, in addition to an examination of labour requirements for specific farming types.

The labour problem can also be examined in the more general framework of accessibility. The present research is designed to facilitate a comparison between three farming environments in the Manawatu and North Wairarapa areas, based on each farmer's relative accessibility to the hierarchy of villages and towns within the area. The virtue of this additional structural frame is that it renders another perspective to the problem - a more sociological interpretation which is advocated by Lloyd (1974). Accessibility, however, is often a restatement of the relationship between labour and the farming system and farming environments.

#### ORGANISATION OF THE THESIS

The aim of this research is to provide insight into one of the factors of agricultural production - farm labour - to determine its dimensions, and its relationship to an expansion of farm output. To this end, the present state of New Zealand's agricultural sector is described, and the probable reasons for the current situation of virtual agricultural stagnation outlined.

In Chapter 2, the dimensions of the labour problem are defined. The duality of the problem is exemplified by considering it from the perspectives of demand and supply. Demand for labour is influenced by the polar positions between which the farmer may alternate with respect to production strategy: minimise risk or maximise profit. The "labour problem" is conceptualised in the four dimensions of availability, cost, retention and efficiency, which constitute the supply perspective, and which manifests itself as a labour shortage in the agricultural sector.

The construction of the research design and the sampling procedure are outlined in Chapter 3. The analysis rests on a survey of sheep farmers in three distinctive physical and farm environments.

Chapters 4 and 5 present and explore the research findings. Firstly, the dimensions of the labour problem are investigated in both a structural and a locational context. Discussion of the relative importance of cost, retention, availability and efficiency

renders important conclusions. An assessment of the labour shortage as a constraint to increases in production is offered, with an examination of the structural ramifications of the labour problem in the farming operation.

In Chapter 6, the findings are interpreted in the wider setting of New Zealand and implications for agricultural policy are considered in relation to national development into the 1980's.

## FOOTNOTES

- 1 N.R.A.C.: The National Research Advisory Council.  
O.E.C.D.: The Organisation for Economic Cooperation and Development.
- 2 The expansion of agricultural exports as an economic growth policy represents adherence to the theory of unbalanced growth, in which it is recognised that change in the economy is dependent upon substantial investment in one sector. Through linkages in the economy, this investment transmits growth to other sectors (Myint, 1960; Streeton, 1963). Typically, the agricultural sector is the first able to earn sufficient foreign exchange to promote overall economic development (Islam, 1974; Lewis, 1956; Papi, 1966), although some New Zealand economists argue that investment in manufacturing is the necessary strategy (Blyth, 1961, 1964, 1965; Franklin, 1978; Holmes, 1976).

Not all economists agree that investment in one sector (i.e. unbalanced growth) will create sustained and irreversible change in the institutional framework of the economy. The call "to diversify or go under" (Anon., 1975b) emphasises an alternative growth strategy in which investment is carried out simultaneously among sectors (Johnson and Kamerschen, 1972; Mundlak et al, 1974; Nurkse, 1961; Thorbecke, 1969). This view of balanced growth requires economic policy to be rationalised among the sectors of agriculture, manufacturing, forestry and fishing, but its attainment is relatively difficult (Gould, 1972; Robinson, 1972).

The theory for balanced as opposed to unbalanced growth is described fully in Dunn (1971), Hirschman (1958) and Islam (1974). Johnston and Kilby (1974) and Mundlak et al (1974) present models for the growth strategies.

Successive efforts in New Zealand to broaden the economic base and provide a new source of economic viability have not overcome the agricultural primary established, and the



unbalanced growth which has occurred (Cant and Johnston, 1973). McLean (1978) outlines five alternative economic strategies for growth in New Zealand in the 1980's:

- 1) "More Market" - greater use of market forces to allocate resources within the economy, with the goal to maximise growth in export industries.
- 2) "Insulation and more central planning" - policy to maximise growth in export industries by using detailed administrative intervention by government on the basis of central planning.
- 3) "Industrialise Rapidly" - strategy based on quickly reducing New Zealand dependence on agriculture by allocating new resources primarily to the manufacturing industry.
- 4) "Tidy Up existing policy" - no change in the present style of economic management, but rationalising existing measures applied to agriculture to obtain what extra output is possible under the constraint of limited change.
- 5) "Social and environmental needs first" - social and environmental goals are pursued at the expense of economic growth.

McLean claims that New Zealand has no option but to adopt the new strategy of "more market". The present thesis goes some way in providing evidence which can be used to better judge which of the alternatives should be emphasised.

- 3 M.A.F.: Ministry of Agriculture and Fisheries, New Zealand.
- 4 Low agricultural incomes incorporate the two aspects of diminishing surplus income and falling total revenue. In the present survey the farmer tended to make no distinction between falling total income and a declining profit margin, although he inevitably raised the point that the cost of farming inputs had increased drastically which suggests that he saw the problem in terms of erosion of the profit margin. As the table below indicates, gross income has increased since

1962, but net income varies considerably. This fluctuation is, as much as any factor, a reason for declining confidence in the farming sector.

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TABLE 1.1  
INCOME PER SHEEP FARM, 1962/63 - 1975/76

	Gross income \$	Net income \$
1962/63	15,100	5,700
1963/64	18,400	7,600
1964/65	17,100	5,800
1965/66	18,200	6,000
1966/67	16,800	4,200
1967/68	16,500	4,800
1968/69	19,200	6,000
1969/70	20,500	6,300
1970/71	20,200	5,800
1971/72	22,900	7,100
1972/73	39,300	18,800
1973/74	38,200	14,300
1974/75	26,700	5,400
1975/76	40,100	12,400

---

Source: Maughan, 1977a, 70.

- 5 Policy measures are discussed in Chapter 6 of this thesis, and are well documented in O.E.C.D., (1974) and M.A.F., (1977a). Over the last decade policy has tended to be defensive in nature; a series of ad hoc responses to particular situations rather than part of a comprehensive and long term agricultural programme (McLean, 1978; Ross, 1976).

The measures introduced in the last ten years include:

- minimum price support
- price stabilisation for the sheep and beef sector

- the Stock Retention Scheme, a direct income supplement
  - the Livestock Incentive Scheme, a capital grant for development
  - various taxation relief measures
  - selective subsidies to inputs (e.g. fertiliser application and transport; pesticide; drench)
- 6 Dry hill country has an average carrying capacity of about 4 ewe equivalents per hectare, whereas the wetter and easier hill country carries about 10 ewe equivalents per hectare (Brougham, 1973).
- 7 A distinction must be made between the types of returns which constitute agricultural development. Economic growth is defined as "an increase in aggregate product, either total or per capita" (Robinson, 1972, 54). Consequently, development can be measured as an aggregate increase in output or scale of productivity - a change in the inputs in type and/or in quality which results in higher output per unit of input (Philpott, 1961; Tennant, 1978).

This thesis concentrates on the issue of securing an aggregate rise in the volume of production. This may stem from both quantitative and qualitative increases, or consistent production and declining productivity, at the farm level.

The emphasis on volume of production is made necessary because of the place labour efficiency (a measure of productivity) takes as one component of the labour problem. It is imperative that the production measure is of changes in the aggregate structure and not the changes within that structure, if these changes also constitute an observed variable.

- 8 The conventional figure, according to Franklin (1978), is one man to 1300 ewes. Milne (1969) describes how it is possible to farm 2000 or more ewes per man by adopting various labour-saving techniques. The survey conducted for this thesis derived an average figure of 1640 stock units per labour unit.

- 9 In terms of economic theory only.
- 10 Terminology used in this thesis is consistent with the definitions below:
- Farming System: a distinctive type of man-modified ecosystem through which flows both energy and money (Harris, 1969; McDaniel and Hurst, 1968). Thus, sheep farm operations constitute one farming system, dairying another.
  - Farming Type: Within each system, there are a series of sub-systems or farming types, which incorporate varying degrees of the system's components. For instance, the sheep farming system includes intensive fattening, mixed cropping-fattening, and breeding strategies.
  - Farming Environment: the physical area, defined by topographical criteria, within which various farm types and systems are located.
  - Farming Strategy: the approach adopted by the farmer as his production policy. The two polar positions of the strategy are to minimise risk or to maximise profit.

## CHAPTER 2

### DIMENSIONS OF THE LABOUR PROBLEM

In New Zealand's farming sector, labour is a scarce factor (Moran, 1974). With a population of only 3,145,900 million (Department of Statistics, 1978), less than 12 percent are employed in agricultural activities.<sup>1</sup> Unlike densely populated countries such as Britain, the agricultural sector in New Zealand has no large reserve labour pool to call on. From a discussion in the Proceedings of the Agricultural Policy Seminar (Maughan, 1977b) a view was advanced that the labour shortage was "killing" farming. It was preventing an increase in production and preventing the farmer from using more sophisticated management techniques.

The assertion that labour problems are a limiting factor to increased production from the farm is advanced by a number of researchers. In Pryde's survey (1977b) on farmers' attitudes towards production and agricultural policy, the need to employ labour was consistently given as one of the five most important constraints to output expansion as perceived by the individual farmer. A report on farm labour in Patangata County, Hawkes Bay (McClatchy, 1966) was partly initiated because in 'the 1965 Waipukurau Farmers Conference, 30 percent of farmers who answered a questionnaire claimed that labour difficulties of one sort or another were their main limitation to increasing production.' The hypothesis that many sheep farmers were at least partly restricted in their farming activities because of the availability and price of farm labour was the motivation for a study by Milne (1969) of labour saving techniques on North Island sheep farms.

Although recognising the importance of the labour input, most of the literature is concerned with discussing the various aspects of the "labour problem", and alternative policies to resolve these problems. Few studies actually relate labour to production and measure the effect of the labour problems on output. This issue can be approached by first outlining the "dimensions" of the labour problem at the farm level. These are logically discussed from a) a demand and b) a supply perspective, which gives to the topic a certain

duality.

#### THE DEMAND FOR LABOUR

The human element in agriculture is responsible for both decision-making and performing the physical work. Whereas in modern industry, the activities of labour and management are usually kept separate, in agriculture they are often combined in the person of the farmer. This adds confusion to the question of farm labour required, as the true demand is often hidden by the farmer working harder himself or utilising unpaid family labour.

There is a demand, however, if labour is priced and can be utilised through time to increase the volume of production and/or productivity on the farm. The demand originates directly from the managerial component, which, in any discussion on farm production, cannot be overemphasised (Neutze, 1956). Regardless of national policy, market trends and farm advisory directives, the final decision for production on the farm falls to the owner/manager. It is his confidence in and perception of the state of the industry that finally decides what he produces and the quantity. It is his decision to adopt new management techniques, outlay capital, hire and fire labour.

There are two polar strategies to production which the farmer may adopt: a policy to minimise risk or to maximise profit (Crump, 1966; McLean, 1978). The more conservative and the more established farmer is likely to approach farming with the attitude of minimising his possible losses. Crump (1966) sees this as a non-monetary goal motivating the farmer. Thus, he will not overstock; he will grow crops for a sure market although the price may be lower than for an undependable cereal - always he will ensure he has reasonable flexibility to change his production patterns or withstand unfavourable conditions should the need arrive. Such a policy is termed minimising the risks - but it usually means smaller (if more stable) profits, and a reluctance to utilise the land to its full potential, which would leave almost no margin of flexibility. Alternatively, the other extreme of the stance is that of maximising

the profit. The farmer is motivated by monetary goals and wants to achieve maximum gain for his time and effort, although this involves greater risks and uncertainty.

Which strategy, or combination of the two polar positions, the farmer will adopt is influenced by the conditions prevalent on the farm and by external matters such as governmental policy incentives. The farmer's decision is constantly being adjusted to suit himself, climatic conditions, staff illness or cost, prices, and adverse situations.

Farmers throughout the world are known to be risk averters, which means they are just as concerned with minimising losses as with maximising profits ... The factors of risk and pressure are discussed as economic factors since farmers respond to them in a rational economic manner. Scientists and extension workers at times wrongly attribute the failure of farmers to adopt new techniques to non-rational behavioural factors, but the degree of risk a farmer is willing to take and the effort he decides to exert are related to the returns he receives, and after a period of low incomes or bad seasons, his response to better prices or government incentives is much slower. This probably explains much of why farming is responding so slowly at present.

(McLean, 1978, 64-65.)

It is exceedingly difficult to ascertain which strategy an individual farmer follows, as he may change over a short time, in response to varied confidence in the economy. The utility of the two polar positions is that, despite measurement problems, they enable questions to be posed of the data, to determine the implications if all the farmers fell into one category or the other. For whichever approach is taken will greatly influence the development on (and hence demand for additional labour) and output from the farm.

#### LABOUR SUPPLY

Classical economic theory states that demand creates supply. If that supply is inhibited through a number of reasons, a problem is created and manifested as a shortage of that commodity. Thus the farm labour issue is investigated under a series of inhibiting factors to ascertain if they are contributing to a general farm labour shortage.

### The Labour Unit

The labour unit on the farm can be classified into two categories: the permanent worker and the occasional worker, the latter category including family, part-time, casual and contract labour.

The farm worker is defined as the permanent, paid employee, engaged in farm work only, and for at least forty hours per week. He is hired on a long-term basis, although he may stay for only a short time. This category can be divided between family and non-family labour, and between married and single workers. Usually the labourer is not a member of the family, but a son or daughter can be included if they are paid an equivalent wage (i.e. they must not be part of the unpaid or underpaid family labour force).

The marital status of the permanent farm worker must also be considered, especially when studying the retention and cost aspect of farm labour. McClatchy (1966) found that the proportion of single men employed to married men grew with increasing isolation, and that the turnover rate for single men was significantly higher than for married men. Thus, in more remote areas, farmers were employing single men when they regarded married workers as more reliable and desirable. The cost of employing a married worker, however, is generally far greater than for a single labourer (as a house must be provided) and this expense must be considered against the expected length of stay from the single worker.

The alternative to employing a full-time labour unit is to make use of occasional labour. In many instances, this is a member of the family, who helps out at peak times. Various studies have looked at family labour as an alternative to the high cost and management problems associated with employing non-family workers (Campbell, 1970; Willis, 1973). The part-time worker is employed on the farm for the whole year, but is only occupied with farm labour for part of each day.<sup>2</sup>

The labour requirements for casual workers are either seasonal or non-seasonal, and involve working all day but not for the entire year. Milne (1969) described seasonal work as that involving live stock husbandry operations such as mustering, lambing, docking and



shearing, for which there are definite peak labour demands. Non-seasonal work involves maintenance and development on the farm, which can be performed throughout the year, but is usually undertaken in off-seasons when the labour requirement for livestock operations is at a minimum. Fencing, scrubcutting, topdressing and building and general repairs are examples of non-seasonal maintenance and development operations.

The final labour category is that of the agricultural contractor. Increasingly, contractors have become an important labour input to the farm, as both maintenance and husbandry operations become more standardised and specialised. It is not economically feasible for the individual farmer to own expensive harvesters and other specialised machinery, for use for only a limited time each year. On the majority of farms, the capital outlay required to purchase cultivation, bulldozing and topdressing equipment is beyond the profitable capability of the individual farmer.

The availability of shearing, crutching, fruitpicking and scrubcutting gangs allows the farmer to employ extra labour for specialised tasks at the times when it is required. Thus, agricultural contracting is a vital part of the labour input into New Zealand agriculture. There has been an increase in farm contracting services available, and in farmer demand for them. In a survey of farm enlargement in Northland, Smit (1971) determined that between 1964 and 1970, 47 percent of farms with enlarged units and 29 percent of non-enlarged units increased their use of contract labour. While there was a continuing decline in the numbers of farm workers in the dairying industry, the numbers in agricultural contracting doubled between 1961 and 1966 (Lloyd, 1974).

The varied nature of the literature on farm labour in New Zealand necessitates the conceptualisation of the supply side of the problem into four dimensions: availability, cost, retention and efficiency. These categories are not complete in themselves, but overlap such that, for example, recruitment and retention of workers in the agricultural labour force may relate to management abilities and wage rates.

### Labour Availability

The shortage of suitable farm labour has been suggested as having a significant effect on the capacity of the farming industry to maintain and increase farm production (Lloyd, 1974). Recruitment into the agricultural labour force is influenced by two major factors: the unpredictable demand, which varies according to the previous years income, and the "image" of farm labouring which prejudices the employee's readiness to engage in farm work. Low wages, long hours and low status have long been associated with and plagued the agricultural industry to the extent that young people have tended to dismiss farm labouring as an undesirable career (Hagan, 1966; McClatchy, 1966).

In the early 1970's, there has been no major reduction in the total farm labour force, although the numbers of paid employees appear to have stabilised at a lower level since 1974 (Table 2.1). From examination of the farm manpower trends since 1966, detailed by Lloyd (1974), it does not appear that the total farm employment figures have fluctuated sufficiently to be a major and disrupting phenomena. The Manpower Working Party Report (1966) established that, in 1963, 17 percent of school leavers looked towards farming for employment and that recruitment from immigration was good. Although now there are probably less than this estimated 17 percent, the recruitment into agriculture would still be higher than the 11.4 percent of New Zealand's labour force which in 1977 was engaged in farming<sup>1</sup> (Department of Statistics, 1978b).

The problem then, is not one of labour shortage per se, but of labour mobility. There does not appear to be any institutional, social or psychological impediment to the flow of sufficient labour into agriculture, but there are factors working which cause farm workers to leave the sector. One area of concern is the social disadvantages associated with rural living. Much has been written on rural depopulation (Franklin, 1969a; Heenan, 1967, 1968; Lloyd, 1974) and time and focus do not allow a full discussion of the factors here. Suffice to say that in the 1960's there was a continuing migration of population from the rural areas to the urban

TABLE 2.1  
EMPLOYMENT IN AGRICULTURE, 1971/72 - 1975/76

	Number of working owners, leaseholders and share- milkers	Number of unpaid members of family assisting in farm work	Number of paid permanent employees <sup>a</sup>	Number of paid casual employees	Number of total labour force working on farms
1971-72	67 191	18 349	33 501	10 371	129 412
1972-73	64 664	18 602	35 088	11 379	129 733
1973-74	66 411	23 850	38 931	11 340	140 532
1974-75	63 787	23 794	37 711	9 359	134 651
1975-76	75 722 <sup>b</sup>	20 266	37 578	9 469	143 035

Notes: a Includes part time and full time permanent employees

b Increase could be due to the inclusion of a new category in the Department of Statistics tables dividing Working Owners, Leaseholders and Sharemilkers into more than and less than 30 hours employment.

Source: Department of Statistics, 1978a.

areas and thus a steady decline in the proportion of the New Zealand population living in the rural areas. From 1961 to 1971, the decline has been both relative and absolute (Lloyd, 1974). Although Gill (1976) has affirmed that recent evidence does not substantiate a continuing "drift from the land", the consequences of the previous rural outmigration on a healthy community are apparent.

Over the years, closure of branch railway lines (Mowat, 1966) and centralisation of dairy factories (Brooks, 1970) have contributed to a gradual decline in the importance of the rural village as a service centre and a focus for community activities. Consolidation and centralisation of educational and medical services, and the personnel associated with them, coupled with the steady decline in the number of farm holdings due to amalgamation and the trend towards increased average farm size (Department of Statistics, 1973-1976a; Lloyd, 1974; Smit, 1971) have created a situation in which there are fewer people in the countryside. This has important social implications for equity to services and amenities. The question is whether the situation has become cumulative, possibly to a point in the more isolated areas where the loss of non-essential services, and more particularly the personnel associated with those services, means it is no longer possible to sustain essential services within the rural districts (Lloyd, 1974). Should this be the case, the ability of farmers to recruit and retain farm workers in the more isolated rural areas is likely to diminish further.

Cant (1967) suggests that there are regional shortages of permanent farm labour, especially in peripheral counties such as Northland and the Bay of Plenty. Morris and Cant (1967) determined that the labour shortage of between 8 and 10 percent in Cheviot County, Canterbury, was for particular skills, especially shepherds. A competent shepherd, with a team of dogs, is becoming relatively scarce. The Manpower Working Party (1964) estimated a current shortage of between 200 and 250 experienced shepherds. Although the Working Party stated that the shortage was greatest in the more remote areas, Morris and Cant concluded that the shepherds were most

needed on smaller hill country farms which were not large enough for two teams of dogs.

The greatest shortage of labour appears to be seasonal (Manpower Working Party, 1964; Milne, 1969). Conventional farming systems have seasonal peaks in their production process (Figure 2.1), when the demand for labour is highest. With livestock the labour requirements are greatest in Spring and Summer: on sheep farms for husbandry operations such as mustering, lambing, docking and shearing; on factory supply dairy farms, for the summer milking season. With arable farming, labour requirements increase during the cultivation and harvesting seasons.

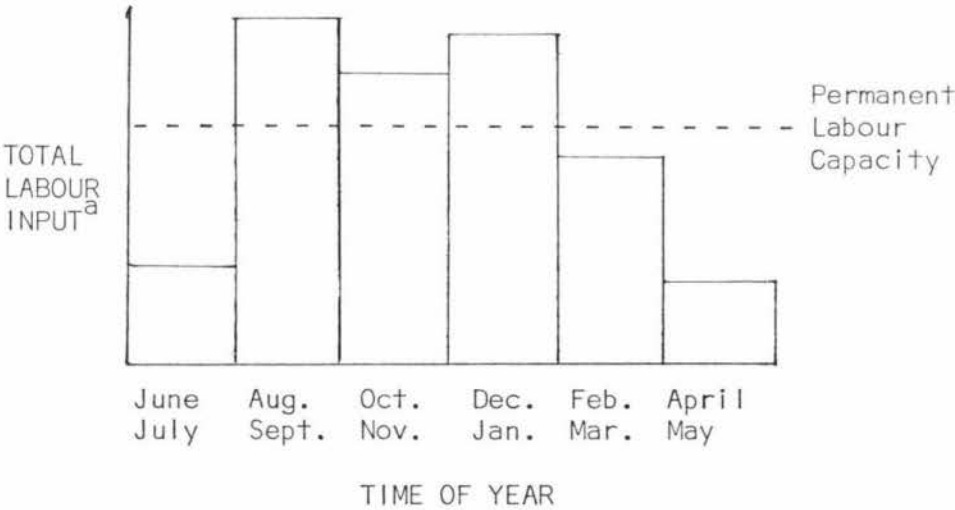


FIGURE 2.1 Labour Profile for a North Island Sheep Farm.  
Notes: a Refers to work which has to be done within the nominated time period.  
Source: Milne, 1969, 45.

In response to this peaking in demand, occasional labour has been employed extensively throughout New Zealand. At one time, when wage rates were lower, the farmer could afford to carry a second worker through the slack period, but this is no longer economic and the farmer must rely on casual labour (Smith, 1971; Woods, 1965). Agricultural contracting services have grown substantially to fill this role and counterbalance the decline in on-farm labour numbers (Lloyd, 1974). The demand for that one extra hand at lambing time, drenching as shed help, however, is frequently not met, as the national objective of full employment conflicts with the seasonal demand in agriculture for casual and temporary labour (McClatchy, 1966; Milne, 1969; Morris and Cant, 1967).

There are shortages of casual and part-time labour in varying degree at different times of the year, but the days when such calls for labour could be adequately met from a pool of more or less permanently unemployed or underemployed men are long past.

(Manpower Working Party, 1964, 185)

### Labour Cost

The extent to which the labour shortage is derived from a genuine lack of labour or from the lack of profit to employ labour is central to the question of a farm labour problem. Labour is a "lumpy" and expensive input into the farming system and consequently any staff increases are justified only if productivity also increases to pay for the extra man. The New Zealand Meat and Wool Board determined that wages are the biggest single item of expenditure in the sheep farming industry, being over 20 percent of the cost of all inputs (McDougall, 1971). Not only does the expense cover rising wage rates but extends to the cost of housing a married worker, perhaps subsidising his superannuation scheme, or his children's education at a boarding school.

Whether the farmer decides to employ available labour depends largely on his working rules - if his policy is one of minimising risks, he will tend to limit output from the farm to that with which the existing labour force can cope. If he is motivated to maximise

profit then the farmer will be looking towards development, usually from increasing stock numbers which inevitably requires additional labour.

The extra man, however, must "pay". The full-time labour unit is indivisible and unless casual and part-time workers can be found, a farmer must limit the scale of his operation (Smit, 1971) or operate at an uneconomic level. Koller (1972) estimates that an additional 780 ewes or 110 cows are required to cover the cost of a new married employee; Holden (1965a) maintains that on developing hill country an extra 1,000 ewes are needed as a minimum.

The problem of the "man and a half" farm is very real but little documented (Bevin, 1953). On a property which is too large for one man but barely large enough to support two, the cost of the extra man enforces an initial decrease in the owner's income, which results in either a reduction of his standard of living, or a reduction in his investment in the farm in order to maintain his present living standard. The New Zealand Farm Advisory Division (Department of Agriculture, 1971) claimed that "the future is being mortgaged": on high country sheep farms, net farm income in 1971 was down by fifty percent and to compensate for the falling prices and rising costs, expenditure on fertiliser, repairs and maintenance, and labour was cut.

Farming is perhaps unique in that its cost structure is determined by the internal market, whereas prices are determined externally by overseas markets. Consequently, the farmer is part of a "price-less" industry and cannot pass on the increased costs of production in the same way that a non-agricultural economy, based on the "cost-plus" structure, is able to (Philpott, 1975a,b). The labour input especially, is becoming very expensive. Between 1972 and 1977, the all costs index has increased by between 80 percent (sheep farms) and 100 percent (dairy farms) (Maughan, 1977a). Increasing wage rates led M.A.F. to state, in a review of the livestock industry (1976e) that there was an increasing number of situations where the most profitable alternative is to reduce stock carried and

save the cost of the labour unit. This has serious implications for future increases in agricultural production.

The alternatives to the cost of employing labour are few: either operate at a lower level of output or utilise more fully unpaid or underpaid family labour. The latter decision conceals the true labour costs of farming. Willis (1973) proposed that the widespread use of family labour on South Taranaki dairy farms was a direct response to the high wages necessary to attract non-family labour, and that with the increasing socio-economic position of the farmer there was less use proportionately of family labour. The traditional family farm continues to be the basis of New Zealand agriculture (Lloyd, 1974; Morris and Cant, 1967; Tennant, 1978) although the effect of equal pay for women and a greater proportion of working urban women may have a considerable impact on the conventional family farm structure in the future.

A subsidy on farm workers wages is one solution to the high cost of labour. There is no guarantee, however, that the farmer will utilise this cheaper labour to increase production. A Dairy Farm Survey, conducted by M.A.F. on 50:50 sharemilkers (1977c) arrived at the tentative conclusion that if wage rates were subsidised substantially, the majority of sharemilkers would employ some type of labour, but significantly fewer would increase their herd size.<sup>3</sup>

### Labour Retention

Retention of farm labour, both at the farm and the national level, is essential to a smooth functioning agricultural system. At the farm level, high labour turnover is undesirable especially if confined to one season. Livestock husbandry operations require a degree of familiarity both with the animals and the individual farm set up which can only be gained from adequate experience on that farm. The inconvenience to the farmer, and time and cost involved in replacement and retraining when an employee leaves, particularly in mid-season at short notice (Bradford, 1971f) makes rapid labour turnover undesirable.



Permanent, non-family labour, however, is relatively mobile. From the Patangata County Survey, McClatchy (1966) determined that 60 percent of all single workers stayed less than twelve months on one farm, while only one man was resident for longer than five years. For married men, the figures were 30 percent and 11 percent respectively. This indicates a high labour turnover and although isolation was not a significant factor to higher turnover, there was greater difficulty in filling vacancies in more remote areas. A Dairy Board Farm Labour Survey (1972) substantiates McClatchy's claim that farm labour is relatively mobile.

The reasons for much of this mobility are dismissals and movement for job promotion, although discontent with working and living conditions, wages, status and interpersonal relations are relevant. In McClatchy's survey, 22 percent of farm workers neither came from nor went to another farm job, which indicates that there is some dissatisfaction with farm labouring.

From the national standpoint, the retention problem is one of migration out of the agricultural labour force, of the more experienced workers. There is an exodus of farm labour, particularly over 35 years of age, 'who have become experienced in their work and whose loss from the industry is the more serious for that reason' (Manpower Working Party, 1964, 188). Between 1951 and 1961, approximately 12,000 people between the ages of 35 and 65 left the agricultural work force, the majority for reasons other than retirement, to be replaced by younger, less experienced workers. Cant (1967a) describes the significant movement in two Canterbury districts of labourers with more than five years experience into the nearby urban centres of Christchurch, Ashburton and Timaru. Although approximately 25 percent of these workers were moving to jobs in which their farm training was directly applicable (e.g. as agricultural contractors, stock agents and rural drivers) more than half were going to unrelated employment. Apart from the loss to the agricultural industry of skill and fitness necessary to productivity, a period of costly retraining would be needed before these people could take on their new jobs.

Lloyd (1974) classified the factors associated with outmigration of farm employees in three categories. The first group incorporates those factors over which the farmer has some control. These include conditions of employment, wage rates, status and recognition, and interpersonal relations. The relative income difference between farm and non-farm workers is often cited as the reason for labour migration (Cant, 1967b; Ross, 1965; Woods, 1965). Cant and Woods (1968), however, contend that the ability of the farmer to handle labour is the key to the manpower retention problem, and argue that status and recognition are basic to the satisfaction and hence retention of the farm worker. Wages are important only within the overall context of Man Management (Gillard, 1972; McArthur, 1964) and are not a substitute for poor interpersonal relations between employer and employee.

The second category of factors associated with outmigration are those which the farmer may be able to alter to some extent. Home ownership difficulties and concern for future security may motivate the employee to migrate into town before retirement necessitates this move. Concern for home ownership tends to coincide with the time the farm labourer's children are ready for secondary school which reinforces the migration.

For tenants in employer-provided accommodation, the Budget in 1978 announced a loan scheme for a first home (Housing Corporation, 1978). Unfortunately, the conditions require that the applicant be over 40 years of age, which is little help to the young farm labourer, and the problem of home ownership continues to be a contributing factor to the movement out of farm work.

The projected image of farm labouring appears to need revising if the employment is to attain the status of a permanent career and not simply a stepping stone to eventual farm ownership, or a "fill-in" job for those who have not the opportunity or desire to buy their own farm. Some writers have advocated payment for skill, responsibility, experience and continued service in order to create a secure position and increase the prospects for workers

remaining in agriculture (Carmody, 1963; Hagan, 1966; Morris and Cant, 1967; Rowlands, 1953).

The final group of factors related to outmigration of farm labour are those over which the farmer has little control. These include the isolation of the farm, emphasised by poor roading; the lack of educational facilities, especially for secondary schooling; the lack of social and medical amenities in the rural areas; and the limited opportunities for female employment (Franklin, 1969a; Heenan, 1967; Lloyd, 1974; N.R.A.C., 1978). These are factors which rural dwellers must, on the whole, accept as part of the country life, especially with the continuing trend towards centralisation of educational and social facilities to capitalise on scale economies.

The concept of non-resident labour has for a long time been accepted as the viable alternative to the problems of isolation on the farm (Andrew, 1962; McClatchy, 1966; Rowlands, 1953; Vine, 1961) but few examples of commuting farm labour can be cited.<sup>4</sup> There is provision for loans for employer-provided accommodation in a village or nearby township (Rural Banking and Finance Corporation, 1977c) which enables employees and their families to have better access to schooling and other social amenities, but it leaves the ownership of the house with the employer and in this regard does not eliminate the central problem of home ownership.

#### Labour Efficiency

The concept of efficiency is defined as the ratio of output to input (Philpott, 1961). Woods (1965) claimed that there was a decline in the ratio of farm labour to farm output. In 1952, there was a labour force of 129,000 to 482 ewe equivalents. He estimated that by 1972, the projected 904 ewe equivalents needed to meet the proposed 4 percent per annum growth in Gross National Product (Agricultural Development Conference, 1963/1964) would require a farm labour force of only 122,800 persons. Thus, each labour unit would on average need to be twice as efficient as twenty years previous.

Although the 4 percent per annum growth was not achieved, labour productivity for the New Zealand labour force did increase between 1960/1 and 1971/2 by 1.6 percent per year, with average sheep farm numbers rising from 1,572 to 1,931 without any significant rise in farm labour (O.E.C.D., 1974). Since 1972, however, output per farm worker has declined (Table 2.2).

The efficiency of labour has been increased by innovations and new management systems of farm organisation. With regard to technology, due to unsuitable, expensive and/or inexperienced farm labour, it is often more economic to invest in laboursaving machinery than in the labour unit. Dobson (1971) states that the 1964/5 average of 53 milking cows per man has increased to an average of 75 cows per labour unit by 1972, through innovations in milking machinery and cowsheds. Electric fences, portable dips and dagging pens, and transportation developments (motobikes, gnats, and multi-purpose tractors) are only the beginning in a long list of mechanical devices which have enabled one man to manage larger areas and greater stock numbers while increasing productivity (Milne, 1969; Smit, 1971).

Changed management systems, reorganised on the principle of minimum labour, have also contributed to a higher average labour productivity. New management incorporates laboursaving technology with reorganisation, method study (defined by McArthur (1967) as analysis of work to find the easiest, least cost/effort procedure) and the use of less labour-intensive livestock breeds, such as the Perendale and Coopworth. Milne (1969) claims that changed farming policy such as the adoption of second shearing to reduce labour requirements in Spring, and easycare lambing, can increase labour efficiency markedly.

A study on the increase in sheep numbers per man, between 1956 and 1966, revealed that certain farmers had achieved 100 percent increases in ewe numbers without additional permanent labour by adoption of new management systems. The annual savings in wages, "perks" and housing were computed at \$3,300 (Anon., 1969a).

TABLE 2.2  
 INDEX OF OUTPUT PER FARM WORKER, 1963/64 - 1974/75  
 (1960-61 = 1000)

		Annual Percentage Change
1963-64	1 110	+3.0
1964-65	1 134	+2.0
1965-66	1 183	+4.0
1966-67	1 209	+2.0
1967-68	1 249	+3.0
1968-69	1 284	+3.0
1969-70	1 277	-0.5
1970-71	1 296	+1.5
1971-72	1 333	+3.0
1972-73	1 279	-4.0
1973-74	1 180	-6.0
1974-75	1 133	-4.0

Source: Pryde, 1977a, 8.

Increased labour efficiency may result from a change in farm policy, e.g. from dairy to mixed farming, or to an increased proportion of dry stock. Smit (1971) studied structural change through farm enlargement in Northland, and concluded that on farms which had changed in type, the productivity of labour had always increased.

#### THE ALTERNATIVES

The labour problem per se encompasses the four areas of concern: availability, cost, retention and efficiency; the manifestation of which is the existence of a labour shortage.

A deficit in labour supply may arise from three situations: the farmer's demand is absent; farmer's demand is present and is not being fulfilled; and/or the farm workers are withdrawing their labour for more lucrative rewards in other employment. In the discussion on labour shortage, it is assumed that either the farmer's demand is there, or that it can be motivated. The enquiry probes the supply of farm labour in relation to this demand, in order that the wider problem of labour shortage and agricultural production can be investigated.

There are a variety of measures documented for overcoming the labour shortage. The farmer may, of course, limit production to a scale which he can handle without employing additional labour. To remain economically viable, however, the farmer must attempt to maintain or increase output, by utilising the alternatives available to him. The contribution of unpaid or underpaid family labour is very significant as a substitute for permanent non-family labour and a reason for the "durability" of many farming systems (Campbell, G.H., 1970; Willis, 1973).

Milne (1969) has referenced many laboursaving techniques designed to increase the efficiency of the existing labour units. These techniques are aimed at reducing the time taken to decide on, prepare for and perform the necessary farm operations, and include such innovations as good labour scheduling, access races, additional

sheep yards, effective farm tracking and transport, pre-lambing controlled grazing and concentrated lambing.

Capital substitution increases the capacity for output per labour unit. Investment in laboursaving machinery such as the rotary milking shed and the farm bike, is in part responsible for the increase in farm labour productivity of 3 percent (male labour force only) from 1960/61 to 1971/72 (O.E.C.D., 1974). Capital expenditure per farm and per stock unit, however, fluctuates widely in response to farmer's income (Maughan, 1977a), and must be cited with reservations as a major alternative to the labour shortage.

The increased use of agricultural contractors and the development of Group Labour Schemes represent alternatives to the employment of permanent labour. Group Labour Schemes work on the principle that a number of farmers share one employee. To be successful, the membership of farmers must be small and a guaranteed minimum wage and hours worked by the employee set down. There are examples of successful Group Labour Schemes (Anon., 1969b) but in practice they tend to break down after several years. Possibly a more flexible arrangement, in which the farm labourer lives and works on a contract basis in the rural community, would be more successful.<sup>5</sup>

These strategies to overcome the shortage of farm labour represent an attempt to prevent an inadequate labour supply from limiting agricultural production increases. An increase in stock numbers inevitably requires additional farm work, and if labour cannot be hired, it can prove a barrier to progress, especially on larger farm units (Hagan, 1966). It is imperative that farm output does not become geared towards the labour available, but towards the farm's potential capacity.

#### LABOUR SUPPLY, LABOUR SHORTAGE AND AGRICULTURAL PRODUCTION

The thesis, thus far, has sketched a framework relevant to the research issue. Management and labour have been conceptually distinguished, although in practice they are frequently combined in the person of the farmer. The discussion has isolated the problem



of farmer demand for labour as dependent on the farmer's position between the two polar production strategies of minimising risks or maximising profits. Separate to this, the labour problem is seen in terms of supply. The four inhibiting factors of worker availability, cost, retention and efficiency are described with reference to previous research on the labour issue.

Discussion in Chapter 1 pointed towards a need to expand agriculture as a specific economic policy, in order to avert serious national economic stagnation. The factors which contribute to an expansion of agricultural output must be determined and evaluated, however, before policy can be reliably formulated. This thesis looks at the labour factor - the nature of the labour supply and the intensity of the shortage - as it affects the volume of agricultural production from the farm.

National policy-makers are interested in what effect the farm labour problem has on the structure of the farming system, and if the intensity of the problem changes with physical environments. To this end, three structural attributes of the farming system are selected as most pertinent to the problem: farmer's accessibility, farmer's motivation, and the farm type. Should the existence of a farm labour shortage vary significantly with accessibility, the national and regional planning issue of establishing social and educational services in rural areas becomes important. If the labour problem is inversely linked to the aging of the farm operator, policy alternatives include incentives to create movement off the land of the older farmer. If a deficiency in labour supply is associated with farm type, policy might be better directed towards the appropriate farming sector, which is closely allied to the physical environment. Appraisals of agricultural potential suggest that the hill country areas have a great potential for readily attainable and sizable production increases (Hight, 1976; N.R.A.C., 1978). If inadequate labour supply is more acute in the hill country environment, the implication is that policy might be better directed towards assisting farming areas rather than assisting



across-the-board. The urgency of the need to raise agricultural production means that inductive enquiry is necessary if the theoretical assertions about the labour problem are to become a basis of policy formulation.

## FOOTNOTES

- 1 In April, 1977, the total labour force in New Zealand numbered 1,230,100. The figure in the Agriculture, hunting, forestry and fishing category was 140,900 (Department of Statistics, 1978b), which represents 11.4 percent of the total labour force.
- 2 Typically, from results from the present survey, the part-time worker is the owner's father who has "retired" from management and full-time duty, but helps every morning or afternoon with general farm jobs, thus keeping an interest in the farm.
- 3 It must be pointed out that the M.A.F. Dairy Farm Survey was biased in that only sharemilkers were questioned, and 50:50 milkers are usually working to capacity to accumulate as much capital as possible with the probable intention of buying their own farm. Consequently, the farm would be producing at close to full potential and the scope for increased stock numbers would be small.
- 4 In the present survey, 5 workers travelled an average distance of 16.7 kilometres to work each day. All owned their own home and in this respect were regarded as permanent employees. The general consensus from the employers, however, was that the worker's commitment to the farm is lessened if he lives away from the property and they preferred labour not to commute.
- 5 In Akitio County, an experienced stockman/fencer is available for employment, but he works his own time and has the right to accept or reject each task, thus he participates in the decision making (Field survey).

### CHAPTER 3

#### RESEARCH PROBLEMS AND METHODS

The labour problem can be examined both in terms of farming systems (a structural approach) and by farming environments (a locational approach). In order to give a focus to the research which is consonant with the conceptual framework, two guiding hypotheses are advanced. The first, a broad structural hypothesis, is that the labour problem, expressed as a labour shortage, is related to certain attributes of the farming system, namely accessibility, farmer's motivation and the farm type. The second, a locational hypothesis, asserts that the labour problem varies amongst farming environments, according to the strength of locational influences. The focus provides a schema for analysing the dimensions of the labour problem in agriculture. The enquiry can then proceed to examine the effect of the farm labour problem on structural change in the farming system, and assess its constraint to increases in agricultural production.

#### THE CHOICE OF A FARMING SYSTEM

The investigation was restricted to the sheep farming system for a number of reasons. Firstly, it was to avoid complications from different variables operating for different farming systems. The very nature of the labour contribution is different on different types of farms, especially when the sharemilking agreements in the dairy sector are considered. Campbell, (G.H., 1970) noted that on dairy farms it was necessary to milk every day for 7 to 9 months whereas sheep and cattle farms were more seasonal in their labour demand, requiring men to work long hours for short periods. In McClatchy's study on farm labour in Patangata County (1966) the sample included a small area of predominately dairying and cropping units, which was felt to have "contaminated" the data and should have been excluded.

Secondly, on sheep farms the labour and managerial dimensions are more likely to be separated. The production process is usually large enough to require additional labour and less easy to substitute capital for labour. In 1974, sheep farms accounted for 37 percent of the paid fulltime and parttime farm employees and 36.5 percent of the paid casual employees as against 23.1 and 8.6 percent respectively for dairy farms (Department of Statistics, 1977b). Consequently, a study on the problems of farm labour will benefit from research into a sector which depends to a large extent on outside labour.

Sheep farms are also less likely to depend on family labour. In dairying, the family contribution is often an integral part of the production process (Campbell, G.H., 1970; Morris and Cant, 1967; Willis, 1973). As such, a bias is created as the true costs of labour are hidden, and capital becomes the most important input when the production process can function without outside labour. A further reason for attempting to keep the study away from the family farm is that family labour is difficult to measure. "Labour" contributed by a member of the family as a family obligation, and "labour" contributed as an economic necessity is difficult to distinguish. Payment is a poor measure, as it may be given in substitution for pocket money, housekeeping funds or as a tax exemption.

Finally, it is in the sheep industry where the large fall-off had occurred in livestock numbers since 1968 (M.A.F., 1976a; Pryde, 1975). This sector, therefore, clearly deserves attention. By restricting the sample to sheep farms, the research eliminates additional complications from the different nature of the labour contribution between farming types. It must be mentioned that other factors, such as levels of indebtedness, inheritance patterns and farmers' innate management abilities cannot be controlled in such a survey, and do have an influence on the level of output from the farm.

In an attempt to impose some control over the uniformity of farming type, the sample of sheep farms was drawn within clustered regions, as defined by the Manawatu Catchment Board for water flow

and drainage purposes. Within each region, the survey attempted total coverage of all the relevant sheep farms. A decision to restrict the size of the sheep farms was deemed necessary. All farms had to be over 40.5 hectares either at the time of the survey or five years previous. This ensured that each farm included was an economic unit, capable of supporting at a basic living wage, at least one labour unit and probably more depending on the production type. The reason the size restriction relates to the five years previous was to ascertain if any farmer had reduced his property size below that on which a farmer could profitably employ a man and to discover the reason why.<sup>1</sup>

#### THE LOCATIONAL FRAMEWORK

The labour problem is examined in four selected areas within the Manawatu and North Wairarapa region.<sup>2</sup> The areas reflect a gradient of isolation from the nearest large city (Palmerston North) which corresponds closely to the transition from lowland to hill country farming as distance from the city increases.

The locational framework is designed to facilitate a comparison between farming environments in the selected farming systems. The four sample areas: Kairanga-Taonui, Kiwitea-Apiti, Mangamaire-Maharashtra West and Akitio-Pongaroa (Figure 3.1-3.5), henceforth referred to as Kairanga, Kiwitea, Woodville and Akitio, are designated as catchment regions by the Manawatu Catchment Board and therefore have natural boundaries in terms of water flow and drainage. As such, the physical attributes of each environment display maximum difference between and minimum difference within each area. They are not necessarily, however, economic, social or cultural entities according to other criteria.

The basic distinction between hill and lowland environments is the topography and related soils. Hill country is defined by the N.R.A.C. (1978, 3) as "predominantly non ploughable land", but this embraces a wide range of geological, climatic and soil conditions. The one uniting factor is the lack of flexibility in production

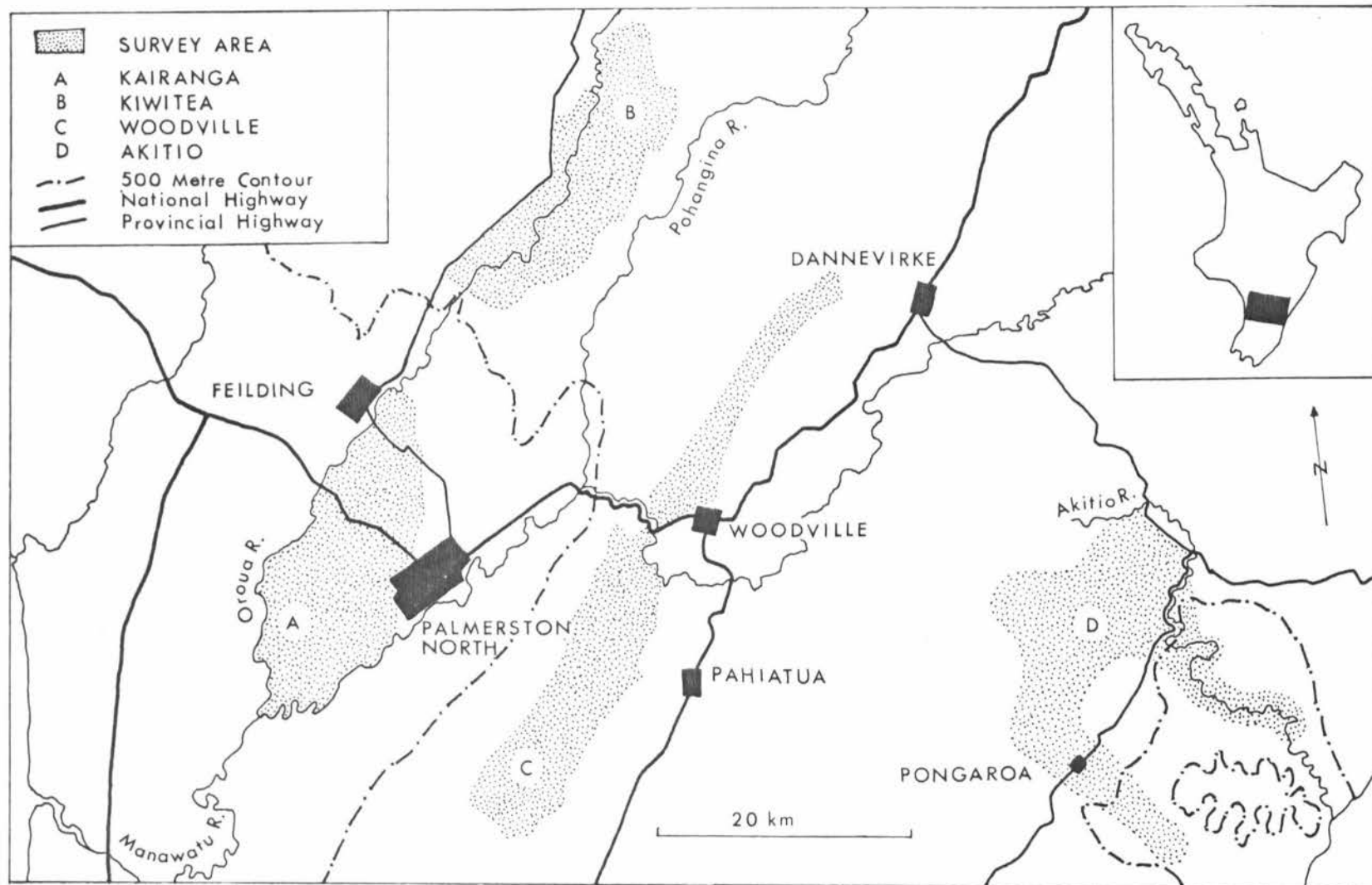


FIGURE 3-1 LOCATION MAP OF SURVEY AREAS

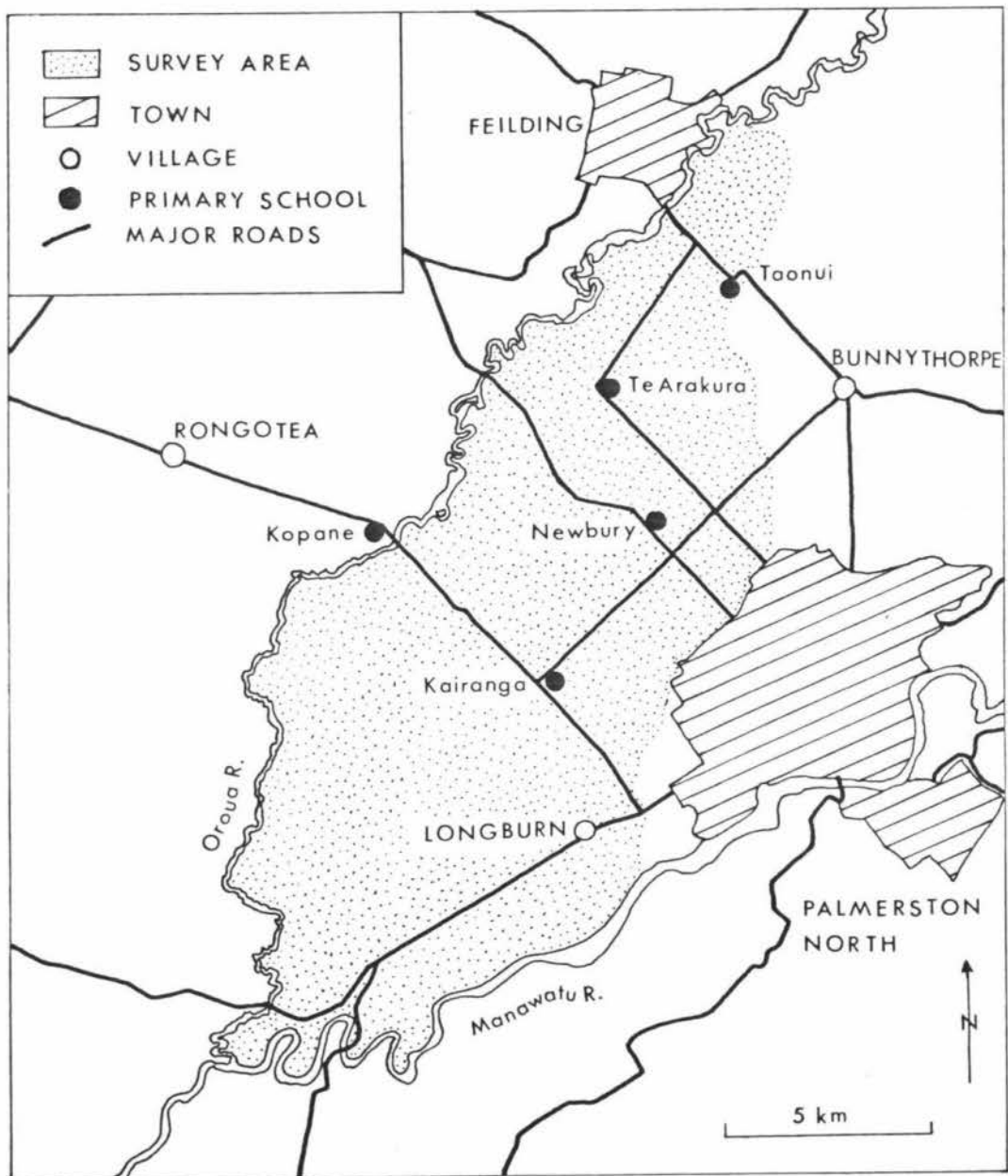


FIGURE 3-2 KAIRANGA-TAONUI SURVEY AREA

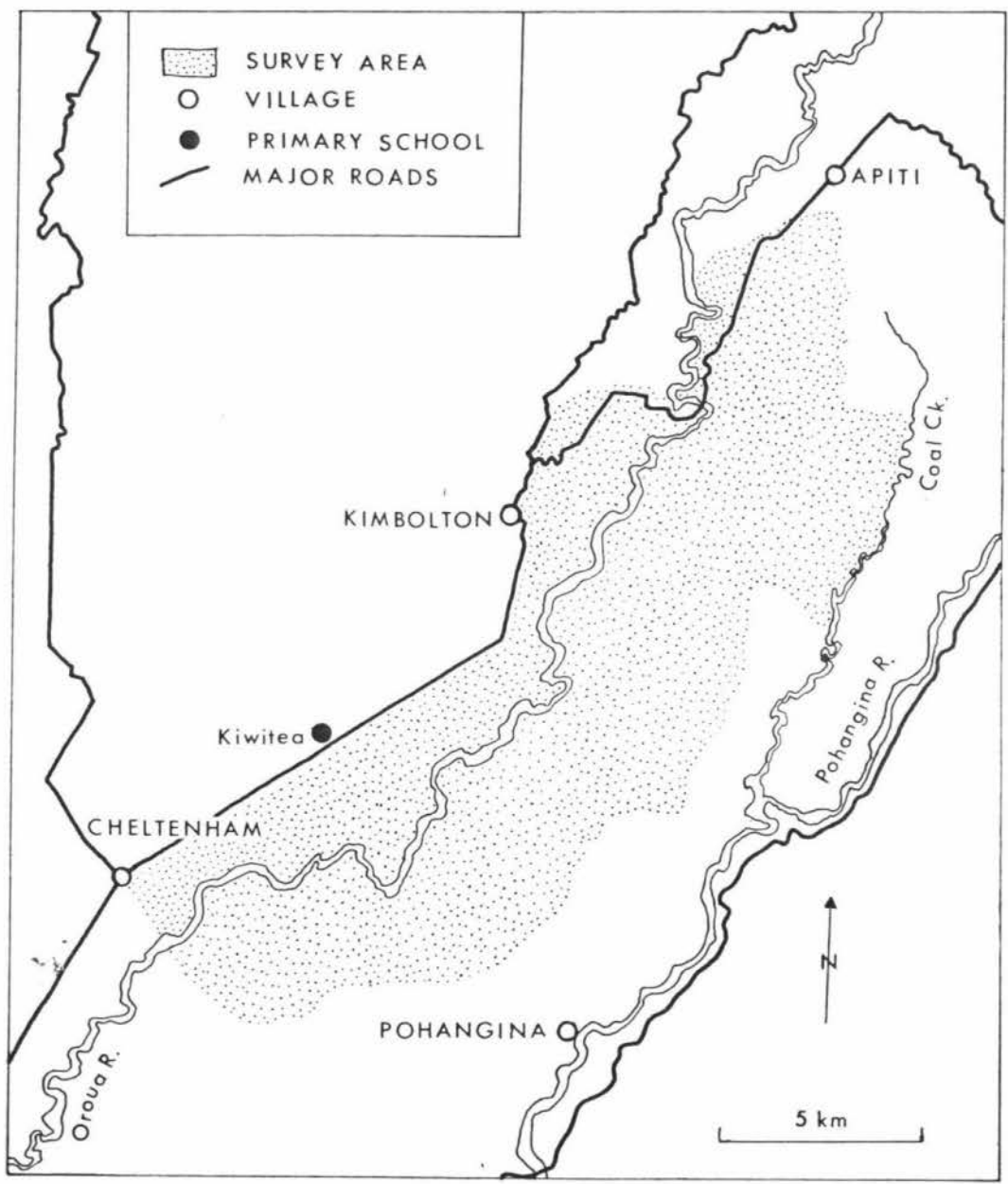


FIGURE 3-3 KIWITEA - APITI SURVEY AREA



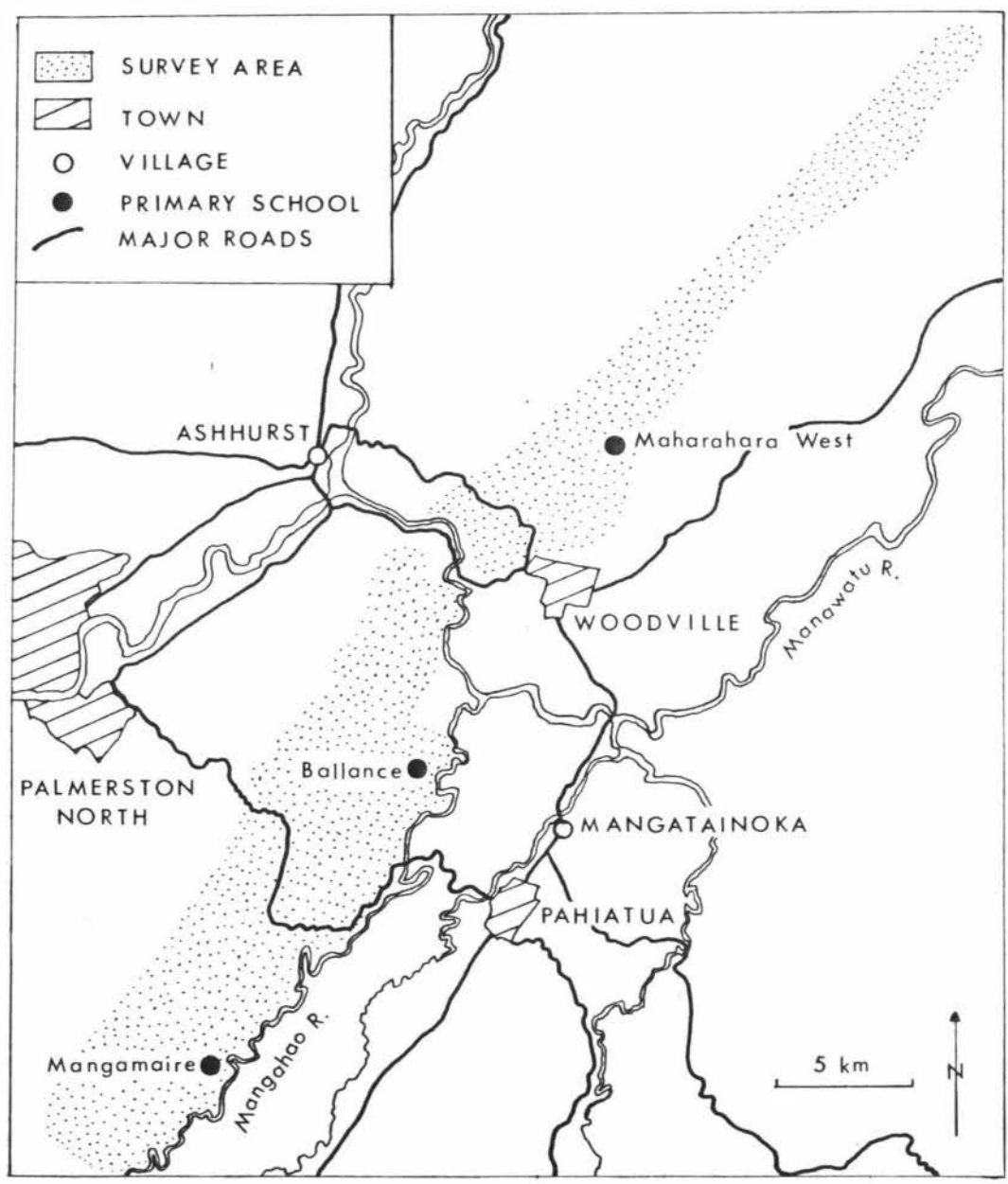


FIGURE 3-4 MANGAMAIRE - MAHARAHARA WEST (WOODVILLE) SURVEY AREA

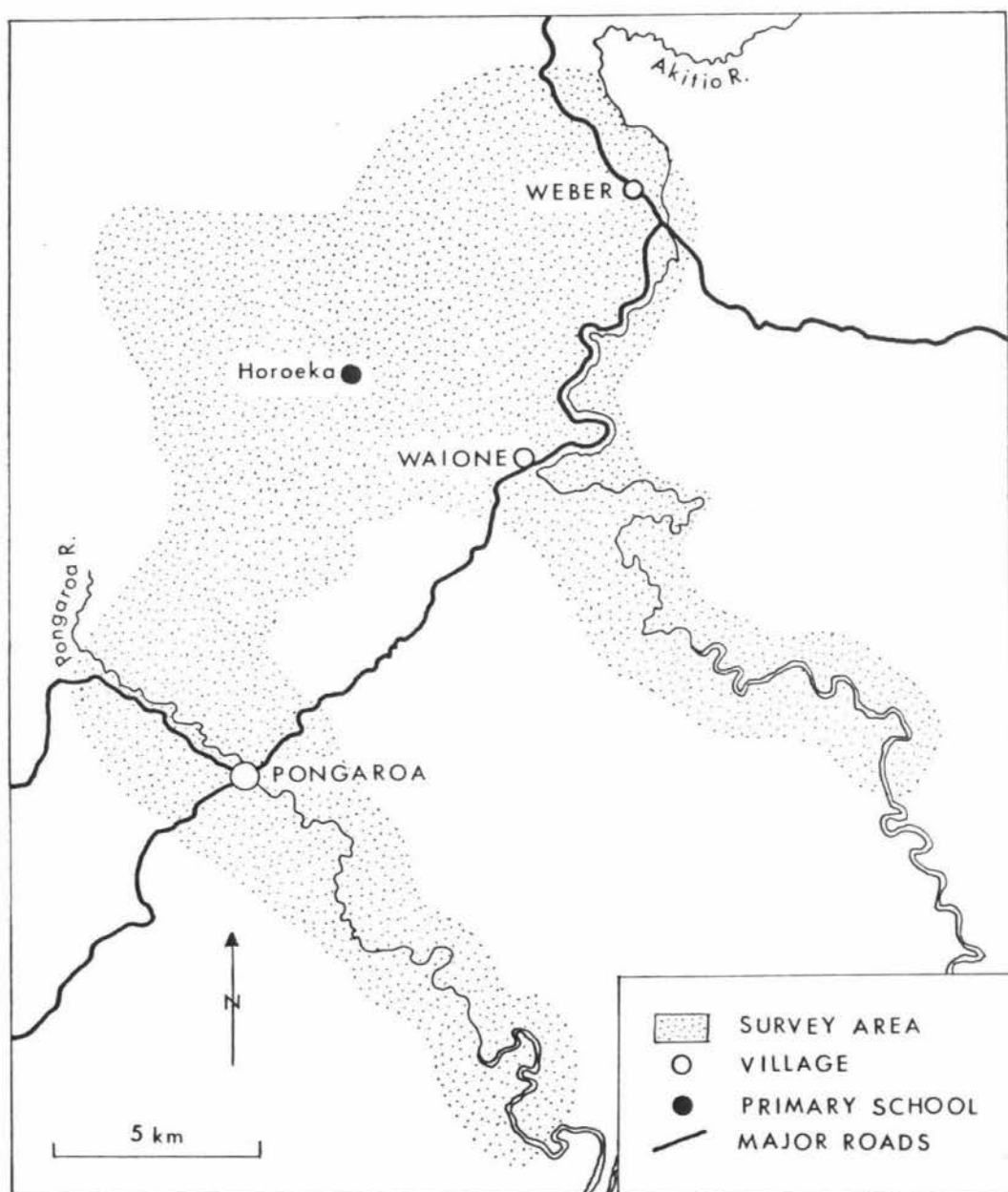


FIGURE 3-5 AKITIO-PONGAROA SURVEY AREA

alternatives on hill country farms when compared to the lowlands. The fundamental agricultural distinction between hill and lowland is the extent to which they concentrate on production of wool, of surplus stock for sale to other farms, and of stock to be slaughtered (Moran, 1974).

The Kairanga survey area typifies lowland farming. The topography is flat, but with a perceptible rise in altitude from the Taonui Basin to the Colyton foothills. Soils are derived from alluvium and are high in natural fertility, but extensive areas are poorly drained (Department of Agriculture, 1970; M.A.F., 1977f). Diversified farming systems are a feature of this area, with a predominance of dairying and fat lamb farming, but in recent years an increase in the importance of cash cropping (Coulson, 1977; Forbes, 1970).

As soils are, for the most part, the product of the five environmental factors of land slope, climate, parent rock, vegetation and time (Pohlen, 1956), they directly influence the potential of the land. Although soils can be modified by man (Tennant, 1978), they are a major reason for the distinctive farming types between the survey areas. In the Kiwitea region, the dominant soils are the yellow-brown loams of the terraces and related steepland soils. Their natural fertility varies considerably, but coupled with the extensive terracing and cliffing by streams in the soft mudstone rock, the land use was traditionally store sheep and wool with some fattening. The natural fertility responds well to fertilisers, however, and today the distinctions between the operation of intensive-fattening farms and semi-extensive sheep-and-beef farms are less definite (Department of Agriculture, 1970; Moran, 1974). Almost all sheep farms in the Kiwitea area incorporate fat lambs in their annual operation, although 'store' stock and beef continue to be important.

In order to create a discernible gradient of isolation, and maintain continuity from the Manawatu to the Wairarapa region, the Woodville foothill area was surveyed as a similiar physical environment to Kiwitea.<sup>3</sup> The high terraces and rolling low hills

approximate the topography of the Kiwitea survey region, and yellow-brown loams and earths predominate (Department of Industries and Commerce, 1963, 1968; Department of Lands and Survey, 1974<sup>4</sup>; Heerdegen, 1965). The land-use practices are not dissimilar, with fattening an integral part of most sheep operations, as the soils respond well to topdressing. In the analysis, the data for the farming environments of Kiwitea and Woodville has been combined.

The Akitio region is included as a representative hill country area. In the 1950's, the Department of Agriculture promoted an investigation of Akitio County as an area of marginal land<sup>5</sup>, to determine the conditions affecting the development of hill country farming (Woods, 1951). Although the present survey does not correspond to the county boundaries the area delineated is that which Woods describes as the Puketoi Range with its steep, broken slopes and the central rolling lowlands which have "the apparently featureless nature" of an undulating landscape (Woods, 1951, 13). The soils<sup>6</sup> respond well to fertiliser, and rainfall is adequate<sup>7</sup>, but argillite underlies a large portion of the area, particularly around Horoeke, the focus of the present survey. Coupled with the Puketoi wind which sweeps through this area, the conditions make drought a serious threat. Farm management innovations and technological improvements, however, have permitted production increases on the Akitio farms<sup>8</sup> such that the area can no longer be said to be marginal land. Many farmers fatten lambs, although this policy alternates in response to farmer's perception of the state of the market prices from year to year.

The most recent appraisal of hill country farming is a report by the National Research Advisory Council (1978) which states that the hill country carries approximately 40 percent of New Zealand's stock units and is a significant earner of foreign exchange. Its vital role as a food supplier, job provider<sup>9</sup> and reservoir for breeding stock for lowland farms means that any expansion of livestock in the hill country is beneficial to the farming sector. The N.R.A.C. asserts that the production of the hill country can realistically be increased by 50 percent, and some appraisals go as high as 100 percent

(Brougham, 1973; Hight, 1976). With the resulting foreign exchange contribution, there is real economic significance in striving to meet the hill country potential.

Of the factors recognised by the N.R.A.C. as affecting the attainment of the hill country's productive potential, the difficult social environment is considered of vital importance (N.R.A.C., 1978, 26). This social environment is characterised by such things as poor roads, long distances to servicing and educational centres, isolation from cultural and sporting activities, a deterioration in medical services and the problems of keeping skilled labour. A recommendation of the report is that investigation into such factors be undertaken by the universities. The research design of the present survey, in isolating the labour problem between hill and lowland environments, represents such an investigation.

#### DATA COLLECTION

The stratified sample was drawn from the four areas designated as water catchment regions. A complete list of sheep farms over 40.5 hectares was compiled from Catchment Board files and Farm Location maps. These were checked with local farmers as the survey progressed. Total coverage within each region was attempted through the use of both mail questionnaires and individual interviews.<sup>10</sup> Total coverage minimises the variations within each area, so that available social facilities, prevailing district attitudes and settlement patterns would be controlled to some degree.

A questionnaire was devised (Appendix B), which was designed to minimise ambiguity, particularly as a proportion of the respondents would be completing it through the mail. The questionnaire was pretested with five Kairanga sheep farmers and several adjustments made before the present copy was distributed to sheep farmers. One hundred and seventy valid questionnaires were completed: 79 from the mail survey and 91 from interviews. In Kairanga, the sample size represented 82 percent of the total population of sheep farms listed on the master list; in Kiwitea, 78 percent; Woodville,

75 percent; and Akitio, 77 percent (Table 3.1).

### Personal Interviews

Within each of the 4 areas, random numbers were assigned to each farm, and 25 were selected for personal interviews. This, however, was difficult to achieve in Akitio where distances were greater, and the interview schedule was selected from farms on the same toll exchange. This should have created no bias.

For each interview, an appointment was made by telephone. Where there was no answer, an introductory letter, explaining the purpose of the survey and introducing the interviewer (Appendix A) was left in the letterbox, and another phone call made within the next few days. One hour was allocated for each interview, which allowed adequate time to locate the farm and farmer, complete the questionnaire and discuss the general farm labour situation. The time did vary with the general talkativeness of the farmer, and those interviews conducted in the evening were generally more comprehensive.

The response was very good, with only three farmers declining to co-operate. Another 6 asked if they could send their replies, as certain information on stock tallies was not readily available. As the farmer in these cases entered the replies and not the interviewer, they have been included in the mail questionnaire section.

### Mail Questionnaire

The size of each mail sample varied, as these farms were the residual in each area once the interviews had been completed. An introductory letter was posted with the questionnaire (Appendix A, B) and a return address envelope. A follow-up reminder was posted 13 days later (Appendix C).

The total sample size for mailed questionnaires, corrected for mistakes in addresses, was 127. Of these, 79 were returned valid, which represents a very high net valid response rate of 62 percent. Five percent were returned incompleted (Appendix D).

TABLE 3.1  
RESPONSE RATE FOR THE INTERVIEW AND MAIL SURVEY

Survey Area	Personal interviews Number of farmers interviewed	Mail questionnaires		Total surveyed of defined population in each survey area	
		Number of valid returns	Net valid response rate %	Number	%
Kairanga	22	15	65	37	82.2
Kiwitea	23	22	63	45	77.6
Woodville	21	20	61	41	74.5
Akitio	25	22	62	47	77.0
Total	91	79	62	170	77.6

Source: Field Survey, May-July, 1978.

### Farmer Response

The very good response rate for both the interview and mail survey probably reflects the time of the year in which the surveying was conducted. Interviews were begun in May, and extended over June and July. The mail questionnaire was posted in July. This is autumn and winter, a period when most farmers are not busy and have time for "form filling". The topical nature of the research issue may also have captured many farmer's interest. It was, however, increasingly obvious that the New Zealand farmer is being subjected to numerous surveys, from the Statistical Department, Federated Farmers, University students and other interested parties. Many farmers, especially in the Kairanga and Taonui area, complained of being "oversurveyed". As concerns the response rate, perhaps future researchers could take heed of this and move further afield. In order to maintain their goodwill, a summary of this report is to be sent to all farmers who indicated they would appreciate one.

It must be emphasised that this survey is aimed at the farmer, the owner or farm manager who is in a position to hire labour. It is not directed at the employees. The data is based on assessments and estimates made by the farmer, and consequently is "only one side of the fence". Many answers are subjective and partly subjective and inevitably influenced by the attitudes of those questioned. The perceived potential for increased development on each farm and the perceived labour problems are exactly that - as perceived by the farmer.

On the other hand, this one-sidedness is offset in many cases by a good understanding of the employees' position by a number of the farmers. A large proportion of respondents had risen through the ranks themselves and therefore had an appreciation of both sides of the problem.

### ANALYTICAL TECHNIQUE

The analysis of the survey data centres on a comparison of selected variables for the farming system in aggregate, and separately, between the farming environments. The Chi-square test<sup>11</sup> is used to



ascertain the existence of significant differences between the variables. Such a coarse analytical technique has its inadequacies - it is non-parametric and fails to show intensity of the problem - but it does allow ready identification of those areas in which more detailed effort is warranted.

Annual farm output, in terms of bales of wool, lambing percentage, number of fatstock sold and crop yield per hectare, was intended as the measure for production, but it proved unfeasible to create a standard measure of output to which comparisons between the many variations in the farming types could be made. Apart from the measurement problem, this section of the questionnaire was poorly completed by a proportion of the farmers, which necessitated the use of other measures for assessing the level of production on the farm.

Production measured by income (Holden, 1965b) proved to be impractical as it involves complex and detailed questioning to ascertain changes in pre-tax money income and pre- and post-tax real income. The accuracy of farmer's replies is also suspect to such sensitive questions. For these reasons it was decided not to use income as an index of production from the farm.

Present stock units per hectare, the change in stock units over a six year period, and indices of development and management system change<sup>12</sup> provide the measure of the level of farm production used in this research. They provide an aggregate assessment of volume increase only, and do not measure improvements in stock performance. The procedure for constructing an index of farm development is outlined in detail in footnote 12. The index provides an approximate assessment of the capital investment and level of development on each farm over the period 1972 to 1978. A similar index for measuring the extent of less labour-intensive change in the farm management system is also devised and outlined in the footnote. These measures provide an adequate assessment of farm production levels against which the existence of a farm labour shortage may be compared.

Chapters 4 and 5 summarise and discuss the results from the analysis of the survey data. All sources for figures and deductions, unless referenced, are derived from this present survey.

## FOOTNOTES

- 1 In the Kairanga survey area, one farmer had sold land and now owned less than 40 hectares. His circumstances, however, are not typical. The farm was acquired only recently as a paying-hobby rather than as an economic necessity, and the acreage was reduced because he and his wife wished to farm the land themselves, not because he could ill afford to pay a worker's wage.
- 2 Certain questions arise as to the representativeness of the Manawatu and North Wairarapa region. Is the Manawatu atypical, in that the attractions, especially educational, encourage farm workers to the area? Palmerston North boasts the university, a teachers college, technical institute and the D.S.I.R. to name the more recognised institutions which could possibly attract more potential farm workers to this area than to, for instance, the Hawke's Bay, Wairarapa or South Canterbury regions, all of which display the same gradient of farming types as distances increase from the focal urban area.

A second feature of the Manawatu region is the high ratio of urban centres to land area, which is markedly different from regions such as Gisborne and Northland. In the Gisborne area, there is no sizeable town between Opotiki and Ruatoria; in Northland, the triangle Kaitia - Kaikohe - Kerikeri represents the main settlements, all under 4,500 population (Department of Statistics, 1977a) and with far greater distances between them than between any towns in the Manawatu.

These features notwithstanding, the Manawatu and North Wairarapa region is considered for this survey to be representative, in a broad sense, of any New Zealand farming environment and community.

- 3 Although similar in physical features, the average accessibility to social, commercial and educational services is greater in the Woodville area than for Kiwitea. The gradient of decreasing

accessibility, however, holds from Kairanga to Akitio (Table 3.2), and consequently the Woodville and Kiwitea survey areas may be grouped together.

TABLE 3.2  
AVERAGE ACCESSIBILITY FOR EACH SURVEY AREA

Survey Area	Average Accessibility <sup>a</sup> Measured in:	
	Kilometres	Minutes
Kairanga	35.6	42.8
Woodville	52.1	55.5
Kiwitea	91.3	93.7
Akitio	141.4	148.1

Notes: a Accessibility is an aggregate measure of each farmer's proximity to his nearest neighbour, primary school, secondary school, community hall, commercial services and town or city.

Source: Field Survey, May-July, 1978.

- 4 The Department of Lands and Survey (1974), in a publication on the Woodville County, classify the main soil groups and their limitations for potential pastoral use.
- 5 Marginal land is defined (Woods, 1951) as land from which farm net incomes are insufficient to sustain the expenditure required for upgrading pastures.
- 6 For a classification of the soils present in the Akitio region, see Woods (1951, 25-26).
- 7 Annual rainfall is between 40 and 60 inches.

- 8 The Woods survey (1951) revealed that 80 percent of the farms were marginal. Since then, management practices such as closer subdivision, better fencing, resowing with improved seed mixtures, topdressing (especially aerial), rabbit destruction, road upgrading and heavier stocking have resulted in increased returns per acre, two-thirds greater on the good soils and at least 12 percent greater on the poorest of soils (Franklin, 1978).
- 9 The N.R.A.C. (1978) claim that there are 8,000 hill country farms which have a total capital value approaching \$2,000 million, and provide direct employment for more than 15,000 people and indirect employment to many thousands of people engaged in servicing them.
- 10 The question of combining mail and interview techniques for data collection is subject to controversy. Ambler (1977) determined that there are different biases operating between the two procedures. For mail questionnaires, there is a response bias operating in that a certain type of farmer (perhaps more dynamic, educated and interested in research) is likely to reply to the questionnaire. This bias should not, however, be overemphasised, especially when the collection of data is uniform and not influenced by sociological and personality differences. With personal interviews, there is an unavoidable surveyor bias, but again this should not be consequential in this survey as all the interviews were conducted by the same interviewer. Thus any bias should be consistent. An important difference between the two techniques is that there is no guarantee in a mail survey that the questions will be answered in a particular order. As the questionnaire for this survey did not rely on a structured approach, this difference is immaterial.
- 11 For a full discussion of the procedure and formula for the Chi-square test of significance, see Chase, 1976, 192-211, or Siegel, 1956, 196-202.

## 12 Procedure for Development Index

The index of farm development is determined as a scale from 1 to 20, weighted for approximate capital outlay and labour commitment for development projects undertaken in the last six years. Additional buildings and alterations to buildings, new and replacement machinery and vehicles, and the purchase of labour-saving equipment are given arbitrary scalings. The score for repair and replacement fencing and new subdivision is determined on the chainage undertaken each year. Major hectares of land bought and/or cleared, and investment in tile drainage, water reticulation improvements (dams and troughs particularly) and participation in an irrigation and water scheme are also included in the development scale. Also incorporated is whether the farmer had received a Development Loan for the programmes initiated.

To this scale from 1 to 20, an index of maintenance tasks delayed over the last six years is deducted. This scale extends from 0 to 5, and the tasks of clearing land, fencing, soil and pasture management, buildings and yard repair, and drainage, which the farmer stated required maintenance but which had been left over the period 1972 to 1978, are each given a score of one. This index is deducted from the first index of development.

Consequently, the final development index has a possible maximum score of 20 points, and each farm is attributed a value along the index as an approximate assessment of capital investment and level of development over the 1972 to 1978 period.

The formula for the index is as follows:

$$I_p = I_D - I_M$$

where I = Index

P = present level of development

D = development programmes

initiated over 1972 to 1978

M = maintenance tasks delayed

over 1972 to 1978.

### Procedure for Management System Change Index

Similarly for management change, an index from 1 to 15 is weighted for less labour-intensive management change which has occurred between 1972 and 1978. A move to Perendale and Coopworth sheep breeds in the last six years is given a higher rating than a change to Romney or Border Leicester. Substitution of traditional livestock husbandry practices by easy care lambing and slow-rotational grazing systems are weighted on the scale. A major increase in dry stock carried, a reduction in the size of the stud flock, a change from dairy to sheep farming, and modification in the land use pattern through variation in the hectares under cropping are all scaled according to the approximate calculated reduction in the management load once these systems become routine on the farm. The final index is an assessment of the extent of management change a farmer has experienced over the 1972 - 1978 period towards less labour-intensive methods.

CHAPTER 4  
A STRUCTURAL AND LOCATIONAL ASSESSMENT OF  
THE LABOUR PROBLEM

Based on the results of the empirical research, the two areas of concern are examined and discussed. In Chapter 4 the dimensions of the labour problem are reviewed in the context of the farming system and within the three farming environments. Chapter 5 examines the production levels within and inclusive of the farming system, which allows a comparative analysis of the structural effects on the farming operation of the labour problem, to determine its strength as a constraint to production increases.

DIMENSIONS OF LABOUR SHORTAGE

Of the 170 farmers who responded to the survey, 92 (54 percent) stated that they had an inadequate labour supply on their farms. The shortage included work for permanent, casual and springtime labour.<sup>1</sup> This represents over half of the surveyed farmers, and indicates that, in fact, there is a shortage for additional labour in the sheep farming sector.

The shortage of labour units is illustrated for each area in Table 4.1. As it stands, Table 4.1 is only a first approximation. The percentage shortage of labour units in each area is an over-estimate of the additional labour which would be employed. An analysis of the reasons why farmers are short of labour illustrates that many would not employ an extra worker even if he was available (Table 4.2). Clearly money is the inhibiting force in the minds of over three-quarters of the farmers who indicated a labour deficiency. Only ten percent stated availability of farm workers as the major reason for their inadequate labour force. This raises a central problem that the labour shortage would seem to be derived from a lack of profit<sup>2</sup> to employ labour, rather than from a genuine lack of workers. Consequently, even if labour was made available, few farmers could afford to take advantage of it.



TABLE 4.1  
SHORTAGE OF LABOUR UNITS IN EACH SURVEY AREA

Survey area	Number of labour units on surveyed farms <sup>a</sup>	Estimated number of labour units for total survey area	Labour shortage on surveyed farms				Estimated shortage of labour units for the total survey area	
			Number of permanent workers short	Number of casual workers short	Number of springtime workers short	Labour units short <sup>b</sup>	Number	%
Kairanga	63	76.6	5	5	2	8.0	9.7	11.2
Kiwitea	70	90.2	10	14	6	18.5	23.8	20.9
Woodville	67	89.9	9	9	5	14.75	19.8	18.0
Akitio	89	115.5	15	11	1	20.75	26.9	18.9
Total	289	372.2	39	39	14	62.0	80.2	17.7

Notes: a Permanent full time workers only

b Labour unit conversion ratio: permanent worker 1.0  
casual worker 0.5  
springtime worker 0.25

Source: Field Survey, May-July, 1978.

TABLE 4.2  
REASONS WHICH PREVENT THE FARMER  
EMPLOYING MORE LABOUR

Reason stated	Responses	
	Number	Percentage
Lack of profits to afford wages	65	75
Suitable workers not available	9	10
Accommodation not available	6	7
All three above reasons	5	6
Other reasons	2	2
Total response	87	100

Source: Field Survey, May-July, 1978.

Subsidising labour would appear to be the logical alternative, as a subsidy would remove the core of the problem: the lack of cash with which to pay the worker. In the survey, however, only 39 percent of the farmers who stated that profitability was the inhibiting factor were prepared to employ additional labour under subsidy, and only five percent were making use of the current Wage Labour Subsidy scheme.<sup>3</sup> This anomaly indicates an aversion to employ subsidised labour, which has been fostered by the present scheme under which the majority of workers are inexperienced and unskilled in farm labouring. Of the comments about the scheme (Table 4.3), 68 percent are unfavourable, the majority of farmers claiming that the workers from the unemployed labour force would be unsuitable and "unemployable". The untrained worker would require supervision which effectively removes an experienced staff member from productive work.

Unfortunately, 14 percent of respondents felt that the type of person available on the Wage Subsidy scheme would be a poor worker - of low calibre and not capable or prepared to work determinedly. This attitude is summed up by one farmer's comment that 'if they are unemployed, they are unemployable'. This is indicative perhaps of a misinformed farming community, and it points sadly towards the continuation of the Farm Employment Subsidy scheme as a comprehensive agricultural policy designed for the good of the farming sector.

If a subsidy is to be effective, the emphasis must be placed on providing assistance to reliable and skilled farm labour who are likely to remain in the agricultural industry. The Additional Jobs programme<sup>4</sup> is a move in this direction, as it is aimed at encouraging employers to train people to meet the skill requirements of the position.

#### THE FARMING SYSTEM: A STRUCTURAL APPROACH

The nature and patterns of the labour shortage are examined by analysing the specific relationship between the inadequate labour supply and three structural attributes of the farming system:

TABLE 4.3  
COMMENTS ON THE FARM WAGE  
LABOUR SUBSIDY SCHEME

Comments	Responses	
	Number	Percentage
<u>Unfavourable</u>		
Labour is not trained and requires supervision	27	36
Labour is "unemployable"	10	14
Will ruin the existing Farm Cadet scheme	3	4
Still need to spend money to employ labour (on equipment and projects)	5	7
Require accommodation	5	7
<u>Favourable</u>		
Is a perk for the farmer and experience for the worker	24	32
Total response	74	100

Source: Field Survey, May-July, 1978.

accessibility, farmer motivation and farm type. The discussion defines and examines the concepts and relationships which are summarised in Table 4.4, and draws out various implications for national policy which are considered more fully in Chapter 6.

### Accessibility

Accessibility is a structural measure of the level of detachment from components in an environment. Although both isolation and accessibility have been used as synonymous expressions, and are both measured in relative and absolute terms, there is a conceptual difference between them. Isolation is a locational concept: a macro measure of seclusion. The framework for this research has been based on increasing isolation from the major city of Palmerston North. Thus, the three environments of Kairanga, KIWITEA - Woodville, and Akitio are points along a gradient of distance or isolation from Palmerston North.

Accessibility, on the other hand, is the micro-level approach, a measure of each individual's remoteness from social and economic contact within his environment. Consequently, the accessibility measure is an aggregate of each farmer's relative and absolute distance from a series of community and commercial services deemed necessary for a healthy society. Proximity to the farmer's nearest neighbour, primary school, secondary school, community hall, commercial services (the local village) and town or city was measured both by an absolute measure in kilometres, and a relative measure in the time taken to travel the actual distance.

In all cases, the measurement was to the nearest facility, regardless of whether the farmer chose to use it. This applied predominately to local high schools, and villages. Often the farmer's children would be sent to a boarding school out of the region, and local villages would be by-passed as the farmer used the closest town for all supplies on a weekly trip.

TABLE 4.4  
RELATIONSHIPS BETWEEN STRUCTURAL ATTRIBUTES OF THE FARMING  
SYSTEM AND THE EXISTENCE OF A LABOUR SHORTAGE

Hypothesised relationship	Chi-square value	Accept/reject null hypothesis	Decision at the 0.05 level
<hr/>			
Ho: That there is no relationship between an inadequate farm labour supply and:			
<hr/>			
1) Accessibility			
• measured by distance (km)	4.00	Reject	Significant
• measured by time (minutes)	5.33	Reject	Significant
2) Farmer motivation			
• age of farmer	4.32	Reject	Significant
• proximity to retirement as perceived by the farmer	2.03	Accept	Not significant
3) Farm type	6.18	Reject	Significant
<hr/>			

Source: Field Survey, May-July, 1978.

In a number of instances in the Akitio area, the furthestmost environment on an isolation gradient, the aggregate accessibility of a farmer was equal to or less than in parts of the Kiwitea and Woodville regions. It was felt that an accessibility measure was more relevant to an examination of the farm labour problem, as it incorporates distance to social and educational amenities, and not solely distance to a major urban area. A farm labourer may be attracted to and remain on a farm which is close to many services and is a functioning and active community, but is, in fact, very remote from the major cities of Palmerston North or Napier.

The measure of relative accessibility is an indication of the condition of the roads to which each farmer has access. Travel time on gravel roads will no doubt be greater and so the farmer's accessibility to amenities lessened. The measure, however, is dependent on the farmer's perception of his remoteness. Whereas one farmer may travel 20 kilometres in 15 minutes, another may take 25 minutes for the same journey. Consequently, the latter's perception of his seclusion is greater.

The inadequacy of farm labour supply is significantly different between farms above and below the median accessibility level (Table 4.4). To assess the direction of the relationship, an examination of the differences between expected and observed values indicates that the existence of a labour shortage is inversely related to accessibility. Above the median relative and absolute accessibility division, the observed number of farms with a labour deficiency is well above the expected number, and conversely for farms grouped below the median. The inverse is true for farms with no labour deficit. This would suggest that as accessibility decreases and social interaction becomes increasingly more difficult, the ability to attract and retain farm labour also decreases. This raises important questions as to the necessity and desirability of establishing social and educational amenities in less accessible areas. A costing-out of the alternative strategies of providing services in the rural areas as opposed to encouraging an urban-

based farm labour force must be faced by policymakers. This discussion is expanded in Chapter 6.

### Farmer Motivation

There is a significant difference between the median age of farmers who have an inadequate labour supply, and farmers with no labour problem (Table 4.4). The seemingly plausible explanation, however, that older farmers would be in most need of additional help, as their capacity for performing demanding stock work declines, is not supported by the data. It appears, from examination of expected and observed values, that younger farmers (below the median age of 46) are in greatest need of labour. The most likely explanation is that younger farmers, particularly those servicing development and mortgage loans, are motivated towards active farm development and therefore are aware of a need for additional labour.

Furthermore, older farmers, having "had their day", and approaching retirement, presumably would not perceive their farm's production potential to be as high or as necessary to achieve as a younger man. The proportion of "risk minimisers" is likely to increase with the farmers' age, as established farmers generally have no need, and in fact are often penalised by higher taxation, to maximise their profit margin. According to Gill (1976), the median age of the farmer in 1921 was 42.3; in 1966, 43.8; and in 1971, 44.0. In this survey, the median age for the owner or manager, actively working on a sheep farm, is 46. This would seem to support the claim that the average age of farmers is increasing (Lloyd, 1974) which (from discussion with M.A.F. and Federated Farmer's personal) is considered in part responsible for the lack of agricultural expansion. The statistical analysis, however, belies such a contention. Proximity to retirement, a more precise measure of motivation than age, and the existence of a labour shortage are not significantly related (Table 4.4). A change in the stock units per hectare from 1972 to 1978 and retirement proximity also proved insignificant (Table 5.3). Closeness to retirement, therefore,



does not appear to significantly influence the demand for labour or the number of stock units on the farm.

Unfortunately, the retirement age recorded is the farmer's opinion at the time of the survey, and is notoriously unreliable as an estimate of exit from farming. A variety of circumstances, including health, finance and opportunity, will influence just when and how the farmer will relinquish his active duties. Of interest is the fact that 21.2 percent of farmers responded "never" to the question of retirement. This represents a New Zealand rural attitude which seems never to fade, that to retire is fatal to a farmer. Proximity to retirement in these cases was calculated by taking the age at which the farmer stated his working capacity begins to decline. In all instances, this figure was above or equal to the present age of the respondent, and consequently provided an indication as to the age at which the farmer would withdraw from active, full-time participation in farm work.

The labour problem, therefore, cannot be linked to the aging of the farming sector. It appears furthermore that youth and labour demand are associated, such that the younger farmers have the greatest proportion of labour deficit.

### Farm Type

Within the survey of sheep farms, four livestock policies are detected. The majority of farms (70 percent) are fattening-breeding operations,<sup>5</sup> in which over 50 percent of the gross farming income is derived from sheep products, predominately wool. Replacement stock is breed on the farm, and beef are frequently also run. Labour peaks correspond to livestock husbandry peaks, e.g. at lambing, mustering and docking, but as these farms are on average larger than fattening and mixed farms, there is work throughout the year for maintenance of fences, buildings, pasture and so on.

Under an intensive-fattening policy, a high proportion of the lambs, fat off their mothers, are sold to the urban market.

Little or no replacement stock is bred, and the income is derived from wool, fat lambs, fat cattle and ewes sold to the freezing works. For the purposes of analysis, mixed cropping-fattening farms are included in the intensive fattening category, as the labour requirement for the sheep component of the farming operation is essentially the same.

Mixed farms combine fat lamb production with cash cropping. Statistically, a sheep farm is defined by the percentage of the gross farming income derived from sheep products: between 51 and 74 percent for sheep and beef policies, and over 75 percent for sheep farming (Department of Statistics, 1976a). In this survey, however, a sheep farm is defined as any policy under which sheep constitute an integral part of the total farming operation. In Kairanga, there is a growing trend towards cash cropping through the summer months, and wintering fat lambs (Coulson, 1977). On these farms, although the income from the sheep operation is frequently below 50 percent, the livestock is an integral and necessary part of the farming system and for this reason, mixed farms are included.

Stud farms are classified as a separate farming policy because of the extra labour commitment required for pedigree stock. Accurate animal husbandry records must be kept, which creates a heavy labour demand in spring.

There is a significant relationship (Table 4.4) between inadequate labour supply and farm type. In the fattening-breeding category, the number of farms with a labour shortage is greater than the expected frequency, whereas the reverse is true for mixed-fattening farms. For stud farms, there is no real difference between observed and expected tallies. This indicates that fattening-breeding policies have a greater incidence of labour shortage, possibly due to the nature of the labour commitment on these properties. The association between this farm type and the hill country environment raises doubts concerning the effectiveness of the farm labour subsidy schemes which, from Manawatu Department of Labour estimates, have been more successful in lowland areas. The implication that

policy directives be aimed at farming environments and types, rather than towards farming systems (encompassing all types of sheep farms) is an important area of concern for future policy formulation.

#### THE FARMING ENVIRONMENTS: A LOCATIONAL APPROACH

With distance away from Palmerston North, a change from lowland to hill country farming occurs. It is generally accepted that the magnitude of each facet of the labour problem should increase the further away from the city. The Chi-square test (Table 4.5) indicates that there is a significant difference in the incidence of labour shortage in the three areas. Further examination of observed and expected frequencies illustrates that Kairanga farmers experience far less of a labour shortage than do the Kiwitea, Woodville and Akitio farmers (Table 4.1). Proximity to Palmerston North, a major pool of labour, may count in this although it has already been established that cash is the major inhibiting force to employment, and consequently adjacency to a labour supply should not be influential. The farmer in close proximity to a city, however, is at an advantage in terms of providing accommodation, and this may contribute to some degree. The probable explanation lies in the fact that the majority (86 percent) of mixed cropping-fattening farms are in the Kairanga areas, and from the discussion on farm type it is concluded that this form of agricultural operation has significantly fewer farms experiencing a labour shortage.

From the empirical work, it is estimated that the labour force could be increased by 17.7 percent (Table 4.1). In total labour units required the Kairanga area has the least estimated labour shortage of 11.2 percent. The Kiwitea, Woodville and Akitio regions have a higher percent shortage of 20.9, 18.0 and 18.9 percent respectively, which probably relates to the greater labour requirements for hill country, fattening-breeding farming systems.

TABLE 4.5  
RELATIONSHIPS BETWEEN THE THREE FARM ENVIRONMENTS AND  
ATTRIBUTES OF THE FARM LABOUR FORCE

Hypothesised relationship	Chi-square value	Accept/reject null hypothesis	Decision at the 0.05 level
Ho: That there is no relationship between the three farm environments and:			
1) Existence of an inadequate farm labour supply	9.14	Reject	Significant
2) Length of stay of employees	14.11	Reject	Significant
3) Number of married to single workers	7.18	Reject	Significant

Source: Field Survey, May-July, 1978.

### Labour Turnover At The Farm Level

High labour turnover is a feature of the farms employing labour in the Manawatu and North Wairarapa survey region. In total, 45.8 percent of workers stayed for less than twelve months on any farm, and only 9.3 percent stayed for longer than 5 years. That almost half of all employees are remaining on farms for under one year must have a disruptive effect on the farming system, which depends on a stable and familiar work force for efficient functioning. Time, money and inconvenience spent on advertising for and training employees is time and money wasted.

McClatchy (1966) determined that "isolation", measured in effective miles from the nearest town, had no significant effect on the turnover rate of workers in Patangata County, Hawke's Bay, although he suggested that there was greater difficulty in filling vacancies in more remote areas. From the empirical data collected for this research, a comparison between the farming environments and length of stay of employees resulted in a significant Chi-square score (Table 4.5), which indicates that the turnover rate between the survey areas is significantly different. The direction of the relationship is surprising, however, as the most rapid turnover for employees is in Kairanga. Significantly more farm labourers left within a year of employment on farms in Kairanga. The same trend, but to a lesser degree, is apparent in the Akitio area. Although no conclusive patterns for rate of mobility may be determined, a possible explanation for the high turnover in Kairanga is the importance of cropping in this area. Workers employed on a permanent basis may be attracted for the summer cultivation season and leave after this, to move to more lucrative employment or for experience on other farms (Table 4.6). The higher mobility of labour in the Akitio region could reflect isolation factors. The majority of reasons given for leaving other than for further experience and job promotion, were from workers in this region. Educational problems and a wife unhappy in the country especially, may be attributed to isolation.

TABLE 4.6  
THE MAJOR REASONS FOR FARM WORKERS LEAVING THEIR  
EMPLOYMENT IN THE SURVEY AREAS, 1973-1978

Reason <sup>a</sup>	Responses	
	Number	Percentage
Dismissed	8	7.2
Moved to job promotion/ further experience	55	49.5
Discontent with working and living conditions	19	17.1
Did not get on with employer	5	4.5
Wife unhappy in country	13	11.7
School children - educational transport problems	2	1.8
Home ownership	2	1.8
Not needed (plenty of notice given)	3	2.8
Retired/health/overseas	2	1.8
Not known	2	1.8
Total response	111	100.0

Notes: a This is the employer's honest, but not necessarily correct, opinion.

Source: Field Survey, May-July, 1978.

The 17.1 percent of farm workers who left because of discontent with wages and conditions may reflect a situation in the short term in which the farmer and the farm worker have conflicting aims (Hodgson, 1963). In the broadest sense, the farmer has a business to run and therefore aims to exploit labour, whereas the worker is providing his labour at the highest possible price. In the long term, however, the conflicting aims are complementary in that both farmer and worker depend on the success and profitability of the farm. Unfortunately, the short term aim may influence the employers treatment of his staff, and the worker's perception of his situation, which will result in termination of employment and disruption of the farming operation.

The turnover rate for married and single workers does not correspond to similar findings by other researchers (McClatchy, 1966; Morris and Cant, 1967). Whereas it has been claimed that single men are more mobile, in this survey only 36.8 percent of unmarried workers stayed less than 12 months and 63.2 percent stayed for more than a year. This, compared to the 50 percent of married employees who remained for less and for longer than 1 year, indicates that in fact it is the married worker who is more mobile. As regards to permanency, the difference between married and single workers is small - 7.9 percent of single employees remained for longer than 5 years compared to 10.3 percent for their married counterparts (Table 4.7). Consequently, it is the single worker who appears to be the better proposition. He is likely to record a lower turnover rate, which, when coupled with the generally higher costs of employing a married man (as a house must be provided) makes the single employee a good prospect.

McClatchy (1966) concluded that the proportion of single men to married men grew with increasing isolation, but this is not substantiated by the present research. A Chi-square test for a difference between the farming environments and the number of married and single workers is significant (Table 4.5) but the direction again points to Kairanga, the least isolated area, as having more than

TABLE 4.7  
LENGTH OF STAY ON FARMS FOR MARRIED AND SINGLE FARM EMPLOYEES WHO LEFT  
THEIR EMPLOYMENT IN THE SURVEY AREA BETWEEN 1973 - 1978

Length of stay on farm	Single workers		Married workers		Total employees	
	Number	Percentage	Number	Percentage	Number	Percentage
12 months and less	14	36.8	34	50.0	49 <sup>a</sup>	45.8
Over 12 months to 5 years	21	55.3	27	39.7	48	44.9
Over 5 years	3	7.9	7	10.3	10	9.3
Total	38	100.0	68	100.0	107	100.0

Notes: a No information regarding marital status for one employee

Source: Field Survey, May-July, 1978.



expected single workers. The observed and expected tallies for Kiwitea-Woodville are very similar, but for the Akitio region there is a significantly higher proportion of married workers than expected. These results lead to the inverse conclusion to that arrived at by McClatchy: that the proportion of single men to married men decreases with increasing isolation.

The question of permanency points to a trend which could have serious implications for planned production increases in the hill country environments. If married workers are more mobile, and the proportion of married to single workers increases with isolation, the outlying areas may be left with a labour force which a) has a high turnover record (creating costs through work delays and the selection and training of new employees), and b) is more costly in employment for the individual farmer, in terms of providing a house, perhaps a superannuation scheme, subsidised boarding for the worker's children's education, and so on. If this is a long term trend, policy formulators must be made aware of its possible implications to a labour supply in the less accessible hill country.

From the empirical work and discussions with the farmers, there appears to be two basic types of farm labourer. The first is the worker who intends remaining in the agricultural industry, either for eventual farm ownership, or a manager's position. These workers frequently have attained some type of agricultural qualification (Diploma or Certificate in Agriculture) or attended a farm training institution such as Smedley and Flock House. Others are employed on the Farm Cadet Scheme.<sup>6</sup> These workers take employment with the intention of spending on average two years on any one farm to gain experience before moving to another to learn more practical knowledge, or to their own farm. These workers are, on the whole, interested and capable, and an asset to any employer as they usually possess adequate skills to implement advances in farm technology. Unfortunately they cannot be expected to remain in the position of farm labourer. Consequently, the farmer must accept that these workers are unlikely to be permanent.

The second category of farm worker is the man who moves from farm to farm, and in and out of the agricultural industry, assessing his future employment by the most lucrative opportunities available to him at the time. His interest is not in agricultural promotion and his skills and training are often not extensive. Because of his transient nature, this type of farm labourer is also unlikely to remain on the farm for any period of time, and again the employer is left without a worker who, when employed, is foreseen to stay for many years. The majority of farmers surveyed expected farm labour today to be mobile, and one employer expressed delight that a worker had stayed for four years! With the average length of stay at 2.27 years, employers, it appears, must accept and adjust to the fact that farm labour is a mobile phenomena.

#### National Farm Labour Retention

The Manpower Working Party of 1963-64 emphasised a drift out of farming, especially of workers in the 25 to 44 age group. Although unable to precisely describe the problem, the Working Party estimated an approximate outflow of 600 workers each year from agriculture, the majority leaving for reasons other than retirement.

In response to this Cant (1967) studied the outmigration of adult farm workers from the Selwyn and Ashburton Electoral Districts between 1963 and 1966. He established that between 9 and 10 percent of workers left farming for other occupations, which on a national level inferred that between 900 and 1,200 men were lost per annum from the agricultural labour force. These were mostly married and young people. In terms of skill and fitness, this loss has implications for an increase in production.

From the present survey in the Manawatu and North Wairarapa area, a substantial loss from the farm work force is apparent. Table 4.8 illustrates the range and importance of the source and destination occupations for all employees who have left farms in the survey area between 1973 and 1978. Examination of the pattern of movement indicates that, of those workers whose destination is

TABLE 4.8  
ORIGINAL SOURCE AND DESTINATION FOR FARM EMPLOYEES IN THE SURVEY AREAS  
OVER THE PERIOD 1973 TO 1978

Destination	Source											
	Farm job		Ancillary agric. work <sup>a</sup>		School		Unrelated employment <sup>b</sup>		Not known		Total workers	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Own/family farm	7	10.6	-	-	-	-	-	-	-	-	7	6
Another farm job	36	54.5	3	50.0	7	36.8	5	33.4	3	60.0	54	49
Ancillary agricultural work <sup>a</sup>	5	7.6	-	-	2	10.5	2	13.3	-	-	9	8
Unrelated employment	8	12.1	1	16.7	4	21.1	6	40.0	-	-	19	17
Further study	3	4.6	-	-	3	15.8	-	-	-	-	6	5
Miscellaneous <sup>c</sup>	1	1.5	1	16.7	1	5.3	-	-	-	-	3	3
Retired to town	2	3.0	-	-	-	-	-	-	-	-	2	2
Not known	4	6.1	1	16.7	2	10.5	2	13.3	2	40.0	11	10
	66	100.0	6	100.1	19	100.0	15	100.0	5	100.0	111	100

Notes: a Includes employment which, although not directly farm labouring, involves servicing the farming sector, e.g. shearing, casual farm work, agricultural contracting, rabbiting, meat inspecting.

b Usually employment in an urban area

c Includes travel overseas and prison.

Source: Field Survey, May-July, 1978.

known, 12.9 percent of labourers who have previously been employed on a farm leave for occupations unrelated to agriculture. This figure is very similar to Cant's estimate of between 9 and 10 percent, and consequently represents a significant loss of skilled or semi-trained workers, which if cumulative is a migration the agricultural sector can ill afford.

In terms of recruitment into agriculture from other spheres, 19 (17.1 percent) of the workers who have left employment on the surveyed farms between 1973 and 1978, were school leavers who had found their first job on a farm. Of those whose destination is known, 41.2 and 11.8 percent respectively went to another farm job or into ancillary agricultural work (shearing, and agricultural contracting). Another 17.6 percent left to further their studies, and as this included courses at Massey University and Lincoln College, the expectation is that these workers will eventually find themselves involved in some aspect of agriculture. This means, however, that 23.5 percent are lost to unrelated employment, and as these are young people whose fitness and youth would be an asset to the farm labour force, their loss is the more serious for this reason.

Of the 13.5 percent of workers whose employment immediately prior to that on a surveyed farm was unrelated to agriculture, less than half returned to a farm labouring job. The large proportion (46.1 percent of workers with a known destination) who left to resume employment which is unrelated to agriculture supports the contention that there is a certain type of worker who is relatively mobile but not interested in agricultural promotion, and who moves in and out of the agricultural labour force in response to his perceived opportunities. In terms of a committed and skilled farm labour force, this type of worker should not be encouraged, although he partly fulfills the gap between demand and supply of farm workers. If farm labouring is to be elevated to the status of a career, it would be desirable to have employees committed to agriculture. To this end, the Labour Subsidy scheme for unemployed workers is perhaps a step

in the wrong direction. The Additional Job and Cadet programmes provide a sounder basis for a trained and motivated agricultural labour force.

## FOOTNOTES

1 Labour Shortage Measurement

Several alternatives exist for the measurement in standard units of the labour required on farms. Labour may be expressed as:

- 1) man hours
- 2) labour expenses
- 3) labour units.

The first two indices are rendered impractical, because accurate records of hours worked and wage rates are not generally available. Also, wages are a poor indication of measurement, as they are subject to inflationary bias. Furthermore, individual interpretations of what constitutes time spent working on the farm varies considerably: is going to the neighbour's to borrow tools considered in the hours of work? (Doig, 1940; Moorhead, 1969; Smit, 1971).

It is therefore decided to employ a system of labour units (Table 4.9) as the measurement of intensity of demand. No allowance is made for intensity of the work effort, but differentiation is possible for full-time, casual and springtime labour requirements. By standardising the demand for labour (into labour units required), one measurement can be deduced for each farming environment, which renders comparisons possible.

TABLE 4.9  
LABOUR UNIT CONVERSION RATIO

Type of Labour	Length of Employment	Labour Unit Ratio
Permanent	Required for the entire year.	1.0
Casual	Required for maintenance and development work, for approximately 6 months	0.5
Springtime	Required for the spring season only (approximately 3 months)	0.25

- 2 "Lack of profit" incorporates the two perspectives of diminishing surplus income and falling total revenue (Chapter 1, footnote 4).
- 3 A Farm Employment Wage Subsidy scheme was introduced in the minibudget of 1977, which entitled farmers to a subsidy of between \$40 and \$50 on wages payable to workers. Initially the scheme was limited to "development" jobs. In the Manawatu area of the Department of Labour, the work included scrubcutting, gorse spraying, fencing, construction of a piggery and painting farm buildings.  
  
In October, 1978, the scheme was extended under the Farm Employment scheme, in which a flat subsidy of \$40 is payable to all eligible workers. Under the subsidy, the staff engaged must be registered as unemployed. For this reason the scheme has been criticised as a policy to "disguise unemployment" rather than a co-ordinated agricultural policy. Nevertheless, the response has been reasonably good considering the accommodation and transport problems associated with farm location. In the Manawatu area, 255 vacancies had been notified by August, 1978, and 243 people had been employed under the scheme. At the 1 September, 1978, 117 people were employed on the subsidy (Department of Labour, Palmerston North, 1978).
- 4 Introduced in March, 1978, a Skill Promotion scheme entitled the farmer prepared to train his employee to a subsidy of \$30 on the workers wages. The disparity in subsidy with the Wage Labour scheme created a greater initial uptake of the latter scheme. In October, 1978, the Additional Jobs programme replaced the Skill Promotion scheme and introduced a \$40 flat rate subsidy. The advantage of the scheme is that the farmer is likely to employ workers who are committed to and enthusiastic about farm work.

- 5 Moran (1974) claims that the distinctions between sheep farming policies are less definite today, and that almost all sheep farms include fattening lambs as a part of their operation.
- 6 There are a number of institutions in New Zealand which offer agricultural instruction. Lincoln College and Massey University offer comprehensive degree and diploma courses in most aspects of agriculture. The Agricultural Training Council co-ordinates the various farm training institutes, namely Smedley Station (Hawke's Bay) which has facilities for 14 trainees but with the 2 year course, the intake is limited to 7 new applicants each year; the Southern Star Abbey, Kopua (Hawke's Bay) with accommodation for 7 trainees annually; the Cadet Training Farm (Masterton) for 30 applicants; Flock House (Bulls) for 60 trainees and Telford (Balclutha) for 50 applicants, providing a one year course although in addition shorter courses are available. The Farm Cadet Training scheme has also been influential in training a proportion of the farm labour force. Between 1971 and 1978, 374 cadets have been employed under the Wellington-West Coast Provincial Farm Cadet scheme.

The certificates of ability and proficiency gained from these training institutes are valuable to the trainee when applying for positions on farms or for financial assistance in any farming venture. The trainee is usually also eligible to apply for a ballot farm. In terms of national worth, such training institutions are invaluable in providing and encouraging a more highly skilled farm labour force, better equipped to cope with increasingly sophisticated technology and new management techniques.



CHAPTER 5  
LABOUR AS A CONSTRAINT TO INCREASES IN  
AGRICULTURAL PRODUCTION

One economic strategy, which is advocated strongly by a substantial body of economists and professionals as a solution to New Zealand's present balance of payments difficulties, is the expansion of the agricultural sector (Johnson, 1977; Maughan, 1977a; M.A.F., 1976a, 1977d; O.E.C.D., 1977; Philpott, 1977; Willis, 1976). Proposed increases in both volume of production and productivity in agriculture have led national policymakers to question which factors affect agricultural output, under what conditions, and in which areas. One factor which has been identified is that of farm labour (Lloyd, 1974; McClatchy, 1966; Maughan, 1977a; O.E.C.D., 1977). The critical evaluation in terms of national policy is to determine if a farm labour problem exists, and if so, the extent to which the problem is limiting agricultural development. Consequently, the effect of the labour problem on the structure of the farming system and between contrasting physical environments must be measured.

The guiding argument in this research is that in order to achieve volume increases in production, the farmer must approach the full utilisation of his land and increase stock performance. Together, output per stock unit and output per hectare render a total definition of farming, such that individual farmer's concern for either animal performance or stocking rate are equally emphasised.

Increased volume of output per stock unit and per hectare necessitates the adoption of a combination of farm management practices, such as grazing management and increased subdivision (McArthur, 1967; McLean, 1978; Milne, 1969). The practices can be classified as farm maintenance tasks and farm development programmes. Maintenance involves the preservation of buildings, fencing and equipment, such that existing assets on the farm are kept in working

order. These tasks, if not performed, work as a cumulative negative factor in farm development: instead of standing still, the farm will in fact be sliding backwards. Development programmes initiate improvements to the farm to achieve increased output, e.g. scrubclearing, development of new pastures, increased fencing subdivision, and higher stocking rates. Such projects usually involve a substantial capital investment in the farm.

These farm management practices are labour intensive. Consequently, the demand for labour becomes an important factor, but varies in accordance with the farmer's production strategy. At one extreme, minimising risks tends to create a holding situation on the farm, as the farmer is unwilling to invest heavily in development. Maintenance is kept up, but any volume increase in output as a result of maintenance performed is short run. Alternatively, the other extreme of maximising profits encourages the farmer to invest in development and maintenance programmes. Expansion from such schemes tends to be longterm and is therefore the preferred agricultural strategy.

In order to adopt additional management procedures, the farmer must increase his permanent labour supply to cope with the extra work involved (McLean, 1978), unless he makes certain adjustments in the production factors of management, capital, land and labour. The working hypothesis for this study has been that the labour problems (of availability, cost, retention and efficiency) prevent the farmer from increasing his permanent labour force, thus acting as either a constraint to farm development or as an agent for necessitating structural change in the input factors of the farming system.

#### LABOUR SHORTAGE AND FARM PRODUCTION

Production on the farm is assessed by a series of measures (Table 5.1). The existence of an inadequate labour supply on each farm is tested against the stock units per effective hectare for 1978<sup>1</sup>, which provides an indication of the present level of output.

TABLE 5.1  
RELATIONSHIPS BETWEEN PRODUCTION INDICES AND EXISTENCE OF FARM LABOUR SHORTAGE

Hypothesised relationship	Chi-square value	Accept/reject null hypothesis	Decision at the 0.05 level
Ho: That there is no relationship between an inadequate farm labour supply and:			
1) Stock units per effective hectare, 1978	0	Accept	Not significant
2) Change in stock units per effective hectare, 1972-1978	1.64	Accept	Not significant
3) Level of on-farm development, 1972-1978	0	Accept	Not significant
4) Management system changes towards less labour-intensive systems, 1972-1978	5.64	Reject	Significant
5) Potential of the farm to increase production, as perceived by the farmer	0.55	Accept	Not significant

Source: Field Survey, May-July, 1978.

The positive or negative change in stock units over the last six years represents an effective measure of production expansion. The level of development is assessed by a weighted index for ongoing development projects and capital investment from 1972 to 1978, minus an index of maintenance tasks which have been delayed since 1972, such as fencing, draining and fertiliser application.<sup>2</sup>

Table 5.1 illustrates that an inadequate labour supply and the level of production measured by these above indices is not statistically related. Labour problems do not appear to have affected the present level of stock units on the farm, or to have provided an obstacle to change in the stock units per effective hectare and ongoing development over the last six years. This is supported by the farmers' own ranking of the most important factors limiting an expansion of output from their farms. Inadequate profits, freezing works industrial disputes, and lack of financial incentives to increase production are consistently given as the major obstacles to output expansion (Table 5.2). The labour issue is ranked as the least important factor influencing farm production levels.

#### The Decline In Farmer Confidence

The factors repeatedly stated as the major obstacles to an expansion of farm production can be grouped loosely under the term "farmer confidence", which in recent years has been declining. In the 1960's, especially following the Agricultural Development Conference of 1963-64 (1966) there appeared to be a genuine enthusiasm among farmers for the concept of "the national interest" - increased production to help New Zealand (Maughan, 1977a). From the surveys conducted for this research, no such attitudes prevailed. Moreover, a general lack of enthusiasm was detected: "why should I work hard for New Zealand when I don't receive any benefit" was the typical response from an increasingly sceptical farming community. This approach is well summed up by a quotation taken from the Agricultural Policy Seminar held at Massey University, in 1977:

TABLE 5.2

THE THREE MOST IMPORTANT OBSTACLES TO EXPANSION OF OUTPUT FROM THE FARM, RANKED IN ORDER  
OF MAGNITUDE AS PERCEIVED BY THE FARMER IN THE SURVEY AREA

Perceived obstacles to farm output expansion	Percentages and Ranking						Composite Ranking	
	%	Rank 1	%	Rank 2	%	Rank 3	%	Rank
Inadequate profits from farming to finance increased production	42.3	1	22.6	2	15.2	3=	27.6	1
Difficulty in borrowing capital for farm development	1.2	9	4.5	7	4.5	8=	3.3	8
Uncertainty, due to market fluctuations overseas	2.5	6=	3.9	8	6.8	7	4.3	7
Financial returns from increased production are not worthwhile (high taxation)	22.0	2	20.6	3	16.7	1=	20.0	3
Shortage, cost and high turnover of farm labour	2.5	6=	2.6	9	4.5	8=	3.1	9
Pessimism, due to the lack of effective restraints on wages in the non-farming sector of the economy	2.5	6=	7.1	4	15.2	3=	7.7	4
High level of death duties - improvements not worthwhile	3.7	5	6.5	5	9.8	6	6.4	6
Climatic uncertainty - fear of encountering a drought and being short of feed	4.3	4	5.7	6	10.6	5	6.7	5
Freezing works industrial disputes - fear of a strike and having to retain stock on the farm	19.0	3	26.5	1	16.7	1=	20.9	2
	100.0		100.0		100.0		100.0	

Source: Field Survey, May-July, 1978.

Group 6 felt that increased agricultural production was needed from the national viewpoint and was essential to any growth, but there seemed little incentive for the individual farmer to want to increase production since there was no profit in it for him ...

It was felt that the situation of asking for more and more production from farmers in a situation where they could only produce more by cutting labour inputs, had led to a great deal of pressure on the individual farmer. He was now discovering that part of the pressure could be removed by producing less and accepting a higher level of profitability for a lower level of production.

(Maughan, 1977a, 64.)

Income fluctuations and industrial problems, particularly concerning the freezing works, are two major causes of farmer's declining confidence in the state of the agricultural sector (Holmes, 1976; Taylor, 1978). In terms of the most significant freezing works stoppage indicator, man hours lost per employee, the Wellington and Hawke's Bay regions are relatively strike prone, recording respectively 88 and 60 manhours lost in 1977, this ranking third and fifth in the highest number of manhours lost for each region in New Zealand (Nordmeyer, 1978, 16). Consequently, the research area has had its share of freezing works industrial stoppages. Time and again, farmers stated in this survey that there was no benefit in increasing livestock numbers if the freezing workers were going to strike, thus leaving the farmer with extra stock and limited feed. "The farmer has to put himself in such a position that he can withstand a siege", one established farmer responded, inferring that it is rational for the farmer to reduce stock numbers and thus allow himself flexibility in times of crisis. This psychological barrier to increased output needs to be lessened if the desired expansion of the livestock industry is to be achieved. Policy should not only incorporate incentives to encourage increased volume of output and to lessen the impact of input cost increases, but also to remove the psychological impediments to production expansion, and thus create an encouraging environment.

## LABOUR SHORTAGE AND MANAGEMENT RESPONSE

Table 5.1 illustrates that the relationship between an inadequate labour supply and change in the management system over the 1972-1978 period is significant. The index for management change is weighted for less labour-intensive methods<sup>3</sup> which incorporate diversification in livestock breeds (Perendale and Coopworth are assigned higher values on the index), adoption of easycare lambing procedures, removal of stud practices, and an increase in the dry stock carried. A movement towards second shearing, block and rotary grazing practices, and modulating cropping acreages are also weighted on the index.

From the statistical analysis farms which have scored above the median (i.e. have attempted considerable change towards less labour-intensive management systems) tend to have a higher incidence of labour shortage than those farms experiencing little or no change in their livestock management systems.

The analysis points only to the existence of a significant relationship, from which causality cannot be assumed. Other factors such as market trends and technological developments may have greatly influenced the adoption of certain management practices. The analysis, however, does support the tentative conclusion that the existence of a labour problem conditions a certain type of management response. The farmers who have attempted and/or achieved less labour-intensive change have adjusted to an inelastic labour supply by a structural input modification. Consequently, the labour problem cannot be hypothesised as a restriction to output expansion and development on the farm, but it appears to be reinforcing a certain management response which is channelling production patterns in certain directions. The consequences of wide scale substitution of traditional Romney flocks by Perendale and Coopworth, or of increases in dry stock, are issues to which policymakers and agricultural advisors must address themselves. The question is, does the management response limit volume expansion of farm output?

## PERCEIVED PRODUCTION POTENTIAL AND LABOUR SHORTAGE

The relationship between the farmer's perceived production potential of his farm and the existence of a labour shortage is not significant (Table 5.1). Had a decisive proportion of farmers with an inadequate labour supply maintained that their farms were capable of a production increase, it could have been suggested that the labour shortage was limiting output expansion. What is interesting, however, is that 78.8 percent of farmers recognised the potential to increase the volume of output on their farms, yet half of all farmers surveyed have decreased their stock units per hectare since 1972. The capacity to increase is recognised by the farmers, but the incentive appears not to be present - which once again raises important questions from a policy standpoint.

## FARM SYSTEM AND PRODUCTION

To determine if other factors are affecting farm production, further Chi-square tests were performed on various attributes of the farming system (Table 5.3). The positive or negative change in stock units per hectare between 1972 and 1978 was deemed to be the most appropriate measure for production increase on the farm in the absence of detailed annual output accounts. Farmer's age, proximity to retirement, agricultural training<sup>4</sup> and the type of farm show no significant relationship to this measure. Consequently, no apparent production pattern emerges with regard to farming type or farmer motivation. What these factors may influence is the farmer's response - will he decide against farm development and maintenance work, and if he goes ahead, which alternative will he choose. There is scope for further research into this area which should greatly benefit the study of production factors in the agricultural sector.

## Accessibility, The Hill Country Environment and Farm Production Expansion

The change in stock units per hectare from 1972 to 1978 is significantly related to accessibility, measured in both distance and



TABLE 5.3  
RELATIONSHIPS BETWEEN STRUCTURAL ATTRIBUTES OF THE FARMING SYSTEM AND CHANGE IN STOCK  
UNITS PER EFFECTIVE HECTARE, 1972-1978

Hypothesised relationship	Chi-square value	Accept/reject null hypothesis	Decision at the 0.05 level
Ho: That there is no relationship between the change in stock units per effective hectare over the period 1972-1978 and:			
1) Accessibility			
• measured by distance (km)	4.07	Reject	Significant
• measured by time (minutes)	5.70	Reject	Significant
2) Farmer motivation			
• age of farmer	0.83	Accept	Not significant
• proximity to retirement as perceived by the farmer	0.13	Accept	Not significant
• type of agricultural training undertaken by the farmer	1.22	Accept	Not significant
3) Farm type	1.74	Accept	Not significant

Source: Field Survey, May-July, 1978.

time (Table 5.3). The more inaccessible farms exhibit a higher positive stock unit change than expected, which indicates that expansion of livestock numbers is being achieved in the more remote areas.

Although not strictly synonymous the accessibility level closely adheres to the gradient of isolation for the three environments. The average absolute accessibility level for Kairanga, in distance is 35.6 kilometres, and in time is 42.8 minutes; for Kiwitea-Woodville, 72.6 kilometres and 75.5 minutes; and for Akitio, 141.4 kilometres and 148.1 minutes. Consequently, it should hold that for the majority of situations the more inaccessible farms will be located in the environment furthestmost along the isolation gradient.

That positive stock unit per hectare change is inversely related to accessibility implies that the most isolated area, Akitio, is likely to be experiencing stock unit increases. Although the relationship between livestock change and the three survey environments is not statistically significant at the 95 percent confidence level (Table 5.4), the strength of the Chi-square statistic points towards the conclusion that there is a greater degree of positive stock unit per hectare change in Akitio, compared to the Kairanga and Kiwitea-Woodville areas.

The greater incidence of negative change in the latter two environments may be the result of two phenomena. Firstly, from discussion with farmers in these areas, it was felt that much of the land was overstocked in the 1972 season, possibly a response to increased pressure from M.A.F. to boost livestock numbers. (The Stock Retention Incentive scheme was introduced three seasons later.) A series of droughts in the 1970's, coupled with lower financial returns and industrial strike action, may have brought about a move to reduce stock numbers to a size with which there is greater flexibility for feed reserve. Secondly, many farmers, especially in the Kairanga area, felt their farms had reached production potential under the present livestock management system,

TABLE 5.4  
RELATIONSHIPS BETWEEN PRODUCTION INDICES AND THE THREE FARM ENVIRONMENTS OF KAIRANGA,  
KIWITEA-WOODVILLE AND AKITIO

Hypothesised relationship	Chi-square value	Accept/reject null hypothesis	Decision at the 0.05 level
Ho: That there is no relationship between the three farm environments and:			
1) Stocks units per effective hectare, 1978	43.48	Reject	Significant
2) Change in stock units per effective hectare, 1972-1978	4.16	Accept	Not significant
3) Level of on-farm development, 1972-1978	3.73	Accept	Not significant
4) Management system changes towards less labour-intensive systems, 1972-1978	8.71	Reject	Significant
5) Potential of the farm to increase production, as perceived by the farmer	11.76	Reject	Significant

Source: Field Survey, May-July, 1978

and an increase in stock units would necessitate an operational change in farm strategy. Further, significantly more farmers than expected in the Akitio area saw the potential to increase production on their farms than in Kairanga, which supports this contention.

These deductions infer that in terms of farm production the Akitio region, a hill country farming environment, has been underfarmed. It is this area which displays the greatest perceived potential by farmers for increase in farm output, has proportionately the greatest number of farms exhibiting positive stock unit per hectare change, and greater than expected number of responses towards less labour-intensive change in management systems.

In light of results from this survey, it would appear that the estimated 5 to 7 stock units per hectare for hill country (Brougham, 1973; M.A.F., 1976a) is an assessment based on present and not potential capacity. The research has isolated Akitio as a hill environment which appears to have the potential to increase farm production (the farmer's opinion) and has been achieving considerable positive stock unit per hectare change over the last 6 years. This corresponds to recent agricultural appraisals of sizable production increases possible from the hill country farming environments (Brougham, 1973; Hight, 1976; N.R.A.C., 1978).

The research also indicates, however, that the Akitio area is experiencing a greater farm labour shortage in comparison to the lowland farming environment. Although on-farm production levels do not appear to be affected by this, certain management response patterns are statistically related to the existence of a labour shortage. These responses may have a limiting impact on attempted increases in production volume and quality. Inevitably, other factors are operative on production and the N.R.A.C. (1978) highlights these as soil and water resource limitations, pasture and fertiliser maintenance, animal husbandry and social and economic factors. Policy formulated to assist the development of the hill country must incorporate these factors, but the labour problem should also be treated as a separate and important issue. This argument is expanded further in Chapter 6.

## FOOTNOTES

- 1 The stock unit conversion ratio used in this thesis adheres to the official M.A.F. stock unit conversion ratios for survey work and national assessments (Table 5.5).

TABLE 5.5  
STOCK UNIT CONVERSION RATIO

Class of Stock	Ewe Equivalents
<u>Sheep</u>	
Ewes	1.0
Hoggets	0.6
Others	0.8
<u>Cattle</u>	
Beef	4.0

Source: M.A.F., 1978, 145-146.

For farmers growing crops which are in the ground for 6 months (this includes all crops except maize), half the cropped area is excluded when calculating the stock units per hectare. For maize, which is in the ground for 10 months, the entire cropped area is excluded. This adheres to standard M.A.F. policy for calculating stock units on mixed livestock-cropping farms.

The stock units are calculated on the area effectively farmed. This is obtained by subtracting the hectares in scrub, gorge or unproductive land from the total area. The total area of the farm is defined as that land which is under one management and worked by the same labour units. Consequently, it does not need to be confined within one boundary fence. A farmer may own two or three pieces of land, geographically isolated by several miles. Providing that he and any employee(s) work these separate tracks of land as one integral unit, the separate land areas are termed one farm.

- 2 Procedure for Index of Development, see Chapter 3, footnote 12.
- 3 Procedure for Index of Management System Change, see Chapter 3, footnote 12.
- 4 Agricultural training includes degree and diploma qualifications, practical courses and Cadet training. In the survey, 4.9 percent of all farm workers (which includes those employed in the last 5 years and workers presently engaged) had experienced some type of agricultural training. Of these employees, 37.5 percent had attained a degree or diploma at Massey University or Lincoln College, 20.8 percent had attended Smedley or Flock House, and 41.7 percent were employed under the Farm Cadet scheme.

## CHAPTER 6

### CONCLUSIONS, INTERPRETATION AND POLICY IMPLICATIONS

The organisation of this thesis reflects an attempt to provide results, and interpretations which are immediately useful to policymakers. This requirement necessitates a transition of discipline boundaries and the resulting research framework reflects this. The study has selected one farming system and within this, examines the farm labour problem in three environments, differentiated by topographical criteria and a gradient of distance from the major urban area of Palmerston North. The concluding remarks are in relation to this framework, although discussion does move beyond the sheep farming system and the general validity of the conclusions are considered in relation to New Zealand. Two major conclusions can be stated: firstly, that the cost of the labour unit is the major inhibiting factor to increased employment on farms, and secondly, that the consequent on-farm shortage of skilled labour does not have a significant limiting impact on production levels between farms, but it does elicit a certain management response towards less labour-intensive systems of operation. The short and long term production consequences of this are as yet uncertain.

#### LABOUR DEMAND AND THE EFFECT OF PRODUCTION STRATEGY

In the context of this research, there appears to be a definite farm labour problem. Over half of the farmers who participated in the study felt that they had an inadequate labour supply. The intensity of the problem, however, is largely determined by the farmer's perception of his demand for additional labour, whether it be of a permanent or seasonal nature. The demand varies with the farmer's production strategy. Some idea of what might happen if farmers shift their attachment to strategy can be obtained by temporarily assuming all farmers fall in either one or other of the two categories, minimising risks or maximising profits. Allowing that New Zealand farmers are all profit

maximisers, their expansionist and profit-motivated activities would require additional farm labour to carry out the farm development programmes, particularly involving an increase in stock numbers. In terms of expanded national production, this is the approach which should be encouraged, although the farmer's ability to employ additional labour appears to be limited by various supply constraints, the greatest being the cost factor.

Unfortunately, in the present economic climate, the New Zealand farmer has tended to become a "risk averter", content to remain in a holding situation rather than create additional risks by expanding production output from the farm. Farmer's confidence in the economy has been shaken by a declining profit margin, increasing costs (particularly for labour), and industrial troubles. Indirectly, this means less labour demand. As a production strategy for New Zealand farm operations it is to be avoided, if increased volume of production is the agricultural policy objective.

#### PROBLEMS OF LABOUR SUPPLY

For reasons of clarity, the supply perspective to the farm labour problem is conceptualised in the four dimensions of availability, cost, retention and efficiency. It is appropriate at this stage to attempt some assessment of the relative importance of each dimension. Clearly in the minds of the farmer, cost is the major problem in terms of employing farm labour. Expenses in wages, accommodation, equipment and those "perks" which have become part and parcel of the farm labour employment agreement (Bradford, 1971a; Brier, 1974; Koller, 1972; Morris and Cant, 1967), have placed the employment of additional workers beyond the profitable means of many farmers. The economically rational alternative for a number of farmers is to stabilise or reduce stock numbers to a size one man can cope with. This leads to large areas being "underfarmed", a practice conflicting with agricultural policy aims of maximum production. As a solution on paper to the cost factor, a subsidy for worker's wages would appear to be the answer. In practice, however, the Wage Subsidy scheme for the unemployed does



not appear to meet favourable reaction from farmers and is a questionable policy for attracting committed and trained workers to the agricultural sector.

Availability of farm labour is an important aspect of the labour question, but the term availability must be qualified. With the present high levels of unemployment, it is generally not difficult for a farmer to acquire a worker. Attraction of suitable and skilled labour proves more difficult, however, despite the existence of various agricultural training institutes and schemes, and farm labour agencies. Of the farmers who indicated that they required additional labour, 10 percent stated that the limited availability of suitable workers was the inhibiting factor to further staff employment. The majority of farmers were emphatic that they were interested only in experienced people. Availability, however, can be considered a subsidiary element of the cost dimension, as trained farm workers could no doubt be employed if the farmer was willing and/or able to pay excellent wages, well in excess of farm manager's rates or urban employment opportunities.

The farmer appears to be reconciled to the fact that farm labour is relatively mobile. This is regardless of whether he employs a committed farm worker or an unskilled labourer, unless he can offer substantial promotion and status in the position. The worker who remains on one farm for longer than 5 years appears to be the exception rather than the rule, and in most cases he has attained a manager's position. Disruption of daily routines and time and effort expended to find replacement staff appear to be an accepted facet of employing farm labour. Consequently, as a problem to the farmer, this dimension of the labour issue is not rated highly.

As a problem for the agricultural sector, the retention of farm workers has serious implications. From the present survey, approximately 12 percent of workers who have previously been employed as farm labourers left agricultural employment for

unrelated occupations. This represents a loss of skilled or semi-trained workers. Of school leavers whose first job is on a farm, 23.5 percent are lost to employment unrelated to agriculture. These are the young potentially able workers, and their loss is the more serious for this reason. If this is a cumulative process, the absolute number of workers leaving the farming sector for unrelated (predominantly urban) employment is questionably large.

It is difficult to measure labour productivity at the farm level. A crude measure of labour efficiency is the calculated average 1,640 stock units per labour unit in the surveyed areas. This figure allows for no differentiation between owners and workers, and further between the workers who intend to remain in agriculture and those who see farm work as "another job" comparable perhaps to factory employment. Presumably the longer a person is involved in agriculture, the more experienced and "efficient" he becomes, up to an arbitrary point beyond which age restricts his activities. In terms of maximum production per labour unit, it is plausible that agricultural policy be directed towards encouraging young people into agricultural employment, and seriously questioning the substantial loss of experienced, semi-trained and young workers who migrate to urban employment each year.

#### STRUCTURAL RAMIFICATIONS OF THE LABOUR PROBLEM

Productivity per labour unit has increased due to the widespread adoption of management techniques and technological innovations, which require a degree of capital investment. From the empirical research, one of the major associations with the existence of a labour shortage on the farm is the widespread adoption of less labour-intensive management systems. A labour deficit and levels of on-farm production proved to be not significant. Consequently, it appears that the volume of production on the farm is not adjusted to available labour. As such, the labour problem cannot be cited as a limiting factor to agricultural development.

Farm management systems, however, may be directed towards the labour available and it is the indirect impact of this management

response on production volume which is important and must be considered by policy coordinators. The volume of production has not appeared to vary significantly between farms with and without a labour shortage, but the quality of that production may have. Management change incorporates diversification in livestock breeds, adoption of easycare lambing procedures, an increase in the dry stock carried on the farm and variation in the cropping acreages cultivated. The question is do these changes limit volume expansion from the farm? Is an increase in the proportion of dry stock the answer to New Zealand's agricultural expansion drive?

An extension of this present discussion is to consider the impact of a hypothesised decline in technological change in agriculture (Philpott, 1977). The change to less labour-intensive management systems involves a large degree of capital substitution. In a sheep farming system, this includes, for example, electric fences for slow rotational grazing for beef and sheep, farm bikes for rapid farm transport, increased fencing subdivision and access races for easier control of livestock. Capital substitution for labour is even more marked in the dairy industry, where rotary cowsheds and automated cup removal greatly decrease the work-load. New Zealand agriculture has been committed to capital intensive development (Hussey and Philpott, 1969), largely due to an acceptance of rural depopulation (Franklin, 1969a; Heenan, 1968; Lloyd, 1974) which has limited labour in the countryside, and the ready availability of advanced technologies (Morton, 1977; McLean, 1978; Smallfield, 1970).

If, as Philpott (1977) suggests, there has been a virtual cessation of technical progress over the last seven years, then management systems based on technological innovations will become less applicable. In the extreme, the response-orientated input change towards less labour-intensive methods will also cease. In such a situation, the labour problem threatens to become the major factor in farm development as the farmer's response to a labour deficit (i.e. adoption of new management systems) will be limited by lack of technical progress. This field of technological

advances, farmer's adoption patterns and consequences of innovation stagnation should prove to be an important focus for D.S.I.R. and a major pursuit area for research in the 1980's.

#### POLICY IMPLICATIONS

Having outlined the structural ramifications of the labour problem, it is now appropriate to consider policy formulation to determine if any dimensions of the labour problem can be overcome. Any proposals must be considered in the context of the agricultural policy formulation evident in New Zealand over the last decade.

#### Agricultural Policy Measures Over The Last Decade

Agricultural policy should encourage the optimum use of the nation's resources within the framework of society's overall economic and social goals.

(Ross, 1976, 103).

The overall policy objectives for agriculture, according to the O.E.C.D. Agricultural Policy Report (1974) are to improve the market and development of pastoral products, as always within the context of national economic welfare. Ross (1976) suggests that the optimum agricultural policy should a) be consistent with the social and economic objectives of the community, b) seek to minimise the effects on the farming industry and on the total economy of the wide fluctuations in export prices, and c) be of a long term nature.

The major criticism of government agricultural policy over the last ten years is that it has been notoriously short term, characterised by ad hoc measures which are designed to meet particular circumstances, rather than a coherent policy with a long term goal (Holmes, 1976; McLean, 1978; Taylor, 1978). McLean (1978) argues that recent policies have helped prevent agriculture slipping, but have not yet succeeded in restoring sustained growth, chiefly due to government's reluctance to try bold measures.

Over the last ten to fifteen years there has been a renewed awareness that New Zealand earns her standard of living by exports (Holmes, 1976; Maughan, 1977a; M.A.F., 1977d; O.E.C.D., 1974). This has been recognised by a series of Development Conferences during the 1960's, particularly the Agricultural Development Conference in 1963/64 (1966) in which the targets committee estimated a 3.5 percent per annum increase in livestock units, and the 1968 National Development Conference (1969). The reports from the Conferences press for measures to stabilise fluctuating incomes, so that the farmer can budget and the nation see development that isn't of a stop/go nature.

The 1970 drought brought about short term emergency measures, particularly the Agricultural Assistance Fund from which lump sum payments were made without specific criteria for granting assistance. In 1971, the Supplementary Finance scheme was introduced as selective assistance through loans, and led the way to the Stock Retention Incentive scheme. In effect, this was a direct income supplement, under which the government paid farmers, on a non-selective basis, to keep stock.

The 1969-72 droughts had prompted Federated Farmers to push for drought relief programmes and encouragement for farmers to accumulate reserve supplies of feed. Various subsidies for transport, rural water supply schemes, new buildings, and so on, were introduced, and the Farm Income Equalisation scheme was expanded, which was designed to reduce fluctuations in aggregate income and assist planned development on farms. This never enjoyed great success.

Policy measures seem always to include a large number of selective input subsidies, on, for example, fertiliser and drench and their application (Franklin, 1978; M.A.F., 1977a; Muldoon, 1978; O.E.C.D., 1974). Frequently, however, the longer term effect is for these subsidies to become built into the cost structure of the farming operation. A removal of the fertiliser subsidy, for instance, would cause a significant drop in net income for many

farmers (McLean, 1978). Continued subsidisation of inputs at a high level may encourage wasteful use of the resource, and even result in a lower usage when prices and incomes fall (Taylor, 1978).

Corresponding to the boom in beef and grain prices the year before, 1974 was a high income year. There was little response, however, in the way of additional livestock numbers (Meat and Wool Boards' Economic Service, 1971, 1972, 1974; M.A.F., 1976a, 1976e, 1977d). The government was concerned that the increasing magnitude and frequency of fluctuations of commodity prices was producing a stop/go situation for development on farms and a resultant "hic-cup" throughout the economy. The government disbanded the National Development Conference in 1974 and with the aid of the Agricultural Production Council announced the Income Stabilisation scheme for wool and meat. These were designed to even out fluctuations in farmer's income, thus terminating the disruption in the economy, and allow for a build-up of funds for planned farm development. Unfortunately, the floor price was set too low to give farmers any real confidence.

By 1976, there was concern that the Agricultural Development Council target of 111 stock units (1966) had not been reached, and that the previous agricultural schemes and subsidies had not performed their task (O.E.C.D., 1974). The government introduced the Livestock Incentive scheme as an incentive for farmers to increase permanently the number of livestock on their properties (M.A.F., 1977e). This saw the first attempt by the government at an on-going commitment to the agricultural sector, and as such represents some consolidation of policy (McLean, 1978; M.A.F., 1976a). The scheme was not across the board, but selective to those farmers prepared to do something themselves. The scheme, however, is more helpful to the established net-income farmer than to the young man who is willing to but financially incapable of initiating development. It also does nothing to directly discourage farmers from investing in non-farm assets. The scheme has been labelled by its critics as the "skinny lamb" scheme, for which the poor climatic conditions following its introduction have

contributed. This highlights the fact that the incentive applies only to increases in stock numbers and not to increased production per stock unit, a distortion in resource use which may become serious in the long term situation.

Thus, agricultural policy over the last ten years has been characterised by ad hoc measures, the fragmented approach of which can only serve to strengthen the stop/go development and stagnating production levels in agriculture. Policies based on long term goals, rather than directed to particular circumstances, are necessary. The numerous subsidies which were expanded over the 1960's were seriously reduced in 1973 but still the 1978 Budget includes many agricultural policies for the short term situation (M.A.F., 1977d; Muldoon, 1978)

We must know something about the longer-run consequences of policies; we must have an assurance that the policies adopted, to deal with a momentary emergency, will not set up, in the longer run, pressures which are greater than we can hope to withstand.

(Hicks, 1950, 1).

### Policy Proposals

In terms of the labour commitment, it appears to be an unstated (but correct?) assumption of the Livestock Incentive scheme that, because the livestock numbers had been static since 1970, there was scope to increase numbers without increasing the labour requirements. Consequently no labour subsidy was introduced with the scheme.

This thesis establishes that there is, in fact, a labour deficit on many farms, particularly on the fattening-breeding hill country sheep operations. The presence of a demand for labour does not necessarily infer, however, that the farmer will employ an additional worker. The major reason established for the labour shortage is that farmers feel they can ill afford to employ an extra person. The cost dimension has received some attention from policymakers. Unfortunately, the present Wage Labour Subsidy scheme,



introduced in the mini-budget in 1977 and recently extended to seasonal labour, is not part of a consolidated agricultural policy, but rather, appears to have been introduced to "disguise unemployment" firstly and contribute to agricultural development as a secondary and "justifying" reason. The farming sector cannot be expected to absorb unemployment and still maintain productivity, let alone increase the returns per labour unit.

One function the farming sector cannot be expected to perform if it is to meet its primary national economic function is the function so conspicuously performed by farming in many other countries, namely, the residual employment function, i.e. giving low productive work to those who cannot be employed at prevailing urban wage rates in the other sectors of the economy.

(Franklin, 1978, 182-183).

Over 75 percent of the farmers who claimed that they required additional labour, stated cost (high worker's wages and their own declining profit margin) as the inhibiting factor to further employment. This, then, is the dimension of the labour problem to which policymakers must direct themselves. Subsidising unemployed labour does not appear to be the answer. The employees must have adequate skills to implement the agricultural technology available. Creating incentives for young people to adopt farm labouring as a career, and offering training opportunities for unskilled yet enthusiastic workers could yield better results. If a subsidy is unavoidable, it might be better directed towards assisting farmers to employ experienced and committed farm workers, rather than towards labour which requires supervision and is very temporary. The Additional Jobs programme goes somewhat towards this proposal.

An alternative which must seriously be examined is the encouragement of an urban-based farm labour force. Rural social change, through the decline in the number of farms and the consolidation and centralisation of education, medical and social services to urban areas, has resulted in rural depopulation and a decline of the importance of the rural village as a service and



community centre (Franklin, 1969a; Heenan, 1967, 1968; Keown, 1971; Lloyd, 1974). Many rural areas, especially the least accessible, exhibit an aging and static population (Gill and Gill, 1975). If the family farm is to remain a viable institution and if production increases are to come from agriculture, then people must be brought into the rural areas, either as permanent residents, or on a daily basis as commuters.

The particular time dimension to be followed must be costed out by policymakers, in terms of economic and social costs. Has the demographic situation reached a point in which it has become a cumulative process such that closure follows closure, and it is impossible to retain essential services in rural communities (Lloyd, 1974)? In this context, specific policy to upgrade rural educational facilities, medical services and social amenities would be an expensive and largely futile exercise. Perhaps the alternative lies with channelling resources into the larger service towns, capable of independent growth, from where labour is encouraged to commute daily to rural farms. This research, however, suggests that employers are not convinced that commuting labour is as committed to the farm as farm-based workers.

#### A NATIONAL DEVELOPMENT PROBLEM

The research evidence suggests that the intensity of the labour problem is related to factors associated with the hill country farming operations. A composite picture may be built up which strongly suggests that it is, in fact, the hill country environment (represented in this research design by the Akitio area) which is experiencing the greatest labour shortage. The results indicate that:

- 1) An inadequate labour supply is inversely related to accessibility, and it is the hill country farms, particularly in the Akitio area, which are on average the most inaccessible.

- 2) A labour deficit is significantly associated with younger farmers - again, it is the hill country environment of Akitio which

displays the youngest average age of farmer: 42.8 years old compared to 50.7 (Kairanga), 46.6 (Kiwitea) and 45.2 (Woodville).

3) The fattening-breeding sheep operations have a significantly greater proportion of farms with a labour shortage compared to the other farm types. Once again, this type of sheep farm is a feature of the hill country.

In addition the hill country farmers appear to have unequal opportunities to employ the single worker, who in terms of retention and initial employment cost, is likely to be the better labour proposition. Akitio has a significantly higher proportion of married to single workers. From the discussion of results it was concluded that the married labourer tended to be more mobile, and more expensive to employ in terms of providing accommodation and other "perks".

National agricultural appraisals suggest that there is great potential for easy and sizable production increase from the hill country farming environments (Brougham, 1973; Hight, 1976; N.R.A.C., 1978; Tripe, 1965). There are also increased production possibilities from the flat and rolling country (Brougham, 1973) but some researchers claim that the traditional grassland farming systems are approaching their maximum level of output in the lowland environments (Curry, 1962; Moran, 1974). From research evidence the extent to which farms exhibited positive stock unit per hectare increase over the last six years supports the conclusion that in Akitio, a representative hill country area, there is still considerable scope for sizable volume increases in production.

Although no significant relationship can be drawn between production levels and the existence of a labour shortage on the farm, an inadequate labour supply is associated with the wide adoption of less labour-intensive management systems. As the hill country farms display the greatest labour deficit, so also do they exhibit the greatest change proportionately, towards reduced

workload in the management systems. If this is a response to the greater labour shortage existing in the hill environments, it is important that technology continues to open avenues for workload reduction in management, such that the labour issue does not become a major constraint to attainment of production potential. Does this provide a case for policy to be directed towards specific farming environments, rather than as measures applicable across the spectrum of farming systems?

Production levels are dependent on a number of interdependent variables, such that the labour issue is only one factor apparently reinforcing a particular management response, which indirectly may have an impact on the volume of production from changed output potential. The N.R.A.C. in their recent research on hill country (1978) highlight a variety of factors, including soil and water resources, pasture renovation, fertiliser maintenance, animal husbandry and social and economic factors, which are contributing to the present situation on the hill country. To achieve the potential, estimated at a realistic 50 percent increase in production, additional research into all these factors is needed. Consequently, policy formulated to alleviate aspects of the labour problem will not produce immediate increases in the volume of output from the hill country, but it will remove one obstacle to the attainment of this environment's production potential. In this way, research helps to foster policy decisions which are instrumental in determining the future of New Zealand's agricultural development.

APPENDIX A  
COVERING LETTER TO QUESTIONNAIRE

MASSEY UNIVERSITY

June 1978

To complete my masters degree in Geography at Massey University, I am undertaking a thesis on the nature and extent of labour problems in selected farming communities within the Manawatu/North Wairarapa region.

This research is being funded by the D.S.I.R. and has the support of the Ministry of Agriculture and Fisheries. With its completion, it is hoped that new light will be thrown on our present knowledge of factors affecting production. There is increasing concern that the pastoral industry is not expanding, and that farmers confidence is at a low level. This study is designed to explore the human aspect of production - the significance of the shortage and high cost of farm labour - and consequently your opinions, as the farmer, are essential.

My research involves surveying several farming regions, to assess the attitudes towards, and magnitude of, the labour problem. As time will not permit me to individually interview all the farmers selected for the survey, I am mailing questionnaires to a percentage of the sample.

Your farm has been selected for inclusion in the mail questionnaire. The questions in the attached circular are so designed that they will take you only about 20 minutes to answer. Could you then please place the completed form in the stamped addressed envelope and post it.

I can assure you that the survey will be completely CONFIDENTIAL and no details of individual farms will be disclosed to any person or organisation.

As I was raised on a farm in the Manawatu region myself, I realise how busy you will be, but could you please complete and post the questionnaire as the success of my survey depends on the goodwill and co-operation of the farming community.

Thanking you in anticipation,

Yours sincerely,

*Jan Beattie*

Miss Jan Beattie.

APPENDIX B  
RESEARCH QUESTIONNAIRE

## MASSEY UNIVERSITY

## DEPARTMENT OF GEOGRAPHY

Palmerston North

Survey on the Nature and Extent of Labour Problems In the Developing Agricultural Situation In New Zealand.

The following questions will provide information for statistical analysis only, and are completely confidential.

Most questions are answered by simply ticking ☒ the appropriate box. There is scope for your comments.

Name (optional)

Farm location (address) .....

I FARMER

- 1) On this farm are you the owner ☐ or manager ☐
- 2) Does your son/daughter work fulltime on the farm? YES ☐ NO ☐  
If YES, does (s)he share ownership and management responsibility with you ☐ or is (s)he a paid worker ☐ (If paid worker, include in Qu. 25).
- 3) How long (in years) have you owned or managed this farm? \_\_\_\_\_
- 4) Approximately how long have you been actively involved in farming? \_\_\_\_\_  
(Include time spent working on/as owner of other farms)
- 5) Were you brought up on a farm? YES ☐ NO ☐  
If YES, (a) type? \_\_\_\_\_  
(b) was it this farm? \_\_\_\_\_
- 6) Are you married? YES ☐ NO ☐
- 7) How many children do you have? ☐ Ages \_\_\_\_\_
- 8) Your age? ☐
- 9) What do you consider is a realistic retiring age for you?
 

Under 45	45-49	50-54	55-59	60-64	65-69	70+over	(i) Never

(i) If "Never", is there an age at which the working capacity of a farmer begins to decline?

What is this age? \_\_\_\_\_

- 2 -

10) What are your retirement plans?

<input type="checkbox"/>	Stay on farm
<input type="checkbox"/>	Move to nearby town
<input type="checkbox"/>	Other (specify)

11) What will happen to the farm when you retire?

Child (son) takes over	Bring in manager	Sell

12) What form does the ownership of this farm take?

Owner-Operator	Absentee Owner	Partnership	Trust	Company	Estate	Other

13) Tenure (specify acreage in appropriate boxes) Freehold ☐ Leased ☐

14) How many years did you spend at Secondary School? \_\_\_\_\_

15) Have you had any subsequent agricultural training? YES ☐ NO ☐

e.g. attended a diploma or agricultural course at  
Massey, Lincoln, Flock House, etc (specify) \_\_\_\_\_

16) Have any of your children attended further agricultural training courses?

Please specify

Comments

17) What community and agricultural organisations do you and your wife belong to?

II DESCRIPTION OF THE FARM

18) How would you describe your farm?

Hard Hill Country	Hill Country	Mixed hill/lowland	Rolling	Flat

19) How would you classify your sheep farming policy?

Fattening-breeding	Intensive Fattening	Stud sheep/cattle	Mixed Cropping-Fattening

20) Has this policy changed in the last 5 years ? YES ☐ NO ☐If YES, what was the previous farm classification? \_\_\_\_\_why did the change occur? \_\_\_\_\_21) Approximately what percentage of your total gross farm income comes from your sheep farming operations? \_\_\_\_\_



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22) Size of farm (please specify if figures are in acres or hectares):

Season	Total Area		Area Effectively Farmed (not in scrub, forest)
	Home Farm	Land in other locality(s) under the same management	
1971/72			
1977/78			

23) Stocking Rate and Cropping Acreage:

Season	Stock Numbers (Winter Carrying Capacity)				Cropping Figures		
	Sheep			Beef	Other	Acreage	Purpose
	Ewes	Total hoggets	Other dry Sheep			Type (eg. oats, wheat)	(fodder, cash)
1971/72							
1977/78							

24) Annual Output:

	Season 1971/72	1977/78
Stocking Ratio		
Lambing Percentage		
Bales of Wool		
No. fatstock sold (including cull cows)		
Total Crop Yield (Bushells/acre)		
Other (please specify)		

### III LABOUR

The labour unit is considered to be a major factor in production on the farm, but the extent to which the so-called "labour problem" is limiting productivity increases is largely unmeasured. Could you please help to fill this gap in our information by answering the following questions.

Permanent labour employed (regard as permanent any person whom is full-time, paid, engaged in farmwork only, and is expected to remain for at least one complete year. He may be a member of the family if paid on equivalent wage to a non-family worker).

25) Do you employ permanent, full-time, paid farm labour at present? YES ☐ NO ☐

If NO, continue with Qu. 26

If YES, please complete the table.

No. Employed line for each employee (Male, Female)	Relationship to you son, father, kin, not related	Married Single M/S	When Employed month, year	Previous Job another farm, school	Farm Experience number of years in farm work	Future? reliability, likely to stay	Wage weekly pre- tax, when & how paid, e.g. hourly, overtime	Perquisites e.g. rent-free house, firewood, meat, subsidised superannuation scheme, etc.

(a) If Married - (i) does he own his own home? \_\_\_\_\_

(ii) how many children does he have (ages) \_\_\_\_\_

(b) If Single, does he "live-in" with you? How does this work out? \_\_\_\_\_

(c) If living off the farm, how far does he travel? \_\_\_\_\_ miles

Comments (optional) - What do you consider is the real problem with farm workers (shortage, not trained, etc).

Do you consider pay levels and official/unofficial fringe benefits (perquisites) at present available to farm workers are sufficient? Do you offer hourly wages/overtime pay?

26) Have you employed permanent paid workers in the past five years

YES ☐ NO ☐

If NO, continue with Qu. 27

If YES, please complete the table (for the last 5 years only)

No. Employed (Male, Female)  line for each employee	Year Engaged	Married Single  M/S	Previous Job  another farm, school etc	Length of Stay  years/ months	Reliability (Experienced)  skilled, good worker, etc	Age when left  approx.	Possible Reason for Leaving  *1	Destination  *2

\*1 Possible Reasons for leaving:

- 1) dismissed (poor worker)
- 2) moved to job promotion
- 3) was discontent with working/living conditions on farm
- 4) didn't get on with employer
- 5) wife unhappy in the country
- 6) had school children - couldn't afford boarding school, disliked long busing hours

\*2 Destination Possibilities:

- a) to his own farm
- b) to another farm labouring job
- c) work related to farming, e.g. farm contracting
- d) work in urban area
- e) overseas
- f) retired to town

- 27) Do you currently require more labour regardless of whether you can afford it?

YES ☐ NO ☐

If YES, (a) specify if permanent ☐  
casual ☐  
spring-time only ☐

(b) what prevents you from employing more labour? \_\_\_\_\_

- 28) Would (do) you find it difficult to obtain permanent farm workers in your locality?

YES ☐ NO ☐

If YES, is this difficulty one of:

☐ general shortage of any workers  
☐ shortage of suitable labour (trained, experienced) \_\_\_\_\_

- 29) In general, would (do) you prefer a married man ☐ to a single man ☐

(a) Why \_\_\_\_\_

(b) Does provision of a house influence your choice?

(c) Would (do) you experience greater difficulty obtaining a married man in comparison with a single worker in your locality

YES ☐ NO ☐

- 30) If reliable labour was substantially subsidized, would you employ more labour?

YES ☐ NO ☐

If NO, continue with Qu. 31

If YES, would this be primarily to:

☐ increase production by initiating/accelerating development programmes  
☐ catch up on maintenance work  
☐ relieve you and your family of certain tasks.

- 31) Are you employing, or have you employed, labour under the current Wage Labour Subsidy Scheme offered in the minibudget last October?

YES ☐ NO ☐

If NO, do you intend to make use of the scheme in the future?

For what tasks? \_\_\_\_\_

If YES, (a) Please complete the table:

NO. WORKERS EMPLOYED	LENGTH OF EMPLOYMENT	PURPOSE OF EMPLOYMENT

- (b) If the scheme is dispensed with in October, would you continue to employ the worker, on a non-subsidized wage? YES ☐ NO ☐

(c) Have you any comments (criticisms, praises) of the Wage Labour Subsidy Scheme?

Occasional Labour

32) Do you use family labour on the farm? YES ☐ NO ☐

(regard family labour as any unpaid or simipaid help with farm work from your family members).

If NO, continue with Qu. 33

If YES, (a) please complete the table:

	WIFE	CHILDREN
keep farm records		
physical work -regularly		
-only during seasonal peaks		
-infrequently (to open gates , etc.)		

(b) If you could employ substantially subsidised reliable labour, would you continue to utilise family labour on the farm?

YES ☐ NO ☐

33) Do you employ casual farm labour? YES ☐ NO ☐

(regard as casual any person who is/was engaged on seasonal or temporary work, in the last 5 years).

If NO, continue with Qu. 34

If YES, (a) please complete the table:

	Frequency	Purpose*1	Change (Increase/Decrease in use over last 5 years)
Part-time (worker occupied with farm work for part of each day, for the whole year).	hrs/week		
Temporary (seasonal and non-seasonal workers employed for only part of the year).	weeks/year		
Contract (workers employed for a short duration).	days/year		

\*1 Alternatives:

- |                 |                               |                              |
|-----------------|-------------------------------|------------------------------|
| - scrub cutting | - yard work (docking,dipping) | - cultivation                |
| - fencing       | - cartage (wool,fertilizer)   | - hay/silage making          |
| - mustering     | - shearing                    | - drainlaying and ditching   |
| - lambing beat  | - shed hands                  | - bulldozer work (tracks,dar |

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- (b) Would you continue to employ casual and contract workers, if reliable permanent employees were available?

YES ☐ NO ☐

Why? \_\_\_\_\_

- (c) Is contract labour readily available in your area?

YES ☐ NO ☐

Are there special problems you experience with contractors? (please specify) \_\_\_\_\_

- (d) Is temporary and part-time labour readily available in your area?

If NO, is this shortage only noticeable in certain seasons?

YES ☐ NO ☐YES ☐ NO ☐

Which season? \_\_\_\_\_

- 34) If you were ill, who would come and look after the farm? \_\_\_\_\_

Would you have trouble finding someone to do this?

- 35) LABOUR PROBLEMS: Farm labour problems can be categorized under four headings. Please rank these according to which you regard as the most important to the least important in your locality (Rank numbers 1 to 4).

RANK


Shortage of labour (workers are not available)

Cost of labour (labour is available, but is too expensive)

Retention (high labour turnover on the farm is a problem)

Efficiency (labour available is not trained, experienced, and therefore they have a low output/hours worked, time and effort in training workers).

Comments

- 36) Have you ever considered working in a co-operative way with other farm owners with regard to farm labour or machinery ownership?

YES ☐ NO ☐

e.g. Group Labour Schemes (in which a group of farmers pool together to hire one farm worker).

Comments

#### IV ACCESSIBILITY OF LOCALITY

37) How far, in kilometres and in travelling time, are you from:

	Actual Distance (specify in km or miles)	Travelling Time by Car (hours, minutes)
a) Your nearest neighbours? - Do you know/associate with them	YES <input type="checkbox"/> NO <input type="checkbox"/>	
b) Your nearest primary school? - Are you on the bus route - Do (will/did) your children attend	YES <input type="checkbox"/> NO <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/>	
c) Your nearest secondary school? - Are you on the bus route - Do (will/did) your children attend	YES <input type="checkbox"/> NO <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/>	
d) Your nearest community hall?		
e) Your nearest commerical services? (e.g. village grocery, hotel, garage) Name .....		
f) Your nearest town or city? Name .....		

38) As the focal centre of your region, do you look towards:

Palmerston North	Wanganui	Levin	Masterton	Feilding	Dannevirke	Woodville	Pahiatua

i.e. which town or city are you most "associated" with?

39) Do you consider that the communications network (roads, telephone service, mail service) is adequate in your locality, so that you have reasonable access to services you require?

YES ☐ NO ☐ If NO, why not? \_\_\_\_\_

40) Do you feel "isolated" in your locality? YES ☐ NO ☐

If YES, does this isolation and feeling of remoteness worry you ☐ or  
do you accept it and appreciate it as part of rural life? ☐

41) Do you consider that there is sufficient community involvement in your locality?

YES ☐ NO ☐ Comments \_\_\_\_\_

(to assess your opinion of the production potential of your farm)

- 44) Increase Production .

	increase the numbers of livestock carried
	increase per animal performance
	change the production type (specify) _____

- |                      |                                    |   |  |   |   |
|----------------------|------------------------------------|---|--|---|---|
| work harder yourself | employ additional permanent labour | utilise family labour to greater extent | employ casual/ contract labour to a greater extent | use less labour intensive management techniques | capital intensity (money into machinery, new transport) |
|                      |                                    |   |  |   |   |



46) In the last 5 years, have you attempted/achieved any of the below:

Tick	Specify	Why	Results
<input type="checkbox"/>	Changed livestock breeds e.g. to Perendale, Cooperworth.		
<input type="checkbox"/>	Changed livestock management systems, e.g. easy care lambing, second shearing, concentrated lambing.		
<input type="checkbox"/>	Changed land-use pattern, e.g. an increase in cropping acreage, increase in dry stock carried.		
<input type="checkbox"/>	Greater subdivision of the farm (additional yards, access races, increased fencing and tracking.		
<input type="checkbox"/>	Significantly increased labour-saving equipment - portable dips, dagging pens, drenching guns, electric fencing.		

47) What "development" has been carried out in the last 5 years?

	Type	Year Acquired	Planned In Future (Year)
Buildings (Woolshed, Haybarn)			
Machinery (Plant)			
Vehicles (Transport)			
Fencing (Permanent)			
Land (bought, cleared-acreage)			
Water Reticulation (& drainage, irrigation)			
Oversowing (acreage)			
Fertiliser (acreage)			

48) Are maintenance tasks on the farm being left? (e.g. repairing fences, clearing scrub, thistles).

YES ☐ NO ☐

If YES, what tasks and why are being left? \_\_\_\_\_

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Thankyou very much for your time and co-operation in filling in the questionnaire.

If you would like a summary of the results from my survey, to be sent to you in December 1978, please complete the return address form below:

Name .....

Postal Address: .....

.....

.....

.....

Thanking you,

Jan Beattie.

## APPENDIX C

FOLLOW UP LETTER SENT 13 DAYS AFTER THE  
DISPATCH OF THE QUESTIONNAIRE



July 1978

Dear Sir,

A few days ago I sent you a questionnaire regarding your attitudes towards the "farm labour problem" and your requirements for labour on the farm. If you have already returned the questionnaire, please consider this a sincere "thankyou" for your promptness and cooperation. If you have put the questionnaire aside, perhaps to finish later, could you please complete and return it in the stamped addressed envelope. Your response is necessary to the success of the survey.

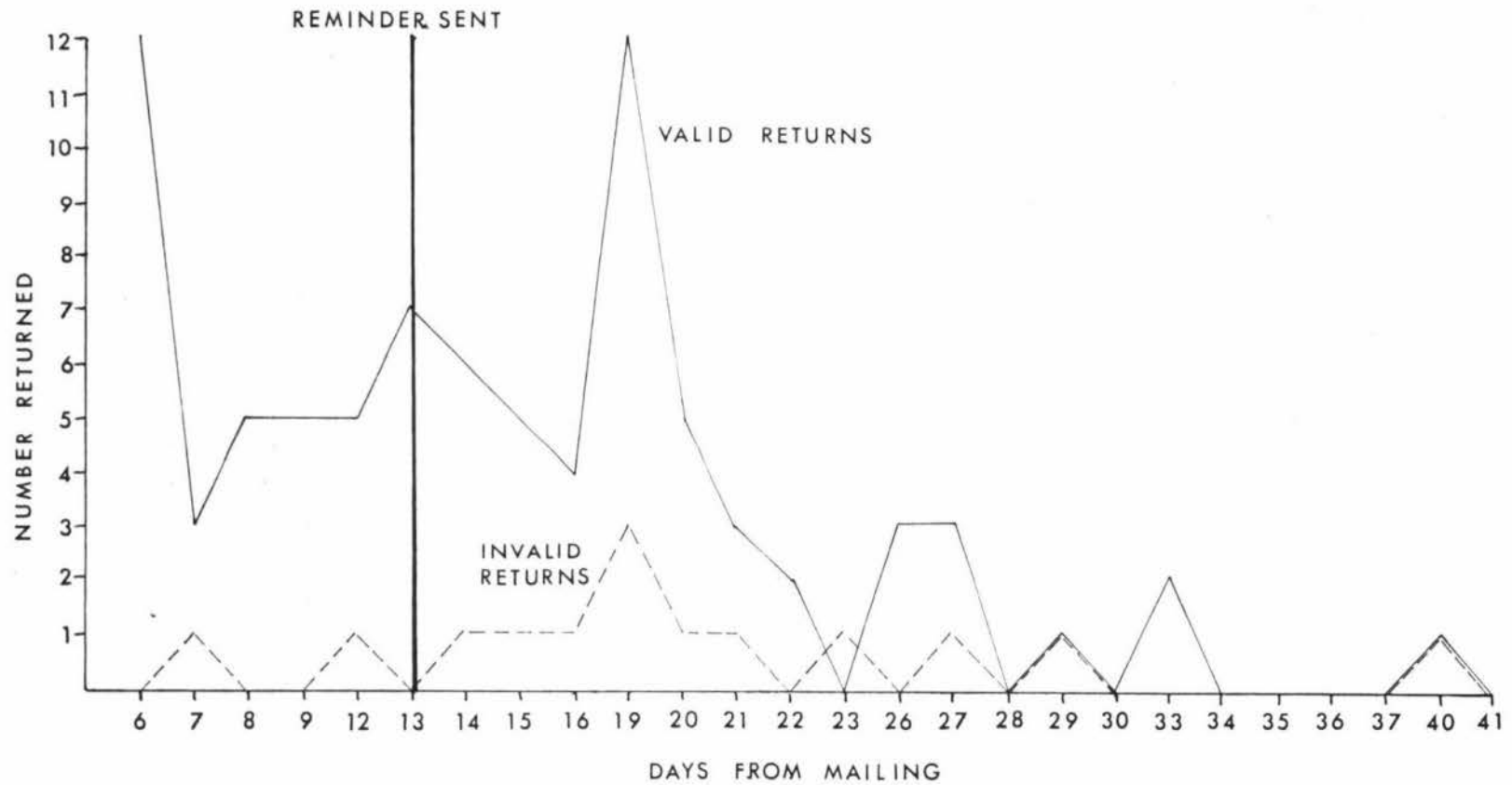
Thank you for your help.

Yours faithfully,

Miss Jan Beattie.

APPENDIX D  
GRAPH TO SHOW THE RETURN OF THE MAIL  
QUESTIONNAIRE

GRAPH SHOWING RETURN OF MAIL QUESTIONNAIRES



# BIBLIOGRAPHY

- Ackerman, E.A. 1963: Where is a Research Frontier?  
Annals, Association of American Geographers, 53, 429-440.
- Agricultural Development Conference 1966: 1963-64 Conference Report.  
Government Printer, Wellington.
- Agricultural Production Council 1971: Bulletin, No.15.
- \_\_\_\_\_ 1971: Bulletin, No.17.
- Ambler, T.I. 1977: Response Patterns to a Mail Survey of New Zealand Farmers. Lincoln College Agricultural Economics Research Unit, Research Report 1978.
- Anderson, G. and Franklin, H. 1955: The Villages of the Manawatu.  
New Zealand Geographer, 11 (1), 53-71.
- Andrew, J.C. 1962: Some Thoughts on Farm Labour Problems in New Zealand. Sheepfarming Annual, Massey College, 57-65.
- Anonymous 1969a: How To Farm 2000 or More Ewes Per Man.  
New Zealand Fertilizer Journal, No.34, 22-24.
- \_\_\_\_\_ 1969b: Tips on How Farm Labour Plan Works.  
New Zealand Farmer, 90 (13), 33.
- \_\_\_\_\_ 1970: Dairymen Learn How to Manage Labour.  
New Zealand Farmer, 91 (14), 13-14.
- \_\_\_\_\_ 1974: Open Letter: Long-term Policy to Safeguard our Future. Dominion, December 3.
- \_\_\_\_\_ 1975a: Our Economic Future. Dominion, February 24.
- \_\_\_\_\_ 1975b: Diversify or Go Under. Dominion, March 5.
- Avery, J. 1971: Managing Farm Labour. Ruakura Farmers' Conference,  
Proceedings, 74-79.
- Baldock, C.V. 1971: Vocational Choice and Opportunity.  
University of Canterbury, Publication No.13. Christchurch.
- Ball, A.G. and Heady, E.O. (eds.) 1972: Size, Structure, and Future of Farms. Ames, Iowa State University Press.
- Bell, F.M.D. 1971: Should a Young Man Go Sheepfarming?  
Sheepfarming Annual, Massey University, 61-65.

- Bevin, R.H. 1953: Farm Labour in New Zealand. Lincoln College Farmers' Conference, Proceedings, 67-77.
- \_\_\_\_\_ 1968: Agricultural Production over Recent Years and Some Thoughts on Diversification. New Zealand Agricultural Science, 3 (2), 42-44.
- Blyth, C.A. 1961: Economic Growth 1950-60. New Zealand Institute of Economic Research, Research Paper No.1.
- \_\_\_\_\_ (ed.) 1964: The Future of Manufacturing in New Zealand. New Zealand Institute of Public Administration, Oxford University Press.
- \_\_\_\_\_ 1965: Strategic Factors in New Zealand's Economic Growth 1965 to 1975. New Zealand Institute of Economic Research, Research Paper No.8.
- Bradford, P.V. 1971a: Are Dairy Farm Workers Poorly Paid? New Zealand Farmer, 91 (22), 12-13.
- \_\_\_\_\_ 1971b: Interviewing and Choosing Your Man. New Zealand Farmer, 92 (4), 10-12.
- \_\_\_\_\_ 1971c: Paying For Hours Worked. New Zealand Farmer, 91 (24), 8-9.
- \_\_\_\_\_ 1971d: Practical Aspects of Managing Labour on Dairy Farms. Ruakura Farmers' Conference, Proceedings, 80-83.
- \_\_\_\_\_ 1971e: Put Wages and Conditions for Job in Writing. New Zealand Farmer, 92 (1), 8-9.
- \_\_\_\_\_ 1971f: Reasons Why Men are Always Leaving. New Zealand Farmer, 92 (1), 13-15.
- \_\_\_\_\_ 1971g: Wages Too Low For the Hours Worked. New Zealand Farmer, 91 (23), 29-31.
- Brier, J.D. 1974: The Level of Wages To Farm Employees in Mid-Canterbury. Mayfield Farmers' Conference, Proceedings, Ashburton.
- Broadhead, B.G. 1953: A Survey of Farm Labour in Springs County. Lincoln College Farmers' Conference, Proceedings, 83-87.
- Brooks, G.C. 1970: Transport Technology and Locational Change: The Taranaki Dairy Factory Industry 1909, 1969. M.A. Thesis, Department of Geography, University of Auckland.
- Brougham, R.W. 1973: Pasture Management and Production. Ruakura Farmers' Conference, Proceedings, 169-184.



- Campbell, A.G. 1970: Intensive Pasture Utilisation and Animal Production in New Zealand. New Zealand Grassland Association, Proceedings, 145-152.
- Campbell, G.H. 1970: The Family Farm and Farm Development on the Central Volcanic Plateau. M.A. Thesis, Department of Geography, University of Auckland.
- Candler, W.V. 1964a: Incentives for Increased Output of Farm Products. Lincoln College Farmers' Conference, Proceedings, 10-19.
- \_\_\_\_\_. 1964b: Scale of Farming. Agricultural Economics and Farm Management, Discussion Paper 14, Massey University.
- Cant, R.G. 1967a: A Case Study in Outmigration: Movement of Adult Farm Workers from the Selwyn/Ashburton Electoral Districts During the Period 1963-66. New Zealand Geography Conference, 5th, Proceedings, 41-48.
- \_\_\_\_\_. 1967b: Why Workers Leave Farming. New Zealand Farmer, 88 (13), 88.
- Cant, R.G. and Johnston, R.J. 1973: Regional Development Patterns. In Johnston (ed.), 1973, 15-40.
- Cant, R.G. and Woods, M.J. 1968: An Analysis of Factors which Cause Job Satisfaction or Dissatisfaction Among Farm Workers in New Zealand. Lincoln College Agricultural Economics Research Unit, Technical Paper No.2.
- Carmody, L.J. 1963: A Provident Fund for Rural Workers. Sheepfarming Annual, Massey University, 197-210.
- Chase, C.I. 1976: Elementary Statistical Procedures. McGraw Hill, Tokyo. Second Edition.
- Coffey, W.S. 1977: Current and Future Strengths of the Manufacturing Sector. New Zealand Agricultural Science, 11 (3), 147-151.
- Cooke, R.U. and Johnson, J.H. (eds.) 1969: Trends in Geography: An Introductory Survey. Pergamon, London.
- Copplestone, J.F. 1969: The Health of the Dairyfarmer. Dairyfarming Annual, Massey University, 89-95.
- Coulson, R.K. 1977: Integrating Cropping and Livestock in The Manawatu. Unpublished report, 1977.
- Court, R.H. 1964: Supply Response of New Zealand Sheep Farmers. M.A. Thesis, University of Auckland.
- Crosbie, C.J. 1967: Work Study and Mechanisation. Lincoln College Farmers' Conference, Proceedings, 68-74.

- Crothers, C. 1975: Limits to New Zealand's Growth. Paper Presented at Demographic Society Conference.
- Crump, D.K. 1966: Studies of the Economic Behaviour of Farm Families. M.Agr.Sc. Thesis, University of Canterbury.
- Cullen N.A. 1977: Current and Future Strength of New Zealand Agriculture. New Zealand Agricultural Science, 11 (3), 138-146.
- Cumberland, K.B. 1948: The Agricultural Regions of New Zealand. Geographical Journal, 112, 43-63.
- \_\_\_\_\_. 1968: The New Zealand Economy: a Geographer's View. New Zealand Geography Conference, 5th, Proceedings, 7-15.
- Currie, J. 1974: Something Better than Unionism for Farm Workers. New Zealand Farmer, 95 (1), 25-26.
- Curry, L. 1962: The Climatic Resources of Intensive Grassland Farming: The Waikato, New Zealand. Geographical Review, 52, 174-194.
- Dairy Board Farm Production Division, 1972: Survey of Farm Labour on North Island Dairy Farms. Farm Production Report, 48th, 1971-72 season, 31-34.
- Datoo, B.A. 1978: Toward a Reformulation of Boserup's Theory of Agricultural Change. Economic Geography, 54 (2), 135-144.
- Dennis, R.A. 1971: Principles of Labour Management. Ruakura Farmers' Conference, Proceedings, 68-73.
- Department of Agriculture 1970: Farming In The Manawatu. Farm Advisory Division, Palmerston North.
- \_\_\_\_\_. 1971: A Guide to High Country Development Investment. Farm Advisory Division, Wellington.
- Department of Industries and Commerce 1963: An Economic Survey of The Dannevirke Region. Wellington.
- \_\_\_\_\_. 1968: Economic Survey of Wairarapa. Wellington.
- Department of Labour 1977: Farm Employment Wage Subsidy Scheme. Employer's Guide.
- \_\_\_\_\_. 1978a: Farm Employment Scheme. Employer's Guide.
- \_\_\_\_\_. 1978b: Additional Jobs Programme. Employer's Guide.

Department of Lands and Survey 1974: Land Inventory Survey: Woodville County. Wellington.

Department of Statistics 1973, 1974, 1975, 1976a: Agricultural Statistics, For The Seasons 1969-70, 1970-71, 1971-72, 1972-73. Government Printer, Wellington.

\_\_\_\_\_ 1976b, 1977, 1978a: Statistical Bulletin: Agriculture, For 1973-74, 1974-75, 1975-76. Government Printer, Wellington.

\_\_\_\_\_ 1977a: New Zealand Census of Population and Dwellings, 1976. Government Printer, Wellington.

\_\_\_\_\_ 1977b: New Zealand Official Yearbook, 1977. Government Printer, Wellington.

\_\_\_\_\_ 1977c: Report On The Official Estimates of Balance of Payments, 1975-76. Government Printer, Wellington.

\_\_\_\_\_ 1978b: Monthly Abstract of Statistics. Government Printer, Wellington.

Dobson, D.J. 1971: Crossing The Labour Barrier In Dairying. Lincoln College Farmers' Conference, Proceedings, 36-42.

Doig, W.T. 1940: A Survey of Standards of Life of New Zealand Dairyfarmers. Department of Scientific and Industrial Research, Bulletin No.75, Social Science Research Bureau, Publication No.1.

Dunlop, K.J. 1971: Should a Young Man Go Sheepfarming? Sheepfarming Annual, Massey University, 66-70.

Dunn, E.S.jr. 1971: Economic and Social Development: a Process of Social Learning. John Hopkins Press, Baltimore.

Dunn, H. 1973: Do Farm Workers Need a Shield? New Zealand Dairy Exporter, XLVIV (6), 2.

Durney, G.E. 1957: The Education of a Young Farmer. M.A. Thesis, Department of Education, University of Auckland.

Federated Farmers of New Zealand (Inc.) nd: The Farm Cadet Training Scheme: An Outline and Brief History. Information Booklet.

Food and Agriculture Organisation of the United Nations 1969: Toward A Strategy for Agricultural Development: F.A.O.'s Five Areas of Concentration. Rome.

Forbes, R.N. 1970: Report on Agriculture and The Benefits From Water Control In The Taonui Basin-Colyton Catchments. Unpublished paper, Department of Agriculture, Economics Division, Palmerston North.

- Forster, J. (ed.) 1969: Social Process In New Zealand. Longman Paul, Auckland.
- Frampton, A.R. 1971: Should a Young Man Go Sheepfarming? Sheepfarming Annual, Massey University, 71-74.
- Franklin, S.H. 1969a: The Age and Sex Structure of North Island 'Communities. In Forster (ed.) 49-76.
- \_\_\_\_\_. 1969b: The Self-Employed Society. Pacific Viewpoint, 10 (1), 29-56.
- \_\_\_\_\_. 1969c: The Sixties: A Review. Pacific Viewpoint, 10 (1), 1-28.
- \_\_\_\_\_. 1972: Some Implications of Population Growth for New Zealand's Economic Development. Pacific Viewpoint, 13 (1), 99-107.
- \_\_\_\_\_. 1975a: Four Futures For New Zealand. Annual Lecture of the Auckland Branch, New Zealand Geographical Society.
- \_\_\_\_\_. 1975b: Regional Development - and Growth - In New Zealand. Pacific Viewpoint, 16 (2), 143-158.
- \_\_\_\_\_. 1978: Trade, Growth and Anxiety: New Zealand Beyond The Welfare State. Methuen, Wellington.
- Gibbs, H.S. 1974: Management of Land and Water Resources. In Johnston (ed.), 1974, 170-184.
- Gill, H. 1976: The Farm Labour Situation. In Ministry of Agriculture and Fisheries, 1976d, Appendix 18, 9.
- Gill, H. and Gill, T. 1975: New Zealand Rural Society: A Framework for Study. New Zealand Agricultural Science, 9 (2), 60-68.
- Gillard, R.A. 1972: The Art of Bossmanship. New Zealand Journal of Agriculture, 124, 19-31.
- Gooding, B. 1974: Will the 40-Hour Week Come For Farm Workers? New Zealand Farmer, 95 (1), 12-13.
- Gould, J.D. 1972: Economic Growth in History: Survey and Analysis. Methuen, London.
- Gregor, H.F. 1970: Geography of Agriculture: Themes in Research. Foundations of Economic Geography Series, Prentice-Hall, Englewood Cliffs, N.J.
- Hagan, C.J. 1966: A Survey of Dairy Farming in Waimate West County. M.A. Thesis, Department of Geography, Victoria University.

- Hamilton, W.M. 1965: Increased Production - its Implications for Science and Technology. New Zealand Agricultural Science, 1 (1), 9-13.
- Harland, R.A. 1971: Lessons For Dairy Farm Employers. Dairyfarming Annual, Massey University, 20-22.
- Harris, D.R. 1969: The Ecology of Agricultural Systems. In Cooke and Johnson (eds.) 133-142.
- Harvey, D. 1969: Explanation In Geography. Edward Arnold, London.
- Heady, E.O. 1962: Agricultural Policy Under Economic Development. Ames, Iowa State University Press.
- \_\_\_\_\_ (ed.) 1971: Economic Models and Quantitative Methods for Decisions and Planning in Agriculture: Proceedings of an East-West Seminar. Ames, Iowa State University Press.
- Heenan, L.D.B. 1967: Internal Migration To The South Island. New Zealand Geographical Society: Record, 43, 23-25.
- \_\_\_\_\_ 1968: Internal Migration In The South Island. New Zealand Geographer, 24 (1), 84-90.
- Heenan, L.D.B. and Trlin, A.D. 1974: Population, Society and Economy. In Johnston (ed.), 1974, 88-122.
- Heerdegen, R.G. 1965: Pahiatua County. M.A. Thesis, Department of Geography, Victoria University.
- Hicks, J.R. 1950: A Contribution To The Theory Of The Trade Cycle. Oxford University Press, London.
- Hight, G.K. 1975: Whatawhata Hill Country Research Station: Its Function, Organisation and Current Research Programme. New Zealand Agricultural Science, 9 (2), 55-59.
- \_\_\_\_\_ 1976: Problems and Potential of Farming on North Island Hill Country. New Zealand Agricultural Science, 10 (4), 141-147.
- Hirschman, A.O. 1958: The Strategy of Economic Development. Yale University Press, New Haven.
- Hodgson, J.N. 1963: Incentives For Dairy Farm Labour. Dairyfarming Annual, Massey University, 65-76.
- Holden, J.S. 1965a: The Economics of Hill Country Development. New Zealand Grassland Association, Proceedings, 64-74.

- 1965b: The Profitability of Hill Country Development. Part II: Case History Results. Lincoln College Agricultural Economics Research Unit, Publication No.24.
- Holmes, F. 1976: New Zealand At The Turning Point. Report of the Task Force on Economic and Social Planning. Government Report, Wellington.
- Housing Corporation 1978: Home Finance For Tenants in Employer - provided Accommodation. Loans Division Pamphlet.
- Hussey, D.D. 1970: An Investigation of Productivity and Technological Advance in New Zealand Agriculture. Lincoln College Agricultural Economics Research Unit, Technical Paper No.8.
- Hussey, D.D. and Philpott, B.P. 1969: Productivity and Income of New Zealand Agriculture, 1921-67. Lincoln College Agricultural Economics Research Unit, Report No.59.
- Inglis, J.A.H. 1967: Farming Methods For High Labour Output. Lincoln College Farmers' Conference, Proceedings, 62-67.
- International Monetary Fund 1978: Balance of Payments Yearbook, 29.
- Isard, W. and Others 1968: On the Linkage of Socio-Economic and Ecologic Systems. Regional Sciences Association, Papers and Proceedings, 21, 79-99.
- Islam, N. (ed.) 1974: Agricultural Policy in Developing Countries. Macmillan, London.
- Janelle, D.G. 1969: Spatial Reorganisation: A Model and Concept. Annals, Association of American Geographers, 59 (2), 348-364.
- Johnson, R.W.M. 1967: Income and Productivity in Agriculture. Lincoln College Farmers' Conference, Proceedings, 46-54.
- 1977: Agricultural Output and the Growth of Export Income. Ministry of Agriculture and Fisheries, Economics Division, Research Paper 9/77, Wellington.
- Johnson, R.W.M. and McClatchy, D. 1970: A Regional Projection Model of the New Zealand Sheep Industry. New Zealand Economic Papers, 4 (1), 5-15.
- Johnson, W.L. and Kamerschen, D.R. (eds.) 1972: Readings in Economic Development. South-Western Publishing, Cincinnati.
- Johnston, B.F. 1965: New Zealand Agriculture: The New Frontier. Erdkunde, 19, 155-161.

- Johnston, B.F. and Kilby, P. 1974: Interrelations between Agricultural and Industrial Growth. In Islam (ed.) 41-70.
- Johnston, R.J. (ed.) 1973: Urbanisation In New Zealand: Geographical Essays. Reed, Wellington.
- \_\_\_\_\_. (ed.) 1974: Society and Environment In New Zealand. Whitcombe and Tombs, Christchurch.
- Keen, W.L. 1961: Discussion of a Paper by Philpott, B.P. Economic Efficiency In Agriculture - The Individual and National Viewpoints. New Zealand Institute of Agricultural Science, Proceedings, 119-122.
- Keown, P.A. 1971: The Career Cycle and the Stepwise Migration Process. New Zealand Geographer, 27 (2), 175-184.
- King, L.J. 1965: Urbanisation in an Agriculturally Dependent Society: Some Implications in New Zealand. Tijdschrift voor economische en sociale geografie, 56, 12-21.
- Koller, B. 1972: The Real Cost of Farm Employees. New Zealand Journal of Agriculture, 124, 60-61.
- Kuhn, A. 1966: The Study Of Society: A Multidisciplinary Approach. Tavistock Publications, London.
- Kuznets, S. 1965: Economic Growth and Structure: Selected Essays. Heinemann, London.
- Kynoch, H.F.W. 1976: A Hill-Top View. New Zealand Agricultural Science, 10 (4), 148-150.
- Lane, P.A. and Hamer, P. (eds.) 1973: Decade of Change. Reed Education, Wellington.
- Lentfer, B.N. 1963: The Relationship Between Land Tenure and Land-Use In Kawhia. M.A. Thesis, University of Auckland.
- Lewis, W.A. 1956: The Theory of Economic Growth. (2nd impression). George Allen and Unwin, London.
- Lloyd, D.W. 1974: A Preliminary Review of Rural Social Conditions with Particular Reference to the Manpower Position On Farms. Report prepared for Agricultural Production Council, Wellington.
- Local Government Commission 1973: Regions and Districts of New Zealand. Areas Adopted to date for various administrative and research purposes. Government Printer, Wellington.



- McArthur, A.T.G. 1964: "Bossmanship" or the Retention and Motivation of Farm Labour. Lincoln College Farmers' Conference, Proceedings, 155-162.
- \_\_\_\_\_. 1967: Method Study. Lincoln College Farmers' Conference, Proceedings, 75-83.
- McCaskill, L.W. 1953: The Financing of Houses for Farm Labour and a Description of Existing Community Farm-Labour Schemes. Lincoln College Farmers' Conference, Proceedings, 88-97.
- McClatchy, D.B. 1966: Report On A Survey Of Farm Labour In Patangata County, Hawkes' Bay, 1965-66. Lincoln College Agricultural Economics Research Unit, Publication No. 34.
- McDaniel, R. and Hurst, M.E. 1968: A Systems Analytic Approach to Economic Geography. Annals, Association of American Geographers, Commission on College Geography, Publication No.8, 7-33.
- McDougall, J.D. 1971: Motivation and Management of Staff. Sheepfarming Annual, Massey University, 51-60.
- McKenzie, D.W. nd: The Build of New Zealand. Man Map and Landscape Series, Book 2, A.H. and A.W. Reed.
- McLean, I. 1978: The Future For New Zealand Agriculture: Economic Strategies For the 1980's. New Zealand Planning Council, Agricultural Strategy Paper No.2, Department of Agricultural Economics and Farm Management, Massey University. Fourth Estate Books Limited.
- McMillion, M.B. 1960: The Sources of Information and Factors which Influence Farmers in Adopting Recommended Practices In Two New Zealand Counties. Lincoln College Technical Publication, No.19.
- McSweeney, D.B. 1963: Rural Secondary Education In New Zealand. Lincoln College Farmers' Conference, Proceedings, 128-133.
- Manpower Working Party 1966: Report. Agricultural Development Conference, 1963-64, Government Printer, Wellington, 177-227.
- Mason, G. 1961: Factors Associated with Output On A Sample of Light Land Farms. New Zealand Institute of Agricultural Science, Proceedings, 129-136.
- Maughan, C.W. 1977a: New Zealand Development - The Problem of Imports and Exports. Unpublished Discussion Paper, Department of Agricultural Economics and Farm Management, Massey University.



- \_\_\_\_\_. (ed.) 1977b: Agricultural Policy Seminar, Proceedings, No.3. Department of Agricultural Economics and Farm Management, Massey University.
- Meat and Wool Boards' Economic Service 1971, 1973, 1974:  
Annual Review of the Sheep Industry for the Seasons 1970-71, 1972-73, 1973-74. Publication No.'s 1622, 1640, 1693. Wellington.
- Mellor, J.W. 1967: The Role of Agriculture in Economic Development. In Southworth and Johnston (eds.) 21-61.
- Milne, A.C. 1969: A Study of Labour Saving Techniques On North Island Sheep Farms. M.Agr.Sc. Thesis, Massey University.
- Ministry of Agriculture and Fisheries 1973a: Evaluating Management Systems. Advisory Services Division, Hamilton.
- \_\_\_\_\_. 1973b: Improving Sheep Performance In The Hill Country. Advisory Services Division, Palmerston North, Regional Publication No.35.
- \_\_\_\_\_. 1976a: Economic Review of New Zealand Agriculture 1976. Economics Division, Wellington.
- \_\_\_\_\_. 1976b: Economic Survey of New Zealand Dairy Industry - Mobility of Dairy Farmers. Economics Division, Wellington.
- \_\_\_\_\_. 1976c: Farm Training For Trades Certificates 1977. Advisory Services Division, Wellington.
- \_\_\_\_\_. 1976d: Review of the Farming Industry - Factors Influencing the Motivation and Investment Decisions of Pastoral Farmers. Advisory Services Division, Wellington.
- \_\_\_\_\_. 1976e: State of the Livestock Industry. Economics Division, Wellington.
- \_\_\_\_\_. 1977a: Assistance and Incentives for Farmers 1977-78. Information Services, Wellington.
- \_\_\_\_\_. 1977b: Cropping and Livestock Gross Margins 1977-78. Advisory Services Division, Palmerston North, Regional Publication No.11.
- \_\_\_\_\_. 1977c: Dairy Farm Survey of 50:50 Sharemilkers. Provisional Results from Unpublished Survey, Economics Division, Wellington.
- \_\_\_\_\_. 1977d: Economic Review of New Zealand Agriculture, 1977. Economics Division, Wellington.

- \_\_\_\_\_. 1977e: Livestock Incentive Scheme: Conditions.  
Economics Division, Wellington.
- \_\_\_\_\_. 1977f: Manawatu Farming. Advisory Services Division,  
Palmerston North.
- \_\_\_\_\_. 1977g: Report. New Zealand Parliament, House of  
Representatives, Government Printer, Wellington.
- \_\_\_\_\_. 1978: Farm Costs and Prices 1978. Economics  
Division, Wellington, Technical Paper No.1.
- Ministry of Works 1971: Land Use Capability Survey Handbook.  
A New Zealand Handbook for the Classification of Land,  
Water and Soil Division.
- Mitchell, K.J. 1975: Will New Zealand's Agriculture be Technically  
Efficient in the Future? New Zealand Agricultural Science,  
9 (3), 98-104.
- Moorhead, M.A. 1969: The Role of Capital in Farm Production: A  
Geographical Appraisal in Two Dairying Areas.  
M.A. Thesis, Department of Geography, University of Auckland.
- Moran, W. 1974: Systems of Agriculture: Regional Patterns and  
Locational Influences. In Johnston (ed.) 1974, 123-149.
- Morgan, W.B. and Munton, R.J.C. 1971: Agricultural Geography,  
Methuen, London.
- Moriarty, M.J. (ed.) 1963: New Zealand Farm Production and Marketing.  
New Zealand Institute of Public Administration, O.U.P.  
Wellington.
- Morris, J.L. 1967: The Labour Position On The Farm.  
Lincoln College Farmers' Conference, Proceedings, 55-61.
- Morris, J.L. and Cant, R.G. 1967: The Nature and Extent of the Farm  
Labour Shortage In Cheviot County, Canterbury.  
Lincoln College Agricultural Economics Research Unit,  
Publication No.38.
- Morton, H.A. 1975: People as a Factor Influencing Future Agricultural  
Production. New Zealand Agricultural Science, 9 (3), 85-90.
- \_\_\_\_\_. 1977: An Impact of Technology on New Zealand. Paper  
presented to the Faculty of Food Science and Biotechnology,  
Massey University Jubilee, 1977.
- Mowat, J. 1966: Technological Change in the Tertiary Sector as a  
Factor in Rural Depopulation; Railway Staff Movements in the  
Southern King Country, 1945-66. B.A. Hons. Dissertation,  
Department of Geography, Victoria University.

- Muldoon, R.D. 1978: Budget 1978. Government Printer, Wellington.
- Mundlak, Y., Danin, Y. and Tropp, Z. 1974: Agriculture and Economic Growth: Some Comments. In Islam (ed.) 102-117.
- Munton, R.J.C. 1969: The Economic Geography of Agriculture. In Cooke and Johnson (eds.) 143-152.
- Myint, H. 1960: The Demand Approach to Economic Development. Review of Economic Studies, 27, 124-132.
- National Development Conference 1969: Agriculture Committee. Report to the National Development Conference (at its second plenary session). Government Printer, Wellington.
- National Research Advisory Council 1978: Hill Country Research. Wellington.
- Naylor, M.R. 1971: Meeting the Labour Crisis in Farming. Lincoln College Farmers' Conference, Proceedings, 32-35.
- Neutze, G.M. 1956: The Management Factor in Farming. M.Agr.Sc. Thesis, University of New Zealand (Lincoln College).
- New Zealand Bureau of Importers and Exporters Inc. 1978: Annual Report and Statement of Accounts, 1977-78. (The Bureau).
- New Zealand Geographical Society (Inc.) 1956: New Zealand: Inventory and Prospect. Wellington Branch.
- Nordmeyer, A.H. 1978: The Meat Freezing Industry in 1977. Report On The Freezing Industry, Commissioned by Accident Compensation Commission, June 1978.
- Nurkse, R. 1961: Equilibrium and Growth in the World Economy: Economic Essays. Harvard Economic Studies, 118. Harvard University Press, Cambridge, Mass.
- Organisation For Economic Co-operation and Development 1974: Agricultural Policy In New Zealand. Agricultural Policy Reports, Paris.
- \_\_\_\_\_ 1977: New Zealand. Economic Surveys, Paris.
- Papi, G.U. 1966: The Place of Agriculture in Balanced Growth. In Robinson (ed.) 75-87.
- Phillips, F. 1978: Hill Country Research, Editorial. Bulletin, No.5, New Zealand Institute of Agricultural Science.
- Philpott, B.P. 1961: Economic Efficiency In Agriculture - The Individual and National Viewpoints. New Zealand Institute of Agricultural Science, Proceedings, 113-119.

- \_\_\_\_\_ 1966: Aspects of Productivity and Economic Growth In New Zealand, 1926-1964. Lincoln College Agricultural Economics Research Unit, Publication No.29.
- \_\_\_\_\_ 1975a: A "Price-Less" Agriculture In A "Cost-Plus" Economy. Project On Economic Planning, Discussion Paper No.4. Victoria University, Wellington.
- \_\_\_\_\_ 1975b: Agriculture in the "Cost-Plus" Economy. Lincoln College Farmers' Conference, Proceedings, 24-37.
- \_\_\_\_\_ 1976: A Productivity Subsidy/Tax To Raise Production and Stabilise Income In Agriculture. Project On Economic Planning, Discussion Paper No.12, Victoria University, Wellington.
- \_\_\_\_\_ 1977: Why Has Agriculture Slowed Down? Project On Economic Planning, Internal Paper No.32, Victoria University, Wellington.
- Pinney, B. 1971: Labour Management In Large-Scale Farming. Lincoln College Farmers' Conference, Proceedings, 43-49.
- Pohlen, I.J. 1956: The Role of Soils and Their Environment in the Development of New Zealand. In New Zealand Geographical Society (Inc.) 11-20.
- Pryde, J.G. 1975: A Postal Sample Survey of Sheep Farmer Attitudes to Incentives and Obstacles to Increasing Farm Output, and Other Agricultural Policy Issues. Lincoln College Agricultural Economics Research Unit, Discussion Paper No.31.
- \_\_\_\_\_ 1976: A Postal Survey of the Opinions of a Group of Farm Management Society Members on Incentives and Obstacles to Increasing Farm Output. Lincoln College Agricultural Economics Research Unit, Discussion Paper No.33.
- \_\_\_\_\_ 1977a: Constraints on Farm Output in New Zealand 1963-1975. Lincoln College Agricultural Economics Research Unit, Review, 1975-76.
- \_\_\_\_\_ 1977b: Survey of New Zealand Farmer Intentions, Expectations, and Opinions, April - May, 1977. Lincoln College Agricultural Economics Research Unit, Research Report No.81.
- Robinson, E.A.G. (ed.) 1966: Problems in Economic Development. Macmillan, London.
- Robinson, S. 1972: Theories of Economic Growth and Development: Methodology and Content. Economic Development and Cultural Change, 21, 54-67.

- Rosenberg, M. 1968: The Logic of Survey Analysis. Basic Books, New York.
- Ross, B.J. 1965: Some Aspects of the Relationship Between Agriculture and the National Economy, with Special Reference to Labour. M.Agr.Sc. Thesis, University of Canterbury.
- \_\_\_\_\_. 1976: A Policy For New Zealand Agriculture. New Zealand Agricultural Science, 10 (3), 103-113.
- Rowland, D.T. 1972: Aspects of Rural Depopulation in Victoria. New Zealand Geography Conference, 7th, Proceedings, 119-126.
- Rowlands, T.E. 1953: The Needs of My District and a Plan To Satisfy Them. Lincoln College Farmers' Conference, Proceedings, 77-82.
- Rural Banking and Finance Corporation, 1977a: Farm Employee Housing. R.B.F.C. Circular, No.44/1977.
- \_\_\_\_\_. 1977b: Housing Finance For People In Employer-Provided Accommodation. Budget Press Statement No.47.
- \_\_\_\_\_. 1977c: Rural Housing. Budget Press Statement No.15.
- Rutherford, J. 1970: Agricultural Geography as a Discipline. Jerusalem Studies in Geography, 1, 43-105.
- Rutherford, J., Logan, M.I. and Missen, G.J. 1966: New Viewpoints In Economic Geography - Case Studies from Australia, New Zealand, Malaysia, North America. Martindale Press, Sydney.
- Sears, P.D. 1962: The Potential of New Zealand Grassland Farming. New Zealand Geography Conference, 3rd, Proceedings, 65-70.
- \_\_\_\_\_. 1963: Cyclic Patterns Within New Zealand Grassland Farming. Sheepfarming Annual, Massey University, 233-246.
- Sheffield, M.C. 1972: Putting Science into Picking Farm Managers. New Zealand Farmer, 93 (18), 31.
- Shouksmith, G.A. 1971: Recruiting and Supervising Labour. Dairyfarming Annual, Massey University, 16-19.
- Siegel, S. 1956: Nonparametric Statistics For The Behavioural Sciences. McGraw-Hill, New York.
- Smallfield, P.W. 1970: The Grasslands Revolution In New Zealand. Auckland, Hodder and Stoughton in Association with English Universities Press, London.

- Smit, B.E. 1971: Farm Enlargement In Southern Northland: A Study of Structural Change in New Zealand Agriculture. M.A. Thesis, Department of Geography, Auckland University.
- Smith, R.H. 1971: The Substitution of Capital For Labour In Farming. Lincoln College Farmers' Conference, Proceedings, 50-57.
- Southworth, H.M. and Johnston, B.F. (eds.) 1967: Agricultural Development and Economic Growth. Cornell University Press, Ithaca, N.Y.
- Spencer, J.E. and Stewart, N.R. 1973: The Nature of Agricultural Systems. Annals, Association of American Geographers, 63, 529-544.
- Streeton, P. 1963: Balanced Versus Unbalanced Growth. Economic Weekly, 660-671, 673-674.
- Sutch, W.B. 1956: Our Changing Industries: Some Reasons Why. In New Zealand Geographical Society (Inc.) 79-98.
- Taylor, N.W. 1978: The Value of Incentives and Subsidies For Increasing Livestock Production. Address to New Zealand Society of Animal Production Annual Conference, Dunedin, Paper No.1778.
- Taylor, N.W. and McRae, A.F. 1977: The Effect of Increased Farm Production on Profitability and Workload. Ruakura Farmers' Conference, Proceedings, Paper No.1765.
- Tennant, D.B. 1978: Soil-Amending Technology, Grassland Farming, and New Zealand Economic Development. Ph.D. Thesis, Department of Geography, Massey University.
- Thomson, R.T. and Taylor, N.W. 1976: An Economic Review of the New Zealand Sheep and Beef Industry, 1971-2 to 1975-6. New Zealand Agricultural Science, 10 (1), 6-14.
- Thorbecke, E. (ed.) 1969: The Role of Agriculture In Economic Development. National Bureau of Economic Research, New York.
- Tripe, J.N. 1965: Rapid Production Increases Possible On Wanganui Hills. New Zealand Grassland Association, Proceedings, 38-45.
- United Nations 1977: Quarterly Bulletin of Statistics for Asia and The Pacific, VII (1) March.
- University of Canterbury, Department of Sociology 1976: The Rural Women of New Zealand: A National Survey (1975). Conducted by Tiiti Gill and Others in conjunction with the Women's Division of the Federated Farmers of New Zealand. Christchurch.

- Vine, H.R. 1961: Problem of Housing Farm Labour. Sheepfarming Annual, Massey College, 119-125.
- Ward, A.B. 1973: The Agricultural Sector. In Lane and Hamer (eds.) 15-38.
- Willis, E. 1973: A Study Of The Contribution Of Family Labour On Dairy Farms In South Taranaki, New Zealand. B.A. Hons. Dissertation, Department of Geography, Victoria University.
- Willis, R.P. 1976: Development: New Zealand. The Agricultural Sector. Pacific Viewpoint, 17 (2), 187-192.
- Woods, L.W. 1951: Developing Marginal Lands. Bulletin No.339, Department of Agriculture.
- Woods, N.S. 1965: Farm Manpower. Lincoln College Farmers' Conference, Proceedings, 17-22.
- Yerex, D. 1971: Give Your Advert Pulling Power! New Zealand Farmer, 92 (3), 10-11.