# RURAL LAND SUBDIVISION AND SUBURBANISATION IN THE PERI-URBAN AREA : KAIRANGA COUNTY (1970-1980)

A Thesis Presented in Partial Fulfilment of the Requirements for the Degree of Master of Arts in Geography at Massey University

by

CHIRA PRANGKIO

1980

## ABSTRACT

After briefly outlining the patterns and processes of rural land subdivision and suburbanisation in other parts of New Zealand, the thesis examines the rural land subdivision regulations and policies throughout the country. The development of a number of small size farmlets in the peri-urban areas has been an indicator of urban expansion in parts of the country.

This study is based upon the Kairanga County, a rural area surrounding the city of Palmerston North. In the introduction the county is described as it relates to the rural land subdivision situation. The study of size of holding refers to those farmlets with an area of 20 hectares or less. It was found that most dwellings in the study area which had been built in the 1970s were concentrated upon 'subdivision' land. These farmlets or holdings also illustrated the patterns of change in land use and land holdings. There has been an increase in the number of dwellings in the rural area of the county, especially in 'subdivision' areas, with an average of more than sixteen houses per year.

A small percentage of rural 'subdivision' landowners work full-time on their holdings but most of them are employed in non-farming occupations and only carry on part-time farming activities on their lands. There are 61 percent of all those employed in the county engaged in the non-farming occupations.

It was found that there are more 'potential' subdivisions than 'actual' subdivisions both in terms of total area and of total

numbers of holdings. Most small holdings tend to be located closer to the Palmerston North Urban Area. The total number of holdings has increased because larger holdings have been subdivided into smaller-sized holdings. The area of 'subdivision' land in holdings of 20 hectares or less represents 23 percent of the total occupied land in the county. The land use patterns of 'subdivision' land have changed with a greater variety of land uses and farming types. There was an average of at least two separate types of land use or farming on each holding.

Some 5,003 hectares of land in the county has been legally subdivided for smaller farmlets each with an area of 20 hectares or less. When these farmlets become 'actual' subdivisions most of them would be in part for residential use and eventually add to the peri-urban area around Palmerston North City.

Finally it was concluded that the pattern and process of suburbanisation of Kairanga County will continue as long as 'potential' subdivision land is available for settlement.

# ACKNOWLEDGEMENTS

I wish to express my gratitude to a number of people who assisted me in the completion of this thesis. My supervisors, Dr R.B. Le Heron and Mr E.C.R. Warr, who with knowledge, experience and considerable patience helped and encouraged me towards this research area.

My thanks go to Professor K.W. Thomson for his special kindness, concern and optimistic encouragement.

Recognition must also be extended to other members of the Department of Geography staff at Massey University who have given me practical and moral support throughout my period of study in the department.

I would also like to extend my thanks to many survey respondents for their co-operation in answering my questionnaire and for the constructive discussion of the project.

My study in this country would not have been possible without a grant from the New Zealand Government who provided me with a scholarship under the Colombo Plan. For this assistance I am deeply indebted.

Finally I wish to thank my parents who have supported me so wholeheartedly.

C. Prangkio

December 1980

TABLE OF CONTENTS

# LIST OF FIGURES

# LIST OF TABLES

# CHAPTER ONE

# INTRODUCTION

The patterns and processes of rural agricultural land use have been changed from time to time by various factors, among them both rural subdivision and amalgamation of holdings. These changes are caused by socioeconomic pressures especially the movement of people from rural to urban or urban to rural areas. Amalgamation occurs in areas which are both near and far from cities while rural subdivision has been taking place closer to urban areas, i.e. "peri-urban" land use.

In New Zealand society in recent years there are more and more people moving in and concentrating in urban areas but there has also been a migration trend back to rural areas. During the period of 1971-1976, net migration numbers and rates for urban and rural populations can be seen from the figures below:

| | Net gains | Net losses | Net change | Rate (%) |
|---|---|---|---|---|
| Urban | 135,158 | 26,187 | 108,971 | 4.7 |
| Rural | 5,784 | 26,916 | -21,132 | -3.7 |

Source: Neville and O'Neill (1979, 73).

The concentration of population in urban areas has emerged as a major factor in the overall spatial distribution of New Zealand population. From the 1976 Census of Population and Dwellings, the urban-rural population distribution is shown by percentage and growth rate for the country as a whole (Table 1.1 ).

"Urban" in New Zealand is defined officially as a residential component

TABLE 1.1

The Distribution of Urban-Rural Population

| Census year | Percentage of Population(i) | | Growth Rate(ii) | |
|---|---|---|---|---|
| | Urban | Rural | Urban | Rural |
| 1945 | 71.7 | 28.3 | 1.9 | -0.8 |
| 1951 | 73.2 | 26.8 | 3.3 | 0.2 |
| 1956 | 74.3 | 25.7 | 2.8 | 1.6 |
| 1961 | 76.7 | 23.3 | 3.0 | 0.01 |
| 1966 | 79.6 | 20.4 | 3.0 | -0.6 |
| 1971 | 82.0 | 18.0 | 2.0 | -0.9 |
| 1976 | 83.0 | 17.0 | 2.2 | 0.7 |

Sources (i) Department of Statistics (1977b)

(ii) Heenan (1979,8)

with population living in nucleated settlement containing 1,000 or more people (Gill: 1975,61). Rural on the other hand, is defined as the settlement with the number of population less than 1,000. In New Zealand society some communities with population less than a thousand may be regarded as urban. Wibberly (Clout, 1972) defined rural as parts of a country which show unmistaken signs of being dominated by extensive use of land, either at the present time or in the immediate past. The significance and exact meaning of the terms 'urban' and 'rural' varies with changing spatial, historical and culture context. Urban and rural may be classified by conditions based on life-styles and quality of living.

To move from rural to urban areas, as in the process of urbanisation, involves changes in behavioural patterns as well as spatial location. Behavioural patterns, values, life-styles, attitudes and habits are changed to suit the new urban situation. The process of urbanisation may be defined as the removal of rural character (Johnston: 1973,3). There may be no consistent differences between rural and urban people and life-styles in New Zealand society but urban structure has produced significant occupational differentiations between people. People might find that there are more social and economic facilities in urban than rural areas. This structure of society is usually reflected in the structural pattern of residential areas. Boileau (1974, 220) divided changes in the distribution of population in New Zealand into two trends. Firstly, the increasing urban concentration of population with the drift of people from rural to urban areas and from smaller urban to larger urban areas. Secondly, the increasing distribution of population within growing suburban areas.

Because of changes of the distribution of population, the structure of

agriculture, which is a prominent occupation in rural New Zealand has also been changed. In the period 1966-1971 for instance, while the total population growth was almost nil, there was a shift in occupation, with 9 per cent of males leaving agriculture and moving in particular to commerce and service occupations (Gill: 1975,65).

The depopulation of rural areas has contributed to congestion in the urban areas, which in turn has led to the spatial growth of urban areas, i.e. urban growth. Urbanisation will contribute to continuous urban expansion around the margins of urban areas. These areas, originally agricultural farm land but converted from rural to suburban use, are associated with urban sprawl. They make up the transition zone, commonly called the urban-rural fringe, urban field, the peri-urban area or the area of urban shadow. This enlargement of the urban area at the expense of the agricultural and rural land is mainly needed to accommodate a growing urban population. This phenomena is encouraged by changes in technology (i.e. car ownership and mobility), new patterns of life-styles and preferred social behaviour. People who move from urban areas to the urban-rural fringe actually do not want to change their urban life-styles and are often called "mentally urbanised but physically rural" (Pahl quoted in Ward: 1979,165), i.e. physically suburban or urban sprawl related to areas with an essentially or at least predominantly urban character, located at the urban fringe but surrounded by or adjacent to areas of rural or agricultural uses. As a result of the urban expansion, a new life-style is emerging in the urban-rural fringe. Berry and Horton (1969) pointed this change as a wider life space involving or relating to residential area, schooling, place of work, shopping, place of work, shopping and leisure activities. The other changes are a wider choice of living environments. Thus the urban field has a rural physical landscape and environment but also has

an urban infrastructural environment and wider community interests in both local community participation and outside community participation. There is characteristically an "easy-going" interchange among all parts of the rural-urban fringe, encouraged by the wider distribution of population.

Repopulation in the urban field or urban-rural fringe creates a demand for land for non-agricultural, residential use. Rural agricultural land has been lost to urban uses by land subdivision, but at the same time there has been a growth of urban demand for the products of agriculture, because of the growth of urbanisation. Urban demand has also been one of the main causal factors in peri-urban, agricultural development. Normally some of the physical qualities which make land valuable for agriculture also make it suitable for urban uses. As a result some rural agricultural land near urban areas will come to have relatively high value especially if it is potential "subdivision" land. But the value of land arises from the urban growth rather than the agricultural production (Clawson: 1962, 100). As the value of land increases, taxes or property rates reduce farm profits and cause holdings to either become uneconomic or stimulate more intensive production. Rising land values force farmers to subdivide their land and capitalise from their land. Farmers may invest to a greater production advantage on equally good but cheaper soil further from the urban areas or leave farming to find new employment in urban areas while they still live in their farm land.

New Zealand urban areas have historically developed on the better soils (except Wellington) and there has been steady expansion in urban settlement. In 1881 (after 40 years of pioneer settlement) 60 percent of New Zealand's population was rural and only 40 percent urban. Change from a rural to an urban dominance in population took place about 1901.

In 1926 more than 60 percent of population was in urban areas. While by 1976 the urban population has risen to 83 percent (Department of Statistics). Because of the high rate of New Zealand urbanisation there has been a high demand for rural land subdivision on the fringe of urban areas. A survey by the Ministry of Works and Development reports that nearly 80 percent of New Zealand household heads would place as their first choice "rural living densities" (quoted in Barker and Brown: 1979, 7). There were about 27,000 small rural holdings in the country, occupying some 100,000 hectares (Jowett: 1976, 44). These small rural holdings were mainly around Auckland and Christchurch, which together accounted for about 50 percent of the total number. In Auckland the small rural holdings occupied 4.5 percent of the land in the Auckland region and 2.5 percent in the Christchurch region. The other urban areas the small holdings occupied less than one percent (Barker and Brown: 1979,8). A major result of small holding subdivision is that agricultural lands near the cities change their type of land use, often to more intensive land uses or to non-agricultural uses such as residential. Small farming reflects traditional agriculture because of the agricultural product demand from the growing urban areas. For such agricultural activities, farm land is subdivided as market gardening, fruit farming, pig farming, poultry farming, nurseries or bee keeping. The type of land use trends evident are the appearance of mixed products, the growing of high value and perishable farm products. Although some kinds of industry have spread to the urban fringe only a small proportion of land is used for manufacturing premises.

The rural residential area is mainly subdivided for the needs of people who really want to live in the countryside. Such people seek a portion of land for either residence or for small-holder, part-time farming but at the same time they still prefer to live like urban people.

People on small-holding subdivision come from a range of occupations. Studies of rural subdivision in Auckland, Manawatu and Paparua (near Christchurch) showed that up to 48 percent of owners were in the professional or semi-professional occupation, followed by skilled tradesmen and clerical or sale workers. Some of them seek a self-sufficiency on their small farms apart from their main occupations. Housewives are able to manage small-farming in their spare time. Consequently, there is an increasing number of farmers who quit farming and commute to urban employment but who still prefer to live on countryside. Rural residents who would fall into this category are often retired farmers, farm workers, hobby farmers who use their land for hobby or intensive or extensive purposes, e.g. horse stud farming, horticulture, nurseries, market gardening, grazing and racing horses. Some use land for "factory" farming such as pig-raising, poultry or mushroom farming. Another change in the subdivision area is the distribution of income of the residents. The residents of subdivision area show a positively-skewed income distribution, and a mean annual income per person or per household higher than that of the associated urban and rural areas (Pryor, 1968). Moreover there is the sign of physical change on these residential subdivision, i.e. houses and farm buildings. New houses are built on the properties with a number of different modern styles. In addition existing older-style houses may be transferred to be rebuilt on the rural property. Subdivision may create a cluster of houses where there was formerly only isolated farm houses. Old farm buildings used for the previous type of farming are demolished, remain obsolete or are converted to new purposes, for instance milking-sheds are commonly converted to hay-sheds for the purpose of livestock raising.

In terms of subdivision property ownerships, there are higher proportion

of freehold of property and a lower rate of renting or leasing than the property in urban areas. The average house rental is also lower than in urban areas. Subdivision areas have high proportion of married residents.

There are some changes of character and pattern of land uses which are influenced by urbanisation and subdivision. One of them is the change from extensive to intensive or semi-intensive land use. To illustrate, livestock production has moved away from sheep raising into beef and pig output. New varieties of crops may also be introduced. The Ministry of Agriculture and Fisheries reported after their survey of "Small Holding Agriculture" (1977) that:

| Percentage of Properties | Use of Land |
|---|---|
| 15 | for residential purposes |
| 55 | for grazing |
| 20 | for cropping |
| 10 | not used at all |

In nearly 60 percent of properties used for residential purposes, the household head was employed full-time away from the property. The properties of households earning their living from the land was found to be very low, only 22 percent were dependent on the holding for income. Small holdings can be highly productive, however, in terms of output per hectare.

There has been much argument about the advantages and disadvantages rural subdivision on the issue of the productivity of the land before and after subdividing into small holdings. The advantages typically stated include

the fact that rural subdivision offers a chance for full-time farm workers or forest workers to obtain their own land and house. They are not able to buy a large area of land for their farming. Subdivision may help to reduce or even reverse the drift of population to the major centres and to rundown of rural facilities. Farmers on subdivisions can farm intensively in response to the demand from nearby urban areas or processing centres. On the other hand, disadvantages arising from subdivision are: land owners may not gain full benefits from the application to part-time farming of their professional skills, management competence, available time, and access to capital. Subdivision leads to higher land values which do not reflect an agricultural value anymore, competition for labour, dissection of the land by road and other kinds of services.

Undoubtedly the distribution of rural land subdivision and small farming subdivision at the outskirts of urban areas is pressured by urbanisation. There remains, however, controversy about the effect of rural subdivision on the countryside as the whole and on individual counties which are being encroached upon by urban sprawl. From the agricultural producer's point-of-view, rural subdivision is often cited as the main cause of static agricultural production. Each county authority is aware of the invasion of urbanisation onto its rural agricultural land. There are quite a number of studies of rural subdivision to support and disagree with these arguments. The study of land use distribution on Ten-Acre Subdivision in the Waitemata County near Auckland concluded that in the east of Waitemata County a loss of productivity took place because former farm land now being held for future urban development. In the west, however, there has been expension of new intensive systems of agriculture and consequently increased productivity. This distribution stemmed directly from social factors and soil patterns (Winn, 1970). In the

Manawatu region, it was found that the intensity of agricultural land use on subdivision farm (as measured by mean farm output and mean total output respectively), were at higher levels than before the farm land was subdivided. It is, however, the exception on subdivisions while were former dairy farms (Chiu, 1975). In Paparua County near Christchurch, Mears (1974) studying part-time farming in the Christchurch rural-urban fringe found that agricultural production had ceased on one-quarter of the holdings looked at. He could not give a definition assessment of whether or not part-time farming results in an increase or decrease in agricultural production. A study of the land use and characteristic of Rural Subdivision around Hamilton City came to a firmer conclusion, that the productivity of the land had not changed much with rural subdivision (Stevens, 1975). A study in Taopo County found no difference in carrying capacity between farmlets and synthetic average full size farms (Crawford, 1977). Cato interviewed a sample of part-time farmlets in Rodney County (Auckland) and found that agricultural productivity was slightly lower than that of full-time farms. He suggested that the relationship could be reversed when intensive part-time farming became established (D.S.I.R., 1979). In 1979 Moran, who had carried out a pilot study of rural small holdings in the Auckland region, concluded that pastural and horticultural small holding maintained a higher productivity than when the land was managed as larger pastoral units (D.S.I.R., 1979).

The fact remains, however that "many properties situated near large urban areas have been subdivided into small block and sold at high prices to people, wishing to own country estates. The result is that the general level of values in the locality rises to a point where normal pastoral production is no longer economic"(the New Zealand Valuation Department quoted by Mears: 1974, 5).

Rural Subdivision involves subdivision of land into holdings of different size. It is however popularly associated with the idea of the "ten acre block" (4.046 hectares). Normally the range of holding size is between one hectare and up to 20 hectares or more. The size of holding is dependent on many factors such as the value of land, the quality of soil, the distance from urban areas and topography features of land. Table 1.2 shows the range of size of holdings with the land use characteristics on the land.

TABLE 1.2

Type of land use by size of holdings

| Type of Land Use | Number of Holdings | | |
|---|---|---|---|
| | Under 5 ha | 5-9 ha | 10-19 ha |
| Total land from below 20 ha | 3,910 | 3,012 | 3,420 |
| Sheep farming | 456 | 558 | 656 |
| Beef farming | 530 | 639 | 808 |
| Poultry farming | 373 | 118 | 71 |
| Market gardening | 834 | 223 | 239 |
| Orchard | 861 | 542 | 375 |
| Cropping | 152 | 168 | 228 |

Source: Department of Statistics, June 1973.

Patterns of size of holdings vary in different county areas. For instance, in Paparua County near Christchurch the total area of small-holding (i.e. 8 hectares and below) is 38, 737 hectares. About 86 percent of this land is the eight-hectare size of holdings while only 5 percent is between six and eight-hectare blocks. In the Manawatu, (consisting of

Manawatu County, Kairanga County and Oroua County), there are 1,830 small-holdings near Palmerston North. A look at the distribution reveals 36 percent are 9-20 hectare holdings, 19 percent are 5-9 hectares and 45 percent are of less than 5 hectares (Ministry of Agriculture and Fisheries, 1974).

## 1. OBJECTIVES OF STUDY

This study is principally concerned with the examination of trends in the Kairanga County during the last decade. Changes in the structure and location of dwellings, in the size of holdings as a result of the growth of rural subdivisions, in types of rural land ownership and in the distribution and location of subdivision will be emphasised. Some aspects of socio-economic structure are also examined and compared with the structure of the city of Palmerston North. The study is limited to an investigation and evaluation of only the rural sector of the county. Townships and other urban communities are ignored for the purpose of this study. The concentration or emphasis is upon rural subdivision and this entails a look at the reasons for subdividing land and/or purchasing land in the subdivided rural areas. The type of land use before and after subdivision will also be outlined. The socio-economic characteristics of the dwellers (full-time farmers, part-time farmers and non-farmers) are also examined and compared. Like other urban areas, Palmerston North has been spreading out onto the surrounding rural areas. These rural areas, mainly agricultural land, become the fringe of urbanisation or suburbanisation.

From the case of Kairanga County, this study leads to the investigation of the situation of subdivision and suburbanisation in other areas of the country. As mentioned before, this phenomena has been taking place around cities throughout New Zealand. A brief discussion on the effect of size of cities on rural subdivision is included. The study ends with a statement on the advantages and disadvantages of rural subdivision and suburbanisation and makes comments on the implications of the findings.

## 2. METHODS OF STUDY

This research was undertaken from late 1979 to 1980 and can be divided into five stages:

(1) dwelling study,

(2) questionnaire survey,

(3) size of holding survey,

(4) analysis and,

(5) mapping.

### 2.1 Dwelling Study

This was concerned with household dwellings and their age, observing their location in the county and the size of holding. Dwellings were categorised according to age into six different periods, i.e. pre-1900, 1900-1918, 1918-1945, 1945-1960, 1960-1970 and 1970-1980. Characteristic features of dwellings in each period was based largely upon Cooke (1972), and were used to help to identify the age of particular houses. Photographs of houses were also taken to assist in dwelling identification for a particular period. All houses were plotted on a series of six cumulative maps, each map relating to a particular period as already noted. These maps showed the location of many houses which located upon the rural subdivision land in the county. The key to identifying ages dwellings was largely based on the style of construction and the materials utilised. Dwellings could be studied by reference to distinctive external characteristics, e.g. roofs, windows, weather-boarding, chimneys and verandahs. A key was devised listing the distinctive features in style, design, planning and construction of dwelling of each period.

### 2.2 Questionnaire Survey

This stage of the research took place from February to April in 1980.

The household survey was applied to the whole rural population and area of the county, except with townships or clusters of houses excluded. The questionnaire (Appendix D2) was designed to contain questions in four parts: a set of questions for each member of the household, for each head-of-household, for each area of farm land and for each farmlet (subdivision). The purpose of the questionnaire survey was to identify the family structure, its socio-economic characteristics and its migration history and the nature of agricultural activities. The actual age of houses was required (if known) to cross-check with the field observations. Information on patterns of ownership and the means of acquiring or purchasing was also sought. Households without farm land were asked to complete only the first two parts of the questionnaire. The third part, relating to households with farm land was completed by their owners. The purpose was to know something about the size of the holding, farm area, ownership, farm buildings (used, unused and new), 'actual' and 'legal' subdivision. Farm buildings are mapped to show a type of change in land use. The last part was surveyed on household on subdivision land only. The questions related to land ownership, means of acquisition, type of land use before and after subdivision and the nature of farm production.

In total 716 questionnaires, with an accompanying letter (Appendix D1), were distributed through the rural letter boxes to every house in the rural area. The accompanying letter asked for an appointment with the householder or owner in the following two or three days. The owner of the house was asked for an interview at their home or to fill in the questionnaire form and leave it for collection. Some households were called back for a second and third time, while some were not available at all or refused to answer.

Some 435 questionnaires were completed, representing a response rate of approximately 61 percent. The number of questionnaires handed out and responses received in various localities within the county are classified according to the type of household (Table 1.3).

## 2.3 Size of Holding Survey

The data for this study was obtained from the Department of Valuation's Kairanga County sheets, 1978[1]. The main purpose was to classify and locate the holdings by size and to distinguish 'actual' and 'legal' or 'potential' subdivisions[2]. Holdings were subdivided into five size categories, namely, less than 4 hectares (10 acres approximately), 4-8 hectares (20 acres approximately), 9-20 hectares (50 acres approximately) and more than 20 hectares. Each group of holdings by size was tabulated by total number and total area of holdings. The Department of Valuation's sheets show areas and boundaries of each title. This study of subdivisions is, however, concerned only with holdings of less than 20 hectares.

Finally, the 20 separate maps of the county by size of holding were reduced on to a 1:50,000 map to show location and distribution of both

---

1. Sheets for the west side of the Manawatu River are drawn at 1:10,000 while those for the east side of the river are at 1:16,000.

2. 'Actual Subdivision' is the land which has been subdivided with separate titles and boundaries and today is generally farmed as a distinct unit. 'Legal or Potential Subdivision' is defined as that land which has been legally subdivided but remains still with the same title. The land is still being farmed the traditional manner. Potential boundaries only are shown. There is, however, the possibility of potential subdivisions being actual subdivisions at some time in the future if and when the owner decides to subdivide.

TABLE 1.3

Handed out and Completed Questionnaire by Type of Household

| Survey Area | Handed out questionnaire | Completed questionnaire | Type of responding household Subdivision | Farmland | Non-Farm |
|---|---|---|---|---|---|
| Aokautere | 28 | 18 | 2 | 13 | 3 |
| Fitzherbert West | 46 | 39 | 23 | 12 | 4 |
| Linton | 98 | 67 | 10 | 42 | 15 |
| Pioneer Highway | 46 | 30 | 3 | 18 | 9 |
| Lockwood | 52 | 30 | 4 | 18 | 8 |
| Aranui | 32 | 20 | - | 19 | 1 |
| Oroua | 23 | 12 | 4 | 7 | 1 |
| Cameron | 25 | 16 | 2 | 10 | 4 |
| Bunnythorpe-Kairanga | 65 | 31 | 9 | 15 | 7 |
| Gillespie Line | 17 | 11 | 5 | 4 | 2 |
| Milson Line | 43 | 25 | 3 | 17 | 5 |
| Newbury Line | 23 | 13 | 3 | 9 | 1 |
| Rongotea | 20 | 11 | 1 | 7 | 3 |
| Cloverlea and No. 1 Line | 33 | 18 | 5 | 9 | 4 |
| Rangitikei | 47 | 29 | 2 | 19 | 8 |
| Roberts Line | 40 | 27 | 9 | 12 | 6 |
| Bunnythorpe | 39 | 19 | 4 | 10 | 5 |
| Te Matai and Whakaronga | 39 | 19 | 3 | 12 | 4 |
| Total | 716 | 435 | 92 | 253 | 90 |
| Percent return | 100% | 61% | | | |
| Percent of responding households in each type | | 100% | 21.1 | 58.2 | 20.7 |

'actual' and 'potential' by size of holding.

## 2.4 Analysis

Some survey data was coded and punched on cards to analyse the results using the computer package programme, MINITAB II. The output was received in the form of histograms, two-way tables and mean and averages of various distributions. Some survey data, which was too complicated to analyse with the computer, was tabulated and counted by hand.

## 2.5 Mapping

Dwellings maps were produced to show location of homes in six different periods. Dwellings and farm buildings were located as well as unused, used, new farm buildings. The farm building map indicates the trend of change of land use in the county. The size of holding map shows both 'actual' and 'potential' subdivisions and also uses colour to identify particular sizes. All maps are produced in the scale of 1:50,000, a scale which was thought to be appropriate to cover the whole area of the county as well as assist in the explanation of the extent of rural subdivision and suburbanisation that existed and took place within Kairanga County.

## 3. RURAL LAND SUBDIVISION REGULATIONS

Before April 1974 when rural subdivision was controlled by counties, it involved only holdings of less than four hectares. This size of holding was assumed to be the minimum size for an "economic unit". Economic Unit or Economic Farm Unit is defined as "... a farm holding as its primary purpose the production of matter for sale and which is the source of full-time employment for at least one person" (M.A.F.: 1977b, 20). Time has passed, technology has been developed, the value of land has increased, rural workers have left farm land and consequently this minimum size of holding is frequently no longer economic. Some non-subdivided farms, which were previously full-time farming units have been forced to change to part-time farming. In effect the idea of "economic farm unit" is dependent upon various factors, i.e. the physical characteristics of the land, the type of production activity and the level of productivity, the farmers' ability, experience and motivation as well as the profitability of farm product and its future. Under the district scheme of many counties, subdivision on rural areas has been permitted when it is an economic farm unit. When the economic farm unit is not used anymore, the minimum size of rural subdivision has been increased. In other counties dwelling construction controls on rural subdivision have been introduced.

The "Land Subdivision in Counties Act" was passed in 1946 to enforce the minimum subdivision size of 10 acres (4.046 hectares) in rural areas. Counties Act 1946, Section 3 (1) stated that

> "When any land outside a borough or town district is subdivided in allotments for the purpose of sale or for the building purposes and any allotment, whether it is intended to sold or not, has an area of less than 10 acres, a scheme plan showing

the purposed subdivision shall, unless the Minister, with the approval of the level authority, otherwise determines, be prepared by a surveyor and submitted to the minister for his approval".

The main purpose was to try to restrict the movement of people out into rural areas by limiting the minimum size of land holding in rural subdivision. It also set out to avoid loss of farm production and the loss of good agricultural lands in rural areas through the discriminatory subdivision of land into holdings for residential purposes. This ten-acre minimum was hoped to meet economic farm units. To control rural subdivision a county has been able to use its District Scheme as a means of fixing a minimum size or area for rural subdivision and including it in a Council's code or ordinances. Subsequently the purpose of this "Land Subdivision in Counties Act" was not fulfilled but there emerged many ten-acre blocks within the rural-urban fringe around New Zealand cities for the counties had little control over rural subdivisions of more than 10 acres.

Important changes were soon to come. In 1961, the "Counties Amendment Act 1961" was introduced. Section 22:1 declares: "Where any person holding any land in the county proposes to subdivide the land for the purpose of sale or for building purposes, and any allotment, whether or not it is intended to be sold, has an area of less than ten acres, a scheme plan of subdivision, with such addition copies as the council requires, showing the several allotments and their dimensions, and the roads and reserves (if any) proposed to be made, shall be prepared by a registered surveyor and approved by the Council".

In 1962 the Counties Amendment Act changed the minimum size from ten

acres to fifty acres (20.234 hectares) by S.6(1) the "Counties Amendment Act 1962" as ..."section 22 of the Counties Amendment Act 1961, is hereby amended by omitting from subdivision (1) the words "ten acres" and substituting the words "fifty acres".

The above amendment, however, was repealed by S.12 of the "Finance Act 1962" as from the commencement of the "Counties Amendment Act 1962". When a county was not given the right to approve a subdivision larger than 4 hectares it became period of "ten-acre explosion". Landowners, without the need for any approval and with the engagement of a surveyor, could quickly subdivide their farms with often a prospect of 100 percent tax-free profit (McIntyre: 1974,32). A demand was the general increase in affluent people who desire a rural home within commuting distance of cities.

Each county has adopted the Counties Amendment Act at different times. A number of them increased the 4 hectare minimum requirement in their district planning schemes to 20 hectares. Although the Act has been adopted, much rural farm land around cities although not actually subdivided, had already been legally subdivided under the previous Act. These areas, i.e. 'potential' subdivisions, can be actually subdivided in the future. After April 1974, Counties were allowed to set larger minimum areas for subdivision and these were generally of a size, usually exceeding 20 hectares, which could be expected to provide an income for a full-time farmer and his family. Some counties have adjusted this regulation to be appropriated to their own rural lands. For instance, an amendment to the District Scheme of Paparua County in 1976 increased the minimum subdivisional size in rural areas from 8 to 40 hectares (M.A.F., 1977b). Kairanga County raised the minimum

subdivision size from 4 hectares to 20 hectares in 1973. In contrast in adjacent Oroua County, where soils are listed as being of a high, medium, or low potential for food production, the minimum areas were defined for various horticultural, cropping and pastoral activities for each soil group. Minimum areas have ranged from 46 to 538 hectares for agricultural and pastoral farming, and from 6-15 hectares for horticultural production (D.S.I.R.: 1979,33). In Pahiatua County to the east of Kairanga County through the Manawatu Gorge, a minimum form of regulation was avoided. This scheme instead relied on considering each subdivision on its own individual merits. Its guidelines for subdivision include a consideration of whether "the site is suitable for the proposed use and will not significantly prejudice land use practices in the long term" (D.S.I.R.: 1979, 33).

It is widely recognised that the expansion of urban areas into the countryside (i.e. the peri-urban zone) is a continuing phenomena. The demand of land for residential use in the rural fringe is increasing and inevitable. As a result, the number of small-holdings, for both agricultural and non-agricultural use, increases every year as shown in Table 1.4

TABLE 1.4

Size of holdings with area less than 10 hectares

| Year | Number of holding |
|---|---|
| 1972 | 5,458 |
| 1973 | 6,922 |
| 1974 | 7,420 |

Source: M.A.F. (1977c, 12).

In view of this the Town and Country Planning Appeal Board recognised that such subdivisions may be an appropriate form of land use if confined to poorer soils. The general reservation to rural residential or rural subdivision are covered by the "Matters of National Importance", set out in section 3 of the Town and Country Planning Act 1977. Section 3 of the Town and Country Planning Act 1977 listed seven matters of National Importance, and three of them concerned the rural subdivision situation.

1. The avoidance of encroachment of urban development on, and the protection of, land having a high actual or potential value for the production of food.
2. The prevention of sporadic subdivision and urban development in rural areas.
3. The avoidance of unnecessary expansion of urban areas into rural areas in or adjoining cities. (Kairanga County Council: 1980: 3).

# CHAPTER TWO

# KAIRANGA COUNTY

## 1. LOCATION

Kairanga County is situated in the Manawatu in the southern part of the North Island (Figure 1). It has an area of approximately 461 square kilometres (46,100 hectares) which surrounds the city of Palmerston North.

According to the 1976 census, the total population of Kairanga County was 6,260 with a population density of 13.6 persons per square kilometre. (In the city of Palmerston North the population was 57,839). The total number of occupied dwellings in the county in 1976 was 1,461, an increase of 11.7 percent since 1971. The county is potentially one of the most productive in New Zealand, with the large areas of high quality soils. Pastoral farming is the predominant form of land use and includes dairying, fattening of lambs and cattle and the raising of sheep and cattle. On the river flats, land is used for market gardening, cropping of wheat, barley, grass seed, potatoes, peas, some process cropping on lands near Palmerston North City.

## 2. HISTORY

The first settlement of the European was begun in Kairanga about 1870s. Most of the land in the county was surveyed and sold in sections ranging from one to six hectares at a cost of £2-3 per hectare. There has been a continued development of land for pastoral farming since the beginning of settlement. Agricultural production in the county has continued to increase with the application of more intensive farming

# KAIRANGA COUNTY : LOCATION IN MANAWATU REGION

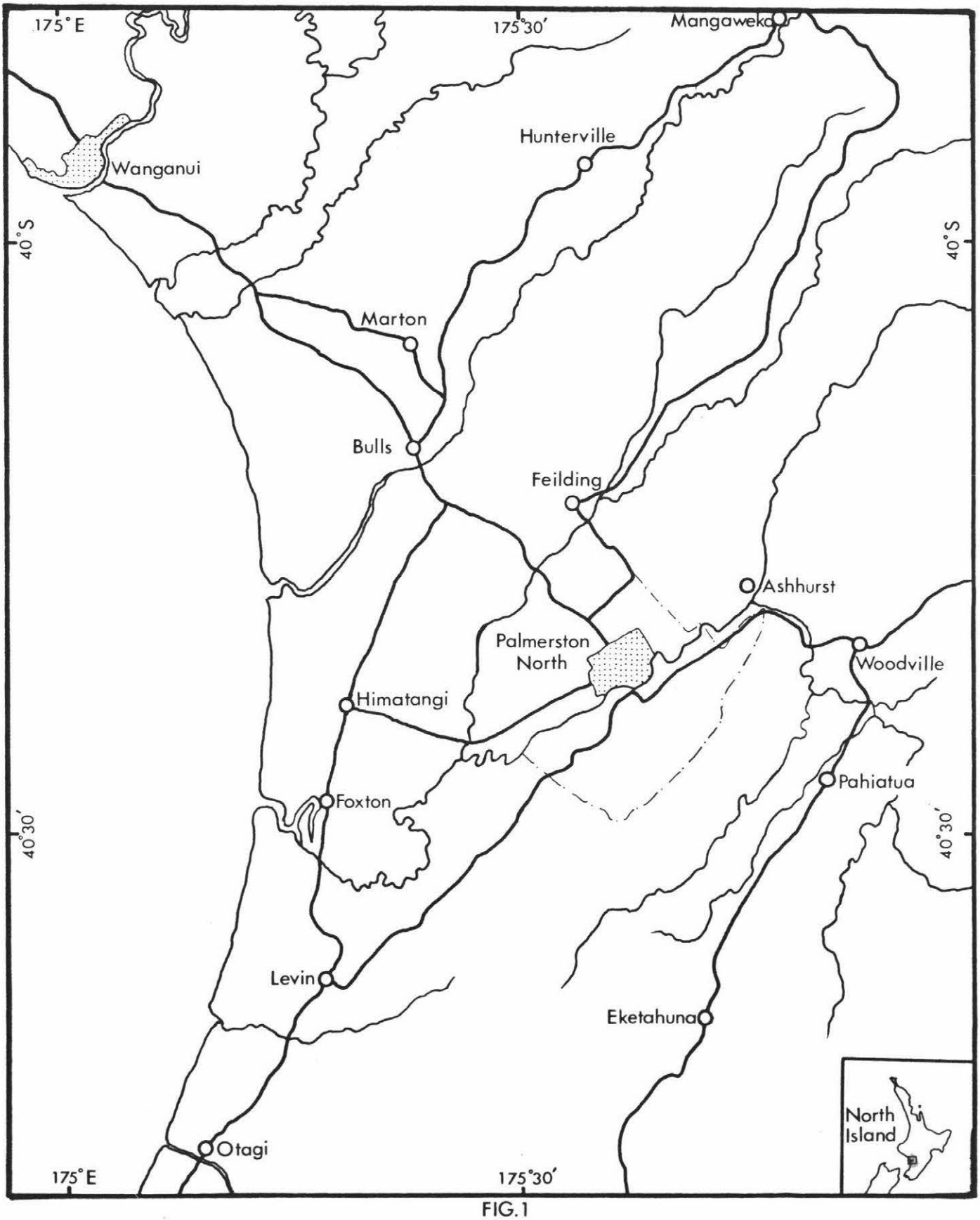



FIG. 1

methods. The increased agricultural production and productivity of Kairanga County has contributed to and been helped by the steady growth of the city of Palmerston North. But at the same time the expansion of Palmerston North has encroached on to the fertile agricultural lands of the county.

## 3. TOPOGRAPHY (Figure 2)

Major landforms within Kairanga County include three distinct physiographic units: the river flats, the terrace land and fans, and the ranges in the east.

3.1 The river flats, making up one half of the area of the county, extend from the Manawatu River in the east to the Oroua River in the west. These flats have been built up by the flood deposits of these two rivers and their tributaries. The river flats, while generally of high fertility, are also extremely wet and extensive drainage is often required for pastoral farming. The northern parts of these river flats are better drained, but the large part to the southern part is low-lying and swampy, and is often called the Taonui Basin, covering the areas of Lockwood and Linton.

3.2 The terrace land and fans cover two parts in the county. The more extensive area lies south-east of the Manawatu River and extends in a belt from the river flats eastwards to the foot of the Tararua Range. A smaller area extends from the north-east of Palmerston North City to Bunnythorpe. The terrace land occupies about a quarter of the county. It is part of an uplifted coastal plain which stretches along the western coast of the lower part of the North Island.

3.3 The ranges, occupying a little more than one quarter of the county

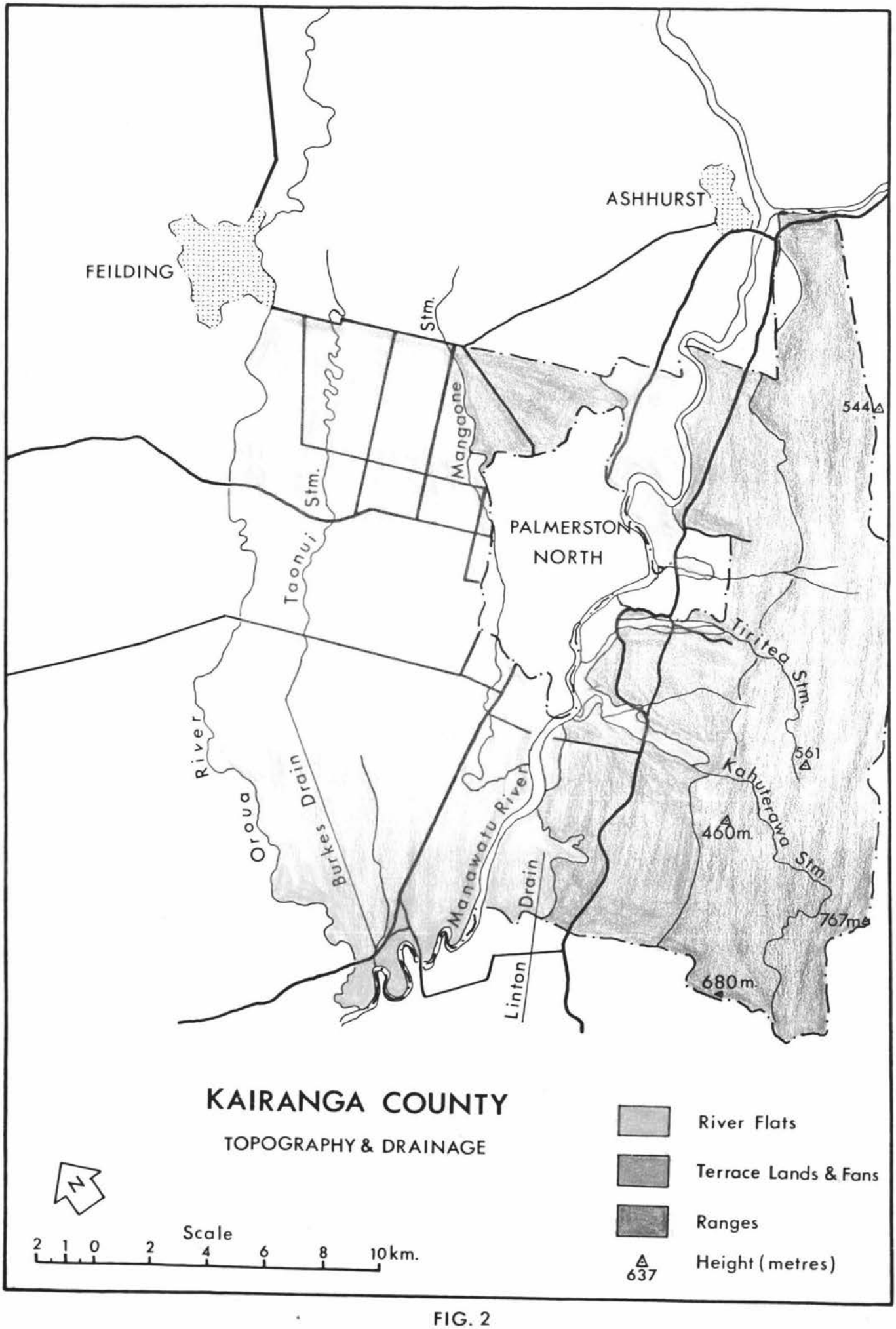

FEILDING
ASHHURST
Stm.
Mangaone
Taonui Stm.
PALMERSTON NORTH
544
Tiritea Stm.
561
Kahuterawa Stm
460m.
767m
680m.
Oroua River
Burkes Drain
Manawatu River
Drain
Linton
KAIRANGA COUNTY
TOPOGRAPHY & DRAINAGE
N
Scale
2 1 0 2 4 6 8 10km.
River Flats
Terrace Lands & Fans
Ranges
637
Height (metres)

FIG. 2

area, make up the northern part of the Tararua Range. The ranges vary in height from 767 metres in the south to 365 metres at the Manawatu gorge in the north. They are composed of hard sandstone and siltstone of Triassic or Jurassic age, with occasional bands of red and green volanic argillites, jaspters, and grey cherts (Cowie, 1978).

## 4. SOILS

The soil pattern in Kairanga County can be described in relation to the landforms of the County (Cowie, 1978, Kear, 1964).

4.1 Soils of the river flats. These soils are derived from alluvium which has been brought down and deposited by rivers during floods. They contain alluvium mixed with the peat and are fertile soils when adequately drained. They are suitable for a wide range of agricultural uses such as market gardening, cropping, intensive dairying or fat-lamb farming.

4.2 Soils of the terrace country. There are two main groups of this type of soil extending over the terrace land, the yellow-grey earths and the yellow-brown loams. The yellow-grey earths occur under a rainfall of less than 1000 mm. with a slight summer dry season. The yellow-brown loams occur under a higher rainfall and are formed from sediments which contain some volcanic ash. Land use of the terrace land is closely related to relief where there are extensive areas of arable, flattish or rolling terrace tops. The yellow-grey earths are moderately fertile and with topdressing sustain good pastures for fattening and dairying. The yellow-brown loams are free-draining soils with yellowish brown friable subsoil. Natural fertility is not high but with adequate topdressing of nutrients, good pastures can be maintained for producing good stock. This soil

is used for sheep farming, fattening and dairying.

4.3 Soils of the hill country. These soils, formed from sandstone and greywacke, are generally shallow and stony. Most of these soils are still under the original forest cover. Land use on the soil is mainly associated with store sheep and wool production, with some fattening. The soils of the Tararua Ranges have been grouped, according to their topography, into two types: undulating, rolling and hilly land; and steep land.

According to the system outlined in "Soils of New Zealand" (1962/63), soils of Kairanga County are classified as Table 2.1.

TABLE 2.1

Soils of Kairanga County

| Soils | Area (ha) | Percent of the county |
|---|---|---|
| Recent soils | 5,270 | 11.0 |
| Rapidly accumulating gleyed recent soils | 1,536 | 3.3 |
| Slowly accumulating gleyed recent soils | 10,631 | 22.3 |
| Gley soils | 6,270 | 13.1 |
| Gleyed yellow-grey earths | 10,949 | 23.0 |
| Yellow-brown earth and steepland soils | 13,021 | 27.0 |
| Total | 47,677 | 100 |

Source: Kear: 1965, 44.

## 5. CLIMATE

Like the other regions in the middle New Zealand, the Kairanga County climate is characterised by warm summers, mild winters, a reliable rainfall, well-distributed throughout the years. The predominance of north-westerly and westerly winds and a high proportion of strong winds is also typical of the county. Snow rarely occurs below 610 metres on the range but frost is more common from April to October. Rainfall is heavy on the ranges east of the county and decreases to the west. The climate is favourable for agricultural activity in the Kairanga County especially the growth of grass, except that strong winds prevail and this affects horticultural activity in some regions of the county.

## 6. LAND USE AND AGRICULTURE

Kairanga County, with a suitable climate and a large area of good soils, is one of the most productive counties in New Zealand, comparing very favourably with the better parts of Taranaki or Waikato. Farming is intensive and fairly diverse-dairying, stock breeding, fattening and cropping being the most important activities (Table 2.2). About 35 percent of the land in the county is used for dairying, about 25 percent for fat lamb and beef fattening and cropping, about 16 percent for store-stock breeding and run-off grazing, and about 0.6 percent for market gardening. Dairy farming is concentrated on the area of river flats, with production generally exceeding 340 kg. of butterfat per hectare. Dairying is also carried out on the wetter, sand country areas. The Friesian breed has been prominent in the area for town milk supply farms, but Jersey herds predominate for factory supply farms. The number of dairy farms has declined because they

have changed to other land uses. Increased stocking rates and larger farm sizes, have, however, prevented any decline in overall production.

TABLE 2.2

Total Farm Holding in Kairanga County

| | 1968 | 1974/75 | 1975/76 | 1976/77 |
|---|---|---|---|---|
| Area occupied (ha.) | 40,164 | 39,580 | 40,870 | 39,260 |
| Number of holding | 552 | 558 | 575 | 579 |
| Average size | 73 | 71 | 71 | 68 |

Source: Department of Statistics (1968-1977)

Fat-lamb farming is common on the flats and the terrace areas of the county. Carrying capacity ranges from 10 to 15 ewes per hectare, supplemented with fattening cattle or grass seed and other crops. Sheep on the hill country produce wool and provide store stock for the low land farmers. The production has increased since the introduction of aerial topdressing and stocking rates have improved from about 2½ ewe equivalents per hectare in 1950 to 10 or more today. Stock numbers have increased over the last decade by more than 30 percent (Table 2.3).

TABLE 2.3

Total Number of County Livestock

| Livestock | 1961 | 1971 | 1974/75 number | 1974/75 holding | 1975/76 number | 1975/76 holding | 1976/77 number | 1976/77 holding |
|---|---|---|---|---|---|---|---|---|
| Sheep | 195,315 | 188,220 | 195,000 | 184 | 244,000 | 186 | 213,000 | 222 |
| Beef | 13,384 | 18,535 | 27,030 | 323 | 24,258 | 299 | 21,485 | 290 |
| Dairy | 32,912 | 36,169 | 28,960 | 234 | 28,097 | 226 | 26,944 | 207 |
| Pigs | - | - | 5,004 | 50 | 3,878 | 47 | 5,737 | 57 |

Source: Department of Statistics (1961-1977)

Cash Cropping (Table 2.4). There is a wide variety of cash crops grown in the county for which the climatic conditions are quite suitable. On the river flat soils, wheat, barley, peas and grass seed all grow well. The yields of seed crops exceed 1,120 kg. per hectare. The area of land which is used for wheat-growing is about 404 hectares with the average yield 2,800 kg. per hectare (in favourable seasons high yields of over 6,000 kg. per hectare). Barley grows well on both terrace and river flat soils. The average yield is about 4,000 kg. per hectare (highest yield exceeds 6,700 kg. per hectare). The growing of peas for seed has increased on the river flats with average yields of 2,800 kg. per hectare. Another crop is potatoes of which 200 to 240 hectares are planted each year, the yield being about 20 tons per hectare. The growing of fodder (forage) crops such as mangolds, fodder beet for supplement feeding to livestock has also increased. Processing crops such as tomatoes, corn, peas are being grown on the soil of river flats.

TABLE 2.4

Major Cropping Areas (hectares)

| Crops | 1968 | 1969/70 | 1975/76 | 1976/77 |
|---|---|---|---|---|
| wheat | 465 | 468 | 613 | 832 |
| barley | 972 | 771 | 1,284 | 1,213 |
| peas | 120 | 107 | | |
| potatoes | 192 | 181 | | |
| forage crops | 1,083 | 1,064 | | |
| grass seed | 675 | 619 | | |
| hay and silage | 3,661 | 3,998 | | |

Source: Department of Statistics (1968-1977)

Horticulture. Most horticulture product of the county is supplied to Palmerston North City. The horticultural industry in Kairanga County comprises nurseries and cut-flower growing, vegetable production, fruit growing and glasshouse cropping. Nursery and cut-flower production is mainly carried around the city of Palmerston North. Shelter is needed to prevent wind damage. Commercial vegetable is grown almost exclusively by the Chinese community in the Te Matai Road area, also the areas of Aokautere and Longburn, although there are also some small vegetable-growers. About 200 hectares of land in the county is used for commercial vegetable production (Muirhead in Cowie: 1978, 72).

Orcharding, i.e. pip fruits and berry fruits (strawberries, raspberries, gooseberries, currants and brambles) does well on soils of the river flats. Most production is consumed within the local area and the city of Palmerston North. Glasshouse crops (tomatoes and grapes)

are produced for the local market with a number of about 16 glass-houses. There are also small areas of 'process' crops, i.e. tomatoes for the local cannery.

## 7. POPULATION (Table 2.5)

According to 1976 census, the population of Kairanga County was 6,260, i.e. 3,744 people in Palmerston North Urban area and 2,516 people in Palmerston North Statistic Division. Population are concentrated in five main regions:

1. Fitzherbert East Region 1,304 people
2. Fitzherbert West Region 1,505 people
3. Taonui 1,197 people
4. Mangoane 1,244 people
5. Central 1,010 people

The average density is 13.6 persons per square kilometre.

TABLE 2.5

Population by Territorial Local Authorities

| | Number of Population | | | Increase | |
|---|---|---|---|---|---|
| | 1966 | 1971 | 1976 | 1966-71 | 1971-76 |
| Kairanga County (Administrative) | 5,611 | 5,747 | 6,246 | 136 (2.4%) | 499 (8.7%) |
| Palmerston North City | 47,667 | 51,893 | 57,839 | 4,226(8.9%) | 5,946(11.4%) |

Source: Department of Statistics (1966-1976)

The population growth rate of the county was low between 1966 and 1971 (2.4%) but higher between 1971 and 1976 (8.7%), compared with the growth rate of the city of Palmerston North, 8.9% in 1966-71 and

11.4% in 1971-76. The growth rate of the county population, however, declined (-.47%) in 1977-78.

## 8. DWELLINGS

The number of occupied dwellings in the 1971 census in Kairanga County was 1,309 dwellings and 1,461 dwellings in 1976, an increase of 11.7 percent. Compared with the city of Palmerston North where there were 15,422 dwellings in 1971 and 17,920 dwellings in 1976, an increase of 16.2 percent.

## 9. OCCUPATION

The main occupation group in Kairanga County is, of course, agriculture (Table 2.6). Since 1966, however, the agricultural population has declined while professional and technical have increased. The percentage of agricultural population in 1961-66, 1966-71 and 1971-76 are 36 percent, 34 percent and 28 percent respectively of the whole employment in the county.

## 10. RURAL LAND SUBDIVISION

According to the County District Scheme 1971, "subdivision" for farming purposes would be permitted by the Council if each allotment had a minimum area of 20 hectares. Much rural land had been legally subdivided, however, under the previous Act, and as a result 'actual' subdivision with a minimum area of less than 20 hectares is still continuing. This area of legal subdivision today represents 'potential' subdivision land.

TABLE 2.6

Occupation Group (number)

| Occupation Group | 1961-66 | 1966-71 | 1971-76 |
|---|---|---|---|
| Professional, Technical etc. | 165 | 215 | 320 |
| Administrative, Managerial | 76 | 30 | 49 |
| Clerical workers | 190 | 165 | 267 |
| Sales workers | 95 | 86 | 120 |
| Service worker (including armed forces in 1976) | 111 | 89 | 432 |
| Agricultural, animal husbandry, forest workers, etc. | 847 | 725 | 690 |
| Production workers, transport and equipment operators, labourers | 586 | 462 | 497 |
| Total activity engaged (includes persons not classifiable) | 2,328 | 2,105 | 2,410 |

Source: Department of Statistics Bulletin No. 8 Census of Population and Dwellings (1977).

In 1980 the County Council has reviewed the District Scheme. Some objectives of this scheme, relating to subdivision, have been set to protect the productive potential and areas of better farm land, and also to prevent the further fragmentation of land for speculative purposes. Subdivision will not be permitted until a land management plan has been prepared. The management plan must contain the conditions, i.e. the use that the new lots will be put to, and the suitability of the use determined by reference to such matters as land use capability, existing use, roading and traffic, topography, vegetative cover, servicing and liability to flooding. Ordinances are proposed which will permit subdivision for residential allotments in rural zones to accommodate retired farmers, rural workers, and under certain circumstances, part-time rural-workers.

## 11. THE SPREAD AND EXPANSION OF THE CITY OF PALMERSTON NORTH

The city of Palmerston North is surrounded by Kairanga County, so the growth of the city and the expansion of the city area directly affect to the rural area of the county. The population of the city of Palmerston North in 1971 was 51,893 rising in 1976 to 57,931. The net increase was 6,038 people, a growth rate of approximately 2.3 per cent per annum. Besides the growth by natural increase, the population of Palmerston North is also increased by migration. According to the 1971 Census, the number of people who moved within five years prior to the 1971 Census, out from Palmerston North Urban Area, was 13,825 people, while 15,361 came in to Palmerston North Urban, a net gain of 1,536 people. The result of the increase of growth rate on Palmerston North Urban Area has been increasing of demand for housing. Between 1971 and 1976 the additional growth has required 1,000-1,200 new homes, a rate of 200-240 per year. Currently the city of Palmerston North has approximately 3,100 'green field' sites and a further 2,250 potential infill sites are obtainable within the 1877 City boundary (Manawatu Urban growth Strategy Study: 1978,18). From the rate of increase, the 'green field' land will last a further 11 years. It appears quite likely that the encroachment onto the agricultural area of Kairanga County will continue. Some evidence in support of this is as follows:

1. The rate of increase of the population of Kairanga County in 1966-71 was 2.4 percent, Palmerston North 8.9 percent. The ratio was 1:3.7. In 1971-76, the rate of increase of population of Kairanga County was 8.7 percent, Palmerston North 11.4 percent. The ratio was 1:1.3. These ratios show the high growth rate of Kairanga County.
2. Between 1971 and 1976 the rate of increase of dwellings in

Kairanga County was 11.7 percent and in the city of Palmerston North was 16.2 percent.

The above evidence suggests the rate of growth of both population and dwellings of Kairanga County is high. Undoubtedly one of the reasons is the growth and the expansion of the Palmerston North Urban Area. This situation is continuing and probably in the foreseeable future the capacity of the city of Palmerston North could be exceeded.

The Manawatu Urban Growth Study has identified three interelated elements upon which regional management of urban growth in the Manawatu should be based on:

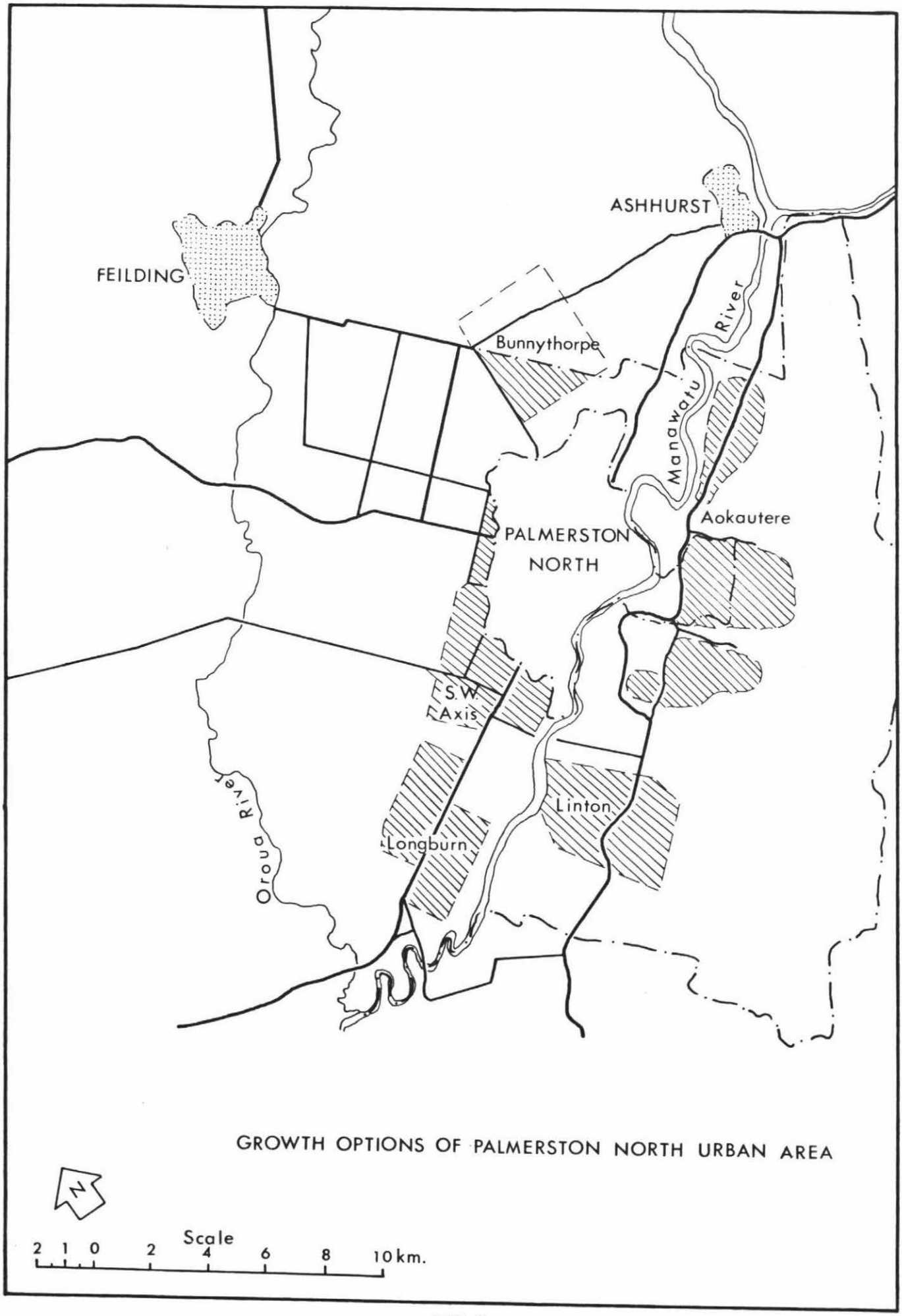
1. policy for development of vacant city land renewal and infilling;
2. policy for physical extension to Palmerston North City;
3. policy for dispersion of urban area growth to settlements surrounding Palmerston North City.

The study proposed extension strategies on the peripheral of the city by choosing six Potential Urban Development Sites. Three of these were in Kairanga County area (Figure 3).

11.1 The south-west Extension. This area is situated adjacent to the western boundary of the city.

11.2 Northern Extension. This area is situated on the north boundary of Palmerston North City. Part of it is in Kairanga County area (Bunnythorpe).

11.3 Aokautere I and II. The areas to the south of the Manawatu River, known as Aokautere, part of the upland plateau sloping from Tararua Ranges to the Manawatu River where it terminates in a terrace approximately 50 metres high.




GROWTH OPTIONS OF PALMERSTON NORTH URBAN AREA

FIG. 3

The areas of these sites have a high potential and actual value for food production. There are a number of agricultural and horticultural activities. The loss of agricultural production up to the year 2001 in these areas, if they would be urbanised, has been calculated. In the south-west Extension, the total loss is $3.4 million ($2,527 per hectare). The northern Extension, the total loss is over $2.8 million ($1,795 per hectare). And in Aokautere I and II areas, the cost of converting rural land from agricultural use to an urban use is $1,311 and $1,256 per hectare respectively, the total loss of approximately $2.2 million for both sites.

Besides these three Potential Urban Development Sites, Linton and Longburn were also proposed as growth options for the dispersion of the city of Palmerston North (Figure 3). Linton comprises an area bounded by the Linton Army Camp, the Camp residential area and Fitzherbert West in the North, stretching southward to Akers Road and Milricks Line. Longburn comprises land to the west of Longburn township and either side of State Highway 56 stretching westward toward the Taonui Basin. These two proposals, however, were considered undesirable and impracticable.

# CHAPTER THREE

# STRUCTURAL BASIS OF RURAL SUBDIVISION IN KAIRANGA COUNTY

## 1. NUMBERS AND SIZE OF LAND SUBDIVISION

As far as that area of rural land that is owned or held in lots of 20 hectares and less is concerned, the size of actual subdivision land is categorised into three groups: 4 hectares and less, 5-8 hectares and 9-20 hectares. In Kairanga County there was a total of 9,192 hectares in holdings of 20 hectares or less (1978). There were altogether 2,935 holdings, of which approximately 70 percent was 'potential' and 30 percent was 'actual' small holdings. The 'potential' area or holdings made up 54 percent of the 9,192 hectares of land while 'actual' allotment land amounted to 46 percent of the subdivision land area.

## 2. SPATIAL DISTRIBUTION OF LAND SUBDIVISION

'Potential' and 'Actual' Subdivision Land trends to be or concentrated in different areas of the county, depending upon the size of the holding. For example, most 'potential' subdivision land or holdings with an area 4 hectares and less is concentrated around the townships of Linton, Longburn and Bunnythorpe. Most 'actual' subdivision land, in the 4 hectare and less and 5-8 hectare groups, is concentrated around the older settlements such as Linton, Longburn, Whakarongo, Te Matai, Aorangi, Bunnythorpe and Kairanga, as well as some areas of new subdivision settlement such as Scotts Road, Fitzherbert West, Bunnythorpe, Newbury Line, Milson Line, State Highway 54, Gillespies Line and Cloverlea. Some holdings are also scattered throughout the county near the main roads.

'Potential' subdivision land, with holdings of 5-8 hectares, is not only concentrated around the townships of Linton, Longburn and Bunnythorpe but is also dispersed in different parts of the county especially on the river flats in the east. 'Potential' and 'actual' subdivision land, with holdings of 9-20 hectares, is dispersed throughout the county although there are concentrations on the river flats.

## 3. SPATIAL DISTRIBUTION OF DWELLINGS

The location pattern of dwellings in Kairanga County shows a concentration upon the early settlement areas such as Linton, Whakarongo, Bunnythorpe, Aorangi, Kauwhata, Longburn and Rangitikei Line (State Highway 3). But the older dwellings are also dispersed through most of the rural farm and non-farm lands in different parts of the county. Some old dwellings have been transferred from outside the county to be rebuilt or relocated within the county. On subdivision land areas of new settlement have been developed with clusters of new rural dwellings in different parts of the county, both on the terrace and river-flat lands.

## 4. SPATIAL DISTRIBUTION OF LAND USE AND NON-UTILISED LAND

The distribution of land use in the county relates to both the topography and the size of holding. Generally land use on the ranges and the terrace lands consists of pastures used for fairly extensive livestock rearing. On the river flats the land is used for dairy farming, fat-lamb farming and horticultural cropping. In terms of holding size, the smaller holding lands on the river flats are used for horticulture including market gardening and nurseries. For

instance, there are the areas of Te Matai, Whakarongo, Longburn and Cloverlea. This type of land use also needs shelter from the strong winds. Part-time farming, both livestock-raising (fattening) and horticulture is generally practiced on much of the subdivision lands. Some reafforestation might be found with fast-growing trees on subdivision lands of the terrace area. Part-time farming on subdivision lands is carried on both a commercial and home consumption basis.

There is a large area of the county, unused for agricultural purposes extending onto the Tararua Ranges, on the east of the county. This area, containing about 1,730 hectares, is used by The Manawatu Catchment Board as the Water Conservation Reserve, the area being conserved as bush.

## 5. SPATIAL DISTRIBUTION OF FARM BUILDINGS

The major farm buildings, i.e. milking-sheds, hay sheds, shearing-sheds and grain silos, help to identify a type of land use on a particular farm or small-holding in the rural area of the county. On the terrace land, shearing-sheds are the dominant farm buildings. In these areas, on lands which were subdivided for smaller holdings or for rural residential purposes, some shearing-sheds have been abandoned or converted to hay sheds, while hay sheds still remain for the use of livestock rearing. It is also common to find abandoned milking-sheds in this area too. Relict features such as shearing-sheds and milking-sheds suggest recent land use changes.

On the river flats, milking-sheds are prominent, as well as grain silos which have been introduced recently. Many milking-sheds

in this area frequently appear abandoned or converted for other uses. The abandoned and converted milking-sheds are found on both 'sub-division' land and ordinary non-subdivided farm land, and often indicate the changes of land use, from farming to residential usage, the change of type of farming and land use from dairying to others, the change of farming method from individual to amalgamated farms. Amalgamation is also indicated among the sheep farms by the occurrence of abandoned shearing-sheds. Grain silos are the most distinctive feature of the new farm buildings in the county, introduced for the use of cropping.

## 6. POPULATION AND DWELLINGS PROJECTION OF KAIRANGA COUNTY

According to the Kairanga County District Scheme, 1971, the population of Kairanga County in 1969 was 5,500. The scheme estimated the future population of the county at 5,400 people by 1974, some 5,450 people by 1979 and 5,500 people by 1988. From the latest figures issued by Department of Statistics, however, the population of the county in 1976 was 6,260. The population projection of the scheme was below the actual. This shows the growth of population in the county is more rapid than was expected.

According to the 1971 Census of Population and Dwellings, the total number of private dwellings in the county was 1,287, with an average occupancy rate of 3.7. According to the 1976 Census of Population and Dwellings, there were 1,434 private households with an average occupancy rate of 3.6.

# CHAPTER FOUR

## DWELLINGS

Early settlement in the Kairanga County developed during the 1870s and 1880s and was characterised by dispersed but close rural settlement, i.e. the area of Rangitikei Line, Pioneer Highway, State Highway 57, State Highway 57A and road junctions. Some parts of these settlements were subdivided for housing purposes earlier. Land in this part of the county was more intensively used for dairying farming and fat-lamb farming and so resulted in the close rural settlement. The establishment of dairy factories in the county followed early settlement and its response to dairy production. As a result there were settlements composed of clusters of houses for the factory workers around the dairy factory, for instance, Kauwhata, near Awahuri, on Rangitikei Line, Bunnythorpe and Longburn, and except Linton, a railway company settlement. Some clusters have grown up and become townships within the county serving as trading and servicing centres for the surrounding farm community. The first settlement was concentrated more on the river flats with dairy and fat-lamb farming activities, while isolated settlement occurred on the terrace land with sheep farming activity.

In the rural area of the county, up to present, there are about 85 houses remaining (8% of the total dwellings), which were built before 1900. They have usually changed ownership several times prior to the present ownership. A lot of renovation and restoration has been done also. These houses are on both farm land and residential land, i.e. 60 percent of them are on farm land (Figure 4). From 1900 to 1918 the survey showed an increase of 198 houses, an average of almost

11 houses per year and about 59 percent of them are on farm land at present (Figure 5). From the end of the First World War to the end of the Second World War (1918-1945) there was an average increase of 9.5 houses every year, totally altogether 257 houses, with 57 percent of them on farm land. There was an increasing number of houses on subdivision land up to 15 percent (Figure 6). After the Second World War (1945-1960) housing increased steadily, with an average of 14 houses per year. Most of them (72 percent) are on farms which are owner-occupiers and which are concentrated in more closely-settled areas as well as scattered throughout the farm land of the county (Figure 7).

From 1960 onwards there were further housing increases, with 8.7 houses per year in 1960-1970 and 16.3 houses per year in 1970-1980 (Figure 8 and 9). Although there have been, however, decreasing numbers of houses on farm land proper there have been large increases on 'subdivision' land between 1970 and 1980. The number of new houses on farm land is only 40 percent while on subdivision land it is as high as 52 percent. Age of houses in the county can be seen in Table 4.1.

The new areas of settlement in the county are concentrated on subdivision land in both the terrace land and river flats. On the terrace land, east of the Manawatu River, settlement is in the areas of Milricks Line, Scotts Road, Kahuterawa Road, Harts Road (Tiritea) and Forest Hill Road (State Highway 57A). Most houses on subdivision land were built in the 1970s. Several houses, while more than 50 years old, were transferred to these locations. Land use in these areas is mainly concerned with livestock-rearing and fattening since

TABLE 4.1

Age of House in the County

| AGE OF HOUSE | Observation Survey | | Questionnaire Survey | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total number | % | Total number | % | Sub-division | % | Farm | % | Non-farm | % |
| More than 80 years | 85 | 8.5 | 35 | 8.0 | 5 | 5.5 | 21 | 8.3 | 9 | 9.9 |
| 62-80 years | 198 | 19.7 | 64 | 14.7 | 7 | 7.7 | 38 | 15.0 | 19 | 20.9 |
| 35-61 years | 257 | 25.7 | 114 | 26.2 | 17 | 18.7 | 66 | 26.2 | 31 | 34.0 |
| 20-34 years | 212 | 21.2 | 76 | 17.5 | 5 | 5.5 | 55 | 21.7 | 16 | 17.6 |
| 10-19 years | 87 | 8.7 | 52 | 12.0 | 8 | 8.8 | 35 | 13.8 | 9 | 9.9 |
| Less than 10 years | 163 | 16.3 | 94 | 21.6 | 49 | 53.8 | 38 | 15.0 | 7 | 7.7 |
| TOTAL | 1,002 | 100 | 435 | 100 | 91 | 100 | 253 | 100 | 91 | 100 |

Source: Field Survey 1980

the farm land was subdivided into smaller units. The change is from large to smaller size of holding and from extensive to part-time land use. On subdivision land, livestock are normally being reared on the pasture around the residential holdings.

On the river flats, on the west side of the Manawatu River, the main areas of subdivision settlement are concentrated around the Cloverlea area, Gillespies Line, State Highway 54 (Kairanga-Bunnythorpe), Milson Line and Kelvin Grove area (Roberts Line and Tatuki Road). The previous land use in these areas was pasture for dairy farming which mostly and was converted to livestock rearing and horses when subdivided. Older farm buildings like milking-sheds which are common as well as the pig sty, indicate this earlier kind of land use. Old milking-sheds in these areas also suggest this kind of change of land use. On the other hand, hay sheds are prominent among new farm buildings which were built since last six years.

As far as rural subdivision in Kairanga County is concerned, the subdivision of land may be permitted by the Council with certain area conditions;

1. for farming purposes, each allotment shall have a minimum frontage of 660 feet and a minimum area of 50 acres;
2. for dwellinghouses, the area is not less than 40 perches, and has a frontage not less than 60 feet (Kairanga District Scheme, 1971).

In terms of dwelling ownership, ownership of most dwellings in rural area of the county is freehold (73 percent), and only 12 percent is rented or leased (Table 4.2). Ownership of dwellings on subdivision land reflects a high percentage of freehold (97 percent), while 77

percent of farm land dwellings and 38 percent of non-farm dwellings are also freehold. On the farm land, however, there are only 14 percent of dwellings provided for farm-workers or share-milkers by land owners. Among the non-farm dwelling group, 49 percent of them are rented houses.

TABLE 4.2

Dwelling Ownerships

| Ownership | Subdivision | | Farm Land | | Non-Farm | | All | |
|---|---|---|---|---|---|---|---|---|
| | Number | % | Number | % | Number | % | Number | % |
| Freehold | 88 | 97 | 196 | 77 | 34 | 38 | 318 | 73 |
| Owned Employer | 1 | 1 | 36 | 14 | 4 | 4 | 41 | 10 |
| Rented or Leased | 2 | 2 | 5 | 2 | 45 | 49 | 52 | 12 |
| Owned Estate | - | - | 15 | 6 | 7 | 8 | 22 | 5 |
| Other | - | - | 1 | 1 | 1 | 1 | 2 | - |
| TOTAL | 91 | 100 | 253 | 100 | 91 | 100 | 435 | 100 |

Source: Field Survey, 1980

Table 4.3 shows the mean of acquiring of dwellings in the county, 46 percent were bought from the previous owners and 26 percent were built by the present residents. Subdivision land dwellings were bought from the original owners (58 percent) and built by the present owners (36 percent). Farm land dwellings were bought from the past owners (48 percent) and built by the present owners (28 percent).

TABLE 4.3

Mean of Acquiring of Dwellings

| | Subdivision | | Farm Land | | Non-Farm | | All | |
|---|---|---|---|---|---|---|---|---|
| | Number | % | Number | % | Number | % | Number | % |
| Bought | 53 | 58 | 121 | 48 | 25 | 28 | 199 | 46 |
| Built | 33 | 36 | 70 | 28 | 10 | 11 | 113 | 26 |
| Inherited | 1 | 1 | 11 | 4 | 1 | 1 | 13 | 3 |
| Other | - | - | 1 | - | 2 | 2 | 3 | 1 |
| No answer or do not know | 4 | 5 | 50 | 20 | 53 | 58 | 107 | 24 |
| TOTAL | 91 | 100 | 253 | 100 | 91 | 100 | 435 | 100 |

Source: Field Survey, 1980

# CHAPTER FIVE

## SOCIO-ECONOMIC CHARACTERISTICS AND POPULATION OF KAIRANGA COUNTY

As far as regional administration is concerned, Kairanga County extends into both the Palmerston North Urban Area and the Palmerston North Statistical Division. Within the Palmerston North Urban Area, this area of the county is regarded as suburban and includes Aokautere Vicinity, Awapuni Vicinity, Bunnythorpe Township, Kelvin Grove Vicinity, Linton Military Camp, Massey University, Longburn Township and etc. (Appendix C). The field survey dealt with only that area of the county within the Palmerston North Statistical Division which consisted of townships, localities, communities and vicinities which are regarded as within the rural part of the county (Appendix C). According to the 1976 Census of Population and Dwellings, the population of the county was 6,260 or whom some 3,744 (60 percent) were in the Palmerston North Urban Area and 2,516 (40 percent) in the Palmerston North Statistical Division.

### 1. HOUSEHOLD STRUCTURE (Table 5.1)

The survey of 435 households included 1599 people, their sizes ranging from 1-9 persons. The average size of surveyed households was 3.7. The average size of households on 'subdivision land' and 'farm land', however, was 3.8 each while the average size of 'non-farm land' households was 3.0.

### 2. AGE GROUP BY SEX

From Table 5.2 shows that the age/sex distribution is well balanced between males and females. The sex ratio is almost 100:100. The dependency ratio (children under 15 years old and adults over 65 years

TABLE 5.1

Household Structure

| Type of Household | Number of Household | Number of Member of Household (persons) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Subdivision Land | 91 | 5 | 20 | 14 | 20 | 20 | 8 | 1 | 1 | 2 | 3.8 |
| Farm Land | 253 | 9 | 54 | 41 | 70 | 45 | 26 | 7 | 1 | - | 3.8 |
| Non-Farm Land | 91 | 12 | 24 | 17 | 18 | 14 | 2 | 2 | 1 | 1 | 3.0 |
| Total | 435 | 26 | 98 | 72 | 108 | 79 | 36 | 10 | 3 | 3 | 3.67 |

years old) is 541 per 1,000 of the adult population while the number of children under 18 years old is 613 (38 percent).

TABLE 5.2

Age group by sex (persons)

| Age / Sex | 0-4 | 5-14 | 15-17 | 18-19 | 20-29 | 30-39 | 40-59 | 60-64 | 65+ | Totals |
|---|---|---|---|---|---|---|---|---|---|---|
| Male | 68 | 169 | 51 | 38 | 127 | 121 | 167 | 32 | 27 | 780 |
| Female | 69 | 195 | 61 | 22 | 106 | 121 | 163 | 27 | 35 | 799 |
| Total | 137 | 364 | 112 | 60 | 233 | 242 | 330 | 59 | 62 | 1599 |

## 3. KIND OF SCHOOLING FOR DEPENDENT CHILDREN

From Table 5.3 it can be seen that there are 622 school children living with their families in the county. About 44 percent of them, the biggest group, attend primary schools while the tertiary (university, technical etc.) group is the smallest group, only 5.6 percent.

TABLE 5.3

Kind of schooling for dependent children

| Kind of schooling | Number |
|---|---|
| Not at school | 83 |
| Pre-school | 60 |
| Primary | 276 |
| Secondary | 168 |
| Tertiary | 35 |
| TOTAL | 622 |

# 4. OCCUPATION

## 4.1 Employment by Sex

From Table 5.4 the sex ratio of the employed population is 100:96, but this includes housewives and retired people in the non-farming category. The total employed population is 976 or 61 percent of total population. Dividing the type of employment into four groups, the non-farming occupations are largest (55 percent), while part-time farming employment is the lowest (3 percent). The full-time farming category represents 27 percent while part-time and non-farming is 15 percent.

TABLE 5.4

Employment by Sex

| Employment | Male | Female | Totals | % |
|---|---|---|---|---|
| Full-Time Farming | 231 | 34 | 265 | 27.1 |
| Part-Time Farming | 22 | 6 | 28 | 2.9 |
| Non-Farming (includes housewife and retired) | 173 | 366 | 539 | 55.2 |
| Part-time and Non-Farming | 70 | 74 | 144 | 14.8 |
| TOTAL | 496 | 480 | 976 | 100% |

## 4.2 Employment of Heads of Household

Comparing employment between heads-of-households on 'subdivision land' and 'farm land', the evidence (Table 5.5) shows that part-time and non-farming employment is most prominent among subdivision households (43 percent). Other groups for heads of households on 'subdivision land' are full-time farming (16 percent), part-time farming (11 percent) and non-farming (30 percent). Among households on 'farm land', full-

time farming is still the prominent employment of heads-of-households (70 percent). There are 5 percent in part-time farming, 13 percent in non-farming with 12 percent in part-time and non-farming category. This table shows that about 30 percent of heads of households on 'farm land' had left full-time farming and turned to part-time farming or non-farming. On the other hand, there is 43 percent of heads-of-households on 'subdivision land' employed in non-farming and part-time farming.

TABLE 5.5

Employment of head-of-household

| Type of Household | Full-time farming | Part-time farming | Non-farming | Part-time and non-farming | Total |
|---|---|---|---|---|---|
| Subdivision land | 15 | 10 | 27 | 39 | 91 |
| Farm land | 177 | 12 | 34 | 30 | 253 |

## 4.3 Employment by Age

The evidence in Table 5.6 shows that the 25-44 year age group is the larger employment group, with 46 percent of employed people, while the 45-64 year age group represents only 30 percent. There are smaller numbers of employed in the under-20 year age group, and the age group, 65 years and over, represent 6 percent each.

## 4.4 Employment by Marital Status

Table 5.7 shows that the married group is prominent wth 76 percent. It includes housewives and retired people in the non-farming group. This breakdown of employment in the county shows change, especially in farming employment, which although prominent, has been steadily declining.

TABLE 5.6

Employment by Age (Persons)

| Employment | Under 20 yrs. | 20-24 | 25-44 | 45-64 | 65 and over | Total |
|---|---|---|---|---|---|---|
| Full-Time Farming | 16 | 25 | 121 | 95 | 8 | 265 |
| Part-Time Farming | - | - | 5 | 19 | 4 | 28 |
| Non-Farming (include housewife and retired) | 47 | 83 | 238 | 123 | 48 | 539 |
| Part-Time and Non-Farming | - | 3 | 84 | 55 | 2 | 144 |
| Total | 63 | 111 | 448 | 292 | 62 | 976 |
| Percentage | 6.4 | 11.3 | 46.0 | 30.0 | 6.3 | 100 |

For example, the 'agricultural occupations' category represented 36 percent in 1966, 34 percent in 1971, 28 percent in 1976[1], while in this survey it is 27 percent.

TABLE 5.7

Employment by Marital status (Persons)

| Employment | Never Married | Married | Other | Total |
|---|---|---|---|---|
| Full-time Farming | 51 | 204 | 10 | 265 |
| Part-time Farming | 1 | 25 | 2 | 28 |
| Non-Farming (include housewife and retired) | 123 | 378 | 38 | 539 |
| Part-time and Non-Farming | 1 | 140 | 3 | 144 |
| Total | 176 | 747 | 53 | 976 |
| Percentage | 18.0 | 76.6 | 5.4 | 100 |

1 The Department of Statistics (1966-1976)

## 4.5 Non-Farming Employment

Considering only the non-farming employment group (Table 5.8), there are 701 people, or 72 percent of the work force, engaged in non-farming activities. The part-time group of non-farming might associate with some part-time farming as well. About 65 percent are females, of whom more than half are domestics. Besides domestics, technical occupation is prominent with 20 percent followed by professional, 12 percent.

Unlike farming employment, non-farming in the county is increasing especially the professional and technical groups. For example, professional and technical occupations represented 7 percent in 1966, 10 percent in 1971 and 13 percent in 1976[1]. From this survey it was found that there are 22 percent of professional and technical occupations together.

TABLE 5.8

Non-Farming Employment

| Occupation | Male | Female | Total |
|---|---|---|---|
| Professional | 43 | 41 | 84 |
| Commercial | 33 | 5 | 38 |
| Technical | 100 | 43 | 143 |
| Clerical | 9 | 31 | 40 |
| Government | 21 | 8 | 29 |
| Domestic | 2 | 278 | 280 |
| Retired | 26 | 40 | 66 |
| Unemployed | 10 | 11 | 21 |
| Total | 244 | 457 | 701 |

1 The Department of Statistics (1966-1976)

# 5. INCOME

## 5.1 Income from Farming

Table 5.9 shows that of all 976 employed population, about 31 percent of them obtain almost all their income from farming (96-100 percent of total income). On the other hand about 57 percent of them obtain almost no income from farming (none and less than 1 percent).

TABLE 5.9

Percentage of Income from Farming for all Employed People

| Percentage of income from farming | Number | Percentage |
|---|---|---|
| None and less than 1% | 556 | 57.0 |
| Less than 10% | 25 | 2.6 |
| Less than 50% | 43 | 4.4 |
| 50 - 95% | 46 | 4.7 |
| 96 - 100% | 306 | 31.3 |
| Total | 976 | 100 |

## 5.2 Income of Head-of-Household (Table 5.10)

Income of heads-of-households per annum does not show a significant contrast in distribution between the three groups of households. The distribution of income of heads-of-households is high in the groups of $5,000-6,999, $7,000-9,999, $10,000-12,499 and $12,500-14,999 per annum with 13 percent, 20 percent, 15 percent and 10 percent respectively. The income of heads-of-households on 'non-farm land' is higher (26 percent) than those on 'farm land' and 'subdivision land' in the group of $7,000-9,999 while the income of head-of-households on 'subdivision

land' is higher than those on 'farm land' and 'non-farm land' from $10,000 up. There was, however, quite a high rate of refusal on the question relating to the income of heads-of-household (about 21 percent).

TABLE 5.10

Income per annum of Household Head (Percentage)

| Income per annum ($) | Subdivision land | Farm Land | Non-Farm Land | All |
|---|---|---|---|---|
| 0 - 2,999 | 3.3 | 3.6 | 5.5 | 3.9 |
| 3,000 - 4,999 | 3.3 | 5.9 | 4.4 | 5.1 |
| 5,000 - 6,999 | 6.6 | 17.0 | 11.0 | 13.6 |
| 7,000 - 9,999 | 16.5 | 19.4 | 26.4 | 20.2 |
| 10,000 - 12,499 | 16.5 | 15.8 | 9.9 | 14.7 |
| 12,500 - 14,999 | 13.2 | 9.9 | 7.7 | 10.1 |
| 15,000 - 19,999 | 11.0 | 5.1 | 6.6 | 6.7 |
| Over 20,000 | 6.6 | 4.3 | 1.1 | 4.1 |
| Object | 23.0 | 19.0 | 27.4 | 21.6 |
| Total | 100% | 100% | 100% | 100% |

## 6. PLACE OF WORK OF HEADS-OF-HOUSEHOLDS

The most popular place of work of heads-of-households from this survey is on their properties (57 percent) or in the nearby city of Palmerston North (20 percent) (Table 5.11). For heads-of-households on 'subdivision land', 35 percent are working on their properties and 48 percent are working in the city of Palmerston North. On 'farm land' households, about 77 percent of the heads of households are still working on their properties. Some 9 percent work in the city of

Palmerston North while about 8 percent work both on and outside their properties.

TABLE 5.11

Place of Work of Head-of-Household (Percentage)

| Place of work | Subdivision land | Farm Land | Non-Farm | All |
|---|---|---|---|---|
| On the property | 35.2 | 77.0 | 25.3 | 57.5 |
| Kairanga County | 8.8 | 3.2 | 6.6 | 5.0 |
| Rural outside Kairanga | 2.2 | 1.2 | 2.2 | 1.6 |
| Palmerston North | 48.3 | 9.5 | 63.7 | 29.0 |
| Other urban areas | 1.1 | 1.2 | 2.2 | 1.4 |
| On the property and outside in rural | 1.1 | 4.7 | - | 3.0 |
| On the property and outside in urban | 3.3 | 3.2 | - | 2.5 |
| TOTAL | 100% | 100% | 100% | 100% |

On 'non-farm land', about 25 percent of heads-of-households are working on their properties with 63 percent working in the city of Palmerston North. There are altogether about 13 percent of all heads-of-households working in other areas, i.e. within Kairanga County itself, in rural areas beyond Kairanga County, in other urban areas besides Palmerston North. Some are working on their properties and others outside their properties in both rural and urban areas.

In terms of distance from the city of Palmerston North, the farthest distance covered to work in the city is not more than 15 kilometres.

## 7. MIGRATION PATTERN OF HEADS-OF-HOUSEHOLDS

One of the causes of population growth in the Kairanga County has been the migration of population into the county. Considering only the migration pattern of heads-of-households, the evidence (Table 5.12) shows that most of them migrated to the Kairanga County from the city of Palmerston North or from other urban areas within the Manawatu Region (40 percent). Most of the heads-of-households, on 'subdivision' and 'non-farm land' migrated from urban areas in the Manawatu (including Palmerston North), about 61 percent and 54 percent respectively. On the 'farm land', there is 24 percent of heads-of-households born on their properties, while 35 percent migrated from urban areas into the country. There is more migration from urban areas throughout the country to the Kairanga County than from other rural areas.

TABLE 5.12

Migration Pattern of the Household Head (Percentage)

| Place of Origin | Subdivision | Farm land | Non-Farm | All |
|---|---|---|---|---|
| Born on the Property | 1.1 | 23.7 | 3.3 | 14.7 |
| Rural of Kairanga | 11.0 | 17.8 | 8.8 | 14.5 |
| Township of Kairanga | 3.3 | 7.9 | 3.3 | 6.0 |
| Rural in Manawatu | 3.3 | 9.5 | 6.6 | 7.6 |
| Rural in N.Z. | 5.5 | 4.7 | 5.5 | 5.1 |
| Urban in Manawatu | 61.5 | 26.9 | 53.8 | 39.7 |
| Urban in N.Z. | 12.1 | 8.3 | 13.3 | 10.1 |
| Overseas | 2.2 | 1.2 | 5.5 | 2.3 |
| TOTAL | 100% | 100% | 100% | 100% |

## 8. PERIOD OF LIVING IN THE HOUSE AND ON THE PROPERTY OF HEADS-OF-HOUSEHOLDS

Although the settlement in Kairanga County began more than a hundred years ago, there is only 10 percent of heads-of-households who were born on their properties (4 percent born in their present house) (Table 5.13 and Table 5.14). The length of occupancy in the house varied somewhat. About 31 percent of heads-of-households have been living for 1-4 years, some 19 percent for 5-9 years, some 17 percent for 10-19 years and 12 percent for less than 1 year.

There was some difference in the period of time on the property. About 27 percent of heads-of-households have been living for 1-4 years, and 11 percent have been living for less than 1 year. Considering those who have lived in Kairanga County less than 10 years, about 62 percent of heads-of-households have been living in their present houses and 54 percent have been living on their present properties.

On 'subdivision land' only, some 88 percent of heads-of-households have been resident in their present houses for less than 10 years (82 percent living on their present properties). In their reasons for purchase of 'subdivision land', 47 percent of respondents preferred country life-style while those with farming interests accounted for another 30 percent. The other reasons included good place for retirement, fertile land for part-time farming and not too far from place-of-work.

TABLE 5.13

Period of Living in the House of Household Head (Percentage)

| Period of Living | Subdivision | Farm land | Non-Farm | All |
|---|---|---|---|---|
| Less than 1 year | 17.6 | 5.5 | 24.2 | 12.0 |
| 1 - 4 years | 41.7 | 23.7 | 39.5 | 30.8 |
| 5 - 9 years | 28.6 | 19.8 | 8.8 | 19.3 |
| 10 - 19 years | 5.5 | 22.1 | 14.3 | 17.0 |
| 20 - 49 years | 6.6 | 20.2 | 8.8 | 14.9 |
| 50 and over | - | 1.6 | 3.3 | 1.6 |
| Born in this house | - | 7.1 | 1.1 | 4.4 |
| TOTAL | 100% | 100% | 100% | 100% |

TABLE 5.14

Period of Living on the Property of Household Head (Percentage)

| Period of Living | Subdivision | Farm land | Non-Farm | All |
|---|---|---|---|---|
| Less than 1 year | 16.5 | 4.3 | 23.1 | 10.8 |
| 1 - 4 years | 37.3 | 19.4 | 38.4 | 27.1 |
| 5 - 9 years | 28.6 | 15.4 | 6.6 | 16.3 |
| 10 - 19 years | 9.9 | 19.0 | 18.7 | 17.0 |
| 20 - 49 years | 4.4 | 21.7 | 8.8 | 15.4 |
| 50 and over | 2.2 | 3.6 | 4.4 | 3.5 |
| Born on the property | 1.1 | 16.6 | - | 9.9 |
| TOTAL | 100% | 100% | 100% | 100% |

# CHAPTER SIX

# AGRICULTURAL LAND AND LAND USE

## 1. TYPE OF LAND

The total area of the county is 46,100 hectares (Table 6.1) of which some 39,260 hectares (85 percent) is occupied (Department of Statistics, 1976-77). The total number of holdings is 579 with an average size of 68 hectares.

The total area of the surveyed farms is 22,386 hectares, which represents 57 percent of the total occupied land of the county. Of the total area some 19,946 hectares (89 percent) is 'non-subdivision' farm land and the remaining 2,440 hectares (11 percent) is 'subdivision' land. The number of holdings surveyed was 344 (50 percent of the total number of holdings).

In all some 253 holdings (73 percent) were on 'non-subdivision' farm land and 91 holdings (27 percent) occupied the 'subdivision' land. The average size of surveyed holdings was 65 hectares (79 hectares per holding for 'non-subdivision' farm land and 27 hectares per holding for 'subdivision' land). There was also the Water Conservation Reserve in the county with an area of 1,730 hectares (3.7 percent of the county area).

In terms of small allotments or farmlets, i.e. occupying an area of 20 hectares or less, there are altogether about 2,935 with a total area of 9,192 hectares (about 23 percent of occupied area). The distribution in the county of these allotments is shown (Figure 10).

TABLE 6.1

Type of Land in Kairanga County

| Type of Land | Area (hectares) | No. of Holding | Average size (ha.) | Percentage |
|---|---|---|---|---|
| Total area of the county | 46,100 | - | - | - |
| Total occupied area | 39,260 | 579 | 68 | 85% of county area |
| Total surveyed area | 22,386 | 344 | 65 | 57% of occupied area |
| Farm land | 19,946 | 253 | 79 | 89% |
| 'Subdivision' land | 2,440 | 91 | 27 | 11% |
| Total Allotments with area of 20 ha. and less (Figure 10) | 9,192 | - | - | 23% of occupied area |
| Water Conservation Reserve | 1,730 | - | - | 3.7% of county area |

## 2. THE DISTRIBUTION OF 'SUBDIVISION' LAND (i.e. holdings with an area of 20 hectares or less) (Table 6.2)

Holdings of 20 hectares or less have been divided into 'potential' and 'actual' subdivisions or farmlets, i.e. those areas that are currently farmed as subdivisions or farmlets and those which although farmed as larger units, are already legally subdivided. Of a total of about 2,935 subdivisions, there are about 2,061 'potential' subdivisions (70 percent) and about 874 'actual' subdivisions (30 percent). Subdivisions with a minimum area of 4 hectares were permitted under "The Counties Amendment Act 1962", adopted by the Kairanga County

TABLE 6.2

Number and Area of 'Subdivision' with Area 20 hectares and less

| Size of Allotment | Total Land | | Potential Allotment (Subdivision) | | Actual Allotment (Subdivision) | |
|---|---|---|---|---|---|---|
| | Area (ha.) | Allotments (no.) | Area (ha.) | Allotments (no.) | Area (ha.) | Allotments (no.) |
| 4 hectares and less | 1,330 | 2,125 | 831 | 1,656 | 499 | 469 |
| 5-8 hectares | 1,950 | 364 | 818 | 143 | 1,132 | 221 |
| 9-20 hectares | 5,912 | 446 | 3,354 | 262 | 2,558 | 184 |
| Totals | 9,192 | 2,935 | 5,003 | 2,061 | 4,189 | 874 |
| Percentage | 100% | 100% | 54% | 70% | 46% | 30% |

Source: Valuation Department (Kairanga County Sheets, 1978)

Council in 1973, but since 1973 it has raised the minimum subdivision size from 4 hectares to 20 hectares.

In terms of area of subdivisions occupy about 9,192 hectares, of which there are 5,003 hectares of 'potential' subdivision (54 percent and 4,189 hectares of 'actual' subdivision (46 percent). These subdivisions are further classified into three groups by size of holding, i.e. 4 hectares or less, 5-8 hectares, and 9-20 hectares. In terms of occupied area, the 9-20 hectare group is largest with 5,912 hectares or 64 percent, but in terms of number of subdivisions the group of 4 hectares or less is largest with about 73 percent of the total. The occupied area is also fairly high, the 9-20 hectare group with both 'potential' and 'actual' subdivisions. The number of 'actual' subdivision is, however, less than the number of 'potential' subdivisions. 'Actual' subdivisions account for 54 percent of the 4-hectare or less group, 25 percent of 5-8 hectare group and 21 percent of 9-20 hectare group. Among 'potential' subdivision, the numbers are high in the 4-hectare or less group with 80 percent, but with only 7 percent of 5-8 hectare group, and 13 percent of 9-20 hectare group.

The average size of 'actual' subdivisions is 4.8 hectares while the average size of 'potential' subdivision is 2.4 hectares. 'Actual' allotments included not only those subdivided since the early years of settlement in the county but also those subdivided in recent years, notably since 1960. During the early settlement many subdivisions with area 4 hectares or less, were located around townships and along communities lines, e.g. Linton, Longburn, Whakarongo, Bunnythorpe and Cloverlea. Later they spread to other parts of the county associated with 5-8 hectare allotments. In most of these areas, land was

subdivided for new settlement, for instance, on the areas of terrace land (i.e. Scotts Road, Tiritea, Fitzherbert West, Kahuterawa) and the areas of river flats (i.e. Gillespies Line, Milson Line, Roberts Line, Bunnythorpe-Kairanga Road). These new 'subdivisions' have resulted in fairly new clusters of dwellings or farm-houses. There are also some isolated 'subdivisions' dispersed along the main roads.

The 'actual' subdivisions, with an area of 9-20 hectares, occupy altogether 2,558 hectares throughout the county, adjacent to other smaller sized subdivisions or different parts of the county. Some 'actual' subdivisions are still being used for farming. 'Potential' allotments, i.e. those which have only been legally subdivided, are still being used for farming of their traditional type. These 'potential' subdivisions will probably be converted later to 'actual' subdivisions as and when the owners so wish. In the areas of Linton Community and Bunnythorpe Vicinity the number and the area of 'potential' subdivisions is high in both the sizes, 4-hectares or less and 5-8 hectares. The Palmerston North City Council proposes to use these for 'rural residence zones'. Besides these two areas, the other 'potential' subdivisions are dispersed throughout the county. The average size of the 'potential' subdivisions, with area of 4 hectares or less, is only 0.5 hectare. These would make up the possible clusters of settlement in the future. The average size of a 5-8 hectare 'potential' allotment is 5.7 hectares while the average size of a 9-20 hectare 'potential' allotment is 12.8 hectares.

## 3. HOUSEHOLDS AND OWNERSHIP

As far as landholding in the county is concerned, the number of holdings has increased. From the figures released by the Department of Statistics,

it is evident that, while in 1974/75 there were 558 holdings, by 1975/76 the number had increased to 575 holdings, and furthermore to 579 in 1976/77. From the survey of 344 households with land, 26 percent are 'subdivision' households while 74 percent are 'non-subdivision' farm land households.

From Table 6.3 it was found that most holdings of 'subdivision' land are freehold (97 percent) while 73 percent of the 'non-subdivision' farm land holdings was freehold. Other ownership categories 'non-subdivision' farm land are owned by employer (13 percent), owned estate (5 percent), partnership (4 percent). There are very few landholdings in the county leased or rented for farming. From the survey it was found that only 20 farmers have leased or rented extra land for farming in addition to their own land. These extra leased lands represent about 3,405 hectares.

## 4. HOUSEHOLDS, OWNERSHIP AND SIZE OF HOLDING

The figures (Table 6.4) show that there are 44 'subdivision' households (48 percent) in the 4-hectare or less group. Of this number, 40 households are on 4-hectare 'subdivision' land. There are also a further 19 households (21 percent) on 'subdivision' land with an area of more than 20 hectares. These lands were not subdivided for dwelling settlement but rather for sale or title separation. On the other hand households on 'non-subdivision' farm land are largely from the over 20 hectare group with a total of 206 households (81 percent). The maximum area of farm land is 756 hectares. The rest of the 'non-subdivision' farm households are on areas of less than 20 hectares which can be used for residence and farming as well. These holdings

TABLE 6.3

Number of Households by Type of Ownership

| Type of Land | Total Households | Type of Ownership of Land (households) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Freehold | Rented or Leased | Owned Employer | Owned Estate | Crowned Land | Partner-ship | Other |
| Subdivision | 91 | 88 | 2 | 1 | - | - | - | - |
| Farm | 253 | 184 | 3 | 34 | 14 | 6 | 11 | 1 |
| Total | 344 | 272 | 5 | 35 | 14 | 6 | 11 | 1 |

TABLE 6.4

Number of Households and Ownership by Size of Holding

| Size of Holding | Number of Household | | | Ownership (number) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 'Subdivision' | 'Non-Subdivision' Farm | Total | Freehold | Rented or Leased | Owned Employer | Owned Estate | Crown Land | Partnership | Other |
| 4 hectares or less | 44 | 18 | 62 | 60 | 1 | - | - | - | - | 1 |
| 5-8 hectares | 14 | 5 | 19 | - | - | - | - | - | - | - |
| 9-20 hectares | 14 | 24 | 38 | 34 | - | - | 4 | - | - | - |
| above 20 hectares | 19 | 206 | 225 | 159 | 4 | 35 | 10 | 6 | 11 | - |
| TOTAL | 91 | 253 | 344 | 272 | 5 | 35 | 14 | 6 | 11 | 1 |

may be original small holdings subdivided more than 20 years ago. The survey, however, was concerned most with subdivisions within the last two decades.

In terms of ownership, most of the holdings with area 20 hectares or less (95 percent) are freehold. Holdings, with an area of 20 hectares or more reflect different types of ownership, i.e. freehold (70 percent), owned employer (16 percent), owned estate (4 percent), and partnership (5 percent).

## 5. AREA AND SIZE OF HOLDING

Of 22,386 hectares of the survey, only 11 percent is 'subdivision' land while 89 percent 'non-subdivision' land. The area of 'subdivision' land and 'non-subdivision' farm land is classified according to size of holding into 4 categories (Table 6.5). In total some 96 percent of land is a size of holding group of more than 20 hectares, 9-20 hectare group 2.5 percent, 5-8 hectare group 0.5 percent and 4-hectare or less group 1.0 percent.

Overall 98 percent of land is in holdings of 20 hectares or more. While some 81 percent of area of 'subdivision' land are in the size of holding of 20 hectares and more, 8 percent in the size of 9-20 hectares, 4 percent in the size of 5-8 hectares and 7 percent in the size of 4 hectares or less.

## 6. 'SUBDIVISION' LAND AND MEANS OF ACQUISITION

From the survey there are 91 'subdivision' holdings which were actually subdivided within the 1960-80 period, with a total area of 2,440

TABLE 6.5

Area of Surveyed Land by Size of Holding

| Size of Holding | All Farms | | 'Subdivision' Land | | 'Non-Subdivision' Farm Land | |
|---|---|---|---|---|---|---|
| | Area (ha) | % | Area (ha) | % | Area (ha) | % |
| 4 hectares and less | 207 | 1.0 | 165 | 6.7 | 42 | 0.2 |
| 5-8 ha. | 122 | 0.5 | 92 | 3.8 | 30 | 0.2 |
| 9-20 ha. | 563 | 2.5 | 197 | 8.1 | 366 | 1.8 |
| above 20 ha. | 21,494 | 96.0 | 1,986 | 81.4 | 19,508 | 97.8 |
| TOTAL | 22,386 | 100% | 2,440 | 100% | 19,946 | 100% |
| Percentage | 100% | | 11% | | 89% | |

hectares (Table 6.6). As far as means of acquiring of land is concerned, some 19 holdings were original subdivided by the present owners. Some 71 holdings were purchased by the present owners where the land had already been subdivided. There was only one case of a holding inherited to the present holder. In terms of area, the 19 original subdivided holdings represented a total of 562 hectares (23 percent) with an average size of 29 hectares, while the 71 purchased holdings represented a total of 1,253 hectares (51 percent) with an average size of 17 hectares. There are 16 farms where some parts of them were subdivided by the owners and sold-off as 'subdivision' land. These sold-off lands represent about 439 hectares. The main farms are still being used for farming.

TABLE 6.6

Number of 'subdivision land' by Means of Acquisition

| Means of Acquiring of Land | Number (households) | Area (hectares) | Average |
|---|---|---|---|
| Original subdivided | 19 | 562 | 29 ha. |
| Purchased | 71 | 1,253 | 17 ha. |
| Inherited | 1 | 625 | - |
| TOTAL | 91 | 2,440 | - |

## 7. 'SUBDIVISION' LANDS AND THEIR TYPES OF LAND USE

Types of land use on small holding subdivision vary more after than before being subdivided (Table 6.7). Of 91 'subdivision' small-holdings, some 73 holdings were farmed which represented about 13 types of land use, whereas only 6 types of land use were found previously. There was generally two types of land use per holding. The most common combinations were livestock rearing/fattening, livestock rearing/fattening/and horses, livestock rearing/fattening/ horses and poultry.

At present most 'subdivision' holdings are concerned with some livestock raising, i.e. there are 25 percent of livestock fattening, 26 percent of livestock rearing, 14 percent of horse raising, 8 percent of poultry, 5 percent of other livestock (e.g. pigs, deer, goats, sheep dogs), and only 1.8 percent of dairying. Most of these types of land use are found on both terrace and river flat land in the county. There are only a few, however, engaged in cropping, market gardening and orcharding on 'subdivision' land. Altogether only 20 percent of total kinds of land use are practiced on river flats except forestry which is practiced on terrace land.

Before subdivision, most of these lands were also used for livestock raising (about 93 percent), i.e. 28 percent of dairying, 30 percent of livestock fattening and 32 percent of livestock rearing. Cropping was practiced in only small numbers on areas of the river flats.

Most 'subdivision' holdings are now used for livestock-rearing and fattening because the land is more suitable for livestock on the one hand and there is need to work as part-time farming on the other hand.

TABLE 6.7

Type of Land Use on 'Subdivision' Land

| Type of Land Use | At present | | Before subdivided | |
|---|---|---|---|---|
| | Number of land use | % | Number of land use | % |
| Dairying | 3 | 1.8 | 27 | 28.4 |
| Livestock fattening | 41 | 24.7 | 28 | 29.5 |
| Livestock rearing | 43 | 26.0 | 30 | 31.6 |
| Horses | 24 | 14.5 | 2 | - |
| Poultry | 14 | 8.4 | - | - |
| Other livestock (pigs, deer, goats, sheep dogs) | 8 | 4.8 | 2 | - |
| Cropping (grain and field crops) | 7 | 4.2 | 6 | - |
| Cropping (process and P.Y.O.) | 3 | 1.8 | - | - |
| Market gardening | 3 | 1.8 | - | - |
| Orchard | 5 | 3.0 | - | - |
| Glasshouse | 2 | 1.2 | - | - |
| Nursery | 5 | 3.0 | - | - |
| Other (Forest, bees) | 8 | 4.8 | - | - |
| TOTAL | 166 | 100 | 95 | 100 |

Farm lands which are suitable for subdivision and for dwellings would need to be higher to avoid flood risk. This kind of land is also in general use for livestock-raising. The change for this type of land use concerns only dairying where part-time farmers on 'subdivision' land could not devote enough time. 'Subdivision' land is not economic unit for dairying either. 'Subdivision' land holders can spend their spare time on livestock rearing and fattening. Like dairying, cropping is difficult for the part-time farmer. There are, however, signs of change from extensive farming to intensive farming, with the appearance of more market gardens, glasshouses, nurseries and cropping holdings.

## 8. FARM BUILDINGS ON 'NON-SUBDIVISION' AND 'SUBDIVISION' LAND

The major farm-buildings which tend to identify the main type of land use on land include milking-shed, shearing-shed or wool-shed, hay shed and grain silo. Milking-sheds, with tanker collection unit, identify dairy farming which traditionally was associated with pig farming. Shearing-sheds or wool-sheds identify sheep rearing and fattening, while most grain-silos may identify cropping such as wheat and barley or livestock feeds. Hay sheds are normally associated with both diarying and livestock rearing or fattening.

Table 6.8 shows three groups of farm buildings, i.e. farm building in use, farm buildings unused for their original purposes, new farm buildings (six years old). In the group of farm buildings currently in use, hay sheds are most prominent (about 55 percent) among about the ten types of farm buildings. Other important farm buildings include milking-sheds (13 percent), shearing or wool-sheds (11 percent),

TABLE 6.8

Farm buildings on land

| Type of farm building | Using farm buildings | | | Unused farm buildings for original purposes | | | New farm buildings (6 years) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | On Farm | On Subdivn. | Total | On Farm | On Subdivn. | Total | On Farm | On Subdivn. |
| Milking-shed | 118 | 114 | 4 | 79 | 70 | 9 | 8 | 7 | 1 |
| Shearing-shed | 100 | 80 | 20 | 10 | 9 | 1 | 4 | 1 | 3 |
| Hay shed | 329 | 288 | 41 | 11 | 10 | 1 | 52 | 39 | 13 |
| Tractor shed | 134 | 115 | 19 | 2 | 2 | - | 15 | 10 | 5 |
| Implement Shed | 152 | 128 | 24 | 3 | 2 | 1 | 22 | 15 | 7 |
| Grain Silo | 19 | 17 | 2 | - | - | - | 6 | 5 | 1 |
| Horse Stables | 43 | 18 | 25 | 28 | 18 | 10 | 17 | 7 | 10 |
| Pig Sty | 15 | 14 | 1 | 19 | 19 | - | 2 | 2 | - |
| Calf shed (Cow Shed) | 14 | 13 | 1 | 12 | 12 | - | 4 | 4 | - |
| Other (packing shed, poultry, deer pen) | 9 | 2 | 7 | 4 | 4 | - | 3 | - | 3 |
| Total | 933 | 789 | 144 | 168 | 146 | 22 | 133 | 90 | 43 |
| Percentage | 100% | 85 | 15 | 100% | 87 | 13 | 100% | 68 | 32 |

tractor sheds or truck sheds (14 percent), implement sheds or work shops (16 percent). There is usually at least a tractor shed or an implement shed on every farm. The most common farm buildings were hay sheds, shearing-sheds, tractor sheds, implement sheds and this was the case on both 'non-subdivision' and 'subdivision' farm land. There is a difference, however, in the number of milking-sheds, grain silos and horse stables. There are more milking-sheds and grain silos on 'non-subdivision' farm land and more horse stables on 'subdivision' land.

Old farm buildings, which are now not being used for their original purposes, make up a total of 168 farm buildings, and some 87 percent are on 'non-subdivision' farm land and 13 percent are on 'subdivision' land. There are about 47 percent of unused milking-sheds, 17 percent of horse stables, and 11 percent of pig sty. These farm buildings are no longer used or converted to other uses because of land subdivision and amalgamation or change type of land use.

On 'subdivision' land, most of the land is used for part-time farming so dairying and pig farming for instance, are not appropriate anymore and have been replaced by livestock rearing and fattening or horticulture. Some 'non-subdivision' farm lands which are no longer economic, owners have to change their occupation to employ in the city and use their land as part-time farming. Some farm buildings are abandoned because of land use amalgamated such as shearing-shed, milking-shed.

There is an increasing percentage of new farm buildings on 'subdivision' land with 32 percent and only 68 percent on 'non-subdivision' land.

Hay sheds still dominate, with 39 percent, followed by implement sheds (17 percent), horse stables (13 percent). The reason for the high percentage of new hay sheds may be because of the increase of land use for livestock raising on both 'non-subdivision' farm land and 'subdivision' land. New horse stables are also more numerous on 'subdivision' land than on 'non-subdivision' land.

The distribution of three groups of the main type of farm buildings, i.e. milking-sheds, shearing-sheds and grain silos is shown in Figure 11.

## 9. FARM PRODUCE OF 'SUBDIVISION' LAND

Most farm produce from 'subdivision' farmlets is derived from livestock farming such as wool, lamb and cattle raising, stud and some cropping. These products are frequently home consumption, sale or both consumption and sale (Table 6.9). There are 16 households of 'subdivision' farmlet use their farm produce for home consumption only, 36 households sell all their produce and 27 households do both while there was no response to the question from 12 households.

TABLE 6.9

Farm Produce of 'Subdivision' Land

| | No. of Household | Percentage |
|---|---|---|
| Home Consumption | 16 | 17.6 |
| Sold | 36 | 39.6 |
| Home Consumption and Sold | 27 | 29.6 |
| No answer | 12 | 13.2 |
| Total | 91 | 100% |

# CHAPTER SEVEN

## CONCLUSIONS

A study of subdivision of rural land in different parts of New Zealand, showed that it was generally a common phenomena in most rural areas adjacent to the larger cities. The main objective of this study of rural land subdivision in Kairanga County was to examine the nature and extent of this trend and related changes in the rural areas of this county adjacent to Palmerston North. As in other areas of the country, there has been a shift out into the countryside, especially in the peri-urban fringe, because of a spread or sprawl of the Palmerston North Urban Area. The areal or spatial expansion of the city of Palmerston North had led directly to the loss of agricultural land in the county. Rural land subdivision has further created new clusters of semi-rural settlement in other parts of the county. Within the present decade there has been a notable increase in the number of dwellings in the rural area of the county with an average increase of more than sixteen houses per annum. Some 52 percent of these new houses have been located on 'rural subdivision' land and 82 percent of new owners within this decade have moved onto 'rural subdivision' land. The main reason given for the decision to move out into the countryside and live on 'subdivision' land was a preference for the country life-style as well as a practical interest in farming. Some people had bought rural 'subdivision' land as an investment or a hedge against inflation because of rising land values. Only a small percentage of rural 'subdivision' land-owners are working full-time on their holdings for most of them are employed in non-farming occupations beyond their properties and only carry on part-time farming activities on their land. Nearly one-half of the

'subdivision' household heads work in the city of Palmerston North. Originally many of these household heads came from outside the county, i.e. other urban areas in Manawatu region, including Palmerston North, and settled in the rural areas of the county.

In terms of employment, 61 percent of all of those employed in the county were engaged in the non-farming occupations. The full-time farming group represented only 27 percent of this total number. With reference only to household heads (mostly males), the percentage in the part-time and non-farming group for 'subdivision' household heads was fairly high as was the full-time farming group for 'non-subdivision' household heads. This evidence suggests that most members of 'non-subdivision' or farming households, apart from the household heads, are employed in non-farming occuptions. It is quite convenient for them to commute between their homes and the city of Palmerston North or wherever else they work.

Holdings of 20 hectares and less are distributed unevenly in different parts of the county. Most small holdings tend to be located closer to the Palmerston North Urban Area whether 'potential' or 'actual' subdivision land. There are more 'potential' subdivisions than 'actual' subdivisions both in terms of total area and numbers of holdings. The average size of 'actual' subdivision holdings is 4.8 hectares while that of 'potential' subdivision is 2.4 hectares. The total number of holdings in the county has increased because land has been subdivided into smaller-sized holdings. Some parts of individual farms have been subdivided for sale as farmlets. But at the same time some farmers have leased extra 'subdivision' land in addition to their own farmland.

In terms of size of holdings, a larger proportion of 'subdivision' holdings are in the 4-hectare or less group, with a greater number of 'non-subdivision' holdings in the 20 hectare or more group. The total area of 'subdivision' land in holdings of 20 hectares and less represent 23 percent of the total occupied land in the county. There is a higher percentage of freehold ownership on 'subdivision' than on 'non-subdivision' land. Most holdings on 'subdivision' land were purchased by the present owners after the land had been subdivided.

Land use of 'subdivision' land too has changed with a greater variety of land uses and farming types, i.e. there were often more varieties on a single holding. There was an average of two separate types of land use or farming on each holding. There were normally combinations of rearing and fattening cattle and sheep, horses and poultry as well as some cropping, including horticultural activities such as nurseries and market gardens. Before subdivision most of this land was used only for livestock-raising. Only dairying has tended to be replaced because it did not prove economically viable on 'subdivision' land. Farm produce from these farmlets on 'subdivision' land has been consumed by the families and some also sold.

As the agricultural lands of the rural Kairanga County surround the fast-growing city of Palmerston North, it has not been possible to stop urban encroachment and urban expansion is inevitable. This phenomena is continuing in other rural areas adjacent to the larger urban areas. The main factors that influence this change in rural areas are social and economic. New 'suburbans' have changed from their original kind of life-style.

Farm buildings are significant in helping to identify some of the patterns of land use change in the rural areas. Old farm buildings indicate earlier patterns while new farm buildings are the significant indicators of changes and trends in land use. Old farm buildings were found on both 'non-subdivision' and 'subdivision' lands. Nearly one-half of the old farm buildings were unused milking-sheds, suggesting the change away from dairying. Unused shearing-sheds were the result of amalgamations, while silos indicate new farm land uses. 'Subdivision' land especially, is not economic for dairy farming. Owners normally have to carry on part-time farming with livestock fattening and rearing. Evidence to support this can be seen by the high percentage of hay sheds, on farmlets indicating the use of land for most livestock fattening and rearing.

Figs. 4-9 show the distribution of old and new dwellings in the rural area of the county for each of six different periods. New dwellings were differentiated for each period. The map for the 1980 period shows the clusters located in about nine main areas. These nine main clusters of dwellings are located on 'subdivision' lands (Fig. 10). This evidence further shows that the settlement on 'subdivision' land has taken place largely in the decade of the 1970s. Fig. 10 also shows that on most 'actual' subdivisions in the county dwellings have already been established. It also suggests that there might be the possibility of the further settlement on 'potential' subdivisions in different parts of the county in the future. Although there are only 23 percent of 'subdivision' lands with area 20 hectares and less in the county, the majority of them are located on the fertile river flats. These 'subdivisions' affect the major types of land use and agricultural production. Fig. 11 shows the distribution of three main kinds of farm-buildings (i.e. milking-sheds, shearing-sheds and grain silos)

used, unused and new. It shows the large number of unused milking-sheds on both river flats and terrace lands. Most grain silos are also found on the river flats. On 'subdivision' land, most abandoned or converted farm buildings indicate the changes of land use from farming to non-farming or other kinds of farming.

As mentioned before some 5,003 hectares of land have been legally subdivided for small farmlets each with an area of 20 hectares or less. The total number of small farmlets is about 21,061. When these farmlets become 'actual' subdivisions most of them would be put mainly for residential use and eventually become peri-urban areas of Palmerston North. The pattern and process of suburbanisation of Kairanga County will continue as long as 'potential' subdivision land is available for settlement. When the new regulation with the minimum subdivision area of 20 hectares was introduced in 1973, it did not relate to those lands, earlier legally subdivided, but only to farm land not already subdivided. An officer of the Valuation Department has suggested that 80 percent of the land of Kairanga County is currently legally or actually subdivided. One might question how this new regulation will control rural subdivision and solve many of the problems arising from subdivision in the rural areas, i.e. rural services. The land, subdivided into farmlets of 20 hectares and less, is not suited economically for full-time farming except some kinds of highly intensive land use, namely, market gardening, nursery, poultry, orchard, glasshouse. Such kinds of land use, however, cannot be located just everywhere in the county. Some need shelter against the wind which is typically strong in this county. One must bear in mind that most subdivision land owners prefer to work on their lands as part-time whether 20 hectare land is suitable for part-time

farming. It may be more worthwhile to work on 4-10 hectare holdings as part-time than 20-hectare holdings. The agricultural production of part-time farming might be lower on 20-hectare land than five 4-hectare allotments under separate ownership titles.

The 20-hectare minimum subdivision might reduce the number of 'residential' sections in the rural area. Only the fairly wealthy urban people, however, can afford to buy subdivision land. At the same time the 20-hectare minimum subdivision might take more agricultural land than 4-10 hectare subdivision. It is felt that the well-to-do might not cope this size of land for part-time farming. The solution just to prevent the loss of agricultural land is not simple as long as the growth of the city of Palmerston North and its population seems to continue. Coordination between the Palmerston North City Council and the Kairanga County Council might be the right solution by choosing for subdivision areas with soils of lower agricultural productivity and so avoid loss of areas suitable for agricultural use for 'residential zones'. In the choice of location of each 'residential zone' it is not necessary to be adjacent to the areas of the city. In addition, there should be a study of fluctuations of agricultural production on the county land as a whole as well as a study of the suitability and productivity of land use on 'subdivision' land.

# APPENDIX A

## AGE OF DWELLING

Dwellings can be categorised by reference to external features or characteristics, i.e. roofs, windows, gables, doors, weatherboarding, chimneys and verandahs. Roofs, for instance are generally made of shingles, wide or narrow corrugated iron, slates or tiles. Weather-boards are either narrow and medium or wide (i.e. rusticated). The use of wood for construction helps to identify the age of buildings, i.e. rusticated weatherboards for the older period houses and overlapping weatherboards for the modern or more recent period houses, generally after the Second World War period. Chimneys were made of different materials such as brick, concrete and iron or steel using different styles differentiated by height, number and decoration. There was one type of house, however, which came in this period, the villa, which is square in shape with the roof of four equal facets meeting at the central point.

### Pre-1900 Dwellings

During the early years of settlement in the county, houses were built with more ornamental features, for instance, cornice, finial were put at the top of edges or gables. Brackets were put around the barge boards, over windows, doors, verandahs, porches and their posts. A lot of fretwork was included to decorate the houses. Verandahs were often built around several sides of the houses, while later porches were placed in front of the entrances. Verandahs had the characteristic bull-nose or curved roofs. Houses had shingled gables, high stud and pitched roofs. Over the windows were placed shingled hoods, which were normally supported by carved brackets. Windows were normally double-hung with sometimes decorated by small panes above or beside. The entrance doors were generally placed symmetrically in relation to front windows and were decorated.

# PLATE 1

1A. This house is 87 years old situated on non-farm land of Rangitikei Line. It has changed ownership several times, with renovation and restoration. The original dormer was replaced with a gable. Further the original ornated tall chimneys were replaced with short and stubby ones. Finials are ornamental gable tops. The iron lace work is decorated around the bull-nose verandah and over the double-hung windows' hoods. The bay window is a typical of this period house.

1B. This house shows the original typical tall and imposing chimneys. The bull-nose verandah surrounds three sides of the house. The entrance door is symmetrical with panes on top and two sides. This house is on farm land.

1C. This was one of the first settlement houses in Kairanga County which was built in 1889. Dormer and finials on high gables still maintain originally but the original brick chimney was replaced with iron chimney.

PLATE 1

1A

1B

1C

# PLATE 2

2D. This house has changed ownership several times and also has been modified. It is about 90 years old on residential land. The chimney was rebuilt. Verandahs are not original but replaced. High stud is typical of houses in this period.

2E. This house is situated on dairy farm land and still has the original wooden shingles under the iron roof. It was renovated recently with some parts being removed, i.e. finials were cut, high and decorated chimneys were replaced with the stubby iron ones. Long verandah is around three sides of the house which its curved roof is supported by decorated brackets. Gables and the porch gable are ornated by carving barge boards. The entrance door is symmetrical.

PLATE 2

2D

2E

# PLATE 3

3F. This square farm house is about 90 years old. The typical characteristics of this period style are shingled hoods over double-hung windows, the symmetrical entrance. The original chimney was replaced with iron one.

3G. This house has just been transferred to a 12 acre subdivision land. It was still under reconstruction. Most original parts of the house remain.

PLATE 3

3F

3G

## Dwellings 1900 - 1918

Between 1900 and the end of the First World War was the period of the Bay Villa or T-House. The bungalow became popular by the end of the period. In the early 1900s, houses still retained finials on top of gables with fretworks around verandahs and barge boards. The verandah posts were mainly square with a cap or some form of cornice in keeping with fretwork. A typical part of the house is a bay window which was normally squarish and high. Doors were changing from the four panels to have more types. There were protruding eaves under the roof which supported by brackets.

By the end of this period, when the bungalow was being introduced, the gable and high stud were reduced. Gables were wider. Verandah was built as part of the main roof and wider. There were a large front gable, a front porch and a smaller gable on the far corner. Double-hung windows were changed to casement windows.

# PLATE 4

4A. This house is 75 years old but remains typical of the last period. The verandah shared part of the main roof. Big and small gables were reduced in height and became wider. It still has double-hung windows, finials on gables and some fretworks. The foundation is high.

4B. This house was built in 1910 in town and then transferred to a subdivision land seven years ago. It is a square house with low and wide gables of bay villa style. Tiles were used for roof but slates were used for window hoods, bay window hood and gable.

4C. This house was built in 1917 and possesses a square house roof with a porch in the middle of the two bay windows. Windows were changed to be casement windows with fanlights above. The front part of the house was made of stucco and the front foundation was decorated with slates. Weatherboards are rusticated.

PLATE 4

4A

4B

4C

# PLATE 5

5D. This squared house was built about 1910 on farm land. There is a verandah in front of the house with iron lace work as brackets. Windows are double-hung with shingled hoods over. The front entrance is symmetrical. The original chimney was replaced with the iron chimney.

5E. This house is about 75 years old which was an early bungalow type. The roof was the square villa type with the influence of bay villa. Shingled gables were low and wide with plain barge boards. The verandah was added on the side of the bay window and ornated by balustrades.

PLATE 5

5D

5E

## Dwellings 1918 - 1945

From the end of the First World War to the end of the Second World War was the period of the dwelling known as the bungalow. Verandahs mostly disappeared and were often replaced by a porch, inset under the main roof and larger. Chimneys were made of concrete and became lower and simple without any decoration. Shingled hoods still remain over the box windows with fan lights above. In this period, there was the prominent use of casement windows, overlapped weatherboards, protruded rafters to the edge of the eaves. Brick was also introduced as a building material and later stucco. There was also the introduction of flat-roofed house with rounded corners towards the end of this period. Flat-roofed houses were normally built of concrete or stucco. Two-storey farm houses were mostly built in this period as well. They had high-pitch gables with porches and box windows.

# PLATE 6

6A. This house was built in 1933 on farm land. The typical slated gables are low and wide with plain barge-boards. The concrete chimney is also simple, without any decoration. Casement windows are decorated by plain fan lights and shingled hoods. The small verandah is the part of the porch and sharesthe same main roof.

6B. This house has the overlapped, large slated gables with narrow plain barge-boards. Like the plate 6A, overlapped weatherboards were the prominent appearance of the houses in this period. Chimneys are simple and made of concrete.

6C. This house shows the large porch as the main entrance while the door window is used as the side entrance. Casement windows are decorated by plain fan lights and slated hoods over. The rusticated weatherboards still remain in this period. The rafters of this bungalow are protruded.

PLATE 6

6A

6B

6C

# PLATE 7

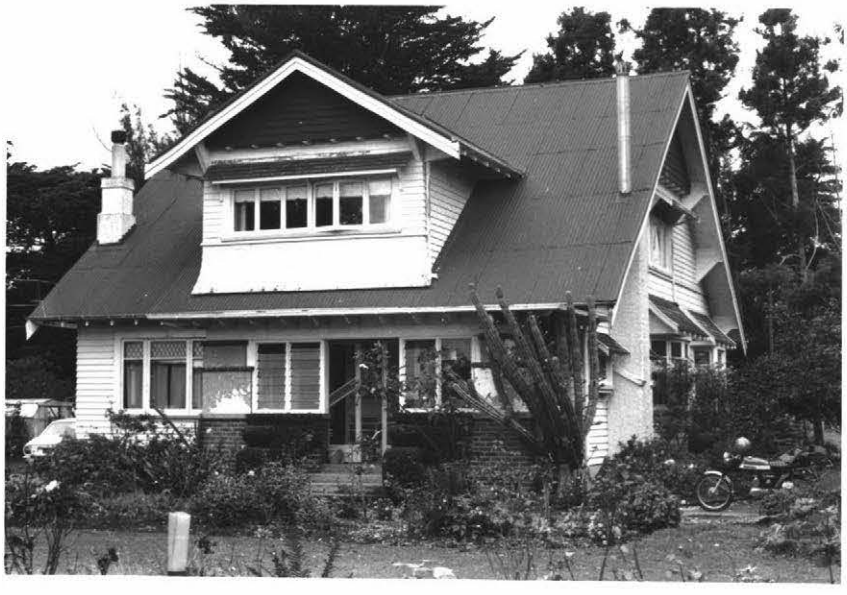
7D. This flat-roofed house was built of concrete around 1930. Its corners are rounded with the open porch as the main entrance.

7E. This two-storey farm house was about 54 years old. It composed of steep pitched roof and the A-frame. The rafters are exposed under the iron roof.

7F. This two-storey brick house was built in 1930 on farm land. The porch is part of the main house. Casement windows are composed of small fan lights without any hoods.

PLATE 7

7D



7E

7F

## Dwellings 1945 - 1960

After the Second World War, there were a few new houses built because of a shortage of building materials. Later in this period, there was the introduction of many new kinds of construction materials, i.e. brick veneers, concrete block veneers, asbestos sidings. Stucco still remained. Houses were built low on the ground with concrete foundation. Most chimneys were made of concrete blocks, some covered with plaster. Some roofs were composed of asbestos cement sheets, with both wide and narrow corrugations. There was also an overhanging lean-to style of flat roof. There were different window styles and plenty of windows with some steel frames.

# PLATE 8

8A. This brick house was built in 1950. The rectangular shape chimney was typical of this period. Windows with wooden frames became larger, and there were plenty around the house. The foundations were of concrete.

8B. This house was built in 1958 on farm land. The front windows were large extending from the ceiling to the floor with wooden frames. The gables were almost flat with corrugated iron roof. The chimney was made of rectangular-shaped cement blocks. The Bay-Villa or T-House type is still depicted in the house in this period.

PLATE 8

8A

8B

# PLATE 9

9C and 9D. These two rough cast houses were built around 1950-1960. They show the prominent building style of houses in this period, i.e. the large front windows, flat gables, rectangular cement block chimneys, ground cement foundations, narrow corrugated iron roofs, brick walls covered with concrete, bay-villa style and little decoration etc.

PLATE 9

9C

9D

## Dwellings 1960 - 1970 and 1970 - 1980

Houses in these two decades show many changes in design. They are more sophisticated in plans and building materials with great variety in design and style. There was new roofing style such as flat roof, an angle and high pitched roof. Gables were low or sometimes were extremely high as in an A-shape. The style of houses in this period was extremely varied with various new features, e.g. large windows with steel or aluminium frames, concrete floors, brick veneer floors, brick walls, concrete block walls, different style and size of chimneys, small chimneys with fans on top, roofing tiles, new lightweight metal patios and swimming pools, sky lights.

# PLATE 10

10A. This house was built in 1961 on farm land. It shows the large aluminium frame windows, brick walls, flat roof and flat gables.

10B. This house was built in 1973 on rural subdivision land. It was built of cement blocks with high-pitched gables. There were plenty of glass windows. The roof was in a modern style with wide corrugated iron.

10C. This large house was built of brick on the farm with area of 30 hectares a year ago. The owner is part-time farmer. The roof of this house is covered with tiles. The chimneys are brick with the modern style of fans on top. It also shows the new style of windows.

PLATE 10

10A

10B

10C

# PLATE 11

11D. This is a typical house on subdivision land with varieties of modern design. The house foundation is concrete. It was built in 1975 with different kinds of material used for the walls. The chimney is rectangular with high chimney pot.

11E. This is another typical subdivision land house with a few livestock grazing around the house and also young trees. The house contains various kinds of design and modification. The roof uses a new style of corrugated iron.

PLATE 11

11D

11E

# PLATE 12

12F and 12G. These two houses were built on farm lands in the same year (1973). The similarity of these two houses in plan and design is quite common for houses on farm land in this period. One has iron pipe chimney hiding on the back of the house and another has low rectangular chimney with fan chimney pot on top. Brick is very popular material for building in this decade.

PLATE 12

12F

12G

# PLATE 13

13H and 13I. Both houses were under-construction on subdivision land. One was built of brick with low concrete foundation. The roof is of wide corrugated iron. Another house is two-storey house which is fairly uncommon in this period as most houses tend to 'sprawl' over a fairly wide area.

PLATE 13

13H

13I

# APPENDIX B1

## AGE OF DWELLING INDEX (PLATE 14)

1 baluster

2 barge board

3 fretwork (wood or iron)

4 bay window

5 window hood

6 bracket

7 double-hung windows

8 casement windows

9 gable

10 bull-nose roof (rolled iron)

11 metal tiles (recovering)

12 corrugated iron

13 shingle

14 slate

15 eaves

16 finial, cornice

17 attic

18 chimney (brick)

19 chimney pot

20 porch

21 verandah

22 symmetrical front door, window passage

23 rusticated weatherboards

24 overlapping weatherboards

25 pile (wood or concrete)

PLATE 14




# APPENDIX B2

## AGE OF DWELLING INDEX (PLATE 15)

| | | | |
|---|---|---|---|
| 1 | roof (metal tiles, pottery tiles) | 7 | wall (decorative bricks) |
| 2 | roof (long-run iron) | 8 | wall (cement blocks) |
| 3 | chimney pot | 9 | stucco |
| 4 | chimney (fan pot) | 10 | windows (aluminium frames) |
| 5 | chimney (cement blocks) | 11 | windows (wooden frames) |
| 6 | wall (concrete) | 12 | concrete foundation |

PLATE 15




# APPENDIX C

## KAIRANGA COUNTY: POPULATION BY LOCALITY

As an administrative county, Kairanga County consists of communities, townships, vicinities and localities with a total area of 461 $km^2$ and a total population of 6,260 people (Table below). Like some other counties which lie adjacent to cities, Kairanga County surrounds Palmerston North urban area. It is one of the consistently-high-growth counties.

Table: Population of Townships, Localities, Communities and Vicinities of Kairanga County

In Palmerston North Urban Area

| | |
|---|---|
| Aokautere (P.N.) vic. | 79 |
| Awapuni (P.N.) vic. | 11 |
| Bunnythorpe (part) T. (2) | 219 |
| Cloverlea loc. | 117 |
| Kelvin Grove (P.N.) vic. | 130 |
| Linton Military Camp | 894 |
| Linton (part) vic. | 42 |
| Longburn T. | 632 |
| Longburn vic. | 80 |
| Massey University | 856 |
| Milson (P.N.) vic. | 54 |
| Newbury (part) loc. | 116 |
| Whakarongo loc. (2) | 358 |
| Boundary adjustments (+ 156) | 156 |
| Sub-total | 3,744 |

In Palmerston North Statistical Division

| | | |
|---|---|---|
| Aokautere loc. | | 187 |
| Aorangi loc. (2) | | 90 |
| Awahuri T. (7) | | 63 |
| Awahuri vic. (7) | | 50 |
| Bunnythorpe (part) T. (2) | | 104 |
| Bunnythorpe vic. (2) | | 55 |
| Fitzherbert West loc. | | 289 |
| Kairanga loc. | | 514 |
| Karere loc. | | 72 |
| Kauwhata loc. | | 108 |
| Linton T. | | 282 |
| Linton (part) vic. | | 117 |
| Mangawhata loc. (1) | | 25 |
| Newbury (part) loc. | | 213 |
| Rangiotu loc. (1) | | 42 |
| Taonui loc. (2) | | 60 |
| Te Arakura loc. | | 229 |
| Tiakitahuna loc. | | 109 |
| Tiritea loc. | | 63 |
| Boundary adjustments (-156) | | -156 |
| | Sub-total | 2,516 |
| | Total | 6,260 |

Source: 1976 Census of Population and Dwellings Vol. 1B.

Note

(1) see also Manawatu County

(2) see also Oroua County

(3) see also Manawatu County

# Massey University

PALMERSTON NORTH, NEW ZEALAND

TELEPHONES, 69-099, 69-089.

In reply please quote:

Department of Geography

April 1980

Dear Sir/Madam,

I am currently writing a Master's thesis on "Rural Suburbanisation within the Kairanga County". The study involves an appraisal of changing land uses particularly with regard to size of holding and land ownership.

The attached questionnaire has been designed to collect part of the data needed in order to evaluate the present situation. I would very much appreciate it if you would help in the survey by completing the questions. I assure you that all information supplied will remain strictly confidential.

I would like to see you on ..... at about ..... o'clock. If this day and time are inconvenient for you would you kindly complete the questionnaire and put it at your front door so that I can collect it on ..... Thank you very much for your co-operation.

Yours sincerely,

Chira Prangkio
Graduate Student.

M A S S E Y U N I V E R S I T Y

DEPARTMENT OF GEOGRAPHY

Kairanga County Household Survey, March 1980.

SECTION A. All Members of the Household.

1. How many people normally live in this house? _____ people.

1.1. Adults only

| | Age | Sex | Marriage Status | Occupation | Percentage of Income from farming |
|---|---|---|---|---|---|
| 1) | ..... | ..... | ..... | ..... | .....% |
| 2) | ..... | ..... | ..... | ..... | .....% |
| 3) | ..... | ..... | ..... | ..... | .....% |
| 4) | ..... | ..... | ..... | ..... | .....% |
| 5) | ..... | ..... | ..... | ..... | .....% |
| 6) | ..... | ..... | ..... | ..... | .....% |

Notes:

1) Marriage Status

   a. single
   b. married
   c. other (divorced, separated, widowed etc.)

2) Occupation

   a. full-time farming
   b. part-time farming
   c. non-farming (please state).....

3) Asterisk (*) any non-family member.

1.2. Dependent children only

| | Age | Sex | Kind of Schooling |
|---|---|---|---|
| 1) | ..... | ..... | ..... |
| 2) | ..... | ..... | ..... |
| 3) | ..... | ..... | ..... |
| 4) | ..... | ..... | ..... |
| 5) | ..... | ..... | ..... |

Notes:

1) Kind of Schooling

   a. pre-school
   b. primary
   c. secondary
   d. tertiary (teachers college, technical institute, university etc.)

2) Asterisk (*) any non-family member.

SECTION B. Head of the Household

2. Place of work of the head of the household.

a. on the property
b. outside the property (rural area) state where .....
c. outside the property (urban area) state where .....

If non-farming occupation please state occupation .....

3. Can you give a rough idea of your net income? (actual cash in hand after tax)

a. $ 0-2999
b. 3000-4999
c. 5000-6999
d. 7000-9999
e. $10,000-12,499
f. 12,500-14,999
g. 15,000-19,999
h. 20,000+

4. If you were not born on the property, where did you last live?
Please give last home address:

.....

5. How long have you been living in this house? _____ years.

How long have you been living on this property? _____ years.

6. Did you move into this house in the last year? a. YES b. NO

If so, can you give a contact or forwarding address for the previous occupant of the house.

.....

7. About how old is this house? _____ years.

Is it the first house built on the property? a. YES b. NO

If so, has it been modified? a. YES b. NO

8. Ownership of the house.

a. owned freehold
b. provided by employer
c. rented or leased
d. other (please specify) .....

9. If you own the house when did you buy it? _____ year, or build it?

_____ year.

If not owned do you know when the house was last sold? _____ year.

SECTION C. All Farms

10. What is the area of your farm land? _____ hectares.

Do you lease any extra land? a. YES b. NO

If so, how much? _____ hectares.

11. Ownership of your land.

a. own freehold
b. rented or leased
c. owned employer
d. other (please specify) .....

12. Farm Buildings.

12.1 What are the main farm buildings on your land? (milkshed, shearing shed, tractor shed, grain silo etc.)

..... .....

..... .....

..... .....

..... .....

12.2 Have you any farm buildings on your land that are now not used for their original purpose? (horse stable, milkshed etc.)

..... .....

..... .....

12.3 Have you added any new farm buildings recently on your land? (last 5 years)

a. YES (please specify) .....
b. NO

13. Has your farm or any of your land been legally subdivided since 1960?

a. YES
b. NO

14. Has any of your land been sold off for subdivision since 1960?

a. YES
b. NO

If so, about how much? _____ hectares.

15. Is the land you are living on the result of the subdivision since about 1960?

a. YES
b. NO

If so, please answer section D.

SECTION D. Subdivided Farms (farmlets).

16. Did you subdivide your land or purchase after subdivision?

a. subdivided
b. purchased

17. If you subdivided, what was the main reason/s? (list in order of importance)

1) .....

2) .....

3) .....

18. If you purchased, what was the main reason/s? (list in order of importance)

1) .....

2) .....

3) .....

19. Type of farming on your land.

At present

a. dairying (town supply or factory supply)
b. livestock fattening (cattle or sheep)
c. livestock rearing (cattle or sheep)
d. horses
e. poultry
f. other livestock (please specify) .....
g. cropping (grain and field crops)
h. cropping (process and P.Y.O.)
i. market gardening
j. orchard
k. glasshouse
l. nursery
m. other (please specify) .....
n. notused for farming (please specify if it is used for other purpose)
.....

Before Subdivided or Purchased

a. dairying (town supply or factory supply)
b. livestock fattening (cattle or sheep)
c. livestock rearing (cattle or sheep)
d. horses
e. poultry
f. other livestock (please specify) .....
g. cropping (grain and field crops)
h. cropping (process and P.Y.O.)
i. market gardening
j. orchard
k. glasshouse
l. nursery
m. other (please specify) .....
n. notused for farming (please specify if it is used for other purpose)
.....

20. What do you do with your farm produce?

a. home consumption
b. sold

If sold, please specify how each kind of farm produce is sold.

1) .....

2) .....

3) .....

.....

.....

.....

.....

# BIBLIOGRAPHY

Anderson, G. and H. Franklin, 1955: The Villages of The Manawatu. The New Zealand Geographer, 11 (1), 53-71.

Anderson, A.G. 1967: Aspects of Population Change in Palmerston North. New Zealand Geographer, 20, 165-170.

Barker, W.H. and A.J. Brown, 1979: Peri-Urban Land Use. Joint Centre for Environment Sciences. Occasional Paper No. 6. University of Canterbury and Lincoln College, Christchurch.

Bates, H.W.L. 1957: The Evolution of the Dwellings. The New Zealand Valuer, 14 (4), 15-21.

Beaumont, W.L. 1970: Land Subdivision in Rural Areas (i) and (ii). Town Planning Quarterly, 22, 29-32 and 23, 24-28.

Bedford, R. (ed.) 1979: New Zealand Rural Society in the 1970s. Studies in Rural Change, No. 1. University of Canterbury, Christchurch.

Berry, B.J.L. and F.E. Horton, 1969: Geographic Perspectives on Urban Systems. Prentice-Hall Inc., New Jersey.

Boileau, I.E. 1974: Future Patterns of Land Use. New Zealand Agricultural Science, 8 (4), 220-225.

Brazer, M.C. 1967: Economic and Social Disparities Between Central Cities and Their Suburbs. Land Economics, 43 (3), 294-302.

Cant, R.G. 1974: Towards a Rural Ecology for New Zealand. Pacific Viewpoint, 15 (1), 68-74.

Carr, D. 1964: Urban Sprawl. New Zealand Geographer, 20 (1), 88-89.

Carrol, R.L. and R.H. Wheeler, 1966: Metropolitan Influence on the Rural Nonfarm Population. Rural Sociology, 31, 64-73.

Chiu, B.K. 1975: The Economic Implications Associated with Part-Time Farming on Rural Subdivision: A Case Study in the Manawatu. Unpublished M. Agr Sc. Thesis, Massey University, Palmerston North.

Clawson, M. 1962: Urban Sprawl and Speculation in Suburban Land. Land Economics, 38 (2), 99-111.

Clevely, R.E. 1975: Bunnythorpe and District 1952-1975. Simon Printing Co. Ltd., Palmerston North.

Clout, H.D. 1972: Rural Geography: An Introductory Survey. Pergamon Press Ltd., England.

Cooke, M.B. 1972: The Age of Houses Illustrated. Lincoln College, New Zealand.

Cowie, J.D. and W.L. Osborn, 1977: Soil Resources of the Manawatu and the Expansion of Palmerston North City. Ministry of Agriculture and Fisheries, Wellington.

Cowie, J.D. 1978: Soils and Agriculture of Kairanga County. Soil Bureau Bulletin 33, New Zealand Department of Scientific and Industrial Research, Wellington.

Crawford, P. 1968: Urban and Rural Population of the Manawatu Region. Palmerston North City Council, Town Planning Department.

_____ 1970: Movements in the Manawatu Population. Town Planning Quarterly, 21, 11-14.

_____ 1979: Farm Study. Taupo County Council, Special Report No. 6.

Crothers, C. and C. Blackmore, 1980: Comparison of Rural Residential with other New Zealand Households. Town and Country Planning Division, Ministry of Works and Development, Wellington.

D.S.I.R. 1979: Peri-Urban Land Use. A Contribution to the "Peri-Urban Land Use Seminar", Waikato University, Hamilton.

Department of Statistics, 1974: 1971 Census of Population and Dwellings. Supplement No. 6. Government Printer, Wellington.

_____ 1977a: 1976 Census of Population and Dwellings Vol. 1A. Government Printer, Wellington.

_____ 1977b: 1976 Census of Population and Dwellings Vol. 1B. Government Printer, Wellington.

_____ 1977c: 1976 Census of Population and Dwellings. Bulletin No. 8. Government Printer, Wellington.

_____ 1979: New Zealand Official Year Book 1979. Government Printer, Wellington.

Farm Advisory Division, 1971: Farming in the Manawatu. Palmerston North, 7th edition.

Federated Farmers of New Zealand (Inc.) 1978: Sharefarming and some Other Systems to Assist in Attaining Farm Ownership. Research Paper, Wellington.

_____ 1979: Peri-Urban Land Use: The Farmers' View. Wellington.

Gardner, W., D. McDonald and B. Hardaker, 1979: Data on Small Rural Properties. Town and Country Planning Division, Ministry of Works and Development, Wellington.

Gill, H. and T. Gill, 1975: New Zealand Rural Society: A Framework for Study. New Zealand Agricultural Science. 9 (2), 60-68.

Gillespie, N.T. 1976: Urban Encroachment into Rural Areas. People and Planning 1 (1), 16-18.

Gillies, A. 1979: Planning Requirements for Rural Development. In Bedford (ed), 45-56.

Gilmore, R.J. 1974: Two Blades for One: Rural Land Subdivision on the Plain of the Asburton County, 1880-1930. Unpublished M.A. Thesis in Geography, University of Otago, Dunedin.

Gottmann, J. and R.A. Harper (eds), 1967: Metropolis on the Move: Geographers Look at Urban Sprawl. John Wiley & Sons, Inc. N.Y.

Harvey, R.O. and W.A.V. Clark, 1965: The Nature and Economics of Urban Sprawl. Land Economics, 41 (1), 1-10.

Heedegen, R.G. and R.B. Le Heron, 1977: Land Suitability, Growth Preferences and Urban Development: A Development Potential Analysis of Land Surrounding Palmerston North. Department of Geography, Massey University, Palmerston North.

Heenan, B. 1979: The Demographic Condition of New Zealand. In Bedford (ed), 7-22.

Higbee, E. 1967: Agricultural Land on the Urban Sprawl. In Gottmann, J. and R.A. Harper (eds), 57-66.

Johnston, R.J. (ed.) 1973: Urbanisation in New Zealand: Geographical Essays. Reed Education.

_____ 1974: Society and Environment in New Zealand. Whitcombe and Tombs.

Jowett, J.H. 1976: Small Rural Properties Part I: A Survey of Distribution and Uses. Town and Country Planning Division, Ministry of Works and Development, Wellington.

Kairanga County Council, 1971: Kairanga District Scheme. Palmerston North.

_____ 1980: Review of District Scheme. Preliminary Statement of Objectives and Policies. Palmerston North.

Kaplan, P.F. 1979: Social Aspects of Productivity: Hill-Country Sheep-Beef Farms in the Mangamuhu Valley. Department of Sociology, Massey University, Palmerston North.

Kear, B.S. 1964: Land Utilisation and the Soil Map, Kairanga County 1962/63. New Zealand Soil News, No. 1, 8-17.

_____ 1965: Soil and Land Utilisation in Kairanga County. New Zealand Geographer, 21 (1), 38-52.

McIntyre, I.G. 1974: Rural Land: Regional and Town Planning Aspects. New Zealand Agricultural Science, 8 (4), 212-219.

McKeown, J.D. 1977: Part-Time Farming in Upper Hutt. Upper Hutt City Council, Town Planning Office.

Maunder, W.J. 1974: Climate and Climatic Resources. In Johnston, R.J. (ed.), 47-63.

Mawhinney, T.J.A. 1974: The Ten Acre Subdivision in Manukau City and Franklin County: A Study of Changes in Rural Land Use. Unpublished M.A. Thesis in Geography, University of Auckland.

Mears, A. 1974: Part-Time Farming in the Christchurch Rural-Urban Fringe. Unpublished M.A. Thesis in Geography, University of Canterbury, Christchurch.

Ministry of Agriculture and Fisheries, 1974: "The 10 Acre Block" Farming Alternatives for Small Holdings. Advisory Services Division, Palmerston North.

Ministry of Agriculture and Fisheries, Economic Division, 1977a: Survey of Small Holding Agriculture in New Zealand. Research Paper 10/77. Wellington.

_____, 1977b: A Case Study in Peri-Urban Agriculture in New Zealand: Paparua County, Canterbury. A Report to the O.E.C.D. Research Paper 3/77. Wellington.

_____, 1977c: Part-Time Farming in New Zealand: An Assessment. A Report to the O.E.C.D. Research Paper 2/77. Wellington.

_____, 1978: Manawatu Urban Growth Study: An Economic Evaluation of the Agricultural Loss. Technical Paper 3/78. Wellington.

Ministry of Transport, N.Z. Meteorological Service, 1973: Summaries of Climatological Observations to 1970. Wellington.

Ministry of Works and Development, The Town and Country Planning and Civil Engineering Division, 1978: Manawatu Urban Growth Study. Wellington.

Moran, W. 1972: Agriculture and Urban Shadow, in Proceedings of the 7th N.Z. Geography Conference, 75-81. New Zealand Geographical Society.

_____ (ed.) 1974: Auckland and The Central North Island. Department of Geography, University of Auckland.

_____ 1979a: Planning Property Tax and Positive Attitudes. A Paper Presented on Peri-Urban Land Use Seminar. University of Waikato, Hamilton.

_____ 1979b: Rural Smallholdings in the Vicinity of Auckland: A Pilot Study. A Report to the Planning Division, Auckland Regional Authority.

Murray, B.B. 1969: Central City Expenditures and Out-Migration to the Fringe. Land Economics, 45 (4), 471-474.

N.Z. Farm Advisory Division, 1971: Farming in the Manawatu. Palmerston North. (7th edition).

N.Z. Institute of Agricultural Science, 1974: Competition For Productive Land: Rural-Urban Pressures in New Zealand. Wellington.

Neville, R.J.W. and C.J. O'Neill (eds.) 1979: The Population of New Zealand: Interdisciplinary Perspectives. Longman Paul Ltd., Auckland.

Norton, F.W. 1969: Control of County Subdivision. Town Planning Quarterly, 17, 32-33.

Oliver, R.G. 1963: The Impact of Communication in Manawatu-Kairanga 1874-1916. Unpublished M.A. Thesis in Geography. Victoria University, Wellington.

Palmerston North, City Planning Department, 1976: The Manawatu in the Late Eighties.

Palmerston North City Corporation, City Planning Department, 1978a: Manawatu Urban Growth Strategy Study. Working Papers: Social Issues.

Palmerston North City Corporation, City Planning Department, 1978b: Manawatu Urban Growth Stragegy Study, Part IIB: Proposals for Growth Management.

Pryor, F.J. 1968: Defining the Rural-Urban Fringe. Social Force, 47 (2), 202-215.

Russwurm, L.H. 1967: Expanding Urbanisation and Selected Agricultural Elements: Case Study Southern Ontario Area, 1941-1961. Land Economics, 43 (1), 101-108.

Ryan, T.A. Jr., B.L. Joiner and B.F. Ryan, 1976: Minitab: Student Handbook. Duxburg Press, Massachusetts.

Saunders, B.G.R. and A.G. Anderson (eds.), 1964: Introducing Manawatu. The Geography of New Zealand Study No. 1. Department of Geography, Massey University, Palmerston North.

Stevens, D.R. 1975: A Geography Analysis of the Land Use and Characteristics of Rural Subdivisions around Hamilton City. Unpublished M.A. Thesis in Geography, University of Waikato, Hamilton.

Tidswell, V. 1976: Pattern and Process in Human Geography. University Tutorial Press, London.

Toyne, P. and P.T. Newby, 1971: Techniques in Human Geography. MacMillan.

Valuation Department, New Zealand, 1972: Rural Real Estate Market in New Zealand 1970. Research Paper 72-1. Wellington.

Ward, A.B., E.C.R. Warr and D.B. Williams, 1979: Rural Subdivisions: Some Critical Observations on the Basis of Smallholders and Farmlets in the Manawatu and Hawkes Bay. In Proceedings Tenth New Zealand Geography Conference and Forty Ninth ANZAAS Congress Geographical Sciences. 166-170.

Winn, G.O. 1970: Ten Acre Subdivision in the Waitemata County. Dip. Town Planning Dissertation, University of Auckland.

Wright, E.R. and E.D. Woodhouse, 1975: Colonial Homes of Palmerston North. A.H. and A.W. Reed Ltd., Wellington.

Maps

Department of Land and Survey. NZMS 1 New Zealand Topographical Map 1:63, 360 Sheet N149 (1969), N 153 (1972), N148 (1974).

Department of Land and Survey. NZMS 216 New Zealand Cadastral Map 1:50,000 Sheet R 23, S 23, S 24, T 23, T 24. 1975-1976.

The Valuation Department. Kairanga County Sheets 1:100,000 Sheet 14410 (1-4), 14420 (1-2), 14430 (1-3) and 1:16,000 Sheet 14440 (1-2), 14450 (1-2) 1978.

KAIRANGA COUNTY SCALE 1 : 50,000 AGE OF DWELLING 1900

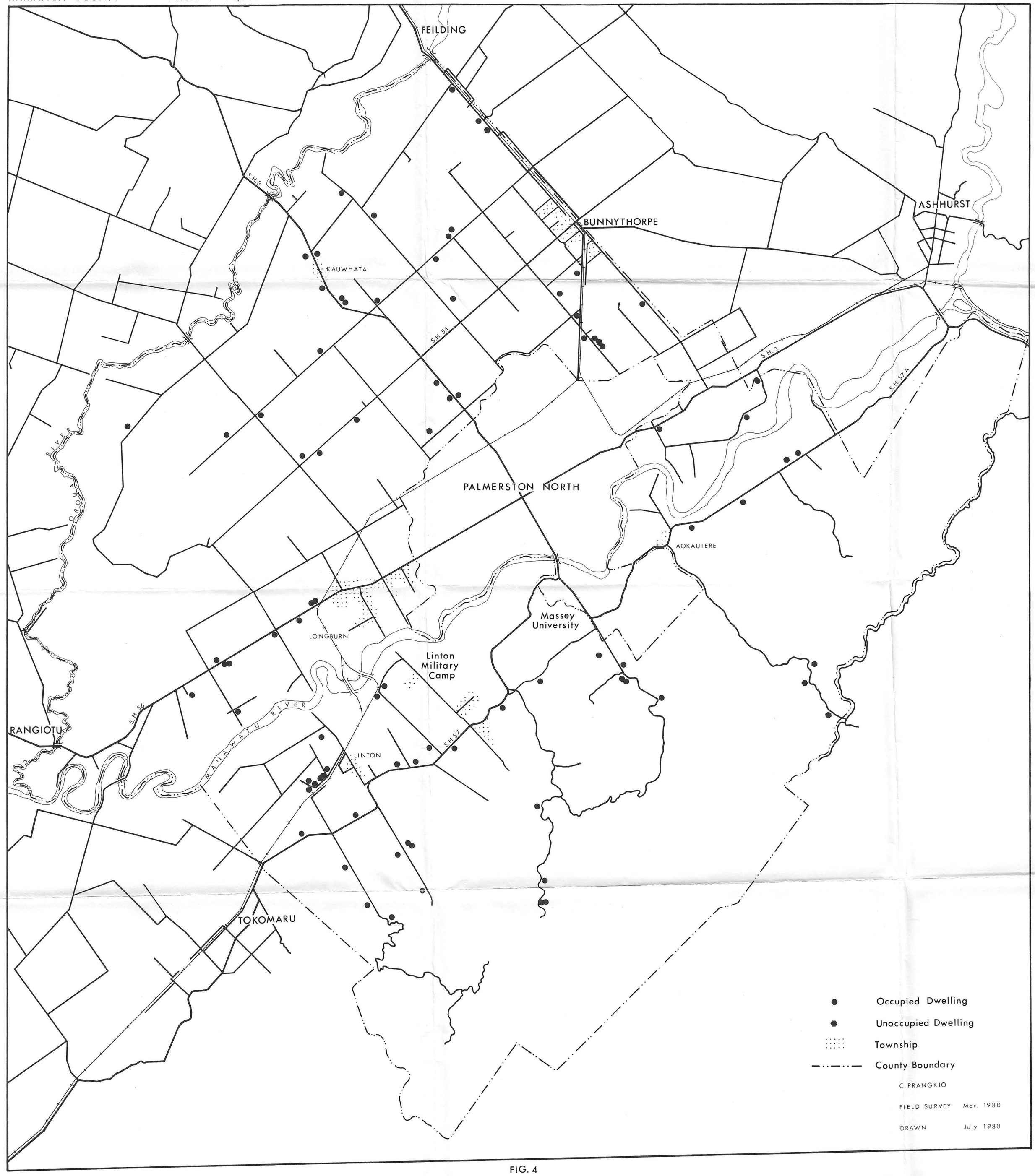



FIG. 4

KAIRANGA COUNTY SCALE 1 : 50,000 AGE OF DWELLING 1918

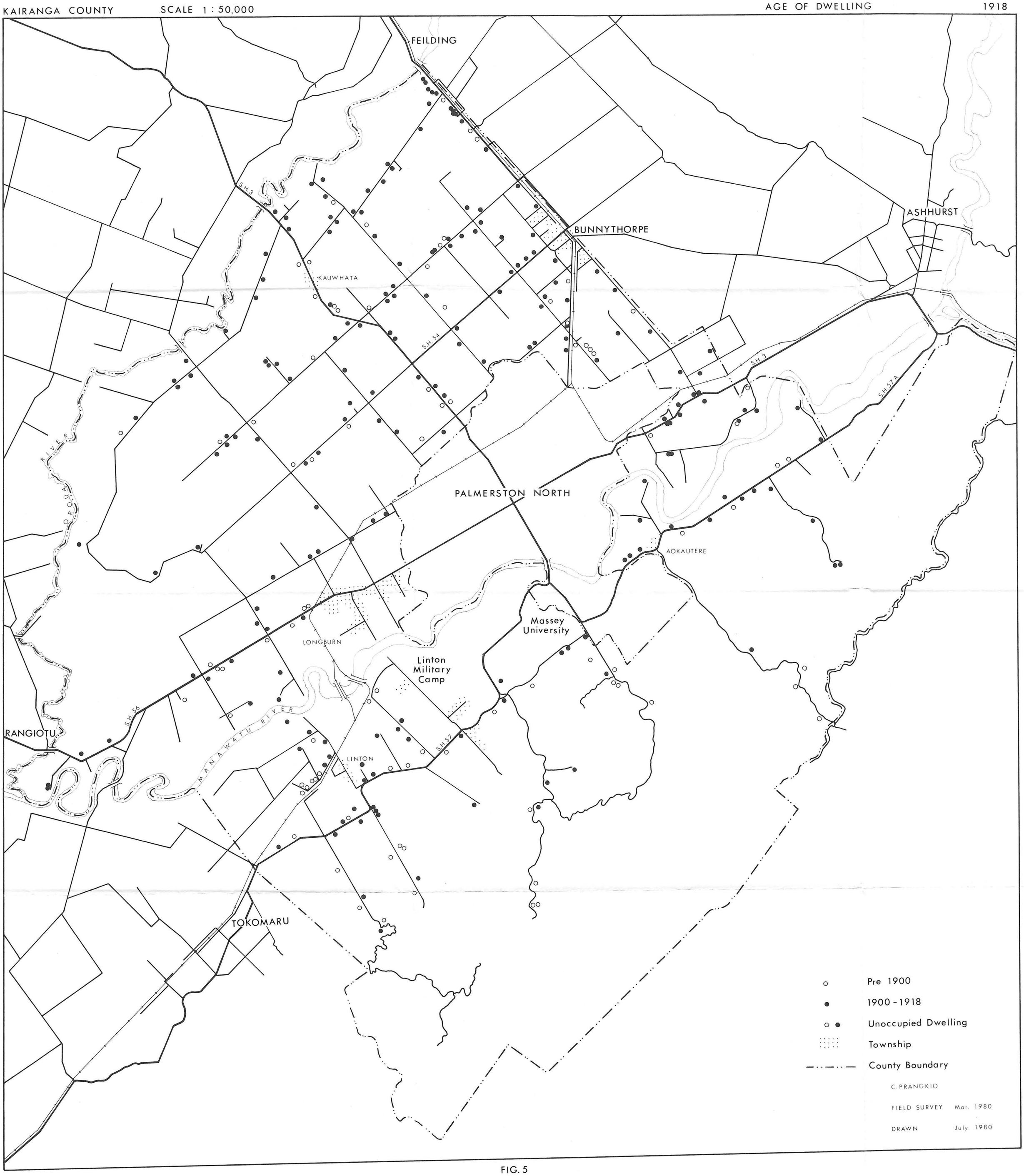



FIG. 5

KAIRANGA COUNTY SCALE 1 : 50,000 AGE OF DWELLING 1945

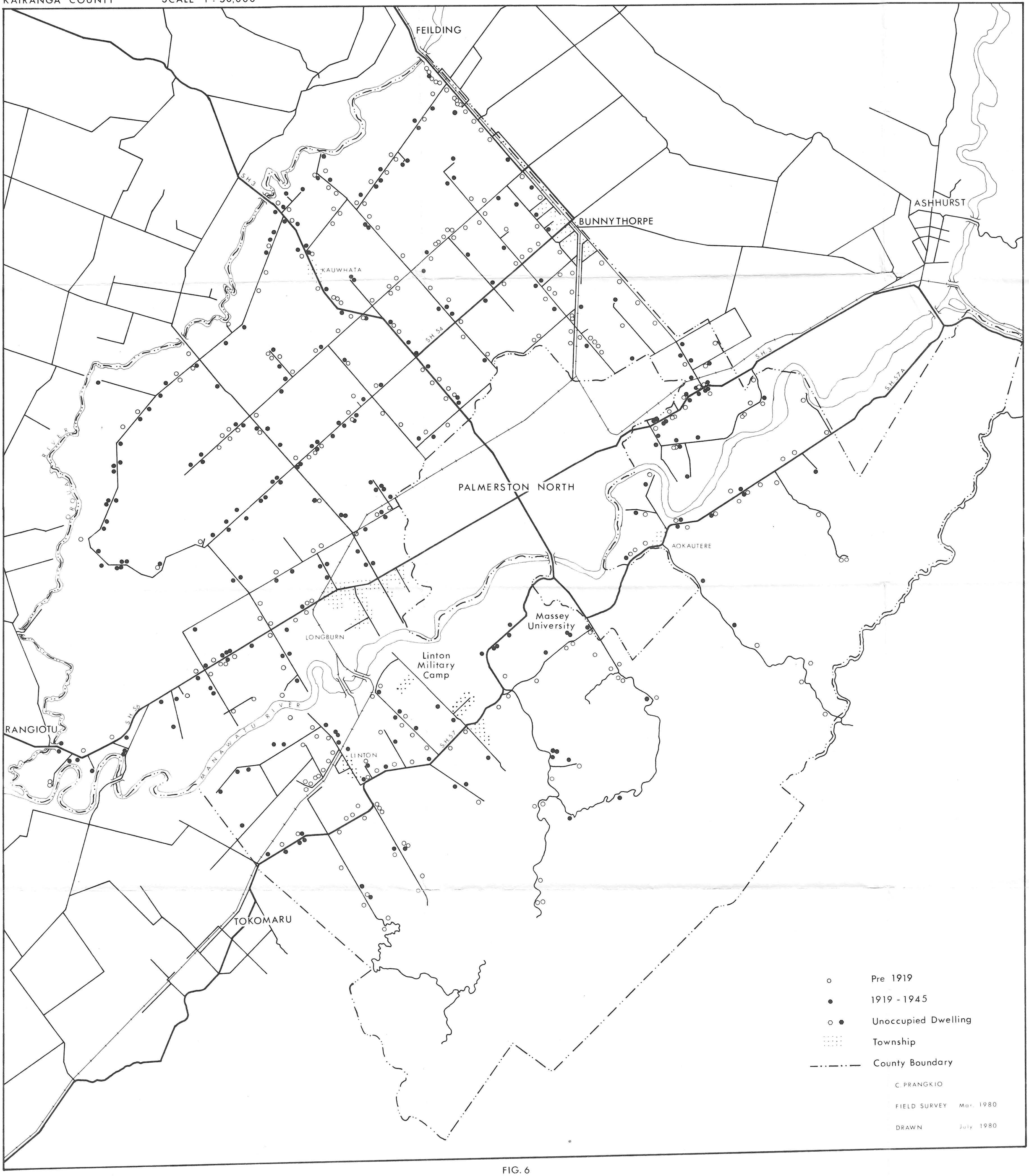



FIG. 6

KAIRANGA COUNTY SCALE 1 : 50,000 AGE OF DWELLING 1960

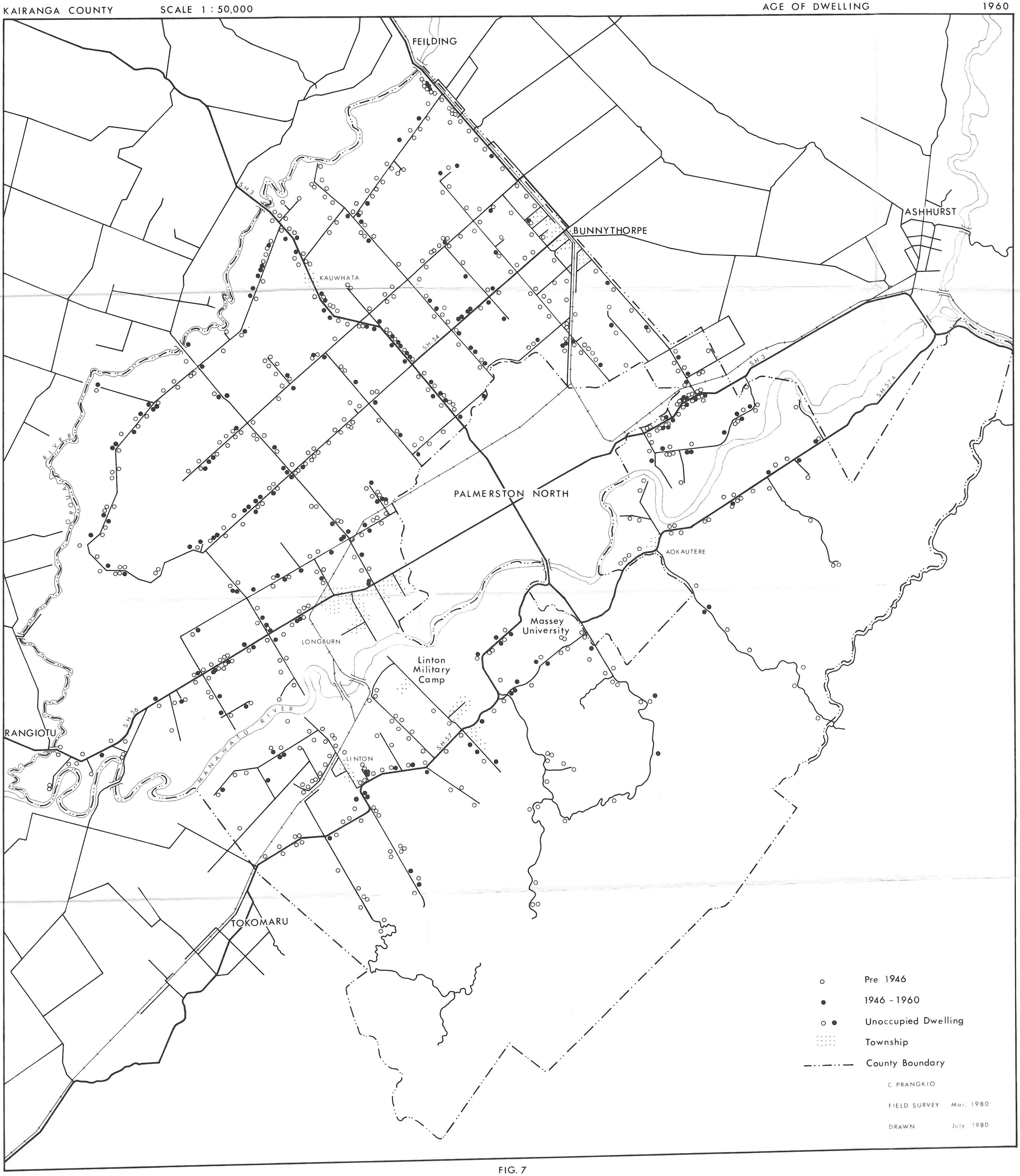



FIG. 7

KAIRANGA COUNTY SCALE 1 : 50,000 AGE OF DWELLING 1970

FEILDING
BUNNYTHORPE
ASHHURST
KAUWHATA
S.H.3
S.H.54
S.H.3
SH57A
PALMERSTON NORTH
AOKAUTERE
RIVER KAIWOPO
Massey University
LONGBURN
Linton Military Camp
RANGIOTU
S.H.56
MANAWATU RIVER
LINTON
S.H.57
TOKOMARU

- Pre 1961
- 1961 - 1970
- Unoccupied Dwelling
- Township
- County Boundary

C. PRANGKIO

FIELD SURVEY Mar 1980

DRAWN July 1980

FIG. 8

KAIRANGA COUNTY SCALE 1 : 50,000 AGE OF DWELLING 1980

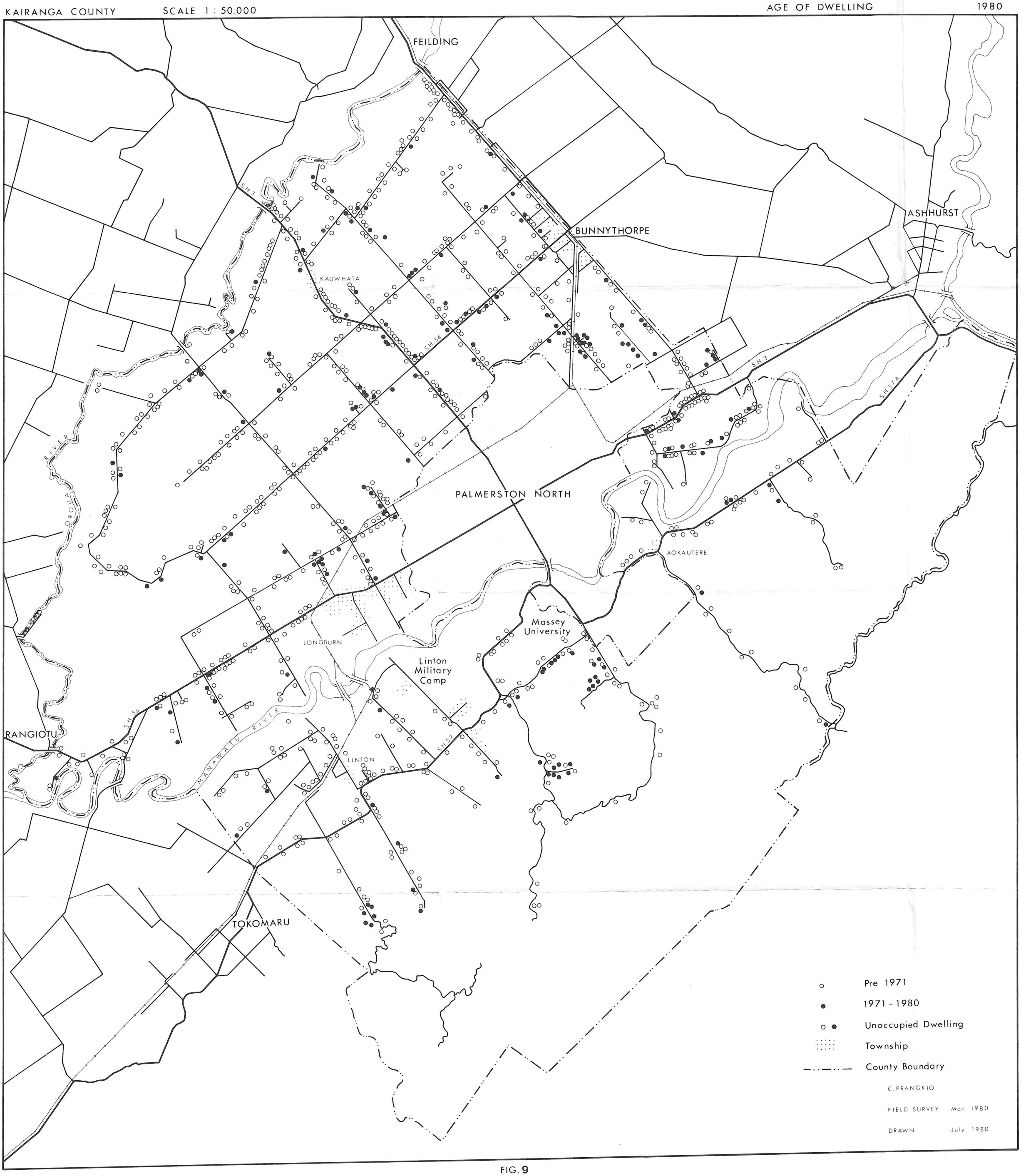



FIG. 9

# KAIRANGA COUNTY Scale 1 : 50,000 Rural Subdivision: Distribution By Size 1980

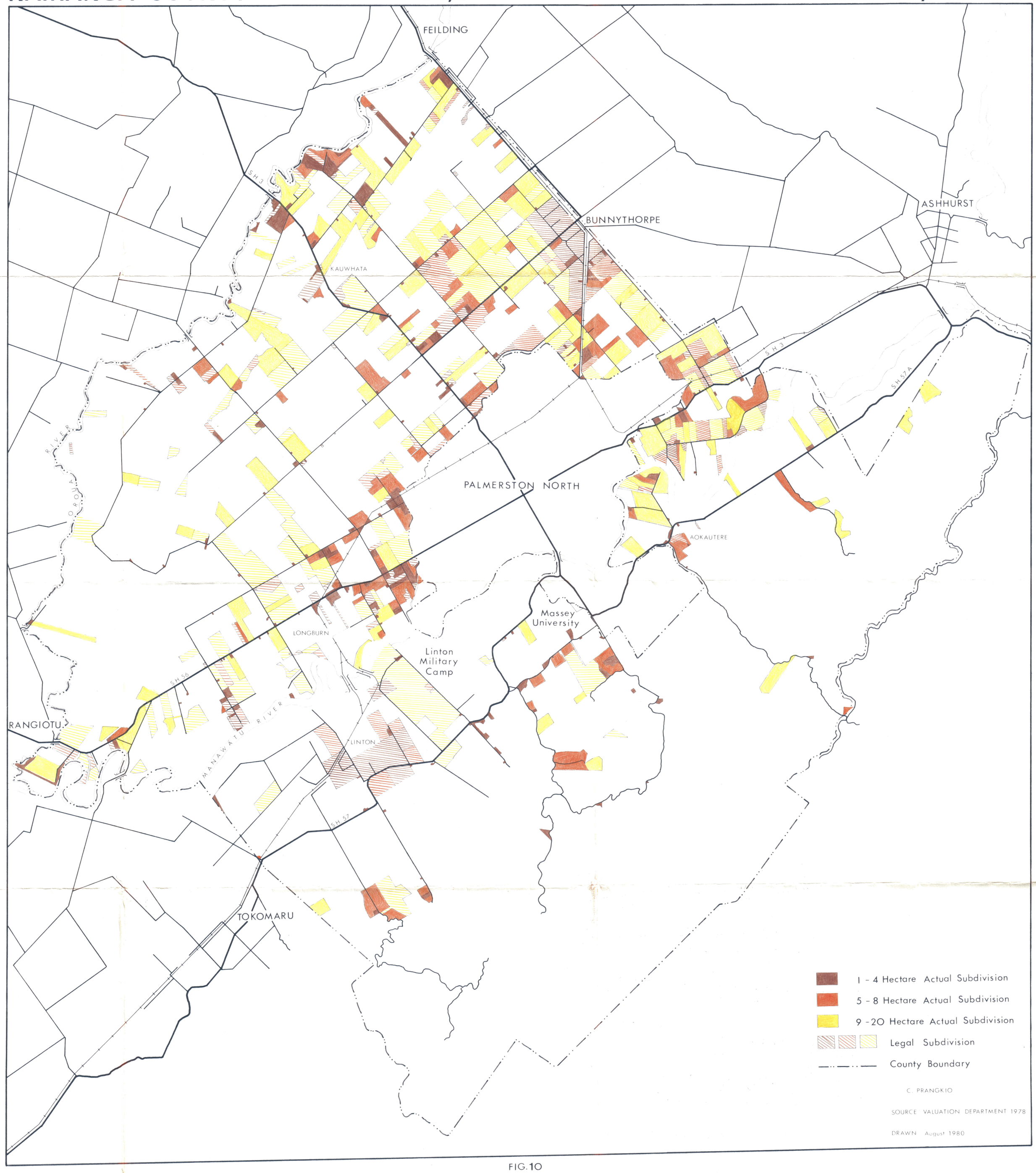



FIG. 10

KAIRANGA COUNTY SCALE 1 : 50,000 FARM BUILDINGS 1980

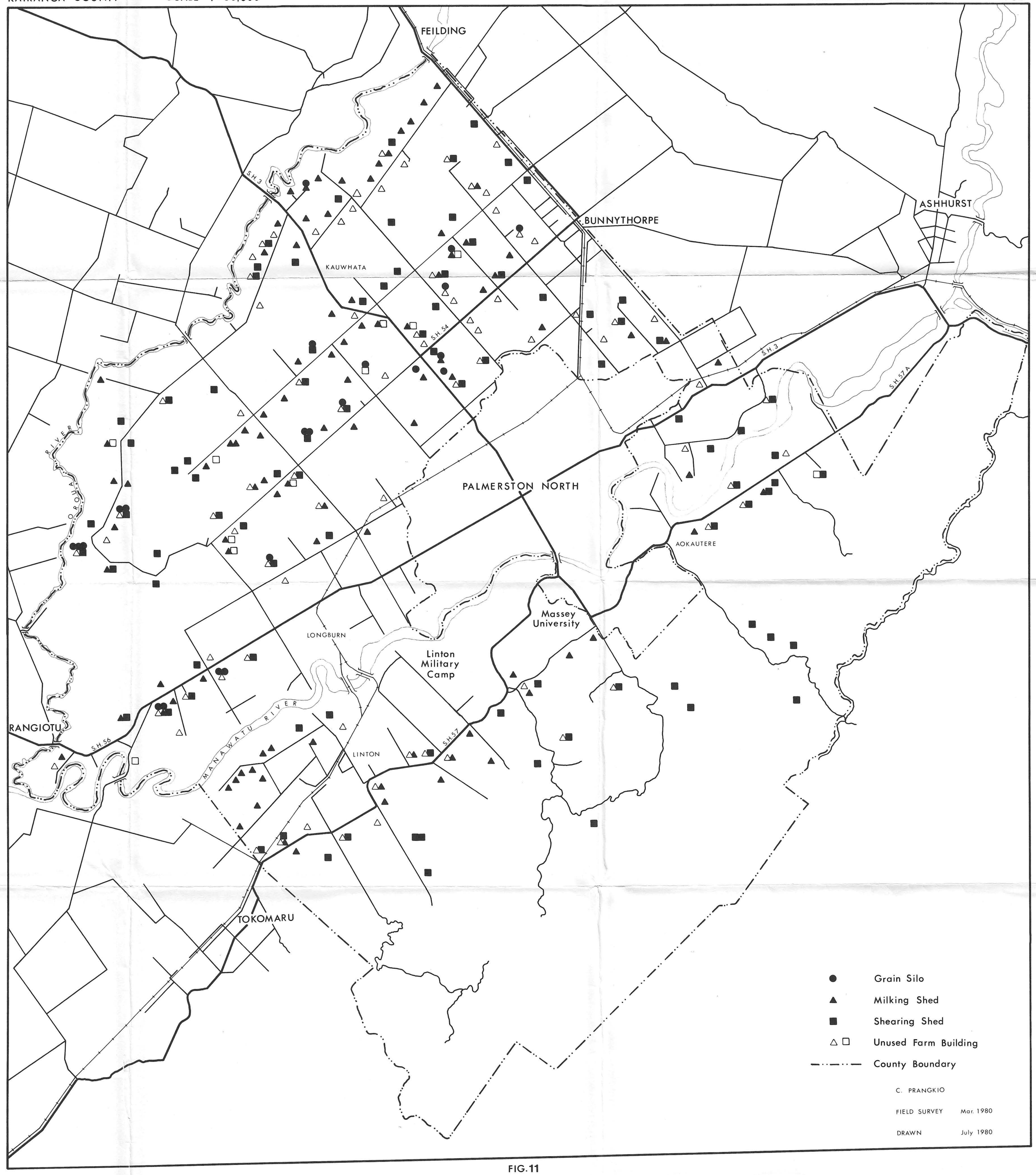



FIG.11