



THE ECONOMIC GEOGRAPHY OF
REGIONAL DIFFERENTIATION -
STUDIES IN SØGN OG FJORDANE,
NORWAY.

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ABSTRACT

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The central concern of this thesis is with the degree of freedom of action which peripheral areas retain in directing their own development. The evolution of regional policy in Norway is described in detail, with close attention being paid to the continued existence of residual marginal areas. These areas are mostly comprised of rural communities, and these residual areas are very well represented within the West Norwegian county of Sogn og Fjordane. Theoretical perspectives are drawn from regional economics, and the relationship between centre and periphery. A relational definition of centre and periphery is proposed: that the periphery is a region differentiated from another region, the centre, because it is disadvantaged in an asymmetrical interaction relationship. Examples are taken from the economic geography of Sogn og Fjordane which illustrate this proposal. The scale of the processes which are described is given by an analysis of Population and Agricultural census information for Indre Sogn, an area of the county. The discussion of the relationship between centre and periphery is closely focussed on the development of one village, Fjærland, which is shown to have been blocked by the external orientation of its economic units.

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Men tidi mel ustanseleg. Med eller mot vår
vilje vert me dregne med i rasjonaliseringi
og dei store einingar sin tidsalder.

(Lars O.Brekke sin tale på 75-årsfesten
i Vikjahalli 9. september 1972 ;
A/L Vik Meieri 1973)

Should not this quotation
also have its translation
in the appendix.

Or is the content so self-evidently
banal that it best be shrouded
in New Norwegian?

Preface and Acknowledgements

To the extent that my interests in Fjærland, planning, and regional development were of separate origins, the form which this thesis has taken is coincidental. To the extent that the experience of this research and the character of this exposition have proved fulfilling for the author, one could believe that a measure of predetermination has been present in the course of this work. The youthful curiosity with which I enjoyed Fjærland at my first visit was not notably innate, but had been sensibly cultivated by my mother and father, and opened to the geographical world by my teacher D. McTurk. When subsequently I was fortunate enough to be able to study geography at the University of Cambridge I was introduced to a range of approaches to regional development which once more stimulated my curiosity. A first attempt at marrying the world of Fjærland with the theoretical environment of economic geography formed my undergraduate dissertation. Retrospectively, this dissertation was theoretically undercultivated but the fieldwork which I accomplished laid a very solid foundation of contacts in Norway who have stood me in good stead in this subsequent endeavour.

My progress in this work has been buttressed by my membership of the L.S.U. Department of Geography, and founded upon the financial assistance I have received from the Social Science Research Council, the Central Research Fund of the University of London, and NAVF, the Norwegian Scientific Research Council. Any acknowledgement which I make here of the help of individuals will be unjust, since many others will find contributions unmentioned.

except in so far as they appear in the text. However, gratitude for the hospitality with which I have been received directs me to thank the following people :

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Naturally, I alone am responsible for the final form of the written thesis, I can only hope that some of the many people who have contributed to my work find something of value in it.

London, 1st June 1975.

Roger Bivand.

Glossary

A major difficulty faced in the writing of this thesis has been the representation in English of Norwegian terms which are by no means uncontroversial in their meaning. In general it has been chosen to avoid using the Norwegian words, but this has the effect of contorting the English text in places. Certain words are translated by convention: Fylke as county; Kommune as commune - in the usage of the Central Bureau of Statistics 'municipality'; Landsdel as region; Prøvesenter as "trial" centre; Region as sub-region; Tellingskrets as census district; Tettsted as urban district - see Chapter 1, p.22; and Utbygging as development. While these conventions are rather approximate, they serve well enough. The next two concepts are not susceptible to conventional translation since the matching concepts do not exist. Firstly, Bygd or Grend has been translated as village or rural community. Secondly, the adjective Utkant has been represented by remote, and on occasion marginal, although neither of these two is wholly adequate.

town

The difficulties which have been encountered are perhaps exemplified by the word 'Distriktspolitikk', which could be 'regional policy' or 'development area policy'. The historian Berge Furre has written a newspaper commentary explaining why the word ought to be expunged from Norwegian.

'Shall we shut the word "distriktspolitikk" out of the language? The word has now lost its meaning because it came to be used of two opposed things. Both people wanting centralisation, depopulation of rural areas, and those who support decentralisation and the protection of rural society speak of

"distriktspolitikk". The word papers over
one of the most important conflicts in
Norwegian politics...'
/Dagbladet, 23rd November 1972/ *

In effect, one could have written the thesis as a sociolinguistic study of the Norwegian regional policy debate, a topic not without its attractive features. For example, Strand /1973,1974/ and Blakar/1973/ stress the importance of the language conflict in Norway between Bokmål and Nynorsk: a summary of Norwegian language policy is given by Trudgill/1974/. Consequently, I would ask for some forbearance from both Norwegian and English speaking readers of this thesis.

*A.i.1

Introduction

It is hoped that these introductory remarks will allow any reader curious about the strategy of this thesis to check his or her own impressions of the material which it contains. It is important to state that it has been written within a specific methodology, the elements have been assembled consciously in order to meet requirements felt to be of value by the author. It has no claims to exhaustiveness, rather it sets exploratory targets for the elements which comprise it. While it has been consciously chosen to avoid the testing of hypotheses in a manner characteristic of positivistic social science of recent years, it has been left open to the reader to impose his or her own interpretation on the contents. While the author could voice personal opinions, could test hypotheses built on them, and could advocate their incorporation into planning practice, this is felt to be a lesser contribution than the openness of the present work. One has learnt that a methodological or theoretical arrogance, while personally satisfying, may not be the most persuasive vehicle for either understanding societies, or for changing them. Shortly, the methodology underlying this thesis consciously promotes its service of three goals: the advance of theoretical development in economic Geography; the widening of interest in the peculiar and important case of regional differentiation in Norway; and to make a contribution both materially and to the debate in Norway about marginal areas.

As is noted in the second Chapter, the theoretical approaches employed here are treated naively, a choice based upon the methodological premises stressed above. In general one

can say that the use of theory in any case is relatively unusual in this type of study. A close adherence to any brand of 'metropolitan' theory would lead one into exactly the form of criticism which is made in this thesis. For example, the application of a concerted econometric approach using the models formulated in Chapter 2 would have left no room for the consideration of the elements of the superstructure, of administration and organisation, which one feels add depth to the work. Equally, a sloganising of the encountered social phenomena would be immature, despite the opinion that the slogans might be correct. Consequently, the models of the regional differentiation and interregional flow of accumulated capital which are elaborated are not pushed home to the hilt, it is left to the reader to execute this. In other studies of foreign countries one notes a certain hastiness to draw conclusions, or alternatively a resignation from the responsibility to make judgements. The choice of the method of presentation and the body of theory here employed are firmly directed towards a middle path.

An important reason for exercising caution is the strong contrast between the academic environment which surrounds one in usual existence, and the empirical world one studies. There is interaction between the two: one's status as a foreign student originating from identifiable institutions produces varied but definite effects among those one encounters. What is important is to grasp the ability to mediate these encounters, to anticipate the responses and opinions of the people one meets. This anticipation is not a tool used to dominate the interview, but to open one's consciousness to aspects otherwise barred by simple ignorance. It is for this further reason that one has sought to avoid a *pejorative* tone in these studies. Partic-

ularly in the study of a specific remote community one must remember, in the sense of the discussion which runs right through this thesis, neither to denigrate the forms of society which have existed, nor to idolise them in the image of one's own preferences.

On the basis of the premises sketched above, it can be seen that the flow of the thesis cannot be a homogeneous nor a continuous one. The economic geography of regional differentiation concerns the integration of the space economy, the under-development of marginal areas, the interaction relationships between geographically defined areas and the symmetry or otherwise of that interaction, the modes of production of the areas, the relationships between different scales of areas, the palimpsest quality of the record of development, and the question of the reversibility of relationships now existing. This 'graft' of concepts has to be simplified in relation to particular circumstances. Consequently one has a problem of composing a work of scale to encompass the characteristics of the empirical world of Sogn og Fjordane, a county of remote communities, muting neither the empirical detail, nor the opposed theoretical conundrum. In a different analogy, Chapters 1, 3, 4, and 5 may be regarded as a large framed canvas, Chapter 1 the frame, Chapter 3 the sketched lines, Chapter 4 the colour and relief applied to the sketch, and Chapter 5 the careful detailing of the foreground. One invites the perusal of this assembly through the chosen glasses provided in Chapter 2, in the hope that the peruser will learn something of the picture, the glasses and not least of the eyes behind the glasses. The concluding Chapter sets out the judgements of the author about the work as a whole. In addition each chapter is introduced formally, so that those with specific demands to make of the text will be able to satisfy themselves readily.

1. NORWAY'S REGIONAL POLICY DILEMMA

I The Pattern of Regional Disparities

- a. The historical and topographical frame
- b. Measures of disparity
- c. Inconsistent disparities

II Development Area Policy

- a. Pre-war conditions and post-war reconstruction
- b. The emergence of the industrial perspective
- c. A development area-growth centre hybrid

III Centres and Spatial Planning

- a. Progress in the "trial" centres
- b. The views of the regions
- c. The aims of spatial planning

IV The Characteristics of Marginal Areas

- a. Population trends
- b. Occupations in the marginal areas

V Marginality and the Second Dimension

- a. Political conflict
- b. The analysis of marginality

Summary

While there are striking disparities between Norwegian counties in their exhibition of modern traits, for example the possession of consumer durables or retail turnover per capita, it is suggested that this pattern of urbanisation and modernisation is not restricted to one dimension. The post-war political attempts to regulate regional disparities is reviewed, from the aspects both of perceived problems and of policies. The culmination of this development in a policy of decentralised concentration expressed in a series of regional reports is described. The dilemma which has resulted is revealed as the difference between the areas seen as marginal - remote, oriented towards the primary sector - and the policies proposed to tackle these problems. The policy of the development of centres in such areas can only exacerbate the plight of areas beyond a reasonable journey to work distance from the designated centres. Subsequently, the characteristics of the marginal areas are considered, amongst which the role of official policy in reducing the demand for labour in agriculture is picked out as important. Finally it is suggested that the opposition of the marginal areas to being modernised is not just resentment at inevitable changes, but calls for the discussion of political alternatives in considering the future of these areas.

I. The Pattern of Regional Disparities

a. The historical and topographical frame

There are few countries which have apparently so little given by nature as Norway. The small area of habitable terrain contrasts with a land mass one third larger than that of the United Kingdom. These pockets of life have been the source of sustenance for what must be a surprisingly large population, a people who have had to utilise what was available in their natural inheritance fully. The areas inhabited by the population of just under four million are almost exclusively coastal, the interior is largely only settled in the valleys. The pattern of settlement is linear, discontinuous and dispersed, formerly conditioned by the availability of resources with which to sustain life. While the demand for transport was small, the roads of the sea sufficed; many inland trade routes which crossed exposed passes, once heavily trafficked, are now being lost to memory.

The early development of trade in fish through Bergen, the city which dominated thirteen degrees of latitude from Jæren to Russia's borders, was shaped by the dependence of the peasant-fishermen on the exchange of part of their catch against bread grains /Ahlmann 1917, p.264/. The beginnings of timber trading in the East established conditions for a combination of forestry and farming far up the valleys, and for the establishment of towns; until rather late in the nineteenth century factory labour was not found. Working of timber, sawing and carrying, was undertaken by men to supple-

ment the subsistence outcome of their farms. From the late middle ages, the kingdom became a Danish colony, Danish written language printed itself onto the then existing and still vigorously surviving spoken language. With the 1814 constitution and a separate state apparatus under Swedish hegemony, there emerged an important group of national administrators filled with zeal to improve and reform the country. They instituted in 1837 the framework of communal authorities, beginning with school and poor relief boards, which are still the formal bastion of local autonomy; many important decisions are made at the level of the remaining 443 communes.

The combinations of fishing or forestry and subsistence farming were well adapted to the available resources in some ways; the sudden arrival of modern industry, pulp and paper, electrochemical, electrometallurgical, the growth of the towns, and the replacement of sea transport by land has cut across the traditional settlement pattern.

b. Measures of disparity

One measure of this change is of the population in urban and rural districts respectively. Urban districts are defined as settlements of not less than 200 inhabitants, whose dwellings are not more than 50 m. apart, and amongst whom not more than 25% of the economically active are occupied in farming or forestry. In 1900, 790 000 resided in such urban districts, out of a total of 2240 000; by 1946 the urban districts contained 1580 000 against 1575 000 in rural areas; and at the latest

population census in 1970 the urban population was 2555 000, against 1330 000 in rural districts /Myklebost 1974, p.146/.

The urban concentration has run through the rural population such that the absolute total of rural population has fallen since 1946, and fell faster in the decade 1960-70 than in the preceding years.

One should stress the fact that the urban decline started so late.

Much of this concentration has occurred in the area of Oslo, the capital, and other strongly developed areas; centres in the weakly developed areas grew fastest of all, but have not yet stemmed the demographic tide /Myklebost 1974, p.146/.

The population in strongly developed areas increased by 8.1 percent between 1965 and 1971 and they registered a positive migration balance of 3.0 percent from 1965 to 1970. The most weakly developed areas only increased in bulk by 0.8 percent between 1965 and 1971, meanwhile incurring a negative migration balance of 5.3 percent from 1965 to 1970 /St. Meld. nr. 13, 1972-3, p.7/. The same Parliamentary report illustrates the backwardness of the weakly developed areas by contrasting the proportions in primary occupations and average incomes per inhabitant, 23.4 percent and kr.7000 respectively, with the strongly developed areas' 4.3 percent and kr.11 600. The consequent proposals will concern us later, the immediate concern is to map the disparities revealed in population growth, migration, and, as it were, socioeconomic well being.

Knox /1973/ examines the ranking of the 19 Norwegian counties on a set of variables covering various social and economic conditions. Under these social indices no causality is postulated, an objective unidimensional measure is desired, so that items may be ordered on a scale, in this case a rank

scale. Table 1.1 shows the ranks of the counties using the most recent information, arranged in the same way as Knox'.
 /Bergen (has been included in) Hordaland county following ^{and} ^{is now merged into one} administrative changes in 1972/.

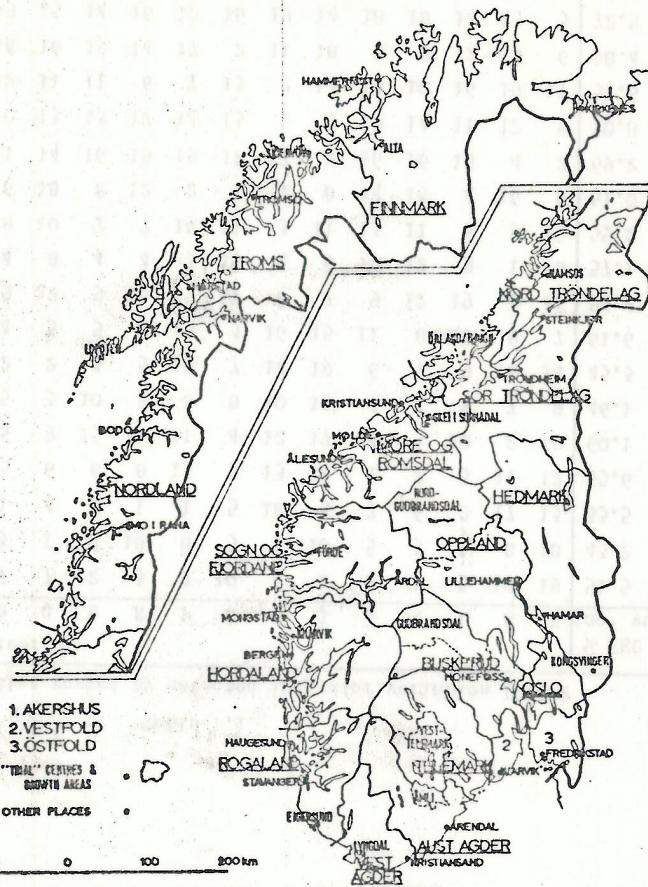
The variables included are as follows, with means and standard deviations in brackets to give the simple rankings some breadth: *

- A. Income, taxed income in kr. per resident taxpayer 1971 /26022, 2542.3/,
- B. Unemployment, percent of total work force 1971 /1.403, 1.011/,
- C. Car registrations per 1000 population 1972 /213.8, 36.9/,
- D. Telephones per 1000 population 1971 /281.1, 96.8/,
- E. Retail turnover kr. per capita 1971 /8329, 1440/,
- F. Doctors per 1000 population 1972 /1.25, 0.58/,
- G. Infant mortality per 1000 live births 1966-1970 /14.2, 1.8/,
- H. New dwelling units per 1000 population 1971 /9.7, 1.7/,
- I. All secondary teachers /full and part-time/ per 100 pupils 1972 /8.4, 1.2/,
- J. Percentage poll communal elections 1971 /72.7, 3.7/,
- K. Percentage poll General Election 1969 /83.3, 3.6/,
- L. Percentage poll consultative referendum on Common Market membership September 1972 /78.4, 2.0/,
- M. Floor space per new dwelling unit m^2 1972 /89.4, 4.2/,
- N. All primary teachers /full-and part-time/ per 100 pupils 1972 /6.4, 1.5/,
- O. Percentage vote cast against membership of the Common Market September 1972
- P. Percentage pupils using Nynorsk as main school language 1972 /All except unemployment and infant mortality are ranked from highest to lowest; these two are ranked lowest to highest/.

Table 1.1
Norwegian counties ranked by selected indicator variables 1971-2

	variables:													% EEC 'no' vote	% pupils nynorsk	
	A	B	C	D	E	F	G	H	I	J	K	L	M	N		
Østfold	4	7	7	12	3	9	10	6	1	2	1	5	10	19	51.5	0.0
Akershus	2	3	1	8	18	8	5	1	10	5	3	1	8	18	43.2	0.0
Oslo	1	1	4	1	1	1	5	18	5	7	6	2	17	13	33.5	0.0
Hedmark	12	13	6	6	8	13	9	13	16	1	2	3	11	12	55.6	0.2
Oppland	17	15	9	15	11	11	4	12	17	4	5	10	2	10	60.1	28.8
Buskerud	7	5	3	10	2	6	8	10	12*	3	4	7	7	9	46.1	5.4
Vestfold	3	2	2	3	5	10	7	14	19	6	7	9	6	14	43.3	0.0
Telemark	10	14	5	5	9	5	3	16	15	11	8	12	9	7	61.6	21.1
Aust-Agder	13	9	12	9	10	15	17	8	7	9	12	19	3	11	54.4	13.3
Vest-Agder	8	4	8	4	4	3	15	4	6	10	12	9	1	16	57.1	7.3
Rogaland	5	8	10	7	7	16	11	3	11	13	11	6	5	15	55.2	29.8
Hordaland og Bærum	6	6	18	2	12	2	1	7	8	14	15	4	16	8	51.0	46.8
Sogn og Fjordane	19	11	14	16	19	19	12	17	4	16	16	15	4	2	69.2	93.7
Møre og Romsdal	14	10	13	13	17	14	13	5	9	12	14	11	12	5	70.8	59.1
Sør-Trøndelag	9	12	11	11	6	7	13	2	13	15	10	16	19	17	57.6	5.8
Nord-Trøndelag	18	16	16	19	14	17	2	11	18	8	8	12	13	6	68.4	18.7
Nordland	11	19	15	14	16	12	16	19	14	18	18	14	14	3	72.5	0.7
Troms	15	17	19	18	15	4	18	9	3	19	19	18	15	4	70.2	0.0
Finnmark	16	18	17	17	13	18	19	15	2	17	17	17	18	1	70.4	0.0

/sources: see appendix iv/



11 NORWAY: COUNTY BOUNDARIES and "TRIAL" CENTRES

As Knox also found, the variables relating income, and telephones per head are highly correlated with each other, and with the absence of unemployment. Political mobilisation through percentage poll seems to be correlated, but rather less strongly /Table 1.2/.

Table 1.2
Spearman's Rank Correlation Coefficient for selected Variables

	A. Income	B. Lack of unemploy- ment	C. Car owner- ship	D. Tele- phones
A. Income				
B. Lack of unem- ployment	0.791			
C. Car ownership	0.630	0.616		
D. Telephones	0.781	0.742	0.546	
J. Percentage poll	0.368	0.493	0.798	0.354

While these variables do represent real features of regional disparities in Norway, it is necessary to be rather clear about their meaning. For instance, differences in variance between variables also mean that a standardised one-dimensional index will weight the variables equally. Patterned residuals from the index are likely to exist, from which it could be suggested that there should be at least two dimensions in Norwegian regional disparities.

c. Inconsistent disparities

Compared to Knox' findings, by 1971 there had not been a great change in the ranks of the counties. However, the net migration per 1000 population registered by counties has been changing rather markedly. This is recorded in Table 1.3*, in which the last decade is compared with the last 3 years /D.U.F. 1972, p.4; SSB 1972, p.50/. The figures are net of migration to and from foreign countries, so that the strong positive balance in Vest Agder, Rogaland and Hordaland between 1971 and 1973 is somewhat obscured; their balance on overseas migration alone is 4060. This is a direct reaction to the surge in oil activities which is leading to heavy pressure on most resources in the Southern sector of the west coast, south of 62° N. The figures for 1970 would be meaningless since unregistered migration from that year was added to the actual 1970 totals. It seems to be improbable that the late registrations can safely be assumed to be distributed the same as the actual totals, so that the series of migration statistics is broken at this point. The improvement in the counties in North Norway from 1969 to the mean 1971-3 figure is noteworthy as is the slump in positive net migration to Akershus, and the faster flow from Oslo. This seems to hang very closely with Myklebost's assertion that to speak of an accelerating process of concentration, although correct over long periods, would seem now to be in error, and that it has decelerated to a level around that of twenty years ago /1974, p.153/.

So it is possible to point both to the existence of well recognised and evidenced regional disparities in Norway, and

*A.iv.2

Table 1.3
Net migration per '000 population by county

	mean 1961-65	mean 1966-70	1971	1972	1973	mean 1971-73
ØSTFOLD	11.2	4.3	5.48	0.56	1.36	2.34
AKERSHUS	19.5	22.1	13.08	16.85	6.15	8.18
OSLO	0.5	- 5.4	-12.80	-10.00	-10.51	-11.04
HEDMARK	- 5.1	- 0.9	0.84	0.88	2.82	1.52
OPPLAND	- 4.1	- 0.7	3.87	4.04	2.46	3.45
BUSKERUD	3.4	3.3	5.29	2.64	6.19	4.71
VESTFOLD	0.9	4.9	6.36	3.22	2.88	4.14
TELEMARK	1.4	- 2.7	-0.35	- 3.87	- 3.37	-2.53
AUSTRAGDER	- 1.2	3.0	5.31	4.20	6.91	5.48
VESTAGDER	3.1	5.7	4.13	2.63	1.80	2.84
HØGDALAND OG BERGEN	-	-	- 1.74	- 2.00	- 1.29	-1.68
ROGALAND	- 0.5	1.6	0.21	0.58	0.70	1.31
SØGN OG FJORDANE	- 6.0	- 5.4	1.72	- 1.54	- 3.50	-1.12
FØRER OG ROMSDAL	- 5.5	- 3.6	0.05	0.02	- 0.38	-0.11
SØR-TRØNDALAG	- 0.6	1.9	- 1.39	0.50	- 0.99	-0.63
NORD-TRØNDALAG	- 8.7	- 6.7	1.77	0.88	4.05	2.24
NORDÅLAND	- 5.6	-11.4	- 7.61	- 3.54	- 2.60	-4.58
TRØNS	- 5.2	- 4.6	- 2.22	5.51	4.19	2.52
FINNHMARK	- 7.3	-11.5	- 6.58	- 6.11	1.44	-3.73

(SSB Folketallet i kommunene, Flyttestatistikk, various years; SSB Statistiske Analyses nr.1, 1972. p.50)

at the same time to suggest that they are changing in time, and that the main forms of disparity do not form a single dimension scaled by strength of development. For variables which Knox labels inconsistent /p.192/ it is possible to find adequate explanation, as he does, for example the inverse relationship of income and teachers per 100 pupils; rural and remote schools are smaller, and since teachers are indivisible, more schools per 100 pupils must mean more teachers. The poor performance of some counties in relation to medical provision is explained by the then existing location of hospitals, since local health services are more or less equally provided. The variables relating to political mobilisation are presumably intended by Knox as a measure of the integration of the counties in the national political system; one response which must be difficult to detect in this measure is the refusal of integration into the larger nation. To construct a one-dimensional index of integration and prosperity assumes an identity of interest amongst the subjects to be scaled. The two variables showing the percentage of school pupils being taught mainly in Nynorsk, the second official language based on rural dialects and the historical Norwegian language, and of votes cast against Common Market membership relate to a possible second dimension, an opposition to the modernisation or concentration represented on the first dimension which Knox describes.

II. Development Area Policy

a. Pre-war conditions and post-war reconstruction

The years of the thirties saw the end of one era of change; the land reforms of the latter half of the 19th century, and the development of market relations in farming as such, happened while the proportion of landless labourers, tenant smallholders, and the poor strata in the countryside fell rapidly. Migration over the Atlantic, the surge of the industrial economy during the first world war, the increasing economic integration of the country all implied that when the crisis years came upon the country, most areas would be affected. Norway was very export dependent, fish, paper and pulp, the products of hydro-electricity all largely left the country in an unprocessed state; the merchant fleet was dangerously exposed to the collapse of the world market. The crisis did not cause as much hopeless unemployment as it did in the industrially depressed areas of Britain.

The responses to the contraction of the economy were varied. For milk producers, the shrinking urban market meant falling prices which were fought politically through the dairy cooperatives, which through the 1930 and 1936 Marketing Acts of the Storting brought about a degree of market regulation: from this the farmers secured the necessary cash supplement to their subsistence economy /Furre 1971, p.223-7/. Brox has contrasted the adaptation of three types of fishermen-peasant households found in North Norway /1966, 1969/. The household lacking resources to feed a cow over the winter was forced to

earn an income from fishing even when the market for fish was at rock bottom: they could barely afford margarine and syrup. The most fortunate had a boat crewed by several men, and land to grow vegetables and enough fodder to secure milk, butter, veal, mutton and other foodstuffs from their own efforts. They could hire labour at the time it suited them, and take advantage of high prices. A larger minority accommodated themselves almost without recourse to the market eating from their own garden, livestock products and their own haul of fish. Although the cash income of this latter group was lower than that of the diners upon margarine and syrup, their standard of living was markedly higher.

Many new households based on this third adaption established themselves, in more or less new houses, with land, and a boat capable of being worked single handed during the reconstruction period following liberation. A proportion of the poorest and landless people left for the towns, and the most privileged were somewhat reduced in status since they could not so readily crew their boats. In 1950 about half of all the economically active in the three northern counties were recorded as either fishermen or farmers, so that they were no meagre part of the population; many of the others, traders, administrators, and workers in food processing depended upon them, so that their economic significance was greater even than that halfpart.

After 1945
The prompt reconstruction of settlements according to the preexisting distribution of population together with the *in the late 1940s* phase in social policy initiated by Labour Party Prime Minister Nygaardsvold, which enabled the establishment of the new fisherman-peasant households, were responses to immediate urgent needs. The policies also sought to meet demands for a more equal

sharing of social resources between town and country, represented by the alliance behind Norwegian Labour Party of both trades union and small farmers organisations. To an extent this was an answer to the problems of the younger generation of the crisis years. Their demands were for security from sickness, ^{Goals were means} from old age, from poverty; not as such demands for modernisation.

One further contribution to the policy debate immediately following the war was conflict over the industrial establishment built up by the occupiers to provide non-ferrous metals for their war machine. At liberation, the aluminium complex in Årdal commune in Sogn og Fjordane was in a state from which it could have either been scrapped or completed. The decision was eventually taken to complete it and operate it under a state holding company as was done at the state iron works at Mo i Rana in Nordland. These decisions were taken for conflicting reasons, in Årdal partly for national reasons to increase Norway's industrial base, partly for foreign exchange, partly to avoid wasting capital already invested, as well as for local reasons /Gjestland 1973a, p.69/. The local implications were not looked at closely; it was assumed sufficient to draw labour from construction workers and others with small farms, or people otherwise assumed to be underemployed in the district.

*but local politicians
and at the
ministers
and work for
them*

b. The emergence of the industrial perspective

Through the Ministry of Labour, area planning offices were established from 1948. Surveys of resources for each county were compiled especially in the "weak" areas of the country, chiefly those seen by the economic staff of the offices as insufficiently

HJ

industrialised. As Mydske /1974^a/ points out, the offices then lacked the official backing to follow a controversial policy, and at least until /until/ 1965 followed a line of least resistance by simply processing requests for development assistance. The general tenor of the policy was established/in the period immediately after the war as Gjestland illustrates from Labour Prime Minister Einar Gerhardsen's statement in December 1945: 'the main way to a higher living standard for the people runs through the development and rationalisation of the country's industry'. /1973 ,p.40/. The Labour Party decided for a fast industrialisation policy, not for its own sake, but to shake off the thirties, under a slogan "Work for All". It is largely due to this policy that Norway has become one of the most prosperous of the world's countries. There are specific aspects of this connected to ownership and control of the economy which will not be dealt with here; the Norwegian economy remains mixed, with the state owning the railways, post, telephones and other services, and economic policy operates indirectly through stimulating or restricting private enterprise.

In North Norway the Economic Area Planning Offices were backed up by the North Norway Plan, which was initiated in 1952. Two justifications were pointed out at the time, the first being the fear of unemployment following completion of reconstruction. The second was that while the region held 12 percent of the country's population in 1939, it produces only 6.2 percent of the national product: "... the stream of goods and services expressed in kroner which is created in North Norway during a year is only half as large - measured per inhabitant - as in Norway as a whole" /Brox 1966,p.9/. The outcome in policy terms

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^a The reference should not be to Brox, but to the study by Studiesskaper for Nord-Norsk Næringsliv, which established the relationships.

was that the slogan "Work for All", and the goals of security from sickness and want, were transformed into a demand for industrialisation, and the areas ripe for such industrialisation were measured by the difference between the stream of wealth they created per head, and the national average.

The wherewithal to pursue the North Norwegian Plan, and projects in other regions, was furnished by the North Norway fund established in 1952, and the Development Fund of the Unemployment Insurance scheme, in 1956. The actions, mostly loans and guarantees as well as indirect infrastructure investments through the borrowing powers of local authorities, were uncoordinated in planning terms, generally aimed at influencing rough indices at county level, unemployment, outmigration, and particularly industrial employment. The principal governmental policies regarding development areas were overhauled in December 1960 with the extension of the area permitted to receive assistance, and with the passing of legislation setting up the Regional Development fund /DUF/. The statute of the DUF states:

" It is the aim of the DUF to promote measures which will ensure increased, permanent, and profitable employment in districts with special employment problems or where underdeveloped industrial conditions prevail. In this respect, the Board and the Secretariat of the Fund shall assist with investigation of the industrial possibilities in such districts as mentioned, and shall - by way of initiative, organisation, planning and coordination - ensure that the possibilities are utilised to the full".
/DUF 1972, p.7, my stress added/.

Figure 1.2
A chronology of Norwegian Regional Policy

Inter-war period	Absolute increase in population in primary occupations and in rural areas. High unemployment but no great movement from the primary sector to other sectors, chiefly because of the crisis in Industry.
up to 1936	"Regional Policy" consists of single measures through allocations from the state budget.
1936	Tax equalisation fund established. The funds dispensed according to the county's and commune's economic situation.
1940-45	Occupation.
1945	Reconstruction commences, especially of razed settlements in North Norway. <small>But also a general catching-up all over the country</small>
1948	The Labour Directorate begins to establish separate offices for area planning. The offices carried out broad economic surveys of the counties in the first half of the 1950's.
1950-51	Reconstruction programme for North Norway nears completion.
1952	Development programme for North Norway decided upon.
1952	North Norway fund to finance programme established.
1956	The Unemployment Insurance Development Fund established to give loan guarantees.
1960	Regional Development Fund /DUF/ to be established, absorbing the North Norway and Unemployment Insurance Development funds.
1963	Regional planning section set up in the Local Government Ministry.
1964	County Development Departments /Fylkesmennenes Utbyggingsavdelinger/ established, absorbing the area planning offices of 1948. The Departments are responsible for coordinating development measures, regional planning, and local planning generally.
1965	Local Government Ministry initiative of three "trial centres".

1965 Østlands committee appointed

*you lost the
charge of government and
the consequent shift to
"growth areas", Jun. 1965*

Mar. 1965 Government invitation to 15 rural counties to designate "trial" centre.

Jun. 1965 The statute of the DUF amended to include the development of centres

Jun. 1965 The Building Act reaches the statute book, with obligations on each commune to produce a General Plan, and intentions for sub-regional plans.

Aug. 1965 Trøndelags and Vestlands committees appointed.

1967 Parliamentary report "On Regional planning". St. Meld. nr. 87 /1966-67/.

1968 Industrial Estate Corporation /SIVA/ established.

1969 Reports from the committees for Østlandet, Vestlandet and Trøndelag published.

1969 Committee for North Norway appointed.

1969 Law concerning tax free funds set aside by enterprises for investment in development areas passed.

1970 Decision to establish an official location advisory service.

1970 Committee for Rogaland and the Agder Counties appointed.

1971 Investment subsidies introduced.

1971 Regional subsidies for freight transport introduced.

1971 Møre og Romsdal county report published

Jan. 1972 Parliamentary report "On regional policy and national and regional planning" St. Meld. nr. 27 /1971-72/.

Aug. 1972 Parliamentary report "On aims and means in regional development" St. Meld. nr. 13/1972-72.

1972 Report of the North Norway Committee published, NOU 1972:33.

Feb. 1973 Supplementary report on regional policy. St. Meld. nr. 50 /1972-73/.

May. 1973 Parliamentary report "On a development programme for North Norway". St. Meld. nr. 108 /1972-73/.

1973 Report of Rogaland and Agder committee published NOU 1973:28 *The whole of Norway then covered by regional reports*.

Dec. 1973 Temporary controls on the location of establishment connected with the exploitation of petroleum.

1974 Parliamentary report "On the place of petroleum activities in Norwegian society". St. Meld. nr. 25 /1973-74/.

Mar.1974 Parliamentary report "supplementary to the development programme for North Norway" St.Meld.nr.33 /1973-7

Jul.1974 Report on industrial development control and the location advisory service NOU 1974:46.

Sept.1974 Report on geographically differentiated subsidies for labour NOU 1975:2.

Dec.1974 Parliamentary report "On various regional development questions in Vestlandet and the coastal area of Trøndelag". St.Meld.nr.32 /1974-75/.

/Lundholm 1973; Mydske 1974^a; other relevant documents/.

c. A development area - growth centre hybrid

During the 1960's, a change in emphasis occurred in the development area policy, making it less single-mindedly industrial, and rather more determined to plan the coordination investments in order to achieve the goals set. That the failures of a purely industrial policy have still not yet been everywhere grasped is evidenced by the location of the refinery project at Mongstad in Nordhordaland. The beneficial local effects /ring effects/ of two previous large industrial establishments, Årdal and Mo i Rana, were conditioned by the ease of communication they had with the surrounding areas. For each extra four cornerstone industry jobs in Mo i Rana, three jobs were created in the service sectors, but for each four cornerstone jobs in Årdal, only one service job was brought into existence. "...Mo, from its central situation, has grown up as a regional centre while Årdal, because of its isolated situation lacks any area to serve". /Berg 1965, p.133; 1971: St. Meld.nr 32 1970-71/. In addition, the lack of growth in industrial employment nationally had directed attention to the expanding tertiary sectors, which had continued to concentrate in the strongly developed parts of the country.

The 1965 Building Act changed the framework, not only of communal planning, but also requested the counties to establish subregional planning zones. Each commune was to draw up a general plan for submission, and subregional plans were called for. At the same time the statute of the D.U.F. was amended by the addition of the following clause: "In its activities the fund shall contribute to the development of expanding centres and

is this
correct?
You simplify
too much. Many
of infrastructure
development in
regions as part
of regional
policy.

other local centres in districts as mentioned in the first section /as cited above/ /DUF 1968, p.6/ . The Area planning offices in the counties were absorbed into newly created Development sections under the county governors /Fylkesmennenes Utbyggingsavdelinger/ responsible for the coordination of development area policy , regional planning and the integrated planning procedure /lundholm 1973, p.22/ In 1965 an initiative with-
p.36: Ministry
in the Local Government Department was made to designate three "trial"centres, in which to try out some of the new elements of the Building Act and development area policy; among these centres were Førde and Kongsvinger. The Government decided to treat the "trial" centres as part of its pre-election policy package, and instead of just these three centres being designated all the counties except for Oslo, Bergen, and the Oslofjord counties of Østfold, Vestfold and Akershus were invited to choose "trial" centres. Nine had been chosen before the Government fell at the election, the remaining six counties were offered rather "growth areas", *understatement* less punctiform than centres. In February the Østlands committee had been named, and was joined in June by committees for Vestlandet and Trøndelag; the Østland committee was mandated to supply the need "... for regional planning which can create the framework for economic and physical development across sub-regional and county boundaries", /Øst.kom.1969, p.9/ .

Following the Building Act came a Parliamentary report which, although roughly handled in Storting, formed the basis for the direction of regional policy as reflected in the eventual reports of the regional committees /St.Meld.nr 87, 1966-67/. It set out a range of points of view on regional growth and structural problems, broadening the debate from one concerning

either physical or sectoral planning, to one concerning the geographical ramifications of the general changes in Norwegian society. It suggested that should policies which attempt to alter the direction or speed of changes in society be found inadequate, other approaches would have to be tried. It stressed the need to evaluate the policies employed realistically /p.32/, not necessarily accepting that the existing trends and social transformations were unavoidable, but feeling no compelling need to try to reverse them, which would be task of Herculean proportions. The call for thorough evaluation seems to have subsequently become lost as the regional policy debate has centred more closely on the question of the maintenance of the existing settlement pattern. Present development area assistance policy has been reinforced substantially. In addition to the extension of funds which enterprises could set aside tax free for investment, first from 1961 in North Norway, from 1969 in other areas, the DUF has been extended as a vehicle for government policy. It administers loans and loan guarantees, respectively 447.7 million kroner and 70.3 million kroner in 1973, and investment subsidies, introduced from 1971, already during 1973 amounting to 195.9 million kroner /Bergan 1974, p.64/. Support is given to surveys, training of labour, removal costs, starting up costs, loans for the construction of advance building for rent and consultancy services. Regional transport subsidies on freight began in 1971, ranging from 35 percent of total cost from origins in Finnmark and Nordre Troms to destinations in South Norway, to 15 percent from origins in the Southern support area, chiefly Møre og Romsdal and Sogn og Fjordane. Investment subsidies have a ceiling of 35 percent

in North Norway, thirteen communes in Nord Trøndelag, and Sogn og Fjordane, and either 25 percent or 15 percent in virtually all others which are not subject to special development control on industrial establishments. The extension of some DUF measures to particular non-industrial sectors was foreseen in St.Meld.nr. 13 /1972-3, p.46/, tourist enterprises had always been able to obtain help, but from 1974 assistance was extended to wholesale trading and other activities /St.Meld. nr.33, 1973-4, p.8/.

Funds are available from a family of state banks, with specific but often overlapping responsibilities. /Lunde 1972/. Local authorities were given facilities to borrow money for land purchase for planning requirements following the 1965 Building Act, and further loans are available for preparation of sites, for example service roads. Support is forthcoming for most other planning purposes, water supply, sewage, open air recreation areas, and for the building of industrial areas in weakly developed areas. Since 1968 an industrial estate corporation /SIVA/ has been active, investing mostly in the centres named as "trial" centres under the 1965 initiative, and by the end of 1973 it had provided about 1700 jobs on its seven estates /Sjøholt 1974; St.Meld.nr.87, 1973-4/.

In three further parliamentary reports, concerned with the implementation of development area policies in North Norway and Vestlandet, a number of new policy measures were introduced /St.Meld.nr.108, 1972-3; nr.33, 1973-4; nr 32, 1974-5/. One was mentioned above, the extension of DUF top financing to the erection of buildings for lease to retail, wholesale, personal service or skilled craft service trades /St.Meld.nr.33, 1973-4, p.8/. The buildings should be located in small and medium sized

urban settlements, fulfilling the requirements of the local centres /miljøbygg/ proposed in the report of the Landsdelskomiteén for North Norway. The first of the other two major developments is the requirement now placed upon firms commencing or expanding their operations at a larger scale than one hundred employees or an investment of 20 million kroner to seek permission for such establishment. These firms can be canvassed by official location advice services, and if the firm proves uncooperative, permission may be denied for establishment in crowded areas /St.Meld.nr.33, 1973-4, p.9; NOU 1974:46/. The second is the differentiation of the employers contribution to the national insurance premium. In areas with a maximum investment subsidy level of 35 percent, the employers contribution is set to 14 percent, of the gross wage; in the 25 percent subsidy zone the contribution is 16 percent, and elsewhere it is 17 percent. The present arrangements are seen as temporary, since a number of anomalies certainly exist, for example large power intensive electro-metallurgical plants in Sogn og Fjordane will get the whole reduction, and in Møre og Romsdal will not, further the 15 percent subsidy zone is aggregated with the most crowded urban areas in receiving no help /NOU 1975:2/.

III. Centres and Spatial Planning

a. Progress in the "trial" centres

The designation of the centres in nine counties, and "growth areas" in six others, was by no means merely a political expedient prior to a general election. The actual selection was guided by three conditions, that the places should be capable

of accommodating rapid implementation of planning and development policies, should offer good prospects for positive results and should be natural growth centres. Since the selection was made by the counties, the fulfillment of these conditions varies greatly; six counties did not name centres as such, but preferred to designate areas chosen for subregional plans- "growth areas" - /Åmli is an exception forming only part of the Arendal-Grimstad sub-region/. Since there was rather substantial variation in their initial situations and sizes, from 4051 to 13051 in population, the progress which they have achieved has also varied. It is important to point out that the choice of centres was not especially intended to be optimal, nor necessarily to contribute to strengthening the system of centres in weakly developed areas as such. They were given no special assistance, since such measures would have made it difficult to use again the experience gained from the first generation of "trial" centres /St.Meld.nr.6,1970-71,p.5/. The implication was that further series of centres would be designated eventually giving everyone a slice of the cake; this has not in fact occurred.

"Through the designation of "trial" centres and "growth areas" it is sought to coordinate in time and space the whole spectrum of measures more strongly than before. The coordination of state, county, and communal investments is especially important. Similarly the adaption of other planning and development policies is sought. In this connection it is important to give the designated places a degree of priority both in the preparation of plans and analyses and in the implementation of specific projects".

/St.Meld.nr.6,1970-71,p.5/.*

A useful comparison is to the British New Towns; while their Development Corporations have some special loan powers, these are not greatly in excess of those possessed by individual Norwegian communes. The contrast lies in the formal structure

of the corporation. The "trial" centres and "growth areas" have not utilised any standard administrative form, although several, notably the most successful, often have set up administrative bodies with close similarities to Development Corporations. In so far as the development initiative had to be followed within a local authority structure concerned with all aspects of public service in the affected areas, the necessary application of planning and development experience was lacking. It may well be that such a lesson was valuable; that specific administrative forms ought to be created in order to make the best use of available planning and development policy measures, and state budget commitments.

*and never so in
'growth areas'
than in trial
centres.*

A survey of the use of some of these measures in "trial" centre Surnadal, and Sel commune in Nord Gudbrandsdal "growth area" has concluded that even though correct and suitable measures can be taken by the commune, problems can nevertheless persist because of the structure of industry. In Surnadal, small dispersed family firms, chiefly in furniture making, were not anxious to make use of the sites or buildings for lease prepared centrally by an industrial development agency started by the commune. In Otta, the urban centre of Sel, persistent efforts and a heavy debt burden for site preparation appear to have paid off in terms of industrial jobs created /Salomon, Drageset and Øyen 1973/. Three "trial" centres provide locations for SIVA Industrial Estates, Førde, Kongsvinger, and Alta; yet another is in Kleivi in Hallingdal "growth area". In the case of Førde, one of the most successful of the centres in terms of increase in population and employment, an active involvement

by the commune has meant that work on the general plan was initiated rapidly. The SIVA project was initiated with a good proportion of advance units now filled, and in addition an office has been established for the sub-regional planning team, who are working on the development of housing areas in neighbouring communes, to assist in spreading the benefits of the centre's rapid growth. An environment in which industry can flourish is being created in Førde and Kongsvinger, in the opinions of leaders of local enterprises /Nilsen 1972/; Førde has been picked out as well for its situation as naturally suitable for rapid growth as a medium rank service centre /Blinkenberg Nilsen 1973/.

b. The views of the regions

5
The whole country has now been covered by reports from the five regional planning committees /landskomiteér/, and the county plan report for Møre og Romsdal. The mandates were generally the same, with emphasis on questions of coordination of communal planning, on the geographical distribution of population and activities, on the forming of proposals for settlement policy, and on questions connected to the continued progress of "growth centres" /Østlandskomiteén 1969, p.10, Vestlandskomiteén 1969, p.1/ or of urban districts /NOU 1972:33, p.1/. The density of coverage of different subjects has varied greatly; in early stages the reports could be held to be lacking in subsidiary documents, for example Vestlandsplanen relies heavily on the prognoses advanced in a report on traffic development /TØI, 1966/ and other secondary surveys, while the reports on

North Norway, and Rogaland and the Agder counties are studded with references to specially commissioned research. One result is that the views of and hence the proposals stemming from, the reports differ according to the measure of influence of centre planners over industrial sector planners.

"For example, the Vestlands committee paid little attention to the rather urgent need for cooperation within the hospital and health service sector, while the development of the industrial economy and communications, hydro-electric projects, and factory building were accorded highest priority - issues chiefly bearing on the commitment of the state to the region."

/Berg 1973a, p.110/. *

In the reports on Northern Norway, Rogaland and the Agder counties and Møre og Romsdal, two principal concepts have been the urban districts, and the area lying within the journey to work zones of such districts. Initial work by Sandal was directed towards defining functional labour regions within 45 minutes commuting journeys of urban districts of varying sizes from 20000 to 2000 inhabitants in 1960 /1971, 1972/. In the country as a whole, only 75.6 percent of the population lived within such a distance of urban districts as small as 2000, in Sogn og Fjordane 23.2 percent, and in North Norway as a whole 38.0 percent. Further research for the report on North Norway showed that in 1970, 68 percent of the population lived within an hour's journey to work radius of urban districts of 1000 population, 66 percent within a two hour daily shopping trip by public transport, and 86 percent within a shopping trip of longer duration in the urban district at least three days per week

/Kotte 1972, p.80/. Sjøholt pointed out that in the view of SIVA,

*A.i.3

FW

Førde's command over the county's largest commuter hinterland, 12 000 people, greatly enhanced its attractiveness /1974, p.27/. In addition, communes within 45 minutes travel time of urban districts over 2000 in population increased in population by 11.3 percent between 1960 and 1970, for the country as a whole, whilst those further than that distance fell in population by 5.5 percent /St.Meld.nr 13, 1972-3, p.9/.

While the earlier three reports for Vestlandet, Østlandet and Trøndelag, regarded the centres as supports to industrial policy, or as an aid to decongestion in the area of the capital, the latter three for Møre og Romsdal, North Norway and Rogaland and Agder, have put forward centre policies justified with a greater independence from the industrial viewpoint. The North Norway report separates basic economic activities from "milieu" characteristics, and continues to hold that the job creating, value creating activities are necessary. The report places a rather high priority on the broadening of policy from simply creating jobs in industry, to the provision of commercial and social services, education, health, and a satisfactory physical environment /NOU 1972:33, p.295-310/. The report proposes the programmatic definition of the basis area, which is a centre of at least a thousand inhabitants, with a hinterland, where the centre provides its own, and the hinterland's inhabitants with the maximum possible supply of milieu characteristics. The ^{not very precise} hinterland is the area which has an acceptable travel time from the centre. The industrial and employment opportunities must be adequate so that the customer demand for the supply of milieu characteristics can be maintained and enlarged. The area ought to strive towards a balanced population growth at

FD

MD

at or near the same rate as a national average /NOU 1972:33, p.12/. These basis areas are seen as promising the fulfillment of the goal of "...securing future settlement: in all the sub-regions of the /whole/region, as these are/will be designated under the 1965 Building Act" /NOU 1972:33, p.3/.

The functional approach has enabled the industrial development area policy to be brought to bear more strongly on the settlement structure problems of the areas which were seen as weakly developed. In addition, it has provided not only for jobs for the populations living within the acceptable travel time radii of the centres, but also has paid careful attention to their other social, cultural and environmental needs. It has been adopted in both the Rogaland and Agder counties, and theMøre og Romsdal reports, where three tier centre systems of regional, subregional, and local centres are proposed /Engja 1972, p.13; Gustavsen 1973, p.119/.

c. The aims of spatial planning

Having identified weakly developed areas as characterised by weak or one sided industrial-occupational structures, difficult employment conditions, and unsatisfactory service provision /St.Meld.nr.13, 1972-3, p.4/, the structural changes anticipated in primary sectors become a significant independent factor. These hinge on the identification of numbers of holdings which are not capable, under current criteria, of giving a full year's work, and which may be expected to be deserted as labour moves to more productive occupations, "Planning and development policies in these areas must assume that the number of

jobs in primary occupations /especially in agriculture/ will continue to fall, and that the strengthening of the basis for settlement therefore must build on the establishment of new jobs in industry and the service industries". /St.Meld.nr.13, 1972-3, p.9/. The need to make these industrial and service jobs open to the largest possible number of work-seekers implies a location centrally placed within a given journey to work hinterland, a condition which falls within this very general goal statement. The future settlement pattern should be shaped so that the people, within geographical areas of a certain size, ought to have possibilities to be able to attain social and cultural objects of equal value /equal, i.e. in the subjective appraisal of the residents/, and possibilities for satisfying and rewarding work, and freedom of choice of occupations /St.Meld.nr.27, 1971-2, p.70/.

The development of the pattern of centres is seen as of the highest significance. Kveine paraphrases the argument like this:

"The population is often reduced in size in communes where the residents have no possibilities to reach an urban district of a certain size within the radius of a reasonable journey time. A centre structure ought therefore to be developed which makes it possible for the greatest proportion of residents in the /weakly developed/ areas to be brought inside an acceptable commuting distance of centres with a reasonable supply of jobs, and services". /1972, p.148; St. Meld.nr.13, 1972-3, p.14/. *

In Møre og Romsdal, the areas isolated in the county plan as being the weakest had, following this rationale, the greatest need for concentrated development, whereas the more prosperous areas could plan in a more decentralised way. The inadequacy of

*A.i.4

planning and development area policies in dealing with the problems which they have isolated as crucial is the root of the dilemma. "If one goes in for creating new jobs in industry or service occupations, this simultaneously carries with it a concentration to urban districts, precisely in areas where the need for decentralised effort would in itself be greatest" /Berg 1972, p.3/.* That is, the problem areas defined by the loss of places of work in primary occupations may, by and large, lie outside reasonable journey times to the centres, and the larger the certain size of the centre, the greater is the proportion of people who live outside its "boundaries".

IV. The Characteristics of Marginal areas

As a precaution before grappling closely with the marginal areas, it should be noted that the urban districts, and especially the eight largest metropolitan areas, four around Oslofjord, Bergen, Trondheim, Stavanger, and Kristiansand, exhibit planning and social difficulties which are equally as crucial from their residents points of view, as those of the marginal areas. That the marginal areas generate more political activity is due to their overrepresentation in the Storting, and because they are more united, whereas the urban problems affect the towns separately, not as an identifiable interest group.

a. Population trends.

The concentration of population into urban districts has not only occurred in the case of the capital, or the major regional centres, the growth of the smaller centres has also

*A.1.5

been founded on a steady flow of population from the surrounding rural districts. The smaller centres tend not to draw from other small centres, rather from rural districts; larger centres may draw both from smaller centres and the rural districts (Hansen 1975, p.268/). The measurement of population change through time within definite areas provides illuminating examples of the way in which regional or county results were composed of different components. The development areas were identified on the basis of their divergence from certain national averages and growth rates; within regions certain communes can be picked out as experiencing growth, while others experience depopulation. The smallest published statistical unit in the population census is the census district, and at this scale an even more finely grained picture develops.

Seventeen per cent of communes in 1966 were losing population at 1.5 percent per annum, a critical level of depletion, but even within communes containing urban districts, and with an apparently healthy balanced growth in population, the remote census districts still registered losses of this proportion. In Tromsø commune around one of the regional centres of North Norway, this is evident (Hansen 1972, p.20/), and in Lower Telemark, Hansen 1970, p.22/, in coastal communes south of Bodø in Nordland, where growth is tightly localised, and in the North Gudbrandsdal trade district and "growth area", where growth is markedly related to distance from Otta, the subregional centre (Myklebost 1974, p.148-151). The census districts over two hours journey time from Otta lost on average 12.5 per thousand annually between 1960 and 1970, while the districts less than one hour away increased on average by 5.5 per thousand per annum.

The demographic process is one of depopulation by age selective migration. Generally it is not the migration of formed and settled families, but of school leavers. Since it has been going for two decades at an increasing rate, and will continue probably in spite of a deceleration in urban concentration nationally, it leaves the age structure very hollow in the childbearing, and hard working age groups. Notwithstanding the larger family sizes in many of these marginal areas, the time at which deaths will exceed births has been passed in some remote census districts, and will be passed by more, more rapidly, as the present, last generation of adults cease to bear children. The stream of migrants could only be maintained with a sufficiently large population remaining to bring about a surplus of births over deaths. If the general reduction of the birth rate will also cut into the chances for population regeneration in the marginal areas, one can begin to number the years before the last residents are evacuated to old people's homes. The problem is of the proportion of the cohort of school leavers who choose to settle in their home communities: the outlook is grim indeed /Hansen 1975, p. 270-71; Myklebost 1974, p. 152/.

Another facet of the same process is the incidence of long distance commuting, involving a return home perhaps once a week. This is strongly felt in the forestry areas in Eastern Norway, but elsewhere as well, and is associated with the recruitment of labour for the construction industry. Investment is concentrated in the metropolitan areas, and in the major civil engineering schemes, especially hydroelectricity and road building, consequently so are the jobs, while the workers' families remain at home working, or very possibly not working their small farms /Myklebost 1968, p. 236/.

b. Occupations in the marginal areas

A basic criterion of development area and regional planning policy is that it is reasonable to anticipate a continued, even an accelerated fall in the demand for labour in the primary sector, because of increasing efficiency and structural rationalisation reducing the labour, and increasing the capital cost per unit product. That the amount of work done has fallen is unquestionable, Vabø cites 313 000 accomplished years work in 1949, that is the total amount of labour used, and only 149 000 in 1972; the area worked per years work rose from 2.9 hectares in 1949 to 6.1 hectares in 1972/1973/.

Where the farm income formed 63 percent of the farmers total income in 1949, it had sunk to 39 percent in 1972, and the income per years work received by the farmer reckoned in 1949 kroner had fallen from 890,- to 608,-. Of the 153 000 holdings in the 1969 agricultural census, only 51 000 claimed to have farming as their only source of livelihood. The others were supported either from pensions, or from work such as fishing, ^{and construction} longdistance commuting to buiding sites, and other part time work.

The form of agricultural policy which is applied under these circumstances is bound to be of importance for the creation or elimination of potential jobs in marginal areas. Borga has outlined a set of three statements describing current policy. First, it should aim to ensure the agricultural population a fair standard of living, achieved through increased productivity, particularly of labour, and that the increased productivity should result from technical progress. Secondly,

once demands have been met, markets should be stabilised to eliminate overproduction such that public spending is minimised. Thirdly, the consumers should be secured regular supplies at reasonable prices./1969, p.253/. The first stems from a micro-economic view of the farm as a production unit, the other two from government budget and welfare criteria. In this model, technical progress is independent, a product of commercial development in areas with the most advantageous natural conditions. A problem which arises is that market regulation becomes more and more necessary as productivity is increased. "If the market is filled, and the highest goal in agricultural policy is to increase productivity through technical progress, it is impossible to adjust agriculture by means other than a reduction of labour and land input" /Borgan 1969, p.254/.

Brox has pointed to a further result of the application in local communities of "the policies of separate sectors. Farmer-fishermen can obtain very substantial government support to improve their farms, in areas of apparently the most unsuitable character for dairy farming, and can then enlarge their herds, and add to the problem of regulating the milk market. At the same time they cannot gain anything similar in attempting to modernise the family fishing boat, even though the home waters are alive with fish /1966, 1971/. Even outside the primary sectors, the loss of jobs seems to be condoned or promoted by official policy. As an example of the local effects of agricultural policy one can cite the freight subsidy system for milk, which has removed from local dairies the protection they originally had from being located near the milk producers. Further, local communities dependent on steamer services have to pay freight

costs for cars and other vehicles between ten and thirty times as much as those which are connected to the state car ferry network. Both of these services receive substantial operating subsidies, but the local effects of these seem not to have been considered /Berg 1974, p.215/.

This weakening of the basic economic activities within marginal areas in terms of the population they support has further consequences in the service sectors, and indeed for the social services too. The school provision has already changed, with village schools either closing, or losing the older children to schools more centrally placed, since the raising of the school leaving age. The characteristic shop, the general store, is in danger as well when most of the other trip destinations, the local authority offices, the clinic, or more specialist goods lie in the centre beside the supermarket. Only ⁱⁿ the most remote areas where such trips are infrequent has the general store been surviving in anything like health /Elden 1973,1974,1975; Røsnes 1973/. Where the falling population has also reduced the number of active adults in the population, the informal self help, which persists doggedly, is sapped, and many older people who could have coped with the help of younger neighbours are thrown onto the social services now that their neighbours are mostly only of their own generation /Midre 1973,1974/.

V. Marginality and the Second Dimension

a. Political conflict

There is an unanswered question in the assumed definition of marginality, that it stems from deep running structural changes in the organisation of society, including the settlement pattern, and is specially manifest in the loss of jobs in the primary sector. The preceding section has proposed that the structural changes are not the work of an unseen hand, but are ^{only} actively reinforced by official policy. The suggestion in the first section that there exists a second dimension, is associated with these proposals. It is conceivable that the forms of social organisation and local autonomy and the perception of local resources will respond to centralising or modernising forces politically or culturally. The responses have formed as either an identity, like Nynorsk, an opposition to threatening policies, or powerful lobbying for government projects. That such political forces can be harnessed ^(for a short time) was demonstrated in the referendum on entry to the Common Market.

One can assert that the view of marginal area resources in official primary sector policies is very likely at variance with that of the local communities; however the general presupposition currently composing the trends in Norwegian society reinforce the official policy. These general presuppositions, in so far as they concern the concepts of career, occupation, and family life, have come increasingly to be shared by the young people who leave the marginal areas. They are conscious of the transition, and given different forms of choice, might choose to

remain. Under the influence of the present formation of Norwegian society, it is likely that for many of the young people their expectations of life will be met in the growing towns. How then can regional policy accommodate a set of goals formed by definite social processes, which it can meet only by flouting others ? One can well make this hypothesis: Present regional policy has to face the dilemma that in order to accommodate the future that might be chosen by the generations to come, it has to turn a deaf ear to the political opposition of the marginal areas. *Or it has to accommodate both by ad-hoc solutions and not only sectional ones at that*

b. The analysis of marginality

Although it is possible to define the situation of the Norwegian marginal areas in terms of universals, such as the broad currents of urbanisation or modernisation, this does not lead to a much deeper understanding of the structures or the changing relationships bound up in these universals. Here it is chosen to examine the relationships between geographically defined regions on the basis of theoretical speculations advanced in the next chapter. The subsequent three chapters serve as the empirical corpus of the work, exemplifying some features of the relationship of various geographically defined units to other such units, and examining their internal paths of development. The derivation of coherent statements about changes and transformations at county and local level, and changes and transformations in the external relationships of counties and local communities will be reserved for the concluding chapter.

The hypotheses which it is sought to expound here concern the nature and development of marginality in the Norwegian regions. One feels that the choice of Sogn og Fjordane as the unit for observations at a county level may be justified by its position

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of being in receipt of development assistance, and being one of the least prosperous counties in the country. More importantly, the county is fairly homogenously marginal, with no major urban settlements. At the local level, the rural community of Fjærland is the example taken; although with several unique characteristics, it will be seen from the analyses presented in Chapter 4 that this community is by no means untypical. Of other marginal areas. The relationships are observed within a nested box design /Elden 1975, p.170/, Sogn og Fjordane being marginal within Norway, Indre Sogn marginal within the counties of Western Norway, and Fjærland one of the most marginal communities in Indre Sogn.

2. ASYMMETRICAL INTERACTION RELATIONSHIPS AT THE REGIONAL AND LOCAL LEVEL

I Some Antecedents

- a. Growth centres and diffusion
- b. Local and non-local multipliers
- c. Centre-periphery systems

II An Economic Model for a Single Closed Unit

- a. Social accounts
- b. The sources of the income stream
- c. The distribution of the income stream

III Asymmetrical Interaction Relationships between Units

- a. Pure metropolis-hinterland relationships
- b. Transformations in peasant economies
- c. Transformations in the mode of organisation of production

IV Deep Structure and Superstructure

- a. The creation of modes of organising production
- b. The creation of the aims and means of planning
- c. Open regions and asymmetrical interaction relationships

Summary

This chapter is devoted to the consideration of theoretical approaches which may shed light on the processes of regional differentiation. In turn the contribution to the theories of the empirical studies is pointed out. The antecedents to the developments made here are reviewed, to form an even basis for construction. The substance of the three main sections of the chapter is a synthesis and extension of a number of key concepts, especially of 'asymmetrical interaction relationships' and of 'geographically defined social units'. A model purporting to be an anatomy of regional economy is described: the model is not an econometric one. This is extended by the consideration of the links between two such economies, one central and the other peripheral. This discussion is couched in terms of the various phases of nodes of organisation of production which may occur from unit to unit. The importance of the flow of institutional and organisational forms - superstructure - from centre to periphery in defining the basic economic structural relationships between them is stressed. Examples are taken from the organisation of co-operative enterprises, and of planning administration.

I. Some Antecedents

a. Growth centres and diffusion.

Growth centre theories, and their various synonyms, have been prominent key words in attempts to synthesise existing disciplinary approaches to regional development. As represented by the surveys of Hermansen /1972/ or Thomas /1972/, the then current conceptual ^M mélange included a certain measure of central place theory, some sociology of modernisation, and a large portion of the theories surrounding industrial development and linkage due to Perroux. These are intimately bound up with the diffusion of innovations, since in a Schumpeterian economic world it is the innovating industries which become dominant, and which are subsequently "creatively destroyed" /Blaug 1964/.

Shifting warily from Perrouxian /Santos 1974/ to geographic or banal space, Hermansen asserts that: "the process of development... can be conveniently described as the introduction and diffusion of successive waves of innovation in functional... and in geographic space" /1972, p.6/. In the same vein, Berry contends that: "if development is substantial at high levels, rural-urban differences are progressively eliminated and the space-economy is integrated by outward flows of growth impulses through the urban hierarchy" /Slater 1972, p.28; Berry and Prakasa Rao 1968/. In a subsequent work, Berry has pointed out that lower levels of welfare will persist in the interstices between the hinterlands of centres of a sufficient size to adopt such innovations, and consequently he advocated that these adoption thresholds be lowered, that diffusion time be accelerated

and that the effective distance to higher order centres be lessened /1972/. Development is regarded as hinging upon the successful adoption of innovations, which diffuse outwards in space and progressively work their way down the urban hierarchy. The function of stimulated growth centres is to increase the efficiency of this diffusion, and to extend its range in the interests of social welfare and/or development. Innovations have been divided into two groups, household and entrepreneurial innovations, on the basis of their functional relationship to the actors adopting them /Pedersen 1970/.

Two points arise in the discussion of the diffusion of innovations, one concerning their creation, and a further one concerning their adoption. In the case of diffusion processes carrying infections diseases the problem of creation is a medical one, and the question of adoption is to a large extent involuntary. Diseases do not constitute themselves either as a means to increase return from investment-entrepreneurial innovations - or to establish or supply a consumer market-household innovations. Small business do not catch rationalisation like myxomatosis, nor do households catch colour television like measles, although the results may seem similar. The diffusion of innovations is a typical blackbox model, with little to say in explanation of the actors' behaviour, except on occasion to postulate a certain conservatism or traditionalism in regions where adoption has been more sluggish than predicted.

We may assert that the diffusion of innovations has undergone a process of hypostatisation, and may now be associated with the set of generalities circumscribed by "development" and "modernisation" as an allsufficing explanatory concept.

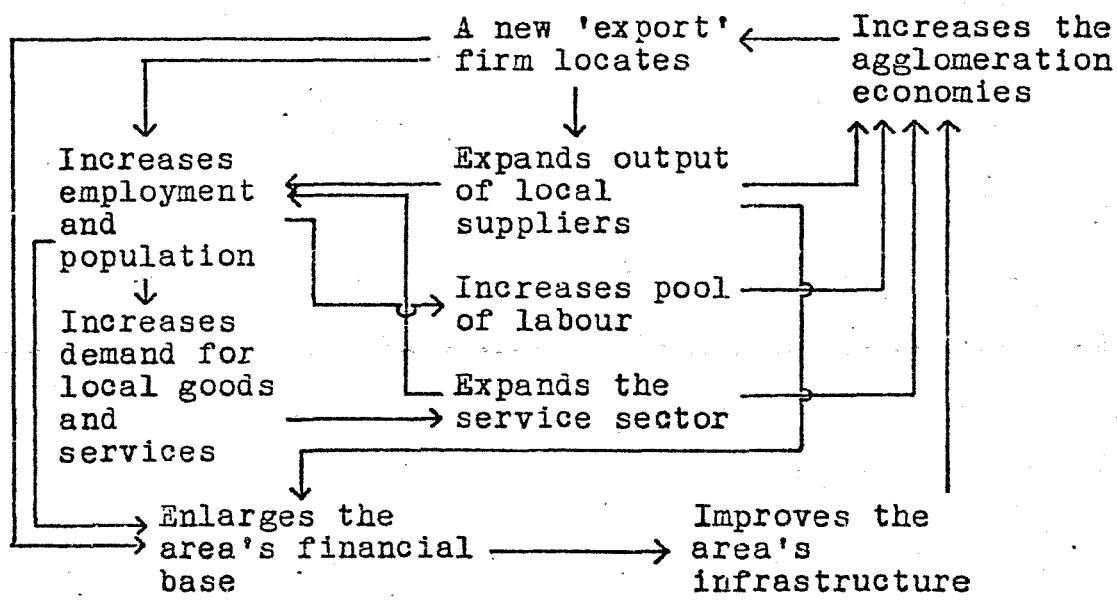
It is perhaps unfortunate that the discussion of growth centres has become pinioned under this clearly unsatisfactory explanation of process, and under the equally unfruitful debate about the "real" size of growth centres. It is a task of some skill to salvage something from this conceptual morass, and one may be very grateful for the clarity brought by Moseley's largely successful attempt /1974/. His focus on spatial planning, and consequent overriding concern for actual policy measures, for example rural transport was doubtless of value, but leaves something of a vacuum in the area of the theory of regional development which the growth centre conglomerate had pretended to fill. It is perhaps unjust so to defame the first attempts at synthesis which growth centre theory represented, since its heuristic value has been very substantial, not least to the present author. Its vagueness is however frustrating, and the conclusion that the black box of diffusion is, in fact, empty impells a return to more specific, if more skeletal, approaches to the theory of regional development.

b. Local and non-local multipliers

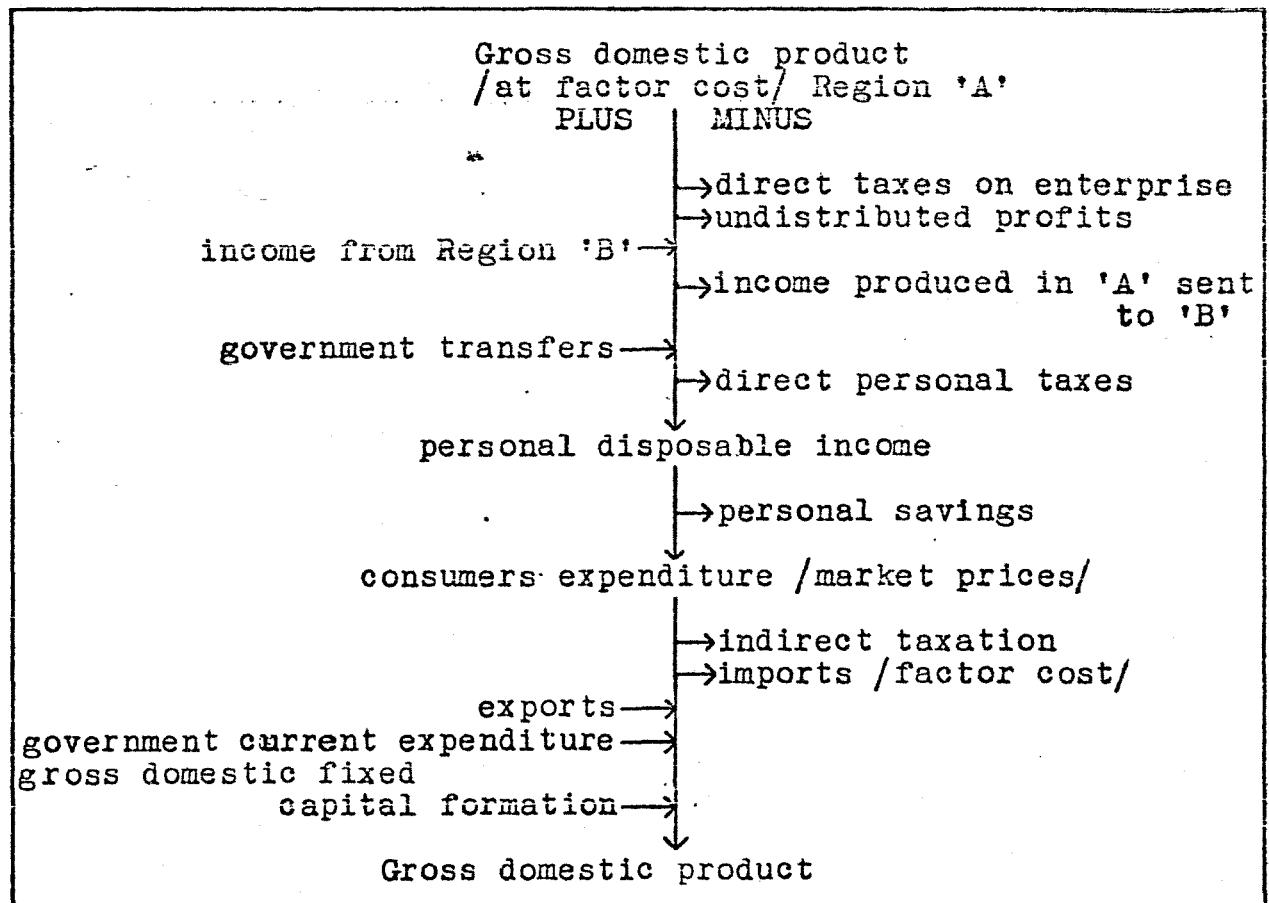
Taking a local, urban, or regional economy, it has often been found helpful to examine the consequences of an enlargement in its productive capacity. Approaches such as the economic base model and the study of employment and income multipliers have attempted to examine the effects of such marginal enlargements /Isard and Czamański 1965/, and these effects have been linked to the attractiveness of the economy for further,

cumulative growth, based upon agglomeration economies. A full discussion of the practical limits of agglomeration economies is to be found in Moseley /1974/ from whose work the accompanying figure 2.1 is derived /1974, p.98/. His conclusions concerning the spatial extent of such economies are a useful supplement to the regional growth theory advanced by Richardson /1973 a/. In terms of the demands of enterprises for labour, material supplies and services, it seems that a pattern of linked centres may function at least as adequately as a single urban settlement /Moseley 1974, p.112/. Indeed, the decentralisation of manufacturing industry from moderately sized centres was one of the major findings of a recent American study, throwing some doubt on the spatial concentratedness of agglomeration economies /Lewis and Prescott 1972/.

Characteristically multiplier studies examine the incremental effect on final demand of an increase in employment in or income derived from a newly established or expanded enterprise. Alternatively, the increment of extra income may be assumed hypothetically for the purposes of comparing the effect of such a marginal increase in different sectors or regions. In addition one may study the impact of the act of investment itself, which will typically have different consequences than the subsequent impact of its beginning to produce either jobs or wages. In a long and stimulating series of studies, regional economists have whittled down the impact on local consumption very considerably /Archibald 1967; Wilson 1968; Steele 1969; Sadler 1970; Brownrigg 1971; Steele 1972; Sadler et al 1973; Gordon 1973/. In a closed economy with no savings, all received income must be consumed, but in reality economies run on edible putty do



2.1 The cumulative process of growth



2.2 The regional multiplier

not exist. In the regional multiplier one must account for the proportions saved, taxed, and imported, simply in order to begin to get anywhere. Further refinements, such as government subsidies, profit distribution, propensities to import at different levels of income and so on eventually mean that the multiplier model could more correctly be called a model of leakages.

For example, Steele /1972/ has assembled a cascade of leaks which he considers are a bare minimum for consideration in regional multipliers /Figure 2.2/. Going further to investigate the impact of an act of investment, Brownrigg concludes that the total effect of an injection of capital may often be reduced below its original size, i.e. the multiplier is less than unity, because of the often large component of imported capital goods /1971/. Cumper derives a yet more disappointing finding, that where the amount of repatriated profit is large, it may be found that this profit is larger than the residual increase in regional income generated by the injection of capital, and hence the regional income multiplier will be negative /1970/. For the multiplier to lie below unity is not uncommon, especially in projects involving very heavy export or import commitments /Bryden 1973/.

This multiplier refers, naturally, to the town or region where the increment of investment is located. It is due to Pred /1973/ that we now can also use the term non-local multiplier. In the cascade of leakages shown in Figure 2.2, there is a little directedness in the leaks themselves; having left the region of study they cease to concern its multiplier.

They will however multiply elsewhere, and it is the location of this leaked spending power which is grasped by the concept of non-local multipliers. Although Pred does not concentrate upon the economic aspects of the concept, a number of pieces of evidence lead one to suspect that the economic ramifications are by no means negligible. Moseley's finding that the purchasing flows of firms and residents in the expanded towns he studied in East Anglia were directed up the urban hierarchy, as one should expect from central place theory, fits into this pattern /1973b/. So indeed do the further conclusions of the American survey cited earlier: Lewis and Prescott found that the central cities in their functional Economic Areas responded in terms of retail turnover to increases in income in the surrounding areas, but the smaller local centres did not /1972/. In addition, the Anglesey study indicated that an increase in incomes for one of the income classes on the island would result in a reduction of spending on the island, since their marginal propensity to consume was directed both towards imported goods and services, and towards centres located elsewhere /Sadler et al 1973, p.75/.

c. Centre-periphery systems.

In the time that has elapsed since the publication of the two seminal works on the development of centre-periphery systems, Myrdal /1957/, and Hirschman /1958/, in fact nearly two decades, it is surprising that so little has grown in the clearing which they made. Writing from opposed viewpoints, Myrdal for the periphery and Hirschman for the centre, they represented

at that time the culmination of certain trends within social science as a whole. One may contend that subsequent developments have stemmed from their work, certainly Frank /1967, 1969/ gained a good deal of his velocity from the experience of trying to use Hirschman's ideas. Friedmann/1972/ has refined the centre-periphery proposition to a set of theoretical statements which back up Hirschman's position in being uncompromising in their view that the forcing of centres into previously unpenetrated peripheries is necessary, or at least unavoidable given development as an innovation governed a-synchronous process.

It is possible to contend that Hilhorst's review is more balanced, and represents the interplay of the development of the centre-periphery system and its component subsystems more incisively /1971/. He introduced the initial stage of an extractive relationship between centre and periphery, followed by an integrative or distributive period when the peripheral political forces, specially peripheral élite, manage to re-establish their legitimacy in the eyes of the central bureaucracy. This is a substantial advance over Friedmann's model, where the peripheral élite is traditional, and is consigned to oblivion by the forces of modernisation. Until this point any definition of centre and periphery has been avoided, since the duality has been identified by the bulk of the above sources with ^{the} duality urban:rural, and the transformation of the system as a whole with urbanisation and development /Friedmann 1972/.

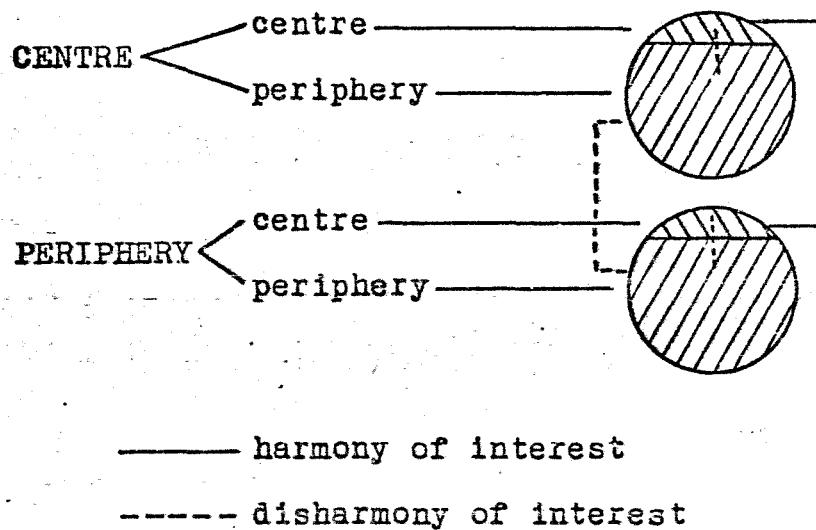
In describing international relationships, Galtung prefers to use the term "imperialism" to cover the set of

relationships defined by the existence of disharmony of interest between two collectivities which are coupled together in such a way that the living condition gap between them is increasing /1971/. He suggests that the angle between the two trajectories may be taken as the degree of disharmony existing in the relationship. From Figure 2.3, he proposes further to distinguish the centre in the Centre and the periphery in the Periphery, that is a nesting design. He asserts that the degree of disharmony is greatest between the Periphery-periphery and the Centre-centre. Although the spheres represent nations in his scheme, the internal division may be social or regional, i.e. the Centre-centre may be the dominant élite in the total system. In Hilhorst's meaning, the centre in the Periphery may act at different times as an advocate of local autonomy, or as a transmission belt forwarding value to the Centre. Galtung's relationships of disharmony - asymmetrical relationships - are directly parallel to Wolf's asymmetrical structural relationships between peasant producers of surplus and their controllers /Wolf 1966, p.10; Brox 1970, p.5/.

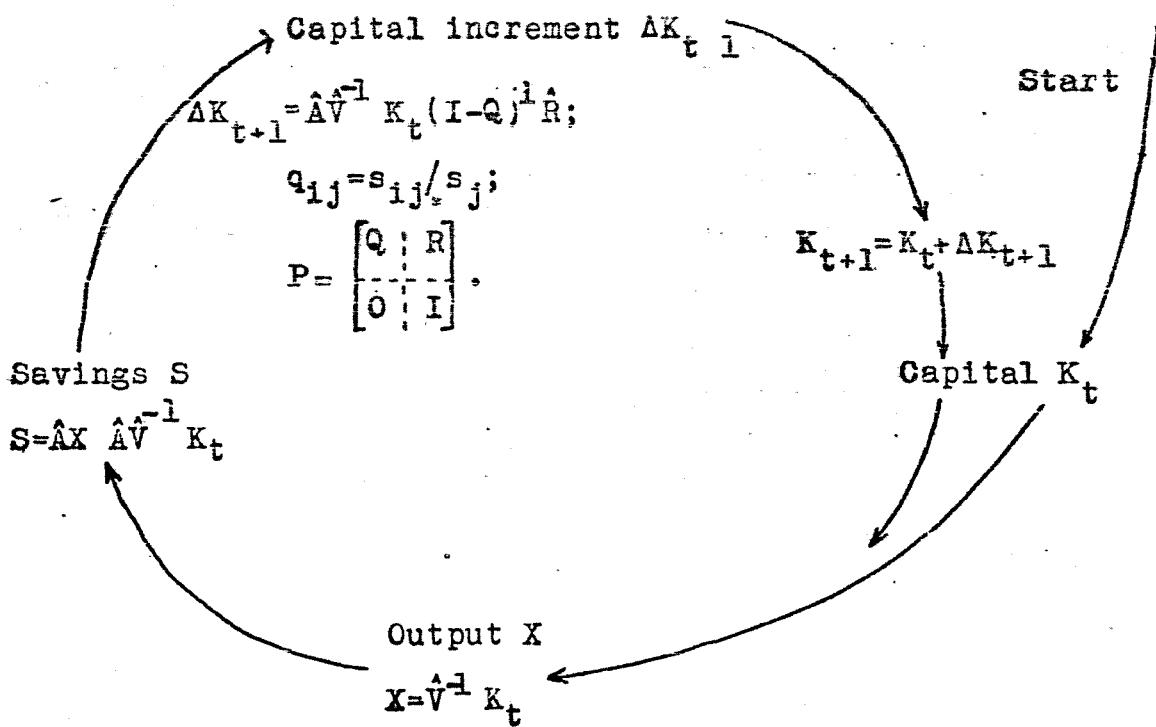
There is no obligation to restrict the use of Galtung's frames of reference to international relationships. There is indeed every incitement to use the conceptual framework to examine regional and local relationships, as suggested by Wolf and Brox. Such has been the aim of a series of seminars begun by Brox in the University of Bergen, and now continued by Torodd Strand. Some of the principal trends of this work have been summarised by Strand /1973, 1974/. It is from this source that a number of the main tools to be used in subsequent sections of this exposition have been taken. Firstly, the

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cumbersome but precise phrase "asymmetrical interaction relationship", the usefulness of which it is the task of this thesis to prove. Secondly, the "geographically defined social unit" which is arbitrarily defined and may exist at any scale. Thirdly, the definition of centre and periphery by means of the existence of an asymmetrical interaction relationship between a coupled pair of such geographically defined social units is of striking importance. A unit may only be spoken of as central if it possesses an asymmetrical interaction relationship with another unit from which it benefits more than the other unit : in that case a relationship between centre and periphery exists defined only by the existence of the relationship, not by definition by the characteristics of either unit. It can occur that the city is the centre and the surrounding peasant villages are the periphery, but such a conclusion here rests on the relationships between the two and not on the units as entities in themselves /Strand 1973, p.4; 1974, p.187/. As a geographical example, take a regional geographic view of dialects: one will map the boundaries between the observed occurrences of two forms of speech, and very possibly contrast their particular differences. Here the difference is immaterial if one's dialect has no consequence for one's ability to interact with others. However, should it be that one dialect is valued below the other in terms of interaction, an asymmetrical interaction relationship will exist between the two regions, and the degree of difference between the valuation of the two dialects will be the degree of asymmetry of the relationship.



2.3 Galtung's model of Centre-Periphery relationships /1971, p.84/.



\hat{V} = capital output ratio
 \hat{A} = propensity to save

Q = matrix of transient states
 R = matrix of absorbing states

2.4 Richardson's Markov chain model of interregional saving

II. An Economic Model for a Single Closed Unit

a. Social accounts

For the purposes of this section, the existence of a certain geographically defined social unit is arbitrarily assumed. In Langton's terms, the economy of this unit is a system, and it is comprised of a set of characteristics, which have in common their location in the unit. The state of each characteristic is constrained by, conditioned by, or dependent on the state of other characteristics /1972, p.128/. It is necessary to attempt to include all the characteristics which are related to one another, and to attempt to specify the way in which the state of the individual characteristics may be affected. The most elegant way of doing this is to construct a regression model, a set of equations specifying the condition of the characteristics and their parameters /Spivey and Wecker 1972/. It has however been preferred to use an *économie raisonée* /Best 1968/, with the intention of increasing awareness of the links by which such an economic structure is tied together /Langton 1972, p.132/.

Of prime importance in this analysis has been the discovery of the sources of fresh capital investment in the unit, the increment of newly invested capital accruing at the end of each time period. One's attention was drawn to this approach to the study of regional development by Richardson's model of regional savings and capital growth /1973c/. Figure 2.4 reproduces the system of circulation which he reduces to a two equation system, containing a relationship between output and capital,

and a propensity to save. In the context of Dománski's stimulating and thorough treatment of the development paths of units - he takes urban systems as his geographically defined social units - the categories of capital, output and saving are the elements of the system and the capital output coefficient and the propensity to save are the couplings between these elements /1973, p.39/. While one feels that Richardson's Markov chain model is a very satisfactory exercise in opening the subject to discussion, it is not a full treatment of all the characteristics necessary in order to give a deeper insight into the system of the economy as a whole. As a comment on the following analysis it is necessary to point out that it is a consciously naive *économie raisonée*. Use has not been made of a number of very powerful theoretical treatments of capital reproduction and accumulation because it was felt that they would overload the structure of the thesis. To that extent the model presented here is provisional and tailored to the measurements of the empirical world which is examined in the thesis.

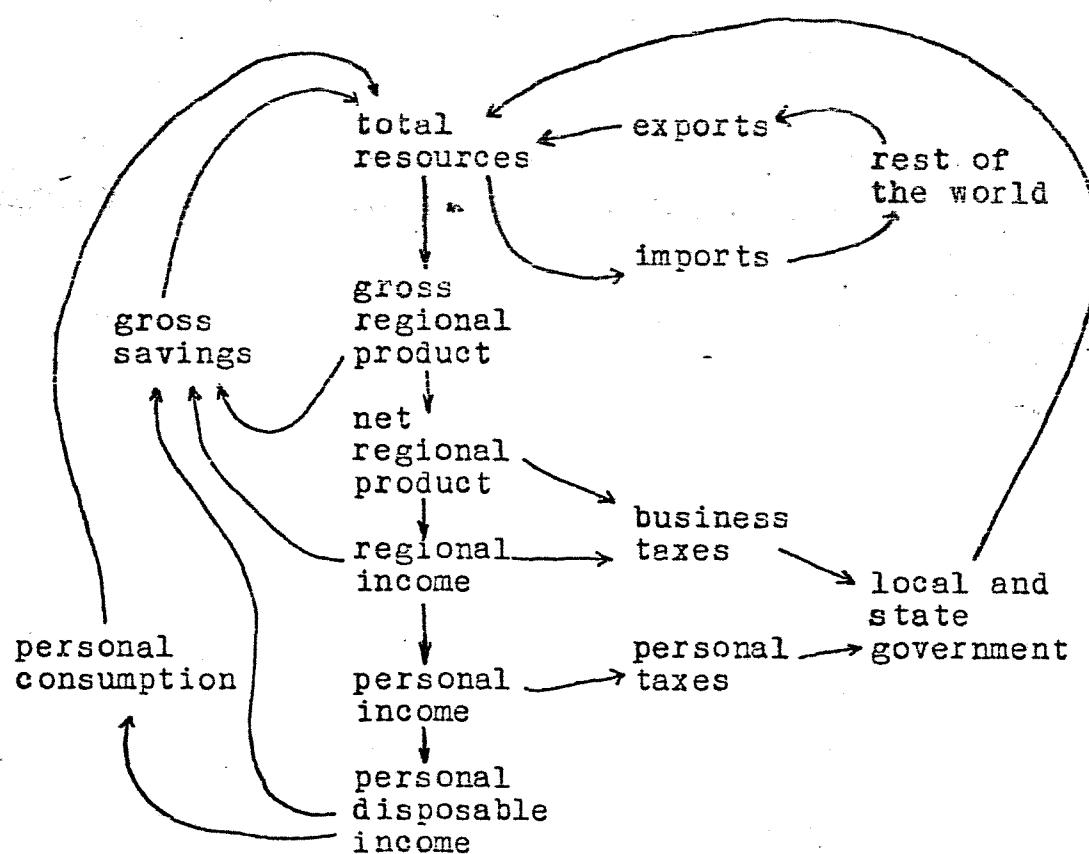
In the analysis of national economic systems it is found necessary to use an accounting system which may be described as social accounts. At a regional scale, these have been discussed by Stone /1961/, and Richardson /1969/ and the whole approach was treated without further outcome in three symposia: Hochwald /1961/, and Hirsch /1964, 1966/. The basic elements of a social accounts matrix are sketched in Figure 2.5, with the economy aggregated to four categories, production, appropriation, accumulation and external. It is important to bear in mind that "the social accounts matrix is a form of double entry book-keeping of intersectoral - or inter-regional - transactions, and does not by itself constitute a hypothesis about how the

economy grows" /de Castro 1970/. In national accounting, the model is highly disaggregated, including an input-output matrix in the accounting cell for transactions between production sectors, highly disaggregated import demand vectors, and detailed means to judge the impact of fiscal or economic policies /Bjerkholt 1970/.

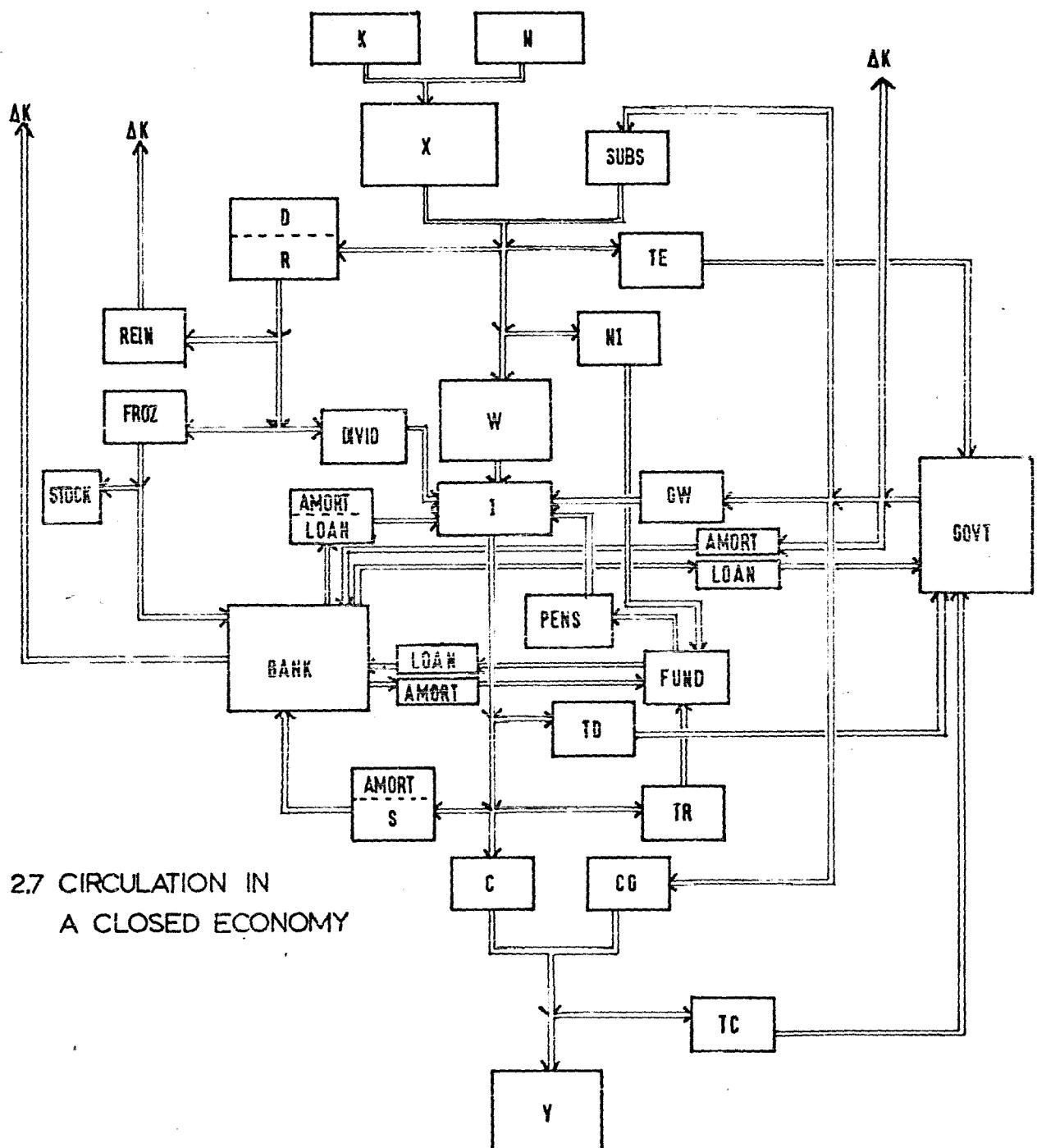
In regional studies, the number of applications of the concept of social accounting is small, but ^{one} ~~one~~ successful example is the study of account components for regions in the United Kingdom by Woodward /1970/. The proposals of Barnard /1969/ or McCrone /1967/ strike one as somewhat inconcrete, and the assembly by Czamański of a number of rather traditional approaches to regional science is not as thorough as one might have hoped /1973/. His circulation model of the Nova Scotian economy, shown in Figure 2.6, is not complete enough to fulfill the demands for completeness in the rendering of characteristics and their relationships which were made above. Probably the most complete use of an accounting system yet made in this subject area in the development by Wilson /1969/ of an integrated accounting- location framework for an urban model, constraining the changes in characteristics by their costs. This was elaborated by Broadbent /1971/, and used in the operational urban development model of Cheshire /Barras et al. 1971/.

payment to:	expenditure by:			
	producers	consumers	investors	rest of the world
producers		payments for goods and services	investment in capital assets	payments for exports
consumers	wages and profits			wages and profits earned abroad
investors	depreciation	savings		imports of capital
rest of the world	payments for imports	expenditure abroad	investment abroad	

2.5 Simple matrix of social accounts



2.6 Czamański's flow diagram of regional social accounts



Key to Figure 2.7

K	capital stock
ΔK	incremental increase in capital stock
N	labour
X	production
SUBS	subsidies to production
D	depreciation
R	entrepreneurial income
REIN	funds reinvested within the enterprise
FROZ	frozen funds
STOCK	fluctuation in stocks held
TE	taxes on the enterprise
TD	direct taxes
TC	taxes on consumption
NI	national insurance premiums
DIVID	dividends
W	wages and salaries
PENS	pensions and social security payments
GW	government wages and salaries
I	total personal income
S	savings
TR	transfers, insurance premiums
C	consumption
CG	government consumption
GOVT	government
FUND	insurance institutions
BANK	financial institutions
AMORT-	
LOAN	loans and repayments to and from the bank
Y	final demand

b. The sources of the income stream.

The model described by the flow diagram /Figure 2.7/ is far from being either complete or coherent, there is a great deal upon which to elaborate in the various channels of circulation. Perhaps first is that the top of the diagram could refer just to one machine, whilst the rest could be a state economy. It is not simply a matter of adding up the smaller parts in order to obtain the whole, a grave risk of error is incurred in extending the sort of assumptions which might be made at a small scale to a different one. In the model, the categories are treated as accounting entities, with as few assumptions as possible, for example, no attempt is made to hypothesise the division of income to labour as distinct from income to capital, or to suggest that the allocation of money by the financial institutions is governed by rates of return; the model merely exhibits some categories. The flows of commodities are absent from the diagram, but will be considered below. There is a serious problem over a possible differentiation between productive and unproductive sectors, chiefly private services, which do not fit happily into the present framework /Baran 1957/. To introduce many links more on the diagram would only make it more difficult to follow.

The productive process can be represented as a production function: $\text{output} = f\{\text{capital, labour}\}$; indeed Richardson's /1973a/ and Olsen's /1967/ models use production functions of some sorts. There is a substantial body of economic debate on the usefulness of production functions, the only thing that

can safely be said is that nothing is fully accepted. The use of the production function with marginalist assumptions can be criticised on grounds of discontinuities in returns to scale, when the function relating units of capital and labour is broken or inverted, as in the case of reswitching. As a description of the economic operation of a production machine it is useful, as Johansen /1972/ shows, it reflects the technical efficiency of the machine. But there is in fact no homogeneity between machines, they are built at different times using different techniques, repaired or rebuilt in such a way that a production function might require a full history of the machine.

His example is of tankers from the Norwegian merchant fleet as production units, and the fleet as the production sector, using these to examine the problems of production functions. He suggests something quite similar to Detkov /1967/, that the production possibilities in terms of capital, labour, material inputs, and scale of operation form a surface. The fact that capital once invested is then embodied in a durable machine means that investment decisions are made on this surface; in an interesting way Detkov incorporates location on this surface, so that the spatial distribution of production could be planned by choosing productive units of appropriate scale for different location patterns. However, one feels that the general models of the Richardson or Olsen form must fall foul of many of these problems, of the vintage of machinery, or of the heterogeneity of capital.

Considering the output from the productive process, a further variety of production function, the Leontief coefficient can be examined. This is the core of the input-output table, the quantity of deliveries from other sectors required to

produce a unit of a specific good. Johansen /1972/ in fact sees the normal ex-post function of a productive unit in this way, simply stating the quantities of other commodities used to produce the output after the level of capacity utilisation has been decided. Whilst the flow diagram concentrates on monetary relationships, commodity relationships are as significant, and form the material basis for the monetary relationships. Here also, the flow diagram is being used in a closed way, without imports or exports, and so the commodity relationships are limited to inter-industry transactions, and final demand, of the form:

$$X_i = \sum_{j=1}^n a_{ij} X_j + Y_i ; \quad Y_i = C_i + CG_i$$

where X_i = the output of the i 'th sector,

Y_i = final demand on the i 'th sector,

a_{ij} = interindustry transfers from the i 'th sector to the $j=1, \dots, n$ sector,

C_i = private consumption,

CG_i = government consumption.

This unrealistic condition of closure is created in order that similar models in geographical social units can then be joined together to show their interactions. When trade between units is shown, there also tend to be some sectors subject to strong competition from outside, and others that are relatively sheltered, which have to be treated differently if the input-output framework is to be used for forecasting /Johansen 1960, 1970/.

The recent work by Richardson /1973b/ on the use of input-output models can be placed into the context of this flow diagram. Certainly, the most effective impact studies, or multipliers, could be taken, as it were, from the reverse of the diagram, the link back from net consumption to output, taken as the Leontief inverse matrix, which will include direct and indirect effects, and when the household sector is made endogenous, the induced effects as well. But the problem with the multiplier tends to be its macro-economic basis, and the problem of all production functions is their foundation at the lowest level, that of the single homogeneous productive unit. Within this diagram there remains the confusion of these two levels, because the diagram could be compared to casting a marked straw into a river, to see in which direction the flow runs. From a single productive unit as the beginning, the straw flows down through income to consumption, without suggesting either the volume or the velocity of the flow. In order to make the model work for its living, to forecast size or speed of transfers, it will be necessary to deal with aggregation and interactions of all the constituent productive units within the region, which means using input-output, the only method available for giving a satisfactory result. The input-output matrix stands as the description of the commodity relationships which are otherwise omitted in the diagram. Without it, it is very easy to join the single commodity world which although analytically spotless, neglects the sectoral interactions through which the economy functions.

Having produced the commodity from our single productive unit, and sold it, through the input-output matrix, paid for

the material inputs, the residue, the net X_i , has to be distributed. This clearly varies greatly between the major social systems, this categorisation is inapposite to peasant economy, and irrelevant is a socialist economy because the private ownership of the productive unit would have been terminated.

$$\text{net } X_i = W + NI + D + R + TE$$

$$\text{where: } \text{net } X_i = p X_i - \sum_{i=1}^n a_{ij} X_i$$

p = price paid per unit of output

W = wages and salaries paid to labour

NI = national insurance payments

D = depreciation

R = entrepreneurial income

TE = taxes on the enterprise net of operating subsidies.

The taxes are far from fixed, given set legislation, an enterprise will adjust the other elements of its accounts to reduce the tax payments. In reverse, operating subsidies flow from the government to the enterprise, perhaps a payroll subsidy or price support. In this way the government can balance out sale prices and production prices between different commodities in order to sustain living standards and the production of capital goods. Of the division of the product going to wages and salaries, part is diverted immediately to National Insurance, pension contributions paid directly by the enterprise. Under a truck system, the company also provides the full range of consumption needs, from the same part of the total product, a good example would be a construction site or an oil rig or a merchant ship at sea.

Depreciation presents not a few difficulties, since it is a matter of practical accountancy rather than economics. There has been a strong tendency for depreciation allowances used in company taxation to rise, in fact a normal regional policy incentive is the freeing of such allowances, or at least the acceptance of a higher rate of depreciation. Depreciation is intended to be equal to the loss in value of the productive unit through time, so that when it is scrapped, the owner still has the capital with which it was purchased. But under conditions when it is difficult to establish even the real value of a machine, as apart from its purchase price, and also that only rarely will it be replaced by a duplicate, one may regard depreciation allowances as being closely tied to entrepreneurial income, and the two are manipulated in the preparation of the balance sheet to minimise taxation, to ensure a steady dividend, and gradual accumulation of capital within the enterprise. In theory, if a productive unit closed after a short operating career, the stock-holders should have received the full value of their investment from the depreciation payments, and the sale of the machine. In practice this is rarely so, partly because the business debts are usually on current account, and because the depreciation allowances are assimilated into entrepreneurial income. In any case, it remains a difficult question, since the amounts involved are characteristically very large /Baran and Sweezy 1966; Phillips 1966/.

Mentioned above was the rather indistinct separation between productive and non-productive activities. The notion of surplus value is at least as difficult, and the categories used in this section cannot do justice to it. It does not only

comprise the depreciation allowances and entrepreneurial income, but also some consequences of the methods of production. For example, it is possible to say that because of frequent changes in design, production is being wasted, or that up to a certain level packaging is a means of ensuring the safe delivery of goods, but above that again it is no longer a productive activity. Expenses incurred by the enterprise, apparently genuinely, are often only brought about by the mode of organisation of production, so that the legal or advertising consultants fees may also be part of this surplus value. There are indeed many desirable forms of non-productive activity absorbing surplus value at a state level, the health and social services, or entertainment, sport, publishing, radio and television for example. But in the regional context, the social definition of what entries are or what are not permissible in the accounts of an enterprise is of significance.

In the model a simple division of the entrepreneurial income into three parts has to stand for a much complex pattern. Part is reinvested in the capital account of the enterprise, in new plant equipment. A further part is retained within the enterprise, rather than distributed to stock-holders, either in the form of larger current account balances, or as larger stocks of materials, perhaps as a hedge against price increases. It may be held in the financial institutions, possibly for the acquisition of subsidiaries by merger. The remainder is distributed to the stock-holders as dividends: dividend payments are not the same as the profits of the enterprise, and the aim is not to maximise these payments, but to keep them steady, and to ensure a continuing growth in the value of the stocks on the

exchange. Since many investors are institutional, not private individuals, the dividend payment is less a jackpot reward for the risktaker, more a steady flow of funds needed for their own business. A regular dividend plus capital gains has given the share in an enterprise an advantage over government "gilt edged" stocks, but most institutions hold a mixed portfolio.

c. The distribution of the income stream

In the diagram, the three main actors in the financial world are represented as the banks, the fund - the pension and insurance institutions -, and the government through the national debt, short or long term borrowing from the other two. The banks are the "hot money" institutions of Richardson's model of money flows /1973c/, and they receive liquid assets in the form of savings from the income stream, and sums held for the pension fund, and for the enterprises. The pension fund receives transfers from the income stream, and directly from the enterprises, and from the interest on this total pays pensions, and insurance claims. This is a simplification in that many of the funds, for example of retirement pensions, health or unemployment insurance, are controlled by the state not by private financial organisations. However it should be clear that by grouping the funds together, one can see how they distribute the money which they hold. May state funds often make a virtually forced loan to the government, perhaps on unfavourable terms too. These pension payments, together with dividends and wages form the bulk of the income of the social

unit, the rest is contributed by government employees.

The income to the government comes from enterprise, income, and consumption taxes, as well as borrowing; and the expenditure is on repayments of loans, capital, and current accounts. In the same way there is a flow from the banks to an increase in capital invested in enterprises - adding to that reinvested within the firm - there is spending on the government capital account, providing new operating facilities for current account spending. In central government this may be chiefly under the military and administrative headings, in local government under education; to involve transport or utilities like water supply risks confusion at this stage. Current account spending is divided between wages, government final demand, and operating subsidies to enterprises. As Strand /1975/ pointed out, apart from work on specific regional policies, very little notice has been taken of the relative effect of government policy instruments between regions, the assumption has been that the same policy everywhere would have the same effects. Simply in educational policy in urban areas, the Plowden report has shown conclusively that this is not so, that in most policy instruments spatial discrimination has to be exercised /Westaway 1974a,b/. Much the same has been shown by Harvey /1971/ in relation to the accessibility of public goods; it is in fact becoming orthodox to hold that the direction of spontaneous - private - economic flows should be undertaken by changing the surface of spatial advantage. Richardson /1973a/ is very much in favour of this approach to the indirect planning of spatial development by baiting with infrastructure investment.

These activities of consumption, distribution, and transport, may not act satisfactorily in this way; whilst one can say that

they may arise spontaneously as a service sector to an existing basic industry, it is more difficult to argue that either they will attract such basic industry, or if they could, whether it would be the least wasteful way in which to construct or locate such an industry. The fabrication of such urbanisation or agglomeration economies is also part of growth centre policy, but until more is known about the effects of the coupling of these urban elements, these categories of public spending, and the stimulation of income growth, evaluation will remain a matter of guesswork.

$$I = TD + TR + S + C$$

where: I = total income

TD = direct taxes

TR = transfer payments to pension or insurance funds

S = savings

C = private consumption

The stream of income produced in the model is created to sustain the existence of the population of the social unit; their existence outside production is of equal importance but is largely ignored here. The last term, consumption, is in both monetary and commodity relationships the necessary counterpart to production. Recent discussion of central place theory suggests that a description of patterns of consumption in space may be made, using probability methods. A junction between the lines of work of Curry /1964, 1967/, and Wilson '1970,1971/, hinted at by Curry /1972/ would be of value. This will be presented more in place of proper consideration of consumption than as an adequate discussion of the categories involved. I would argue that the probabilistic treatment of consumption is

justified because of its mass character; it does not necessarily imply that all the differences between actors are random.

Curry's theory derives ⁱherarchical market areas, without definite boundaries, from the frequency of purchase of bundles of goods, from the inventories of the purchasers, and the retailers actions under uncertainty. Some common household goods, like bread, are purchased very frequently, and, related to elasticity, the retailer is fairly certain about the level of demand every day. For more lumpy commodities which are bought much less frequently, the retailer may be more uncertain about the demand and may feel it desirable to hold a larger stock. The uncertainty may be reflected in other ways than in the obvious division of the market area, perhaps using mail order, a means of removing any distance constraints. One may hypothesise similar frequencies, either simple, or complicated by seasonal influences, for many other activities. In terms of the use of transport, the journey to work, or journey to shops could be treated in this way; as could recreation and visits to friends and relatives. The method of frequencies provides a way of relating the activity of individuals or groups in the regional system to the overall demand at points in space and the loading of the transport network. The demand can be decomposed into frequencies occurring, as can the flows of goods and passengers, the frequencies being associated with bundles of goods and services, or journey purposes.

The link with Wilson's use of entropy as a maximally noncommittal statistical method is through the patterns of activity in space, formed by large numbers of individual actions at fixed points in time and space being represented by

the observed demands and flows, so that the precise pattern cannot be predicted at any one moment from the frequencies, but a range of likely alternatives could be modelled. It is probable that the frequencies will vary between regions, and that the costs of the same frequencies would also vary. The differences would not only be caused by income difference, or by different proportions of social groups, but also because of obstacles to mobility, which would demand a different pattern of residential settlement if a similar set of frequencies was introduced with a fixed cost constraint.

So the modes of action and couplings of some of the categories of the model have been described. Because of the form of the model, the link back from demand to production is far from clear, and the multiplier obscured. But it is hoped that at least the possible sources of capital accumulation within the geographical social unit have been exposed. This is emphasised because the increment of investment in production equipment, the increase in production capacity, seems crucial to regional development. It is from production that commodities flow, necessary for existence, and also the surplus used for social purposes, principally by the government. It is not only a matter of productive capacity, there is also necessary an interdependence within the economy of the social unit, via the input-output matrix, which enables the productive capacity to deliver the needed bundle of goods to final demand, and which directs the ^c increment of investment in production to such sectors as will enable the delivery of the next, subtly changed, bundle of goods. In this sense it is a spaceless model, not yet related closely either to its own unit or to other units.

III. Asymmetrical Interaction Relationships between Units

a. Pure Metropolis-Hinterland relationships

One of the major inspirations for the form of the model used here as an accounting model treated as an *économie raisonnée* has been the work of Levitt /1966/ and especially of Best /1968/.^{*} Best's categorisation of the relationships between metropolis and hinterland is as acute as it is individual, as may be seen from Figure 2.8. He differentiates between hinterlands of conquest to which only soldiers are sent, and from which only booty returned, and hinterlands of settlement to which metropolitan labour is transported, and which rapidly attain the standing of metropolii themselves. Between these two lie hinterlands of exploitation, which produce commodities rather than booty, but which rarely produce for their own consumption beyond that production which predated their coupling to the metropolis. His pure plantation economy is a species of hinterland of exploitation. The depiction of the different hinterlands is matched by that of Rościszewski /1974, p.49/, with some minor differences. The separation of hinterlands of conquest and exploitation is by no means fixed, since very often one will become transformed into the other.

The characteristics attributable to the pure "periphery" and the pure "centre" are reviewed by Strand /1973, p.42; 1974, p.188/. As may be observed from Figure 2.9, they correspond well with the forms of relationship sketched by Best. Strand's category of geographical couplings is involved both in the "Inter caetera" and in the "navigation" provisions, relating to the direction

^{*}see also Oxaal 1975.

The General Institutional Framework of collaboration between
Metropolitan and Hinterland Economies

Inter Caetera	defines exclusive spheres of metropolitan influence and limits the external intercourse of the hinterland
Muscovado Bias	hinterland restricted to either primary production or assembly; elaboration occurs only in metropolis, and with it the lion's share of value added
Metropolitan Exchange Standard	use in hinterland of metropolitan financial intermediaries, free convertibility at fixed exchange rates; guarantees metropolitan intermediation in hinterland payments
Navigation Provision	guarantees metropolitan intermediation in hinterland trade

2.8 Best's model of Metropolis-Hinterland relationships

*These dimensions should have been
better explained*

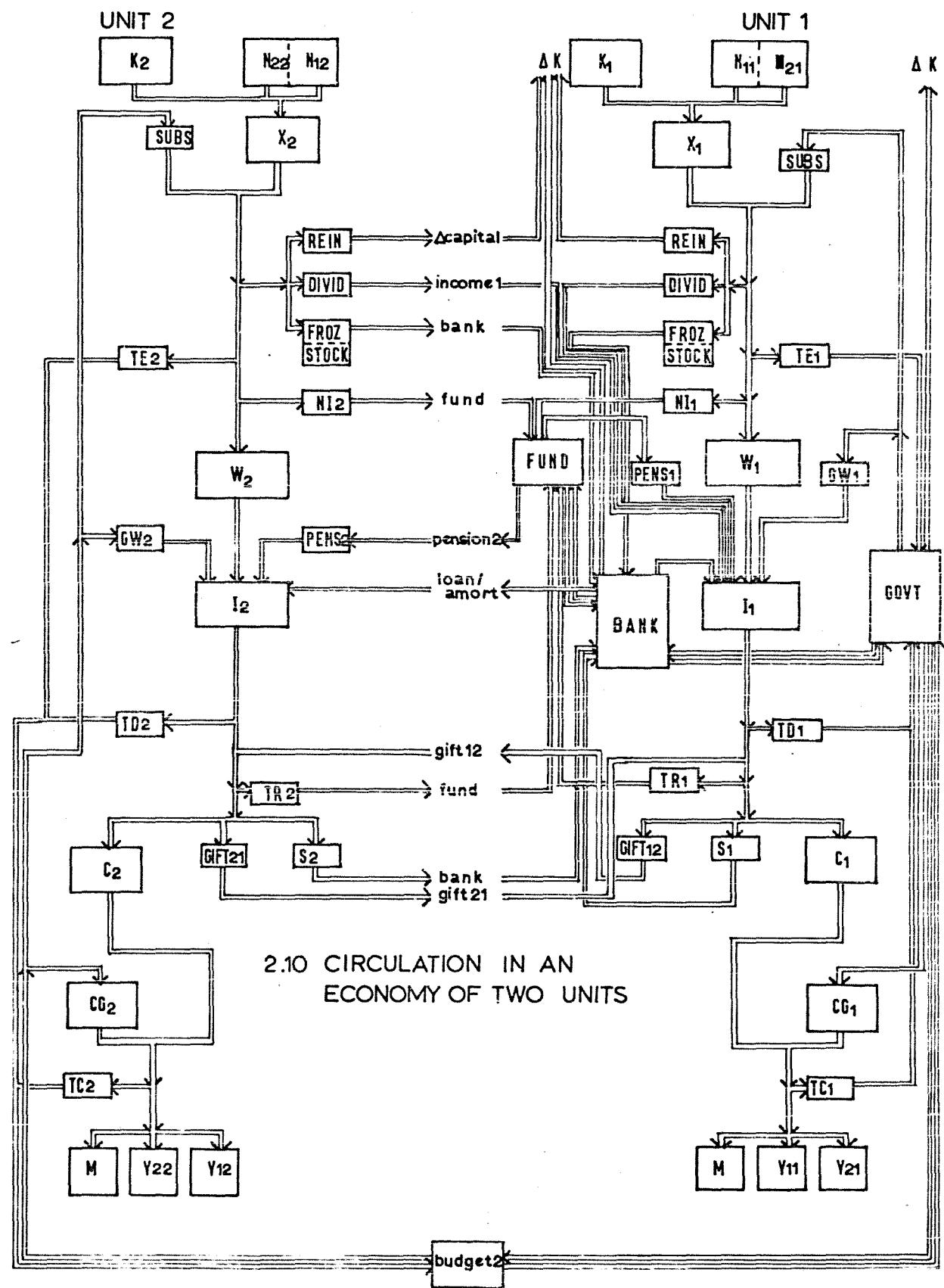
Characteristics of 'pure' centre and 'pure' periphery

PERIPHERY	CENTRE
<p>Geographical: Coupled to few means of transport. High absolute and relative contact costs. Poor position on transport network. Difficult access to other peripheral places.</p>	<p>Coupled to all means of transport. Low absolute and relative contact costs. Strong position on transport network.</p>
<p>Economic: Raw material production. Simple processes, one-sided, vulnerable production. Export of labour. Import of finished wares.</p>	<p>Finished wares, services produced. Expansion, agglomeration economies. Complex control processes. Import of labour. Adaptable business community. Control over capital. Contact with other economic agents.</p>
<p>Cultural: Accepts others language. Forced to take the consequences of others models of society. Consumes symbols created elsewhere.</p>	<p>Produces and spreads the symbol system. Represents expertise. Control of information media. Rejects symbols from periphery as irrelevant or unimportant.</p>
<p>Political: No strategic resources. Absence of elites, or only agents of centre in administration. Poorly represented in the centre. High costs incurred in assembling and putting forward views. Few initiatives.</p>	<p>Control over strategic resources. Concentration of elites. Over-represented in formal administrative organs. Low costs incurred in assembling and putting forward views. Many initiatives.</p>

2.9 Strand's model of Centre-Periphery relationships

of the communications network. "Inter Caetera" further governs Strand's cultural and political couplings, while both the "Metropolitain Exchange Standard" and the "Muscovado Bias" are implicated in the economic couplings. On the basis of these two listings of descriptions of "pure" relationships, it is of interest to observe the consequences of coupling two units, one pure periphery and the other pure centre. For this purpose, the model developed for a single closed unit above will be expanded, as shown in Figure 2.10.

To draw a clear diagram of the two unit system is, even having simplified the model somewhat, not so easy. Again the transfers from section to section will be elaborated upon here, and some of their consequences pointed out. In this diagram, the bank, the fund, and the government are located in Unit 1, trade with the rest of the world occurs in intermediate goods and to meet final demand, but the trade of Unit 2, the hinterland, is directed through businesses in Unit 1. It may be objected that by locating the government, bank, and fund in one unit, the consequences of the model are reduced, that the establishment of the metropolis is not explained. But these institutions characteristically spring up and intensify around the previous centre of power, or are very tightly bound together in the densest part of the network of business and government contacts: in addition they are associated with the location of the control functions of the major enterprises /Westaway 1974a,b; Thorngren 1970, Törnqvist 1970, 1973/. There are a number of consequences in this differentiation for the spatial pattern of occupational opportunities.



2.10 CIRCULATION IN AN ECONOMY OF TWO UNITS

Key to Figure 2.10

K_i	capital stock in the i'th unit
ΔK	incremental increase in capital stock
N_{ij}	labour force from the i'th unit working in j
X_i	production in the i'th unit
SUBS	subsidies to production
REIN	funds reinvested within the enterprise
DIVID	dividends
FROZ	frozen funds
STOCK	fluctuations in stocks held
TE _i	taxes on the enterprise in the i'th unit
TD _i	direct taxes in the i'th unit
TC _i	taxes on consumption in the i'th unit
NI _i	national insurance premiums in the i'th unit
W _i	wages and salaries in the i'th unit
PENS _i	pensions in the i'th unit
GW _i	government wages in the i'th unit
I _i	total personal income in the i'th unit
S _i	savings in the i'th unit
TR _i	transfers from the i'th unit
GIFT _{ij}	gifts from the i'th to the j'th unit
C _i	consumption in the i'th unit
CG _i	government consumption in the i'th unit
GOVT	government
FUND	insurance institutions
BANK	financial institutions
Y_{ij}	final demand for products from the i'th unit in the j'th unit.
M	import component of final demand

The origins of different parts of the work force, and their migration patterns affect the distribution of income, and through this the differences in opportunities between regions are affected by the metropolis-hinterland relationship. If migrants from Unit 2 are short term residents in Unit 1, a proportion of their income will be transmitted from Unit 1 in Unit 2 will be concentrated in certain occupations, principally those with longer training or more control. They may be those who are employed to run production in the hinterland, perhaps even in the interests of the hinterland. As Bryden /1973/ suggests, they are likely to have a different pattern of consumption, and are rather likely to have a higher propensity to consume goods not produced within the unit. Long term migration to the hinterland may occur in such groups as retired people, but the net flow, given free movement of labour, will be to the metropolis. This is chiefly because of the Muscovado Bias in the rather unconnected sectors of the productive industry in the hinterland, which tend to be either low wage industries, or industries in which the demand for labour is now quite weak following capital intensification. There may be a lack of job opportunities, and a low level of pay, but both of these are included in a generally poor range of occupational opportunities. The aspirations of those looking for work are derived from local and non-local information, national or even international channels of contact, and are not easily met in a local environment with a rather stunted distribution of career possibilities /Hannan 1969/.

The consequences of an act of migration are interesting to pick up: take first migration from periphery to centre. If the migrant was employable, then he either drew wages or unemployment benefit in the periphery, and his departure will reduce the income stream there. The reduction in the income stream will

Do not
understand
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have consequences for producers delivering to final demand in the periphery. In the centre the migrant will fill a job, but will also create a demand for housing, transport, and services which will mean that his effect in the centre is not just his wage added to the income stream, but also in the indirect effects through the expansion in the supply of goods and services which his demand has stimulated /Thirlwall 1966; Mishan and Needleman 1966; Winger 1971/. It is reasonable to assume that relatively little of this demand will leak back to the periphery. On the other hand, because of the higher periphery to centre leakages, the effect of a migrant's arrival in the periphery will also be experienced in the centre, and relatively more, according to the degree that the migrant to the periphery has marginal demand patterns favouring the consumption of goods from the centre /Bryden 1973/.

It has been quite popular to choose the Muscovado Bias, the unequal division of labour between regions as the cause of differentiation. But one could conclude from this that the pattern of economic activity had hardly changed, that there was no historical element in its development. Certainly one can plan the repair of a biassed industrial structures, to increase the interdependence of industries within a region. The ideal of completely self-supporting regions is unreal, because of a need to trade in materials in which some regions have natural advantages, and because some interregional division of labour in the most specialised industries is more than for each to carry out expensive research or production at a too small scale. It is probably desirable to intensify interdependence at a supranational level, in order to promote the development of member

states of co-operative organisations. But it is necessary that these interactions be controlled and planned in order to exclude the development of asymmetrical relationships: when the interactions occur through private organisations this is difficult to ensure.

But in the metropolis-hinterland relationship, the industries of the Unit 2 have no autonomy in production, they produce according to the demands of industry or final demand in Unit 1, or for export through Unit 1. Only in production for final demand in Unit 2 is there more independence, and here too the level of demand is externally regulated by demand for hinterland products. Also the productive units supplying hinterland final demand could either be at a low level, few possibilities to can or freeze foodstuffs, little capital remaining to invest in plant of viable scale, or they may have been absorbed or taken over by metropolitan enterprises, for example the Welsh breweries /Watts 1972/. The principal industries in the hinterland may well be among the most important in the units altogether, but they will tend to employ few at the plant who have any power of decision over matters greater than day to day production.

It is likely that these plants may be quite large, and incorporate many of the services that they require, from toolshops to cafeterias, they give quite an appearance of modern industry to the districts. Even if they were planned in the form of industrial complexes as proposed by Luttrell /1972/, the problems of the Muscovado Bias and of ownership may remain. In order to promote the repair of an industrial structure, to increase the actual interdependence between industries, rather than just a representative distribution of employed persons, a territorial industrial

complex of the form of Kolosovskiy /1961/ is needed. As is shown by Berg /1965/, Penouil /1969/, and Hansen^N /1967/, the location of modern industry is not incontrovertably a route to development. The production may not be interlocked with the regional economy, the plant may function as an enclave in the region, the hinterland economy lies in segments unconnected to one another. It is reasonable to look to the location of natural resources as one cause of a less than adequate spatial pattern of production, and to the cost of distance, but there remains a large residue which must be attributed to the development of the organisation of production.

b. Transformations in peasant economies

Since the transformation of peasant economies may be considered to be germane to the consideration of Norwegian marginal areas, a discussion of some theoretical developments is advanced here. In addition, it provides an entrance, perhaps a back entrance, to the problem of the mode of organisation of production in the above model, a problem which will be tackled more fully in the next section under the slightly more fecitous designation of "phase". The general issues involved in the system of peasant economy will be taken for granted here, they are based on the formulations of Chayanov /1924;1925/, Shanin /1971;1973a,b/, Franklin /1969; 1971/, and most concretely Gałęski /1972/. Within an isolated peasant economy, one can propose a scheme of rural stratification which corresponds to the conditions of many areas. Under the pressure of producing a surplus to pay rent, taxes, or to sell on the market, an originally homologous mass of peasant households begins to differentiate

itself. In Norway in the seventeenth century the burden of taxation was very heavy, and the peasants owned relatively little land, although they were not serfs, the church and the king were in a position of power /Kolstad 1971; Lunden 1969/. The differentiation of the peasantry proceeds in theory to create a rural poor, who have to work off their farms in order to live, and an upper crust of richer "farmers", "kulaks", who employ this semi-proletariat. The middle band of peasants gradually disintegrate towards one or other of these extremes, depending upon their natural resources.

In Norway the nineteenth century was marked by the rapid growth of a system of husmenn, cottars, who were transitory between leaseholding small peasants, and landless village poor. They laboured on the larger farms, but only in a few areas did any political conflict arise between these classes. Subsequently, in the second quarter of this century following the liquidation of husmann system, ^{mainly} by migration, all the remaining peasants and farmers were threatened by the problems of marketing their produce in the face of a collapse in demand from the towns. In order to inhibit their degradation to the ranks of the village poor, the middle peasants organised cooperatives for market regulation, using a political weapon to inhibit the impending further capitalisation of the rural areas.

This sketch of rural class differentiation is one-sided, as Gałeski points out:

"If the process of capitalist development and of capitalist accumulation are examined in the light of the fact that both country and town are parts of a social whole in which this process is occurring, then the scheme of changes in the village socio-economic structure outlined...above... will prove inadequate for the understanding of these actual changes. For that scheme is limited to an examination of the analogous effects of the process of capital accumulation

in town and country, whereas here the argument leads to a different proposition, namely that many of the social effects of the process of capital accumulation occurring in the village - and quite often its basic effects - have repercussions not so much in the countryside as in the towns

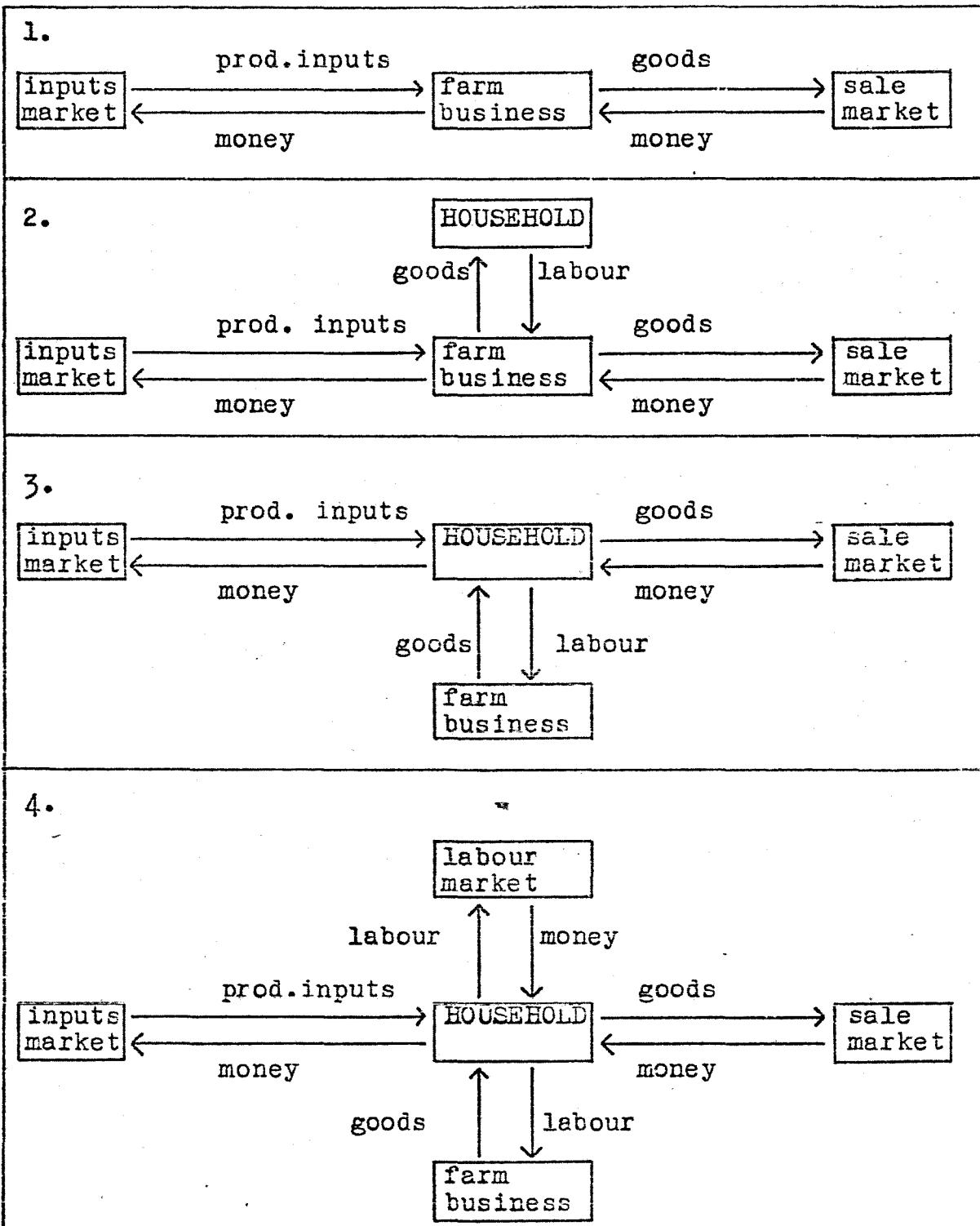
This proposition becomes even more convincing when one considers the changes in rural social structure. Excess labour-power freed in the village is absorbed not only locally, where it forms a rural proletariat, but also - even primarily - by the cities, where it becomes absorbed into the working class. Peasants with small-holdings do not necessarily have to seek work with their more affluent neighbours; as industry develops they can seek it primarily outside agriculture. They then come to constitute a semi-proletarian group largely outside the system of rural class relations.

Capital created in agriculture does not necessarily accumulate only in the hands of the rural bourgeoisie, but also, even mainly, in the hands of the banks...and so on. Even that part of the capital which remains in the farmer's hands can be, and usually is, invested not only in agriculture but outside it"./1972, p.114-5/ .

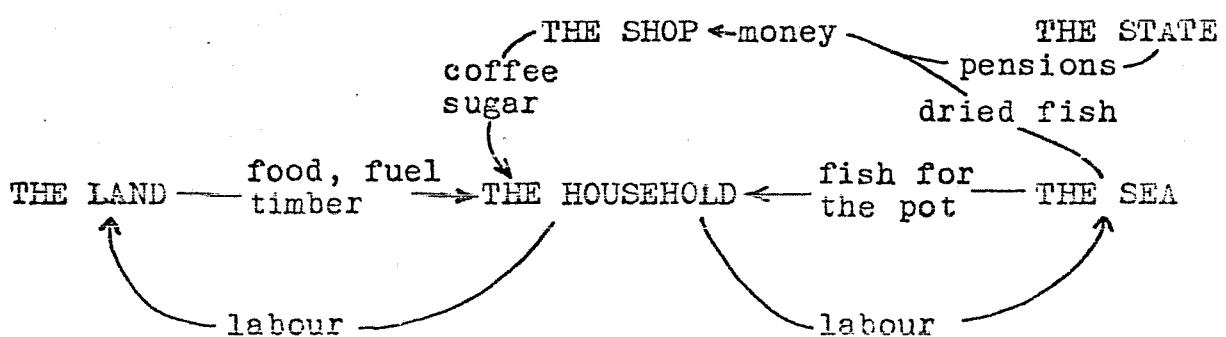
Treating the peasant farm as an economic unit one may assert that the farm which is totally self supporting, feeding, clothing, sheltering, and warming its household internalises the categories of rent, interest on capital, production and trading profit, and wages. Related to the available natural resources and the internal technical equipment, the labour input of the household will depend on the marginal benefit in terms of use value of an extra unit of work: the output is valued solely in terms of its value to the household. The obligation to pay taxes may be taken as equivalent to an arbitrary expansion of the household if the tax can be paid in kind, or labour time. Through the externalising of rent, either through leasing of the farm or ^tmorgaging it, a further arbitrary increase in output is demanded which must be met before the needs of the the household can be met. Depending the terms of trade, it will be necessary to sell some output on the market, thus sacrificing trading profit; such a sacrifice may be made to purchase equipment which can make production easier, but certainly not

for everyday consumption purposes. Rather than by trying to sell output from the farm, the same result may more readily be realised by finding work off the farm in order to raise the cash income. Where the terms of trade between the primary sector and industry move dramatically against the primary sector, the results may be serious, as in Norway during the inter war crisis years.

Solli has sketched the interaction systems of typical Norwegian farms in some detail /1969/. Beginning from a model of the farm as a business, he has successfully modified it to include the peasant household in the model, in a more satisfactory correspondence with reality. He stressed especially the subsistence relationship between household and farm, and concluded by stressing the central position of the household, and the relative flexibility which the household has had in evaluating the relative benefit to it of marginal extra drudgery in any one of a number of pursuits /Figure 2.11/. An example is given by Brox /1964^a/, from whom Figure 2.12 is taken. He has analysed the adaption of a small group of households to society at large, and especially to innovations, in terms of those households' evaluation of the innovations. They dispose a small cash income, from dried fish, and in order to earn more would have to spend much more time fishing. Consequently, it is better to spend two weeks cutting firewood than to have to earn kr.200 to pay for electricity for heating. On the other hand, nylon nets for fishing were purchased immediately they became available, since they increased production per unit of drudgery at sea, and paid for themselves very quickly. The peasant's evaluation of these innovations was hard-headedly rational, and corresponded to the needs and resources of his household. It was "traditional" only in that he valued



2.11 Solli's models of Farm-Household relationships



2.12 Brox' model of Hamarne, Fjords

his existing way of life above having to work on sea-going boats away from home for weeks on end, having to live in a town flat, and having to pay for recreation in the area in which he was already living.

c. Transformations in the mode of organisation of production

In the previous subsection it has been shown how small enterprises - peasant farms - may become differentiated from one another, both in isolation, and in interaction with an urban area which appropriates their interest, rent, and profit, and which consequently impairs their ability to accumulate capital. One may attempt to construct a register of modes of organisation of production, in which the peasant farm is perhaps the starting point: from the "farmer" phase onwards the transition into the business modes of production organisation becomes marked. These gradations are not distinct, and here are termed "phase", which neither implies stage, nor that phases necessarily succeed one another mechanically, nor that they exist in isolation, since all of them may exist simultaneously, varying only in their importance in given economic relationships. The economic landscape will have the equality of a palimpsest, with the more recently established phases overlying and by no means entirely obliterating those previously existing.

The phases one could register would run from a paternalistic small business, resembling the guild craft enterprise of master and journeymen, family businesses of various types, through partnerships outside the family to the joint stock company /Bull 1955/. Further one may use Hymer's categories, of national, multidivisional, and finally multinational corporation /1972,

Westaway 1974/. These apply not only to production and trading enterprises, but also to their financial intermediaries, associated with the development of credit, banking, and the trading of stocks. Using this concept of phases, one may examine the interaction relationships which arise when two geographically defined social units are coupled together, having different dominant modes of production organisation. We may return to the scheme of relationships advanced above in Figure 2.10, where Unit 2, the periphery, may be assumed to have only family businesses in manufacture and trading, and to have no financial organisations, nor any credit system as such. Unit 1, the centre has a stock exchange, a part of the complex of financial establishments located there, and the enterprises are more often run as joint-stock companies. They may even have reached Hymer's categories of national or multi-divisional corporation in some cases. There existed differences in the forms of organisation of production before the units were coupled : it is suggested that this will lead to the spontaneous development of asymmetrical interaction relationships. The Unit 1 financial institutions have at least the security of the Metropolitan Exchange Standard, and quite likely a higher or more regular dividend than funds invested in family businesses in Unit 2: savings from Unit 2 will tend to flow out. This will form one pressure directing the family enterprises to convert to joint-stock organisation, but it is not likely that they will be strong enough to organise their own exchange; they must seek funds on the exchange in Unit 1. Not only will the dividends then be distributed according to the residences of depositors in the financial institutions, but the character of the operations of the enterprise

must conform to the standards of the exchange in order to win the investor's confidence.

This will extend from the accepted rate of profit, assurances about the continued growth of the market for the enterprise's products, security in case of need for liquidation, perhaps to the presence on the board of directors of reliable metropolitan men to oversee the running of the company. There are a number of reasons to doubt that confidence would often be extended chiefly because the Unit 2 enterprises would tend to be absorbed by corporations in Unit 1, or to go into liquidation when faced by competition from centre based corporations, or to be blocked at their previous level of production. Asymmetrical interaction relationships would arise because the enterprises in Unit 2 would become dependent either financially, or by merger or close trading association with Unit 1 corporations. Enclaves of Unit 1 corporations would be established in the region of unit 2, typically of plants with very specific requirements for natural resources, but such enclaves have limited effects. In terms of the growth of the hinterland they contribute little /Cumper 1970, Francis 1969/, but in terms of development they are a blockage, absorbing labour and other productive resources which could have been better used in an alternative way /Bryden 1973/. The opportunities for change in Unit 2 are filtered through the financial institutions of Unit 1, and only those which may benefit Unit 1 are taken up: the possibilities of the periphery are seen only from the point of view of the centre, and within this, from the point of view of the forms of production organisation existing there. But central patterns are not only transferred by financial inter-

mediation, by merger, and by the copying of accepted practices, central consumption patterns are a strong reinforcement, moulding the periphery's demand and levels of expectation to match the production of central manufacturers /Best 1968, Beckford 1972, Brydem 1973/.

IV. Deep Structure and Superstructure

a. The creation of modes of organising production

One of the points mentioned in passing in the preceding sub-section was the difficulty which enterprises in the periphery faced in trying to move from phase to phase. In general, the operating rules of each phase have been generated in the centre, so that even when these rules are applied by a peripheral entrepreneur, this economic action necessarily subsumes that enterprise in the economic system of the centre. The organisational models of production modes are most frequently transferred unmodified to the periphery, either by direct penetration of central enterprises, or by the central compulsion to follow "standard" accounting and credit practices. It is even often a matter of doubt whether the administration of the central unit can wholly oversee the operating rules of large enterprises and banks, which may rather define the legitimate possibilities for the government.

It is now generally accepted that even quite large nations cannot gain a full insight into the operations of large linked enterprises, either under a single ownership, or tied together by interlocked directorships. It is possible to assert that

the generation of accounting practices takes place in these large enterprises, aimed at realising value from their relatively uncontrolled operations, for example by non-market pricing of sales between companies in the same group to avoid taxation in one area or another /Seers 1963, Girvan 1971/. The orientation directorates of these enterprises demand a full compliance with their business practices in entering negotiations with suppliers, and will concede nothing to businessmen whose enterprises operate to a different accounting tempo /James 1964/. Those trained in skills used in such accountancy practice innovation will be concentrated around the centres of information about business and trade, and thus the periphery will be denied their skills. So the periphery has a pessimistic appearance for the budding entrepreneur, few skills, little capital without recourse to central institutions, and an isolation from information rich business environments. Enterprises which do become established will almost obligatorily have to follow "accepted" accounting practices in order to survive /Westaway 1974; Törnqvist 1973/.

However, the periphery is not bereft of its enterprises: the co-operative movement in Norway and in many other countries was an attempt to break out of the stranglehold of "normal" enterprises over trade, especially in food processing, and wholesale and retail sales. The co-operatives almost without exception began from collective activity, often political, designed to achieve certain common goals. It has already been stressed how important were the years of the inter-war crisis for the Norwegian primary sector and market regulation. At that time there were over 600 dairies, now reduced by rationalisation

to 239, in 1971 /Almås 1973/. The dairies were set up to process the surplus milk of their members, not as such to compete against a private sector. On the other hand, co-operative fish processing factories in North Norway were set up with this aim, as a defensive action by small fishermen who felt discriminated against by the price and quality practices of the fish buyers. One may assert that these co-operatives were a phase of enterprise established by conscious sections of the peripheral population to serve their interests, particularly their economic interests.

What has happened is, however, not encouraging. The vast majority of the co-operative fish processing plants have gone bankrupt, since they too had to operate within market conditions and prices. They, in common with the private factories, could not accept very small deliveries, they needed to run throughout the year, while their members only wanted to work seasonally, delivering small quantities when it suited them. It was difficult to appoint staff to direct the factories, since the difficulties of financing the factories were eventually, inevitably insuperable. This led to problems between the manager and the workers, and the fishermen, since the factories could not afford to pay adequate wages, and the working conditions were also below standard /Otnes 1972/. The same sort of problems have arisen in the dairy industry, except that small dairies have been rationalised and closed, rather than bankrupted. The jobs to remote communities are quite large in number, but very often at the existing scale of operation it had become impossible to employ staff at the official rates, and to pay for their national insurance.

The pressure for rationalisation has come from two directions, from the dairy industry, and from those farmers who, having specialised heavily in milk production, need to receive the highest possible price for their milk. The dairy industry is limited by the fixed consumer price and the subsidy granted per litre, and by the efficiency of operation of its plant in attempting to maximise the farmer's milk cheque. However, the role of state policies, especially transport subsidies has led to the situation that although the dairy industry purports to be independent in terms of its economic and accounting decisions, these are in fact completely built upon subsidies, and consequently, with a reorganisation of the subsidy system, could lead to a slackening of the pressure for rationalisation. In any case, the industry has wholeheartedly adopted a business model of accounting, and applies it ruthlessly to cut costs. As Chayanov points out, co-operatives can only arise where local capital is weak, entrepreneurs are held back by forces of social cohesion /Brox 1963/. "Co-operation in capitalist countries is no more than an adaption of small commodity producers to the conditions of capitalist society, no more than a weapon in the struggle for survival". /Chayanov 1925/.

b. The creation of the aims and means of planning

In this short note, it will be proposed that the ability of the periphery ⁱ to generate planning goals of a concrete nature, the methods of analysis with which to approach them, and to secure the means to realise them is very restricted. One may begin with Baldersheim's model of accessibility and autonomy

in the institutional organisation of administration /Figure 2.13/. The consequence of an active communal administration having low autonomy but high access is that the flow of symbols and directives will come from the centre to that commune relatively strongly and rapidly. Baldersheim expresses this as reciprocal distance, that one unit in such an asymmetrical relationship must use a greater proportion of its resources to gain the same ends than another unit. In this case a commune will have to lobby hard and expensively to ~~realise~~ ^{can} an object which the state grant almost without cost: for example to win a special exception from regulations, such as planning regulations, which apply to the country /Baldersheim 1973, p. 33-2/.

At a regional level it has been pointed out that the expression of certain political phenomena as a "regional" problem has served to mask the detailed asymmetrical relations within the region not only between geographical social units, but also between classes. In this case, regional planning was created by a regional élite as a means of preserving their own grasp on the development of the area as a whole, an attempt to regulate and mask the unevenness arising in the course of development. The inequalities were largely local and social, but were submerged in a regional ideology /Rowntree Research Unit 1972a, b; 1974; Lebas 1974; Davies 1974/. Such a point of view is supported strongly in the development of the Norwegian brand of populism /Brox 1969b/; the criticism of the report of the advisory committee on North Norway by Brox and Handegard /1973/ is a stinging attack on the "sector" view of the region.

No they really propose comprehensive alternatives
They propose alternatives which are rather based on the concept of local communities, which they assert are the basic and most

important social unit in North Norway. Rather than that healthy economic sectors would lead to increasing welfare for the population, they hold that economic activity and welfare in these communities should be increased directly.

In Norway the 1965 Building Act obliged all communes to prepare a General plan, and where necessary to make zonal regulating plans for housing or industrial areas. At that date, the communes, and especially the smaller ones, possessed no planning staff or perspective, the budget for example was prepared to fill state obligations in education and the social services, and otherwise the administration worked from case to case, occasionally like a fire brigade /Olsen J. 1970/. The leadership in the commune, responsible for the decisions involved in the Generalplan, either represented distinct localities within the commune, or had a function of linking the commune into political activity at a higher level /Kjellberg 1965/. In many of the communes in remote areas, no attempt to prepare a General plan was made, simply from lack of resources.

In others, contacts with the county Development Office in relation to regional policy assistance applications led to some work being started on the plan. In most cases the plans had to be drawn up by outside, private consultants, who had many similar cases with which to deal; the General plan then corresponded very closely to the official guidelines as regards contents and yardsticks. Opposition, for example from people protecting agricultural land, was written off as traditionalist and against the interests of the commune as a whole /Österud 1971/. The plans of this period characteristically ring the communal centre with housing and recreational areas, designatin

large areas for industry, which it is hoped that national regional policy measures will bring into being. However, the number of communes in the country with finalised General plans is minuscule. It is only now that some voices are being raised against the General plan, holding that its form and yardsticks are totally unsuited to use in remote areas, where pressure to fit everything into the communal centre may largely be artificial, and where the need to build dense housing areas really ought to be absent, given the enormous areas in each remote commune which could be used for dispersed housing

/Aanesland 1974; Kyllingstad 1974/.

In this case, the stream of planning symbols even from outside Norway, from Sweden, and from architecture and traffic engineering as disciplines the world over /Strand 1969/, swept over the remote communes without any discussion of their suitability or consequences. The pressing need of these communes was for the defence of their work places in primary activities throughout the commune, in order to maintain a sufficient level of demand for the services proffered by the communal centre.

In the absence of the 1965 Building Act it is anyway unlikely that the communal leadership of these remote communes would have tried to organise any concrete planning of their own: their development activity is largely restricted to constructing advance industrial buildings and lobbying for projects in which the commune is interested. It may now be that a fierce political debate will arise in the communes about planning, and attempts may be made to generate plans in the periphery to serve its goals rather than simply to accept goals, means, and in fact a complete planning package from the centre.

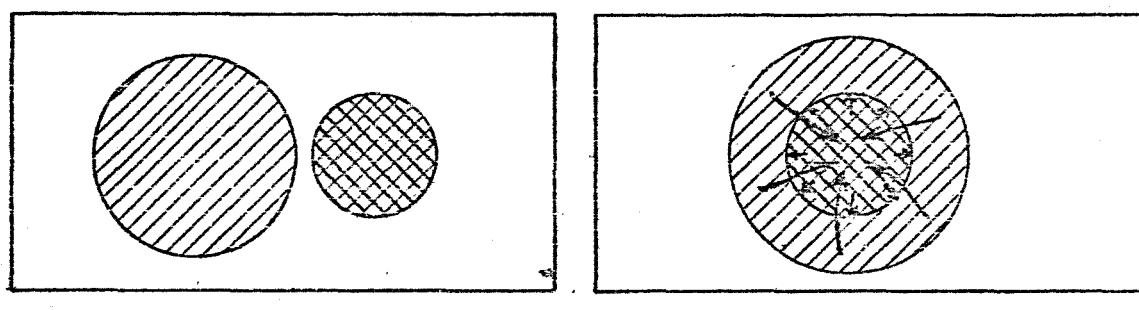
c. Open regions and asymmetrical interaction relationships

There is a paradox in the development of open economies, especially regional economies: the central and peripheral economies are open to one another, but the openness is not the same. The periphery leaks to the centre, its multipliers are low internally, while the centre benefits both from multipliers within its own unit, and from the periphery. One may also say that the periphery is an externally propelled economy /Best 1968; Beckford 1972/, and that its economy is typically segmental; it has more inter-industry links with the centre than it has within its own boundaries. It has little control over the disposition of its own resources, because its ability to accumulate and control capital is blocked, its labour and resources are employed and directed from the centre. Even if those blockages were removed, the patterns of organisation or policy would be copied from the centre using metropolitan skills and training. The openness of the centre serves to boost its production, trade, its accumulation of capital and skilled labour: the openness presents opportunities to metropolitan entrepreneurs to develop new forms of production organisation.

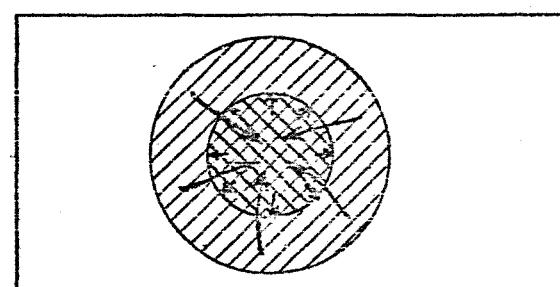
But autarky - complete self-sufficiency - is not necessarily a route to development: under autarky the blocks are more likely to be caused by natural conditions, a lack of resources, or the small scale of the unit /Amin 1970; 1973/. There is a balance between autarky and openness which may occur accidentally or which may be consciously sought, which gives conditions suitable for development. The openness has to permit an adequate accumulation of capital, while the autarky has to limit the

		Autonomy:		
		High	Middle	Low
Access- ibility:	High	metropolis- metropolis	state- federation	active commune- state
	Middle		expanding region - world market	passive commune- state
Low	isolated soci- ety - rest of the world	neocolony- metropolis		colony- imperial power

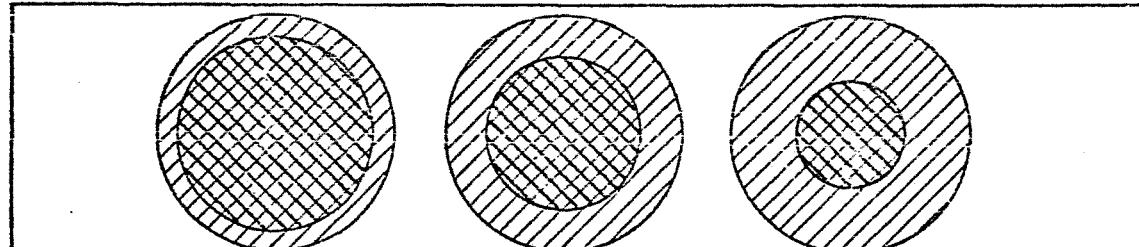
2.13 Baldersheim's dimensions of Accessibility and Autonomy:
hypothetical examples



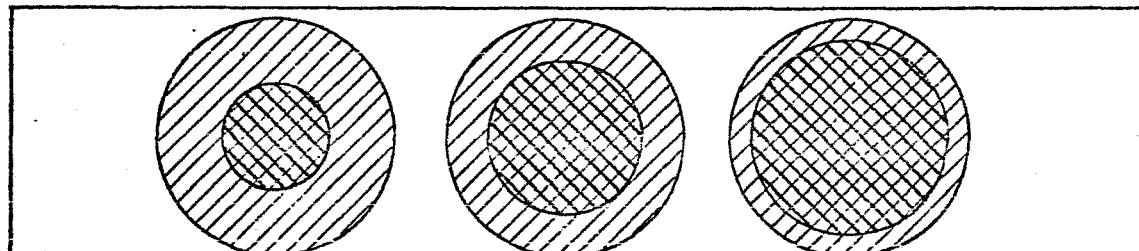
colony - metropolis



centre - periphery



increasing asymmetry in centre-periphery relationships



decreasing asymmetry in centre-periphery relationships

Openness

Autarky

2.14 Openness and Autarky illustrated

regions within which that capital may circulate /Figure 2.14/. Asymmetrical interaction relationships may arise where the two characteristics are bounded differently, when a core or metropolitan area receives the capital accumulated over the whole, but permits its circulation to transform the economic and social structures only within the core. The periphery is open, but excluded from the benefits of autarky: however it is precluded by the *Inter Caetera* provision from seeking better terms from another metropolis . It is this general structure of relationships and their changes which will be examined using examples taken from Sogn og Fjordane.

3. REGIONAL DEVELOPMENT POLICY AND SGN OG FJORDANE

I Sogn og Fjordane: a Marginal Norwegian County

- a. The county in outline
- b. Policy measures and administration

II The Economic Structure of Sogn og Fjordane

- a. Production
- b. Circulation and the income stream
- c. Structural relationships in the economy

III Labour and Investment

- a. Hydro electric construction projects
- b. Årdal Verk
- c. Labour recruitment and its consequences

IV Industrial Services and the Phase of Enterprises

- a. Prøvesentret Førde
- b. Linkages and service demand

V Savings Banks in Indre Sogn

- a. Functions of a savings bank
- b. Savings bank performance
- c. Savings banks and the use of accumulated capital

VI Communal Planning and Regional Development

- a. Sogndal in Indre Sogn
- b. Førde in Sunnfjord
- c. Planning and policy

Summary

Sogn og Fjordane is a county in Western Norway, which ranks with Northern Norway in its receipts of development area assistance. A regional report of 1969 recommended the development of two centres in the county, Førde and Sogndal, which have labour market areas covering most of the county. The reaction of the county was hostile, opposing any threat to the rural communities which have made up the county. The economic structure of the county, production and distribution, is described. Stress is placed on the absence of internal articulation, except in the farming, fishing, and food processing complex. Four areas for further investigation are distinguished, in an attempt to map out the interaction processes which operate to influence the results of development policy. Firstly the role of large aluminium plants is examined as suppliers of jobs, related to the continuing mobilisation of workers joining the construction industry. Secondly, the potential local linkages of firms located in the "trial" centre Førde are evaluated. Thirdly, the functioning of the local savings banks is described in terms of the supply of and demand for investible capital in Indre Sogn: much saved capital leaks out of the sub-region to national financial centres. Finally, the planning strategies being followed at commune level in Førde and Sogndal are reviewed.

KEY

County Boundary



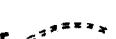
Major Roads



Other Roads



Roads closed in winter



Vehicle Ferries



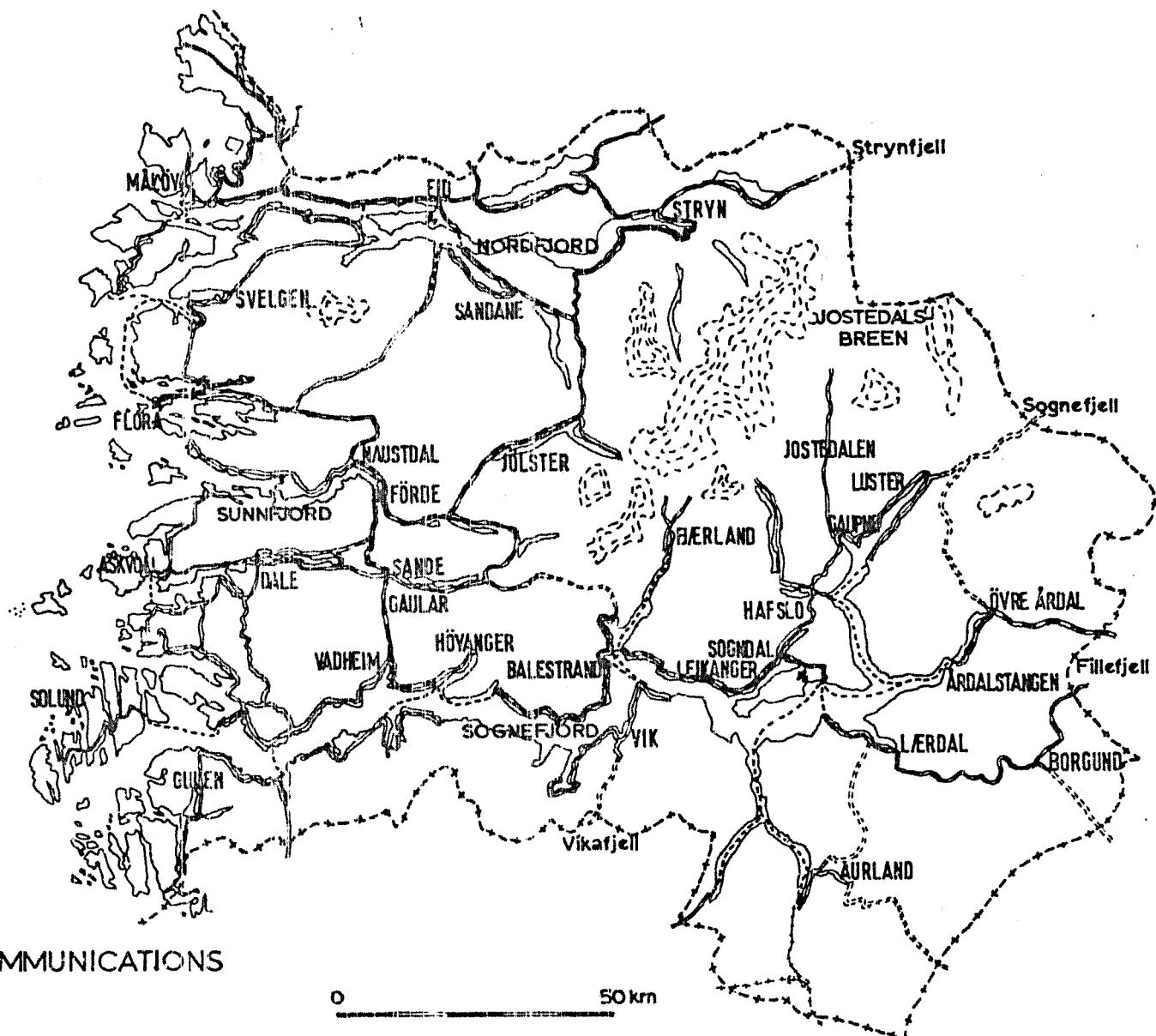
Railway



Airfields



Ice-caps



3.1 SGN OG FJORDANE COMMUNICATIONS

I. Sogn og Fjordane : a Marginal Norwegian County

a. The county in outline

The land area of the county is 17 829 km², a little larger than Jamaica, but smaller than Wales, of which 2.7 percent is cultivated, and a further 11.5 percent is productive forest, leaving 85.8 percent of mountains, moorlands and glaciers /NOS A 640, p.109/. The coastline of the mainland measures some 2075 kilometres, and of the numerous islands a further 1774 kilometres. Sogn og Fjordane is deeply incised by fjords, with Sognefjord and Nordfjord being the longest. In terms of accessibility the county is perhaps still more split up by mountain ranges. The fjord sides are steep, and consequently there is often only a narrow band of land above the waterline, and up into the valleys that is habitable. Only in a few places, for example in Sunnfjord, are there any larger lowlying areas.

Settlement is spread along a narrow coastal band, on many larger and smaller islands, along the fjordsides, and in the valleys. On the coast, the basis for habitation has always been fishing, partly combined with farming. Further inland farming is the most important activity. There are also individual industrial settlements, like Høyanger, Årdal, and Svelgen, which are built around single factories. These have great importance in their own communes, but are too isolated to become centres for larger areas. Generally, one can say that settlement is located according to the preexisting means of subsistence. While small boats were used for fishing, and further while a subsistence household economy was practised,

*A.iv.3

it was very desirable to live as near as possible to the fishing grounds. Farming settlement is of course tied to fixed resources, and most of the large industrial establishments are big users of electrical power, and are located according to energy availability /Aksjonsprogram 1967/.

Within Western Norway the county occupies a special position in relation to population change and occupational structure. Table 3.1 shows that while Hordaland and Bergen, Sogn og Fjordane's partner counties in the Vestlandskomiteen, and Møre og Romsdal, all increased at or around the rate supposed to correspond to the natural rate of growth of the population, 0.80 percent per annum, this county did not, during the past nine years.

Table 3.1

Population change by county 1965 - 74

	1965	1970	1974	yearly change %
Møre og Romsdal	216522	223502	229407	0.67
Sogn og Fjordane	100890	101133	102261	0.17
Hordaland	157790	163040	168186	0.70
Bergen	195600	207984	214470	1.14
Vestlandet	670802	695659	714324	0.71
North Norway	436724	454121	463381	0.67
Norway	3591234	3866468	3972994	1.18

/St. Meld. nr.32, 1974-5, p.7/

During the five year period 1961 - 5, the county experienced a net migration balance per thousand population of - 6.0 per year, in the next five years 1966 - 70 of -5.4 per thousand per year, and finally over the three years 1971 - 3, - 1.12 per thousand per year /SSB Statistiske Analyser 1, 1972, p.50; above Table 1.3./. As the most recent parliamentary report comments it is difficult to explain the recent improvement

although there may be reason to suppose that the reinforcement of regional policy is perhaps one of the causes /St.Meld.nr.32, 1974-5, p.7/.

The division of the population between economic sectors in 1970 could be taken as an almost ideal definition of a weak industrial-occupational structure. As Table 3.2 shows, in 1970 30.7 percent of the economically active were occupied in the primary sector, and only 34.2 percent in commerce, transport, and services.

Table 3.2
Economically active by sector 1970 percentages

	total	primary	industry	construction	transport services
Møre og Romsdal	78975	17.9	31.3	9.2	41.6
Sogn og Fjordane	35508	30.7	22.8	12.3	34.2
Hordaland	73106	13.7	34.4	11.7	40.2
Bergen	63525	0.2	23.1	7.6	69.1
Vestlandet	251114	14.0	29.0	9.9	47.1
North Norway	147725	20.2	18.7	10.9	50.2
Norway	1471169	11.1	27.6	9.2	52.1

/St.Meld.nr.32, 1974-5, p.7./

Even in North Norway, only 20.2 percent were occupied in primary activities, which itself was a large proportion compared to 11.1 percent in the country as a whole. The decline in the number active in agriculture and fisheries, and the growth in those active in the tertiary sector, were not greatly different from the national rates of change between 1960 and 1970, for the county - 28.3 percent and + 19.4 percent. From Table 1.1 above it may be recalled that the county was ranked last on the following variables: taxed income per resident taxpayer; retail turnover per capita; and doctors per 1000 population; there were also

the lack of a
county
capital

relatively few car registrations, telephones, or new housing completions per capita. However, the county had the second largest number of primary school teachers per hundred children, the highest proportion of pupils using Nynorsk, 93.7 percent in 1972, and a poll of 69.2 percent against Common Market entry.

The county has been served by Bergen and Ålesund as centres through which contact with the outside world was articulated. From Sogn, most trade which was not done in Lærdal, passed through Bergen, and for many villages, their only link with the outside markets was through Bergen /Thue 1971/. In the last decade, the area of influence of Ålesund has been spreading southward from Nordfjord, but has been supplemented by the growing competitiveness of centres within the county /Smørdal ^{County's} 1974/. In 1960 only 24.6 percent of the county's inhabitants lived in urban districts /described above Chapter 1, p.22 /, and in 1970 still only 33.7 percent did; of these the proportion living in urban districts in the onesided industrial towns of Høyanger, Årdal, and Svelgen was about 40 percent in 1960 and 36 percent in 1970. In 1970 there were no centres as large as 10 000 in population, Florø being the largest centre, other than the industrial towns, then having just 4416 inhabitants.* Only 46.5 percent of the population of the county then lived in communes within 45 minutes journey of a centre with a population of at least 2000, and fully 53.5 percent had to travel further than 45 minutes from their home communes to reach such a centre. Of the country as a whole only 15.9 percent of the population lived in such isolation, even in North Norway only a little over a third, 36.7 percent, had such isolated dwellings /St. Meld. nr. 13, 1972-3, p.11./. In outline, therefore, the county is

*A.iv.4

thoroughly marginal, in population trends, in occupational structure, and the lack of any centres and an exceptionally dispersed settlement pattern.

b. Policy measures and administration.

The county is now included with North Norway in the zone where development area policies are applied most strongly. Investment subsidies may be granted up to a limit of 35 percent, transport subsidies are available, and as from January 1975 the employers National Insurance contribution has been fixed at 14 percent in contrast to 17 percent of the gross wage in areas outside the 25 and 35 percent investment subsidy /NOU 1975:2/. By the end of 1973, the county had received a total of kr.264 million from Distriktenes Utbyggingsfondet /D.U.F./, kr.163 million in top-financing loans, kr.64 million in investment subsidy, and kr.37 million in loan guarantees. Of this, 72.5 percent was invested in industry and 21.2 percent in the tourist sector. The amount received in specific years has been very variable, because of the completion of larger projects; for example kr.69 million was used in 1972, but only kr.48 million in 1973 /Sogn og Fjordane Utbyggingsavdelinga, 1974, p.35/. Among the large projects has been the Industrial Estate in Førde /SIVA/ which at the end of 1973 encompassed thirty hectares upon which stood finished buildings with a floorspace of 16 262 m², with a further 2100 m² completed in early 1974. At the end of 1973 230 people were employed on the Estate, and a considerable increase occurred during 1974, with recruitment to a number of newly completed plants /St. Meld. nr. 87, 1973-4/. Further, by the end of 1972, nearly kr.34 million had been

borrowed from the Kommunalbank for purchase of land and planning by the communes /Sogn og Fjordane Utbyggingsavdelinga 1973, p.43-4/

Planning work in the county has followed a fairly uncertain course since the passing of the 1965 Building Act. The county has not designated any subregional units, and prefers to treat the whole administrative area as one planning unit, and this view has now had the consequence that subregional planning as such has not begun, and these sections of the Building Act will not be implemented. The work already done on county-wide planning questions has passed over to the county plan, an innovation proposed in a 1973 amendment to the Building Act /Sogn og Fjordane Utbyggingsavdelinga 1974, p.38/. Cooperation between groups of communes in what might otherwise be seen as sub-regions does exist, particularly between Førde, Gaular, Naustdal and Jølster. Proposals to establish a publicly responsible planning consultancy for Indre Sogn have not yet borne fruit, although building promisingly /Anderssen 1974/. Only one commune has a ratified general plan, Førde; as of January 1974, eleven of the counties' twenty five communes could not give dates for the completion of first draft plans. Twelve of the communes have engaged private consultants to prepare their plans, and in the others there is considerable difficulty in accommodating a full-time planner within the existing communal administrative structures.

The main directions of official policy were set out in the report of the Vestlandskomiteen in 1969, which may be said to reflect fairly well the then-felt, and indeed still felt opinions of national policy makers about the country /Vestlandskomiteen 1969/. The report has been criticised for pandering to heavy industry /Hjellum 1970/, and especially for its proposals for rural settlement and agriculture /Varpe 1970/.

The discussion of alternatives within agriculture is limited to the consideration of upper and lower limits for family farms capable of meeting the goals set by national agricultural policy, centred around the family farm.

"The net income per years work on a modern and rationally operated holding, large enough to give full employment to a trained adult for the whole year, ought at least to equal the level that adult men earn on average in rationally run industry" /NOU 1974:26, p.101./*

Since, in the committee's view, agriculture was especially backward, it was necessary for the shake-out to be especially thorough. In order to attain an evening out of opportunities and incomes between regions, they chose to concentrate growth very specifically, pulling labour out of agriculture, into employment in other sectors. In Sogn og Fjordane, the centres to be developed were Sogndalsfjøra and Førde, the former to serve Indre Sogn, and the latter the remainder of the county. They made the reservation that the planned growth of these centres should not be at the expense of natural growth in other centres, but saw it as unavoidable that growth had to be concentrated in these two settlements /Vestlandskomiteén 1969, p.75-6/.

The committee chosen by the Fylkesting to consider the Vestlandskomiteén report voiced a strongly felt opposition to the centralisation proposals which it contained.

"People would rather remain living in their own districts if there are jobs there, but the committee backs a policy which stimulates mobility to the benefit of the larger centres' growth. Obviously not all the dispersed settlement can be maintained, but greater weight should be placed on smaller village centres in order to hold up the settlement in all the communes, instead of concentrating it in a few centres in the county".

* A.i.6

"On page 78 of the report the committee choose to develop a few large centres. So that these will grow rapidly, it is decisive that peasants looking for work move into the centres as quickly as possible. One almost gets the impression that these peasants really ought to be evicted in order to achieve the goal: a rapid development of large centres."

"The Committee further suggests that a rapid development of large centres will accelerate the next step in the development process; smaller centres. It is difficult to understand the connection in this argument. It is of little use to develop the small centres after the majority of the inhabitants have moved to the larger ones. It must be correct to go the other way about, to develop the hinterland first as far as the opportunities exist for doing that. Experience from the past all shows that a strong, viable hinterland forms the basis for the growth of larger urban settlements. A town without a strong hinterland will become more or less artificial, and sooner or later will stagnate and decline."

/St.Meld.nr.27, 1971-2, p.89-90/.^{*}

The county is very shy of following a centre policy, since it arouses such strong passions among the people /Drangsholt 1970, The state has borne the blame of the less favoured communes in relation to Førde's favoured position as a "trial"centre. The Utbyggingsavdelinga has pursued its mandate as far as possible, processing applications to the relevant state funds , the D.U.F. for private and public economic enterprises, and to the Kommunalbank for the communes. It has also done its best to implement the regulations of the 1965 Building Act, in relation to Generalplans in the communes, but has had to contend with the now obvious fact that this sort of planning is inappropriate outside large urban areas, and where there is no growth to distribute by land use category to coloured zones on a plan.

The most recent parliamentary report on regional development

^{*}A.i.7

questions concerning the county sidesteps all the thorny questions about centre policy, making some detailed commitments to agriculture and forestry, and to industry, but concentrating on the difficulties of the single plant industrial towns, where may be found the overwhelming majority of Labour party voters: from a Labour Government this is not imaginative, but more important not at all risky /St.Meld. nr. 32, 1974-5/. Not very 'open'. New part of the thesis.

Sogn og Fjordane is not only thoroughly marginal, it is also thoroughly awkward in opposing the official policy of decentralised concentration of development. This concentration is taking place despite the opposition, but without heated debate. The county and its representatives are conscious of their marginality, and use it to demand concessions from the state, for example in transport planning. The most specific part of St.Meld. nr.32, /1974-5/ is the listing of road projects to receive additional finance. The debate over the road to connect Indre Sogn with Sunnfjord, and thus the rest of the county, which will be discussed in more detail in Chapter 5, has raged for almost a decade, ^{and} has generated such temperate contributions as this:

"In my view it's impossible to understand how the important road need Hella-Skei became postponed indefinitely in the proposed Norwegian Road Plan. It's plain and simple discrimination against the people in Sogn og Fjordane. It's not just our fylkesting, the highway administration and our five storting representatives who've been undervalued but the people of the county as well." /Firda Tidend 15 July 1969, after Thornquist M.1971/.*

The local leaders have however not yet generated any alternative to the planning methods and goals which they have received from outside the county.

II. The Economic Structure of Sogn og Fjordane

a. Production

From the distribution of the economically active population by sectors shown in Table 3.2, it is clear that the primary sector is of great importance in the economy of the county.

In agriculture, production is concentrated upon animal products delivered to cooperative processing plants within the county.

The 1973 production of milk was 92 million kilos with a value of about kr. 90 million. The average production per cow was

3200 kilos per year; for herds with production control, that is about 45 percent of all cows, the average was higher, 4824 kilos per year. Meat production in 1973 according to receipts from the slaughterhouses was: pig carcasses 1156 tonnes; cattle

2751 tonnes; and sheep 645 tonnes, with a total value of some kr. 55 million. Potatoes were grown on about 10000 decares, but are used for subsistence on the farms, so that setting a value on sales off the farm is difficult. Sales of fruit, soft

fruit and vegetables amounted to some kr. 35 million in 1973,

a rather low figure in that fruit yields in that year were only

44 percent of normal /Sogn og Fjordane Landbrukselskap, 1974, p.13-15, 62/. Fish landings in 1973 were good, reaching a value of kr. 116 million, kr. 40 million more than in the previous

year. However the prospects are far from stable, and this recent increase was only partly due to increased volume, mostly to increased prices. Timber production for sale only had a value of kr. 4 million during the 1972-3 season, and the yearly volume felled has been declining, both for coniferous timber and for firewood. The volume of cut deciduous timber has

What is then the
average for the
55% without
prod. control
17000?

Auto consumption?

One should perhaps analyse why this factory went bankrupt collapsed since the bankruptcy of the processing pulp factory in Vadheim in 1971 /Sogn og Fjordane Utbyggingsavdelinga 1974, p.21, 24/.

A number of anomalies arise in attempting to interpret the presented in the Regionalised National Accounts /NOS A 376/.* Dahl /1972/ has explained why the production of the fictitious twenty-first county renders much of the detail in the real counties rather spurious. Table 3.3 reproduces the sectoral accounts for Sogn og Fjordane, but must be read with these reservations in mind. Especially the account for agriculture must be in doubt. The tables in the regionalised national accounts show a gross production value of kr. 318 million in 1965, while the estimates tentatively made above, even with normal fruit yields, give a little more than kr. 180 million in 1975, in 1965 kroner about kr. 115 million. Given that the volume of production was also lower then, it is difficult to find any correspondence between reality and the published accounts; the estimate advanced for depreciation is also astonishingly large. In 1965, the deliveries from agriculture to food processing were valued at kr. 79 million, which is the amount one would expect at that time. Deliveries from fisheries to the same sector totalled kr. 12 million, the food processing industry was second in importance in the number of employees to the primary metal industry in 1970. In 1972 the industry employed 1667 persons, with a production valued at kr. 367 million, 27 percent of industrial production in the county. It also had the strongest inter-industry connections of all sectors in the county, mainly with agriculture, fisheries, and final demand .

Table 3.3

Production accounts by sector 1965, with employment and gross production,
by industrial sector 1970 million kroner

	depreciation	wages	indirect tax	subsidies	gross profit	total production	employment	1970
Agriculture	45.8	4.0	0.3	16.0	78.2	318.3		
Forestry	0.5	2.3	0.1	0.3	11.3	15.7		
Fisheries	16.5	3.2	0.0	1.6	36.6	53.5		
Food Processing	5.2	19.3	0.9	24.1	- 2.3	157.3	1289	266.2
Textiles, Clothing	1.4	10.0	0.3	0.0	2.2	31.0	780	47.8
Wood, Furnishings	1.1	5.7	0.4	0.0	2.3	22.0	352	27.4
Wood processing	0.8	1.5	0.0	0.0	2.2	10.1	:	:
Printing, publ.	0.2	1.6	0.1	0.0	0.9	4.0	135	5.0
Chemical etc.	3.5	11.9	0.1	0.6	7.2	81.4	64	6.6
Stone, clay etc.	4.0	2.6	0.1	0.0	1.1	4.9	135	12.4
Primary metals	41.4	69.0	0.2	0.0	59.2	454.1	2701	600.3
Metal goods & machinery	0.3	2.4	0.2	0.0	1.8	6.0	317	26.7
Transport goods	1.4	13.1	0.8	0.8	4.3	36.0	716	95.2
Building & construction	6.1	65.7	13.4	0.0	25.6	278.0		
Energy & water supply	54.7	7.5	6.8	1.8	43.6	164.1		
Wholesale & retail trade	6.4	23.8	41.0	5.6	25.0	120.9		
Transport	14.4	37.5	2.8	0.9	14.4	80.1		
Services	27.6	102.3	2.1	3.2	37.7	178.8		

(NOS A 376, Sogn og Fjordane Utbyggingsavdelinga 1972, p.23)

The only other sector appearing to purchase large quantities of goods within the county is the building and construction industry, but it is likely that the method of calculation of the account has been responsible for this impression. This is because a method assuming the use of local supplies within twenty-three broad sectors was used. For example the building sector appears to buy kr.32.8 million of timber and furninshing, but production in the county only totals kr.22.0 million, implying that the bulk of building timber comes from the "balancing" sector. The same with the machine industry, producing only kr.60 million, but selling kr. 20.9 million to the building sector, and having a negative "balance" of kr.43.2 million in total. Only in the sectors supplying the food processing industry does the production actually originate within the county, in the building industry simply a small part does so. However, without subsidies the food processing industry would be in difficulties, the cost of labour and depreciation being covered by subsidies in total. This is at least partly caused by market regulating policies at a national level, the subsidies are not intended to defend un-economic enterprises.

There is a further flow between sectors which exists within the county, of kr.47.7 million worth of electricity purchased by the primary metal plants, two producing aluminium, and the third in Svelgen producing iron and feric alloys. The generation of power, unlike the delivery of farm products, creates very few permanent jobs, only work in the construction of the complexes of dams, tunnels, and power stations; in 1972 the county had an annual generating capacity of 4484 million kilowatt hours, 7.1 percent of the national total. In addition,

the sectors using this power are the most capital intensive in the country; in the production of non-ferrous metals nationally, wages only form 29.7 percent of the total value added in production. The average value added per employee was also highest, kr.109679 in 1970. This may be contrasted with the machinery industry, in which wages were on average 59.1 percent of the kr.51354 value added per employee in 1970 /NOU 1975:2, p.13/. Both at Høyanger and at Årdal, rationalisation of production has led to a steady reduction in the number of employees. The number employed at Årdal Verk is given in Table 3.4; production was 148 000 tonnes of aluminium in 1973, and is planned to rise to 195 000 tonnes in 1980, provided that extra energy supplies are made available; even with these the work force may fall by a further 300.

Table 3.4

Employment at Årdal Verk 1952-74

1952	1960	1966	1970	1972	1974	projected 1980
1390	1918	2213	2076	1940	1880	1500

/St.Meld.nr.32, 1974-5, p.52/

The situation in Høyanger has been worse for longer, but plans for diversified production are being implemented. The primary metals sector imported all its raw materials into the county in 1965, and exported all its production. The establishment of Vik Verk A/S /ÅSV/ and the plans for Høyanger will ensure that some part of the aluminium undergoes further processing in the county. Without more or less continuous expansion in capacity, or through diversification, and hence in power demands, rationalisation inevitably leads to a fall in employment.

The other sectors which made large contributions to industrial production were textiles, clothing and shoes, and transport goods, chiefly shipbuilding. Both these two major industry groups have been very exposed to price competition from abroad, and consequently have been forced to rationalise strongly. This has lead to the location of two large enterprises in these industries in Førde, Ankerløkken Verft A/S in shipbuilding, and Hagbarth Schött A/S in clothing manufacture. In shipbuilding the present outlook is poor, except in so far as contracts for North Sea deliveries can sustain activity in the shipyards and machine shops. The prospects for the clothing industry once oil revenues begin to affect the national economy are really very poor indeed, and unless protected vigorously the industry may disappear. In 1972 the textile, footwear, and clothing industries employed 580, 200 fewer than two years previously, and the gross production had a value of kr. 45.1 million. In shipbuilding and other transport goods industries, 826 were employed, and the production had a value of kr. 144.0 million /Sogn og Fjordane Utbyggingsavdelinga 1974/.

b. Circulation and the income stream

The assessed income for the county's taxpayers was kr. 938 million in 1971 /NOS A 640, p.146/. This derived from the production sectors discussed above, from construction, commerce, transport, and official and private services. Industrial wages amounted only kr. 223 million in the same year /NOS A 640, p.120/. The income from farming could be of the order of kr. 80 - 120 millions, based on the return to family labour on accounting

farms in the county. In 1971 on accounting farm household earned on average kr.15 247; the farms had an average size of 89 decares, substantially greater than the 1969 county average size of 46 decares for 10357 holdings of five decares and larger /Sogn og Fjordane Landsbrukselskap 1974, p.65-9/. The average income of the county's 2092 fishermen was kr.22 700. in 1971, giving a total of some kr.47 million /Sogn og Fjordane Utbyggingsavdelinga 1973, p.21/. The only other sector for which wage totals are published is that of local government employees: in 1971 the communes and the county spent kr.159 million on wages, and possibly also employers' national insurance contributions /NOS A 640, p.142/.

*Model
duplication* Income from pensions amounted to almost kr.190 million, of which old-age pension was kr.77 million, and family allowances kr.36 million. Subtracting this unearned income from the total taxable income for the county, the sectoral origin of income stream elements may be represented by Table 3.5. The number active in services, transport, and construction have been approximated from the population census of November 1970, being rounded totals of persons with more than 1000 hours work, both employed and self-employed. Since there are no details from which one may separate official and private services some rather circular estimation has been required. There seems to be some cross-counting between the categories of agriculture, fisheries and other sectors, but the total of some 36 000 economically active tallies well with the census figure of 35 297 /NOS A 640, p.84/. In order to allow for possible double counting, the average agricultural income is reduced to kr.9000 per holding. It is necessary to remark that the information upon

which Table 3.5 is constructed is of the flimsyest; it represents an exercise in coordinating a variety of official statistical sources which in principle are not compatible.

Table 3.5
Estimates of income by sector 1971

	number occupied	average income	total mil.kr.
Agriculture	10 000	9000	90
Fisheries	2 100	22700	45
Industry	7 600	29100	225
Construction	4 000	19000	75
Services	5 500	23000	125
Transport	3 200	19000	60
Local Authorities	3 500	37000	130
	35 900	21000	750

The local government activity in the county is concentrated at the communal, not the county level, the central administration is chiefly responsible for providing specialised services to the communes and the county's inhabitants, as well as performing higher level technical tasks, for instance road engineering. The individual taxpayers tax returns are received by the taxation departments in each commune, and on the basis of the general condition of the communal economy, a proportion is sent on to the county administration. From the income stream of kr. 938 million, kr. 274 million was diverted to official purposes, of which kr. 78 million went to national insurance contributions, kr. 52 million to national taxes, and kr. 144 million to the communes. The communes and the county had a total income of about kr. 370 million, kr. 122 million transferred from the state, and a sum of kr. 58 million was borrowed during 1971. In this

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particular
written give
full details etc

year, investment by the county was kr.63 million, and by the communes amounted to kr. 99 million; in the county 38 percent was invested in roads, and a further 30 percent in electricity supply. 23 percent of communal investments were devoted to schools, and approximately the same proportion was used for roads. The bulk of current expenditure was used for wages, relatively more in education in the communes, and in health and social security in the county administration /NOS A 640, p142-5/.

The condition of the finance institutions in Sogn og Fjordane has been bewailed for some time. In national discussions' comprehensive mergers of the local network of savings banks have been planned, but have not come to fruition. In 1971 there were 30 savings banks, and branches of five commercial banks, with two small independent commercial banks. The banks had a total capital of kr.966 million, with loans of kr.608 million; the average capital of the savings banks was kr 26.7 million /NOS A 640, p.149/. The report of Vestlandskomiteen recommended strongly that the savings banks be rationalised into larger units, possibly with the participation of the local commercial banks, and also banks from outside the county. Because of the rules under which savings banks operate, an artificial capital scarcity has been created in the county, since these banks have to maintain higher liquidity, and are restricted in loan activity to very safe risks /Vestlandskomiteen 1969, p.93-4 /. Since there are no other financial institutions, for example insurance companies in the county , a substantial transfer of capital takes place here too /Aksjonsprogram 1967 p.28/. Placements by the National Insurance fund in banks in the

county, which are due to be withdrawn following a change of policy totalled kr.44 million in 1973 /Folketrydefondet 1974, p.64/. On the basis of the three year average increase in deposits in the banks, one may estimate savings in these institutions in 1971 at kr.80 million; saving in the Post Office savings bank is in addition to this.

After these deductions the remaining stream of income has been reduced successively by kr.274 million for tax, and kr.80 million for saving, to kr.584 million. It is likely that this is an underestimate for two reasons, firstly that some income is excluded from taxable income as allowances and secondly that private loans have not been added to the income stream.

While some groups in the population will have a low debt burden, for others the contribution of loans, for example hire purchase, to their incomes may be great. Retail turnover in 1971 amounted to kr.647 million, 57 percent of which concerned the sale of food, drink and tobacco /NOS A 640, p.129-131/. This total should be reduced by some estimate of tourist expenditure, in order to represent purchases within the county, and by a further percentage to represent actual sales to private consumers, some of the sales being made to private businesses or the official organisations. In Stryn commune, Arnestad found that tourist spending was 11.5 percent of the total turnover in the service institutions other than hotels in 1971 /1973/; using the same proportion the local purchases are estimated at kr.575 million. From the regionalised national accounts, it appears that up to one-third of deliveries from commerce are to other economic sectors: this would reduce sales to local final demand further to kr.585 million.

Wagtskjold has estimated that all food, drink and tobacco are purchased within the county, but that of total purchases of other goods, including motor vehicles and fuel, only 77 percent is bought within the county /1971/. Disaggregating the estimate somewhat, this would mean that local final demand for food, drink and tobacco was about kr.218 million, and for other goods about kr.219 million, totalling kr.437 million. This does tally with the rough estimates made in the regionalised national accounts, in which 36.9 percent of private consumption is assigned to food, drink and tobacco /NOS A 640, p.107/. This estimate, of kr.218 million, is 37.4 percent of the estimated income after saving and taxation of kr.584 million. On the basis of Wagtskjold's survey, Hügelid has pointed to the large opportunities for expansion in various retail branches, especially in the more specialised goods, of which many are bought from outside the county. The same applies with still more emphasis to the development of wholesale trading, and business services /1973, 1974/. Of the kr.584 million income after tax and savings, some kr.383 million was spent in retail establishments in the county, and about kr.54 million on specialised goods outside the county, leaving kr.174 million to cover other expenditure.

So what? Conclusion?

c. Structural relationships in the economy

Structurally, the economy of Sogn og Fjordane is marked by a lack of relationships, within the county, either of categories or of sectors. The strongest complex is that involving agriculture, fisheries and food processing, as was also found in the input-output study Anglesey /Sadler et al 1973/

Otherwise, the construction sector receives very substantial payments from other areas, for assembling real capital in hydro-electric projects, in roads, and on industrial sites. However, its purchases are not often from suppliers within the county, since industries supplying stone, concrete, timber, furnishings, building steel, and other goods are either absent from the county, or too small to meet the demand. The same applies to the delivery of supplies through wholesalers located in the county. The construction sector has a number of parallels with the aluminium plants, most of its potential benefits to the county are contained in the wages it pays.

The form of organisation of production also plays a role in the lack of structural relationships within the economy. Where local firms exist, they most frequently have become subcontractors to other enterprises, either within the county, but owned outside it, or to others outside the county. All enterprises are also dependent on the availability of business services to maintain their competitive development. Thirdly, although the role of the savings banks as agents in the circulation of accumulated capital is vital, they have not functioned as commercial and industrial users of capital might have wished, in the view of Vestlandskomiteén. Finally, there is a vital relationship between communal initiative in planning, and the location of new enterprises and official institutions. Individual communes have attempted to fulfill their obligations to produce General plans; the differences between these plans are of interest in examining the process of further change in the county. Hence the remainder of this chapter will concentrate on four problems: 1. the relationship of the county through

labour to construction projects in the Indre Sogn, and the aluminium works at Årdal; 2. the types of enterprise which are evolving in the county, especially in Førde; 3. the record of the savings banks in Indre Sogn; and 4. the aspirations of the communes for change, especially in and around Førde and Sogn-dal.

III. Labour and Investment

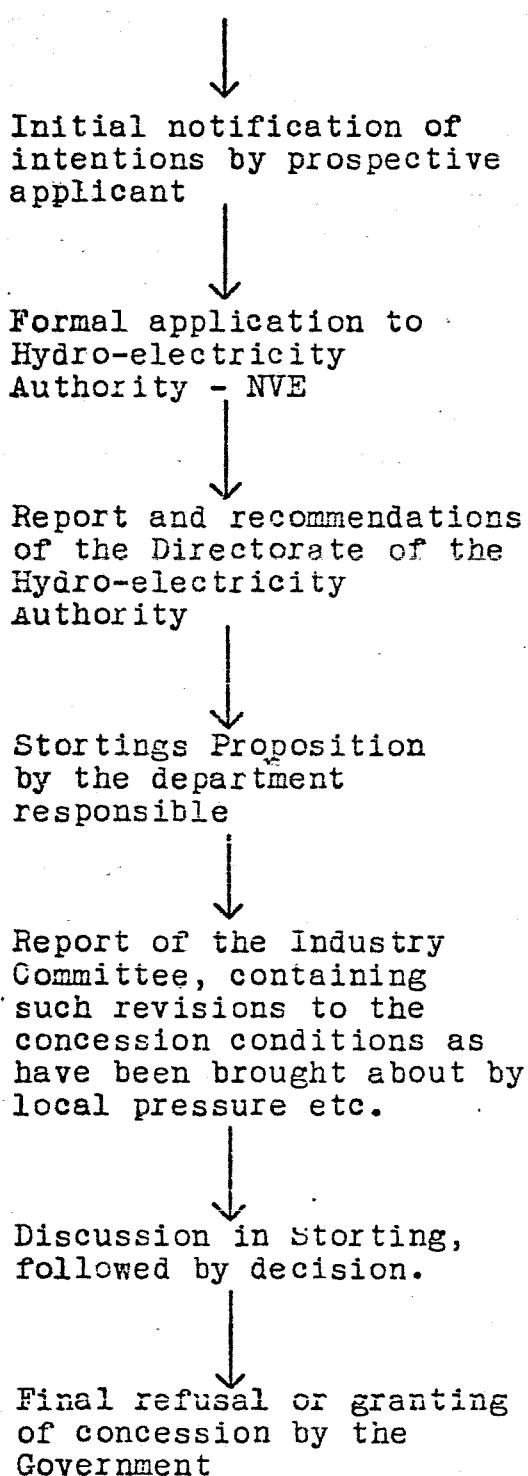
a. Hydro electric construction projects

The process followed in the granting of development concessions is shown in Figure 3.2. Since 1964, four projects in Indre Sogn have been given concessions, the latest Leirdøla in Luster. The terms of the concessions are summarised in Table 3.6, indicating the concession payments yearly received by the state and communal authorities. The development funds established in Vik and Aurland are supplemented by a proportion of the concession payments; the funds only begin to operate once the power station begins to generate electricity. The concessions are not very satisfactory, although other less formal points were necessary to secure the concessions, for example state help with building the road east from Aurland into Hallingdal to an adequate standard. Also, Luster commune refused permission until its demand for jobs was met by plans for an engineering base for Akergruppen in Gaupne: Akergruppen pulled out of the agreement in the spring of 1975. The scheme was seen to be reduced considerably for environmental reasons (the transfer of water from west to east)

The county employment office has records of employment monthly by sector up to the end of 1970; consequently Table 3.7

3.2 Procedure for the granting of Hydro-electricity

Concessions



only runs to that year.

Table 3.6.

Formal conditions of hydro-electric development concessions
1964 - 74, Indre Sogn

	Vik /1965,9/	Lærdal /1966/	Aurland /1969/	Leirdøla /1974/
Power mill kw. h.	602	880	2600	446
Natural horse power	68000	150000	460000	66000
Concession payment per N.Hp per year				
to state kr.	1.-	1.-	2.50	1.-
to communes kr.	3.50	4.50	4.50	6.-
Development fund kr.	250000.-	500000.-	2.0 mil.	2.0 mil.

Sources: St.prp.nr.32 /64-5/; 72 /65-6/; 92/68-9/; 144/68-9/;
90 /73-4/.

Innst. S. nr. 126 /64-5/; 206 /65-6/; 259 /68-9/; 309
/68-9/; 290 /73-4/.

The available figures are for self-employed in construction and
energy/water supply, and for employees disaggregated.

Table 3.7
Persons active in construction and power and water supply
1963-70 August totals Indre Sogn

	total	employed, construction	employed large projects	% in large project
1963	1075	744	305	40.9
1964	1190	876	370	42.2
1965	1349	1006	564	56.0
1966	1476	1147	646	56.4
1967	1527	1227	672	54.8
1968	1477	1178	741	62.9
1969	1701	1373	768	55.8
1970	2106	1790	1103	61.7

Source: Fylkesarbeidskontoret, Leikanger. *

The column of total persons active thus includes all active in
both construction and energy/water supply. It is reasonable to

suppose that most engaged in the hydro-electric construction projects were employed: it is interesting that the proportion of construction employees employed on notifiable sites rose from 40.9 percent in 1963 to 61.7 percent in 1970 of all construction employees. As Figure 3.3 shows, the notifiable sites included Årdal Verk, where a fairly stable staff of construction workers was maintained in connection with modernisation in the works. The large projects had seasonal swings in employment, but during 1970 their seasonality was slightly less marked than that of the total of construction employees. In Indre Sogn, the population census of 1st November 1970 gives a figure of 1394 persons employed in building and construction for at least 100 hours in the previous year; of these 1277 had more than 1000 hours work.

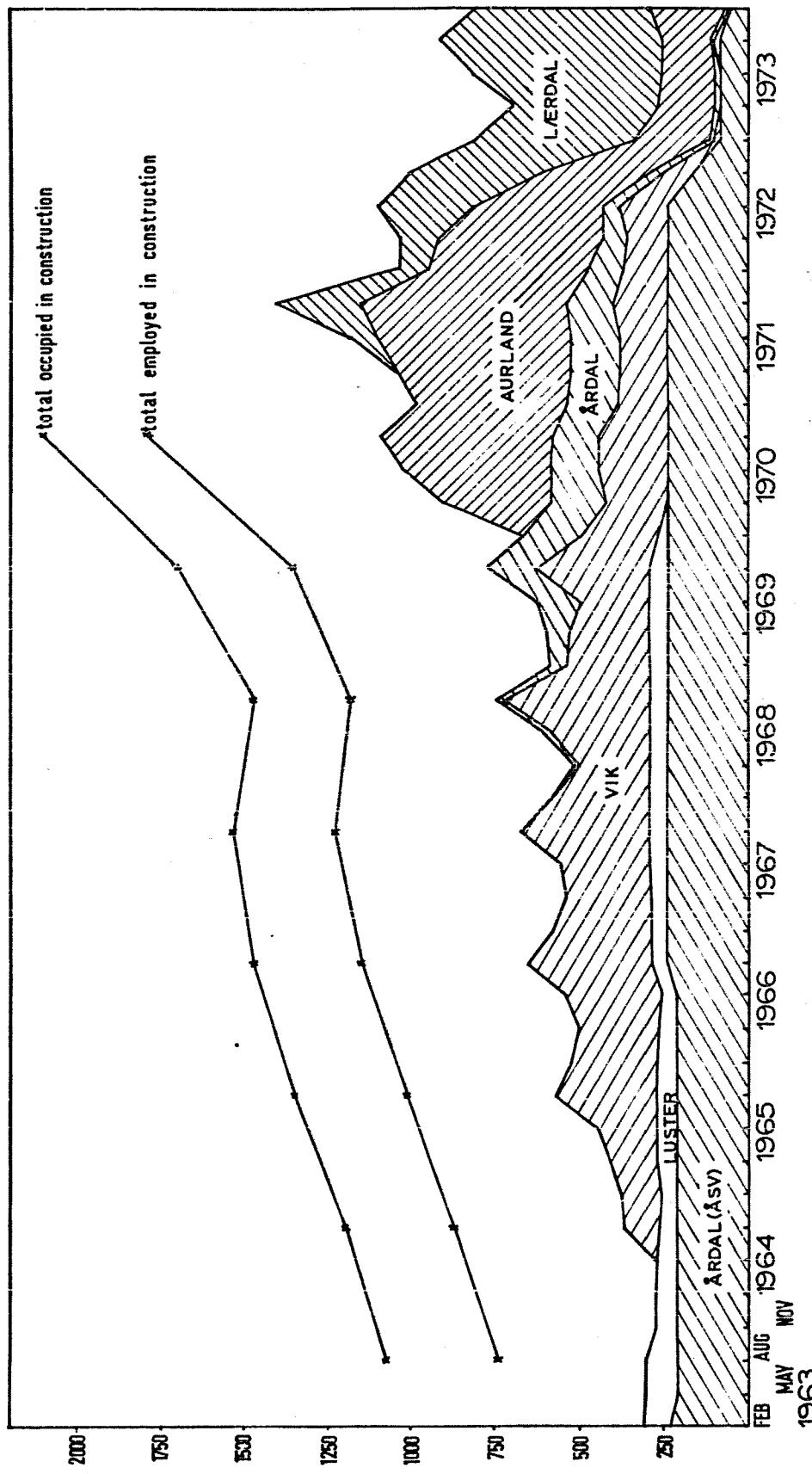
Table 3.8
Employees in building and construction 1970
by month Indre Sogn

	total	large projects	%
January	1272	-	-
February	1355	914	67.5
March	1402	-	-
April	1449	-	-
May	1564	1037	66.3
June	1667	-	-
July	1718	-	-
August	1790	1103	61.7
September	1779	-	-
October	1719	-	-
November	1576	994	63.1
December	1428	-	-

Source: Fylkesarbeidskontoret. Leikanger.

These are included by place of residence, so that the

difference from the employment register figures stem largely from employees in Indre Sogn having their homes elsewhere.



3.3 NUMBERS EMPLOYED ON LARGER CONSTRUCTION PROJECTS IN INDRE SOGN 1963-73

p

Table 3.9 shows the numbers of employees on different successive construction projects in Indre Sogn; one may remark that the average construction period is being shortened, largely from the need for economies on the part of the contractor.

Table 3.9.
Employees on Hydro-electric construction projects
1963-73 Indre Sogn, August figures

	Luster	Vik	Aurland	Lærdal
1963	90			
1964	45	110		
1965	56	293		
1966	45	361		
1967	54	378		
1968	54	433		
1969	48	330		
1970		202	520	
1971		165	620	
1972		103	324	602
1973		17	139	667

Source: Fylkesarbeidskontoret, Leikanger.

While Vik took nearly a decade to build, Aurland was almost finished after half that time.

b. Årdal verk

The decisions around the establishment of Årdal Verk were discussed above /Chapter 1, p.33/, and it may be recalled that the regional effect of the plant was not a high priority at that time. Nevertheless, in employment terms it has contributed a large number of industrial jobs, all with relatively high pay, and from these and other taxable funds has contributed greatly to the communal and county economy. The conditions of this class of industrial town have been examined by Hansen /1966/.

who pointed to the dangers of such remote locations, on the basis of earlier experiences, where the full exploitation of power resources, and rationalisation led to the cessation of recruitment, and consequent migration of the children of the first generation of employees. Berg /1965/ has further pointed to the relatively small effect of the plant in terms of generating other employment; in 1968 65 percent of all employed persons in the commune worked in Årdal Verk /Hjellum 1970, p.37/. However, the plant has given jobs to a large number of people from Indre Sogn, on average between 1946 and 1960 41 percent of all migrants from communes in Indre Sogn except Årdal ; and of all persons working for more than six months at Årdal Verk between 1946 and 1971, 49 percent were from Indre Sogn, including 18 percent actually from Årdal /Gjestland 1973 c, p.42-3/.

c. Labour recruitment and its consequences

In an investigation of career development patterns, Lie /1972/ has discussed the process of recruitment to the construction industry, and especially to large projects, to major contracting firms. While workers employed by the Highways Authority in construction or maintenance, 191 in August 1973, were relatively specialised, could live at home, and had opportunities to work continuously in the same district, workers on larger projects did not enjoy these advantages. Construction work is relatively well paid, especially with shift and weekend-working, and when a project commences the contractor normally attempts to recruit local labour so as to minimise the cost of providing temporary accommodation. Local people with

the opportunity to take work on site are divided between those with or without established families; their motives may differ in that some, a minority, will see the extra income as a way to finance investments in their farms or other activites, the rest will use the cash to raise their standards of living. The decision to work in construction for local people is rational, and represents often the best use of resources in the community.

The consequence pointed to by Lie is that this leads to a nomadised work-force, of people whose skills and experience are in construction, who still need the large cash income, but who following completion on their home site, are forced to follow the trail from site to site, with substantial reductions in their enjoyment of their hard-won standard of living, for example home visits once a month, for a "long weekend". The background of the workers whom he interviewed was quite rural, 37 percent of their fathers had farm work, against 43 percent in construction and industry /1972, p.43/. The career conversion from relatively underemployed, and poorly paid jobs in the local community to well paid work on site was an improvement. However, after a spell of having to travel hundreds of kilometres home, or even to any place in which free time may be enjoyed, the improvement in living standards is seen to be dearly bought. Gjestland /1973c, p.76 / compares this to the career adaptions of merchant seamen, who after some time want to settle down to an established family life ashore. He characterises a large part of the recruitment to Årdal Verk as being of this variety, very often workers who had been employed in building work in Årdal would begin as factory workers directly thereafter. In the period 1956-60 when the second part of the plant was

completed, 33 percent of new recruits came from jobs in the construction sector /1973c , p.46/. One could characterise a sequence in career development in this way: being under-occupied in the home community, but reluctant to take any definite step away from it, the opportunity to earn good wages locally arrives as though heaven sent /Selvik 1974/. Once this construction project is terminated, it represents a natural step to wish to continue with similar wages, and to use the newly won experience , necessarily outside the home district. After some time, a search for opportunities of a more settled character is begun, and in the case of many young men from Indre Sogn, was met by Årdal Verk. Since recruitment there has now ceased, and since the development of the Aurland and Lærdal drainage basins is more or less complete, it is necessary to secure more jobs "ashore" in Gjestlands description, for the local people who began working in the construction industry in the past few years.

IV. Industrial Services and the Phase of Enterprises

a. Prøvesentret Førde

The population of Førde commune, which contains the designated "trial" centre, has increased rapidly. The increase is not simply related to the designation, the urban settlement at the head of Førdefjord has been expanding rapidly over several decades. The intentions for the centre voiced in official policy statements are that it should establish a broad range of job opportunities, and that after a development period, it should be well enough

equipped with services of every kind to dam up the demand now leaking from the county to centres outside its boundaries. The Sunnfjord area had been the part of the county with the best growth, and opportunities for growth in the 1960's, and these opportunities have been taken up in the plans made for the "trial" centre. By the end of 1973, the Industrial Estate on Cyrane was employing 230 workers, ^{new many} some in the shipyard of Ankerlökken Verft Førde A/S. Initial plans by Akergruppen to build a ship engine factory fell through after the site was ready, and it was fortunate that Ankerlökken could step in.

As a centre for services, Førde's position is predominant in the county already, as a detailed survey by Blinkenberg Nielsen has shown /1973/. Only in official services was Førde less powerfully placed than other centre, since its provision of further education facilities has been limited, the main sections of the county administration are in Leikanger, and it had no hospital. There are plans to build a central hospital in Førde, but other centres in the county feel that their existing institutions may then be threatened with decline, and have consequently opposed the commencement of work in Førde. From surveys by Wagtskjold /1971/ and Smördal /1974/, the absolute dominance of Førde in certain service sectors is clear, especially car sales and maintenance. In 1973 car maintenance alone employed 190 people, nearly as many as ^{the} shipyard. At the same time, 127 were employed in building and construction, 25 in wholesale trading, 54 in personal services, 107 in miscellaneous services, and fully 703 in official administration and services /manuscript sources, kommunekasserar/.* The turnover of retail enterprises in goods other than food, drink, and tobacco, was some kr. 66 million in Førde in 1969; kr. 45 million of this total was for vehicles and

fuel. Wagtskjold estimates from this that the local demand for goods other than vehicles and fuel could be met twice over from the actual sales, implying that Førde intercepted a large part of the purchasing power from its district which otherwise would have left the county /1971, p.81/.

b. Linkages and service demand

From other surveys of the demands of different industrial enterprises for services, it was possible to conduct structured interviews with senior personnel in four companies in Førde, and further to discuss some relevant problems with representatives of local business interests. The interviews took place mainly in February 1975, but preliminary discussions were held eleven months earlier. The basis for these interviews was the interest one had concerning the local linkages of the enterprises, and also about the degree to which they could satisfy their demands for industrial service in the service environment of the "trial" centre. Stenstadvold /1971/ stresses the current importance of access to information, as much for marketing as for innovation as such in the current business scene. Where, for example, news about possible emerging markets in the oil industry may be passed by word of mouth in Bergen or Stavanger, small enterprises in Sogn og Fjordane will have to work harder simply keeping in touch. The results of the discussions with reference to the local effects of the enterprises in employment terms will be presented in a subsequent section; here one will attempt to describe the conditions of existence of enterprises in Førde.

Of the four enterprises visited, two were large, and newly established, owned by companies outside the county.

The other two were small, one new and the other older, owned by the people who were running the operations, and established with the support of the local savings bank, rather than with regional policy financial assistance. The two larger firms differed in sector, one employing chiefly men, and the other principally women workers. The work could be classified as semi-skilled, both involving about three months training. One factory had made substantial use of official facilities for training its employees, the other found that the pupils leaving short technical college courses were technically proficient but completely unversed in production under factory conditions. This difference is caused by one company recruiting mostly people with industrial experience and where necessary retraining, the other recruiting from those without experience. Both of these two companies received their production orders from their head offices, and to a large extent their specifications and designs. Some raw materials were purchased direct, otherwise through head offices. Very little use was made of local industrial or business services in one plant, the other had contracted out quite large sections of its work in initial stages, but was planning to internalise these by establishing departments to cover the particular needs.

One need which has been felt by all the companies is for security against machine down-time. Where production is dependent on only a few machines of one type, perhaps even a single machine, failure means that unfortunate bottlenecks arise which cannot easily be overcome locally. In the two larger plants this was felt as an especial difficulty, and a real limitation on their work. Without access to air transport, such down-time could have been very serious indeed. Further

problems are caused by occasional failures in power supply which do occur from time to time. Both large companies have specialists trained to repair the plant should the need arise, but certain problems can demand the presence of factory engineers from elsewhere, often abroad. It is necessary for them to hold a large stock of spare parts, rather probably larger than if they were within easy reach of ^{an} agents warehouse. By way of contrast, the two smaller companies had made use of the technical college workshops. One company especially felt more or less able to repair its plant in this way under any circumstances.

The two smaller companies had different raw material demands, one very standardised, which could only be supplied in Eastern Norway, the other very varied, which had meant holding large stocks of raw material elements or sections, before the arrival of a number of stock-holders, wholesalers of the necessary materials in Förde. This company has been established largely on the basis of the demand for specialised work from other sectors; it has been a subcontractor to one of the large companies, and takes subcontracts in many construction projects, most of its deliveries have been within Förde. The other, older company delivers widely, mostly in Vestlandet, and to many factories in the county, especially to companies in the food, clothing and footwear industries. This company is exceptional in not having its plant in the centre, but some distance away, although still lying in the commune. A great proportion of the time of the owner is spent ⁱⁿ travelling, meeting customers, and keeping abreast of new technical developments. This factory was dependent on the supply of essential process materials from laboratories in Bergen, but has now almost completed equipping its own workshop, so rendering it much more self-contained, and

more able to meet urgent orders. The companies all experienced some difficulty with transport, but especially this small company, since the road between it and the centre has demanded improvement for decades, improvement for which they are still waiting. Both small companies use local financial services, and consider that their relationships with these institutions are very good.

As Ni-lsen /1972/ also found in Kongsvinger, the organisation of companies is significant in explaining their different use of local services. The larger companies, which are the ones attracted to sites such as Øyrane, and who fit best into the financial organisation of regional policy, are most likely to be either branch factories, or to be companies owned within a group by a holding company. They will demand very much less of the local industrial milieu than small companies founded locally, and consequently they will scarcely increase the demand basis for industrial or business services locally. Stenstadvold points to the desirability of some coordination of technical and business services in North Norway, and the same certainly applies in Førde, even given the existence of the information circulating organisation "Utviklingselskapet for Næringsliv på Vestlandet" /1971, p.122-132/.

V. Savings Banks in Indre Sogn

a. Functions of a savings bank

The first three savings banks in Indre Sogn were established in the 1840's, first Sogndal, then Vik, and Balestrand in 1847. Balestrand savings bank was founded "for the advancement of virtue, diligence, thrift, and the Word of God" by the prominent low-church Stortingsman H.U.Sverdrup, the local military commander, and the representative of the law in the commune /Balestrand Sparebank Rekneskap og arsmelding 1971/. Coffer bottoms were no longer satisfactory places to stack up capital; farming had begun to accumulate capital at the same time as new investment possibilities created the need to pool local resources /Thue 1972, p.633/. In addition, it was felt right to reward the poor with some interest on the few kroner which they might save. On this basis the banks were established, and it is on this basis of accumulation that they largely still stand. Now a large part of the funds are lent out to house purchase or other personal loan objects, but the banks nevertheless have a role of circulating funds within the local community. One can see this in the effect of a poor tourist season: the tourist enterprises are forced either to reduce their balances, or to borrow for working capital more than otherwise would have been necessary. This reduces the liquid funds available to other borrowers, both private and business.

b. Savings bank performance

From the year book of savings bank accounts, and the more recent NOS Finance institution statistics, it has been possible to compile series of deposits in the banks in Indre Sogn, all savings banks with the exception of Fjærland Privatbank L/L.^{**} The series covers deposits by others than banks, loans, and holdings in other banks, shares, government stocks, etc. One series runs between the two wars, the other since the end of extraordinary financial regulations in the early 1950's. For each bank in each year a score has been calculated on an index relating loans to holdings in banks, stocks etc. presumably outside the area. The index runs from +1.0 to -1.0; where loans equal holdings the index equals zero, where loans are greater than holdings it is positive, and holdings greater than loans it is negative. It represents the degree of local exploitation of the funds available in the bank, with the exception that in recent years a large proportion, up to third, of housing loans are made to borrowers outside the district, usually in Oslo or Bergen.

First, by examining Table 3.10, one may see that while the depression years had minimal impact on deposits in the banks, the index changed markedly in favour of local investment continuously up to 1930. The series is related to the movement of consumer prices; the fall in food prices may have led to investment in order to try to cut costs, a process which stopped in the depression years when incomes fell, and deposits were withdrawn.

^{*} $\text{Index} = \frac{(L^2 - B^2)}{(L+B)^2}$; L=loans; B=deposits in other institutions.
^{**} A.iv.9

Table 3.10

Savings banks in Indre Sogn. Total deposits and loan -

leak index 1925 - 1938

	deposits other than by banks '000 kr.	loan-leak index
1925	22285	0.435
1926	22500	0.469
1927	22547	0.506
1928	22583	0.537
1929	22237	0.601
1930	22255	0.626
1931	22347	0.619
1932	22485	0.612
1933	21691	0.622
1934	21356	0.594
1935	21155	0.588
1936	20794	0.557
1937	21001	0.550
1938	21728	0.513

Table 3.11

Savings banks in Indre Sogn. Loan - leak

index 1930 and 1933

	1930	1933
Aurland	0.603	0.482
Balestrand	0.445	0.412
Sørgund	0.63	0.660
Fjærland privat bk.	0.069	- 0.032
Hafslc	0.708	0.784
Leikanger	0.834	0.728
Luster	0.321	0.350
Lærdal	0.856	0.806
Sognadal	0.786	0.801
Vik	0.598	0.603
Årdal	0.370	0.537

The individual banks experienced these changes in various ways, firstly, in the very large differences between their degrees of local investment. Those banks with clients in retail trade, mainly Lærdal, Sogndal, Leikanger, and Hafslo, had much better indices than the more remote banks.

This can also be corroborated strongly in the post war series of indices for each bank. Table 3.12a shows the larger and less agriculturally based banks, and the others are shown in Table 3.12b. It is obvious that there are many internal inconsistencies, connected to local factors, and one of these will be expounded in detail. The rural areas have much in common with the others, except in perhaps being more sluggish to respond to national impulses. The accounts for the whole district show very little association with any national trends, and seem to be more closely associated with the local income base and potential loan demand. Årdal savings bank, except for its last year of independence, had a great lack of loan demand, while having a very strong generation of savings from workers at Årdal Verk. From Figure 3.3 it will be recalled that work on the hydro-electric construction project at Vik began in the third quarter of 1964, for which year the loan-leak index was 0.262; the following year it stood at 0.05, and fell right down to -0.317 by 1967. The proportion of local workers on the project was probably quite large, and they seem to have saved up their newly earned cash with diligence, resulting in a flood of liquidity, most of which was unusable locally, and which consequently was absorbed outside the district. The movement out of the area from 1965 to 1967 was of the order of kr. 9.8 million /1966 prices/, which when compared with the kr. 0.25 million development fund proposed in the development

Table 3.1ca

Loan-leak indices for savings banks in more sogn
1952 - 1973

	Leikanger	Lærdal	Sogndal	Vik	Røldal	Aurland
1952	-0.302	0.166	0.196	-0.099	-0.306	-0.291
1953	-0.291	0.209	0.299	-0.053	-0.282	-0.219
1954	-0.177	0.263	0.258	-0.161	-0.216	-0.164
1955	-0.112	0.210	0.098	-0.150	-0.324	-0.029
1956	0.032	0.368	0.114	-0.127	-0.409	-0.046
1957	0.150	0.388	0.060	-0.064	-0.371	0.081
1958	0.249	0.477	0.101	0.033	-0.318	0.161
1959	0.261	0.492	0.018	0.081	-0.301	0.251
1960	0.094	0.472	0.030	0.110	-0.206	0.169
1961	0.050	0.533	0.066	0.116	-0.056	0.153
1962	-0.042	0.509	0.112	0.225	-0.163	0.167
1963	-0.076	0.380	0.067	0.297	-0.122	0.165
1964	0.078	0.324	0.193	0.263	-0.063	0.074
1965	0.051	0.263	0.080	0.056	-0.087	0.178
1966	-0.113	0.342	0.043	0.085	-0.134	0.173
1967	-0.006	0.079	0.194	-0.317	-0.082	0.178
1968	-0.094	0.135	0.177	-0.281	-0.117	0.164
1969	0.113	0.288	0.245	-0.179	-0.100	0.228
1970	0.062	0.374	0.316	-0.182	-0.065	0.051
1971	0.175	0.321	0.248	0.119	0.094	0.088
1972	0.196	-	0.190	0.147	-	0.046
1973	0.300	-	0.225	-0.016	-	0.158

table 3.12b

Loan - leak indices for savings banks in Indre Nogn

1952 - 1973

	Salestrand	Borgund	Rjærland privat.	Hafslø	Jostedal	Luster
1952	-0.172	0.461	-0.490	-0.133	-0.322	-0.365
1953	-0.110	0.424	-0.467	-0.147	-0.332	-0.352
1954	0.56	0.473	-0.483	-0.023	0.346	-0.270
1955	-0.012	0.425	-0.461	-0.076	-0.411	-0.216
1956	-0.001	0.462	-0.420	-0.022	-0.464	-0.227
1957	0.106	0.603	-0.382	0.023	-0.469	-0.259
1958	0.133	0.564	-0.246	-0.023	-0.531	-0.187
1959	0.200	0.644	-0.032	0.004	-0.411	-0.211
1960	0.191	0.733	-0.034	0.017	-0.442	-0.248
1961	0.200	0.572	0.142	0.146	-0.362	-0.222
1962	0.214	0.517	0.145	0.156	-0.354	-0.217
1963	0.175	0.492	0.089	0.208	-0.352	-0.227
1964	0.152	0.461	0.089	0.205	-0.342	-0.199
1965	0.239	0.401	0.088	0.182	-0.474	-0.190
1966	0.237	0.507	0.108	0.039	-0.519	-0.237
1967	0.171	0.340	0.050	0.022	-0.569	-0.243
1968	0.132	0.187	0.007	0.060	-0.635	-0.182
1969	0.159	0.112	0.030	0.056	-0.683	-0.106
1970	0.091	-0.023	0.019	0.104	-0.646	-0.122
1971	0.154	0.087	-0.024	0.071	-0.645	0.034
1972	0.263	-	-0.092	0.112	-0.606	0.095
1973	0.049	-	0.006	0.153	-0.534	0.278

concession looks somewhat absurd. Of course the workers deposits were used eventually for the purchase of consumer durables, but even so the leakage of so much capital cannot be ignored. The impact in Aurdal ^{land} was not so great, only a fall from 0.228 in 1969 to 0.046 in 1971, mainly because of the smaller fraction of the labour force from the locality; the capital leakage from 1970 to 1972 was kr.2.9 million /1971 prices/.

c. Savings banks and the use of accumulated capital

The capital resources mobilised by the savings banks were the farm surpluses realised by the first contact of the farming economy with the market, especially where the cash outgoings of the farms were small, and the incomes relatively large. In such a relatively good agricultural area as Indre Sogn, such accumulation was quite powerful; few of the traders or other businessmen managed to accumulate any great capital deposits. Having been so accumulated the capital formerly was reinvested sparingly in modernisation of the farms, and financed trading activity of retail establishments, and small manufacturers, for example bakers or shoemakers. Even after the war this pattern was not so greatly altered, except that housing finance became a more significant element in the banks' business. It would be possible to find the cause for the lack of innovativeness, the lack of demand for loans to start enterprises in the remoteness, the backwardness of the district, certainly the demand for loans from enterprises seems to be inelastic, and has not responded to increases in liquidity. However this seems to be a mistake, since the problems of the local enterprises which do exist stem not from relations within the district, but with the market at

large. The savings banks' function in mobilising accumulated capital has come by default to the service of national capital accumulation, in central commercial and state banks and in large corporations.

VI. Communal Planning and Regional Development

a. Sogndal in Indre Sogn

The draft General plan for Sogndal commune sets out the role of Sogndalsfjøra, the communal centre, as being important not merely for the stemming of migration from the commune, but also from the subregion, especially naming the communes Luster, Lærdal, and Leikanger. If the centre could be developed fast enough, it could provide jobs for people who otherwise would have to leave the county. This applies not only to the remoter areas within Sogndal commune, but to the neighbouring communes; people with jobs in Sogndalsfjøra will be able to live in their home villages, and simply commute. Without the rapid development the draft plan suggests that the alternatives for the future lie in migration out of the county, or stagnation on small-holdings with incomes rapidly falling behind the national average. While so proposing that the workforce for Sogndalsfjøra should live outside the centre, the plan proposes a rate of population growth higher than the 0.8 percent per annum natural growth norm. This means that the plan anticipates migration to Sogndalsfjøra in quite large measure, from within the commune and the neighbour communes /Sogndal Kommune, Generalplan utkast 1972, p.16-17, 27,31/. This is realistic since, as Tables 3.13 and 3.14 show, there exist not only immigration but also strong

journey-to-work flows already.

Table 3.13.
Migration to and from Sogndal commune
1971-2

	to Sogndal		from Sogndal	
	1971	1972	1971	1972
Vik	6	5	1	6
Balestrand	3	6	5	7
Leikanger	9	14	3	5
Aurland	9	5	6	4
Lærdal	11	5	3	1
Årdal	19	18	9	6
Luster	20	33	10	5
rest of the county	21	31	22	31
total	252	284	152	166

/NOS A 640 p.58-61 /

Table 3.14
Persons working or studying in Sogndal
by commune of residence 1970

	working		students
	men	women	
Vik	1	-	41
Balestrand	1	-	21
Leikanger	20	1	60
Sogndal	1063	698	144
Aurland	2	-	17
Lærdal	12	-	25
Årdal	1	2	16
Luster	34	5	104

/1970 Folketellingen, kommunehefter/ *

Examining the labour market in Sogndal more closely, one forms the impression that the recruitment and family establishment processes may not support growth in the centre for a sustained period. Sogndalsfjøra is seen as a service centre, indeed the industrial employment that exists is concentrated in the dairy and slaughterhouse. In shop and office trades, it is normal for most of the jobs to be taken by women; men

Table 3.15
Employment by sector in Sogndal commune 1966-74

	1966	1970	1974	increase 1966-74
Slaughterhouse	126	140	150	24
Milk processing	38	38	45	7
Other food processing	35	23	32	-3
Textiles	23	15	0	-23
Sawmilling	14	23	35	21
Other timber	4	5	5	1
Vehicle repair	25	29	40	15
Private construction	66	136	120	54
Official construction	54	59	62	8
Electricity supply	11	15	21	10
Wholesale trade	14	19	14	0
Retail trade	82	128	140	58
Finance	21	24	39	18
Sea transport	4	6	2	-2
Public transport	59	70	80	21
Private transport	11	24	26	15
Post office	18	18	20	2
Telephones	20	22	25	5
Official administration	25	35	30	11
Education	89	115	180	91
Health service	10	16	18	8
Paid housework	33	23	20	-13
Hotels and cafes	43	55	65	22
Laundries	8	25	15	7
total:	833	1063	1190	357

sources:/Sogndal Generalplanutkast 1972, p.23; Sogndal
kommunekasseraren/. #A.iv.10

qualified in these careers have difficulty in getting jobs in Sogndalsfjøra. On the basis of interviews at the county employment office, and at the college in Sogndal providing training for shop and office workers, it was found that there exists a very great demand by teenage girls for jobs in Sogndalsfjøra, partly because it is the only place where these jobs exist in large numbers locally, and partly because the youth of the whole subregion is orientated around the schools located in Sogndalsfjøra. Having obtained training, up to eighty pupils per year emerge onto a labour market which is more or less saturated, even given a rapid turnover of labour. Many are or will be qualified in subjects, such as marketing, which they cannot use within the subregion, or the county.

In the experience of the teachers at the college, many of their pupils were unable to find satisfactory jobs, and either married and withdrew from the labour market, or left the county anyway for a job elsewhere, or to continue their education. Further Education policy has the goal of providing all with equal opportunities for training, a goal which must be accepted as praiseworthy, but this policy has the consequence of flooding the labour market with skills which are not in demand locally.

b. Førde in Sunnfjord

Førde has had a slightly more planned relationship with its subregion than has Sogndal. The three neighbouring communes of Gauldal, Jølster and Naustdal will all very shortly have draft General plans ready, that for Gauldal was published in February 1975. From Tables 3.16 and 3.17 it may again be seen that the "trial" centre has quite strong commuting and migration links

with its neighbouring communes.

Table 3.16
Migration to and from Førde commune
1971-2

	to Førde		from Førde	
	1971	1972	1971	1972
Høyanger	17	23	5	3
Askvoll	10	16	4	10
Fjaler	25	34	6	9
Gaular	30	13	13	13
Jølster	16	15	8	21
Naustdal	15	7	7	13
Bremanger	7	12	1	9
Flora	28	35	17	8
rest of the county	95	81	41	43
total	461	487	200	283

/NOS A 640, p.58-61/

Table 3.17
Persons working or studying in Førde
by commune of residence in 1970

	working		students
	men	women	
Fjaler	6	-	23
Gaular	35	5	41
Jølster	84	13	40
Førde	1229	839	121
Naustdal	80	14	20

/1970 Folketelling, kommunehefter/ *

Indeed, this was one of the reasons for its being chosen by the Industrial Estate corporation as a suitable site. From the interviews with some enterprises referred to above, it was possible to obtain the impression that the male labour force was recruited from the subregion as a whole, while the female labour force

* A.iv.11

depended either upon shared journeys-to-work with husbands, or use of public transport when convenient. While women workers with established families would accept the troubles involved in journeys-to-work without their own cars, it was felt strongly by those interviewed that unmarried girls would not accept this, and indeed their demand for lodgings and small flats in the centre is very great.

This difference is revealed in Table 3.18, where the percentage of residences by zone in predominantly male employing companies are shown together with various service sectors all with workplaces in the centre. In the male employing enterprise, the car maintenace sector, and the construction sector a substantial proportion of the employees live in neighbour communes.

Table 3.18

Employees residences by zone for two manufacturing companies, and selected service sectors. Førde, percent

	Førde commune	Fjaler, Gauld Jølster, Naustdal communes	elsewhere
male employing company 1974	43.6	29.4	27.0
female employing company 1974	85	10	5
car maintenace	72	17	11
building contractors	81	16	3
official administration and services	94	3	3
private services	96	2	2
miscell services	85	9	6

/interview material,^{*} manuscript material Førde kommunekasserar January 1974/.^{**}

In the other sectors, even the very large official administration and service sector, very few do. In the draft General plan for Gauld commune, 57 residents are reported to have been

^{*}A.iv.8 ^{**}A.iv.7

working in Førde in 1971 out of a total of 451 taxpayers; in total 211 of these have part or all of their work outside the commune /Gaula kommune Generalplanutkast 1975, p.20/. Bolstad et al found that of these economically active outside agriculture in Naustdal in 1973, some 60 percent had their places of work outside the commune, and fully 70 percent of the jobs in industry and transport of commune residents were elsewhere /1974, p.95/. In addition, the average annual housebuilding rate in Naustdal commune has increased from about 8 houses per year before 1970 to about 40 in 1974.

c. Planning and policy

In comparing approaches to planning one may contrast the plan documents of Sogndal and Førde, which concentrate almost exclusively on the channelling of growth to the subregional centres in their communes, with the plan for Gaula, a smaller and less prosperous commune in Førde's hinterland. Here growth is planned to be located at three points spaced along the length of the commune, with industrial buildings for lease, and new housing areas prepared under zone regulating plans /reguleringsplaner/. The intercommunal planning office in Førde has worked hard to locate housing areas and other developments outside Førde, in order to permit neighbouring communes to benefit from the expanded demand for labour. However this faces the same problem as was pointed to in Sogndal, that highly qualified female residents even in central Førde cannot find work, so that those living 30 minutes drive from the centre have little chance of a satisfactory job.

The planning process in the central communes has depended upon the assumption that urbanisation would continue, for example in the extension of educational opportunities to the whole population. They have assumed that urbanisation would work to the benefit of their central urban settlements but against this one can place a large question mark. If, as it seems, the aspirations of a large proportion of the youth of the county cannot be realised even in the county's centres, then they have few options left but to migrate. The jobs which are accumulating even in Førde, are relatively unskilled, and even the building of the central hospital would not alter this greatly. Sogndal's draft plan voices the hope that the central jobs in Sogndalsfjøra will provide work off the holding for farmers whose farms are too small to earn a living from, but the jobs are nevertheless central, and it is merely a hope, no proposals are advanced /1972, p.31/. Österud /1971/ has made a number of pertinent comments about the problems of communal planning: he represents the view of the centre developers as an element of the official welfare and rationality ideology /p.24/. Their view of those opposing their plans was that the people trying to defend the local settlement patterns were tradition bound, and lacked any perspective on or appreciation of the interests of the commune as a whole /p.62/. He describes the centre developers as being unable to stand as heirs to the old tradition of communal autonomy, whereas the opponents of urbanisation are its direct descendants. The reaction of the Fylkesting to Vestlandsplanen, cited above, is much more in line with the sentiments of the planning proposals in Gauldal than in either Førde or Sogndal.

4. THE DIMENSIONS OF CHANGE AT THE LOCAL SCALE

I Methods of Analysis

- a. The choice of entities and variables
- b. The grouping of entities
- c. The sample design

II Assembly of the Data Files

- a. Population census
- b. Agricultural census

III Spatial Patterns and Changes in the Three Trade Districts

- a. Description of the data
- b. Population change
- c. Migration
- d. Occupations

IV Grouping Census Districts in Indre Sogn

- a. Principal components analysis
- b. Hierarchical Clustering and discriminant analysis

V Agriculture and Settlement in Indre Sogn

- a. Structural features and trends in farming
- b. Characteristics of the farmers relationships to their holdings
- c. The experience of change in the strata
- d. The characteristics of farm holdings at the stratum level
- e. The relationship between agriculture and settlement change

Summary

Nestling between the previous and following chapters, the function of this chapter is to give some scale to the assertions about marginality and differentiation made above, and to form a context in which to place Fjaerland, a single remote community. Initially, the methods used and the sources of information consulted are remarked upon. These are the Norwegian Population and Housing Censuses of 1960 and 1970, and the Agricultural Census of 1969. For the three trade districts of Indre Sogn, Førde, and Flora, 189 taxonomic units are constructed which are comparable through time, based on the smallest census unit. Results for the three trade districts are mapped and discussed, most of the maps are contained in Appendix iii b. Subsequently, the data for Indre Sogn was analysed using Principal Components Analysis, and the taxonomic units grouped using Johnson's Hierarchical Clustering Scheme. The groups form strata used to stratify the farms of the trade district, in order to sample their responses to the 1969 Agricultural Census. The relationships between the population census results, and the sample observations concerning the state of the farms are discussed, especially with reference to the occurrence of part-time farming as a transitional form.

1. Methods of Analysis

a. The choice of entities and variables

Chapter 1 showed that the definition of the regional policy 'problem' has created some difficulties for itself. The identification of weakly developed areas as having weak or one-sided industrial-occupational structures unsatisfactory service provision, and the anticipation of a further fall in numbers occupied in agriculture, forestry, and fisheries has raised the dilemma that practical regional policies may be unable to help the marginal areas, the areas most weakly developed. Although it is unsound to look at the structure of settlement, and its changes between 1960 and 1970, as any sort of evaluation of centre policy, it can contribute some conclusions which could indicate how the newer policies will bite. In addition, the anticipated loss of labour from agriculture makes a close examination of the situation in farming potentially valuable. With these considerations in mind, and to provide an internal frame of reference for the preceding chapter, and an external frame for the next, an analysis of Population and Agriculture Census data was undertaken.

The smallest usable census unit is the tellingskrets, here called census district. These are defined in areas outside urban districts, defined above in Chapter 1, by the matriculated farms they cover, or by specific holdings of matriculated farms. In urban districts in rural communes there is one census district per urban district; in urban communes there may be several census districts within the urban district. Rural and Urban

never more than
More was going one member
everywhere (Florø)

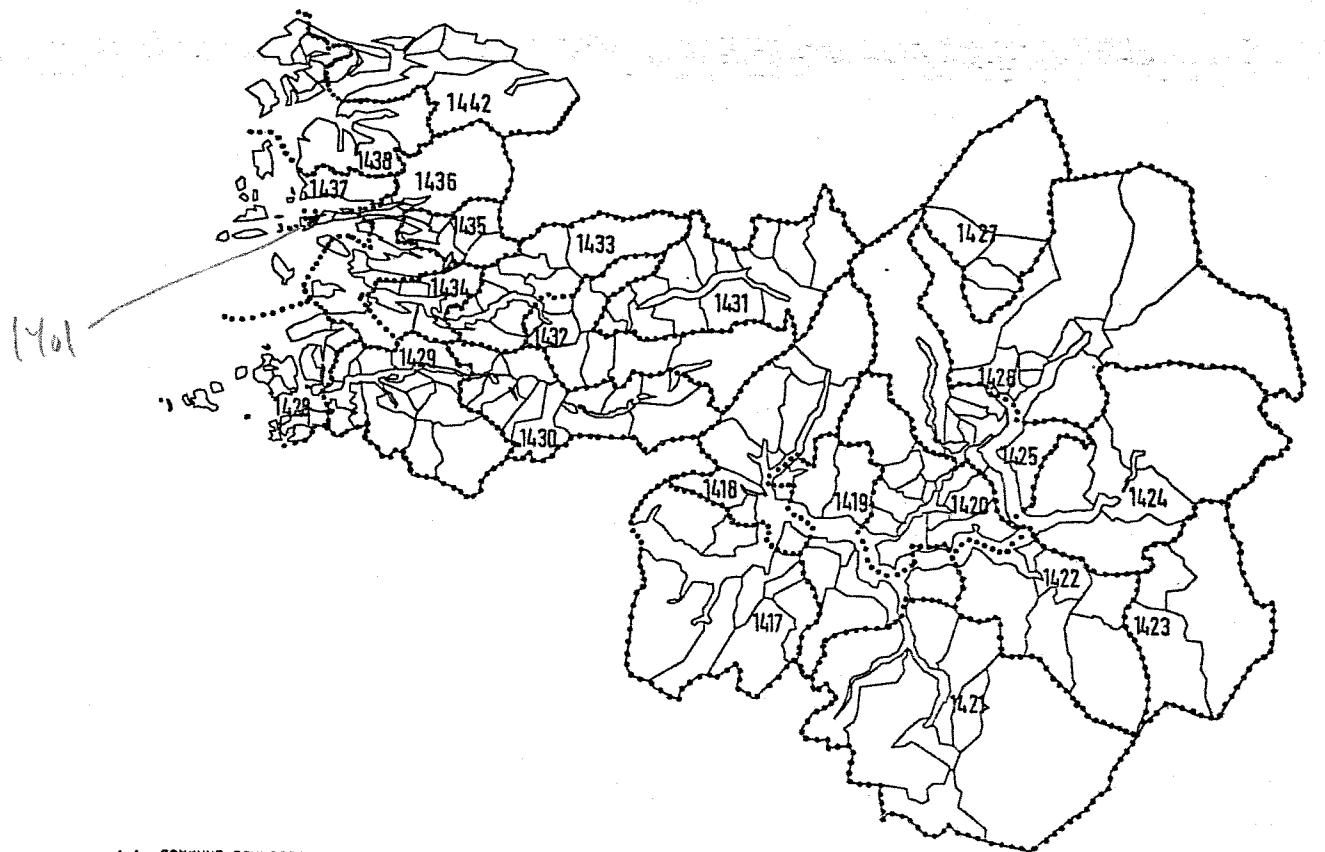
communes were so designated according to their administrative position, and no longer exist in Sogn og Fjordane. In comparing areas according to their condition of weakness or otherwise of development, as fine a scale as possible seems desirable, but study at the level of the individual population member rather inappropriate. The census districts are adequate objects of study in that they, as located containers, held certain volumes of different categories of individuals when observed, and the changes in contents of the districts can be calculated readily. In relation to farming, this could have also been the case, except that census district data is unpublished, and has only just become available, solely for 1969. In order to investigate the relationship between general structural changes and the pattern of agriculture in 1969, it was chosen rather to sample the farms from census districts which had been grouped for similarity in changes experienced over the decade. In addition to giving a stratified sample to relate to the experience of change, this method enabled analysis of characteristics of individual farmers, especially of important categories such as pensioners and part-time farmers, which could not have been carried out at census district level.

The three trade districts of Indre Sogn, Førde, and Florø were chosen for the analysis of population census data at the census district level. Subsequently the Agricultural Census was sampled for the communes in the Indre Sogn trade district. The communes included are shown in Figure 4.1 and Table 4.1 /NOU 1972:44, p.154/. On this basis of statistical units, certain variables, relating to production and income, are not available, only being prepared at the communal level, and then

Table 4.1

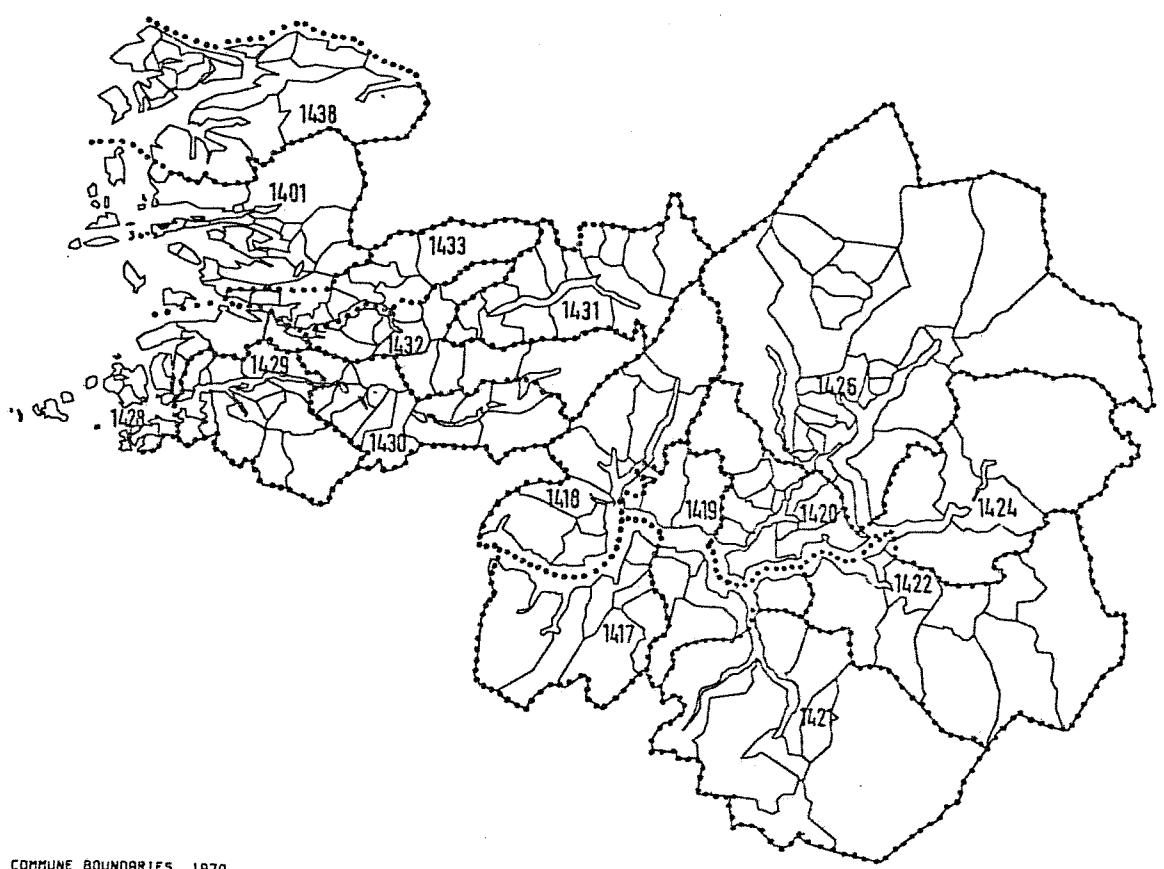
Communes by trade district 1960-70

INDRE SOGN	FÖRDE	FLORÖ	
1960	1417 Vik 1418 Balestrand 1419 Leikanger 1420 Sogndal 1421 Aurland 1422 Lærdal 1423 Borgund 1424 Årdal 1425 Hafslo 1426 Luster 1427 Jostedal	1429 Fjaler 1430 Gaular 1431 Jölster 1432 Förde 1433 Naustdal 1434 Vevring / part / 1401 Florø 1428 Askvoll 1434 Vevring / remainder / 1435 Eikefjord 1436 Bru 1437 Kinn 1438 Bremanger 1442 Davik / part /	
1970	1417 Vik 1418 Balestrand 1419 Leikanger 1420 Sogndal 1421 Aurland 1422 Lærdal 1424 Årdal 1426 Luster	1429 Fjaler 1430 Gaular 1431 Jölster 1432 Förde 1433 Naustdal " "	1401 Flora 1428 Askvoll 1438 Bremanger



4.1 COMMUNE BOUNDARIES 1960

25 KM



4.2 COMMUNE BOUNDARIES 1970

25 KM

not in connection with the census. Consequently, variables considered by Willis /1971, 1972/ are impossible to use, but a set of variables may be constructed satisfying many of Moseley's criteria for dynamic variables. He points out that many growth centre studies have used static variables, and as such seldom measured change /1972, 1974, p.15/. While this analysis does not seek to pose growth centre hypotheses as such, it is the experience of change over the decade across the subregions which is the focus of interest.

The interest is concentrated on two themes, one demographic, the other occupational, with about half of the data extracted from the census relating to each theme. The demographic variables are constructed from population size, and proportions of children and elderly people in the population; a subset are cohort survival figures for male and female cohorts who grew up from 10 - 19 years in 1960 to 20 - 29 in 1970. The occupational variables cover only four categories, together with the total of economically active; they were agriculture, forestry, fishing and hunting; industry and construction; commerce; transport, public administration, public and private services. In addition numbers of persons active in basic metals and construction in 1960 were used; although not dynamic, these variables show the extent of other manufacturing activity at that time. Further variables cover housing quality, and the number of pensioners in the districts. The set of variables entered into different stages of the analysis has not been constant, and more specific information about the sets included is given in appropriate sections.

b. The grouping of entities

There is no necessarily objective method for grouping similar objects, except when they form non-overlapping subsets, and if the subsets all have intersections which are empty the grouping must be banal /Pernarowski 1974/. Consequently, a method of clustering or grouping entities which are members of overlapping subsets must admit its subjectivity; the eventual partition will not be decided exactly. The existence of groups or clusters within a universe of operational taxonomic units, groups sharing definable characteristics is the hypothesis with which one must begin /Johnston 1970/. In the case of nominally scaled characteristics, definition as such is plainer, and interpretation seems more direct. Generally, interpretation tends to reduce to a nominal scale even though the data on which the classification was based was of interval or ratio scale. The data analysed here was extracted from the population census at interval scale on 189 taxonomic units; it was converted to dynamic variables by subtracting 1960 values from 1970, to give absolute change, by calculating percentage changes, in order to allow comparability between census districts whose population differed grossly, and by calculating percentage changes in proportions which reserved the effect of change in population size to only one variable.

There are a number of alternative routes from such a battery of information on each taxonomic unit to a grouping. The route followed here is fairly well travelled, but there are, nevertheless, pitfalls. The number of taxonomic units in Indre Sogn was 75, but four were excluded at various times since

they had particularly abnormal growth experiences during the decade, leaving 71; some analysis has been made of the remaining two trade districts for comparative purposes. Grouping methods on more than one variable, as in this case, treat each variable as a separate dimension in constructing a matrix of dissimilarities between taxonomic units, on the basis of which they are grouped. It is desirable that the variables should be orthogonal in which case the dissimilarity matrix will not be distorted by correlation between variables. The most appropriate method of orthogonalising a matrix of variables observed on taxonomic units is to extract their principal components.

This procedure transforms the variables to a new set of variables /components/ which are pairwise uncorrelated, and of which the first will have the maximum possible variance, the second the maximum possible variance among those uncorrelated with the first and so on /Johnston 1972, p.322 -331/. Normalisation of the variables by transformation is not necessary /King 1969, p.165, Clark 1973, p.110/, and would impede interpretation, but standardisation is necessary, so that variables are measured in the same units; the cross-product matrix of the observations is now a correlation matrix rather than a co-variance matrix.

A principal components solution has the advantage over an orthogonal factor solution that, provided the variables are more or less equally autocorrelated, the transformed matrix of scores is more reliable /personal communication Dr A.Cliff. June 1974/; the extent of possible variability is at present unknown. The difference in method is that factor analysis assumes the presence of an independent normal error term, accounting for the difference between the estimated communality and unity, unity being

used by assumption in principal components analysis. However, the normal practice of discarding the later components /Mather 1971, p.252/ may lead in fact to a rather similar situation /Johnston ^J 1972, p.327/.

In handling this data set, principal component analysis is probably also suitable, in that non linear relationships are not a priori realistic, as they would certainly be in ecological data /Austin and Noy Meir 1971/. Following Anderson, principal component scores themselves may be used as a basis for ordination, or run into further forms of analysis. The finding of a configuration of points in low-dimensional Euclidean space, such that similarities between taxonomic units are in some degree reflected by the interpoint distances is the result of ordination, and may circumvent conventional clustering. Both in multi-dimensional scaling and in the function minimising quadratic loss, the number of dimensions is successively reduced against a measure of the adequacy /lack of stress/ of the ordination /Kruskal 1964 a,b; Anderson 1971 a/. These procedures obviate the immediate problem of the arbitrary combination involved in constructing the dissimilarity matrix for a cluster analysis, but at least multi-dimensional scaling is excessive in its demands on computing time. After having considered both these ordination methods, and the relatively similar Smallest Space Analysis /Guttman 1968 /, it was decided to use an elementary form of cluster analysis to group the taxonomic units by their component scores.

The methods open to choice are described as a family of sorting strategies by Lance and Williams /1966 /. Experimental work by Byfuglien and Nordgård /1973/ and Pritchard and Anderson

/1971/ has shown that furthest neighbour, and minimum variance clustering were approximately equally efficient. In the Byfuglien - Nordgard experiment the methods were tested for grouping with a contiguity constraint, but this is felt not to invalidate their finding, backed up as it is by Pritchard and Anderson's results. Despite Everitt's many strictures on agglomerative methods of hierarchical clustering /1974, p.8-18, p.78-84/, single linkage analysis still performs tolerably, especially when compared to very expensive alternatives. After Spence and Taylor /1970/, the hierarchical clustering ² of scheme of Johnson /1967/ was examined, and found satisfactory in employing a furthest neighbour - maximum distance diameter - method, and being efficient as a monotone invariant clustering method. Johnson claims that the resulting groups are optimally homogenous, but since only the dissimilarity matrix is entered into analysis, the only check on homogeneity is the original dissimilarity in the given dimensional Euclidean space. The grouping of taxonomic units should therefore be checked once made, and discriminant analysis was used for this purpose /Demirmen 1969/. Many questions remain unanswered in this flow of analysis, but, like for example the choice of a Euclidean metric, would have required a strong justification to depart from conventional practice. /The flow of analysis is shown in Figure A.i.i; details of programmes used are contained in Appendix ii/.

c. The sample design

The groups of census districts formed a frame for stratification of farms in Indre Sogn by the experience of change in the area over the decade. Necessarily the reduction to five

groups meant an increase in within group heterogeneity, that the groups were more similar. The matriculated farm registration numbers, and holding registration numbers of the census districts were assembled within the strata. Since the numbers of farms in the strata varied greatly, a sample of equal proportion in each stratum seemed ill-advised. Instead, it was decided to sample 45 farms picked at random from each of three strata, and 60 farms from each of the remaining two. This allows for the possibility of being able to compare classes of holding within stratum, as well as to make population estimates for the trade district as a whole, by weighting the disproportional samples back to proportionality. In effect this improves the relative estimation in strata where the sample was larger than the population proportion as well as permitting within-stratum comparisons. It was considered that this sample design would be satisfactory, given the conflicting demands made on the data. The advantages of within-stratum analysis were balanced against the disadvantages of having to weight the separate strata differently to get whole population estimates /Moser and Kalton 1971, p.93-99/.

2. Assembly of the Data Files

a. Population census

The censuses of 1950, 1960 and 1970 were collected on somewhat similar census districts, but it was decided at an early stage to only attempt to use 1960 and 1970 data /Hansen 1974/. The sources of data for 1960 were the published volumes for each commune then existing, entitled 'Tellingsresultater -

Tilbakegaende tall - Prognoser", and unpublished data held on tape by the University of Bergen /Maskintabell 201/. These extra data permitted the construction of the cohorts, and the modification of other variables to improve comparability. The 1970 data was taken from published volumes in the series of *komonnehefter*, which corresponds to the 1960 series; those volumes unpublished at the time the data was assembled were consulted at draft stage through the courtesy of the Central Bureau of Statistics.* In Table 4.2 the sources of the raw variables assembled for each census district are shown for 1960 data all 1970 variables originate from the *komonnehefter* /Table 4.3./.

The taxonomic units, upon which the data were assembled were based on the census districts, but a number of changes were made necessarily by boundary changes between 1960 and 1970. Drangsholt /1970, Appendix 2/ gives details of the changes, which occurred in several ways. Some communes were combined, leaving the boundaries of census districts intact; others lost or gained individual census districts, again posing no problem; yet others divided a 1960 census district into parts, each a separate district in the 1970 census. When aggregated for 1970 variables, a single district is reconstructed. Further aggregation was necessary because of the very small population of some districts, the minimum 1970 population being set at 90 for this purpose. The most troublesome cause of aggregation was the distinction between urban and rural census districts. From air photographs and 1:50 000 maps held in the Central Bureau of Statistics, it was possible to see that firstly, the extent of the urban census districts changed between 1960 and 1970, and

*A.iv.12

Table 4.2
Source of 1960 variables kh = published volumes
Et = extractables

code	description	
1. POP 6	total population	Et
2. YOUTH 6	population aged 0 - 15	Kh, Et
3. SKP 6	population aged 0 - 14	Kh
4. MCOHA 6	males aged 10 - 14	Et
5. KCOHA 6	females aged 10 - 14	Et
6. MCOHL 6	males aged 15 - 19	Et
7. KCOHL 6	female aged 15 - 19	Et
8. MOLD 6	males aged over 59	Et
9. KOLD 6	females aged over 59	Et
10. MPOP 6	total male population	Kh
11. KPOP 6	total female population	Kh
12. ECONACT 6	total economically active	Kh, Et
13. AGFIS 6	occupied in agriculture, fisheries etc.	Kh
14. INDCON 6	occupied in industry, construction	Kh
15. COMMER 6	occupied in commerce	
16. TRANSER 6	occupied in transport and services	Kh
17. PENFOM 6	pensioners, capital income	Kh
18. HUSFOR 6	housewives, unoccupied adults	Kh
19. METAL 6	occupied in basic metal industry	Et
20. BUILD 6	occupied in building, construction	Et
21. AGRIC 6	occupied in agriculture	Et

Table 4.3
1970 variables

code	description
22. POP 7	total population
23. YOUTH 7	population aged 0 - 15
24. MCOHA 7	males aged 20 - 24
25. KCOHA 7	females aged 20 - 24
26. MCOHB 7	males aged 25 - 29
27. KCOHB 7	females aged 25 - 29
28. MOLD 7	males aged over 59
29. KOLD 7	females aged over 59
30. MPOP 7	total male population
31. KPOP 7	total female population
32. ADULT 7	population over 15 years
33. ECONACT 7	total economically active
34. AGFIS 7	occupied in agriculture, fisheries etc.
35. INDCON 7	occupied in industry, construction
36. COMMER 7	occupied in commerce
37. TRANSER 7	occupied in transport and services
38. PENFOM 7	pensioners, capital income
39. HUSFOR 7	housewives, unoccupied adults
40. ECON 7	females economically active
41. KADULT 7	females over 15 years
42. HUS 7	total number of houses
43. NEWHUS 7	houses built 1960 - 1970
44. BUILD 7	total number of dwellings
45. BATH 7	dwellings with own W.C. and bath

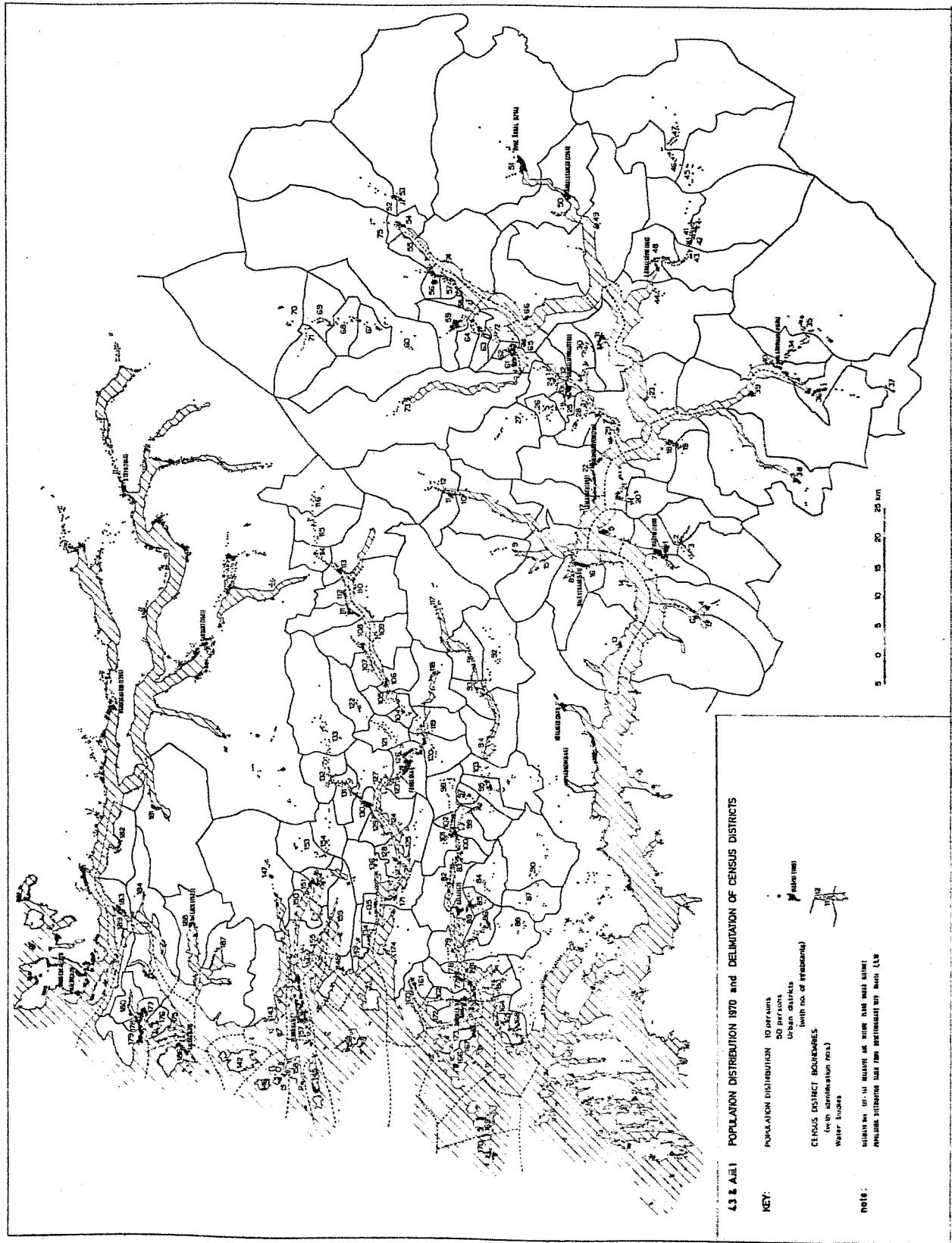


Table 4.4

Names and identification numbers of census district aggregates.

no.	name	no.	name
1	Hove	51	Øvre Årdal
2	Seljedalen	52	Bjørk
3	Ovrisdalen	53	Fortun
4	Framfjord	54	Bolstad
5	Vangsnæs	55	Kvåle
6	Arnafjord	56	Dale
7	Vik i Sogn	57	Flåhamar
8	Esefjorden	58	Nes
9	Vetlefjorden	59	Gaupne
10	Ytre Fjærland	60	Alsmo/Dalane
11	Mundal	61	Alme
12	Indre Fjærland	62	Kjos
13	Nessane	63	Fet
14	Kvamsøy	64	Joranger
15	Sværefjorden/Eitorn	65	Solvorn
16	Balestrand	66	Ornes
17	Grinde	67	Myklemyr
18	Fresvik Nedre	68	Sperle
19	Fresvik Øvre	69	Kriken
20	Tjønn	70	Mjølverdal
21	Feidje	71	Krundal
22	Leikanger	72	Ugulen/Molden
23	Frønningen/Fimreite	73	Heggestad
24	Øyabrekka	74	Sørheim
25	Bjella	75	Dalsdalen
26	Notsete	76	Vårdal
27	Dalavatn	77	Holmedal
28	Nygard	78	Bakke
29	Lomelde	79	Rivedal
30	Hovland	80	Lone
31	Kaupanger	81	Gjølanger
32	Barsnes	82	Hestad
33	Sogndal	83	Strand
34	Dalen	84	Vassdalen Øvre
35	Vassbygdi	85	Vassdalen Nedre
36	Flåm	86	Flekke
37	Myrdal	87	Hovlandsdal
38	Nærøy	88	Tyssedal/Espedal
39	Undredal/Berekvam	89	Dale i Sunnfjord
40	Aurland	90	Guddal/Heggheim
41	Ljøsne	91	Øvrebotten
42	Rikheim	92	Eldal/Mjell
43	Tønjum	93	Viken
44	Erdal	94	Hestad
45	Husum	95	Sande
46	Berge	96	Sygna
47	Hegg	97	Lunde
48	Lærdal	98	Skilbrei/Hjelmeland
49	Nærdvik/Ofredal	99	Osen
50	Årdalstangen	100	Birkeland

Table 4.4 continued.

no.	name	no.	name
101	Kårstad	151	Hovland
102	Lien	152	Eikefjord
103	Skudal/Senneseth	153	Endestad
104	Eikås	154	Langedal
105	Fluge	155	Sandvikfjell
106	Gjesdal	156	Brufjorden
107	Svidal	157	Havrenes/Krokane
108	Ålhus	158	Skorpa/Furesund Vestre
109	Sanddal	159	Svardal/Høydalane
110	Myklebost	160	Stubseid
111	Årdal i Jølster	161	Stongfjord
112	Helgheim	162	Strømmen
113	Viken	163	Olset
114	Klagegg	164	Fure
115	Veiteberg	165	Våge
116	Åmot	166	Herland
117	Haukedal	167	Vilnes
118	Holsen	168	Hovland
119	Mo/Åsen	169	Værlandet
120	Sundegrend	170	Bulandet
121	Furebø	171	Rørvik
122	Indre Angedal	172	Askvoll
123	Ulltang	173	Kumle/Høyvik
124	Kråkenes	174	Gjelsvik/Vågane
125	Ervik	175	Novelandet
126	Førde i Sunnfjord	176	Rylandet
127	Erdal/Åse	177	Førde i Bremanger
128	Helle	178	Hauge
129	Frammarsvik	179	Grotle
130	Naustdal	180	Dalen
131	Horstad	181	Ålfoten
132	Ullaland	182	Dombestein/Davik/Endal
133	Fimland	183	Rugsund/Elde/Otteren
134	Kvellestad	184	Leirgulen/Bortne/Hennøy
135	Vevring	185	Berle
136	Redal	186	Kalvåg
137	Florø Nedre Vestre Bydel	187	Sørgulen/Midtgulen/Botnane
138	Florø Øvre Vestre Bydel	188	Svelgen
139	Florø Hesteneset Bydel	189	Rugsund/Hunskår
140	Florø Midtre Bydel		
141	Florø Tua Bydel		
142	Hovden/Barekstad		
143	Årebrot/Nærøy/Haukå		
144	Brandsøy/Nyttingnes		
145	Rogndalsvåg/Kinn/Reksta		
146	Batalden		
147	Norddalsfjorden		
148	Stavøy/Stavang		
149	Standal		
150	Ytre Eikefjord		

secondly, that rural districts having apparently the same boundaries in the two years had in fact been encroached upon by 1970. It was therefore regretably necessary to aggregate most rural census districts which bounded an urban census district with that district. In Leikanger commune, four 1960 and five 1970 census districts had to be aggregated because of this, destroying the looked for homogeneity within the taxonomic units. Appendix iii/a/ gives the origin of the eventual taxonomic units, which are summarised in Figure 4.3, and Table 4.4.

b. Agricultural Census

The Central Bureau of Statistics provided me with a list of the matriculated farm and holding numbers for all holdings of five decades and over which responded to the 1969 Agricultural Census, and to which respondent numbers had been assigned.* Groups were found for 2431 of these holdings, a further 187 were omitted since there was no definite trace of them in the boundary definitions of census districts as annexed to the *kommuhefter* of the population census. The remaining twelve occur mostly where two responses were recorded for a single numbered holding, and the first has been taken as the appropriate one to use. The distribution of the holdings excluded because their location by census district was unknown is given in Table 4.5; the high figure for Leikanger commune is cause for some alarm, and arose because the holdings lay completely within the boundary of the urban district. The way in which this has affected the distribution of the sample of farm sizes against the population is unfortunate, with fewer of the smallest size

*A.iv.13

class, after the sample strata frequencies have been weighted back to proportionality /Table 4.6/.

Table 4.5.
Farms omitted from strata in sample

Commune		all farms	omitted	% omitted
1417	Vik	315	18	5.7
1418	Balestrand	234	23	9.8
1419	Leikanger	300	58	19.3
1420	Sogndal	397	25	6.3
1421	Aurdal	174	5	2.9
1422	Lærdal	253	5	2.0
1424	Ardal	60	6	10.0
1426	Luster	897	47	5.2
	other		12	
		total	199	7.6

NOS A 425 Jordbrukssteljinga, Sogn og Fjordane.*

Table 4.6.
Farm sizes, sample and population

Size, decares		sample	%	population	%
cl.2.	10-19.9	41	16.1	630	24.0
cl.3.	20-49.9	114	44.8	1047	39.8
cl.4.	50-99.9	90	35.3	821	31.2
cl.5-6	100-299.9	10	3.8	132	5.0
	total	255	100.0	2630	100.0

NOS A 425 Jordbrukssteljinga, Sogn og Fjordane

On the remaining 2431 farms the overall sampling proportion was 10.5 percent varying between 19.5 percent in stratum One and 7.9 percent in stratum Three /Table 4.7/. In the established file the individual cases are weighted back to the whole sample proportion by stratum, for example cases in stratum one are weighted :

$$x \cdot (231/45) \cdot (255/2431) = w(x).$$

Generalised, the weighting used is:

$$w_i = (p_i / s_i) \cdot (s / p) ,$$

Where:

w_i weight on cases in stratum i ;

p_i population in stratum i ;

s_i sample in stratum i ;

$P = \sum_{i=1}^s p_i$, sum of strata populations ;

$S = \sum_{i=1}^s s_i$, sum of strata samples.

Table 4.7

Farms, sampled farms, and sampling proportions by stratum

stratum	farms	sample	%
One	231	45	19.5
Two	654	60	9.2
Three	759	60	7.9
Four	419	45	10.7
Five	368	45	12.2
total	2431	255	10.5

The weighting is only used when operations on the whole sample are undertaken, the strata being combined. Within-stratum analysis is made with a weight of unity on each case. The weighting used will be stated beside each table where appropriate.

For the sampled farms, the Bureau extracted information from their completed census forms /Skjema 1 only/, and entered it onto a form which I provided, the farms solely being identified in the material returned to me by their stratum. The need for confidentiality in handling census material was met by this procedure. The extraction of complete census responses would have provided more information about each farm, but not about topics of interest in this analysis. The only improvement could have been through a higher general proportion, permitting more

Table 4.8
Variables on sampled holdings

Code	description
1. AGE	holders age
2. FARMSIZE	Agricultural area in use, decares
3. TOTALREA	total area including forest and other area, decares
4. CATTLE	number of cows at 20.6. 1960
5. SHEEP	number of sheep at 20.6.1969
6. DIESEL	number of tractors
7. PETROL	number of tractors
8. TWOVEL	number of tractors
9. HAY	possession of a hayharvester
10. LEVLEV	the holding's importance as an occupation
11. MARK	source of income outside the holding in 7 categories for the holder if male, or male spouse.
12. RIVINNE	source of income outside the holding in 7 categories for the holder if female, or female spouse
13. MBRUK	days worked on the holding as agriculture by male holder or spouse
14. MSHOG	days worked on the holding as forestry by male holder or spouse
15. MUFROM	days worked off the holding by male holder or spouse
16. FERUK	days worked on the holding as agriculture by female holder or spouse
17. FSHOG	days worked on the holding as forestry by female holder or spouse
18. MUFROM	days worked off the holding by female holder or spouse
19. SILE	cubic metres silo volume
20. TURISM	importance of tourism to the holding
21. UTGIFTER	1968 expenditure on concentrates, fertiliser, lime, pesticides etc.

complete examination of some interesting differences which may now simply result from small sample size. The variables which were extracted for each holding are shown in Table 4.8, a copy of the relevant census form is annexed to the report of the 1969 Agricultural Census /NOS A 413, 1971, Appendix 3/.* The choice of variables reflected an interest in the relationship between types of holding and types of activity on the holding in terms of the holding's significance as a source of income, and related to this, the spatial variation over the trade district as a whole of occupations of farmers outside agriculture.

3. Spatial Patterns and Changes in the Three Trade Districts

a. Description of the data

In this section some leading features of the file of data will be described, chiefly concentrating on the census districts in which there have been positive changes in the sense of the goals set for planning policies. The census can be relied upon in areas with a professionalised population, but in remote rural areas, the categorisation of occupations, economic activity, and other non-demographic features may not reflect the occupational structure too well. An example is the classification of women economically active in agriculture, farmer's wives, who in 1960 often seem to have been categorised as housewives, but who in 1970 were included with the economically active, and may have concealed a larger decline in activity in agriculture and fisheries. Likewise, periodical changes in opportunities for part time construction work in 1970 may not have been the same as in 1960, resulting in an apparent increase in activity in

*On the opposite
page there were
to many farmer workers
(Squatters do
now derive in 1960*

in agriculture, and a decline in industry construction.

Despite these shortcomings, one can hope that the relative ranking of districts would have been the same had the same characteristics been measured at each census, that is to say that, for example, the shift from 1960 housewives to 1970 occupied in agriculture and fisheries did not vary much between districts. These relative positions on the complete set of variables are shown in the maps prepared for Indre Sogn, and Sunnfjord /Førde and Flora taken together/. The maps were drawn onto microfilm by the program 'Choremap' available on the ULCC CDC 7600, and are placed together in Appendix iii/b/. They should be seen in the light of the population distribution map, which shows the location of habitations in 1970 based on the settlement map of Norway /Byfuglien 1974/. The choropleth maps are deceptive in apparently showing large districts displaying certain classes of characteristics, when these characteristics are based only on the small area of habitable terrain within that district. Additionally, and especially in connection with variables which have been made independent of the size of population, it should be remembered that very often the largest seeming districts have the smallest populations, and consequently that large percentage changes reflect only a quite small absolute change.

b. Population change

The theme which will keep reappearing in this section, and which is plainly visible from the maps, is that despite the overall poor demographic condition of these subregions, and

their relative weakness contrasted with the country as a whole, some census districts have experienced very rapid growth. This corresponds to patterns referred to in Chapter 1, patterns shown in Hansen /1970, 1971, 1972, 1975/, and Myklebost /1974/. These patterns are in turn linked to the discussion in the previous chapter of the provision of opportunities for the establishment of jobs, and hence households. Within this class of generalities it is hoped to bring out the nuances of the experience of change, first in the districts experiencing positive change, and subsequently in following sections, the districts which may be considered marginal.

Table 4.9 lists the districts which increased in population by more than five percent in Indre Sogn. From the preceding chapter it will be recalled that, over and above normal secondary and tertiary activity, Indre Sogn contains in Årdal a large aluminium plant, in Leikanger the chief offices of many county administrative departments, and that in 1970 Aurland contained the construction force working on the major hydro-electric project in that commune. Consequently, when it is seen that the population of /35/ Vassbygdi has increased by 182,7 percent, it can fairly be expected that the population of the district has now fallen back to around the level it had before construction began. However, other population increases cannot be expected to vanish so readily, and result from either natural increase, or natural increase and a positive net migration balance. The increases in /50/ Årdalstangen and /51/ Øvre Årdal relate to the then continued recruitment to Årdal Verk in the two centres, and to increased service employment, but must chiefly result

Table 4.9

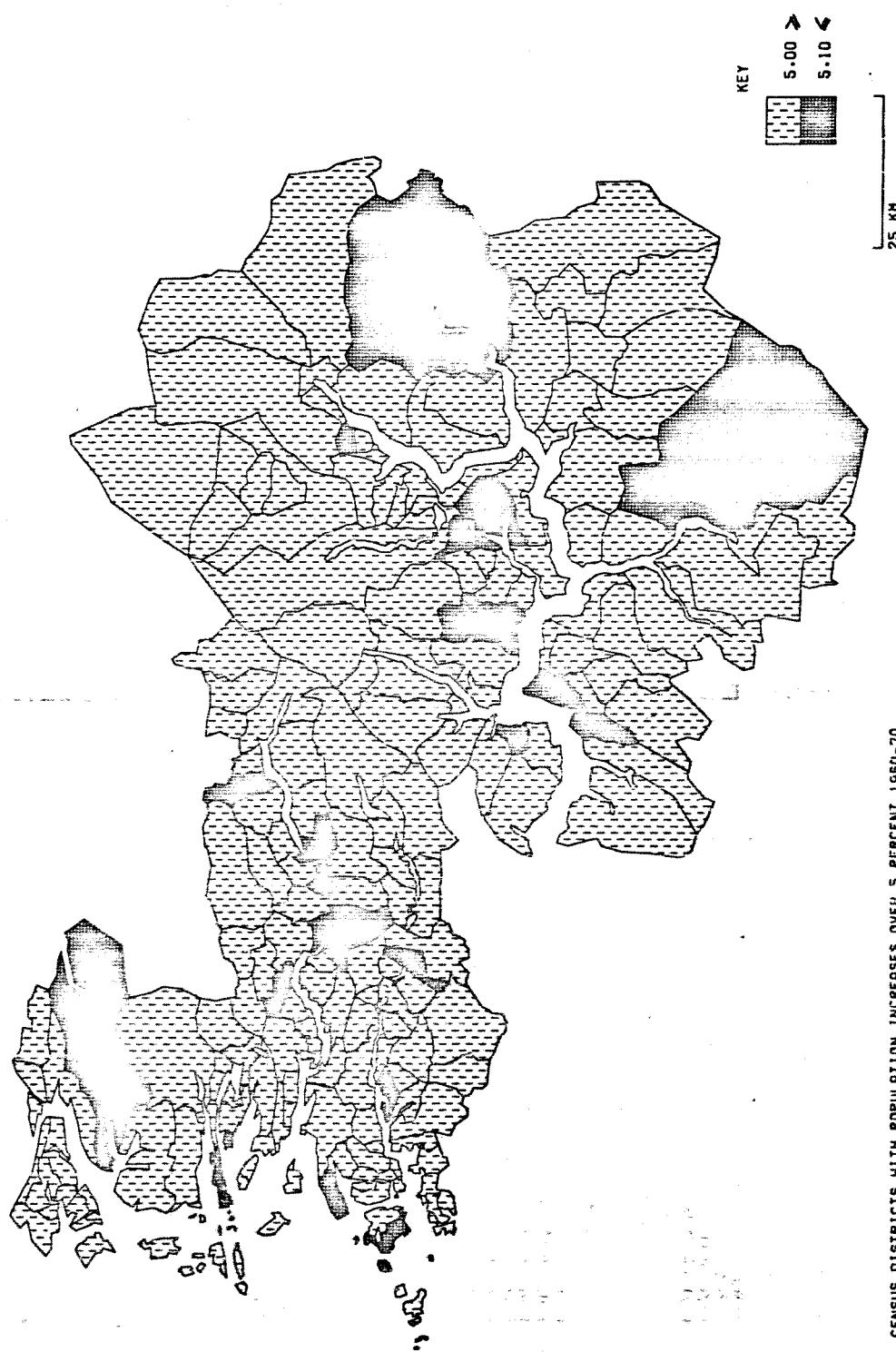
Census districts with over 5 percent increase in population 1960 - 70, Indre Sogn

no.	name	increase	percent
5	Vansgnes	78	41.1
7	Vik i Sogn	252	20.8
16	Balestrand	50	9.2
22	Leikanger	180	11.8
24	Øystreksnes	33	12.0
30	Howland	23	13.1
32	Larsnes	66	40.8
23	Sognsdal	517	20.6
34	Dalen	38	18.6
35	Vassbygdi	232	182.7
40	Aurland	77	10.1
50	Ardalstangen	248	11.2
51	Øvre Areal	1149	31.0
56	Dale i Luster	120	32.2

Table 4.10

Census districts with over 5 percent increase in population 1960 - 70 Sunnfjord

no.	name	increase	percent
89	Dale i Sunnfjord	94	9.3
95	Sande	25	7.9
104	Eikås	19	11.0
100	Gjesdal	33	17.5
111	Ardal i Jølster	22	10.3
120	Lundegrend	58	23.9
126	Førde i Sunnfjord	1147	60.0
130	Kaustdal	53	13.7
144	Brandspor/Åyttingnes	51	15.1
157	Havrenes/Irokane	1268	73.3
160	Stubseid	18	14.2
166	Herland	15	7.2
167	Vilnes	6	5.3
181	Ålfoten	13	5.0
188	Bælgen	516	47.8



4.4 CENSUS DISTRICTS WITH POPULATION INCREASES OVER 5 PERCENT 1960-70

from the high rate of natural increase caused by the very young population, a characteristic feature of 'one-sided' industrial towns /Hansen 1966, p.250/. Even so, the growth recorded in the decade 1960-70 is less than that for 1950-60. Vik i Sogn has received new industrial jobs to supplement its functions as a communal administrative and service centre. This is represented by population increases in /7/ Vik i Sogn, and contiguous districts, notably /5/ Vangsnæs.

The remaining districts experiencing population increases over five percent are divided between Sogndal and its surroundings and the remaining communal centres. Of these /48/ Lærdal in fact declined in population, losing 11 inhabitants /-1.2 percent/ over the decade. /16/ Balestrand, /22/ Leikanger, and /40/ Aurland grew modestly, while the amalgamation of communes to create the larger Luster commune has expressed itself in growth in /56/ Dale, and /59/ Gaupne; the increase in /56/ Dale is largely taken up by an increase in males aged 60 and over from being 21 in number to 136, apparently an old peoples' home. The increase in population in /33/ Sogndal is larger than elsewhere excluding /51/ Øvre Årdal, and is buttressed by increases in the neighbouring districts, particularly /32/ Barsnes, which lies just to the east on the road to the airfield and Kaupanger.

The situation in Sunnfjord displays many similar traits, but with different special conditions. First are the five districts which made up the former urban commune of Florø, none of which increased in population by as much as five percent, in fact only /140/ Florø Midtre Bydel increased at all, by 14 inhabitants /3.5 percent/. Florø's growth was recorded outside its former

boundaries, in /144/ Brandsøy - Nytingenes, and /157/ Havrenes - Krokane, which lie around Florø on the same narrow peninsula /Table 4.10/. /157/ Havrenes-Krokane was the district which grew most, and fastest /excluding /35/ Vassbygdi/ in all three trade districts, but mainly this is attributable to the district absorbing most of the growth of the whole urban district of Florø. If Havrenes-Krokane is added to the Florø districts the total increase in population over the decade was 1041 inhabitants, only 28.0 percent. This compares well with Sogndal, in relative terms, but Florø has a much more developed basis of infrastructure provision than Sogndal, and more industry. One might have expected the overall growth to be somewhat higher, and in search of explanation may look to Førde and its surroundings.

Førde's growth up to 1970 seems to be almost completely confined within the census district /126/ Førde in Sunnfjord, although it is possible to suggest that growth in the centres of neighbouring communes could also be attributed to the "trial" centre. Modest growth in /95/ Sande, in the three districts in Jølster, in /104/ Eikas, /106/ Gjesdal, and /111/ Årdal i Jølster, in /120/ Sunde-grend, which is contiguous with /126/ Førde, and in /130/ Naustdal may have been supported by commuting to Førde, or may have more simply reflected the presence of burgeoning communal administrations. In any case the growth is relatively so small that it is more absence of decline, than a real increase, except in /120/ Sundegrend. /89/ Dale i Sunnfjord also experienced a rather small percentage increase, as did a further communal centre, /172/ Askvoll, which grew by only 18 inhabitants /2.7 percent/. With the exception of /188/ Svelgen, the other census districts registering an increase of five percent and over only

just reached that mark, and the absolute effect was rather small. As another 'one-sided' industrial town, Svelgen increased quite rapidly in population; the population is becoming more youthful, with 343 inhabitants aged 15 and under /31.8 percent of the population/in 1960/, and 550 /34.5 percent/ in 1970. This contrasts with Årdalstangen and Øvre Årdal; Årdalstangen's youth under 16 years were 35.8 percent of the population in 1960, 31.3 percent in 1970; Øvre Årdals were 33.3 percent of the population in 1960, 34.0 percent in 1970.

c. Migration

The accumulation of population within certain census districts is not so much the result of differential rates of vital events, but rather flows of migration. After a certain point the population can no longer reproduce itself, and following that population decrease is related to the death rate, but up to that extreme point, the change in population relates to the opportunities open to people without household or property ties to set up households in the district. The opportunities may be from succession to the family farm, or business work outside the farm, or business prior to the head of household's retirement, or employment in work outside the parental household altogether. As Brox /1971/ has argued, it is the form of economic organisation which is found locally which determines whether or not niches can be carved out for those who have not already settled down, those either without families, or resources of their own. If the places can be created for them, then it is not unlikely that they will stay in numbers enough to maintain

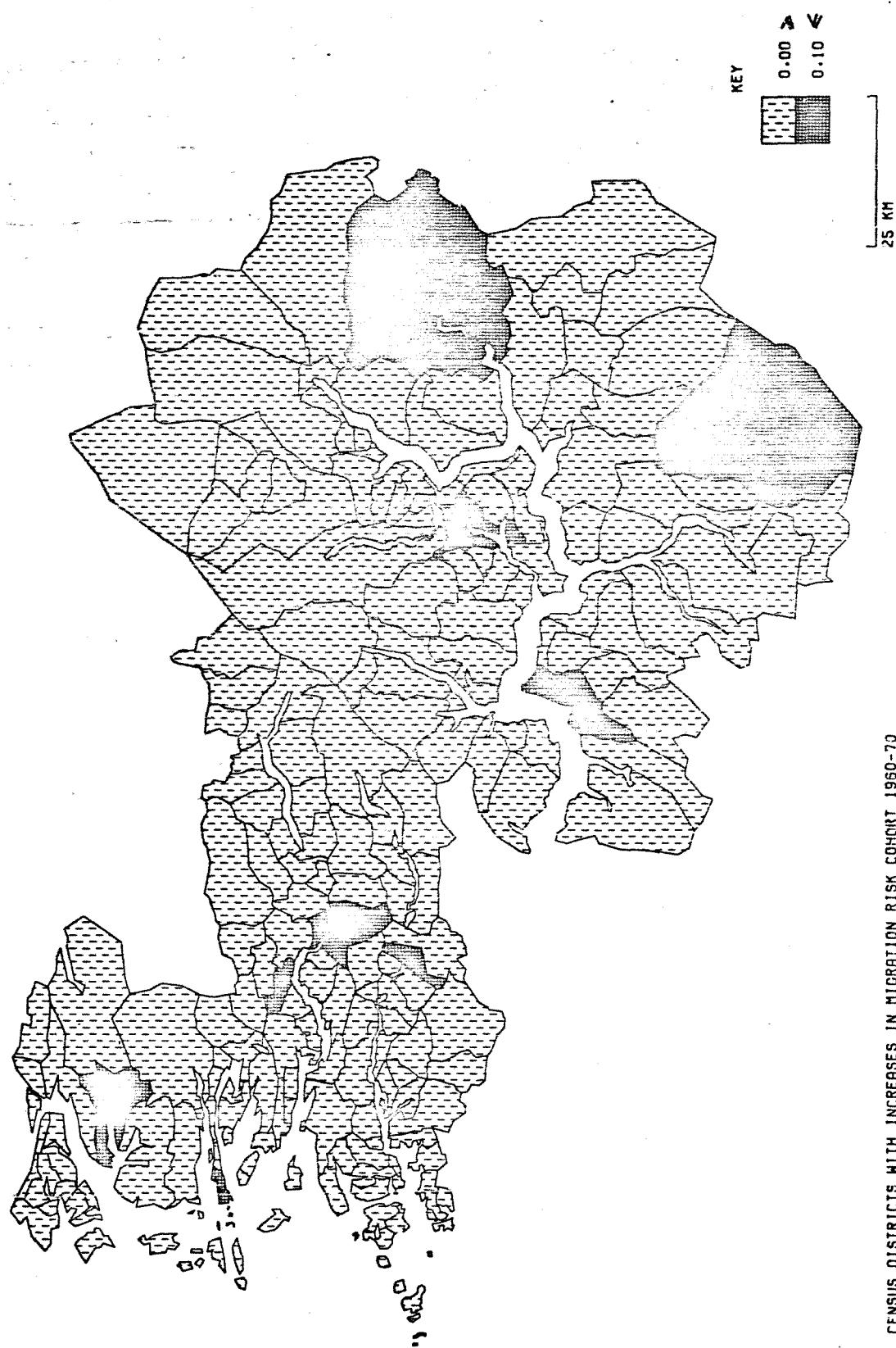
th population. The important question then becomes whether the locally occurring modes of economic organisation provide such niches, and if not, how they may come to do so.

On the basis of both local studies, and national data, one can say that young people, especially school-leavers, have the highest propensity to migrate, and that girls tend to move earlier (SSB, 1972, p48.). Between 1966 and 1970, in Norway as a whole 123.0 girls moved per each year per thousand 15 - 19 year olds, while only 48.2 per thousand boys of the same age migrated; for the 20-24 year olds 137.0 per thousand boys moved, and 190.0 per thousand girls. In these three trade districts, net migration as revealed by changes in the size of the migration risk cohorts, who were 10-14 and 15-19 in 1960, and who became 20-24 and 25-29 in 1970, repeats the national trend. Table 4.11 lists all the census districts in which the four parts of the migration risk cohort taken together, male and female, younger and older, were greater in 1970 than in 1960, where one may assume that a positive net migration balance existed. Many of the points made about individual districts above need no further emphasis, the dramatic increase in Vassbygdi has been explained already.

The districts which seem to benefit from this migration may be divided into two groups, one group with a majority of females over males, and the other with a minority of females in the net migration balance. Typical of the former are Vik i Sogn with a balance of 28 girls to 11 boys, Sogndal gaining 75 girls and only 17 boys, contrasting with Svelgen, 25 girls and 81 boys and Årdalstangen, losing 8 girls and gaining 35 boys. In between are Øvre Årdal, Førde and Havrenes-Krokane, where there were an approximately equal number of either sex in the net migration balance.

Table 4.11
 Census districts with increase in migration
 risk cohort 1960 - 70, Inne Sogn & Sunnfjord

no.	name	increase	percent
1	Hove	1	2.4
5	Vangenes	18	72.0
7	Vik i Sogn	30	24.7
24	Øyatrekka	1	3.0
32	Larsnes	3	12.0
33	Sognadal	92	34.8
35	Vassbygdi	116	610.5
50	Årdalstangen	27	7.3
51	Øvre Årdal	289	53.4
95	Sande	10	23.3
120	Bundegrend	11	33.3
125	Øvre i Sunnfjord	252	10.1
130	Kaustdal	6	5.0
140	Florø Midtø sydel	6	14.8
157	Havrenes/krokane	173	58.6
188	Svelgen	108	59.7



These census districts which experienced a positive net migration balance in the migration risk cohort are the cream of the cream, the districts in which population growth may be expected to accelerate, and seen in that light are rather few in number. There are three districts characteristically single sector 'one-sided' industrial towns, Svelgen, Årdalstangen, and Øvre Årdal, where the future level of population is closely bound up with rationalisation of production and the creation of jobs outside the dominant sector. In Indre Sogn two centres stand out, Sogndal, and Vik i Sogn, which each have two neighbouring districts in which growth may be expected to accelerate. In Sunnfjord, both Førde, and the district of Havrenes-Krokane gained substantially from migration; around Førde the districts of Sunde-grend, Naustdal, and possibly Sande have probably been supported by the growth of opportunities in that centre. It is more difficult to set a threshold of negative net migration at which the population can still reproduce itself, while not actually either rising or falling greatly in number. It is generally assumed here that districts with a negative net migration balance will not be able to accelerate in terms of population growth without that loss being made good. Since this is a very conservative assumption, other centres of the scale of Gaupne, Lærdal, Aurland, Leikanger, Balestrand, Årdal i Jølster, Dale i Sunnfjord, and Askvoll may in fact be able to grow quite rapidly, but may depend upon the stemming of the flow either out of the subregions, or to the larger centre within the subregions or even upon the increase of the flow from the marginal districts.

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longer

d. Occupations

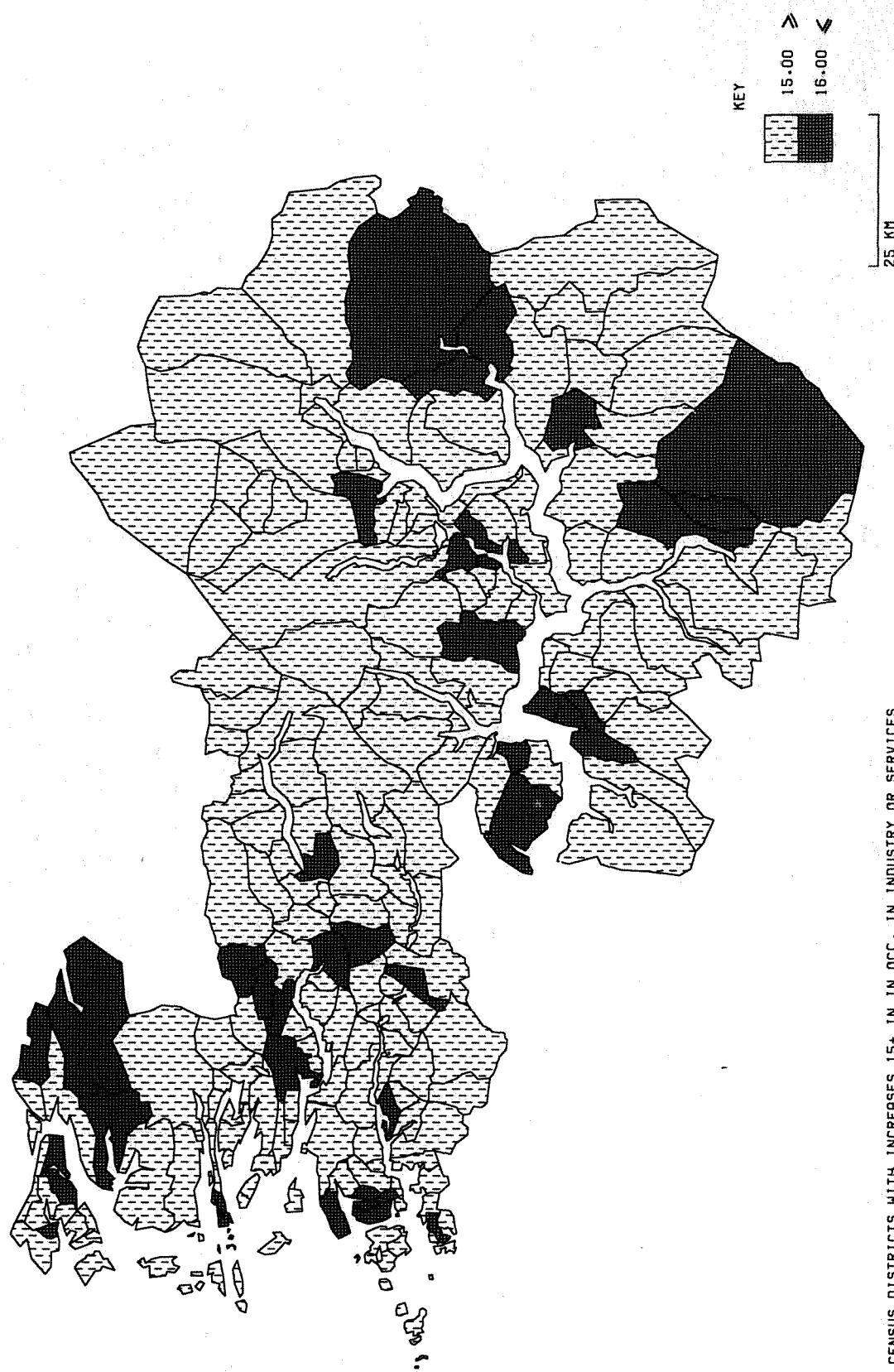
Of the 189 census districts here considered, 158 experienced a reduction in the number occupied in agriculture and fisheries. Had not the categories become confused as described above, more districts might have had a recorded decline. Perhaps what is surprising is the number in which agriculture has not declined, almost one sixth of all the districts. It may be seen from Table 4.12 that '36/ Flåm is the only district which did not lose any occupational places in agriculture while gaining 15 or more in either industry and construction, or transport and services. The pattern which one would seek to draw from these tables may begin with the assumption that the larger centres have by and large exhausted their own reserves of primary sector labour which could have been rationalised into secondary or tertiary employment. This seems to be supported, in that the increases in other occupations in Vik i Sogn, Sogndal, Leikanger, Dale i Sunnfjord, Førde i Sunnfjord, and Hovrenes-Krokane are far greater than the losses to the primary sector.

In these districts, the growth in secondary and tertiary occupations is based on increases in the number economically active, as indeed it is in the single sector towns of Svelgen and Årdal, and at Vassbygdi. The number economically active may be altered by changes in the activity rate, or changes in the total population by immigration or natural increase. As has been seen, certain districts have experienced a rapid population increase, and they are also those with large increases in the number economically active. They are also the areas which have the greater proportions of houses constructed during the decade.

Table 4.12

Census districts with increases of 15 and over in persons occupied in either industry and construction or transport and services, by changes in number economically active, or occupied in commerce or agriculture and fisheries 1950-70
Innre Sogn & Sunnfjord

no.	name	industry constr.	commerce	transp. service	agric. lit. fisheries	econ. act.
1	Hove	31	10	-2	-26	10
5	Vangsnæs	28	5	3	-2	5
7	Vik i Sogn	81	14	7	-22	170
13	Nessane	18	0	-1	-17	10
16	Balestrand	5	14	22	24	27
22	Leikanger	-16	0	130	-2	9
24	Øyabrekka	6	0	17	13	16
32	Barsnes	10	0	10	34	33
33	Sogndal	11	0	14	30	283
34	Dalen	13	0	11	10	21
35	Vassbygdi	135	0	0	20	20
36	Flåm	-2	0	15	-11	7
40	Murland	18	0	44	22	21
43	Isefjord	-12	0	36	11	11
50	Ardalstangen	24	0	33	10	10
51	Øvre Ardal	112	30	7	14	27
59	Gaupne	-3	-1	29	14	14
89	Dale i Sunnfjord	28	0	0	14	14
95	Sande	5	33	0	2	2
100	Gjesdal	17	0	0	2	2
120	Sundegrend	22	0	0	4	4
126	Fjærde i Sunnfjord	163	110	0	182	182
130	Naustdal	16	0	45	16	16
131	Morstad	22	0	33	25	25
132	Ullaland	10	0	16	19	19
136	Redal	17	1	4	1	1
157	Havrenes/Krokane	183	63	1	14	43
160	Stutseid	16	0	0	1	1
162	Strømmen	18	1	0	1	1
165	Vage	18	1	0	1	1
172	Astvoll	3	11	0	45	45
178	Hauge	13	0	22	22	22
181	Alfoten	28	0	0	0	0
182	Bombeistein/Davik/Engdal	15	-1	2	2	2
185	Berle	16	-1	0	0	1
188	Svelgen	100	18	57	7	16



4.6 CENSUS DISTRICTS WITH INCREASES 15+ IN OCC. IN INDUSTRY OR SERVICES

Growth is multiplied at the local level, creating niches for jobs, for example, through the increase in staff occupied in communal administration, and from demand for housing. The heavier immigration to certain larger centres, and in particular selective immigration of potential establishers of households, leads to the formation of relatively strong local multipliers in official and private services, construction, and to some extent in commerce. These multipliers are dependent for their induced effects on the later distribution of wages and entrepreneurial income. What concerns the present analysis is the location of niche creating districts within the subregions: the answer seems to be that Vik i Sogn, Sogndal, Førde and Florø, followed by lower order communal centres, and the single sector industrial towns were those districts during the last decade.

4. Grouping Census Districts in Indre Sogn

a. Principal Components Analysis

Why do you tell us this?

The grouping of the census districts was carried out hurriedly on the basis of a restricted investigation of the methods and data matrix in order to assemble the sampling frame. Subsequently more elaborate tests were carried out, and found to substantiate the initial results. Initially two steps were taken, the choice of the variables and the decision to exclude four districts from the statistical analysis. In the first run of the clustering scheme it was found that Vassbygdi, Årdalstangen, Øvre Årdal and Myrdal were extreme outliers,

because of their especial characteristics. Vassbygdi was subject to great changes during the construction of the hydro-electric station in Aurland; Årdalstangen and Øvre Årdal are one-sided industrial towns; and at Myrdal there is only the railway junction and service depot.

Table 4.13 lists the variables which were included in the different stages of the analysis; there are in effect two sets, one adjusted to account for scale, and the other not. They will be referred to as index and absolute variables, index variables usually being of the form of a change in proportion, and absolute variables being the difference between observations in 1960 and 1970. The index variables generally have the value of 100 at 1960. In the analysis upon which the initial grouping was made, a set of 16 index variables was used, others being withdrawn in order not to introduce extra, unnecessary elements into the interpretation of the analysis. The results may be compared with those of the analysis of the same variables in Sunnfjord, and with the analysis of ten absolute variables in both subregions.

To begin with, the distributions and statistical properties of the variables in Indre Sogn will be considered. It is held that normality as such is not required simply in order to transform the multicollinear data matrix into a matrix of scores on orthogonal components, nor is it necessary that the variables should be free from autocorrelation, simply that the level of autocorrelation should be even. Despite this, it is felt that knowledge of distributions of variables, and of their spatial autocorrelation is necessary so that the matrix of component loadings may be interpreted. While the scores matrix is believed

Table 4.13

Variables constructed for entry into the analyses

code	description
POPCH	index of population change 1960 = 100
YOUTHCH	index of change of youth under 16 as proportion of population 1960 = 100
MOLCH	index of change in male migration risk cohort /10 - 14/ - /20 - 24/
KOCH	index of change in female migration risk cohort /10 - 14/ - /20 - 24/
MUCOCH	index of change in male migration risk cohort /15-19/-/25-29/
KOCOCH	index of change in female migration risk cohort /15-19/-/25-29/
MOLCH	index of change of males 60 years and over in male population 1960 = 100
KOLCH	index of change of females 60 years and over in female population 1960 = 100
ACTRATCH	index of change in proportion of adults econ. active 1960 = 100
AGFISH	index of change in proportion of economically active occupied in agriculture and fisheries
INDECONCH	index of change in proportion of economically active occupied in industry and construction
COMMERCH	index of change in proportion of economically active occupied in commerce
TRANSLCH	index of change in proportion of economically active occupied in transport and services
PENFOLCH	index of change in proportion of adults receiving pensions or capital income
NYTHUS	new houses 1960 - 70 as percentage of all houses
DAUL	percentage of dwellings with bath and W.C. in 1970
ABSTOPP	absolute change in population
ABSYOUTH	absolute change in population under 16
ABSMOCH	absolute change in male migration risk cohorts
ABSKOCH	absolute change in female migration risk cohorts
ABSACTrf	absolute change in number economically active
ABSELD	absolute change in population aged 60 and over
ABSAAG	absolute change in number occupied in agriculture and fisheries
ABSLIND	absolute change in number occupied in industry and construction
ABSCOM	absolute change in number occupied in commerce
ABSTRAK	absolute change in number occupied in transport and services

to be unbiased by autocorrelation, the spatial pattern being mapped onto orthogonal components and components will probably not be unbiased. Examination of Tables 4.14 and 4.15 shows that some variables are more skewed than others, but also that the index variables are less affected. Of the index variables, the younger female cohort KCOHACH, and the older male cohort MCOHBCH, the increase in the proportion occupied in transport and services TRANSECH, and adults receiving pensions PENFOMCH all have high skewness indices. This is also shown in the larger difference between the standard normal deviates of Moran's statistics calculated under the normality and randomisation assumptions. Where the two standard normal deviates are approximately equal the effect of distribution on the variable is not great.

The table of autocorrelation statistics was calculated on the basis of a standardised binary lattice, which is shown in Figure 4.7. It is very difficult, once one has decided to examine the autocorrelation within variables, to establish an appropriate weighting matrix. One can take all boundaries, as would be appropriate on a flat plain, and assess interaction between the observations as proportional to contiguity, the length of shared boundary. One can further introduce a distance-decay constraint, by combining the length of common boundary with the inverse of centroid to centroid distance. In this case, several different lattices were used, but with very little change in the resulting statistics. The difficulty one faces is that by attempting to create a more appropriate weighting matrix, one may find that the variables so created might rather have been included in the analysis. The result may become an impromptu simultaneous system, modelling the relationships between

Table 4.14

Means, standard deviations, and distributional form of variables in 71 census districts.

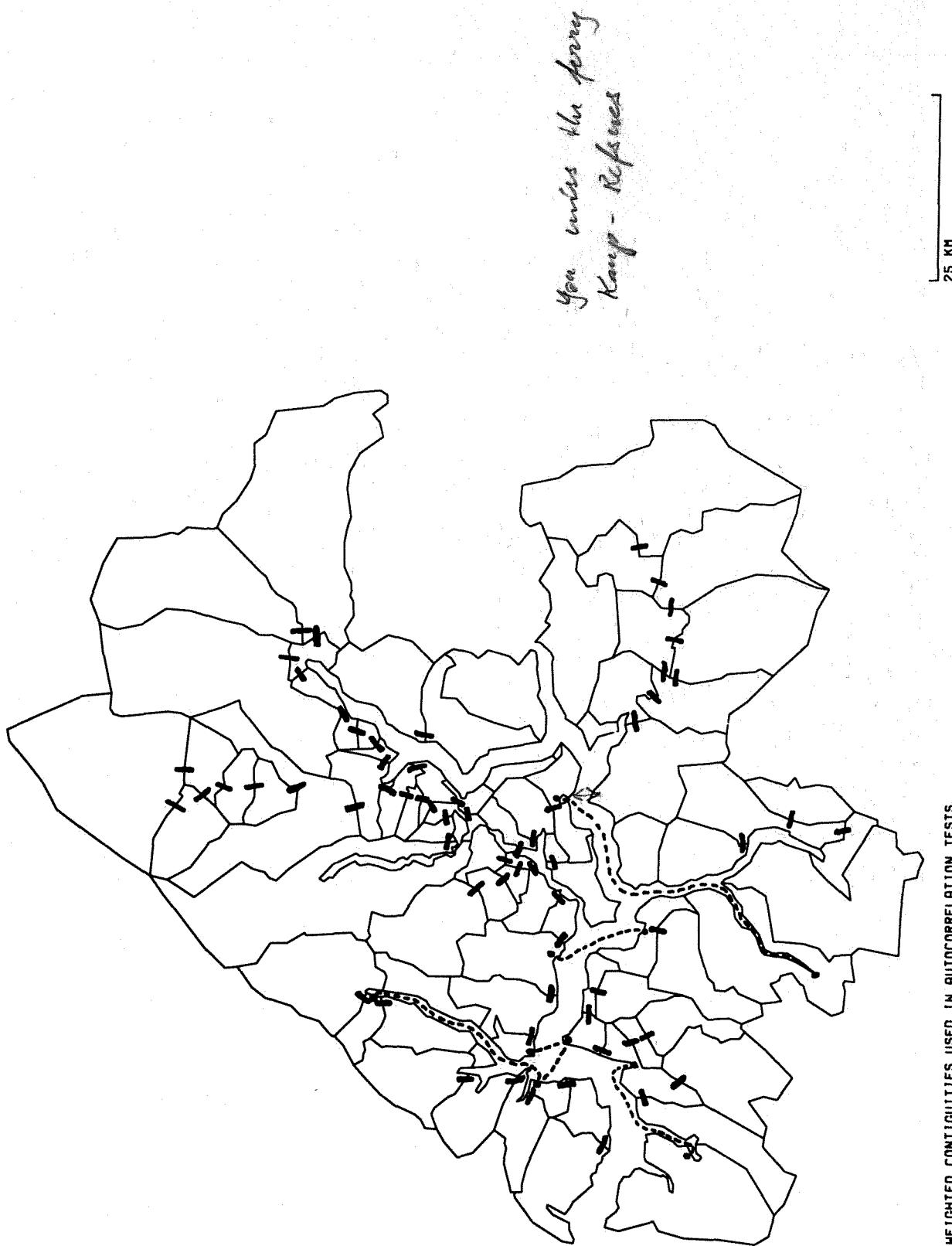
code	mean	standard deviation	kurtosis	skewness
POPCH	91.26	17.53	1.24	0.95
YOUTHCH	89.67	20.18	5.94	1.20
MCOHACH	70.24	31.57	3.07	1.33
KCOHACH	59.97	52.46	14.76	3.06
MCOHBCH	58.92	51.00	26.37	4.27
KCOHBCH	59.94	45.45	2.18	1.37
MOLDCH	137.28	46.05	6.36	1.79
KOLDCH	126.23	33.34	0.15	0.33
ACTRATCH	102.63	14.40	3.80	0.99
AGFISCH	87.22	24.65	1.61	0.86
INDCONCH	127.86	78.94	5.10	1.92
COMMERCH	132.22	107.45	2.07	1.13
TRANSECH	145.16	85.97	7.38	2.47
PENFOMCH	222.37	92.12	8.80	2.30
NYTTHUS	12.87	8.10	1.25	1.01
DQUAL	41.06	14.55	-0.80	0.19
ABSPOP	-8.96	87.47	17.84	3.51
ABSYOUTH	-9.31	28.76	13.63	2.81
ABSMCOH	-7.38	7.88	1.93	-0.20
ABSKCOH	-6.35	12.36	25.39	4.29
ABSELD	10.97	25.70	12.20	3.22
ABSACTRT	-1.58	33.65	12.59	2.37
ABSAG	-11.04	10.69	-0.50	-0.18
ABSIND	-0.11	19.39	10.21	-0.86
ABSCOM	2.09	7.32	36.92	5.53
ABSTRAN	8.45	25.80	19.11	4.20

Table 4.15

Spatial Autocorrelation : 71 district lattice, standardised binary weights, Moran (I) expected value = -0.0143
 Variables by observed value, sigma (I) , standard normal deviate (normality, randomisation)

code	observed	normality			randomisation		
		sigma (I)	SND	sign.	sigma (I)	SND	sign.
POPCH	0.3127	0.0151	21.6619	****	0.0155	21.1366	****
YOUTHCH	0.2015	0.0151	14.2951	***	0.0144	14.9654	***
MCONACH	0.1543	0.0151	11.1689	***	0.0151	11.1933	***
KCOHACH	0.1125	0.0151	8.4002	***	0.0124	10.1886	***
MCOHBCH	0.1114	0.0151	8.3251	***	0.0099	12.7576	***
KCOHBCH	0.1208	0.0151	8.9459	***	0.0153	8.8488	***
MOLDCH	0.0674	0.0151	5.4138	***	0.0143	5.7051	***
KOLDCH	0.1250	0.0151	9.2280	***	0.0157	8.8652	***
ACTRATCH	0.1426	0.0151	10.3956	***	0.0149	10.5328	***
AGFISCH	0.4729	0.0151	32.2749	****	0.0154	31.6601	****
INDONCH	0.0732	0.0151	5.7976	***	0.0146	5.9913	***
COMMERCH	-0.0383	0.0151	-1.6937	***	0.0153	-1.5739	***
TRANSECH	0.1270	0.0151	9.3603	***	0.0141	10.0222	***
PENFOMCH	0.0281	0.0151	2.8110	***	0.0138	3.0796	***
NYTTHUS	0.2433	0.0151	17.0665	***	0.0155	16.6543	***
DQUAL	0.1425	0.0151	10.3855	***	0.0159	9.8430	***
ABSPOP	0.1070	0.0151	8.0374	***	0.0118	10.3192	***
ABSYOUTH	0.2258	0.0151	15.9021	***	0.0127	18.9022	***
ABSMCOH	0.3042	0.0151	21.1001	****	0.0153	20.7956	****
ABSOCH	0.1170	0.0151	8.6974	***	0.0101	13.0377	***
ABSELD	-0.2489	0.0151	-15.5417	***	0.0130	-18.0208	***
ABSACTR	0.1401	0.0151	10.2301	***	0.0129	11.9423	***
ABSGAG	0.1173	0.0151	8.7156	***	0.0159	8.2954	***
ABSIIND	0.5783	0.0151	39.2579	****	0.0135	44.0128	****
ABSCOM	0.1077	0.0151	8.0827	***	0.0075	16.2888	**
ABSTTRAN	-0.0741	0.0151	-3.9598	***	0.0115	-5.2097	***

**** significant at 0.01 ; *** significant at 0.025; ** significant at 0.05



4.7 WEIGHTED CONTIGUITIES USED IN AUTOCORRELATION TESTS

variables, which, valuable as it may be, would be better constructed from scratch. Even so, this table, indicating positive autocorelation on the basic lattice used, does reinforce statistically the visual impression gained from the maps of the variables.

In the interpretation of the loadings matrices for Indre Sogn, the relative lack of independence of scale of the first component of the 10 absolute variable analysis should be borne in mind /Table 4.16/.

Table 4.16
Partial correlation coefficient and census district size.
First component of 16 index variable analysis and 10 absolute variable analysis.

zero order coefficient with: POP7 POPCH ABSPOP	First components	
	16 Index variables	10 Absolute variables
POP7	0.4206	- 0.8142
POPCH	0.8176	- 0.6597
ABSPOP	0.5988	- 0.9761
partial coeffs. controlling for POP7 : POPCH ABSPOP	0.7746 0.4881	- 0.5499 - 0.9284

From Table 4.18 it will be seen that the first component accounted for 60.8 percent of trace with only ABSELD, ABSAG, and ABSIND, respectively increases in elderly population and those occupied in agriculture and industry not loading heavily on it. Consequently, that fist component compounds the effects of small size and relative decline in most districts with large size and relative rapid growth in a few districts. By contrast, the loadings on the components from the analysis of 16 index variables, Table 4.17 are generally smaller, and the condensation

Table 4.17

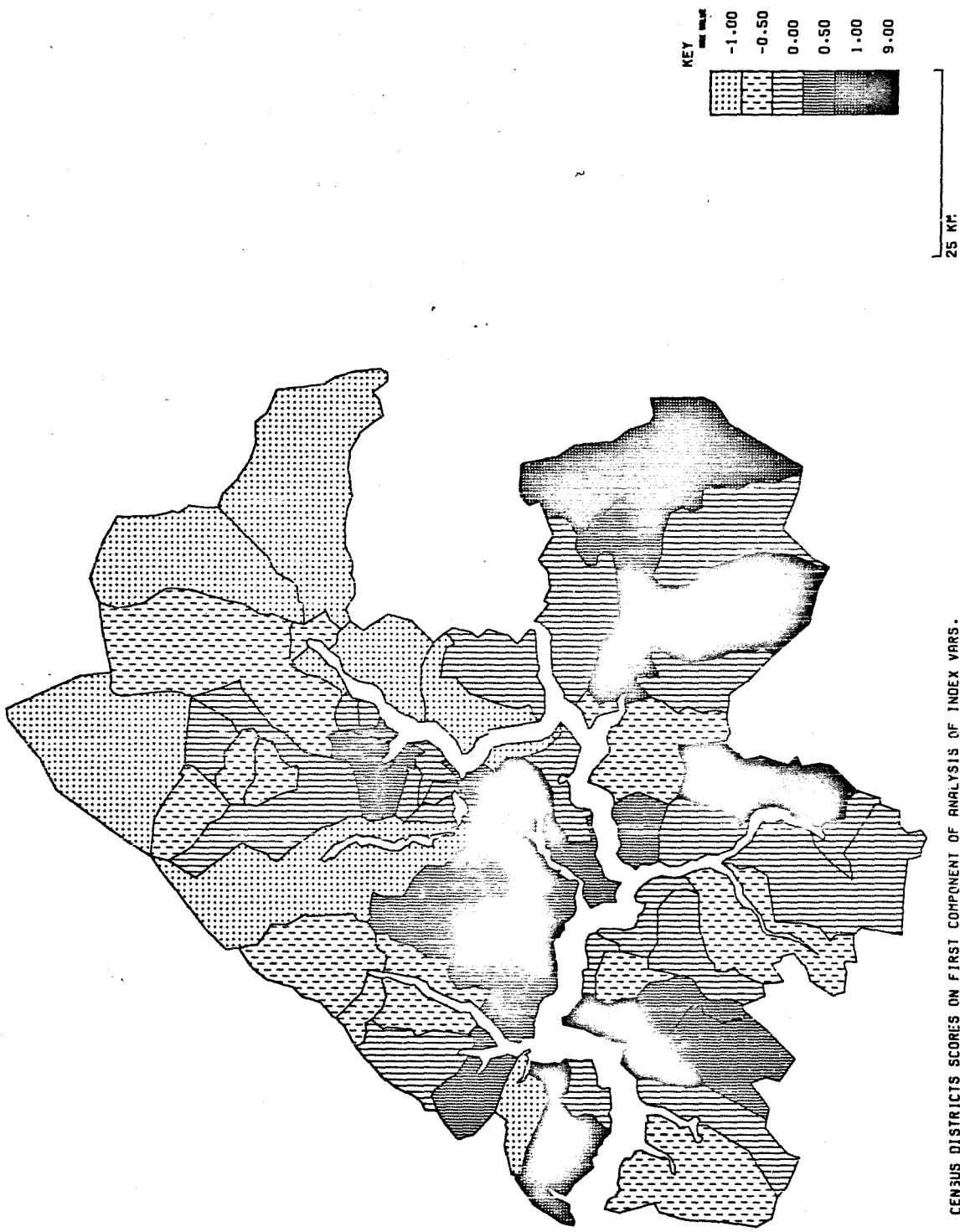
Principal Components Analysis of 16 Index variables, 71 census districts, Indre Sogn

Variables	Component Loadings				
	1.	2.	3.	4.	5.
OPCH	0.7729	-0.3675	0.1783	-0.0551	-0.1569
YOUTHCH	0.6068	-0.3311	0.3317	-0.2047	0.4487
MCNACH	0.8176	0.0540	0.1465	-0.1453	0.0193
KCCHACH	0.7241	0.1803	0.3226	-0.0020	0.3276
MCCHACH	0.4662	0.3399	-0.3039	0.2851	0.0510
KCCHACH	0.6812	-0.0542	0.3230	-0.0481	0.1061
MOLDCOH	-0.5957	0.5666	0.2778	0.0339	-0.0897
KOLCH	-0.6948	0.2640	0.1503	0.2877	0.268
ACTRATCH	0.1781	-0.3586	-0.0074	0.4445	0.7421
AGFISCH	-0.7106	0.0643	0.0599	-0.1590	0.5152
INDCONCH	0.4168	-0.4519	0.4377	0.3546	-0.2549
COMMERCH	0.4202	0.2282	-0.1034	0.3873	0.0387
TRANSECH	0.0780	0.0637	-0.2302	-0.3348	-0.1246
PERFOMCH	-0.6249	0.4383	0.4629	0.0077	0.0445
NYTHUS	0.6461	0.5515	-0.2113	0.0463	-0.0517
LQUAL	0.3893	0.1775	-0.1775	-0.1457	0.1457
Eigenroots	5.5299	2.2225	1.4615	1.2790	0.8886
% trace	34.562	13.891	9.134	7.994	5.554
cumulative % trace	34.562	48.452	57.587	65.580	71.134

Table 4.18

Principal Components Analysis of 10 Absolute variables, 71 census districts, Indre Sogn

variables	Component Loadings		
	1.	2.	3.
ABSPOP	-0.98	-0.09	-0.02
ABSYOUTH	-0.90	0.23	-0.15
ABSMCCH	-0.06	0.39	-0.45
ABSKOCH	-0.90	0.10	-0.15
ABSELD	-0.59	-0.69	0.12
ABSACTRP	-0.92	-0.04	-0.01
ABSAAG	0.42	-0.22	-0.78
ABSIIND	-0.48	0.60	0.26
ABSCOM	-0.87	-0.14	-0.04
ABSTRAK	-0.84	-0.38	0.13
Eigenroots	6.076	1.351	0.962
trace	60.8	13.5	9.6
cumulative % trace	60.8	74.3	83.9



4.8 CENSUS DISTRICTS SCORES ON FIRST COMPONENT OF ANALYSIS OF INDEX VARS.

of the variation between districts to low-dimensional space is less rapid. The number of components, dimensions, preserved has been arbitrarily decided: as noted above in the first section of this chapter, the exclusion of the tail-end components is very close to the acceptance of the factor analytic model, which includes an independent error term.

The first component ^{is} associated with population growth, with a proportional increase in the youthfulness of the population, and is negatively associated with an increase in the proportion of old people, pensioners, or those occupied in agriculture. It is not closely related to changes in occupational structure other than in agriculture. The second component is associated most closely with dwelling quality, the only non-dynamic variable included in the analysis, and with increases in older men as a proportion of the male population, and pensioners, negatively with increases in the proportion economically active, and increases in industrial occupations. Dwelling quality is uncorrelated with the other variables related to this component; one would expect districts where industrial occupations were growing to have a high dwelling quality, and districts with ageing populations to have a rather poorer quality, but as one can see from the maps of these variables, dwelling quality does not follow a simple pattern. The third component relates negatively to increases in the activity rate, positively to increases in occupations in industry, and to the proportion of adults receiving pensions. Lastly, the fourth and fifth components are connected respectively to change in occupations in transport and services, and to the youthfulness of the population.

*This point
might need
some elaboration*

Table 4.19

Principal components analysis of 16 Index Variables,
114 census districts, Sunnfjord

variables	Component Loadings				
	1.	2.	3.	4.	5.
POPCH	0.5146	-0.0023	0.1104	-0.0217	-0.0112
YOUTHCH	0.3131	-0.3212	0.0072	0.1031	0.2200
MCOACH	0.6900	0.1407	-0.0453	-0.1082	-0.1115
KOACH	0.7260	0.0192	-0.0624	0.1147	-0.2071
MCHECH	0.7836	-0.0159	0.0741	-0.0055	-0.1377
KOCH	0.3443	-0.0603	0.2085	-0.4236	0.2187
MCLDCH	-0.2818	0.5486	-0.2890	0.1417	0.3358
KOLCH	-0.1432	0.7137	0.2519	0.0826	-0.2047
ACTRATCH	-0.0030	-0.6445	-0.1899	0.0574	-0.5383
AGFISCH	-0.4225	-0.2064	0.6930	-0.0437	-0.1746
INDONCH	-0.0333	-0.2315	-0.2275	0.6341	0.3388
COMERCH	0.1444	-0.342	-0.0153	0.5582	0.2113
FRANLCH	0.0689	-0.1029	-0.5486	-0.4492	0.4177
PENFOMCH	-0.1175	0.7295	0.1788	0.0498	0.3740
NYTTIAS	0.8001	0.0384	-0.0250	-0.0062	0.0205
DQUAL	0.5612	0.4522	-0.0422	-0.1111	-0.0467
Eigenroots	3.944	2.202	1.428	1.243	1.157
% trace	24.7	13.8	9.3	7.8	7.2
Cumulative % trace	24.7	38.4	47.7	55.5	62.7

Table 4.20

Principal components analysis of 10 absolute variables, 11, census districts, Sunnfjord

Variables	Component Loadings		
	1.	2.	3.
ABSPCP	0.99	0.00	-0.01
ABSYOUTH	-0.97	0.03	0.01
ABSMOCH	-0.94	0.12	0.11
ABSKOCH	-0.92	0.14	0.25
ABSELD	-0.83	-0.10	-0.20
ABSATRF	-0.98	0.09	0.02
ABSAAG	0.03	0.98	-0.19
ABSIIND	-0.97	-0.09	-0.01
ABSCOM	-0.91	-0.02	0.29
ABSTFRN	-0.70	-0.19	-0.04
Eigenroots	7.584	1.058	0.644
% trace	75.8	10.6	6.4
Cumulative % trace	75.8	86.4	92.9

The loading of matrices from Sunnfjord may be used to bolster up these interpretations /Tables 4.19, 4.20/. Again the analysis of absolute variables yields an almost uni-dimensional solution, with little variation remaining after the solution for the first component. The interpretation of components from the index variables analysis is similar too, the first one again associated with population growth, the second with the ageing of the population, and a falling activity rate. Since the economic structures of the two subregions do differ, an identity of component interpretations would be surprising; in this case the third component resembles more the fourth component in Indre Sogn, associated with change in activity in transport and services. The conclusion from this examination of the input variables, and the resulting matrices of loadings is that despite reservations about ratio scaled variables /Kuh and Meyer 1955, Wrigley 1973/, for this purpose they are less blunt than non-deflated absolute variables, and preserve a better structured space for the scores matrix.

b. Hierarchical clustering and discriminant analysis

The construction of the dissimilarity matrix from the component scores was accomplished using the Euclidean metric, where

$$d_{ij} = \sqrt{\sum_{s=1}^t (x_{is} - x_{js})^2}$$

d_{ij} the distance in t dimensional space

x_{is} the score on dimension s in district i .

In two dimensions this reduces to the standard solution for the hypotenuse, and is in no sense a simple addition of the dimensions /Kruskal 1964 a/. Knox' /1974/ arguments against the summing of dimensions seem wrongly aimed, since such a measurement in Euclidean space is not aggregation of scores, but of dissimilarities on different dimensions. It is an open question whether the components should be weighted other than equally. A weighting by proportion of trace was tried using the component scores, but seems merely to have suppressed outliers. Smith /1973 p.92/ has suggested that some weighting may be desirable, but so equally might be the weighting of variables in the initial matrix, a question which once raised is almost impossible to deal with adequately. Procedures such as transformations and weightings need to be controlled by a definite structure of hypotheses, and become at least as much a matter for empirical analysis as the observations themselves.

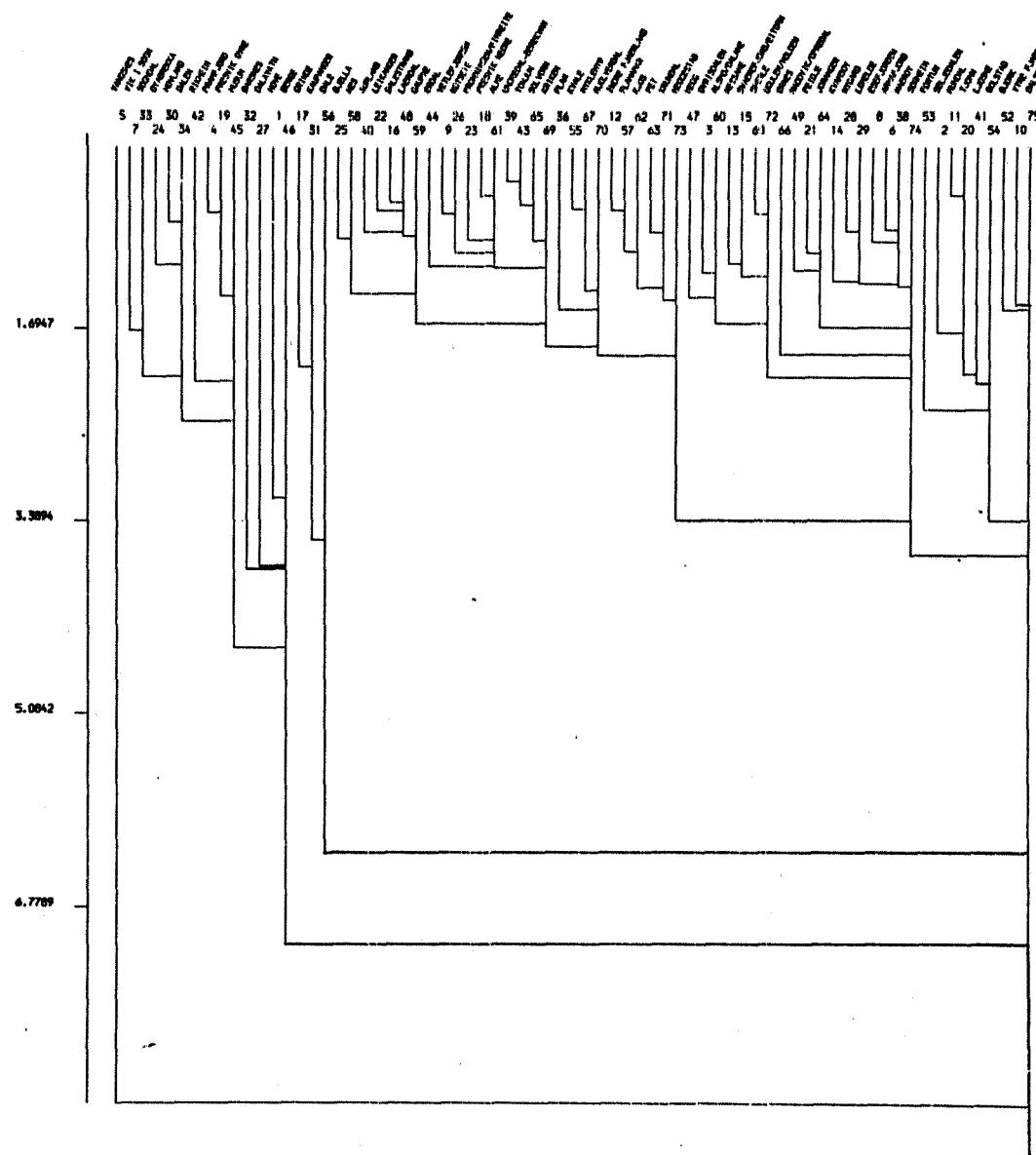
The dendograms resulting from the clustering of districts by least dissimilarity on the five components in the scores matrix are shown in the accompanying figures. Although the Bergen components analysis was duplicated later in London, it has not proved possible to duplicate the hierarchical clustering solution, which may be blamed on either a slightly different algorithm, or more likely on the transfer of the scores matrix to the dissimilarity matrix calculation subroutine in binary in Bergen, while in London the same data had to be entered with only four decimal places, resulting in a slightly different dissimilarity matrix. Three dendograms from this scores matrix are presented, the Bergen and London ones, Figures 4.9 and 4.10 respectively, and Figure 4.11 in which the scores were weighted

by the proportion of trace. In addition, Figure 4.11 is the dendrogram from the clustering of the districts scored on the components from the analysis of absolute variables. On the basis of the first of these, the groups were assembled, by inspection of the dendrogram, and comparison of the original scores and values on variables in cases which seemed uncertain.

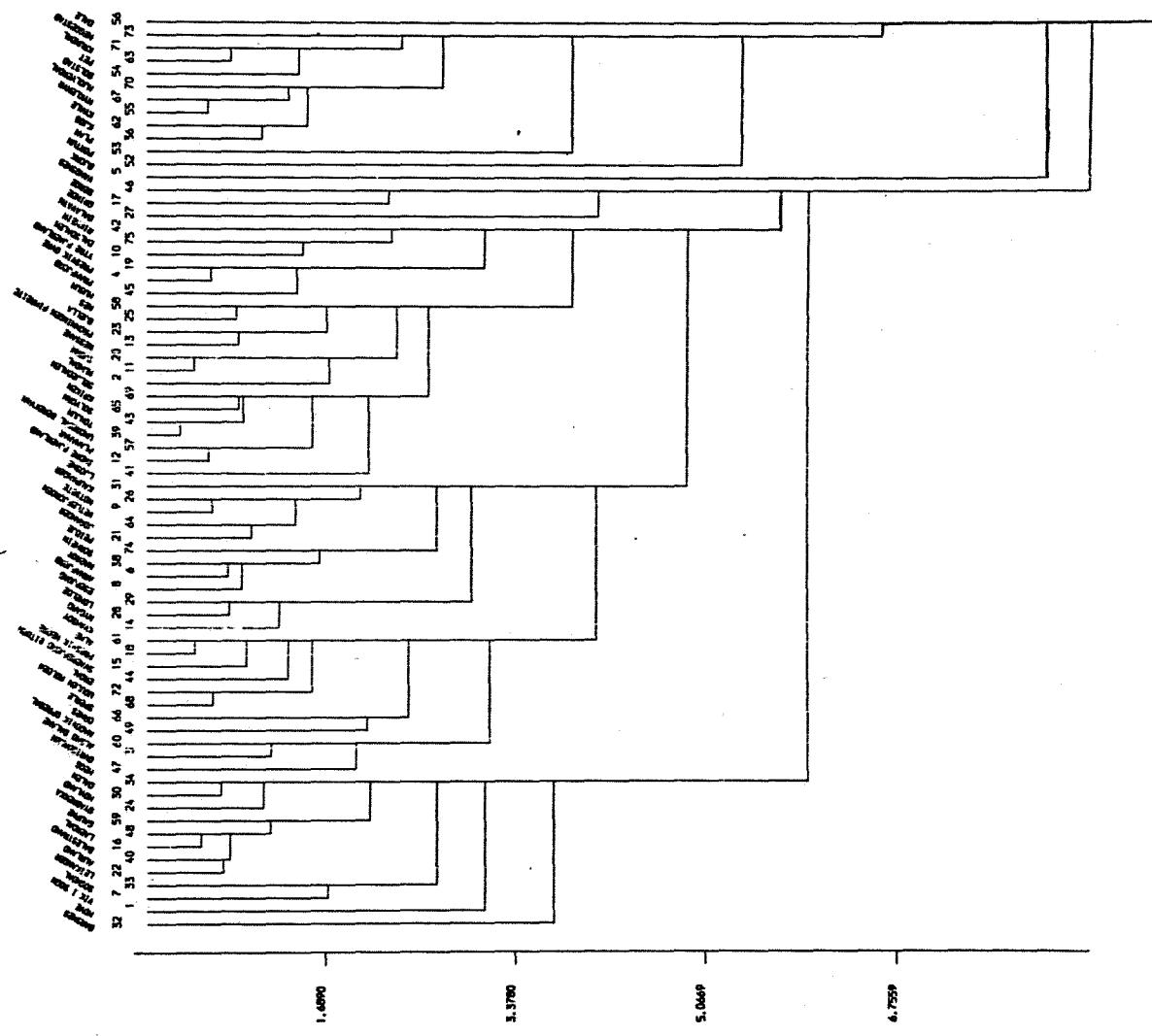
At this stage the four excluded districts were reintroduced, added to group 5, the group most akin to them, which was in any case an amalgam of outlying districts on the dendrogram like /56/ Dale i Luster or /5/ Vangsnæs. Table 4.21 shows both the groups to which the districts were assigned, and their component scores. For those districts with component scores this matrix was then subjected to discriminant analysis with the aim of detecting misclassifications. While considerable swapping has occurred within the two broad sets, the first three and last two groups, remarkably few have been found to be in the wrong set after five iterations (Table 4.22). /28/ Notsete should have been in the second major set, and /46/ Berge^x in the first, but remain in the groups to which they were first allocated because the stratum definitions were settled before the discriminant analysis was executed. As will be seen in the following section the groups in themselves do represent discrete facets of the experience of change in the subregion, and as such the exercise of orthogonalising the data matrix and clustering the districts by the resulting dimensions has proved worthwhile. The uncertainty of assignment to individual groups within the major sets is also allayed by examination of the contrasts between these admittedly rather subjective groupings.

^x also /17/ Grinde, /42/ Rikheim.

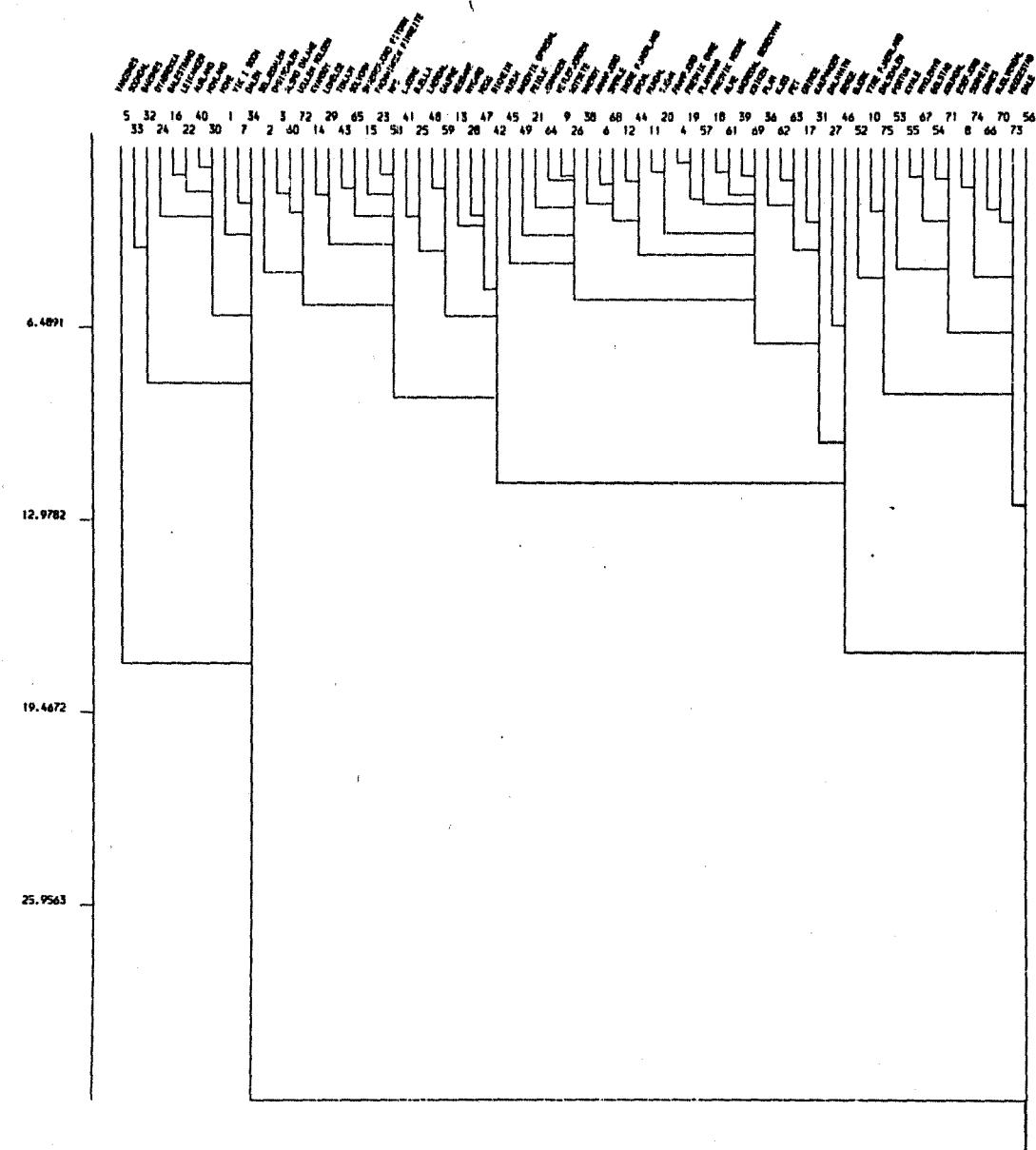
4.9 HIERARCHICAL CLUSTERING OF SCORES ON 5 INDEX VARIABLE COMPONENTS, BERGEN
JOHNSON CLUSTERING PROGRAM - DIAMETER METHOD



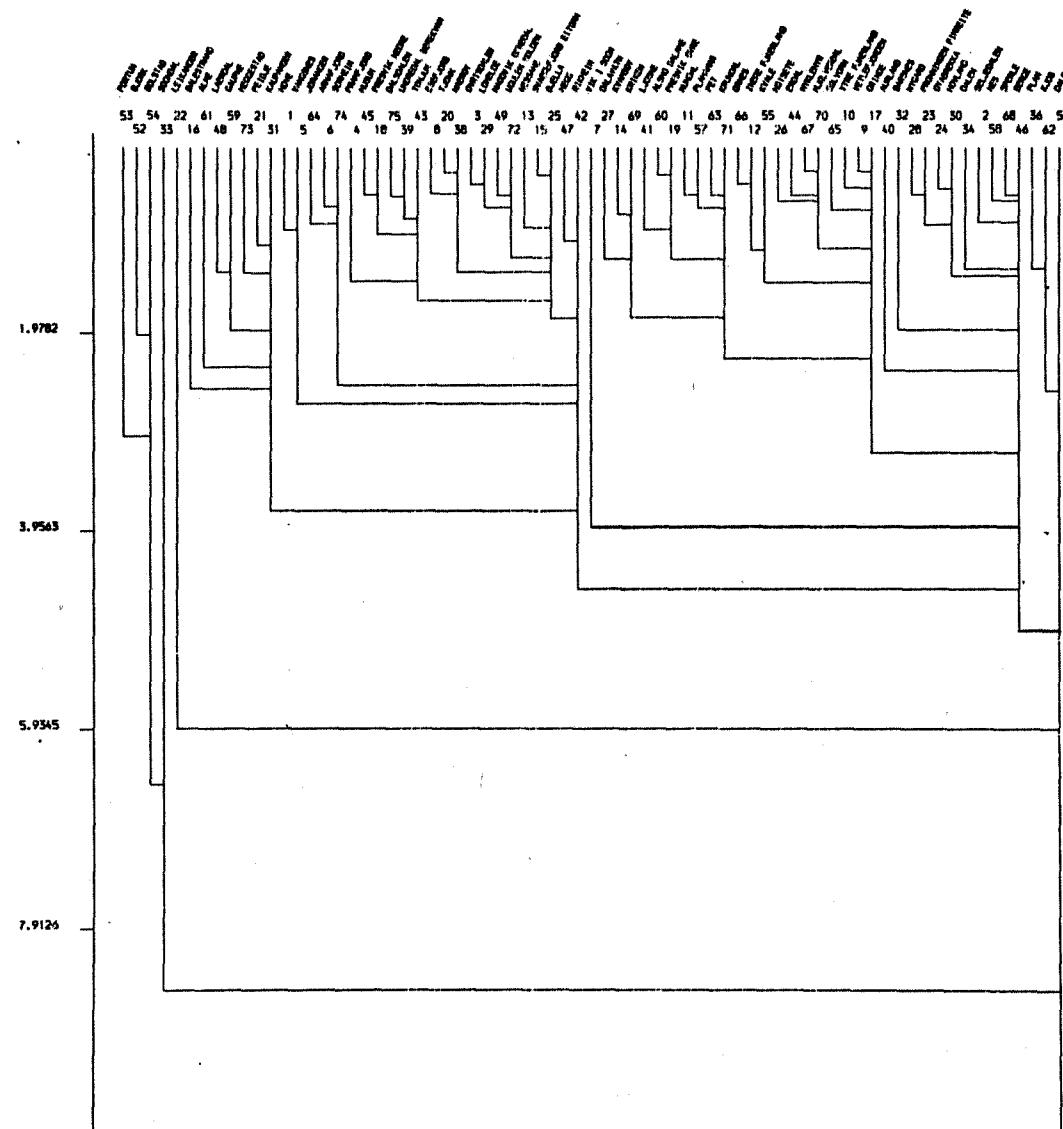
4.10 HIERARCHICAL CLUSTERING OF SCORES ON 5 INDEX VARIABLE COMPONENTS, LONDON
JOHNSON CLUSTERING PROGRAM - DIAMETER METHOD

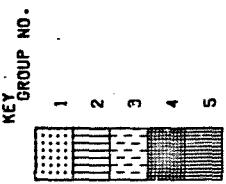


4.11 HIERARCHICAL CLUSTERING OF INDEX VARIABLE SCORES WEIGHTED BY PERCENT TRACE
JOHNSON CLUSTERING PROGRAM - DIAMETER METHOD

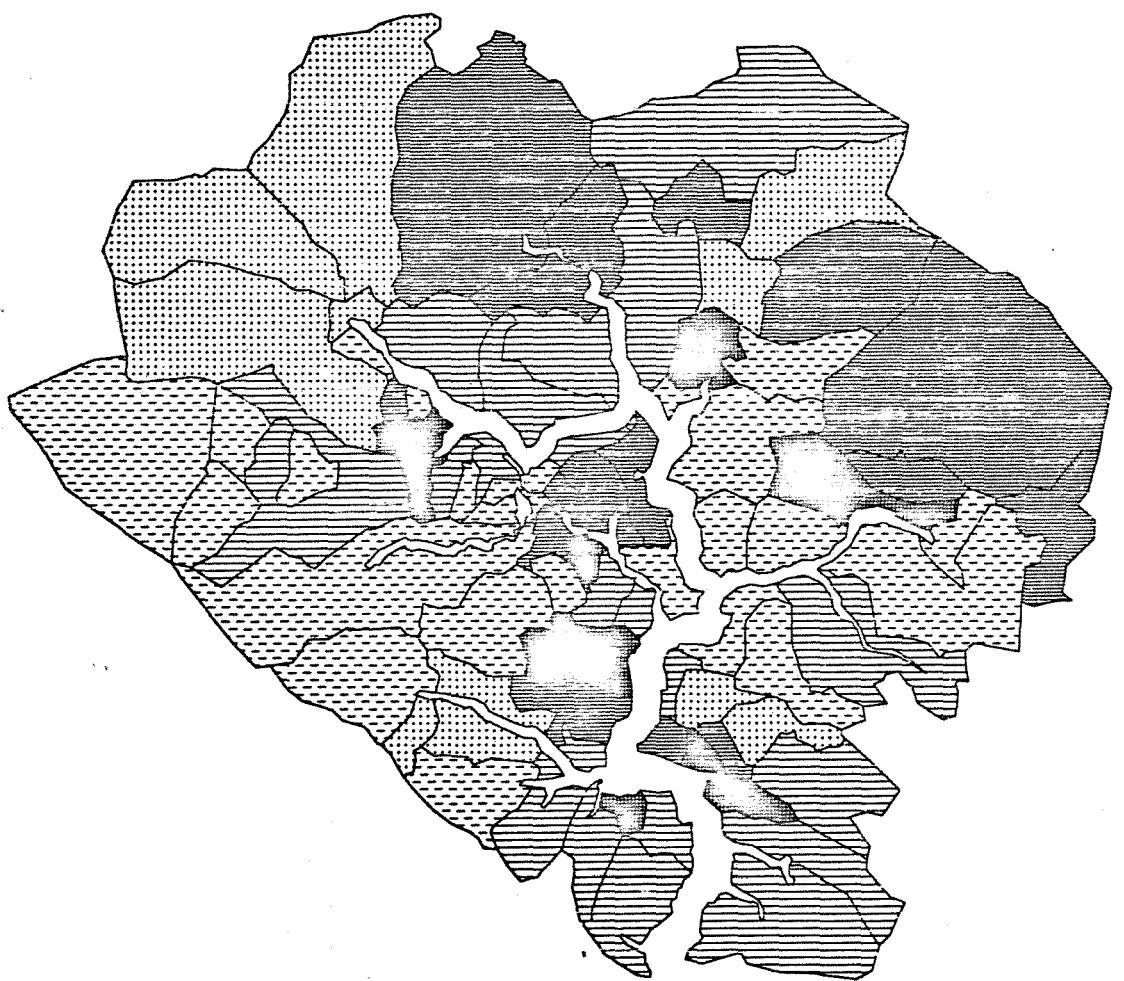


4.12 HIERARCHICAL CLUSTERING OF SCORES ON 5 ABSOLUTE VARIABLE COMPONENTS
JOHNSON CLUSTERING PROGRAM - DIAMETER METHOD





25 KM



4.13 GROUPS OF CENSUS DISTRICTS STRATIFIED. INDORE SOGN

Table 4.21

Census districts stratified into 5 groups, with their scores
on the first 3 components
/16 index variable analysis/.

census district no.	1st component	2nd component	3rd component
STRATUM I			
2	0.2756	-2.0259	-0.3041
10	-0.6606	-1.1885	-0.2094
11	-0.7086	-0.7396	-0.1772
20	-0.5708	-1.1006	0.1306
41	0.5042	-0.2460	-1.2934
45	-0.1374	-0.5662	-1.0688
52	-1.1440	0.0554	0.0501
53	-1.1010	1.1329	1.6413
54	-0.9243	0.8381	-0.5615
75	-0.6797	-0.1667	-0.3117
STRATUM II			
3	0.0371	-2.2002	0.2408
4	-0.4405	-0.5078	-0.1951
6	-0.5724	-0.7873	0.6448
8	-1.2872	-0.2765	0.9143
13	0.6152	-1.4374	-0.3753
14	-0.0178	-0.5532	1.4197
15	0.1613	-0.6025	-0.2616
21	-0.2573	0.3385	1.1552
28	0.6446	-0.4164	0.5359
29	0.2668	-0.2320	0.8297
38	-0.8621	-0.4779	1.0975
47	0.7252	-1.0174	1.4958
49	-0.4540	0.3087	-0.0977
60	-0.1098	-2.0241	1.4199
64	0.0092	0.0995	0.5986
66	-1.8618	0.2691	0.4108
68	-0.6002	-1.0420	0.4157
72	-0.2442	-1.3386	0.1035
74	-1.1802	-0.5094	0.9459
STRATUM III			
9	-0.1538	-0.0041	0.5930
12	-0.7134	-0.2041	-0.6411
18	-0.4579	-0.4458	-0.8285
19	-0.4428	-0.2949	-0.0558
23	0.3737	-0.7845	-0.3953
26	0.0299	0.0310	0.1290
27	0.2127	-0.9933	-2.1458
36	-0.4540	1.3797	0.0821
39	-0.3486	-0.4285	-0.2615
43	-0.0722	-0.2980	-0.3872
44	-0.7575	-0.1045	-0.5083
55	-1.0246	0.7553	-0.0019
57	-0.4666	0.1129	-0.9300

Table 4.21 continued.

census district no.	1st component	2nd component	3rd component
61	-0.2852	-0.6622	-0.4580
62	-0.4325	0.7548	-0.4850
63	-0.2181	0.6473	-0.5081
65	0.2125	-0.0509	-0.3063
67	-0.8653	0.4087	0.4533
69	-0.4247	-0.2629	0.3173
70	-1.6297	1.0093	0.1858
71	-0.8532	0.6963	-0.9424
73	-1.6805	-0.0233	-0.8760
STRATUM IV			
7	1.7351	0.2552	0.4734
16	1.0386	0.7768	0.1789
22	1.0306	1.2211	-0.4168
25	0.8943	-0.4642	-1.0993
33	1.9880	1.8110	0.2436
40	1.1055	0.4528	-0.5354
48	0.5641	0.9193	-0.1251
58	0.2427	-0.5131	-0.6749
59	0.4195	0.2984	-0.5056
STRATUM V			
1	1.8667	-0.0063	-0.2400
5	3.8778	-0.8153	4.1551
17	0.0258	1.2774	-0.4141
24	1.3273	1.3091	-0.7146
30	1.0116	0.4815	-0.4906
31	-0.1444	1.7303	0.6855
32	2.3624	1.9346	-1.6473
34	1.6046	0.3621	-0.4021
42	1.1268	-1.0612	-0.3677
46	0.4402	1.5651	-2.5705
56	-0.4910	3.7408	3.2437

Table 4.22

Initial stratification contrasted with results of 3rd and 5th

iterations of discriminant analysis.

no.	iteration		no.	iteration	
	3rd.	5th.		3rd.	5th.
STRATUM I					
2	I	I	27	III	III
10	I	I	36	III	III
11	III	III	39	III	III
20	I	III	43	III	III
41	III	III	44	II	II
45	IV	I	55	III	III
52	I	I	57	III	III
53	III	III	61	II	II
54	III	III	62	III	III
75	I	I	63	III	III
			65	III	III
			67	II	II
STRATUM II					
3	II	II	69	III	III
4	II	II	70	III	III
6	II	II	71	III	III
8	II	II	73	III	III
13	II	II	STRATUM		IV
14	II	II	7	IV	IV
15	II	II	16	IV	IV
21	II	II	22	IV	IV
28	IV	IV	25	IV	IV
29	II	II	33	V	IV
38	II	II	40	IV	IV
47	II	II	48	IV	IV
49	II	II	58	IV	IV
60	II	II	59	IV	IV
64	II	II	STRATUM		V
66	II	II	1	IV	IV
68	II	II	5	V	V
72	II	II	17	III	III
74	II	II	24	IV	IV
STRATUM III					
9	II	II	30	IV	IV
12	III	III	31	V	IV
18	III	III	32	IV	IV
19	II	II	34	IV	IV
23	IV	II	42	I	I
26	II	II	46	III	III
27	III	III	56	V	V

Table 4.23

Group means component scores prior to first and fifth iterations, discriminant analysis, 71 districts, Indre Sogn

	mean	component	scores		
first iteration	1	2	3	4	5
Group I	-0.5147	-0.4007	-0.2104	-1.4225	0.6464
" II	-0.2857	-0.6530	0.5947	0.5239	-0.5500
" III	-0.4751	0.0563	-0.3623	0.2520	0.4386
" IV	1.0020	0.5286	-0.2735	-0.2805	-0.0113
" V	1.1825	0.9562	0.1125	0.1128	-0.4990
fifth iteration					
Group I	-0.2164	-0.8774	-0.2286	-2.5043	-0.2138
" II	-0.3561	-0.5257	0.4548	0.4948	-0.5369
" III	-0.4857	0.2444	-0.4988	0.2195	0.8987
" IV	1.0631	0.4160	-0.4049	-0.2626	-0.3608
" V	1.0808	1.5519	2.6948	0.0904	0.1297

5. Agriculture and settlement in Indre Sogn

a. Structural features and trends in farming

With the exception of the former Jostedal commune, the entire trade district lies within the agricultural zone designated as fjord land inland from the coast. From a national perspective, the district is relatively homogeneous, but even so may be subdivided between typical classes of holdings. Compared with the coastal areas, the climate is more continental, less exposed; the soil quality is better, and there is much more rough pasture. These areas have experienced substantial increases in

milk production, although goat-milk deliveries have fallen back. The area is very well suited to sheep, which can utilise the rough pasture resources. Cultivation of fruit is another leading feature of the area, and one which has developed strongly in Indre Sogn in recent years, especially soft fruit and vegetables for freezing.

In this varied fjord landscape the production type of holdings is largely determined by their local situation. On most of the holdings in the more exposed part of the area, the rain belt south of Jostedalsbreen, the conditions are well suited to cultivated grass for silage, and pasture, which can be exploited through livestock; grass and spruce generally have the best growth potential. In the lee of the rain belt lie the best fruit areas, still with cattle and sheep the most important livestock. A further class of holding may be categorised as valley bottom farms, with flat, easy-to-work land, and consequently fewer restrictions on their forms of production. Further up the valleys, away from the fjord heads, the holdings are more similar to those in mountain areas, depending principally on milk, sheep, and goats for their existence /Vestlandskomiteen 1969, p.10-11/. In this area the climatic zones run from south-west to north-east, with Fjærland, Sogndalsvatnet, and Jostedal all having average precipitation well over 1000 mm per year and relatively lower average temperatures than for example Hafslo, 910 mm per year precipitation or Lærdal /Tónjum/ 410 mm per year /NOS A 640, p.44-6/. For the agricultural products which the holdings can deliver, the local markets are good, and the important milk and meat markets are regulated through cooperatives. The soft fruit and vegetable market has been organised by a private firm

which has marketed these products very effectively. Only the deciduous timber market has been in difficulties, caused by the bankruptcy of the pulp mill at Vadheim in 1971. From 1974 it seems that it will again be profitable to utilise these resources, for sale as firewood, but this only applies in certain favoured areas with workable woodland.

From Tables 4.24 to 4.26 it may be seen that there were variations between the communes in average sizes of holdings over 5 decades in 1969. Leikanger and Årdal have smaller holdings averaging 36 decades against the trade district average of 43.7 decades. Leikanger certainly possesses many of the features of the fruit cultivating holdings described above; the commune also has smaller than average milking herds. In Aurland too the average herd size is low, 2.44 cows per herd, but this has some connection with the larger flocks of sheep there, 48.7 sheep per flock, with the fact that 41.8 percent of farmers were aged 60 years or over, and with the higher proportion of farmers with their main source of income outside agriculture. The communes with more younger farmers were Vik, Sogndal, Lærdal, and Årdal, and of these all had a high proportion with farming as their sole occupation, except Årdal, where fully 68.3 percent of farmer received income from outside the farm.

If one groups communes to allow for comparability in spite of the boundary changes which occurred between the agricultural censuses of 1959 and 1969, one finds that the number of farms over 5 decades has fallen by 194 in the trade district, and the average size of these holdings has risen by 4.1 decades from 39.6 to 43.7 decades. The cultivated area increased by just over 3000 decades, so that the remaining 75 percent of the land used to increase the average holding size came from the re-allocation

Table 4.24

Farm holdings 5 hectares and over. Average size, holding with
milk cows and sheep. 1969. In ha and

commune	holdings	average size ca	hold. with cows	average herd size	hold. with sheep	average flock size
1417 Vik	315	44.2	73.4	4.08	60.5	36.1
1418 Sælestrand	254	40.0	35.5	4.76	85.5	26.5
1419 Leikanger	300	36.3	46.7	2.41	77.0	40.1
1420 Sogndal	397	47.5	68.8	4.15	74.0	30.3
1421 Aurland	174	45.2	51.2	2.09	92.0	48.7
1422 Lærdal	253	48.0	53.7	4.27	72.4	54.7
1424 Irådal	60	50.1	48.8	3.28	86.7	43.3
1426 Luster	897	42.0	55.0	4.11	69.5	25.7
trade district	2630	43.7	62.0	3.94	78.1	35.2

SSB Jordbrukssteljinga 1969 1.08 A4-5

Table 4.25

Age distribution of farmers by commune
1969 percent

	>40	40 - 59	60 <
1417 Vik	14.4	55.5	30.1
1418 Sælestrand	10.6	49.1	40.3
1419 Leikanger	11.4	49.1	39.5
1420 Sogndal	16.3	48.5	35.2
1421 Aurland	13.3	44.9	41.8
1422 Lærdal	15.5	53.5	30.6
1424 Irådal	16.7	51.7	31.5
1426 Luster	10.7	48.6	40.7
trade district	12.8	49.9	37.3

/NOS A 425/

Table 4.26

Occupational relationships between farmers and holdings
by commune 1969, percent.

commune	sole occupation	main occupation	subsidiary occupation
1417 Vik	47.9	20.0	32.1
1418 Balestrand	39.3	34.6	25.6
1419 Leikanger	38.7	27.3	30.0
1420 Sogndal	54.1	18.3	27.6
1421 Aurland	41.6	19.7	38.7
1422 Lærdal	44.3	18.2	37.5
1424 Årdal	31.7	20.0	48.3
1426 Luster	41.0	23.0	36.0
trade district	43.6	22.7	33.7

/NOS A 425/.

Table 4.27

Comparison of farm numbers and sizes 1959-69, 5 decares and over.

commune	farm holdings		cultivated area da.		mean farmsize	
	1959	1969	1959	1969	1959	1969
Vik/Balestrand	620	549	24629	24828	39.7	45.2
Leikanger	278	300	9558	10889	34.4	36.3
Sogndal	403	397	18760	18852	46.6	47.5
Aurland	213	174	7991	7867	37.5	45.2
Lærdal/Årdal	366	313	14211	14295	38.8	45.7
Luster	944	897	36736	38220	38.9	42.6
trade district	2824	2630	111885	114951	39.6	43.7

/NOS XII 40; XII 79; A425/ [#]A.iv.16

Table 4.28

Comparison of age distribution of farmers 1959-69
percent.

commune	>40		40-59		60≤	
	1959	1969	1959	1969	1959	1969
Vik/Balestrand	19.8	12.8	52.3	52.8	27.9	34.4
Leikanger	14.1	11.1	53.5	49.1	32.4	39.5
Sogndal	20.3	16.3	56.1	48.5	23.5	35.2
Aurland	13.8	13.3	51.8	44.9	34.4	41.8
Lærdal/Årdal	20.1	15.8	53.9	53.4	26.1	30.8
Luster	16.7	10.7	55.6	48.6	27.7	40.7
trade district	17.9	12.8	54.2	49.9	27.9	37.3

/NOS XII 40; XII 79; A 425/.

Table 4.29

Comparison of occupational relationships between farmers and holdings 1959-69, percent.

commune	sole occupation		main occupation		subsidiary occupation	
	1959	1969	1959	1969	1959	1969
Vik/Balestrand	67.0	44.3	15.6	26.3	17.4	29.4
Leikanger	61.7	38.7	19.1	27.3	19.1	30.0
Sogndal	67.1	54.1	17.1	18.3	15.8	27.6
Aurland	56.4	41.6	16.9	19.7	26.7	38.7
Lærdal/Årdal	56.2	41.8	15.8	18.5	28.0	39.6
Luster	63.7	41.0	15.9	23.0	20.4	36.0
trade district	63.2	43.6	16.4	22.7	20.4	33.7

/NOS XII 40; XII 79; A 425/

or leasing of land released from holdings which ceased to exist independently. /Table 4.27/. In fact, the loss of holdings and the winning of new cultivable land was by no means evenly distributed; Leikanger gained 22 holdings and Sogndal lost relatively few; the increase in cultivable area was concentrated in Luster and Leikanger. The result of these disparities is that the increase in average farm size varied between 0.9 decares in Sogndal, and 7.7 decares in Aurland.

Generally there is a marked shift from farming as the sole source of income to work outside the farm as the main source. This must be seen in the light of the shift in the ages of farmers, with the consequence that many of the older age group have begun to be able to claim retirement or other pensions. The farmers in Sogndal and Luster seem to have aged relatively most rapidly, in both cases the category of farmers aged 60 years and over has increased by more than 10 percent. However, in Sogndal the proportion of farmers living solely from farm income fell least, and the percentages in this category in 1969, and in the group of farmers under 40 years old, were the highest of all the communes in the trade district. The trade district had relatively more holdings which were the sole source of livelihood 43.6 percent, than Norway as a whole, 33.1 percent; however the holders aged 60 years and over were 37.3 percent of all holders in the trade district, and only 33.6 percent in the country as a whole /Tables 4.28, 4.29; Lianes 1972, p.23, 63/. Compared to the national averages, the increase in sources of income off the farm is running behind in this district, but the age structure of the farmers makes it probable that they are likely to receive pensions than earned income. Individual communes lead

and lag these trends, for example Leikanger has fewer full time farmers, and Aurland has more older farmers than the averages for the district.

b. Characteristics of the farmers' relationships to their holdings.

From the sample of the 1969 Agricultural Census it is possible to describe the main features of farmers in several classes of relationship to their holding. The classes used here are those developed by Lianes /1972/ but with the addition of one subclass. First the farmers are divided by sex, and male farmers then categorised by their responses to several questions in the census, corresponding in this sample to the variables LEVEVEG, the holding's importance as an occupation, and MANN, source of income outside the holding by seven sectors for male holders or spouses. Farmers in receipt of pensions or other social security income are partitioned off next, and the remaining male farmers are distributed among four classes. Full-time farmers have no work outside the farm; the farm understood to mean agricultural activity on the holding, forestry work in the farm's own woodland, and other activities using the farm's resources, such as fishing, hunting, lease of huts, or camping sites on the farm /NOS A 413, Appendix 7, p.161-8/. There are three classes of part time farmers, the first and second receiving less than half their income from outside the farm, and differing simply in that the first group did not respond to the question represented by variable MANN. The third group of part-time farmers received more than half their income from outside the farm.

Table 4.30

Sample compared to national proportions in categories of relationship to the holding 1969

	Norway	%	Indre Sogn	%
male farmers				
full time	50642	32.7	127	49.8
part time main	22079	14.3	41	16.1
part time subsid.	49470	32.0	38	14.9
pensioners	22343	14.5	31	12.2
female farmers	9959	6.5	18	7.0
	154493	100.0	225	100.0

Sample weighted to proportionality
Lianes 1972, p.31.

In Table 4.30, the two groups of part-time farmers with less than half their income from outside the farm are aggregated to compare with the national proportions in these classes. It is clear that Indre Sogn has relatively many fewer holdings where the main source of income is off the farm and almost half the holdings were the sole source of income for their farmers. This is not unexpected, in that the two major opportunities for work outside the holding, fisheries and forestry, are generally absent in Indre Sogn. In other parts of the country, the pressure for structural rationalisation of holdings, touched upon in chapter 1, has been responded to by a rapid fall in the number of farms under 50 decares, and by a large proportion of farmers earning their cash incomes off the farm. These holdings may then become more extensive, or may be leased in part to larger professional farms. Where the opportunities for work off the farms are few, or are themselves being reduced, the transformation to a desire system of full time family farms may be extremely difficult.

Table 4.31

Sample variable means and standard deviations by categories of relationship to the holding 1969

	full time	main income		part time	pensioner	female farmer	all farmers
		sector unkn.	sector stated				
Farm size da	57.1 (26.4)	48.5 (22.7)	39.9 (20.7)	27.9 (20.0)	34.8 (23.4)	26.6 (15.3)	45.7 (26.7)
Farmers age	54.0 (11.5)	55.1 (12.9)	55.4 (12.4)	52.9 (10.7)	71.5 (7.0)	65.6 (11.4)	57.0 (12.6)
Cattle	4.17 (2.96)	2.83 (3.89)	1.94 (1.90)	0.88 (2.08)	1.65 (2.27)	1.16 (1.60)	2.87 (3.01)
Sheep	26.8 (24.0)	27.6 (32.2)	32.8 (25.5)	15.4 (15.5)	15.0 (14.8)	18.2 (23.1)	23.3 (23.5)
Man's work on farm, days	299 (45)	206 (89)	227 (71)	56 (45)	160 (118)	(-)	211 (122)
Woman's work on farm, days	113 (101)	88 (70)	109 (85)	75 (84)	45 (96)	127 (118)	98 (98)
Man + woman's work on farm	412 (117)	294 (133)	335 (110)	131 (105)	205 (173)	127 (118)	309 (110)
cost of concentrates, fertiliz. kr.	6833 (4607)	4782 (6083)	4718 (9321)	1961 (2835)	2867 (4859)	2022 (2572)	4938 (5365)
man's work off farm, days	(-)	32 (45)	66 (59)	221 (57)	(-)	(-)	41 (83)
n =	127	20	21	38	31	18	255

Sample weighted to proportionality

Taking the trade district as a whole, one may relate the transformation problems to the characteristics of the relationships of classes of farmers to their holdings.

Table 4.32 records the means and standard deviations of some variables from the sample by the classes of farmers described above. Although even within the limits set by Morrison and Henkel /1970/ it would be possible to apply an analysis of variance to this table, it has been chosen not to do so here: it is sufficient ~~the~~ the classification reduces the variance in the subsets compared to the full sample, and that one can point to explanatory differences in the averages /Walker 1975/. To begin with, one may comment that those holdings with male pensioners or female farmers are smaller, and have relatively small livestock holdings, indicating an extensive use even of such small holdings. This is also expressed in the relatively small labour inputs, and purchased inputs of concentrates and fertilisers.

The four remaining categories form a continuum, in respect of farming activity. The full-time farmers on average worked 299 days a year on holdings of 57.1 decares, spent kr. 6833,- on concentrates and fertiliser, and over the whole category had 4.17 cows, and 26.8 sheep. The part-time farmers with over half of their income from their farms, and no stated other activity, only worked 32 days off the holding, but nevertheless worked rather less on the farm than the full-time farmers, only 209 days. The sizes of their holdings, and their complement of livestock was about halfway between the full-time farmers, and those part-time farmers with a subsidiary outside income who had stated its sector of origin. The use of purchased

inputs was very much the same as this group, and so was the use of family labour on the holding. One may suggest that the failure to state a sector may have its roots in rather temporary connections with sources of income outside the farm, either as a transition to a more stable part time adaption, or occasional money-raising jobs outside the farm aimed at strengthening the farm. While the resources of this transitional group have more in common with the full time holdings, their mode of operation is most like that of the other part time farmers.

The confirmed part time farmers divide rather definitely between those who have seasonal jobs off the farm and those who work seasonally on the farm. The former still depend on the farming for most of their income, and apply considerable inputs of labour and cash purchases to the holding. While they had rather fewer cattle, their flocks of sheep were larger, and the average farm size was still 39.9 decares. The holdings where the farmer is mainly occupied off the holding were smaller 27.9 decares, many fewer still kept cattle, and the size of the flocks was also smaller. The farmers were very slightly younger on average but the difference is negligible. Most of the work on these holdings was done by the farm-wives but still less than on other categories of holdings. The number of days worked outside the farm was far greater than the other categories, fully 221 days per year, and the man's work on the holdings corresponds to little more than weekends.

Within these last two categories, 10 percent worked in agriculture, forestry, fisheries off their own holdings, 21 percent worked in industry, 31 percent in building and

construction, 10 percent in transport, and 28 percent in services and miscellaneous other sectors. The average number of days worked off the holding varied considerably, from 69 days in agriculture/fisheries, to 231 days in industry, with transport averaging 184 days, construction 177 days, and services and others 134 days. A general feature which may be borne in mind is presented in Tables 4.32 and 4.33, that there is a relationship between size of holding and in this case expenditure on purchased inputs, and herd size. In this case herd size is calculated; above, the number of cows held by farmers in that category has been averaged for all farmers, here only for farmers with cows.

Table 4.32

Average purchases of concentrates and fertiliser per holding by size and by occupational relationship to the holding 1969,
kroner

	male holders				female holders
	full time	main occ.	part-time	pensioners	
5 - 19 da.	2079	1520	1344	823	178
20 - 49 da.	3995	2698	1890	1677	2810
50 - 99 da.	8187	8310	3830	5436	:
100 < da.	13699	-	-	:	-

Sample weighted to proportionality

Table 4.33

Herd sizes for holdings with cows, by size of holding and by occupational relationship 1969

	male holders				female holders
	full time	main occ.	part-time	pensioners	
5-19 da.	1.50	1.6	:	:	:
20-49 da.	3.87	3.09	2.37	3.18	2.02
50-99 da.	4.82	3.20	2.53	2.28	:
100 < da.	9.25	-	-	:	-
all	4.67	3.01	2.92	3.30	2.25

Sample weighted to proportionality

There is also a strong relationship between the age of farmer and the size of holding, shown in Table 4.34; 26 of 41 holdings under 20 decares are worked by farmers over 59 years old.

Table 4.34

Age of farmers by size of holdings 1969

	>40	40-59	60+	total
5-19 da.	1	14	26	41
20-49 da	8	44	59	111
50-99 da	14	50	29	92
100 da	2	5	3	10
	25	113	117	255

Sample weighted to proportionality

This may in part related to the difficulty of succession in an area without possibility for either the development of more full-time family farms, or adequate access to satisfactory opportunities to earn income off the farm.

The characteristics and trends of relations between farmers and their holdings may be summarised thus: There are many reasons why a larger proportion of farmers are working their holdings as secondary occupations; conditions both on and outside the holding are influential. Mechanisation and other rationalised operations lead to a reduced demand for labour on the holding per unit of production. The farmer thus faces a choice between increasing the volume of production - or more labour intensive products - on the holding, or finding more work off the holding. What the individual farmer chooses is dependent upon his alternatives and preferences. Travel time - and its cost - to other places of work is significant and the improvements in communications have increased the distance between home and job; the local

situation also plays an important role. There is no doubt that the tendency to concentrate on the resources within the holding is stronger where the quality of the local agricultural resources, both natural and human, is good, and other sectors are weak, than where farming is weaker than other, stronger sectors /Lianes 1972, p.27/.

c. The experience of change in the strata.

The set of tables placed under this subheading deserve considerable attention, but only the most significant traits will be commented upon here. The census districts grouped in section IV have been aggregated, so that tables showing the numbers of inhabitants within particular categories may be constructed to contrast the strata used in the sample of the agricultural census. The percentage change within the strata is given, as are the relative percentages of the whole trade district held within each stratum at the two population censuses. Population decline was rapid in stratum I, by 25.5 percent, falling from 7.5 percent of the population of the whole trade district in 1960, to 5.4 percent in 1970. The other two rural strata declined less rapidly, but both still by about 15 percent /Table 4.35/. The urban strata gained, but the fifth stratum, dominated by Årdal, grew most rapidly, by 22.5 percent, and held 36.5% of the total population in 1970.

The four migration risk cohorts behaved differently, as noted above in section III; most of the migrating boys went to the fifth stratum, stratum IV actually lost 37.7 percent of its older male cohort. However, the girls tended to move to stratum

IV in the younger cohort, and stratum V in the older. It seems likely that this may be explained mostly by the sustained phase of family establishment in Ardal which petered out during the decade, and by the recent more rapid growth in the communal administrative centres which comprise stratum IV.

In all three rural strata, agriculture and fisheries, here almost entirely farming, maintained its share of the economically active at about 50 percent; in stratum I it actually rose, and the fall in stratum III was negligible. In stratum I the cause seems to lie in retrenchment after a very heavy fall in the number economically active in construction, who around 1960 were working on power station sites in Luster. The bulk of the work places lost in agriculture are in strata II, III, and V; this corresponds with increases in industrial and construction jobs in these strata. The bulk of the increase in jobs in commerce, transport and services was concentrated in strata IV and V, stratum IV having in 1970 about 46 percent of all jobs in the trade district in these sections. This stratum however only had 23.7 percent of the industrial jobs, less than its share of the economically active, 30.1 percent, while stratum V had 57.5 percent of all the industrially occupied who were 62.3 percent of the economically occupied in the stratum.

Of the rural strata I and III are similar in occupational terms, with the exception that stratum III has not retrenched into farming after completion of power station construction. Stratum II is different, having a lower activity rate amongst adults of 47.8 percent, the activity rate in the other two being 49.9 percent and 50.4 percent. It also had the most dramatic thinning out of its agricultural labour force of all the strata,

from 980 in 1960 to 676 in 1970, a fall of 31 percent. On the other hand, there was a marked increase in those occupied in industry and construction, from 251 in 1960 to 360 in 1970, a 43 percent increase. Those formerly occupied in farming seem to have transferred more or less evenly to part-time work in industry and construction, and to living off pension payments. A number of these features will be clarified in the next section, which presents the results from the sample of the agricultural census at the stratum level.

Table 4.35

Population change by strata in Indre Sogn 1960-70

stratum	1960	%	1970	%	change	%
I	2104	7.5	1566	5.4	-538	-25.5
II	4103	14.7	3509	12.1	-594	-14.5
III	5432	19.5	4541	15.7	-891	-16.4
IV	7689	27.5	8742	30.3	1053	13.7
V	8613	30.8	10549	36.5	1936	22.5
total	27941	100.0	28907	100.0	966	3.5

Table 4.36

Change in younger male migration risk cohort /10-14/ - /20-24/

by strata in Indre Sogn 1960-70

stratum	1960	%	1970	%	change	%
I	89	6.9	60	5.0	-29	-32.6
II	214	16.6	136	11.3	-78	-36.4
III	267	20.7	142	11.7	-125	-46.8
IV	324	25.2	328	27.2	4	1.2
V	394	30.6	541	44.8	147	37.3
total	1288	100.0	1207	100.0	-81	-6.3

Table 4.37

Change in younger female migration risk cohort /10-14/ - /20-24/
by strata in Indre Sogn 1960-70

stratum	1960	%	1970	%	change	%
I	91	7.8	38	4.0	-53	-58.2
II	162	13.8	78	8.2	-84	-51.9
III	242	20.7	112	11.7	-130	-53.7
IV	309	26.4	360	37.8	51	16.5
V	366	31.3	365	38.3	-1	-0.2
total	1170	100.0	953	100.0	-217	-18.5

Table 4.38

Change in older male migration risk cohort /15-19/ - /25-29/
by strata in Indre Sogn 1960-70

stratum	1960	%	1970	%	change	%
I	66	6.4	30	3.4	-36	-54.5
II	145	14.0	72	8.1	-73	-50.3
III	217	20.9	98	11.0	-119	-54.8
IV	314	30.3	271	30.6	-43	-13.7
V	295	28.4	416	46.9	121	41.0
total	1037	100.0	887	100.0	-150	-14.5

Table 4.39

Change in older female migration risk cohort /15-19/ - /25-29/
by strata in Indre Sogn 1960-70

stratum	1960	%	1970	%	change	%
I	77	8.5	35	4.3	-42	-54.5
II	130	14.3	68	8.3	-62	-47.7
III	170	18.7	80	9.8	-90	-52.9
IV	252	27.7	261	32.1	9	3.6
V	280	30.8	370	45.5	90	32.1
total	909	100.0	814	100.0	-95	-10.5

Table 4.40
Change in population aged 60 years and over by strata in
Indre Sogn 1960-70

stratum	1960	%	1970	%	population over 60 as % total popn.	
					1960	1970
I	412	8.5	396	6.7	19.6	25.3
II	972	19.9	1061	17.9	23.7	30.2
III	1178	24.2	1362	23.0	21.7	30.0
IV	1447	29.7	1775	30.0	18.8	20.3
V	865	17.7	1330	22.4	10.0	12.6
total	4874	100.0	5924	100.0	17.4	20.5

Table 4.41
Change in number economically active and adult activity rates
by strata in Indre Sogn 1960-70

stratum	1960	%	1970	%	adult activ- ity rates		change
					1960	1970	
I	825	7.8	586	5.3	51.6	49.9	-239
II	1550	14.6	1297	11.8	49.6	47.8	-253
III	1921	18.2	1776	16.2	47.2	50.4	-145
IV	2869	27.1	3310	30.1	50.4	51.6	441
V	3416	32.3	4026	36.6	57.3	54.8	610
total	10581	100.0	10995	100.0	51.7	51.9	414

Table 4.42
Change in number economically active in agriculture, forestry,
and fishing by strata in Indre Sogn 1960-70

stratum	1960	% tot.	% econ. active	1970	% tot.	% econ. active	change
I	344	9.4	41.7	283	9.9	48.3	-61
II	980	26.7	63.2	676	23.8	52.1	-304
III	1051	28.7	54.7	963	33.9	54.2	-88
IV	720	19.6	25.1	532	18.7	16.1	-188
V	571	15.6	16.7	391	13.7	9.7	-180
total	3666	100.0	34.6	2845	100.0	25.9	-821

Table 4.43

Change in number economically active in industry and construction, with percentages of these in construction and basic metals in 1960, by strata in Indre Sogn.

	I	II	III	IV	V	total
1960: no.	347	251	419	943	2096	4056
% total	8.6	6.2	10.3	23.3	51.6	100.0
% econ. active	42.1	16.2	21.8	32.9	61.4	38.3
% construction	78.7	31.5	47.0	25.2	11.3	25.2
% basic metals	5.2	18.7	14.3	7.8	72.0	42.1
1970: no.	135	360	323	1034	2508	4360
% total	3.1	8.3	7.4	23.7	57.5	100.0
% econ. active	23.0	27.8	18.2	31.5	62.3	39.7
change	-212	109	-96	91	412	304

Table 4.44

Change in number economically active in commerce by strata in Indre Sogn 1960-70

stratum	1960	% tot.	% econ. active	1970	% tot.	% econ. active	change
I	31	5.2	3.8	30	3.8	5.1	-1
II	52	8.6	3.4	52	6.6	4.0	0
III	69	11.5	3.6	86	10.9	4.8	17
IV	271	45.2	9.4	363	46.1	11.0	92
V	177	29.5	5.2	256	32.6	6.4	79
total	600	100.0	5.7	787	100.0	7.2	187

Table 4.45

Change in number economically active in transport and services by strata in Indre Sogn 1960-70

stratum	1960	% tot.	% econ. active	1970	% tot.	% econ. active	change
I	101	4.6	12.2	138	4.6	23.5	37
II	253	11.6	16.3	209	7.0	16.1	-44
III	373	17.1	19.4	403	13.4	22.7	30
IV	894	40.9	31.2	1380	46.0	41.7	486
V	566	25.8	16.6	868	29.0	21.6	302
total	2187	100.0	20.7	2958	100.0	27.3	811

Table 4.46

Change in number receiving pensions, and proportion of adults receiving pensions by strata in Indre Sogn

stratum	1960	%	1970	%	pensioners	
					1960	1970
I	202	9.0	311	6.7	12.6	26.5
II	396	17.5	811	17.6	12.7	29.9
III	565	25.0	1054	22.8	13.9	29.9
IV	717	31.8	1444	31.2	12.6	22.5
V	376	16.7	1001	21.7	6.3	13.6
total	2256	100.0	4621	100.0	11.0	21.8

* 1960 and 1970 categories not strictly comparable

Table 4.47

Dwelling quality 1970: inhabitants per dwelling, proportion of detached houses in total stock, and proportion of dwellings with bath and W.C. by strata in Indre Sogn.

stratum	total dwellings	popn.	inhabitants per dwell.	% det. houses	% with bath & W.C.
I	495	1566	3.16	95.4	41.0
II	1125	3509	3.12	91.6	31.6
III	1431	4541	3.17	91.0	45.1
IV	2843	8742	3.07	78.9	62.9
V	3218	10549	3.28	61.0	70.0
total	9112	28907	3.17	76.9	57.6

Table 4.48

Housing construction 1960-70: new dwellings by strata as a percentage of all new dwellings, and new dwellings by strata as a percentage of total dwellings 1970, Indre Sogn.

stratum	new houses % total new houses	new houses % total houses
I	3.0	8.1
II	6.6	8.1
III	11.0	10.5
IV	43.9	24.4
V	35.5	22.6
total	100.0	17.8

d. Characteristics of farm holdings at the stratum level

Table 4.49 shows the distribution of sampled holdings amongst the categories discussed in section V. b above.

Table 4.49

Occupational relationship of farmer to holding by strata,
percentages, 1969

stratum	male holders				female holders	total	n
	full time	main occ.	part time	pension			
I	60.0	12.0	16.0	8.0	4.0	100.0	45
II	50.0	11.8	19.2	14.7	4.3	100.0	60
III	65.0	5.0	6.3	15.0	8.7	100.0	60
IV	50.0	11.8	25.0	11.4	6.8	100.0	45
V	60.5	7.9	13.2	7.9	10.5	100.0	45

Two forms of comparison between strata will be presented here, the first by tables of frequency distributions in categories such as age group and size of farm, and the second by averages of some variables for all holdings, for full-time holdings, and for part-time holdings. From the frequency distributions it is possible to define subsamples, such as full-time holdings, which can then be examined and compared more fully by using average values.

The differences within the three rural groups and within the latter two urban groups are at least as great as the differences between the urban and rural groups. There is indeed no reason why the two broad groups need be homogeneous, although the three rural strata could correspond to a definition of marginality or remoteness, being the areas most dependent on farming as the main economic activity, and having the most marked demographic problems. Stratum III has relatively fewer farmers working part-time, and stratum I has fewer pensioner farmers. The number of part-time farmers is somewhat uncertain,

and here it may be that the effect of respondents not recording an occupation outside the farm is felt most. For example in stratum III, seven farmers had employment off the holding in definite sectors, but a further six did not respond to the question regarding sector. As seen above, it is likely that their average employment outside the farm was only 4-5 weeks, and that their motives for such employment may be mixed. As such, the presentation of the tables was purposefully conservative, recording only confirmed part-time farmers in that category. This of course depends on the interpretation of non-response as reflecting an unstable situation, and may thus be in error.

Table 4.50

Age of holders by strata, percentages, 1969

stratum	>40	40-59	60≤	total	n
I	6.7	66.7	26.6	100.0	45
II	3.4	48.3	48.3	100.0	60
III	11.7	33.3	55.0	100.0	60
IV	17.8	48.9	33.3	100.0	45
V	8.9	40.0	51.1	100.0	45

The age of farmers seems to be most satisfactory in strata I and IV, where the proportion of full-time farmers aged over 60 years is much lower; however, the average ages for full-time farmers in all strata differ only by a few years, with strata I, III, and IV having the youngest. Only strata I and IV have more than half of their holdings over 50 decares: this shows up more strikingly in contrasting full-time and part-time holdings. While the part-time holdings are generally around 30 decares in all strata, the average size of the full-time holdings ranges from 46.0 decares in stratum II to above 70 decares in strata I and IV. The same similarity between stratum

and stratum IV is observable in the average livestock complement, in the labour time used on the holdings, and in the amount spent on cash inputs to the holding.

Table 4.51

Size of holdings by strata, percentages, 1969

stratum	decares				total	n
	5-19	20-49	50-99	100≤		
I	15.6	28.9	44.4	11.1	100.0	45
II	16.7	56.7	25.0	1.7	100.0	60
III	11.7	50.0	35.0	3.3	100.0	60
IV	20.0	24.4	48.9	6.7	100.0	45
V	20.0	46.7	31.1	2.2	100.0	45

Table 4.52

Holding as the holder's source of income by strata, percentages, 1969

stratum	farm income			total	n
	sole inc.	main inc.	subsid. inc.		
I	55.6	22.2	22.2	100.0	45
II	43.3	21.7	35.0	100.0	60
III	55.0	20.0	25.0	100.0	60
IV	42.2	22.2	35.6	100.0	45
V	55.6	20.0	- 24.4	100.0	45

Table 4.53

Sectors from which off-farm income was derived by strata, percentages, 1969

stratum	agricult. forestry fishing	industry	building constr.	transp.	servic.	total	n
I	-	-	54.0	23.0	23.0	100.0	15
II	22.2	22.2	16.7	5.6	33.3	100.0	18
III	-	43.0	28.5	-	28.5	100.0	7
IV	7.2	21.4	50.0	7.2	14.2	100.0	14
V	10.0	10.0	20.0	20.0	40.0	100.0	10

Table 4.54

Average values for all holdings by strata, 1969

	I	II	III	IV	V
age of holder	55.2	59.2	57.5	53.4	57.4
size of holding da.	56.4	39.0	46.2	52.0	42.9
no. of cows	3.67	2.10	3.40	3.00	2.47
no. of sheep	41.1	22.5	14.7	30.4	23.2
cash inputs kr.	5544	3602	5106	6169	5185
n	45	60	60	45	45

Table 4.55

Average values for all full-time holdings by strata, 1969

	I	II	III	IV	V
age of holder	53.4	56.9	53.3	51.6	55.0
size of holding da.	70.6	46.0	53.1	72.9	49.8
no. of cows	4.72	2.90	4.18	4.96	3.59
no. of sheep	48.6	27.1	15.8	41.5	24.2
days worked on holding by holder and spouse	461	363	369	436	418
cash inputs kr.	7766	5251	6283	9164	5495
n	29	30	39	23	27

Table 4.56

Average values for holdings with income from a stated sector off the farm by strata, 1969

	I	II	III	IV	V
age of holder	56.8	57.1	56.6	46.1	52.4
size of holding da.	29.1	29.7	32.7	34.1	36.9
no. of cows	2.15	1.11	1.43	0.93	1.20
no. of sheep	25.4	19.6	13.1	21.9	23.0
days worked off holding by male holder or spouse	173	146	188	172	172
n	13	18	7	14	10

Table 4.57

Average size of holding by occupational relation of holder to by strata, decares, 1969

stratum	male holders				female holders	total
	full time	main occ.	part time	pension		
I	70.6	41.9	21.1	37.2	34.0	56.4
II	46.0	32.4	28.0	37.6	29.3	39.0
III	53.1	45.7	23.0	36.4	29.4	46.2
IV	72.9	42.1	31.9	23.6	22.0	52.0
V	49.8	47.4	30.0	36.1	21.5	42.9

Sample weighted to proportionality.

e. The relationships between agriculture and settlement change

Under the previous two sub-headings, some elements of the changes in Population ⁿcensus variables, and of the pattern of Agricultural census variables were discussed. It is necessary to summarise these for each of the five strata, and to base this summary on the possibilities for adaption in settlement structure found within the individual strata. Where such possibilities are absent in remote or marginal areas, then these areas will be dependent on the sustenance of a favourable relationship with other areas. The summaries outline the resources, and possibilities for adaption in farming, especially part time adaption, and the influence of accessibility on these. All of the first three strata may be considered marginal in terms of their loss of population, their concentration in primary activities, and their relative remoteness; even some ⁿcensus districts in stratum V are as remote and onesided.

Stratum I contains census districts with varied natural resources, but does contain districts with larger lowlying areas adjacent to fjord-heads. There are also steep and rough fjord-side areas, but the average size of farms is large. There are relatively many with part time occupations, predominantly in construction, transport and services. In the early 1960's Luster was affected by power station construction and it is likely that some small farmers who joined the construction industry then have remained occupied in it. Accessibility is poor, the districts are remote, and partly cannot be reached by road. Although there has been rapid population decline, it seems that recruitment to the farms is good, in spite of the

how do you know?

because there is no other alternative
but moving?

apparent retrenchment into agriculture in Luster. There are two possible explanations for the relatively satisfactory appearance of the farms, first that the remoteness has encouraged those unwilling to leave to develop the local resources. Secondly, the remote location and consequent difficulty in making journeys to other work places could have forced some people to leave who might otherwise have settled in their home villages. It seems likely that these two relationships both operate: the main basis for family establishment and hence continued settlement is farming, and without the possibility either to work a holding of sufficient size, or to develop relatively intensive products, then the chances for families to become established are restricted to areas with adequate access to other work.

The scope of these relationships may become clearer in the analysis of the second stratum. The areas are rather generally of a fjordside character, but also include some mountain farm zones, and the average farm size is rather small, even for full time farmers. There are relatively many pensioners, and more than 30 percent have a stated source of income from a sector outside agriculture. Within the stratum there was a large increase in the number occupied in industry between 1960 and 1970, and about one in five of the farmers with part-time work was occupied in industry. However, there is little industry actually located in districts in the stratum, so that the loss of jobs in agriculture and the increase in industry has been at the price of a great increase in commuting. Many of these districts received their first road links during the decade 1960-70, and so were first put in a position in which commuting became

feasible, and in which a choice between the intensification of work on the farm and finding work off the farm became realistic. It may be more correct to say became realistic again, since these districts were on the same type as those from which various off-farm activities were carried out until recent times, for example fjord-fishing or freight carriage by jekt. In these districts one could conclude that, in contrast to the first stratum, the resources were rather limited, but the access to other sources of part time income improved markedly.

The retrenchment in the first stratum cannot be pointed to in the third stratum. Consequently one may interpret the difference in the rate of population decline, and in the proportion of farmers with incomes from off the farm as being due to the interruptions experienced in the first stratum, which is rather similar to the third stratum in terms of its remote locations, and relatively, satisfactory agricultural resources. The average size of the full-time holdings is smaller, and may be connected with problems arising in finding willing heirs to the farm.

The proportion of pensioner farmers is high, and the age structure of all farmers is unpromising, 55 percent ageing 60 years and over. Of those farmers with part-time work, a substantial proportion do work in industry but of the total economically active only 18.2 percent were occupied in industry and construction in 1970, this proportion being smaller than it had been in 1960. It seems that in the third stratum the difficulties of transformation in farming are exemplified, that family establishment is not taking place, and that commuting as such is at present a minor phenomenon, and unlikely to become important in providing off-farm incomes.

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Because it was necessary to aggregate rural census districts with contiguous urban census districts in order to compare the 1960 and 1970 population censuses, the resulting census district aggregates comprise the built-up areas and their surrounding areas. Farms within easy commuting distance of the urban districts thus mostly were contained within the fourth stratum. Fully one quarter of these farmers had their main source of income outside the holding, relatively most in construction, although with some in industry and services. Almost all the urban districts have experienced much constructional activity, almost 44 percent of the private houses built between 1960 and 1970 were sited in this stratum. In addition there have been private service buildings, offices, and shops, as well as extensions to the centrally located food processing industries, dairies, the slaughterhouse, and the jam and frozen food factory. The full time farmers in this stratum have generally large holdings, and high cash inputs to their operation. The proximity to urban or communal centres seems to ease the transition to a different farming structure by the relatively very easy access to jobs, especially in construction. The proximity does not seem to hinder the development of efficient holdings on the good valley bottom sites typical of this stratum, except in so far as land is lost because of development.

The fifth stratum is less easy to generalise about, since the census districts in it are very heterogeneous. One group are contiguous to Sognalsfjøra, others to Vik and to Leikanger, while Vassbygdi and Årdal are exceptions which have been pointed to repeatedly previously. There are relatively fewer part-time

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farmers, and few pensioner farmers, although with women farmers, who are by and large in receipt of pensions, this group still occupy almost one holding in five. The population census tables for this stratum are completely overshadowed by the large population in Årdal, but it is reasonable to assert that some census districts contiguous to the communal centres have benefited from the opportunities to commute in to work there, and benefited relatively more than comparable districts in the second stratum. The average size of full-time holdings is small, and the complement of livestock also is less than that in most other strata. The average size of the part-time holdings is also more similar to the size of full-time holdings than in other areas. Probably it is in this stratum that the heterogeneity of the census districts becomes too great, such that confident summary is risky, nevertheless, the outlook for those districts contiguous with urban or communal centres may be quite bright, even though they may not be able to look forward to actual growth in population. They have perhaps more restricted natural resources, but may enjoy easy access to jobs in the centre, which will benefit the families already established there.

The transformations which have occurred may be seen in this way, that where the possibility existed to take central jobs by commuting, possibly even where the farming resources were good, there was a movement out of farming into other sectors, notably construction. This adaption is suited to those families which already were established, but may not be so acceptable to their successors. Where the agricultural resources were satisfactory, but where work outside the farm was relatively unavailable, the extension of the farm, or the cultivation of labour intensive

crops has became necessary for the families established on the land. There was little increase in the availability of jobs in services and industry in these rural areas, rather the contrary. While these results are by no means unexpected, other work on labour market areas has suggested the same, it is interesting how the models of farm holding transformation begin now to have some flesh. It is also important too that other work has stressed a boundary for commuting of 45 minutes or one hour, whereas the census districts appearing to benefit from concentration are much more tightly grouped around the centres. Simply only the communal centres have been able to carry through a transformation of the labour market, providing accessible part-time work for farmers whose labour was economically speaking redundant on their own holdings.

yes, but these distances are calculated around bigger centres than the ones now.

Two questions appear to be of interest on the basis of the pattern of changes and relationships sketched here. The first is the way in which individual local factors and resources may influence the transformation processes at a lower level, say at the level of a single parish. This is dealt with in the next chapter, and may articulate some of the points made inductively here. The second is the general question reviewed in the first chapter concerning the dilemma of regional policy. It has been attempted to increase understanding of the dilemma by way of examples pointing to the operation of various helpful or obstructive features and processes. It is necessary to wait until the final chapter before one can attempt to tie together the theoretical speculations advanced, and the observed examples from Sogn og Fjordane.

5. FJÆRLAND : A REMOTE RURAL COMMUNITY

I Fjærland's Natural and Historical Circumstances

- a. Settlement location and form
- b. The historical background

II The Structure of Production in Agriculture

- a. The farm holdings in Fjærland
- b. The resources for progress in farming

III Agriculture and Settlement

- a. Population
- b. Occupations
- c. Cohort survival and career aspirations

IV Economic Links between Sectors

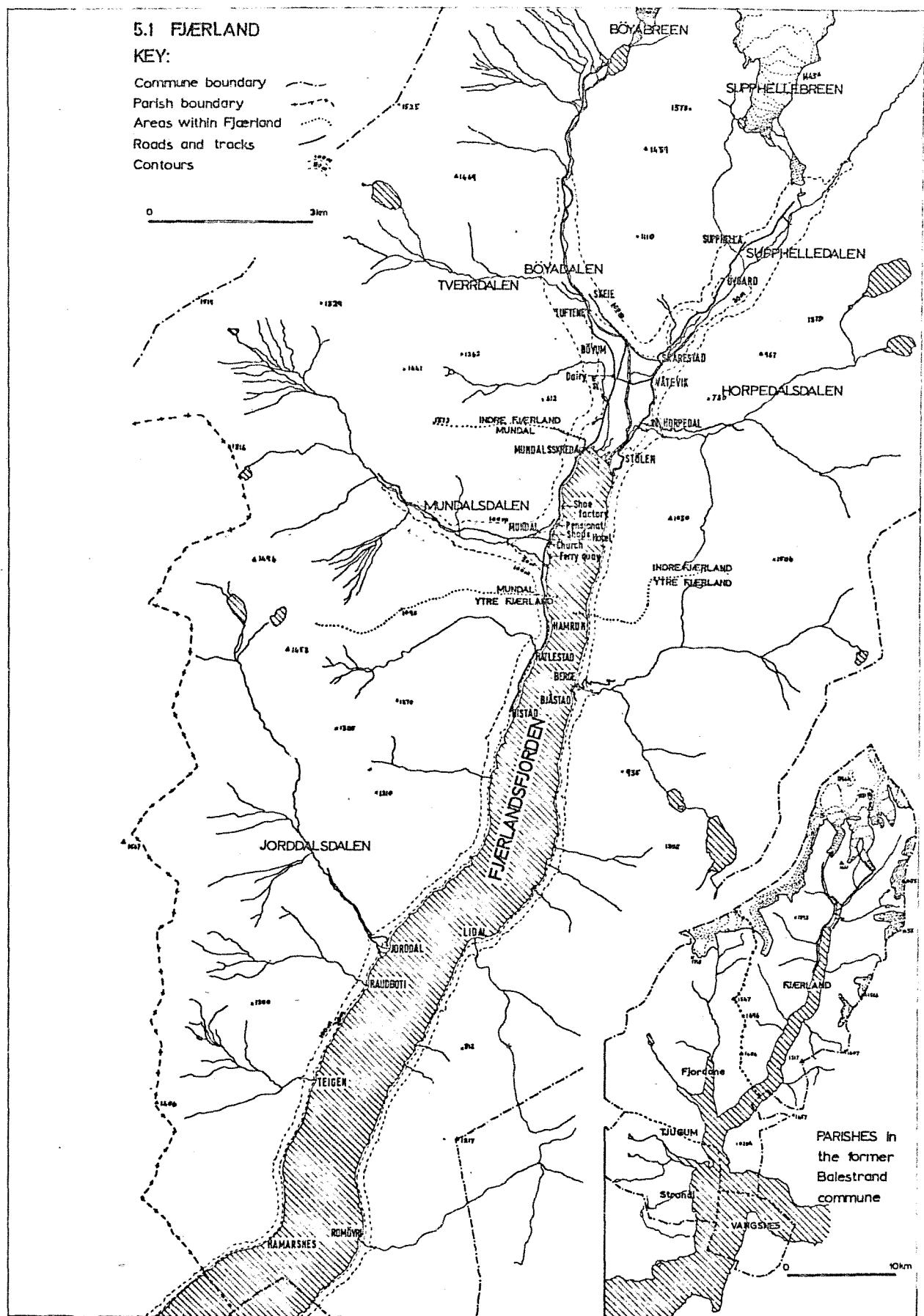
- a. The farming economy
- b. Household income and expenditure
- c. The expansion of job opportunities

V The Road Question

- a. The road as civil engineering
- b. The road as Fjaerland's future

Summary

Since the roots of this thesis were intentions to produce prognoses for Fjærland, a thorough review of the past and present development of the community is undertaken. After introducing the village in its context among other remote communities in Sogn og Fjordane, and as the largest mainland community without a road, the history of its economic and social structures is described. Particular importance is attached to the position of the husmenn, cottars, who contributed to the wealth of the community in the half-century ending in the 1930's. The current structure of agricultural production is described, and the attempts made to devise a production plan for agriculture in Fjærland are discussed. Changes in population and occupations between the 1960 and 1970 population censuses are analysed for the three census districts which make up the community. A set of accounts is drawn up for the village, firstly of farming production income and costs, and secondly of household income and expenditure. It is revealed that apart from the retail sales from the shops, the volume of economic interaction within the community capable of generating new jobs is not great, despite the large sums passing through the economy. Finally, the campaign waged to obtain a road link to a higher order centre is described.



I. Fjærlands Natural and Historical Circumstances

a. Settlement location and form

Fjærland lies along and at the head of Fjærlandsfjord, which runs N.N.E. from Balestrand and the main line of Sognefjord. Both sides of the fjord are steep, and both experience frequent avalanches and stone falls. The flat land at the head of the fjord has been extended by isostatic adjustment, which continues; the fjord is icebound only rarely. Around the fjord rise mountain ranges, with few negotiable passes into neighbouring valleys. To the West is the small Jostefonn ice cap, and stretching from the Bøya and Suphelle glaciers, which finish in Fjærland, the Jostedal ice cap extends far to the North East. The passes out to the east, and over the mountains to Jølster in the north, were used as trading routes before the regular boat service began; in the narrow fjord it was often difficult to sail heavier boats from lack of wind from the right direction. The precipitation is rather high, around 2000 mm per year, and the average temperature is somewhat lower than nearby valleys, partly a consequence of the glaciers but also of the melt water layer on the surface of the fjord in summer time.

Although there are local roads reaching down the fjord to Distad, and up the valleys around the fjord head, Fjærland is not connected to the outside world except by boat. From May 1974 a car ferry has been operating three times daily from Hella-Draugsvik, under the summer timetable; before that the steamer connection was with Balestrand, the commune administrative centre. During the winter there has been one boat daily in each

direction, and in summer two, one summer route specifically operated for tourists visiting the glaciers as a day trip. Fjærlanders have been able to go into Balestrand for 4¹/₂ hours a day during the winter, but it has been necessary for visitors to Fjærland to stay at least one night. The steamer quay, and the new ferry quay are in Mundal, where also lie the general store, the cooperative retail shop, the post office, telephone exchange, cargo handling office, the pensjonat, and the hotel. The telephone exchange remains manual, but now it is a section of the larger Balestrand exchange.

Beside these commercial functions there is a shoe factory in Mundal now working at a very low tempo, and the disused dairy building in Bøyum which has become a farm machinery and motor repair shop. The names of places in Fjærland are those of the matriculated farms. Although most are on the local road, some are not, those fjordside farms between Jordal and Teigen, Lidal Romøyri, and Berge-Bjastad opposite Distad. The matriculated farms include both cultivated and pasture land, with access to woodland, not only for timber, but also because leaves and the shoots from pollarded trunks were a very important source of winter food. Much of the timber is deciduous, especially scrub birch along stream courses, and although good for firewood or fencing it is not suitable for construction. There has however been much spruce planting, and this is felled and used for building. Fresh building stone is not easy to get, since most exposed faces are on valley walls. There is a currently used outcrop of sound stone at Skarestad.

b. The historical background

Although Fjærland was settled in Viking times, it seems to have been deserted from before the Black death. There is a mention of Mundurdalir /Mundalsdalen/ in 1534, but not of any church. Jon Laberg, the author of the local history, holds that since all medieval churches owned land, and there was no land owned by the later churches in Bøyum and Mundal, the ^lresttlement of the community occurred in the 16th and 17th centuries after the Reformation /1934, p.514/. The land in the whole former commune of Balestrand, Vangsnes, Tjugum and Mundal was owned as shown in Table 5.1. Laberg asserts that Balestrand peasants owned rather more than average for Sogn, in other rural communities four or five percent was normal/1934, p.18/.

Table 5.1.

Owners of land in Balestrand

	1646	1663	1690	1723	1802
The king	23.5	0.9	0.3	0.4	0.0
Bishops and preists	29.4	19.4	19.7	22.2	24.3
Peasants	21.2	20.4	26.6	31.8	59.4
Administrators	14.0	27.7	31.6	41.2	15.0
The Church	7.2	16.9	6.1	4.4	1.3
Nobles	4.7	14.7	5.2	0.0	0.0
Town burghers	0.0	0.0	10.5	0.0	0.0

/Laberg 1934, p.18/

Before 1/1 1964 Balestrand did not include Kvamsøy or Nessane, but did include Vangsnes and Fitorn.

Even in Fjærland the town merchants owned some land; in 1646 Peder Jenssen, probably of Bergen, owned Hammarsnes /Laberg 1934, p.514/, and in 1691 Manufakturhuset of Bergen owned Bjastad /Lidal et al 1973, p.68/. After the early nineteenth century, the farmers bought up most of the rest of the land. At the same

time, the numbers of servants, and the number of husmenn /cotters/ rose.

The transition from the natural household to the money household in Fjærland took place rather recently, compared to some other areas in Sogn. However, this does not mean that the living conditions were poorer, since rural communities with few possibilities for subsistence became dependent on selling their products earlier in order to obtain enough to eat. In the old Balestrand commune, the parishes of Tjugum, Hundal and Vangsnæs, there was a great difference between the more remote areas, Fjærland, Sværefjorden and Vetlefjorden /Fjordane/, and the areas of Strondi and Vangsnæs; Tjugum parish is made up of Strondi and Fjordane.

Table 5.2

Normal yearly income from farming in Balestrand commune
in the 1860's

	cultivation		timber		livestock	
	spd.	%	spd.	%	spd.	%
Fjærland	4301	28.2	1921	12.6	8989	59.2
Tjugum	6030	19.2	4997	24.5	9689	46.3
Vangsnæs	2126	41.2	1413	27.4	1620	31.4

Matrikkelfor arbeidet av 1886 Balestrand Spd. = spesiedaler,
old currency

/Thue 1973, p.8/

Table 5.2. shows the difference in economic emphasis between the cultivation of land and getting of timber, and the keeping of livestock in the 1860's. Fjærland obtained a much higher proportion of its income from animal products, but in parts of Tjugum, and Vangsnæs, potatoes and timber were sold against grain, fish, and other wares. From Table 5.3, this distinction

is reinforced. Fjærland and Fjordane sowing relatively more grain which was solely for subsistence, while the other areas sowed potatoes for sale, or exchange. /Thue 1973 ,p.8-10/.

Table 5.3

Proportion of corn and potatoes sown in Balestrand in the 1860's

	corn			potatoes		
	barrels	seed	corn %	barrels	seed	potatoes %
Fjærland	342		59.5	233		40.5
Fjordane	151		65.8	79		34.2
Strondi	256		45.2	310		54.8
Vangsnæs	82		39.9	124		60.1

Matrikkelforarbeidet av 1868 Balestrand.

Corn reduced to barley value by 1 hectolitre barley = 65 kg,
1 hl mixed corn = 72 kg, and 1 hl oats = 48 kg.

1 Barrel is approximately 4 Bushels

/Thue 1973, p.10/.

The form of farming in Fjærland was closely adapted to the local resources of cultivable land for grain, and large areas of pasture. This adaption required rather large amounts of labour, servants to look after the herds at pasture, and to milk them, and for the cultivation of the intensively used land. Fjærlanders did not take so much part in the traffic on the main fjord , as did the Vangsnæs farmers, who served as heavy cargo carriers until the beginning of this century, sailing coast wise in their own craft /Thue 1971 /. The holdings of livestock in Fjærland were as large as in Tjugum in the 1860's and, for example, there were 722 cattle and 2159 sheep, against 343 and 777 in 1972 . /Lidal et al 1973, p.52/. Laberg has estimated that in the three parishes in the 18th. century, the servants were between 15 and 20 percent of the total population, but this could be an underestimate, since children under 16 were not counted but certainly often

were servants. In 1801, at the census, there were 208 servants, 131 /67% of them girls, that is about 15% of the population; by 1900 there were still 96 servants, but their proportion of the total population had fallen greatly /Laberg 1934, p.59-50/. The commune had 73 husmen in 1801, 7 in Vangsnæs, 38 in Tjugum, and 28 in Fjærland /Laberg 1934, p.52, Lidal et al 1973, p.53/. This mounted to 94 in 1835, and to 117 in 1865; the number of husmann households in the whole commune fell to 160 in 1875, although in 1900 Fjærland still had 54 of them.

The husmann was not a tenant as such, he leased a holding /plass/ from the head of the farm, for the space of his and his wife's life time. The rent was often paid with labour, usually at specified times of the year, and the normal amount of work to be done was set by convention. In Vestlandet generally there was little social distance between husmenn and farmers, the lot of the small farmers and the husmann was very similar. However, there was little for husmann to fall back on in illness or old age, except the goodwill of the farmer, relatives, or assistance from the commissioners for the poor. A further reason for the amicable relations between landowning farmers and the husmenn were their close family connections. They also shared participation in the low church revival, which raised up individual, or household, success in keeping out of debt, in saving, and in advancing to prosperity as the chief signs of a Godly life /Thue n.d. p.6; 1974; Tveit 1973 p.81-3; Semmingsen 1960/.

From the lists of the 1875 and 1900 censuses it is possible to divide up the households living at that time in Fjærland. ^{*}
Table 5.4 shows the distribution of main households by social ^u
 *a.iv.17

category; many households had subsidiary families also living with them. The category of households without land grew rather rapidly, reflecting the development of service and commerce, as well as the emergence of landless labourers.

Table 5.4

Social categories in Fjærland in 1875 and 1900

	1875	1900
Farm households	41	45
Husmann households		
with land	49	54
Leasehold households	3	1
Landless households	9	18
total	102	118

Population census 1875, 1900

Of the total population in 1900 of 757 in Fjærland, 386 lived on husmenns holdings; of these 265 were aged fifteen or older. Of the remaining population, 78 were servants on the farms; the age distribution of the husmann heads of household, including the landless labourers, and the servants in Table 5.5, shows how relatively young many of the servants were.

Table 5.5

Age Distribution of heads of households in husmenn and landless labourer households, and of servants 1900 Fjærland

	husmenn and labourers	servants	
		men	women
under 20	-	15	19
20 - 29	6	9	20
30 - 39	18	5	6
40 - 49	16	1	-
50 - 59	14	2	2
60 - 69	6	1	-
70 and over	4	-	-
total	64	31	47

Population census 1900

One origin of the servants was certainly the husmann households, where the children seem to have almost all left after the early teens. Typically these families had a regular pattern of births, with the first child born when the mother was aged 25-27, but very often the oldest child still at home, aged 10 or a little more was born when its mother was already well into her thirties. Those children who did not go into service were among those many who left Fjærland entirely.

Fjærland seems to have advanced rapidly in the last quarter of the century. There was rather less migration from Fjærland than Vangsnæs, but a similar proportion of the population as Tjugum. From 1889 to 1910 altogether 238 people emigrated, 31.1 percent of the average population of those years /766/. But of those who left, as many as 77 percent went to North America, while from Vangsnæs parish only 52 percent travelled over the ocean, others went to Bergen, Vestfold, and other areas, in Norway. Thue related the greater proportion leaving Vangsnæs to the end of the coastwise trade by ~~je~~kt, and the smaller proportion going to America to the much greater contact with the outside world at Vangsnæs, so that more knowledge was available there of opportunities within the country /1973, p.14-15/. It was migration growing from the 1840's which brought the end of the husmenn, and of the free availability of servants. People had often come to work in Balestrand from other communes; between 1847 and 1866 155 came /Laberg 1934, p.50/, many to Fjærland where the larger farms needed labour /Tveit 1973, p.82/.

Of the established husmann and labourer households in 1900 55 had both spouses present. Twenty of the male spouses were born outside Fjærland, and fifteen of the female spouses were also.

There were eleven couples in which both spouses were born outside Fjærland, or possibly Balestrand; the census rubric is indecisive as to whether the response "this place" applies to parish or commune. Many responded as though it meant parish, but the practice could vary between enumerators. Thirty one couples were purely from Fjærland, and thirteen were mixed, nine with the male spouse from Fjærland. Eighteen of the 78 servants came from outside Fjærland, seven of the 24 men, and eleven of the 36 women. Of the foreigners, the vast majority were from Sogn, and most of these from other villages in Indre Sogn.

The large farms in Fjærland prospered, relative to the small farms in Vangsnæs; butter prices stayed steady being kr. 1.40 per kg in 1876 and kr. 1.50 per kg in 1890's. Barley prices, the main import, fell from kr. 11.93 per hectolitre in 1876-8, to kr. 8.54 in 1892-4. Potato prices were less stable, ranging between kr. 2.72 per hectolitre in 1890 to kr. 4.50 in 1892. Wood prices rose sharply in 1888, but fell back thereafter /Thue n.d. p.8, Table 1/. The larger farmers in Fjærland were able to send their sons to college, and new machines were brought into the village /Tveit 1973, p.16/. Three small dairies were built at the turn of the century, producing both butter and cheese, and by 1913 plans had been made to build the hydro-electric plant in Horpedal. The cost was rather considerable, kr. 80 000 and the savings bank in Balestrand felt unable to help them, but a loan was contracted in Vik, and the plant was operating in 1914 /Tveit 1973, p.24/. When the Fjærland Privatbank L/L opened in 1916 the deposits mounted rapidly, to kr. 329 000,- in 1918, and 721 000,- in 1921 chiefly as a consequence of transfers from Balestrand savings bank /Fjærland Privatbank, yearly accounts, see Appendix iv./.*

The mass of accumulated savings seems to have been won during and after the latter part of the 19th century, when the sale of livestock products, chiefly butter, could be undertaken by the farms in return for few cash outgoings. The farmers tended not to come into debt when they invested, but rather saved first; hired and husmann labour was paid, and at the normal rates, but even so savings built up in the community. It is hypothesised that savings by husmenn and other propertyless families were often used to buy tickets for the journey to America. After the migration it was the families of the farmers who remained, and who then ploughed back the savings in new equipment and buildings, in the electricity works, and the balance lay in the bank. In 1922, the deposits and bank funds reached kr.838 000,- of which kr.582 000,- were held in other banks, shares, or government stocks. Of the remaining ordinary loans, kr.256 000,-, most were to local people, but over the following two years loans totalling 43 000,- were made to Lavik and Gulen communes, and further loans outside the area were also made /Fjærland Privatbank, yearly accounts; manuscript record of loans, Appendix iv/ ^x. Although many of the farms were still operating as semi-natural household they had come into the advantageous side of the market, at least until the second world war.

^xA.iv.18

II. The Structure of Production in Agriculture

a. The farm holdings in Fjærland

The information available about the organisation of Fjærland's farms over the last few years comes from two main sources, the commune agricultural department /Balestrand jordstyre/, and a questionnaire survey conducted by the Norwegian institute for Agricultural Economics /NLI/ in April 1971. Much of the information from the jordstyre is based on official returns, including those for the 1969 Agricultural census. In addition, records of farmers organisations in Fjærland cover other aspects, most importantly the registration of milk production /Fjóskontroll-lag*. The number of farms included in each of these sources differs, and may differ from year to year: in the agricultural census 63 holdings over 5 decares were reported but the NLI survey only included 43 holdings. The fjóskontrollag register normally contains records from a little over twenty dairy herds, and tends to show the results of the better ones, the averages for all Fjærlands herds are rather lower. Table 5.6 shows the proportion of farming land by the various sources of information. The NLI survey excludes twenty farms whose average size is 21.4 decares, Table 5.7 shows the size distribution both of those surveyed, and these excluded, indicating that the survey covered the larger farms more effectively.

*A.iv.19

Table 5.6
Farm area included in the sources used

Farm area decares

	1969 Agric. census	1971 NLI survey	1970 Fjøs- kontroll
Ytre Fjærland	699	467	96
Mundal	677	495	418
Indre Fjærland	3153	2837	1115
total	5419	3799	1629

Source: Bjelland 1973, p.21; manuscript fjøskontroll records;
Balestrand jordstyre.

Table 5.7
Coverage of NLI Survey by size classes

decares	Ytre Fjærland			Mundal			Indre Fjærland			total
	incl.	exc.	tot.	inc.	excl.	tot.	inc.	excl.	tot.	
<40	3	7	10	-	3	3	2	9	11	24
40 - 75	8	-	8	1	-	1	5	-	5	14
76 - 100	-	1	1	1	-	1	10	-	10	12
100≤	-	-	-	3	-	3	10	-	10	13
total	11	8	19	5	3	8	27	9	36	63

Source: Bjelland 1973; Balestrand Jordstyre.

Fjærland is fortunately situated with as many as 25 out of 67 farms /39.7%/ over 75 decares. The smaller farms are concentrated along the sides of the fjord, below Mundal, at Stølen and Skreen, distributed among the larger farms on the fjord head plain, and up the valleys. The Ytre Fjærland area only contains one farm over 75 decares, at Berge, while Indre Fjærland has 20. From the 1969 Agricultural census, 44.4% of the farmers were under 50

years of age, and 8.0 % older than 69 years /Bjelland 1973, p.19/. There is some relationship between age and farmsize, in 1968 8 of the 16 farmers aged 60 years and over worked farms of less than 30 decares /Balestrand jordstyre manuscript , Appendix iv/. However this related more to the greater age of farmers of fjord-side farms, where replacement on retirement is felt to be less certain, than to a direct association of age and size. Fjærland has relatively many young farmers, and many of the older ones are confident that their children will take over the farm, 56 percent in Indre Fjærland, however, the age at change of hands has been rising /Bjelland 1973, p.40-1/. In addition the NLI survey achieved an overrepresentation of farmers with their farms as their only occupation. The 1969 census found 31 /49 percent/ in this situation, but 25 /58 percent/ of the survey respondents were. All of those with part-time occupation worked in Fjærland, and the frequency of subsidiary work was highest in Mundal, 4 out of 5 farmers. The other areas had about 36 percent with part-time occupations; most were working in the school, transport, the bank, or distribution, and 15 of the 18 respondents had permanent positions /Bjelland 1973, p.28/.

The production from cultivated land is chiefly grass, little now dried as hay, mostly for silo feed /Table 5.8/. The potatoes grown for sale are sold to a trader from the Bergen area who purchases them yearly in Fjærland. Apart from soft fruit, cultivation is concentrated in Indre Fjærland; as indeed is the area of grass for silage. The use of pasture for cattle has halved in the last decade, but some of this has been transferred to other livestock, to raising calves and sheep for slaughter.

Table 5.6

Cultivated area by use 1971 decares

	soft fruit	veget- ables	potatoes	improved grass	partly improved grass	total
Øvre Fjærland	23.0	0	9.2	265.0	170.0	467.2
Mundal	0.5	0	17.0	247.0	23.0	494.5
Indre Fjærland	4.0	4.5	157.4	2361.0	310.0	2836.9
total	27.5	4.5	183.6	2873.0	710.0	3798.6

Source: Bjelland 1973, p.24, Table 3.8.

A proportion of the plant production goes directly to the households as does a considerable quantity of the meat. Apart from the sale of potatoes, several holdings now cultivate vegetables commercially, and several grow soft fruit under contract to Halvard Brægni A/S in Leikanger.

Although Fjærland herds have been following trends general in Vestlandet, they lag in several respects. The most important features have been feedstuffs, Table 5.9a/ and breed quantity /Table 5.10/ although if these are changed, the need to renew farm buildings will become pressing. Silage always was used in Fjærland, as in other villages, before it became especially modern to use it, but is has now largely replaced hay and root vegetables. The dramatic change has been in the increase of purchased concentrates against pasture; in cash terms the increase in milk volume has been largely consumed in the purchase of the concentrates. Had the change to the high volume breeds been more thorough, the high proportion of concentrates might have paid off in a greatly increased volume of milk. Individual farmers have been achieving herd averages of

Table 5.9a

Volume of milk per cow year, and percentage composition of feed

	kg.milk/ cow year	hay	silage	roots and potatoes	pasture	concentrates
1959-61	2539	18	20	7	40	15
1969	2175	12	22	4	20	27
1970	2222	23	31	5	26	25
1971	2551	25	31	2	27	37
1972	2736	25	32	2	24	27
1973	2179	5	31	2	22	40
1974	2171	6	30	2	23	39

Source: Fjøskontrollag records.

Table 5.9b

Total milk deliveries, number of cows, and average production
1970-74

	total milk production kg	no. of cows	average delivery to dairy per cow
1970	808330	380	2130
1971	875717	342	2500
1972	1006898	332	3040
1973	1099029	306	3600
1974	1113377	367	3030

Source: Sogn og Fjordane Landbrukselskap. *

Table 5.10

Milk volume per cow year by breed for fjøskontrollag herds.

	1970		1973	
	kg milk	cow years	kg milk	cow years
NRF	4259	18.5	4667	50.3
NRF first cross	3002	29.4	4401	63.1
Vestlandsfe	3106	134.1	3682	70.0
All	3202	180.0	4178	198.4

Source: Fjøskontrollag records.

over 6000 kg of milk per cow year using the relatively new NRF cow and higher proportions of concentrates, while the average for all herds for this breed is still very low, even now that it is represented in most herds. Some herds are still dominated by older breeds, reflected in their lower volumes per cow year. In fact in other villages even these breeds can perform better, perhaps because in Fjærland the larger herds can carry more poor performers, since the supply of feedstuffs or size of farm is not the limiting factor. The herds in Fjærland are now changing swiftly: since the NRF cattle arrived in 1968, the breed has taken 34% of the total herd membership by 1973. Including crossed cattle, the improved breeds are now in a strong majority, and have raised the output of milk dramatically.

An investigation by Sogn og Fjordane Landsbrukselskap has found out that compared to an ideal margin of kr.3330 per cow year, realised from milk and meat sales, in 1974 the farms, largely around the Grunska river averaged kr.2175, largely because of the lower milk volume. The ideal calculation was based on a volume of 5500 kg per year, but the average for all cows in Fjærland in 1974 was only 3050 kg, and even for Fjøskontrollag cows the average was still only 4171 kg /Tables 5.9a,5.9b/.

Since 1966, the smaller farms in Ytre Fjærland have rapidly picked up the growing of soft fruit, chiefly under contract, for the jam factory and freezing plant of A/S Drægni in Leikanger. In 1966 some 3500 kg of raspberries were delivered rising to 4900 kg of strawberries and 10500 kg of raspberries in 1973. In 1974, 27,4 decares were under contact, mainly for raspberries, which because of the extended travel time, cannot

be frozen as separate berries and must be used processed; this disadvantage reduces the payment to the farmer to kr.4.15 per kg, a loss of kr.1,-per kg. In order to facilitate purchase of plants, canes, polythene sheeting and other necessary production goods, Drægni offer interest free loans of 16 months for strawberries, and two years for raspberries, which enables smaller farmers to start immediately without regard to shortage of capital.* The company has diversified into freezing vegetables sold for catering, and in 1974 began the trial production of cauliflowers on several holdings in Fjærland; great interest was expressed, and the 1975 harvest is expected to be quite large.

A further element in farm production is the delivery of animals for slaughter to the cooperative slaughterhouse in Sogndal, which is shown in Table 5.11.

Table 5.11

Slaughterhouse receipts from Fjærland 1970-74

	sheep and lambs		cattle	
	number	tonnes	number	tonnes
1970	506	10.9	272	27.1
1971	401	8.4	202	20.8
1972	525	11.6	257	27.4
1973	555	11.4	254	31.2
1974	793	17.3	273	34.9

Source: Sogn og Fjordane Landbrukselskap.**

In addition, mutton and pork is slaughtered on the farms for home consumption, cooperative members being only bound to deliver carcasses intended for sale. Deliveries of logs to the now closed pulp mill at Vadheim has been important, but wood is still taken for firewood, in considerable volume, partly for household use, and partly for sale.

*A.iv.21 **A.iv.22

b. The resources for progress in farming

At the 1970 annual meeting of Fjærland Bondelag, the farmers organisation, a decision was taken to approach the Sogn og Fjordane Landbrukselskap, an official technical and advisory body, in order to get a production plan for farming in the district. This led to the involvement of the NLI, to the interviewing of the 43 farmers, to the published report /Bjelland and Bruland 1973/, and to a series of meetings based on the report. A general meeting on 4th December 1973 received a presentation of the report, and following this six working groups were established in cooperation with the Bondelagets project to compile a report on the resources in and possibilities facing the village. These working groups met on the 18th-20th February 1974, and were responsible for the following issues: the General group to oversee and coordinate the work of the others and liaise with other interests; the group on river regulation and ditching on the extension of the cultivated area ; on tourism; on production of fruit and vegetables; and on the availability of skilled craft workers, such as masons and carpenters.

An interesting section of the NLI questionnaire which bears on the production plan for Fjærland was a contact study, grouping farmers according the frequency with which they were consulted by others for technical advice. In the group of seven asked by more than four others, a smaller group with a much higher frequency of consultation was revealed. /Bjelland 1973, p.44/. This was to be anticipated, in that they are the official or unofficial representatives of Fjærland to the outside world, with

contacts in the communal administration, in business, and with the press. They are also office holders in the organisations impinging on the farmers lives, or take an active part in meetings, from the chair or the floor, of the Bondelag, or the dairy or slaughterhouse cooperatives. Compared with the bulk of those consulted by at least one of their neighbours, they are older, and have much larger farms /Bjelland 1973, p.46/.

Another point which came out of the survey was that the farms had in general become more extensive in operation between 1960 and 1970, and that the farm income remaining after variable costs had been paid, fell in real terms for farms in all size classes, except 40-75 decares, between 1960 and 1970 /Table 5.12/

Table 5.12
Change in intensity of farming 1960-70

	1960	1965	1970
cultivated land other than grass da/farm	7.0	6.5	5.0
herd size per farm	9.2	8.9	8.7
winterfed sheep per farm	18.1	18.2	16.0
pigs per farm	2.5	2.1	2.1
farm income thousand 1971 Kr per farm	24	23.5	22

In the report, the weakening confidence in the future for those in farming is mentioned clearly /Bjelland and Bruland 1973, p.21/ an apprehension compounded of anxiety about finding a successor to the farm, about expensive sounding technical advice, and about the road problem, Bjelland attributes the unwillingness to contract debt to a tradition bound attitude to the question of capital, the direction of investment usually only being towards marginal improvements of the present farm system, with production method and buildings unchanged /1973, p.47/. But in the face

an uncertain future a hesitancy to invest is reasonable although most likely foolhardy, and the lack of confidence throughout the community has not encouraged individual farmers to take big risks. Investment as such is the main practical problem, in that if the production systems are rationalised, the volume of production will be too great for even adapted old buildings to handle.

The possibilities for such rationalisation lie in two main areas, the full utilisation of the land resources available, and then of feasible production combinations. The land in Bøyum and Vatlevik suffers from waterlogging throughout most of the growing season, and regulation of the rivers and streams in this area would increase hay and silage yields, and perhaps make vegetable growing more attractive. A survey was originally made in 1953, and the designs for the regulation prepared. For such work a grant from the state grant of 75%, and a further 12.5% from the communal authorities may be obtained, leaving 12.5% to be shared between those who would benefit from the work. The actual sums required of the farmers have not been very great, and can in any case be met by equivalent labour on the site once work commences. Eventually in early 1974 work began on the small Grunska river, which cost kr. 180 000; the commencement was fortunate, and work was made much easier by the unseasonal February and March weather. The main rivers are a much larger proposition, and also involve the clearance and bringing under cultivation of a large area in the throat of Suphelledalen. In Indre Fjærland 1280 decares could be brought into cultivation, 205 decares in Mundal, and 282 in Ytre Fjærland, principally in Jordal. Following river regulation, more work on drainage and ditching would be necessary, and for these further official grants can be obtained.

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In Tables 5.13 and 5.14 the 1975 estimates of the cost of the various elements of a production plan for Fjærland's farms are listed. Fortunately, the most important foundations can be begun almost immediately, since the land-owners section of the cost of regulating the Bøyum and Supphelle rivers has been taken over by the state, in line with the sentiments expressed in St.Meld.nr 32 /1974-5, p.11-12/. It seems likely that the investments projected in these plans from the Landsbrukselskapet would be very suited to especial assistance from the Agricultural Development fund, proposed in the Stortings Melding. The heaviest burden upon the individual farmers is undoubtedly the cost of new buildings and new stock. The experience of costing several planned buildings has shown that erecting a modern sectional building sold by Rieber and Søn A/S, Bergen, from scratch is cheaper than gutting and reequipping an old building, provided that the farmer carries out the construction work himself.

Having got the land into good heart, the number of ways forward become greater. In the changed situation which has been brought about by higher concentrate and fertiliser prices, the best use of local resources will have to be made, especially the substitution of root vegetables for concentrates, and getting the best quality of hay and silage /Sogn og Fjordane Landbrukselskapet 1974/. This means careful use of fertiliser, but puts the amount of good cultivable land at a premium, and this is something which the farms of Mundal and Indre Fjærland have, or can have at the price of the river regulation and drainage works. Compared to other milk and meat producers, they have the resource to produce most feedstuffs locally, and so to avoid the heavy

Table 5.13

Planned schemes in Fjærland

I River regulation	cost estimates kr.	statutory subsidies		payment by freeholders kr.
		State kr.	Commune kr.	
a. Bøyumselva og Supphelleelva	3 300 000	2 475 000	412 500	412 500
b. Grunnska	180 000	135 000	22 500	22 500
c. Mundalselva	29 000	24 000	2 500	2 500
d. Steindalselva	12 000	10 000	1 000	1 000
e. Horpedalselva	57 000	47 500	4 750	4 750
Sum I River regulation	3 578 000	2 691 500	443 250	443 250
II Ditching				
a. Skarestadpyane	47 500	28 500		19 000
b. Myra og Langane på Skarestad	20 000	14 300		8 200
c. Kanal på Bøyum	19 500	11 700		7 800
d. Tuftegravvi	17 500	10 500		7 000
e. Vætlelva	41 000	24 600		16 400
Sum II - Ditching	146 000	87 600		58 400
III Waterworks at Mundal Water supply and irrigation	259 500	64 800	65 000	129 500

Paid by freeholders and other parties

Source: Sogn og Fjordane Landbrukselskapet

Table 5.14

Some outstanding investment objects in Fjærland /preliminary estimates/

	cost estimates kr.	estimate of subsidy kr.	cost to freeholders kr.
1. Ditching	1 500 000	500 000	600 000
2. Reclamation 150 @ kr. 1500	2 250 000	1 800 000	450 000
3. farm buildings			
a. 20 @ kr. 300 000	6 000 000	1 400 000	6 250 000
b. 10 @ " 100 000	1 000 000		
c. 13 @ " 50 000			
4. herds	1 000 000		1 000 000
Sum	12 400 000	4 100 000	8 200 000

burden of payment for now uneconomic proportions of concentrates in the diets of their animals. Although prices could change again investment in the land can never be wasted.

The production system most appropriate on the large flat farms involves milk, and meat - beef or veal and mutton - with perhaps potatoes for sale if not used as pig food. On the fjord-side farms the already established pattern of soft fruit and sheep is well adapted as far as the resources on the farms are concerned, except that if many more decades are cultivated, it will be difficult to get labour to the fruit at its peak. For vegetable production, a cold store in Fjærland would be a great advantage, but would be difficult to finance, and would depend on the willingness of A/s Drægni and/or Gartnerhallen, the market garden produce cooperative to agree to buy the produce. A number of the other topics taken up above also hinge on the likelihood of some form of agreement or collective operation. A cooperative machine station for ditching, or for breaking and cleaning new land is another possibility, and the use of such land for common pasture might be considered. As the report concludes, technically the situation looks suitable for a number of both collective and private solutions /Bjelland and Bruland 1973, p.26/.

III. Agriculture and Settlement

a. Population

Fjærland's population rose from 549 in 1801 to 762 in 1865, was at the same level /761/ in 1891^x, and fell from outmigration in the subsequent decade. It is reasonable to assume that the population declined slowly from then on, or maintained its numbers, until the second World War, and fell increasingly fast

thereafter. In the Population Census of 1.11. 1960, the three enumeration districts which comprise Fjærland held a population of 527 persons.^x Ten years later the population had fallen to 456, but for the parish as a whole, the deficit of deaths over births, the failure of the population to replace itself, was only three, from 1960 to 1973. Taking the population as closed to migration, and adding births, and subtracting deaths, the population in 1970 at the time of the census could have been 534. The difference between this and the 1970 census return, 78 is a measure of net migration over the decade /Appendix iv/.^{xx}

Table 5.15 shows the population changes in the three enumeration districts, in them all the rate of decline is steep, 13.5 percent for Fjærland over the decade. The percentage change for Ytre Fjærland is lower, since the population there was more aged than for the parish as a whole, 38 /31%/ against 121 /23%/ aged 60 and over in 1960.

Table 5.15
Population resident in Fjærland

	1960	1970	change	%
Ytre Fjærland	123	109	-14	-11.4
Mundal	179	154	-25	-14.0
Indre Fjærland	225	193	-32	-14.2
Fjærland	527	456	-71	-13.5

Tables 5.16 and 5.17 show the changes at the two extremes of age in the population, and in the changes of those age groups as proportions of the total population. The fall in the proportion of young people is slightly less marked in Mundal than elsewhere, but the tendency for the population under 16 years old to fall twice as fast as the population as a whole gives cause for concern. This is reinforced by the 61% increase in the proportion

of the total population made up of those of 60 years and older, from 121 /23%/¹ in 1960 to 146 /37%/¹ in 1970.

Table 5.16

Population aged 15 years and under in Fjærland

	1960	1970	change	%	change in prop. of total population %
Ytre Fjærland	28	20	-8	-28.5	-19.4
Mundal	56	42	-14	-25.0	-12.8
Indre Fjærland	57	40	-17	-29.7	-18.6
Fjærland	141	102	-39	-27.7	-16.4

Table 5.17

Population aged 60 years and over in Fjærland

	1960	1970	change	%	change in propn. of tot. pop: %
Ytre Fjærland	38	34	-4	-10.5	0.9
Mundal	35	45	10	28.5	49.4
Indre Fjærland	48	67	19	39.5	62.7
Fjærland	121	146	25	31.7	61.0

Only in Ytre Fjærland is there a different trend, the old seem no longer to be being replaced by succeeding cohorts: it is likely that the district itself may be divided into those farms on the local road, and those only accessible by boat. The remaining young people are most likely to live on the farms on the road, and if this is so, the other fjordside farms have probably passed the point of no return, and would need people to move to them if they were to remain in use.

Table 5.15
Economic activity in Fjærland

	1960 no.	% econo. active	1970 no.	% econo. active	change
Ytre Fjærland					
Agriculture	35	81.5	33	80.5	- 2
Industry and construction	6	14.0	3	7.3	- 3
Commerce	0	-	0	0	0
Services & transport	2	4.5	5	12.2	3
total	43	100.0	41	100.0	- 2
Mundal					
Agriculture	12	20.4	14	23.7	2
Industry and construction	23	39.0	8	13.5	-15
Commerce	4	6.8	4	5.8	0
Services & transport	20	33.8	33	56.0	13
total	59	100.0	59	100.0	0
Indre Fjærland					
Agriculture	57	73.0	55	68.8	- 2
Industry and construction	9	11.5	5	6.2	- 4
Commerce	1	1.3	1	1.3	0
Services & transport	11	14.2	19	23.7	8
total	78	100.0	80	100.0	2
Fjærland					
Agriculture	104	57.8	102	56.7	- 2
Industry and construction	38	21.1	16	8.9	-22
Commerce	5	2.8	5	2.5	2
Services & transport	33	18.3	57	31.6	24
total	180	100.0	180	100.0	0

Source: Population census 1960, 1970

b. Occupations

The total economically active in agriculture reported by the 1970 census /Table 5.18/ seems to agree with the 1969 Agricultural census, given a good deal of interchange between categories. The apparently stable number of economically active could be masked by the exclusion in 1960, and inclusion in 1970 of some farmer's wives; and the assignments of occupations to people having more than one is another problem. The relatively great decline in industrial and construction occupations may be related to the shoe factory's reduced tempo, and to fewer men working on building projects inside Fjærland or out, as well as to the reaching of pensionable age by many hand workers. Anyway it seems that there has not been a noticeable fall in the amount of work available for farmers, and their families, and the extensivisation noted above probably signifies that more labour could be substituted for capital in making agriculture more intensive. The increase in the number occupied in transport and services is concentrated in Mundal, but is evident in the other districts. This could result from greater job opportunities in the tourist and other trades, or from the enumeration of people partly occupied in other ways, on farms or at home. In that the Agricultural census showed 31 farms with the head of household having outside work, and that some proportion of their spouses also had another occupation, it is not reasonable to see the increase in tertiary occupations^{as} necessarily representing discrete new jobs. As a moderately conservative guess, the actual number of new tertiary 'jobs', persons occupied who were not so occupied in 1960, would

be in single figures. But as an indication that incomes from tertiary sources are getting back to the farms, the increase is anyway welcome.

c. Cohort survival and career aspirations

The analysis of the survival of the cohorts who were 10-14 and 15-19 years old in 1960 seems to confirm the gloomy hypothesis that leaving Fjærland for school outside marks the decisive point in outmigration. Military service is another period when the young men are required to live away from Fjærland, and unless there is a good reason to return, such as the possibility to gain a livelihood, they will, with regret, settle down elsewhere. The general pattern of boys leaving after girls seems to hold, with the younger cohort of boys being the only one not to fall by more than half /Table 5.20/. Of the younger girls, and the older cohort as a whole, few remain, except of the older girls in Mundal probably connected to jobs in the various central functions located there, or household formation associated with the same source of income.

Table 5.19

Cohort aged 10-19 in 1960; 20-29 in 1970 in Fjærland

	1960	1970	change	% change
Ytre Fjærland	22	10	-12	-54.5
Mundal	33	17	-16	-48.5
Indre Fjærland	38	17	-21	-55.3
Fjærland	93	44	-49	-52.6

Table 5.20
Cohort survival from male and female cohorts
10-14 /1960/ and 15-19 /1960 in Fjærland

	male 10-14		female 10-14		male 15-19		female 15-19	
	1960	1970	1960	1970	1960	1970	1960	1970
Ytre Fjærland	10	7	4	0	3	0	5	3
Mundal	14	8	10	4	3	0	6	5
Indre Fjærland	10	7	8	4	12	5	8	1
Fjærland	34	22	22	8	18	5	19	9

The availability of a definite position to which to return is vital, if those finishing school outside Fjærland are to return. This situation affects the relationships within the household, and gives the young considerable scope for influencing the running of the households to which they return. This applies to the family run businesses in the service sector, as much as to the farms.

Some indication of the attitudes of schoolchildren aged 11-14 can be gained from survey data collected by questionnaire in Fjærland by Arne Selvik in the spring of 1973. In his report /1974/, the results for Fjærland are included as part of Balestrand in part of a longer study. He has made available to me tables to the questions in his questionnaire, to be found as Appendix 5 in his report. The school in Mundal now has children from 7 - 14 years old, after which they go to secondary school in Balestrand for the 8th, 9th and 10th classes; they can then study for two years at a higher secondary school /realskule/, and subsequently at junior college /gymnas/ prior to applying for university entrance. While Table 5.21 shows that the children

Table 5.21

Career aspirations of children in Fjærland (n=26)

5.33) Would you consider being a ...	yes	dk.	no	1. single choice	
				1.0.	%
03 scientist	6	5	10		
04 nursing	6	6	14	1	3.8
06 children nurse				5	18.5
06 teaching	7	8	10		
06 professor				6	23.1
09 teacher	6	8	12		
09 artistic or literary work				1	3.8
10 actor/actress	10	8	8		
10 author	7	17	2		
29 other office work				2	7.7
40 farmer				1	3.8
41 Farm worker	6	6	13		
42 Hunter etc.				1	3.8
61 Deck crew etc.				2	7.7
62 air transport					
62 air hostess	8	3	15		
62 pilot	7	17	2		
64 Road transport	11	3	11	1	3.8
69 Other communication					
71 T.V. reporter	11	3	11		
75 Clothing work				1	3.8
75 Metal boring				3	11.5
76 electrical work	6	2	17		
77 Wood work				2	7.7
77 Carpenter	9	2	14		
79 Skilled building work				1	3.8
87 Machine operator	7	5	13		
90 Civil supervision				2	7.7
90 police officer	8	7	11		
94 Community health work				1	3.8
95 Other service work					
95 advisor on social problems	7	17	2		
missing				1	3.8
				26	100.0

Source: Selvik 1974

could make definite statements as regards their future careers, q.1, there were unclear replies to a further question, q.33 which listed about seventy occupations and asked if they would consider being each of them with a yes, no, or don't know reply. Only the occupations with over six favourable responses are included in Table 5.21, consequently the occupation of farmer, which only four children felt like considering, is not shown in the first three columns.

As Selvik pointed out elsewhere in his report, the careers aspired to are dependent on exposure to them, direct experience of them through relatives, or from aspirations in the family or peer group. In Fjærland the aspirations seem to be widely spread amongst careers, and the occupations are not simply ranked by prestige. There is a well trodden path into the educational world, Fjærland is proud of itself as raising teachers /Tveit 1973, p.33-37/. But the interest in skilled manual work, presumably from boys who were 50 percent /13/ of the total, is significant, and crops up again in the preferences for school subjects, where handwork-craftwork is the most popular, beside English language /question 9 variable FAGBEST/. The majority, 59 percent had fathers who were farmers, and all their mothers were either farmers wives or housewives /question 34, 35, variables FARSYRKE, MORSYRKE/. From a further analysis of compositions with the title "Me in fifteen years time", Selvik estimated that 38 percent /10/ of the replies expressed the wish or expectation of living in or very near Fjærland. 88 percent /23/ of the replies were considered to be realistic, but in their view of the future, only 11 percent /3/ evinced a positive outlook, 27 percent /7/ a negative, pessimistic outlook, and the remaining 62 percent /16/, felt

the future as unclear /Selvik 1974, Appendix 6, variables
EJEMSTED, REALISME, FRAMTID/.

It seems fairly likely that the divergence between the childrens career aspirations, and the possibilities for earning a living in Fjærland at present must lead to a frustration of their desire not to leave their home parish. It could also be commented that these attitudes reflect indirect experience of the world outside Fjærland. Most of the children will not have lived off their parental farms, or outside their households for very long before beginning the 8th class in Balestrand. A point which is not encouraging is the apparent lack of interest in agriculture, which does not bode well for recruitment of successors to Fjærland's farms.

confidence
among the
farmers (parents),
not among the
children.
What motivates
to Fjærland's farms.

The ageing of the population can fairly be attributed to post-school job searching, attempts to satisfy career aspirations which unfortunately can not be met within Fjærland. This virtual evacuation results in an already topheavy age structure becoming still more unbalanced, and probably in the present decade will mean that the population will no longer be able to keep a balance between births and deaths. One feature of the occupational structure is its lack of professionalisation, with many people filling several different work roles, one at least being farmer, or farmer's wife. The careers discussed by the children were professionalised, for people with only one occupation, and these sort of lumpy jobs will be the most difficult to fit into Fjærland. Unless they can find a larger market based on Fjærland, or become attached to a larger centres labour recruitment area, these skills: drivers, carpenters, electricians, metal workers

would not give the satisfaction for which those aspiring to them are looking, nor the income.

IV. Economic Links Between Sectors

a. The farming economy

In the set of accounts for Fjærland for 1973, Tables 5.22 to 5.25, the farm sector is the largest productive sector.

Initially the accounts will simply be described, and an immediate commentary advanced; further conclusions are reserved until the next chapter. Here the accounts will be described entry by entry detailed reference to the sources is made in Appendix /iv/. In general the information was obtained verbally, from manuscript records, or by rule-of-thumb adjustments to these two forms of data. How far the totals are underestimates is unknown, but the accounts in themselves seem to balance adequately.

The largest single item of farm production income is the payment from Sognemeieriet for milk delivered to Vik dairy. The farmers contributions to transport costs kr.39 000,-, and to the kontrollaget and insemination 19 000,- were deducted before payment was made.* The milk price, like other agricultural prices, is agreed with the Government yearly, and reflects the operating costs of the farms, and the need for an acceptable income for farmers. Consequently the prices are subsidised directly, through transport, and subsidies relating to operating costs. In this case it is with Sognemeieriet that the farms deal, and the exact price they receive depends on the operating costs at the dairy. A similar situation holds in relations between the

*A.iv.26

individual forms and Vestlandske Salslag, the ^aslughtering, meat processing and distribution organisation, via the Sogndal slaughterhouse. As cooperatives, the Fjærland farmers control some part of these organisations through their elected representatives, but the election is more nominal than political, and the officers of both cooperatives in fact take care of the interests of their members as they see them, chiefly through mergers, cutting processing costs, and increasing the producer price returned to the farmer.

The dairy does receive the loyalty of the farmers with dairy cattle, in that they despatch all the milk not kept for farm use, for calf feed for example. The slaughterhouse probably receives at best half of the production of meat, since a large amount is killed on the farms for domestic consumption, despite the apparently attractive bargains offered to members, of which some are unfortunately subject to a value added tax. From subsistence consumption of home killed meat, together with potatoes, vegetables, and milk, the farm households reserve their cash incomes for goods which cannot be produced on the farm, restricting cash outgoings as far as possible. The estimate of the income from meat is based on the receipt by Vestlandske Salslag of 11.3 tonnes of sheep and lamb carcasses at an average price of kr.12.50 per kg, and 31.2 tonnes of cattle carcasses at an average price of kr.11.50 per kg /Table 5.10./.*

The best of the farms in Fjærland only deliver the same weight in cattle and sheep for slaughter as would be average for the county as a whole, on 58 accounting farms, that is about two tonnes/Sogn og Fjordane Landbrukselskap 1974, p.66/. In addition, Fjærland farms deliver little pork, pigs are raised

Table 5.22
Farm production income 1973 Fjærland

	1000 kr.	
ilk	1180	
of which subsidy:	470	470
meat	500	
soft fruit	60	
potatoes	50	
Timber/Firewood	30	
Other subsidies:		
Operating subsidy	110	110
Holiday subsidy	40	40
Concentrates	70	70
Winterfed sheep	10	10
Fertiliser	10	10
total	2660	710 = 27%

Table 5.23

Farm operating costs 1973 Fjærland

	100 kr.
Concentrates	640
Fertilisers	140
Fuels	110
Insurance	40
Other costs	20
total	950

more or less exclusively for farm consumption.

Other production income is made up of receipts from soft fruit sales, to A/S Drægni, which here are net of a flat rate transport cost which allows A/S Drægni to use fruit from a quite large area. In addition, sales of potatoes and wood do take place, potato production may be estimated at a little over 300 tonnes, from Table 5.8 180 decares at a yield of around 2 tonnes per decare. Much of this is consumed locally, but as stated before, a quantity are sold to a Bergen trader. The sale of timber has fallen greatly since the closure through failure of a pulp plant at Vadheim; logs from deciduous tress can be sold only for firewood now. Their principal use remains for heating dwellings, the great bulk are simply burnt in Fjærland, but again quantities are still sold to the towns. Fjærland now has mature stands of fir and pine, and planting continues, but most of the felling is for construction work in Fjærland itself.

One feature of the account is that fully 34 percent /710 000,-/ of the production income comes from public funds. The milk subsidy comes through Sgnemeieriet, but ^{most} of the other varieties are paid through the herads-agronomen, who administers them based on regular returns and applications. There are specific rules governing each variety, for example the operating subsidy is only paid when farming income is at least one fifth of the applicant's total income, and only reaches its full rate when farming income is over half the total. The subsidy on concentrates is at a higher rate for smaller farms than larger, and only covers a proportion of total usage. For Fjærland, it only extended to 200 tonnes out of over 600 tonnes purchased

during the year. Other subsidies apply to the capital rather than current account, and are dispensed through the Landbrukselskapet. They apply to land improvement, draining and ditching, silo building for silage, and assistance through other government institutions with loans for new equipment or buildings. The heradsagronom administers the yearly grants and subsidies on behalf of the Landbrukselskapet, and the Department of Agriculture*. As a final note, non-farm incomes to the farm households are considered in the household account.

The farm operating costs shown in Table 5.23 correspond reasonably with those of the average county accounting farms in the annual report of the Landbrukselskapet /1974, p.67/, except that Fjærland costs for building and equipment maintenance and depreciation are not included, and at around 9000,- per farm, at the county average, could range from 150 000,- to 300 000,-, for Fjærland as a whole. In addition, the cost of bought-in stock is unknown, and at a time when the herd proportion of NRF cows has been increasing, this too could be added to the account. All fuels are included, even though some fuel should rather be for household than farm use. The account is dominated by concentrates, about 20 percent supplied through the local cooperative jordbrukslaget, from Vestlandske Kjøpelaget. A further 25 percent comes through the cooperative store in Mundal, through the subregional retail cooperative Samyrkelaget. Of the remainder, at least part comes directly from the large Bergen commercial firm, Rieber and Søn A/S, via an agency held by one of the farmers. The Jordbrukslaget is also in a position to supply fertiliser, machinery and equipment,

and to buy in sheep. The jordbrukslaget is run part-time by a farmer who is actively involved in the Bondelaget, and in the recently established working groups; the amount of work involved is now quite large.

The estimate of fuel costs is based on the sales of the retail samyrkelaget, and on the retail sales of the bus company, who need to keep fuel tanks for their own vehicles. However, people taking vehicles out of Fjærland may well have filled up outside, or brought supplies back in other ways, since freight added about kr. 0.20 per litre to the price within Fjærland. While the high cost of freighting a vehicle out of Fjærland will have limited the use of fuel, agricultural use may well have been greater than this estimate, given that in Bøyum farm units are fragmented, individual fields being widely spread around the central cluster of farm buildings. Insurance premiums on buildings and equipment are about kr. 800,- per farm per year; and other costs ^{are} in soft fruit production. The amount of paid labour used on Fjærland's farms is not great, although labouring does take place. Its omission here is not important since it is in any case a payment from farm production income to the household sector. In general, the agricultural surplus, to meet interest, amortization, taxation, saving, and consumption, estimated for 1973 to be of the order of kr. 110 000,- is conservative, but consistent with Bjelland's estimate of around 22 000 on the average farm in 1971 /1973, p.32/; assuming fourty active farms: 28 000,- per farm, or sixty farms: 18500,- per farm.

Subsidy
710000

b. Household income and expenditure

The amount transferred to the household account of incomes, Table 5.24 from the farm account has already been described. Since the recent reduction of the pension age from 70 to 67 years of age, and increases in pension rates, payments from the social security funds have become the largest single source of cash income. The estimates are made from the accounts of the communal social security office 'Trygdekontoret'*, reduced by the proportion of persons of pensionable age in Fjærland, or for family allowances, by the proportion of persons under 16. Further social security benefits are obtained, for example for travel to Balestrand to the doctors surgery, but as these are tied to a particular use, they are excluded from this account. In relation to pension payments, it is helpful to bear in mind that pensioners in urban areas avail themselves to a much greater extent of the social services, and that rural pensioners probably receive less in cash and services as a consequence of their relative lack of need for housing, help at home, or frequent travel by public transport.

The household incomes from the service sector are rather insecurely estimated, since in the case of family businesses the amount consumed or ploughed back may vary greatly, and an effective division is difficult to make. For the hotel and pensjonat, an amount over 150 000,- was paid for local labour, the remainder is an estimate of household incomes.** The bus company Fjærland Billag L/I had a turnover of 160 000,-; wages of 50000,- were paid to one full-time and three part-time drivers.

Table 5.24
Household incomes 1973 Fjærland

'000 kr.	
Farm surplus	1110
Old age pensions	1100
Family allowances	130
Service sector:	
shops	100
hotel and pensionat	200
post and telegraph	60
bank	40
bus company	50
School	130
Craftwork	60
Road maintenance	130
Interest on savings	230
total	3340

Table 5.25
Household expenditure 1973 Fjærland

'000 kr.	
Retail turnover	1450
Telephone and post	120
Savings	660
Tax	750
Interest to bank	100
subtotal	3080
other expenditure	260
total	3340

The Billag receives about 30 000,- from the commune for transport of children to school but unlike other larger companies in the country as a whole, is not in receipt of government subsidy to any great extent. This is because the profit on tourist routes during the summer covers the bulk of operating costs. The load factor is very high in the summer, and it has been possible to purchase used equipment in a good condition with which to expand the capacity; necessarily most of this capacity stands idle for ten months of the year. The local purchases of the service sector from the farms are few, perhaps 5000,- worth of vegetables for hotel and pensjonat catering. *but the commune is remunerated for the sale up to 80%*

The teachers at Mundal school are paid by the commune, as are those farmers and others who work part-time on road maintenance. The amount paid for road maintenance also includes allowance for the use of machinery, and fuel, so that the actual flow to households is less.* The income from craftwork is very much a guess, the shoe factory produces only 3000 pairs yearly now, since marketing the shoes has become nearly impossible, traders demanding such margins that the profitability of the small factory has been destroyed. It had produced 12 000 pairs, employing six men part time, but now operates sporadically, run by two men part time, and by its owner. He is very sure that the low level of activity is not because his prices are too high, but because in order to get the shoes distributed he has to sacrifice so much to middle mens' margins. From craft weaving, a traditional activity in most farmhouses, the return is unknown since much weaving is done for members of the family, but the purchase of wool for weaving at the two Fjærland shops alone amounted to nearly 40 000,-. Again, outside sale is obstructed by lack of

of appropriate means of distribution, but much is sold to tourists through the shops, and through kiosks at both glaciers where the tourist bus routes terminate. In themselves, the kiosks probably yield about 5000,- ^{kr.} but it is very dependent on the varying strength of the tourist trade from season to season.

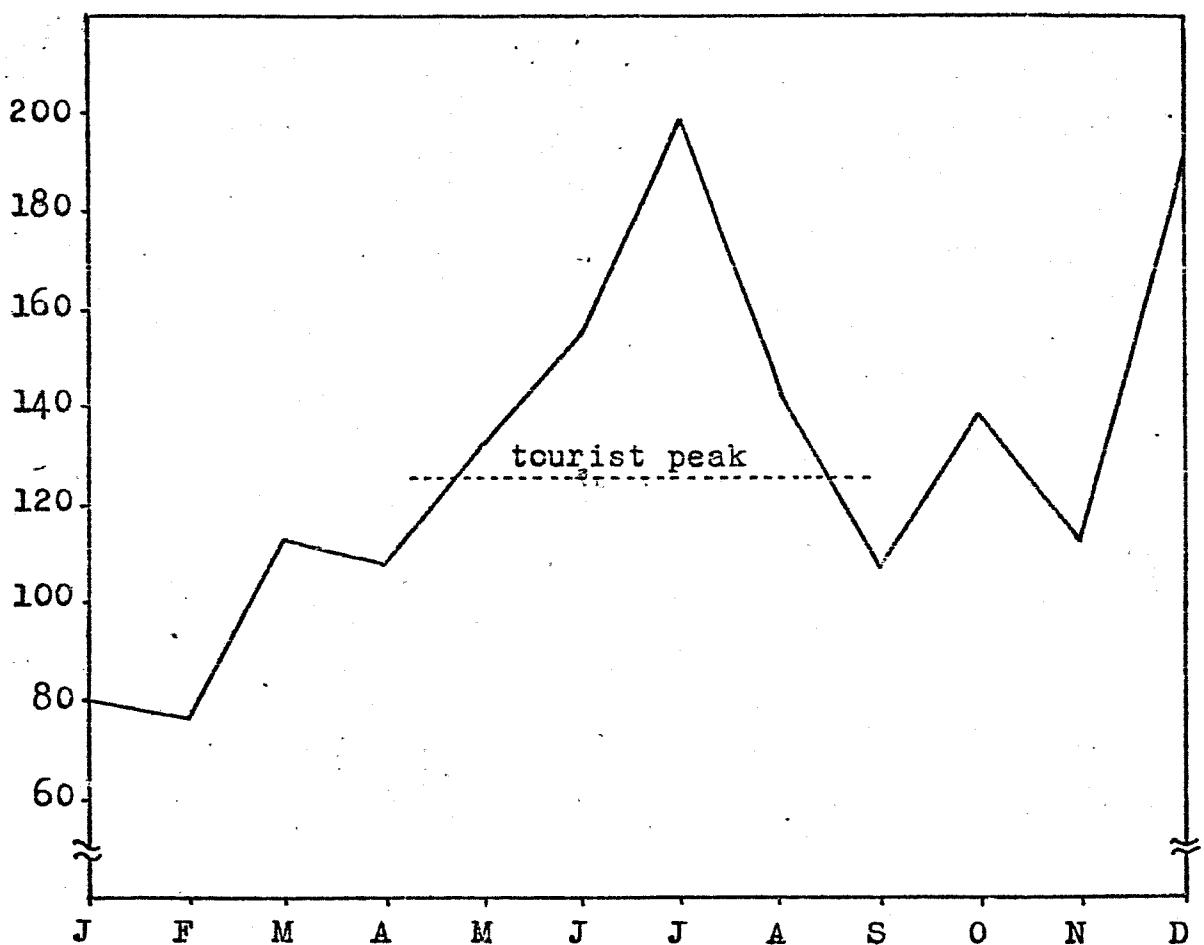
In both this account, and the household expenditure account, Table 5.25, the loans from the Fjærland Privatbank L/L and amortization to it are not included. However, interest paid by the bank to depositors is attributed in full to Fjærland's household income, because there are few outside depositors, and the lack of distinct separation between household and business economies in Fjærland would make it difficult to ascertain a reasonable amount to deduct for interest on business deposits. In the expenditure account, the bank's receipt of 330 000,- in interest payments is reduced first by half, to allow for funds deposited in other banks, held in stocks, and held by the government, and by a further third to exclude interest paid on loans made to borrowers not resident in Fjærland. In fact during 1973, the bank ceased to exist independently, and has become a branch of Vestlands-banken A/S. *

In the expenditure attributable to the retail turnover of the shops in Mundal, 100 000,- has been deducted as caused by tourist spending, although tourist spending may have been as high as 150 000,- depending on how much residents are assumed to spend in the summer months. ** The effect of tourist spending is shown in Figure 5.2; the effect is in fact small compared to other areas, particularly where passing traffic calls. The expenditure on telephone and postal services is based on the

* A.iv.18 ** A.iv.34

5.2 Retail turnover by month in Fjærland 1973

'000 kr.



average telephone charges in the Lærdal exchange region, 1320,- per subscriber, in Balestrand commune the average inhabitant bought kr.135,- worth of stamps in 1972 /NOS A 640, p.141/.* Savings are taken as the increase in deposits in the bank over the year, naturally, deposits exist in other financial institutions, notably the post office giro, Balestrand savings bank, and various large commercial banks. The increase must chiefly be attributed to local depositors, but in fact includes both household savings, and increases in businesses cash holdings. Taxation for 1972 is used in the absence of 1973 information; the whole amount goes to the commune, which transfers about 45 percent to the state. In addition, an employers national insurance contribution of 80000,- was made half from the hotel, and rest from other commercial and service sector workplaces.

The remainder of unattributed expenditure is not large, and could in reality be several times bigger. It covers inaccuracies in other calculations, as well as the possible conservatism of the estimate of total household income. It is spent on transport outside Fjærland, and purchases made during stays outside Fjærland. The passenger receipts on the boat route to Balestrand are distorted by the tourist traffic, but if these are added to the costs of shipping vehicles into and out of Fjærland, probably about 150000,- is spent outside Fjærland in consumption of goods and services. A further cost not included here is electricity, which would absorb another slice of the unattributed expenditure.

From Table 5.26 one can see that the estimate of gross household income is about kr.250 000 larger than the recorded income net of allowances for 1973. Rule of thumb reckoning would

estimate the allowances claimed at about this sum, so that the general outline of the accounts for the community given above may be relied on as acceptably accurate.

Table 5.26

Declared income in Fjærland /net of allowances for life insurance, loans, travel expenses, dependents, etc. 1970-73 kr.

1970	2283700
1971	2441000
1972	2856100
1973	3099700

Source : Sogn og Fjordane Landbrukselskap; Balestrand Likningskontoret*

c. The expansion of job opportunities

The circulation of income in Fjærland relates to payments between sectors within the unit, and most of the account entries simply describe payments from distant sources, or to distant recipients. The retail shops are the main point of articulation at present, but the prospects for new jobs are poor, since the demand is falling from population decline, and commercial thresholds are rising. Secondary points occur around agriculture, chiefly in the supply of production goods, for example concentration in the maintenance of machinery, based on the old diary building where the vehicles of the bus company will also be serviced, and in construction for the farming sector. While there has not been much demand for skilled craftsmen, carpenters, masons, or electricians, over the past years, an increase in building activity on the farms would be a useful source of part-time income. At present there is a shortage of the required skills,

* A.iv.36

and it would be necessary for some craftsmen to move to Fjærland, most likely Fjærlanders who had left when younger. If much construction was to take place, the extension of operations at the sawmill, and in the quarrying of stone, the digging of stone chips of concrete quality from moraines would become possible. The fewer components bought in, the greater would become the income circulation within Fjærland.

However, the career aspirations of the schoolchildren may very possibly not incline themselves to such a future, of operating a small farm part-time, and working on small construction projects locally for the bulk of their cash income. In the case that the construction work was executed by non resident workers, or contractors, the work would be likely not only to cost more, but would not leave any lasting benefit, other than the buildings themselves. Even if resident workers were engaged, the completion of a wave of new building would be unfortunate in terminating the sources of cash income for those involved. These farm building craftsmen would still have the difficulty of access to a larger demand for their skills.

Tourism does create a useful contribution to the income stream, not only for the families owning tourist businesses, but also for others, mostly young people and farm and house wives who are able to gain a cash income in the summer months from part-time work. It contributes to the bus company as well, although in doing so excludes the company from government subsidies. One could make out a case for an official attitude to remote places like Fjærland which sanctioned loans or loan guarantees balanced against the savings made by the community from such resources as the tourist traffic, and from the lower demands made on social

services. Availability of government finance to agriculture is virtually unstinted, and DUF assistance may be had in the tourist sector, but these are very client oriented. A project like a collective cold store, which could permit extended market garden and soft fruit production, as well as expanded consumption of local products in tourist catering, is at present difficult to finance. The loan system, like the income system, is very segmented, and projects aimed at more than one segment of economic activity in Fjærland, which are the ones with income creating capacity, are those for which, by and large, financial backing would be least forthcoming.

V. The Road Question

a. The road as civil engineering

Among other roads discussed in relation to the implementation of Norway's national road plan in the county has been the one linking Indre Sogn with Sunnfjord and the county northwards; the county has been split into two by the poor access from north and west to the south east. The existing route Riksveg /Rv./ 5 over Gularfjell is closed for about four months in the winter and until Rv. 13 was opened through to Kongsnes, with a state car ferry to Mordeide, traffic between Ytre and Indre Sogn went by the daily Bergen steamer from Høyanger to Balestrand. In winter the route used is Rv.13 to Kongsnes, c.50 minutes ferry journey plus waiting time, Rv.13 to Vadheim, and eventually Rv. 14 northwards. The Ytre Sogn subregion is perhaps the area most at risk in the county as a whole, and prospects for aluminium

*Refer to
fig. 1*

fabrication from the Ardal and Sunndal Verk plant in Høyanger would be improved by better communications eastwards. The need to extend the market area, or accessibility area, for Førde is pressing, especially for such services as the central hospital. Indre Sogn certainly needs better contact with the rest of the county, not least for the county administrative offices located at Hermansverk.

The routes which have been examined are the existing Gaula-fjell route, a tunnel linking Høyanger and Kongsnes, and two lines through Fjærland. Originally favoured was the fjord line, running either down the west side of the fjord to Menes, or down the east side to Hella, and northwards through a tunnel to Lunde and joining Rv.14 at Skei. Subsequently the direct Sogndal - Fjærland - Skei route has become more attractive chiefly for its greater security from avalanche, stonefall, and other exposedness. Costing of the routes and their specific alternative lines had been made according to the following road design criteria:

Full standard II d

6 m. surfaced width

0.5 m. shoulder

9% maximum gradient /c. 1 in 11/

100 m. minimum radius

10 tonnes axle loading /16 t. for multiple axles/

Adequate standard B II d

6 m. surfaced width

9.5% maximum gradient /c. 1 in 10/

8 tonnes axle loading /12 t. for multiple axles/.

Taking three points into consideration, time, road standard, and development needs, one may evaluate the alternatives. Such

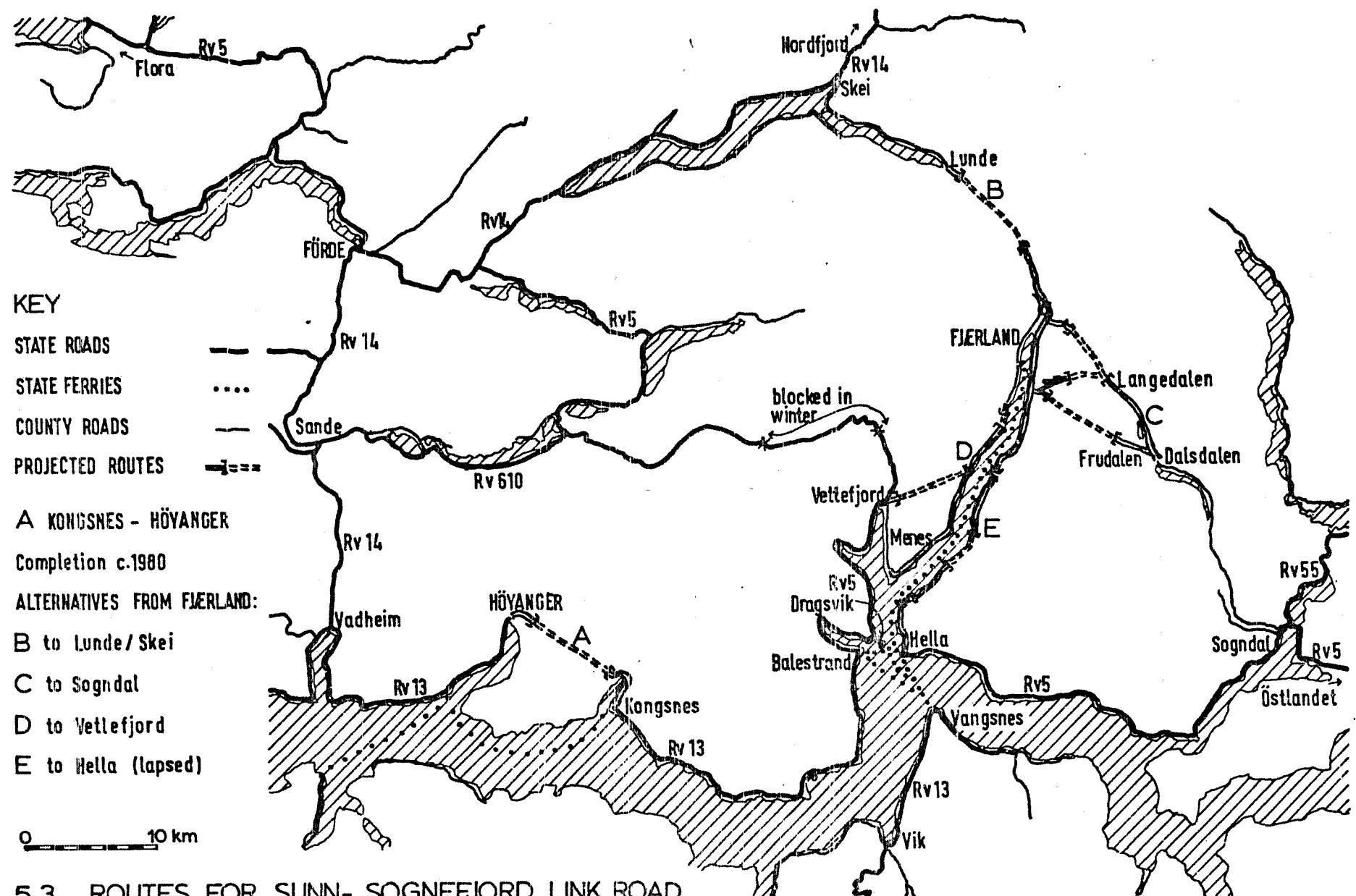
an evaluation has been made by the county road administration, Vegkontoret, but the conclusions have not yet been implemented /1972/. The Gaularfjell route could be opened for year round use quickly, followed successively by improvements along the rest of the line, shortening it, but only reaching full standard in the plan period 1981-90. In terms of traffic handling, the road would be more of a hindrance than a help during construction, and has at present been dropped from further consideration.

The route across the Hella - Dragsvik ferry and westwards through Høyanger may be completed much sooner. The coast roads are of mixed standard at present, but could accept the traffic, with the Gaularfjell route still available for the summer peak. Although the distance from Dragsvik to Førde would be some 25 km. greater than over Gaularfjell, the flat nature of the route would make journey times equivalent. The 7.3 km tunnel and associated works between Kongsnes and Høyanger could be finished in 1979-81, within the funds already assigned, costing kr. 68 million.

The route through Fjærland is not seen particularly as a means to secure the existence of the village from the civil engineering point of view. It is a good engineers line, given the lie of the land, and the routes to the north west traditionally have led through Fjærland over to Jølster. That Fjærland remains without a road had been accommodated as a minor issue in the general discussion about the relevant priorities for these projects. From May 1974 the opening of the State car ferry between Mundal and Hella - Dragsvik has had the effect of reducing the vehicle shipment cost from some 43,- ^{kr.} to about 15,- per car, and easing milk and livestock handling somewhat, cutting

out transhipment by ship's winch. The journey time has also been reduced to 70 minutes, and the need for booking freight space in advance removed. The fjord line, from either Menes, or Hella, is the older of the two through Fjærland, as early as 1928 a road from Hella - Eitorn along the east side was considered after a railway project on the same line had proved abortive. The west side was first investigated in 1940, and proposed in the county council in 1960. / Vegkontoret 1972, p.14-15/.

The east side has since 1963 been the subject of repeated investigations, costings, proposals, and decisions by all levels of officialdom, in consideration of the route Hella - Fjærland - Skei. The 1967 estimate was kr.67.2 million, raised in 1970 to 85.8 million, with Hella - Stølaholmen costing 38 million. The total was almost doubled to kr 150 million as a result of further surveys, especially of the avalanche risk on the fjord side, where most gullies in the 1200 - 1600 m. high walls are named "Skreda" - avalanche. Based on further calculations, the works Hella - Grandane /tunnel mouth/ are assessed at 1972 prices to cost kr.108 million at full standard IIId. This would also achieve a ferry-free route between the two main subregions, and with Nordfjord. But for the same cost, and resulting in only slightly worse road standards, namely gradients, the alternative route Sogndal - Fjærland - Skei could be adopted, greatly shortening the road distance between Sogndal and Førde or Sandane, but at the cost of an extra summit, in the tunnel to be cut from Langedalen or Frudalen to Horpedalen or Berge. The Vegkontoret preferred the line from Langedalen to Horpedalen, but detailed survey of geological conditions might cause them to alter this /1972, p.36/. The road distance to Sogndal from



Fjærland would be then 36 km. and to Førde 79 km.

The programme proposed by the Vegkontoret is as follows:

/1972, p.42/

1. Høyanger - Kongsnes
full standard IIId
kr. 63 million, ready 1978-80;
2. Fjærland - Skei
full standard IIId in tunnel, IIa elsewhere, no ventilation
kr. 38 million, ready 1983-85;
3. Dragsvik - Høyanger - Vadheim
adequate standard B IIId on existing roads
kr. 35 million, ready 1986-88;
4. Sogndal - Fjærland - Skei
full standard IIId
kr. 154 million, ready c.2000.

This judgement reflects the development needs of the county as a whole, by first providing the last link in the low level route, and a good link for Høyanger to the east, and then a road for Fjærland, which when linked to the state car ferry to Hella - Dragsvik would provide another through route, as well as satisfying the Fjærlanders demands. Since the Vegkontoret expressed these priorities, the government had not made any very clear statement of intent. Government decision is necessary to secure the release of funds, or their allocation for the next period. Loan guarantees to permit earlier commencement of work based on loans would be given, the interest on which might be met from toll revenue. In March 1973 the county council voted 15 votes to 14 in favour of the Høyanger tunnel, but as the casting vote was that of the Jølster commune leader, and most of his commune backed the Fjærland line, the situation remained unclear.

In May 1974, the Transport Department in Oslo made revised proposals on the basis of the voting in the Fylkesting, and from the Labour Party Government's interest in securing a road eastward from Høyanger. Stortings Melding nr.104 /1973-74/ states clearly that the government considered it most important to reach a rapid solution of the problem, and consequently chose the tunnel Kongsnes - Høyanger, for the same reasons as those advanced by the Sogn og Fjordane Vegkontoret. In addition, it is stated that any line through Fjærland will not give a satisfactory solution for the village before Fjærland is linked with Rv.5 and with the communal centre, Balestrand. This peculiar view was echoed by the Minister of Transport in speech in Høyanger on 9th February 1975 /Sogn Dagblad 10 Feb. 1975/ ; peculiar in that the demand from the people in Fjærland has been for exactly what she regards as a partial solution. Her speech was made to elaborate the points in a new Stortings melding published on 7th February 1975, in which the building of a road to Fjærland is discussed.

" In St.Meld.nr 104 /1973-74/ the Sognefjord line was chose as the link road between Sogn and Sunnfjord. This means that Fjærland will not get its road as a part of the link road Sogn - Sunnfjord. The only connection Fjærland has has today is the car ferry Fjærland - Nella, which during 7 1/2 months operation in 1974 had a kr. 600 000 deficit and which is budgetted to incur a deficit of kr. 900 000 in 1975. It is the opinion of the Department that Fjærland ought to be connected to the road network by a local road. This is demanded by the size and location of the village. This can happen by means of a tunnel from Fjærland to Lunde in Jølster commune, or a road along the west side of Fjærlandsfjord to Balestrand, the communal centre or a tunnel and road to Selseng in Sogndal commune. These two latter lines link Fjærland to other villages in Sogn. A road along the west side of Fjærlandsfjord would link the community directly to the communal centre in Balestrand. Before the choice of a line can be made, a number of technical questions need clarification, amongst them the costs. The Department intends to obtain this clarification as soon as possible, and after that to hear the

Gulvind!

2000 ncr. per habitant
per year!

(taxes from Fjærland to
government for less
than that)

considerations of the County and the Commune about the possible alternatives.

The case will then be laid before Storting for the necessary decision. It is understood that the road will be built as a riksveg, partly because the present car ferry forms a riksveg connection. If the necessary preparations and planning of details occurs so rapidly that it is possible to begin work in 1977, the Department at that time will seek to solve the question of financing in that year. For 1978 and subsequent years, allocations to the project will be considered in connection with the next revision of the Norwegian Road Plan. The use of regional development transport funds will also be considered" /Bergens Tidende 8 Feb 1975. *

The immediate reaction of the Fylkesutvalet, the central committee of the Fylkesting, was to welcome the proposal, linked as it was to concrete promises of funds for Kongnes - Høyanger, and the main Oslo - Bergen road through Aurland commune. The Fylkesutvalet, the head administrators of the communes Vagsoy, Gloppe, Naustdal, Leikanger and Luster, voiced the opinion that the consideration of the three alternative lines was unnecessary and that preparations should begin immediately for building the tunnel northwards into Jølster. In an interview in Bergens Tidende the day after publication, the chairman of the Road Committee in Fjærland voiced the same opinion, that the community had already made its view plain about wanting the tunnel to Jølster.

b. The road as Fjærland's future

At least since the awakening of hopes that Fjærland might find itself located on a main through route in 1963, the road has been the central political issue. Although to outsiders the acquisition of a link to the road network would seem to be the main objective, this is not simply so. Consciousness of the

loss of the younger people is widespread, and many feel that the chances, for instance, for the children to take over after them would be raised if the road were built. Without the road, and the road soon, any will to invest becomes weakened by the apparent senselessness of investing in a condemned community. It is worth citing several passages from Tveit's survey of opinion /1975/ , which correspond fairly closely with my own experience. From the hotel owner:

"But if Fjærland is to flower, we must get to a place with jobs, a place with motor and agricultural services. So it's clear that we've got to get to Sogndal or rather Førde. It's because of this that we've fought so hard for the tunnel" /p.92-93/. ^{*}

From an influential farmer:

"What characterises Fjærland nowadays is resignation. People have lost heart. They doubt their own future, and this doubting drains away their energy" /p.86/. ^{**}

The son of the pensionat owner replied thus to the question: do you think the road will come ?

"Yes. But there's the question of us getting it in time. In the next ten years we'll have a change of generations in Fjærland, and if the road doesn't come, there'll be many of the young ones who won't have farms. That isn't so bad, perhaps, someone or other will always have the farms. It's worse with the others who live here - seamen and handworkers and people who take occasional jobs - their successors won't settle. We've hardly one single handworker left under sixty. The girls leave as fast as they're confirmed. When we concentrate on the tunnel, and try to get it finished before time, it's so that the community here will survive... Without the road, we have lost, and are doomed. That's what almost everyone thinks" /p.79-80/. ^{***}

There are three areas in which a road would be important: in providing door to door transport for economic activity in Fjærland, in permitting daily commuting to work outside, being part of a larger labour market, and enabling access to outside

^{*}A.i.10 ^{**}A.i.11 ^{***}A.i.12

Leisure of
people?

services, particularly medical. Road transport would cut out break of bulk in deliveries from and to the farms, which with large herds, hence high milk production, and high concentrate consumption per farmer at present means manual handling of very heavy loads. Farm milk tanks would become practical, as would normal farm collection of animals for slaughter. These two are difficult using the road ferry, since the vehicles visiting Fjærland would be trapped by the timetable for much longer than might actually be required. The road ferry is a very blunt instrument in relation to the communication needs of the farms, but does help greatly. The hopes of people hinge rather on joining the labour market of a larger centre, to which commuting might be possible. Then the skilled craft workers might be able to settle in Fjærland while still finding enough work to do outside, or the son of the farm could settle before taking over the actual running of the farm, and be supported from outside. Access to services would be valuable, allowing children attending school a chance to get home, at least for longer weekends, and for everyone to get to the doctor when necessary.

With these considerations in mind, the Fjærlanders have lobbied hard on behalf of their road. The case has often been raised during debates on the National Road Plan in the Storting, and individual people have become well known in national terms for their work. A delegation had met the Prime Minister, and the question has been canvassed round the members of Stortinget very thoroughly. National press and television attention has been attracted, partly by ultimata that should the commencement of the road not be decreed, Fjærland will go to action, although the programme for action is unclear. A limited company A/S

Fjærlandstunnelen was formed on 11th September 1971; its aim "is, with the help of toll income, to take part in the construction and operation of a tunnel between Fjærland and Skei i Jølster /Tveit 1973, p.59/. Within a few days, over half a million kroner had been subscribed to the company. The company has received offers from a large contractor to begin work on the tunnel, at a cost less than that estimated by Vegkontoret, some kr.28 million for the tunnel, and kr.7.5 million for supporting link roads. The company proposes to borrow the money commercially, and to pay the interest from the toll revenue. The Vegkontoret reckoned that the toll revenue would reach about one third of the interest charges, on a 30 percent larger capital sum /1972, p.40/.

The aim of the company is not the private ownership of the tunnel, but simply its earlier construction, the capital sum being repaid from the road-budget at the appropriate time. The Vegkontoret itself suggested a similar arrangement in case funds were unavailable for the immediate construction of the Kongsnes - Høyanger tunnel /1972, p.29/. In both cases, the loan would need guaranteeing by the government. The toll on the tunnel added to the ferry fare, would discourage some traffic, especially from Sunnfjord, and it would make the achievement of the main points essential to the community very difficult, especially commuting, unless special treatment was given to local residents, for example, shareholders in the company. The officers of the company were people who had been organising the campaign of pressure and were drawn from those leaders of the community active in business with strong outside contacts.

Following the latest developments, opinion in Fjærland was mixed: there was pleasure that funds were to be allocated to the

road, but also irritation that the authorities in Oslo had seen fit to reopen the question of the line of the road. People had still hoped that the road linking Sogn and Sunnfjord would be built at once through Fjærland, and those hopes are now seen to be dashed finally. The option towards Balestrand would rule out any future hopes of a main road, but the other two opinions would leave open the possibility of building the road right through from Sogn to Skei in Jølster. If the car ferry to Hella and Balestrand is kept in operation, the option northwards would be a very attractive through route for traffic from Nord - and Sunnfjord, even though the tunnel might only be cut to single track width. One can imagine that the preference of the authorities in Oslo is for a simple local road linking Fjærland to its communal centre, Balestrand. In terms of the advantages sought by the Fjærlanders, this would hardly represent any improvement over their existing car ferry.

6. CONCLUSION

I The Community

- a. The course of development viewed theoretically
- b. Current events
- c. Prognoses

II The County

- a. The labour market
- b. Economic policy
- c. Development and Sogn og Fjordane

III Summarised Conclusions

I. The Community

a. The course of development viewed theoretically

One may argue that Fjærland has arrived at its present condition in the following way. From its resettlement down to the nineteenth century Fjærland remains unknown, living from its grain and livestock, and trading in horses over the passes. In the third quarter of the nineteenth century we know that dairy products and timber were traded, and that the amount of labour used in cultivation and herding was relatively large; the type of production and the number of husmenn and servants tell us this. While the public leadership of Balestrand Commune was undertaken by the redoubtable priest Sverdrup, Fjærland had no local political form, hence no bank or communal enterprises. The social organisation of production was based upon a range of family farms, some of them very large, and these were by the turn of the century employing much labour. The labourers were husmenn, obliged to work in periods of high labour demand by custom, and landless labourers otherwise working as carpenters, masons, and in other trades. The appearance of these individuals signals the point at which the largest farms became fully committed to the market. Until this time production was planned to match actual demand, of farm family members, for taxation, for the church, and for especial family commitments. From this time production on the larger farms was planned through the market; the needs of the farm family for education, travel, or capital investment were increasingly being met through the market.

These changes in production organisation were reflected in, and furthered by the projects adopted by the then existing

leadership within the community. While the changes were conceived of as being in the interests of the community, their adoption was hastened by the high standing of the individuals who advocated them. It is likely that the record of adoption of innovations by certain larger farm families would reflect favourably upon their standing. The question of the emergence of leadership within the community is unsettled, but it is reasonable to suppose that an ambassadorial function has always been part of the role of a leader. In this way, men of learning, and men with firm contacts in the external administrative framework would come to make up the leadership. One may suggest that to the community the ambassador has been in the past a man going forth to parley with equals.

Although, as has been proposed above in Chapter 5, the conditions and earnings of the husmenn and village poor in Fjærland were adequate, to the extent that many could save to travel to America, the great difference in wealth between them and the freeholder farmers does not need stressing. This does not mean that the freeholders were homogeneous, they were divided by the size and location of their farms and their wealth. While the farms were largely independent of the market, there was little interaction between them, they did form closed units. Labour was readily exchanged, and the development of economic interaction was fostered by wider employment on the farms. The economic base which the farm production constituted gave the baker, tailors, shopmen, shoemakers, carpenters, masons and others their living. Under the guidance of the leadership, the economic strength of the farms was led into the establishment of the dairies, the electricity station, and the bank. The larger farms built spacious and immensely solid

operating structures based on their previous capital accumulation, a thriftiness symbolised by the new bank. It must be commented that tourist payments were a contribution to this accumulation.

While one can propose that the accumulation of capital was a result of the application upon Fjærland's resources in the period around the turn of the century, by the time of the crisis in the 1930's, most of the non-familial labour had left. The investments were to some extent a substitution of capital for labour, in the sense that it was once again family labour that was involved in producing the means of subsistence on the larger farms. The institutions introduced by the community leadership may be assumed to have directed the pattern of production for the market, and the pattern of saving; incidentally, Fjærland Privatbank is the only bank in Indre Sogn to have displayed a negative loan-leak index result for 1933 /Chapter 3, Table 3.11/. Two influences may have shaken the self-confidence evident on the faces of the men establishing the Bank portrayed in Laberg /1934, p.236/. One is the market crisis: it was clear that the self-sufficiency of the farms which made up the economic strength of the community had been surrendered. The other is the open affirmation by community members of opposing political creeds, especially support for the then revolutionary Labour Party among the farm labourers /Tveit 1973, p.81-3/

b. Current events

After three decades of relative stagnation in the community, certain forces begin to become apparent. In the social formation of the settlement, the most striking feature is the

renewed outward flow of migrants. Former migrants, husmenn, servants, could have worked in occupations then existing in Fjærland, but present migrants leave because they cannot reconcile their social and career aspirations with continued residence in the place of their birth. This is not to deny that many either stay or return, they take up the farms or enterprises of their families. However, many, the seamen, hand-workers, and craftsmen have no such inheritance to bequeath to their successors. Between 1960 and 1970 the farms became increasingly extensive in operation, except for the few which adopted soft fruit cultivation during the decade. Although the introduction of the new breed of N.R.F. cattle was relatively late, and the use of concentrates as feedstuff increased only slowly, they have now reached most active holdings. As indicated in Tables 5.22 and 5.23, the production income and expenditure is now largely directed to places and institutions outside Fjærland.

During a long period, the opportunities for the exercise of control within the community were eroded. The institutions established by the leadership at the beginning of the century were subsumed into larger unit, they were rationalised. The dairy was amalgamated with Vik dairy and operations in Fjærland gradually ceased. With the cessation there fell away the relevance of the meetings of the dairy co-operative members. Local control through the local leadership of local operations became supplanted by representation by individual community leaders in the governing of larger units. The electricity plant also closed after links to the regional grid were constructed. The bank has passed into the larger Bergen bank, Vestlandsbanken. While the other community organisations have continued active,

the missionary associations, sports club, Farmers' Union, this atrophy of the economic expressions of the community's self-reliance must be considered serious. Not only did it reflect the subsumption of the farms into an external economy already accomplished, but it also removed a traditional forum in which it was acceptable to voice the values of the community and from which leaders could be drawn.

Two initiatives have been made in Fjærland in recent years, the campaign for the road, and the approach to the authorities to obtain assistance in improving agriculture. Instead of these initiatives having the appearance of strengthening Fjærland's self-sufficiency, like the bank or the dairy, they are openly supplicatory. In the case of the road, the incorporation of A/S Fjærlandstunnelen is not a serious attempt to build the tunnel by the community's leadership, it is more of a standard behind which to marshall the campaign, and also provides useful publicity. In the end the community has few cards in its hand worth holding; the authorities can dispose their road investments almost at will. The supplication of the Fjærland leadership is received at the same moment as requests from all sorts of other interests and professional opinions of varying calibre. Nevertheless, the leadership has remained intact, passing above the changes which have occurred in the community, and contributing its efforts generously from deep personal commitment.

The economic initiative to draw up a production plan for farming has proceeded faster in the last year than had been expected. The enthusiasm of certain individuals, for example the soft-fruit growers, and one farmer who immediately began to build a new farm building, seems to have infected many others. The completion of the Grunska regulation in 1974 was the first

positive sign, and it has fortunately been followed by the approval by the authorities of extraordinary assistance to hasten the other regulation and drainage works. It now depends upon the farmers themselves to secure the outcome they desire from the upgrading of the resources available to them. The ability of Fjærland to support a number of farms providing a satisfactory income for their farm families will be assured, and the problem of succession to these family farms will be lessened. Even the relatively small farms will be able to support a family, through concentration on soft fruit and sheep. This initiative bears the mark of the traditional leadership to a much smaller degree than the road campaign; their role has tended to be a neutral one, and the running has been made by others, not least agricultural advisors from outside Fjaerland.

c. Prognoses

Viewed theoretically, the course of development in Fjaerland has been sketched in this way. The family farms of the nineteenth century began to use larger amounts of the labour of people not members of the farm family. This led to a system of husmenn and landless labourers, and became elaborated to include a large number of craftsmen and tradesmen serving the local demand. During this period certain farms changed from general dependence on subsistence to general dependence on the market as a means of financing their activities. In addition, quite large capital sums were accumulated. The then leadership exercised its authority to promote the development of the community by establishing institutions articulating the economy. The institutions efficiently articulated the links between

Fjærland's farms and the external world, the market, and the financial institutions. Some articulation of internal links was achieved by the retail traders and craftsmen, but this has had relatively little lasting impact. The leadership at that time could do no other than it did, as well as serving its own interests it was consciously setting out to serve Fjærland's interests by setting up the formal mechanisms by which Fjærland's production economy was segmentally joined to that of the world outside Fjærland.

In the same way, the improvement of the farms and the road campaign have been unavoidable. The local demand for most services and crafts has fallen away with the closure of community economic ventures, the dairy, and the shoe factory, and with the fall in population. The farms can survive once modernised, but the activity that was contingent upon local demand will fall away with the failure and dispersal of that demand. The main component of local demand has always been the farms, and the farm households. It is at this point that the income to be generated in the modernisation of the farms becomes important. Should the road be completed swiftly, a road to Sogndal or Førde, it would be possible for younger people to join those larger labour markets, to reconcile their social or occupational preferences with their desire to live in Fjærland.

The least hopeful prognosis is to see Fjærland as the location of a number of farming enterprises, supporting their farm families, and being serviced almost exclusively from without, and including tourist enterprises. This could occur despite the construction of the road, and given the directions of present change this is the most likely outcome. It is very optimistic to see Fjærland as more than a very remote part

of the labour market of either Sogndal or Førde. An alternative is for conscious plans to be laid for the more active circulation of incomes within the community, either using the economic base provided by the farms, or from some separate enterprise. In such plans the road could be crucial: for example Fjærland would be central in the county if the complete Sogndal-Fjærland-Førde road was constructed. On the other hand, the road, and already even the ferry, entails the installation of farm milk tanks and silos for concentrates, which will tend to split off the smaller producers who cannot afford these. The problem of providing diversified occupational opportunities would not necessarily be solved even by these proposals. Whether they can be solved in the sub-regional centre of the county is a separate question. The most optimistic but least likely prognosis is that family establishment will occur in Fjærland based on jobs elsewhere in the county within commuting distance. The forces acting against this are many, not least the impediments to travel faced both by working and non-working household members. If the most likely prognosis turns out to be in correspondence with reality, Fjærland could look forward to continued population decline until a point was reached where the inhabitants balanced the resources of the community, at the externally given level of technology current in agriculture. It is a matter for speculation whether this would provide the demand necessary to support the current level of service provision.

II. The County

a. The labour market

From the analysis of the information from the Agricultural and Population censuses contained in Chapter 4 above, the conclusions drawn from the study of Fjærland may be generalised. The demand for work and services will vary depending on the future location of settlement. If the marginal areas, taken as the first, second and third strata, are simply to consist of full-time farms, the overall level of demand on communal and sub-regional centres will not grow rapidly, if at all. The ability of centres within the county to service the needs of the farms for specialist equipment and expertise will be taxed: for example the purchases of farm building components from companies in Bergen. In addition, the centres may experience difficulties in absorbing the inflow of people seeking work. The smaller communal centres like Balestrand or Lærdal have proved unable to attract enough potential family formers. In the more successful centres the expansion of local administration and education has provided many jobs in itself. Moreover, the construction of new buildings has enlarged the market for building labour and for contractors, and these extra sources of income have in turn raised the demand for goods and services in these centres.

At the time of the last census and presumably still, the greatest movement into these centres was of schoolchildren and students. It is generally accepted as right that no matter in which part of the country a child lives, he or she ought to

have equal access to opportunities for self-advancement through education. Education has been championed especially in the more remote areas as an honourable way of life. There is a difficult relationship between the education open to the children of the county, the career aspirations they develop, and the structure of occupational opportunities in the county. It seems that the schools cannot avoid socialising their pupils into an expectation of pursuing definite careers. The feature which marks out the marginal areas is that the typical occupations are not "careers" and probably can only socialise their participants by actual involvement in the work done in those communities. It seems also that pupils determined to follow a career of prestige must leave their homes to travel to a place where the necessary qualifications are dispensed. Those who are not strongly motivated to pursue a career seem to have settled simply in the sub-regional centres, and to have settled very soon after leaving full-time education. These observations are of a speculative nature, and the motivations of the young people of the county towards careers, residence, and other matters of importance for their future would be an important field for careful investigation.

If one speculates that the residential population of the marginal areas is to be bolstered by commuting, there are two problems which deserve close attention. Elden /1975/ and Svingum /1974/ have pointed to the consequences for the immobile sections of the population of a substantial travel barrier separating residence and central services. The sections of the population chiefly affected are the elderly and infirm, housewives and young children. As one can see from Tables 3.14; 3.17, and 3.18, the male workforce commutes much longer

distances at present. While there is a great demand from women for work, the only work available has tended to be poorly paid and very often a waste of training which could be put to more effective use. These two problems, of general immobility, and of the virtual denial of the right to work of women which follows from this, are not insoluble. On the basis of the actual demand for work, it is now necessary to examine the supply.

b. Economic policy

Economic policy outside agriculture has been directed towards the provision of industrial jobs, and to the expansion of tertiary employment consequent upon this. In Chapter 3, section III it was suggested that the labour mobilised in construction projects had taken advantage of the high wages offered in the metallurgical industry to settle in places where these jobs had been made available. Now that recruitment to these plants has ceased because of rationalisation, it seems that this range of heavy and often skilled industrial jobs is now closed in the county for new entrants to the labour force. Other industrial jobs are restricted is sector to food processing, shipbuilding and some engineering, wood processing and furniture, and textiles and clothing. All of these sectors are exposed to the erosion of their competitive positions *and other increases labour in urban areas* during the period of increased oil earnings which is now beginning. In addition, the newer industries moving to take advantage of development area policies have tended to be highly rationalised, offering mostly semi-skilled work, and they are

often monopoly employers in their sector within a given labour market. Their impact on tertiary employment, indeed upon other local sectors in general, cannot be assumed to be great. The immediate effects of industrial incomes has certainly increased consumer demand, but for goods which are only available at a few places in the county, if at all.

It is characteristic of the larger firms that they will not use local business or industrial services, and if they are forced to for some time, they will endeavour to establish their internal self-sufficiency within the enterprise as soon as possible. Since they rather frequently are members of larger corporations or groups, this means that increased demand for local services from the enterprise is drained off to associate companies located outside the county. Local entrepreneurs provide the demand for these services, and seem to benefit more from local contacts than from development area policy measures as such. Such services include for example accountancy and auditing, which is needed by small businesses, workshops, pensionats, and shops. Even now the demand for this type of service is only sufficient to support a handful of bureaux, despite the large number of qualified students leaving the technical colleges each year. It can be asserted that the number of jobs available in service trades, especially retail and wholesale businesses has been far smaller than the supply of labour. The same almost certainly applies in official administration / see Table 3.15/.

The local financial institutions have played a constructive part in assisting local entrepreneurs, so far as they have been able. The good reasons for entrepreneurs to be somewhat tardy in coming forward were set out above in Chapter 3,

section V. It is only under quite exceptional conditions that a business in such a remote and rural county can compete and succeed in an important outside industrial market. The market inside the county has to all extents and purposes not existed while it has been necessary to distribute wares via wholesalers in Bergen. The case advanced by Høgelid /1974/ for the rapid expansion of the distributive network inside the county is unanswerable. In concluding this section one may point to the warning given by the collapse of plans for engineering plants in Gaupne and Lærdal caused by the withdrawal of Akergruppen, the large outside firm.

c. Development and Sogn og Fjordane

Sogn og Fjordane has not been bypassed in development, simply the forms of organisation of economic life from the the entrepreneurs' point of view have not changed. Most businesses which are mainly based in the county are family businesses from the farms to the shops. Beyond these exist a range of collectively initiated agents of economic articulation, the co-operative dairies, slaughterhouses, banks, transport concerns and retail co-operatives. They are integrated economically with the resources available to the farmers and fishermen of the county. The settlement structure is attuned to the use of these resources, and the communal administration and service centres were established to provide for the steadily increasing needs of their populations. It should not be forgotten that much of the wealth of the county was contributed by people who migrated from the poverty they had known there. Nevertheless, the

economic mechanisms relating resources and production, and the institutional framework in which they were cast, was appropriate and could have held the seeds of further development.

This possibility was inevitably blocked by the changes taking place in both the economy and within the institutions. The economic and institutional basis of the communities which made up the county was sundered by rationalisation in agriculture. The farms are now linked to dairies in say Sogndal or Førde, slaughterhouses in the same centres, and agricultural merchants in Bergen or Ålesund. The previous socialisation of local loyalties has not been wiped away, but the ideas young people have of their futures are now more career oriented, in effect a labour market has been created. The penetration of the county by expectations and aspirations which could not be met in the former relationship between institutions, production, and resources has been accompanied by varying forms of personal adaption. The consequences of these several changes points towards a concentration of settlement in the short term to some centres within the county, with other centres falling by the wayside. These labour market centres will depend not only on the processing of agricultural produce, but also upon the regular expansion of the public budget and upon official location policy for the continuation of growth in the number and type of jobs. At this point the centres may become rather dislocated from their hinterlands, dependent not as formerly on the production of value from the enterprises surrounding them, but more likely upon official budget decisions taken higher up the departmental hierarchy.

A further question to be asked concerns this method of supporting settlement in the county. Would it be more efficient in terms of public resources to use an alternative to current policy? Certainly the agricultural policy seems designed to streamline leakages out of the county, and so does industrial policy, at least in its likely effects. The results of Aanesland's work indicate that it might be possible to evaluate alternative policies according to settlement and cost criteria /1971/. It seems necessary to try to maximise the impact of each krone of public support for the county, which will mean a concentration on the use of resources within the county, financial as well as physical. One would hope to maximise the impact of a given krone transfer from central government in terms of the number, location, and occupational distribution of jobs, and in terms of the reduction of leaks from the county, hence in terms of the cumulative effect of that spending.

III. Summarised Conclusions

*The question of
the strength of
the rural community
to provide an alternative*

In the first Chapter, the existence of a dilemma in Norwegian regional policy was asserted. Broad tracts of the country which had been identified as having weak or one-sided occupational structures and depopulation were subject to policies which, though designed to help, were weakening and depopulating the areas yet further. Concentration into urban areas was pursued most energetically in areas where the need for deconcentrated, decentralised efforts was in itself greatest. It was pointed out that despite the apparent lack of modernity and urbanisation in parts of Norway, the values placed upon these abstractions were not simply one-dimensional. Representatives of the marginal areas defend their right to speak a different language, to impede the consumption of alcohol, to oppose their submergence as part of the life of the country.

One may assert that the map of Norway is not simply differentiated by the density of telephones per capita, retail turnover per capita, or any other index of integration into 'modern' society. Nor is the differentiation determined by remoteness as simple physical distance, nor by the richness or paucity of natural resources. There is of course a relationship between the available resources, the location, and the apparently measurable prosperity of inhabitants of a place, but it is not preordained by nature. It results from relationships between men, and their use of the natural given, either raw, or modified through the passage of human history. The marginal areas of Norway studied above suggest that the reason for their apparent weakness and depopulation lies not in their remoteness, but in

a history of suffering the consequences of the asymmetry of their relationships with other places. Their marginality is not physically determined, rather it is historically determined. The man celebrating the seventy-fifth year of Vik dairy said truly: "With or against our will, we were dragged into the time of rationalisation and large units" /see p.10/.

In relation to metropolitan centres outside the areas studied, the local economies formerly had a degree of autarky, and exhibited an internal structure of simple order. The relationship with Bergen was never symmetrical, but through the course of time the openness to economies external to the studied areas has increased, and the level of autarky has diminished markedly. How one should value this change is open to dispute, but the fact that the county and its constituent communities have been progressively integrated into the national economy as peripheral units is beyond dispute. Simultaneously with the weakening of forces for local economic integration, the particles of the economy of the county have been linked into external economic structures. The efficiency with which Sogn og Fjordane leaks into the national economy, and especially into the metropolital economies of Bergen and Oslo, has been enhanced. At present, indeed, one cannot speak of Sogn og Fjordane as an economic entity, its particles, the farms, the power stations, the metallurgical plants signify the external propulsion to which the unit is subject. The fact that the count has become increasingly externally propelled is very closely connected to its observed marginality.

(Is asymmetry
Are we satisfied then?) This increase in the asymmetry of the interaction relationships of centre and periphery can be accounted for on two levels

of this proportion
has not been true
the whole of
Norway would
have been
marginal.

(Is asymmetry
Are we satisfied then?)

One level concerns the realities of the social relations of production, the other the institutional forms outside production which accompanied changes in the production base. In terms of the phase of enterprises, the mode of organisation of production, those indigenous to Sogn og Fjordane remain relatively simple, mostly family businesses, with the exception of co-operative food processing factories. Most indigenous enterprises are not major employers of wage labour, they cannot be compared with the intrusive metallurgical plants, contracting firms, or even the newer industries relocated in accord with development area policy. Even though a landless labour force was created in farming areas, the movement of agriculture towards a capitalist structure was blocked; the labourers, or rather their successors migrated out of the county, to the cities and across the ocean. The economic form of the county described by the phases of its enterprises indicates that its possibilities for internal transformation to other modes of production organisation have been blocked. Instead of internal transformation leading to capital accumulation and further transformation, the county and its component communities are subject to external transformation and external capital accumulation.

In addition to the economic relationships between centre and periphery, the stream of symbols between them is vital, often more important than the economic. The stream of symbols from centre to periphery creates an institutional given. It means that saved money ought to be deposited in a bank, and that by the nature of banks, a proportion of that money will leak from the periphery. It means that the metropolitan

definition of career is superimposed upon the occupations of the periphery, which are thereby reduced in value. It means that pupils at school are expected to have career aspirations which cannot be realised in their own communities. Metropolitan standards for what is or is not business, what are or are not legally sound accounts, becomes mandatory. The creation of a labour force adjusted to the new and intrusive social relations of production is arranged through the institutional medium of the stream of symbols. It means that the dilemma of the planners is reproduced: Fjaerland's leaders have consistently adopted and advocated courses of action which have led eventually to the disintegration of the local economy, and its integration in segments with external economic units. In the county too, it is probable that the intensified integration of economic entities with external units has led to stronger leakages, with the paradoxical result that development area assistance will have larger multipliers in the metropolitan areas than in the periphery.

The regional differentiation which is highlighted here is a differentiation in the degree of control over the internal structuring of the space economy of different geographically defined units. Under what circumstances different sizes of units ought to have control over their own structure is a normative question, and as suggested in the preceding paragraph, metropolitan norms have a habit of being the most frequently encountered. The centre may be happy to administer the integration of the periphery sector by sector into its own economic structure. It is less certain whether the periphery will concur in this assumption. While the periphery disposes

the resources, energy, and labour, it does not have any control over the economic articulation of production. It cannot transform its own structure, and is dependent on the centre for assistance, assistance which further reinforces that dependence. The process of one region becoming differentiated from another is revealed in the asymmetry of some aspect of the relationships between them.

APPENDICES

Appendix i Norwegian originals of translated citations

Appendix ii Description of computational procedures

Appendix iii Mapping of census data for three trade
 districts in Sogn og Fjordane
a. boundary definitions of census district
 aggregates
b. maps of selected variables

Appendix iv Detailed references to sources of data

Appendix i Norwegian originals of translated citations

A.i.1:

"Skal vi luka ordet distriktpolitikk ut av språket? Ordet mister i dag si meining fordi det vert nytta om to motsette ting. Både dei som vil sentralisering, avfolkning av bygdene og dei som satsar på desentralisering og vern om bygdesamfunnet talar om distriktpolitikk. Ordet dekker over ein av dei viktigaste motsetningane i norsk politikk..."
 /Furre; Dagbladet 23.november 1972/

A.i.2:

"Ved utpekingen av prøvesentrene og utviklingsområdene ville en søke i sterkere grad enn tidligere å samordne i tid og rom hele spektret av tiltak. Særlig viktig ville det være å koordinere statlige, fylkeskommunale og kommunale investeringer. Tilsvarende ville en forsøke å tilpasse andre former for tiltak av planleggings- og utbyggingsmessig art. Et viktig moment i denne sammenheng ville det være å gi de utpekt steder en viss prioritet både i forbindelse med planleggings- og analysearbeid og med iverksetting av konkrete prosjekter."
 /St. Meld. nr.6; 1970-71, p.5/

A.i.3:

"Eksempelvis ofret Vestlandkomiteen liten oppmerksomhet på de nærliggende interne samarbeidsbehov innen sykehus- og helsesektoren, mens hovedvekten ble lagt på den næringsøkonomiske utvikling og på kommunikasjoner, kraftutbygging og industrireising, - spørsmål som hovedsaklig vedrører et statlig engasjement i landsdelen."
 /Berg 1973a, p.111/

A.i.4:

"Folketallet går ofte sterkt ned i kommuner hvor befolkningen ikke har muligheter til å nå et tettsted av en viss størrelse i løpet av en rimelig reisetid. Det bør derfor utvikles en senterstruktur som gjør det mulig for den overveiende del av befolkningen i distrikten å komme innenfor en akseptabel pendlingsavstand til sentre med rimelig service- og arbeidsplass tilbud."
 /Kveine 1972, p.148/

A.i.5:

"Om en går inn for å skape nye arbeidsplasser i industri eller tjenestenæringen innebærer dette samtidig en konsentrasjon til tettbygde strøk nettopp i distrikter der behovet for en desentralisert innsats i og for seg ville være størst."
 /Berg 1972, p.3/

A.i.6:

"... nettoinntekten pr. årsverk på et tidsmessig og rasjonelt drevet bruk, stort nok til å gi full sysselsetting for en øvet, voksne person hele året, bør ligge på et nivå som minst svarer til den årlønn voksne menn i gjennomsnitt oppnår i rasjonelt drevet industri."
 /N.C.U. 1974: 26, p.101/

A.i.7:

"Folk vil gjerne bli buande i sine distrikter om det er arbeid å få, men komitéen legg her opp til ein politikk som stimulerar flytting til føremøn for oppbygging av større sentra. Sjølvsagt kan ikkje all spreidd busetnad oppretthaldast, men ein meiner det må leggjast større vekt på mindre bygdesentra med tanke på å halde på busetnaden i kommunane i staden for å konsentrera han i nokre sentra i fylket.

"På side 78 i innstillinga gar komitéen inn for å få bygt ut nokre store sentra. For at desse skal veksa fort, er det avgjerande at arbeids-søkjande bønder flytter inn til sentra snarast mogeleg. Ein får næ rast ei kjensle av at desse bøndene helst burde tvangsflyttast for å nå målet: ei rask utbygging av store sentra.

"Komitéen kjem vidare inn på at ei rask utbygging av større sentra vil framskunda det neste steget i utbyggingsprosessen: mindre sentra. Det er vanskeleg å skjøna samanhengen i dette resonnementet. Det nyttar vel lite å byggja ut dei små sentra etter at storparten av folket har flytta til dei store. Ein meiner at det rette må vera å gå den motsette vegen, nemleg å byggja ut opplandet først så sant vilkåra ligg til rette for det. Gjennom tidene har all røynsle synt at eit sterkt levedyktig oppland gjev grunnlag for framvokster av store tettstader. Ein tettstad utan eit sterkt oppland vert meir eller mindre kunstig og vil før eller seinare stagnera og gå attende."

/St. Meld. nr.27, 1971-72, p.89-90/

A.i.8:

"Etter mitt syn er det heilt uskjøneleg at det viktige vegkravet Hella-Skei vert utsett på uviss tid i framlegget til Norsk Vegplan. Det er rett og slett diskriminering av folket i Sogn og Fjordane. Det er ikke berre fylkestinget, vegadministrasjonen, og våre fem Stortingsmenn som blir undervurdert, men også folket i fylket."
 /Firda Tidend 15. juli 1969; Thornquist M, 1971/

A.i.9:

"I stortingsmelding nr. 104 /1973-74/ er den såkalte fjordlinjen valgt for tverrsambandet Sogn - Sunnfjord. Dette medfører at bygden Fjærland ikke får veiutløsning som et ledd i tverrsambandet Sogn - Sunnfjord. Den eneste forbindelse Fjærland i dag har, er ferjeforbindelse Fjærland - Helle som for $7\frac{1}{2}$ maneds drift i 1974 hadde et underskudd i 1975 på 900.000 kroner.

"Departementet mener at Fjærland bør få en veiutløsning ved en lokalvei. Bygdas størrelse og beliggenhet tilsier dette. Dette kan enten skje ved vei/tunnel fra Fjærland til Lunde i Jølster kommune, ved vei langs utsiden av Fjærlandsfjorden til kommunesentret Balestrand eller ved vei/tunnel til Selseng i Sogndal. De to siste løsningene knytter Fjærland til andre bygder i Sogn. Vei langs vestsiden av Fjærlandsfjorden vil knytte bygden direkte til kommunesentret i Balestrand.

"Før valget av trasé kan foretas, må en rekke tekniske spørsmål klarlegges, blant annet kostnadene utredet nærmere. Departementet har til hensikt å få klarlagt dette i løpet av så kort tid som mulig, og deretter få fylkets og kommunens vurdering av de mulige alternativene. Derpå vil saken bli lagt fram for Stortinget for nødvendig vedtak. Det forutsettes at anlegget utføres som riksvei, blant annet fordi den nævnevende ferjen er riksveisamband.

"Hvis de nødvendige forberedelser, detaljplanlegging m.v. kan skje så raskt at det blir mulig å starte anleggsdrift i 1977, vil departementet på det tidspunkt söke en løsning på finansieringsspørsmålet i 1977. For 1978 og senere vil bevilgninger til prosjektet bli vurdert i sammenheng med neste revisjon av Norsk Vegplan. Bruk av distriktsutbyggingsmidler vil også bli vurdert."
 /Bergens Tidende 8. februar 1975/

A.i.10:

"Men skal Fjærland blomstre opp, må vi nå fram til ein stad med arbeidsplassar, ein stad med bil- og landbruksservice. Da er det klart at vi må til Sogndal eller helst Førde. Dette er grunnen til at vi har stridd så hardnakka for tunnelen."

/Tveit 1973, p.92-3/

A.i.11:

"Det som pregar Fjærland i dag er resignasjon. Folk har mist motet. Dei tviler på si eiga framtid, og denne tvilen drep handlekrafta."

/Tveit 1973, p.86/

A.i.12:

"- Men trur de ikkje at vegen kjem?
- Jo. Men det spørst om vi far han tidsnok. I dei nærmaste ti åra far vi eit generasjonsskifte i Fjærland, og dersom ikkje vegen kjem, er det mange av dei unge som ikkje vil har gardane. Det er kanskje ikkje det verst, gardane vil alltid ein eller annan ha. Verre er det med dei andre som bur her - sjøfolk og handverkarar og folk som tar tilfeldige jobbar - deira etterkommarar vil ikkje slå seg til. Vi har snart ikkje ein einaste handverkar tilbake under seksti ar. Jentene reiser så fort dei blir konfirerte. Nar vi satsar på tunnelen, og prøver å få den ferdig før tida, er det for at samfunnet her skal overleve... Utan veg har vi tapt.- og er fortapte. Det meiner dei aller fleste."

/Tveit 1973, p.79-80/

Appendix ii Description of computational procedures

The data analysed in this thesis were partly handled by computer. The computers used were the University of Bergen Univac 1110 and the University of London CDC machines. With one exception, the data have been processed from files organised by the Statistical Package for the Social Sciences - SPSS /Nie et al 1970/. The more complex analyses have been run from SPSS file bases, since their data management and selection capabilities are of the highest order. Simple analyses, such as that of county data in Chapter 1, section Ib, or of the Agricultural Census data, Chapter 4, section V, were accomplished using SPSS exclusively. The exception to the use of SPSS was the analysis of time series of bank accounts, Chapter 3, section V, for which a program called Time Series Processor was used on the CDC 7600 in London /Hall et al 1973/. The bulk of the computing work is concentrated in the fourth chapter; the flow of analysis is shown in Figure A.ii.1.

The descriptive statistics of the population census variables were calculated using SPSS. The calculation of Moran's I was performed using user-written programs, firstly to calculate the weights to be used, and secondly to arrive at the statistics for the list of variables. A program was written using mapping polygons and coordinates, the same lattice data input as 'Chormap' below, to calculate the weights. It offered a choice of standardised and non-standardised binary weights, weights proportional to the length of boundaries of contiguous units, and weights based on

centroid to centroid distance. It was found that the difference in estimates between these weighting methods for a given basic binary lattice was very small. It was felt that the choice of binary lattice was a subject needing further investigation. The statistics were calculated in a program written around the equations presented in Cliff and Ord /1973; p.8: eq 1.31; p.15: eq 1.66-1.68; p.38: eq 2.47/. Geary's c was also calculated, but the results were merely duplicates of the Moran statistic; the significance levels were always the same or higher.

In Bergen the principal components analysis and Johnson Hierarchical clustering scheme were contained in a package, MULVRP version 2.8, supported by the University department of Psychometry, written from Veldman/1967/. The Johnson program was due to Tschudi of the Oslo University Institute of Psychology. In London the principal components analysis programs used were either SPSS or a program supported by the LSE computer unit named FACCOM. The Johnson Hierarchical program was held by the University of Surrey, and was user-modified to present its results on microfilm. The discriminant analysis program is described in Demirmen /1969/ and is supported by the LSE Geography Department. The mapping program 'Chormap' was written by M.J.Jeffery, and is also supported by the LSE Geography Department, and has been used for the production of a substantially greater number of maps from the Norwegian data than appear in this thesis. The same program was used in the production of 'The Social Atlas of London' /Shepherd et al 1974/.

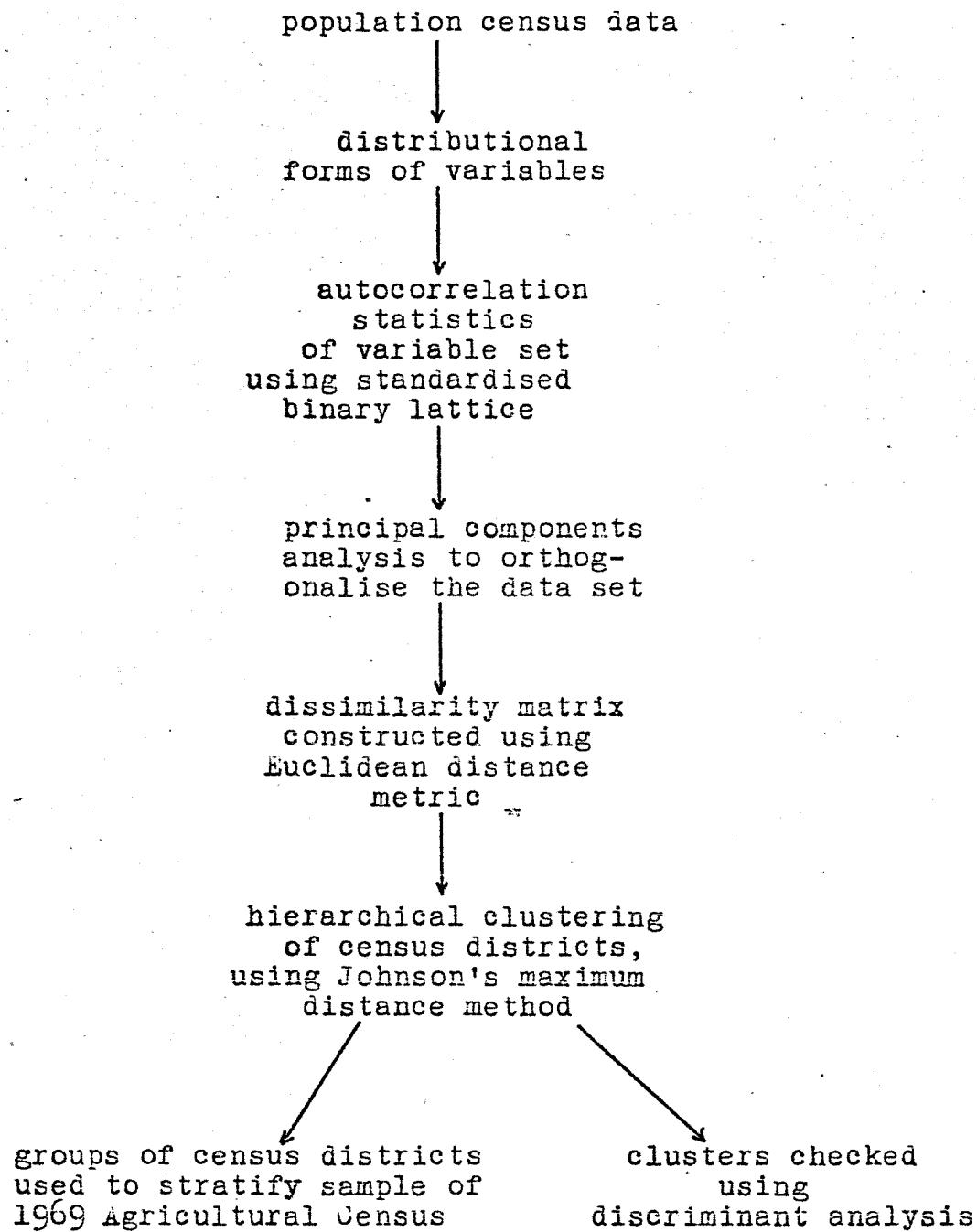


Figure A.ii.1 Flow of analysis using Population census data

Appendix iii Mapping of census data for three trade districts
in Sogn og Fjordane

a. Boundary definitions of census district
aggregates.

The taxonomic units used are listed below with the commune and tellingskrets numbers for the Population Censuses of 1960 and 1970, and with the equivalent krets aggregate numbers as listed in Langen /1975/. The criteria used here to define new aggregates differ from Langen's in having a minimum 1970 population of 90, and in crossing 1970 commune boundaries. Variations from Langen's scheme are marked with an asterisk.

no.	name	1960	1970	Langen equivalent
1	Hove	1417 3	1417 3	1417 002
2	Seljedalen	1417 4	1417 4	1417 003
3	Ovrisdalen	1417 5	1417 5	1417 004
4	Framfjord	1417 7	1417 7	1417 005
5	Vangsnes	1418 10	1417 10	1417 007
6	Arnafjord	1417 8	1417 8	1417 006
		9	9	
7	Vik i Sogn	1417 1	1416 16	uninhabited
		2	2	
		6	6	
8	Esefjorden	1418 4	1418 4	1418 002
9	Vetlefjorden	1418 6	1418 6	1418 004
10	Ytre Fjærland	1418 7	1418 7	1418 005
11	Mundal	1418 8	1418 8	1418 006
12	Indre Fjærland	1418 9	1418 9	1418 007
13	Nessane	1417 10	1418 10	1418 008
14	Kvamsøy	1417 11	1418 11	1418 009
15	Sværefjorden/ Eitorn	1418 5	1418 5	*1418 003, 1419 12 in 1419 001
16	Balestrand	1418 2	1418 1	1418 001
		3	2	
17	Grinde	1419 1	1419 1	*1419 001 includes 1419 12
18	Fresvik Nedre	1419 7	1419 8	*1419 003 part
19	Fresvik Øvre	1419 8	1419 9	*1419 003 part
20	Tjønn	1419 9	1419 10	1419 004

no.	name	1960	1970	Langen equivalent
21	Feidje	1419 10	1419 11	1419 005
22	Leikanger	1419 2	1419 2	1419 002
		3	3	
		4	4	
		5	5	
		6	6	
23	Frønningen/ Fimreite	1419 6 1420 10	1419 7 1419 10 13	*1419 7 part of 1419 003 1420 10 & 13 part of 1420 009
24	Öyabrekka	1420 2	1420 2	1420 002
25	Bjella	1420 5	1420 5	1420 004
26	Notsete	1420 6	1420 6	1420 005
27	Dalavatn	1420 7	1420 7	1420 006
28	Nygard	1420 8	1420 8	1420 007
29	Lomelde	1420 9	1420 9	1420 008
30	Hovland	1420 11	1420 11	1420 011
31	Kaupanger	1420 12	1420 12	*1420 009 part
32	Barsnes	1420 1	1420 1	1420 001
		14		
33	Sogndal	1420 3 4	1420 3 4	1420 003
34	Dalen	1421 4	1421 4	1421 002
35	Vassbygdi	1421 5	1421 5	1421 003
36	Flåm	1421 6	1421 6	1421 004
37	Myrdal	1421 8	1421 8	*1421 005 part
38	Nærøy	1421 10	1421 10	1421 007
39	Undredal/ Berekvam	1421 7 9 11	1421 7 9	*1421 7 part of 1421 005 1421 9 is 1421 006
40	Aurland	1421 1 2 3	1421 1 2 3	1421 001
41	Ljøsne	1422 1	1422 1	1422 001
42	Rikheim	1422 2	1422 2	1422 002
43	Tønjum	1422 3	1422 3	1422 003
44	Erdal	1422 6	1422 6	*1422 006 part
45	Husum	1423 1	1422 8	1422 007
46	Berge	1423 2	1422 9	1422 008
47	Hegg	1423 3	1422 10	1422 009
48	Lærdal	1422 4	1422 4	*1422 004 & 005
49	Naddvik/ Ofredal	1424 5	1424 5 1422 7	*1424 5 is 1424 003 1422 7 part of 1422 006
50	Årdalstangen	1424 3	1424 3	1424 002
51	Øvre Årdal	1424 4 1	1424 4 1	1424 001
52	Björk	1426 1	1426 1	1426 001
53	Fortun	1426 2	1426 2	1426 002
54	Solstad	1426 3	1426 3	*1426 003 part

no.	name	1960	1970	Langen equivalent
55	Evåle	1426 4	1426 5	*1426 004 part
56	Dale	1426 6	1426 6	*1426 004 part
57	Flahamar	1426 7	1426 8	1426 006
58	Nes	1426 10	1426 11	1426 008
59	Gaupne	1426 11	1426 12	1426 009
60	Alsmo/Dalane	1426 12	1426 13	*1426 010 part
61	Alme	1425 3	1426 16	1426 012
62	Kjos	1425 4	1426 17	1426 013
63	Fet	1425 6	1426 20	1426 016
64	Joranger	1425 7	1426 22	1426 017
65	Solvorn	1425 9	1426 24	*1426 014 part
66	Ornes	1425 10	1426 25	1426 018
67	Myklemyr	1427 1	1426 26	*1426 010 part
68	Sperle	1427 2	1426 27	1426 019
69	Kriken	1427 3	1426 28	1426 020
70	Mjølverdal	1427 4	1426 29	1426 021
71	Krundal	1427 5	1426 30	1426 022
72	Ugulen/Molden	1425 5	1426 18	*1426 18 & 23 part of 1426 014
		8	19	1426 19 & 21 are 1426 015
			21	
			23	
73	Heggestad	1425 1	1426 14	1426 011
74	Sørheim	1426 2	1426 15	1426 007
75	Dalsdalen	1426 8	1426 9	*1426 4 part of 1426 003
		9	10	1426 6 part of 1426 004
76	Vårdal	1429 1	1429 1	1429 001
77	Holmedal	1429 2	1429 2	1429 002
78	Bakke	1429 3	1429 3	1429 003
79	Rivedal	1429 4	1429 4	1429 004
80	Lone	1429 5	1429 5	1429 005
81	Gjølanger	1429 6	1429 6	*1429 006 part
82	Hestad	1429 10	1429 10	1429 008
83	Strand	1429 11	1429 11	1429 009
84	Vassdalen Øvre	1429 12	1429 12	1429 010
85	Vassdalen Nedre	1429 13	1429 13	1429 011
86	Flekke	1429 14	1429 14	1429 012
87	Hovlandsdal	1429 16	1429 16	1429 014
88	Tyssedal/ Espedal	1429 7	1429 7	*1429 7 part of 1429 006
		15	15	1429 15 is 1429 013
89	Dale i Sunnfjord	1429 8	1429 8	1429 007
		9	9	
90	Guddal/Heggheim	1429 17	1429 17	1429 015
		18	18	
91	Øvre botten	1430 1	1430 1	1430 001
92	Eldal/Mjell	1430 2	1430 2	1430 002
93	Viken	1430 3	1430 3	1430 003
94	Hestad	1430 4	1430 4	1430 004
95	Sande	1430 7	1430 7	*1430 005 part

no.	name	1960	1970	Langen equivalent
96	Sygna	1430 8	1430 8	1430 007
97	Lunde	1430 9	1430 9	1430 008
98	Skilbrei/ Hjelmeland	1430 10	1430 10	1430 009
99	Osen	1430 11	1430 11	1430 010
100	Birkeland	1430 12	1430 12	1430 011
101	Kårstad	1430 13	1430 13	1430 012
102	Lien	1430 14	1430 14	1430 013
103	Skudal/ Senneseth	1430 5 6	1430 5 6	*1430 5 part of 1430 005 1430 6 is 1430 006
104	Eikås	1431 1	1431 1	1431 001
105	Fluge	1431 2	1431 2	1431 002
106	Gjesdal	1431 3	1431 3	1431 003
107	Sviðal	1431 4	1431 4	1431 004
108	Ålhus	1431 5	1431 5	1431 005
109	Sanddal	1431 6	1431 6	1431 006
110	Myklebost	1431 7	1431 7	1431 007
111	Årdal i Jølster	1431 8	1431 8	1431 008
112	Helgheim	1431 9	1431 9	1431 009
113	Viken	1431 10	1431 10	1431 010
114	Klagegg	1431 11	1431 11	*1431 011 part *1431 14 excluded from this classification
115	Veiteberg	1431 12	1431 12	*1431 012 part
116	Åmot	1431 13	1431 13	*1431 012 part
117	Haukedal	1432 1	1432 1	1432 001
118	Holsen	1432 2	1432 2	1432 002
119	Mo/Åsen	1432 3	1432 3	1432 003
120	Sundegrend	1432 4	1432 4	1432 004
121	Furebø	1432 6	1432 6	*1432 006 part
122	Indre Angedal	1432 7	1432 7	*1432 006 part
123	Ulltang	1432 11	1432 11	*1432 007 part
124	Kråkenes	1433 1	1432 12	*1432 007 part
125	Ervik	1433 2	1432 13	1432 008
126	Førde i Sunn- fjord	1432 5 9	1432 5 9	*1432 005 part
		10	10	
127	Erdal/Åse	1432 8 1433 6	1432 8 1433 4	*1432 8 part of 1432 005 *1433 4 part of 1433 004
128	Helle	1433 3	1433 1	1433 001
129	Frammarsvik	1433 4	1433 2	1433 002
130	Naustdal	1433 5	1433 3	1433 003
131	Horstad	1433 7	1433 5	*1433 004 part
132	Ullaland	1433 8	1433 6	1433 005
133	Fimland	1433 9	1433 7	1433 006
134	Kvellestad	1434 3	1433 8	*1433 007 part
135	Vevring	1434 4	1433 9	*1433 007 part
136	Redal	1434 5	1433 10 1401 31	*1433 10 is 1433 008 1401 31 part of 1401 011

no.	name	1960	1970	Langen equivalent
137	Florø N.V. Bydell	1401 1	1401 1	*1401 001 part
138	Florø O.V.	1401 2	1401 2	*1401 001 part
139	Florø Hesteneset	1401 3	1401 3	*1401 001 part
140	Florø Midtre	1401 4	1401 4	*1401 001 part
141	Florø Tua	1401 5	1401 5	*1401 001 part
142	Hovden/Barekstad	1437 1	1401 7	*1401 003 part
143	Årebrot/Nærøy/ Hauka	1437 2	1401 8	*1401 002 part
144	Brandsøy/ Nyttingnes	1437 3	1401 9	1401 004
145	Rognaldsvåg/ Kinn/Reksta	1437 7	1401 15	1401 007
146	Batalden	1437 9	1401 18	*1401 003 part
147	Norddalsfjorden	1436 1	1401 20	1401 009
148	Stavøy/Stavang	1436 5	1401 25	1401 012
149	Standal	1436 6	1401 27	1401 013
150	Ytre Eikefjord	1435 1	1401 32	1401 014
151	Hovland	1435 2	1401 33	1401 015
152	Eikefjord	1435 3	1401 34	1401 016
153	Endestad	1435 4	1401 35	1401 017
154	Langedal	1435 5	1401 36	1401 018
155	Sandvikfjell	1436 2	1401 19	*1401 19, 21, 22 &
		3	21	30 are 1401 008
			22	*1401 23 & 29 are
			23	1401 009
			29	
			30	
156	Brufjorden	1436 8	1401 13	1401 006
		1437 6	14	
			26	
157	Havrenes/ Krokane	1437 4	1401 10	1401 005
		5	11	
			12	
158	Skorpa/ Furesund Vest.	1437 8	1401 16	*1401 003 part
			17	
159	Svardal/ Høydalane	1436 4	1401 24	*1401 011 part
			28	
160	Stubseid	1428 1	1428 1	1428 001
161	Stongfjord	1428 2	1428 3	1428 002
		3		
162	Strømmen	1428 4	1428 4	1428 003
163	Olset	1428 8	1428 8	1428 006
164	Fure	1428 9	1428 9	1428 007
165	Vage	1428 10	1428 10	1428 008
166	Herland	1428 13	1428 13	1428 010
167	Vilnes	1428 14	1428 14	1428 011
168	Hovland	1428 15	1428 15	1428 012
169	Værlandet	1428 16	1428 16	1428 013
170	Bulandet	1428 17	1428 17	1428 014
171	Rørvik	1434 1	1428 20	1428 016
172	Askvoll	1428 5	1428 5	*1428 5 & 6 are
		6	6	1428 004
		7	7	1428 7 is 1428 005

no.	name	1960	1970	Langen equivalent
173	Kumle/Høyvik	1428 11 12	1428 11 12	1428 009
174	Gjelsvik/ Vågane	1434 2 1436 7	1428 18 19	1428 015
175	Novelandet	1438 3	1438 3	1438 002
176	Rylandet	1438 8	1438 8	1438 005
177	Førde i Bremanger	1438 9	1438 9	1438 006
178	Hauge	1438 10	1438 10	1438 007
179	Grotle	1438 11	1438 11	1438 008
180	Dalen	1438 12	1438 12	1438 009
181	Ålfoten	1442 2	1438 14	*1438 010 part *1438 13 excluded from this classification
182	Dombestein/ Davik/Endal	1442 3	1438 15	1438 011
183	Rugsund/Elde/ Otteren	1442 6	1438 16	1438 012
184	Leirgulen/ Bortne/Hennøy	1442 7	1438 17	1438 013
185	Berle	1442 8	1438 18	1438 014
186	Kalvåg	1438 1 2	1438 1 2	1438 001
187	Sørgulen/Midt- gulen/Botnane	1438 4 5	1438 4 5 1401 6	*1438 4 & 5 are 1438 003 1401 6 part of 1401 002
188	Svelgen	1438 6 7	1438 6 7	1438 004
189	Rugsund/Hunskår	1442 9 10	1438 19 20	1438 015

b. Maps of selected variables

A.iii.1 Population distribution 1970 and delimitation of census districts. /see Figure 4.3/

A.iii.2 Percentage change in total population 1960-70

A.iii.3 Change in proportion of youth under 16 in population

A.iii.4 Percentage change in male cohort 10-14/1960/ - 20-24/1970/.

A.iii.5 Percentage change in female cohort 10-14/1960/ - 20-24/1970/.

A.iii.6 Percentage change in male cohort 15-19/1960/ - 25-29/1970/.

A.iii.7 Percentage change in female cohort 15-19/1960/ - 25-29/1970/.

A.iii.8 Change in proportion of males aged 60 or over

A.iii.9 Change in proportion of females aged 60 or over

A.iii.10 Change in proportion of adults aged 16 or over economically active

A.iii.11 Change in proportion economically active in agriculture and fisheries

A.iii.12 Change in proportion economically active in industry and construction

A.iii.13 Change in proportion economically active in commerce

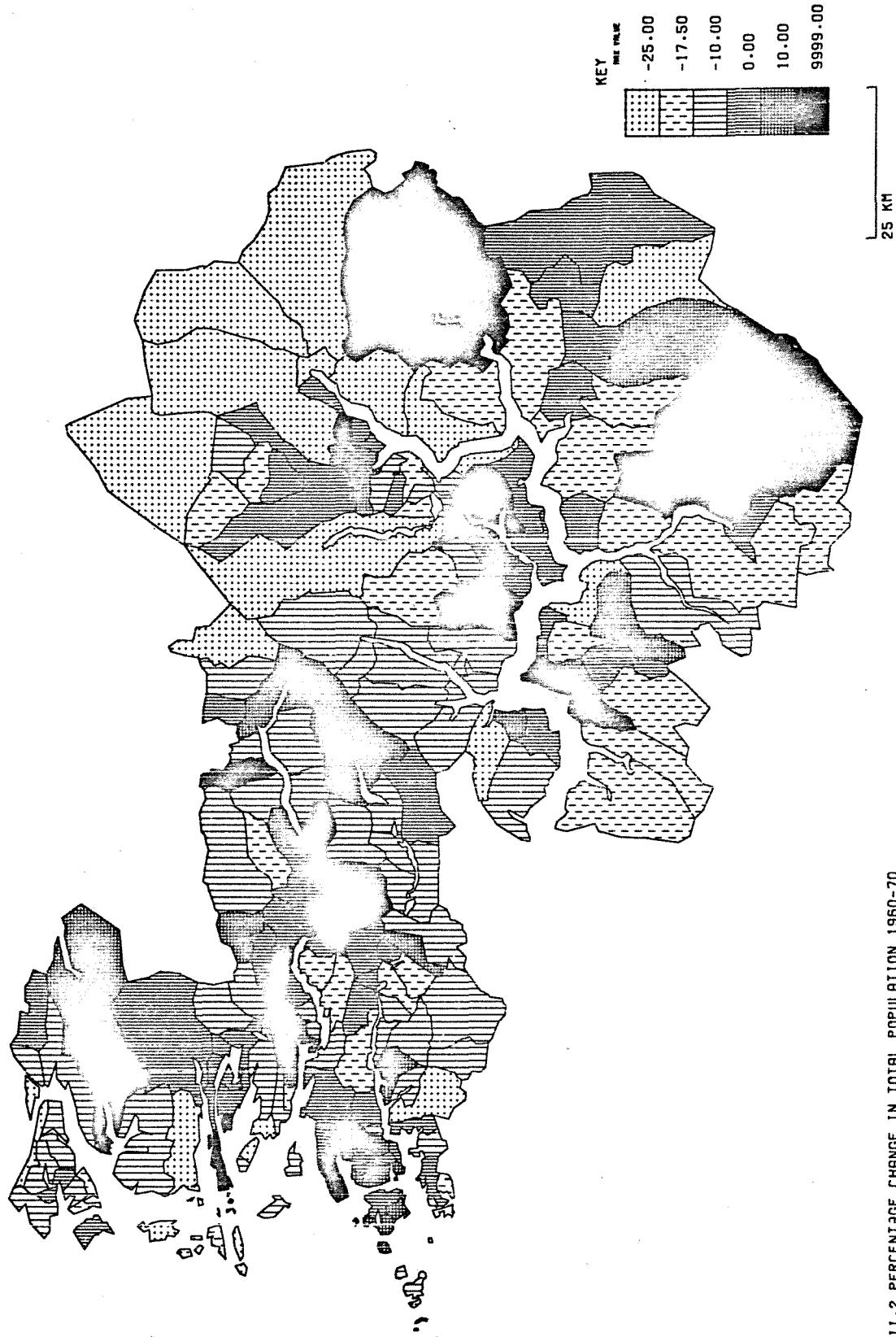
A.iii.14 Change in proportion economically active in transport and services

A.iii.15 Change in proportion of adults receiving pensions as main income

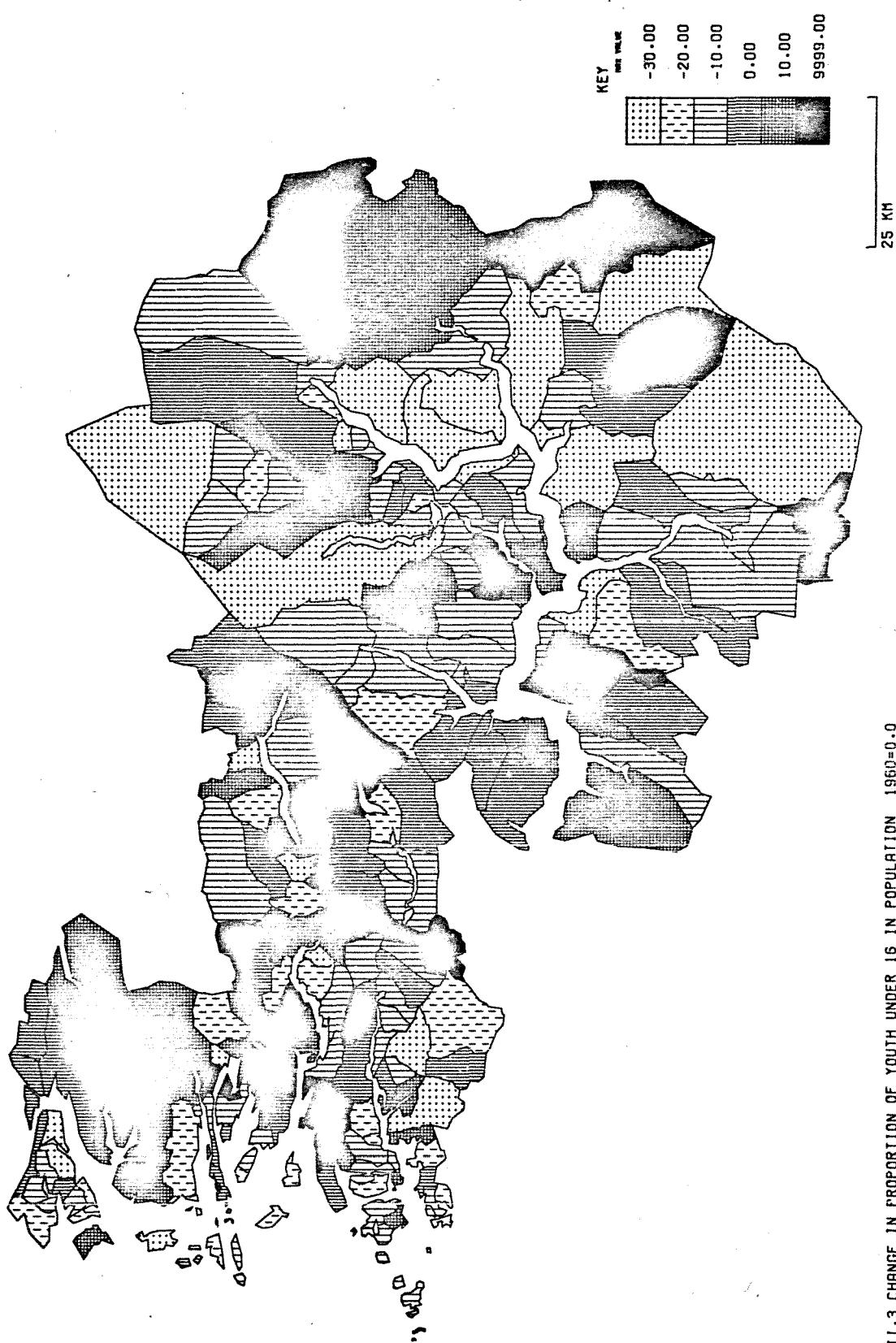
A.iii.16 New houses built 1960-70 as a percentage of total housing stock 1970

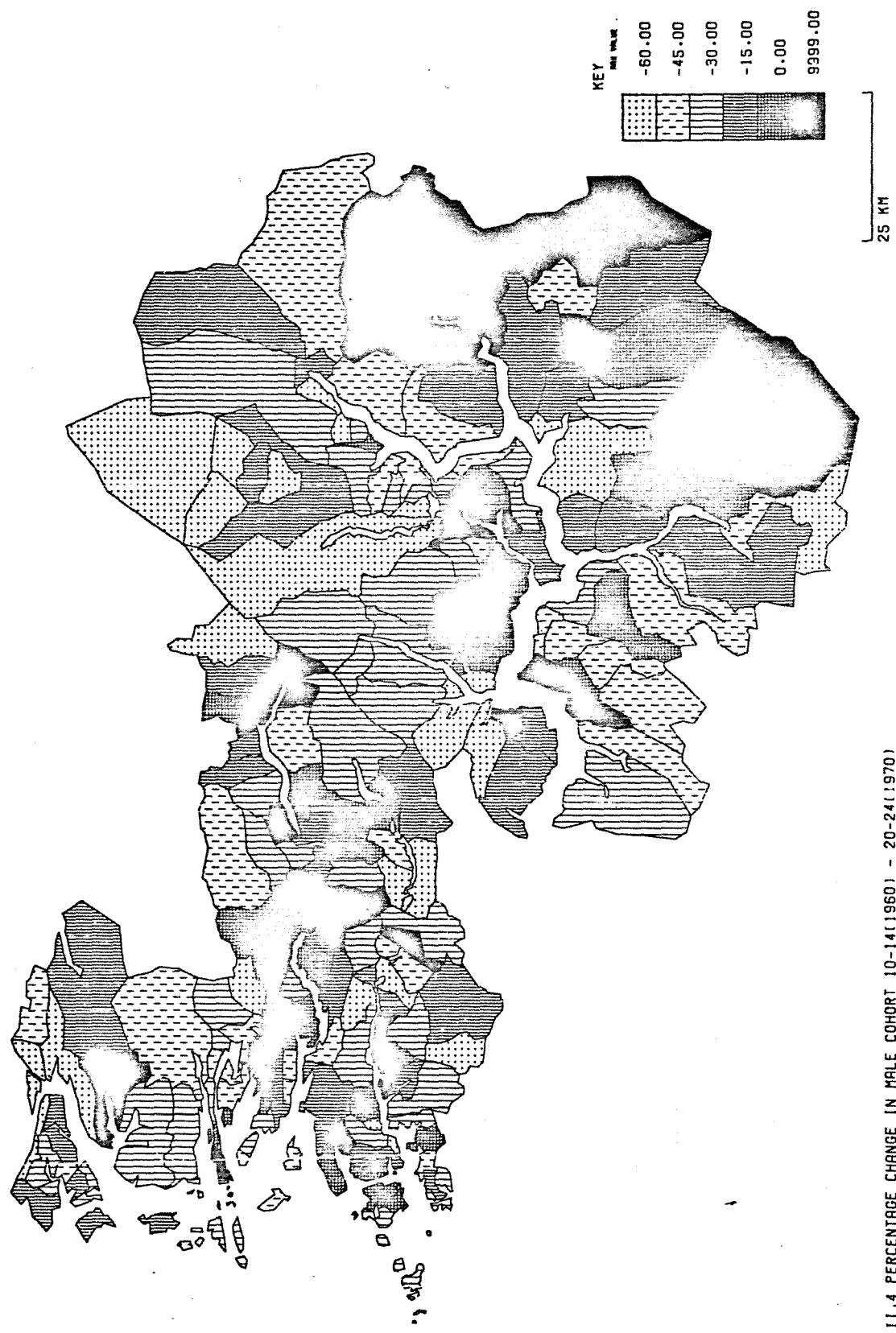
303

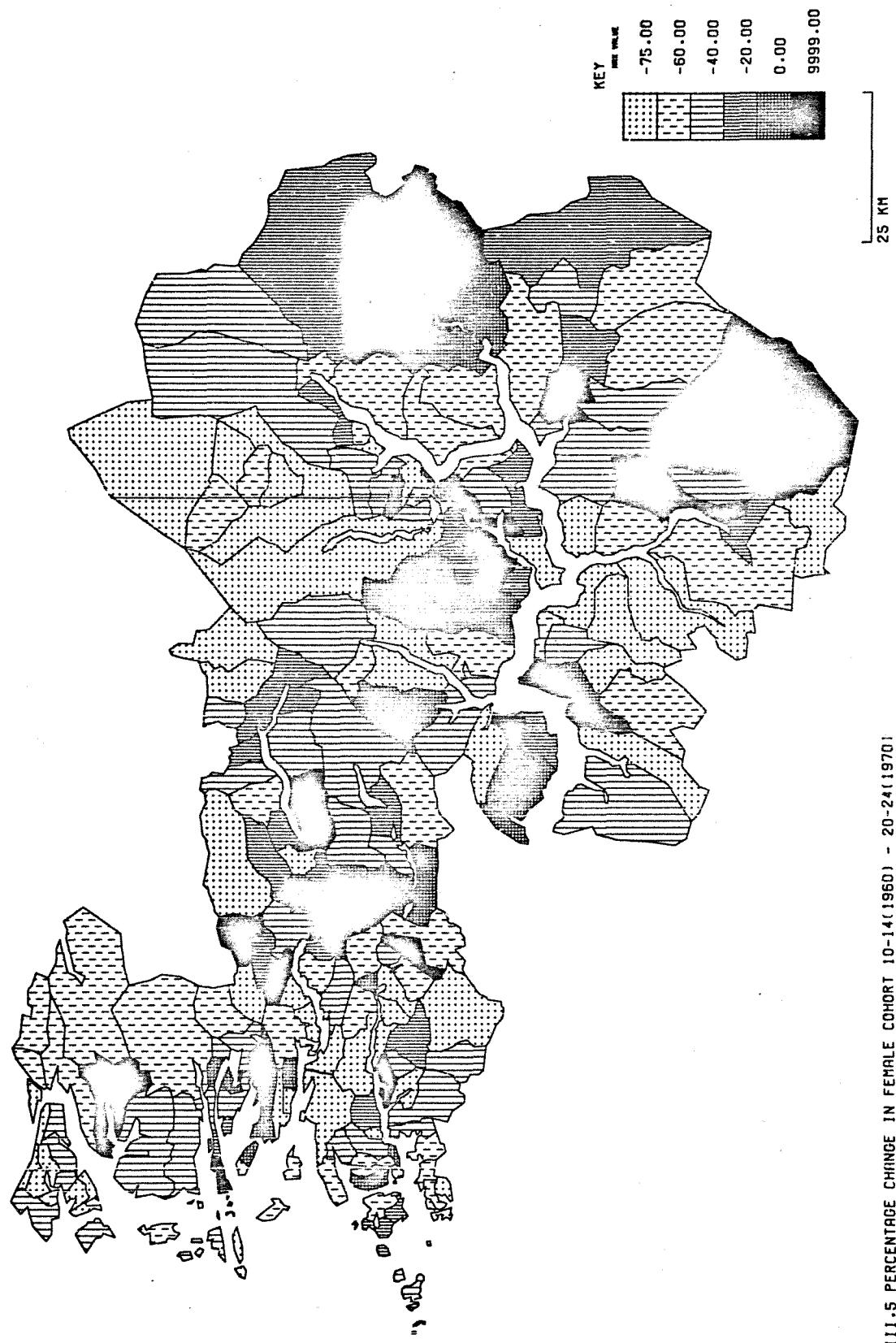
A.iii.17 Percentage of dwellings with both bath and w.c.
1970

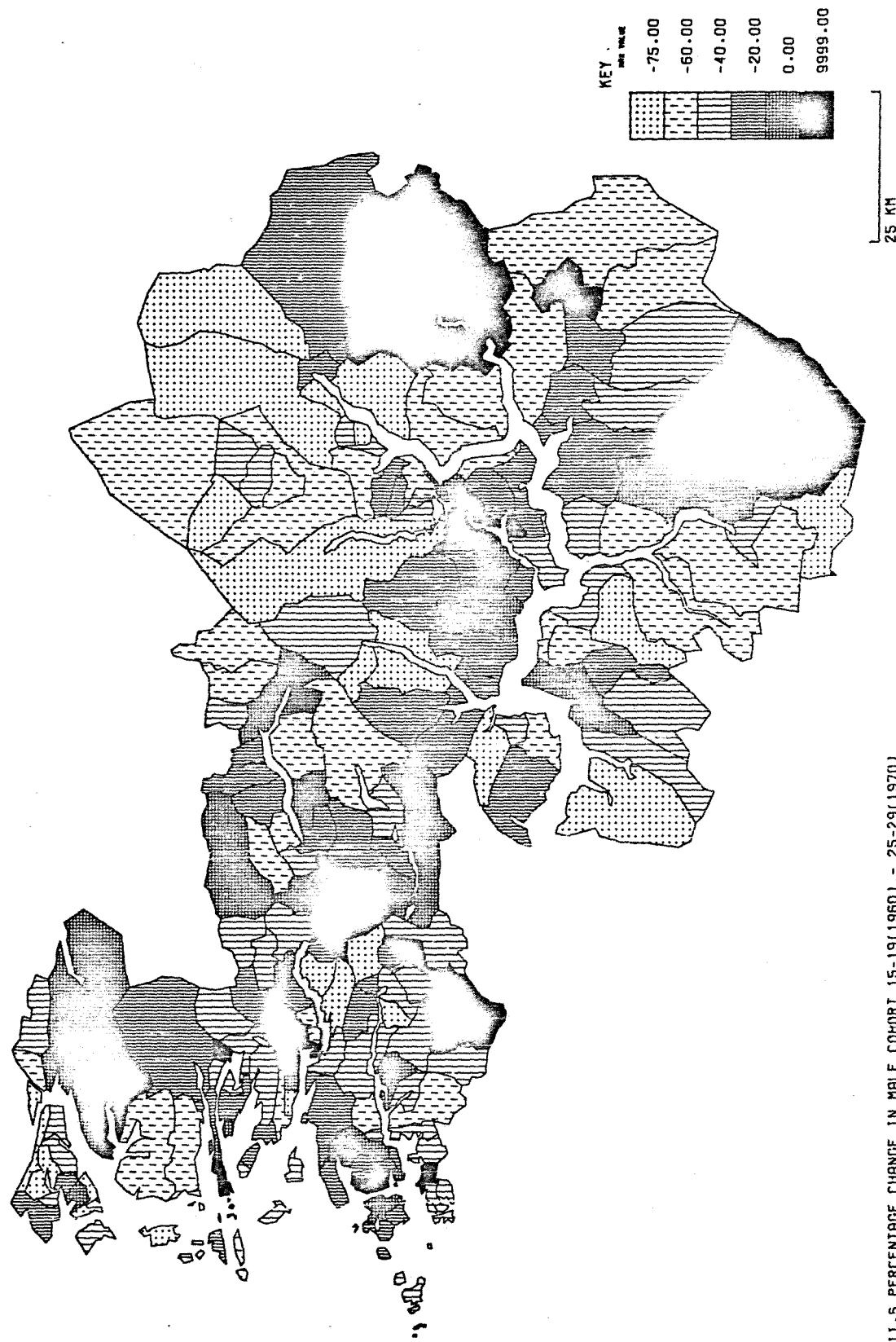


A.III.2 PERCENTAGE CHANGE IN TOTAL POPULATION 1960-70

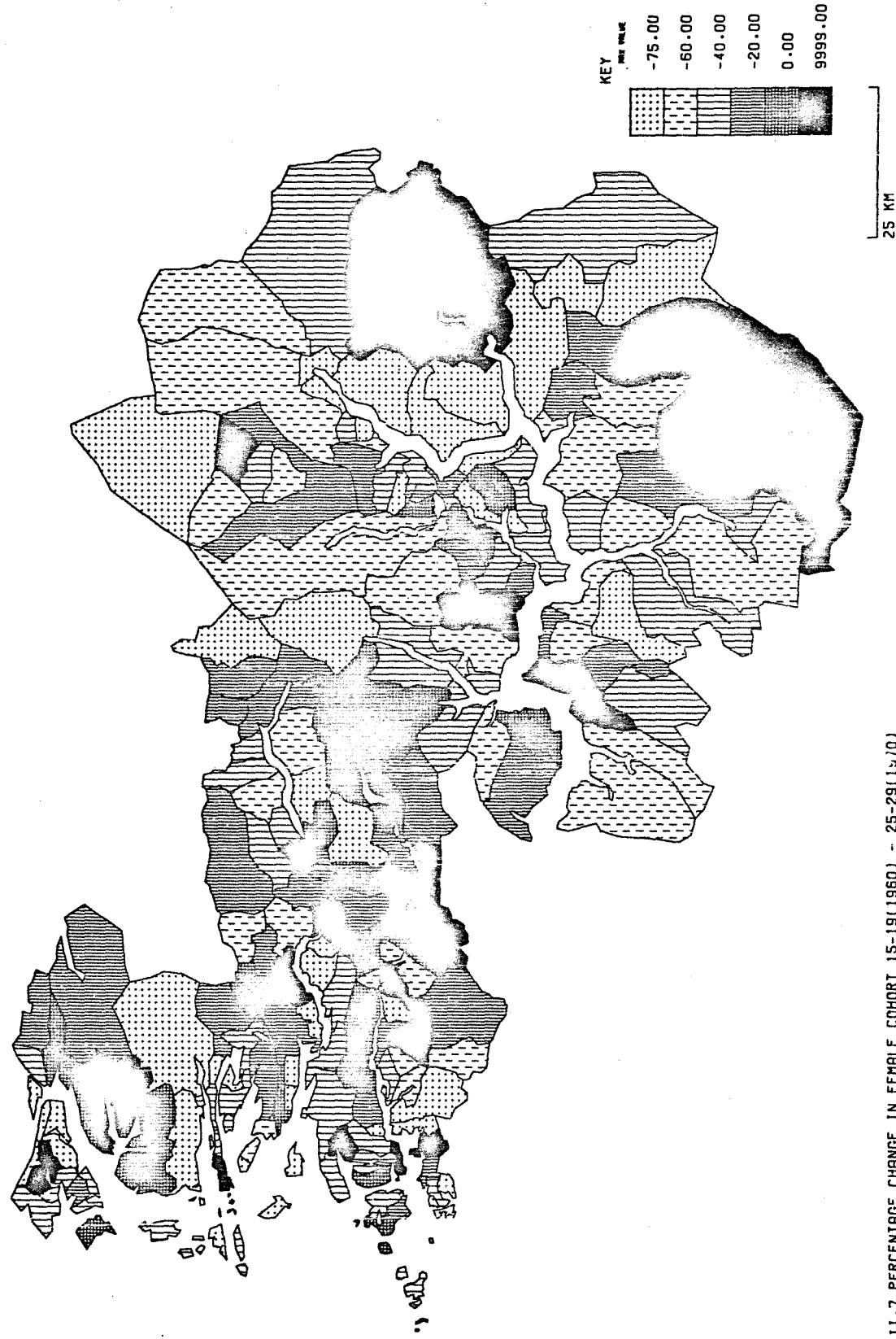


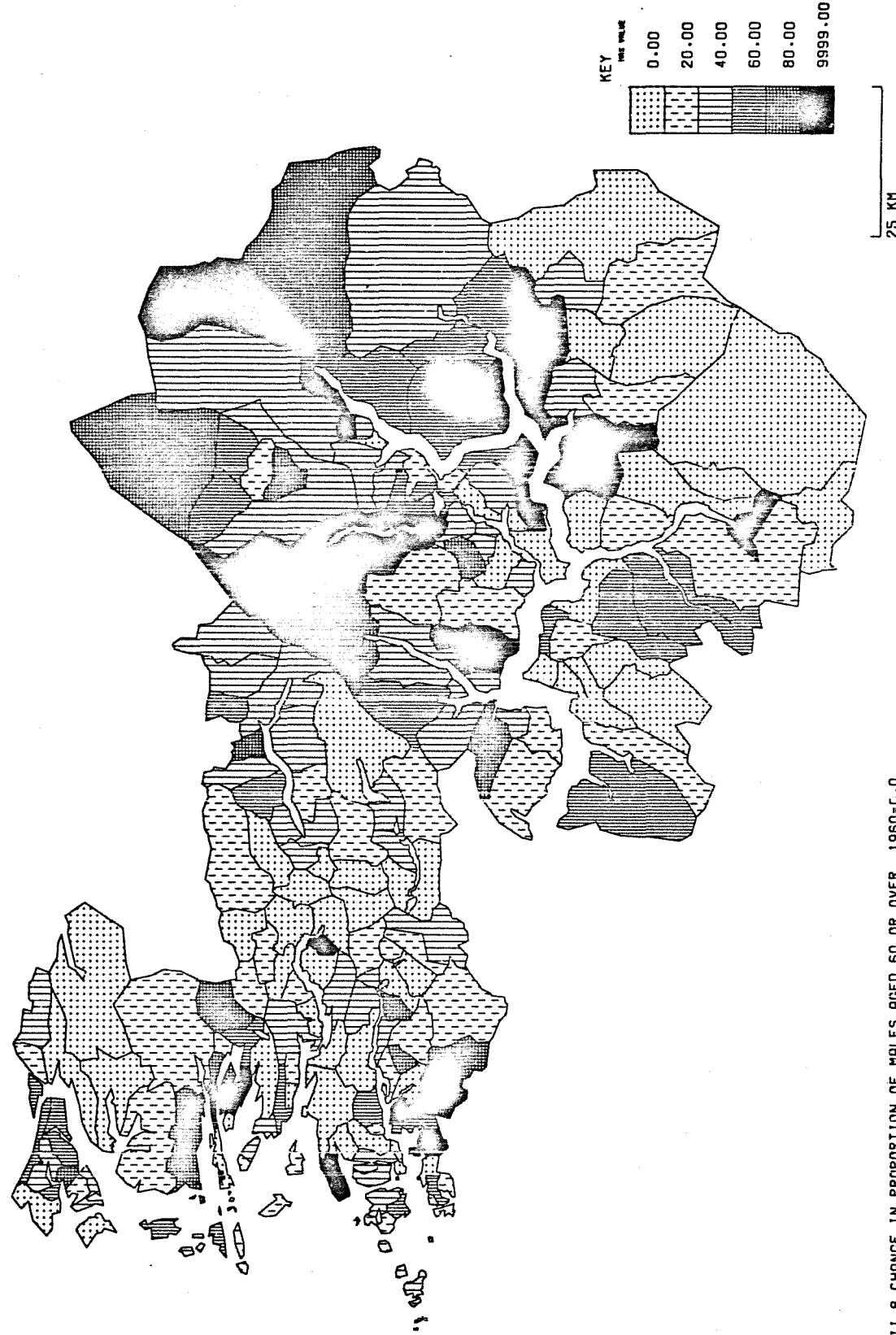


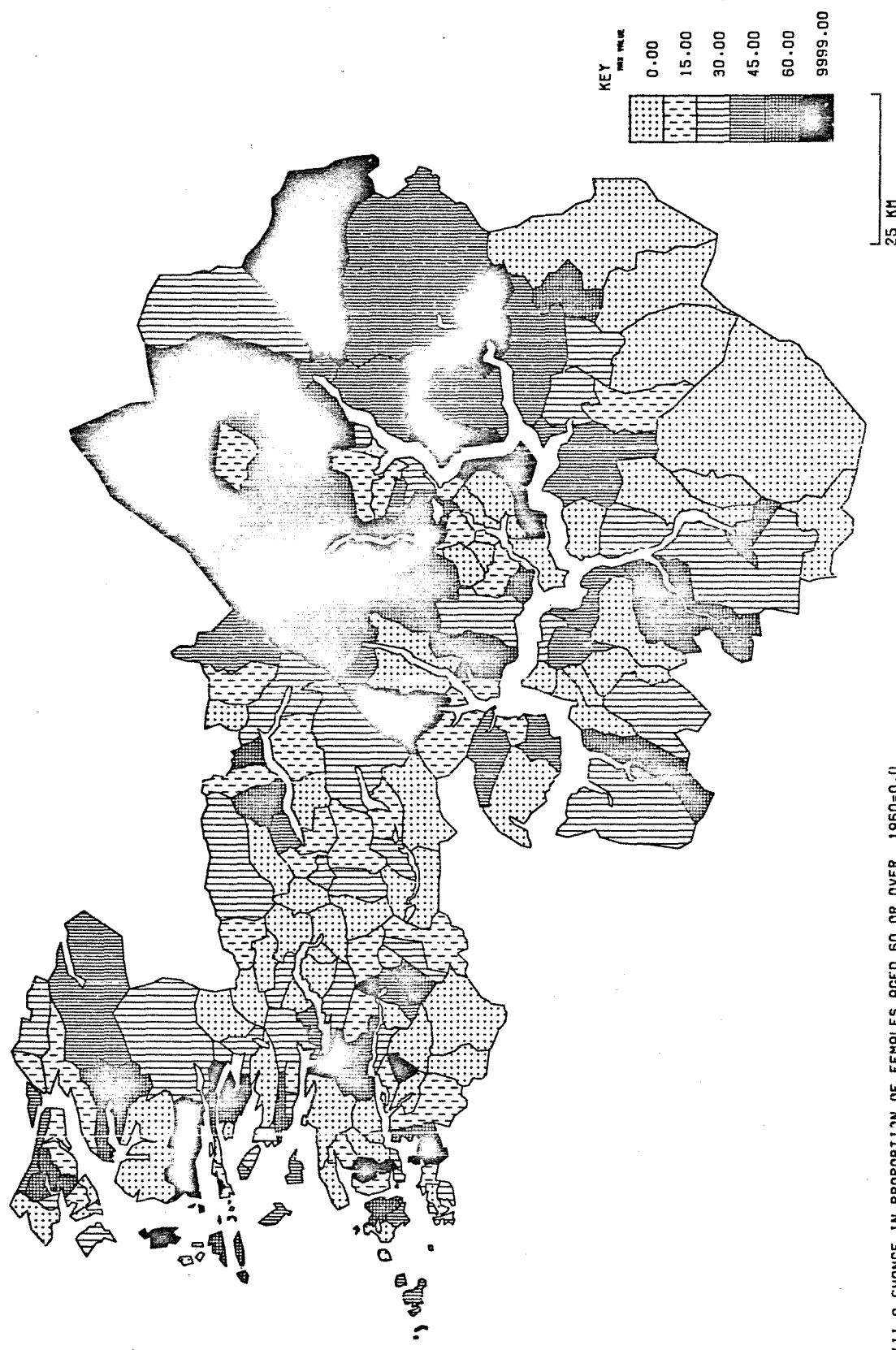


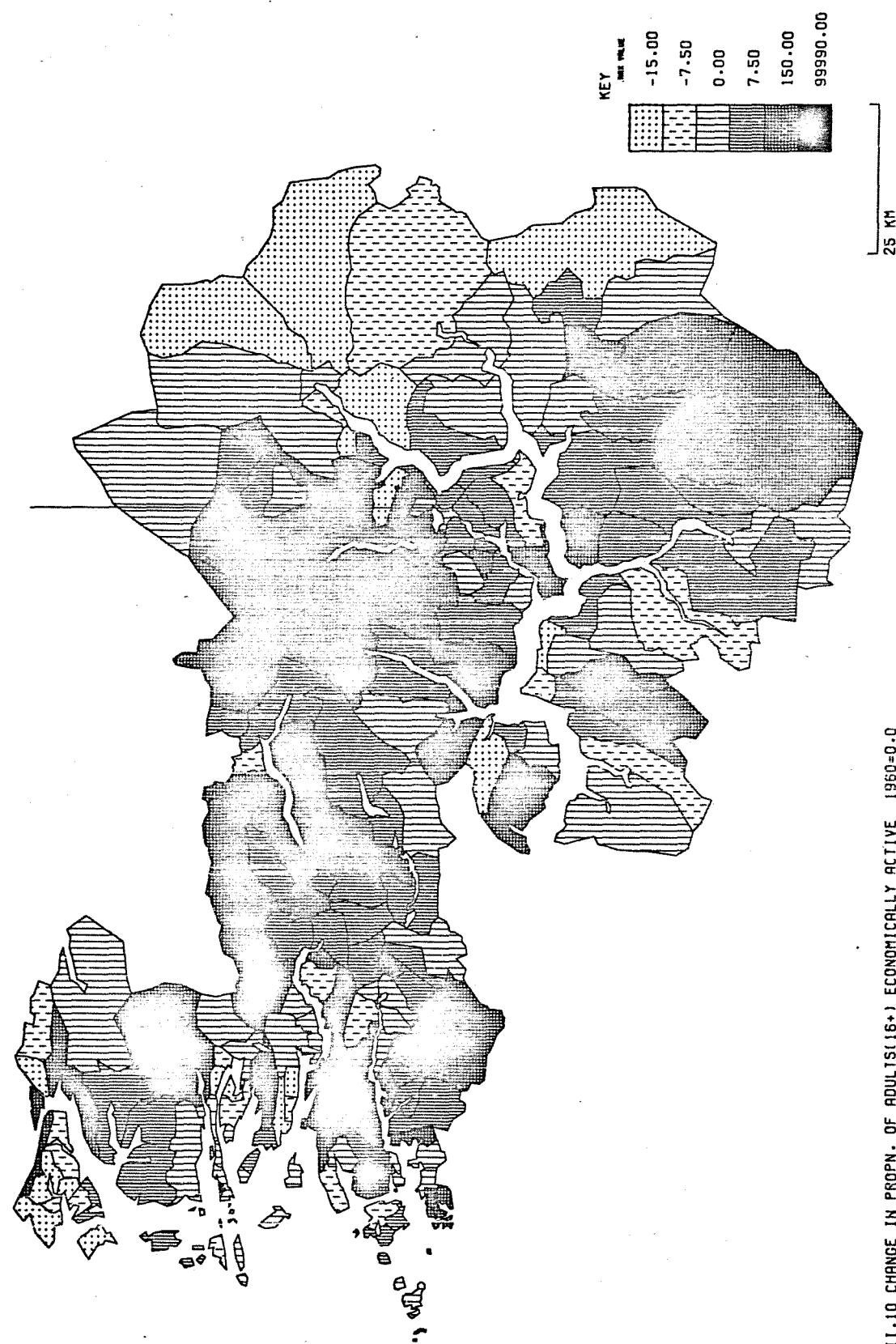


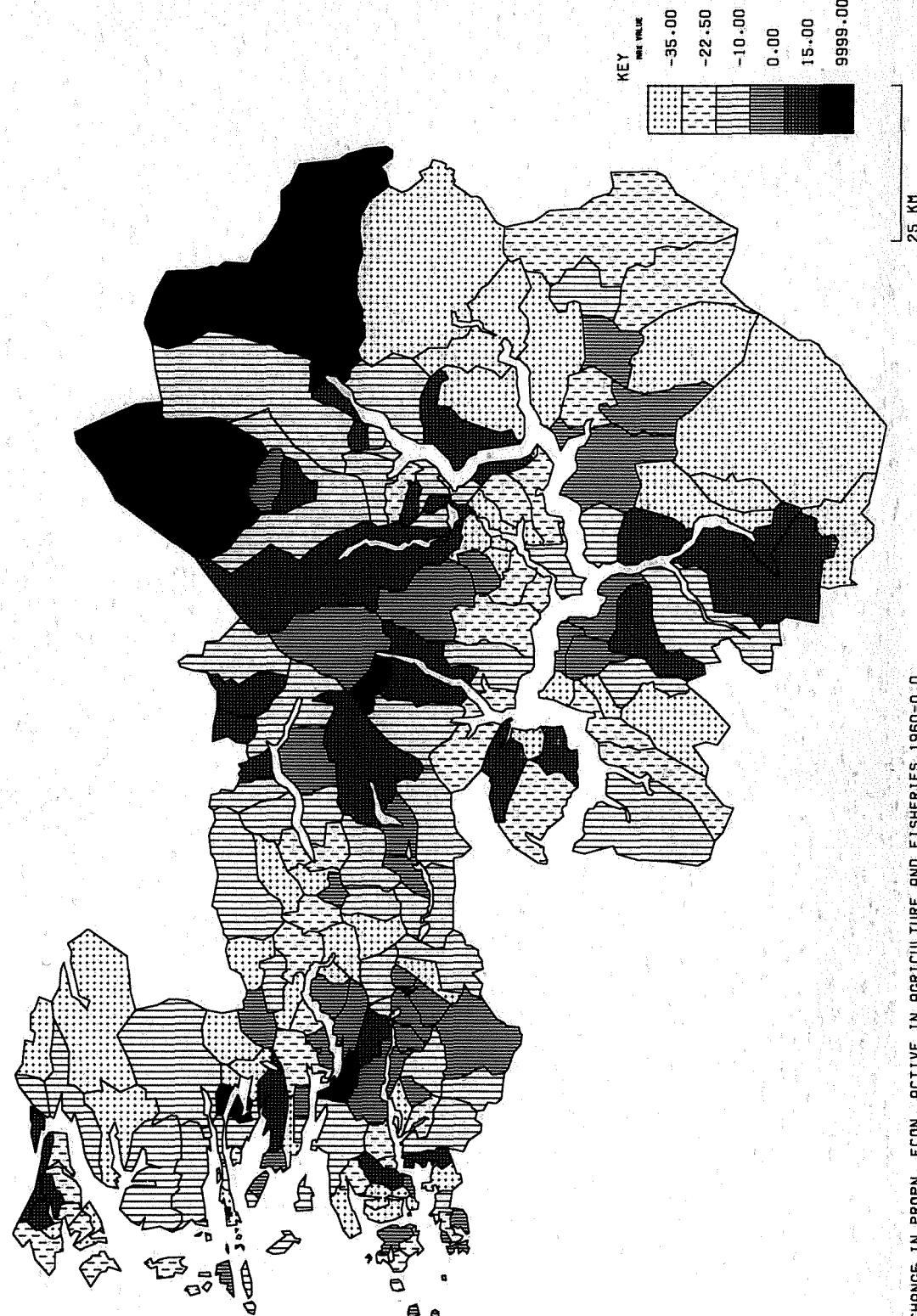
A.111.5 PERCENTAGE CHANGE IN MALE COHORT 15-19(1960) - 25-29(1950)

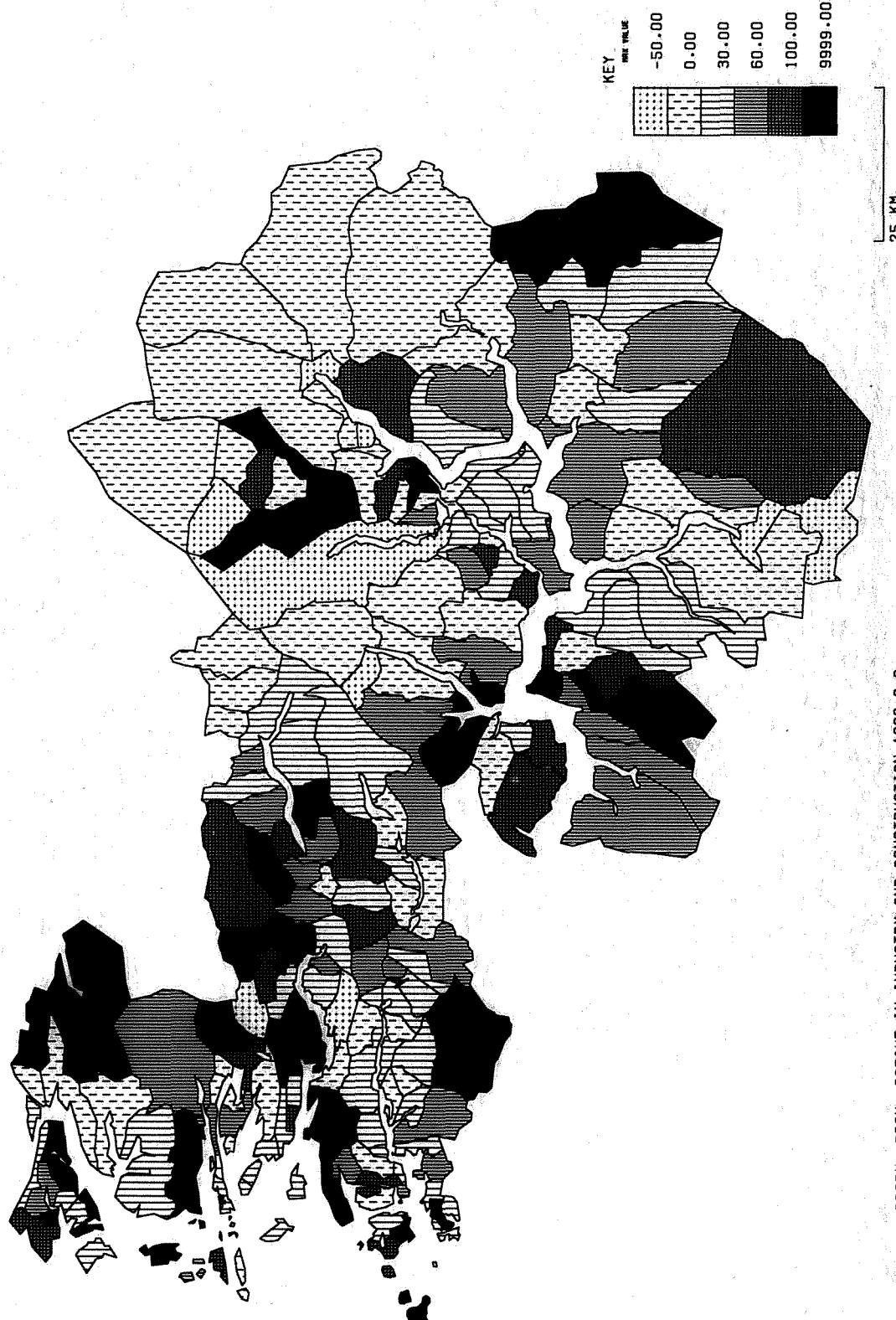




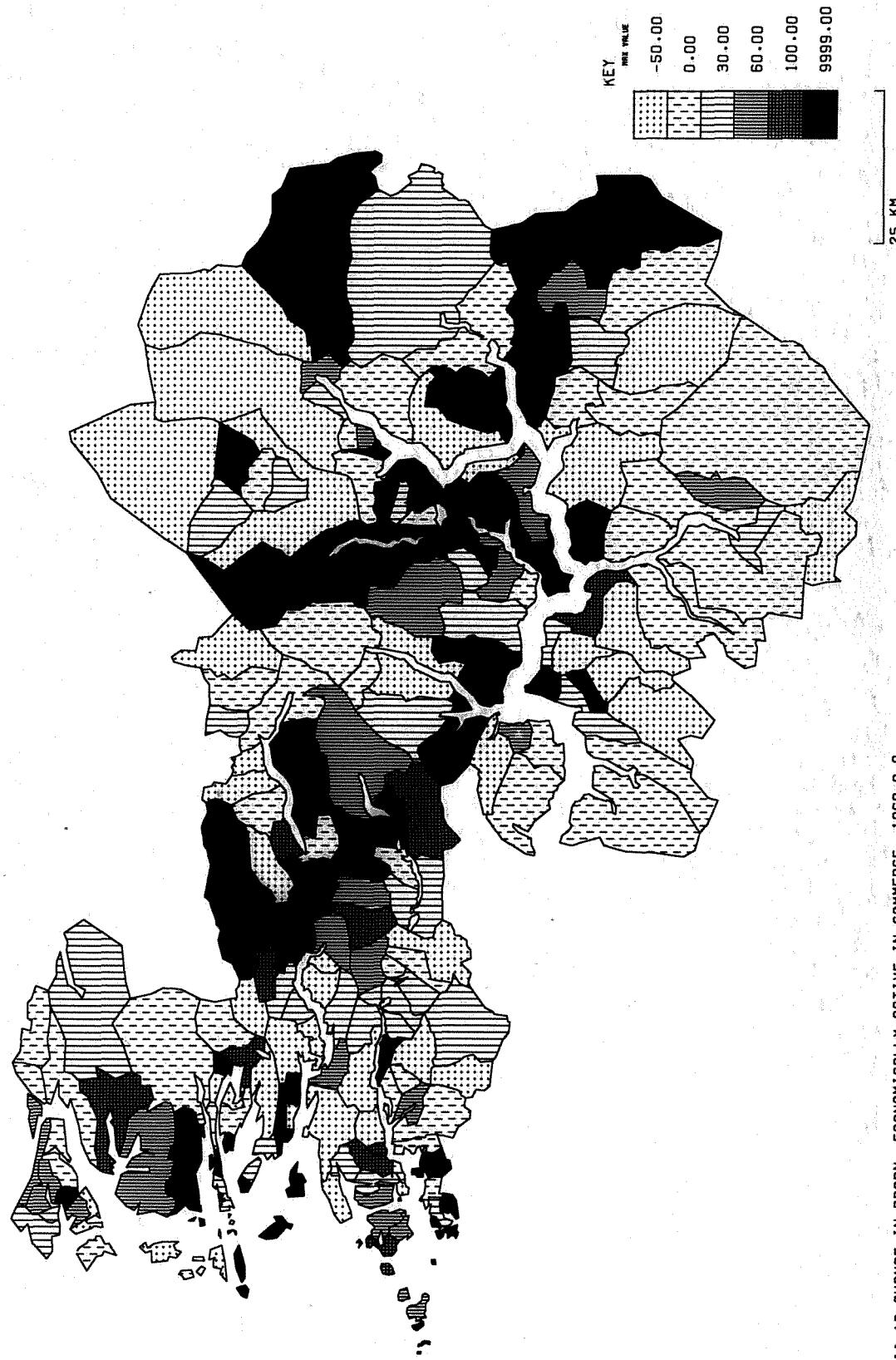


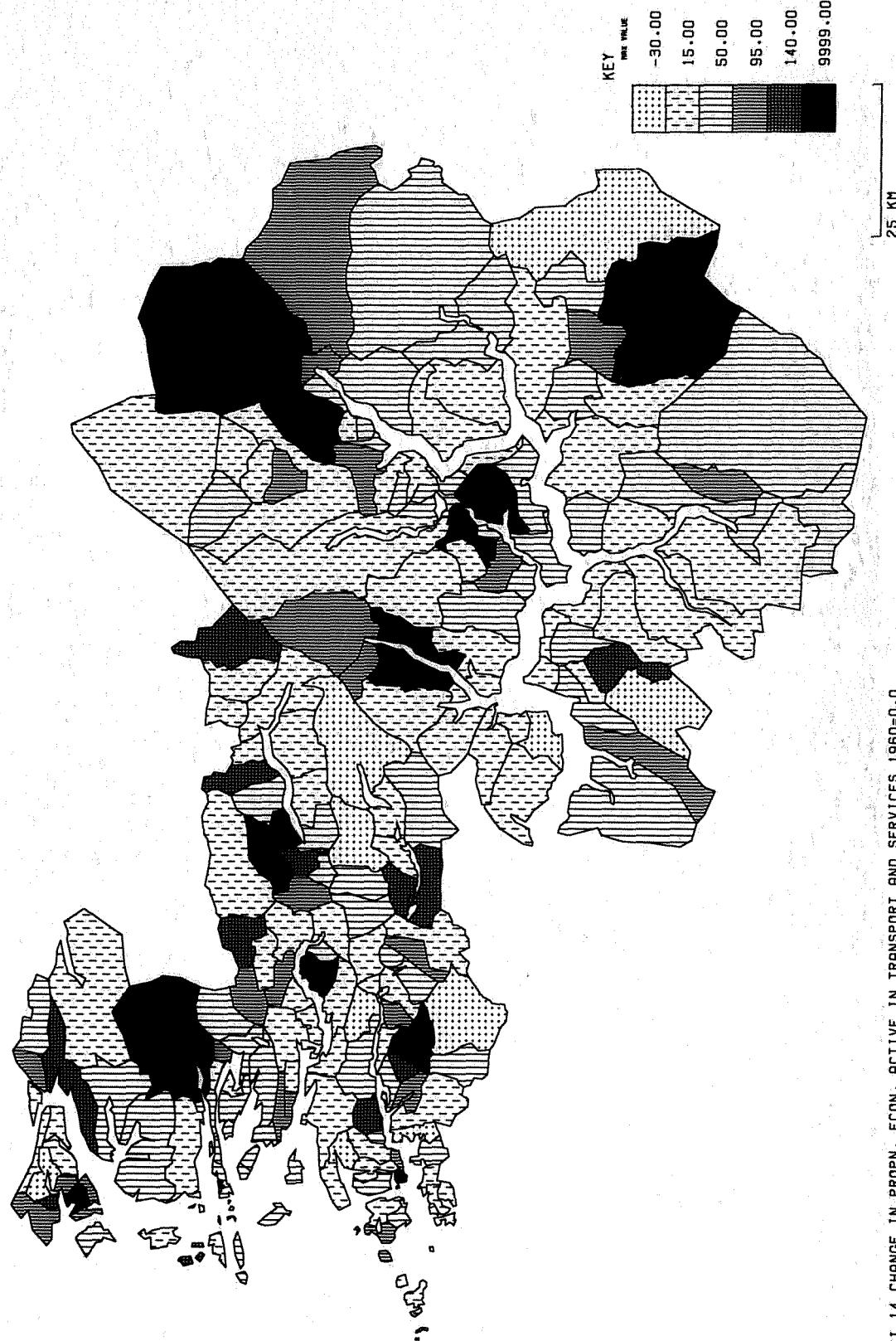


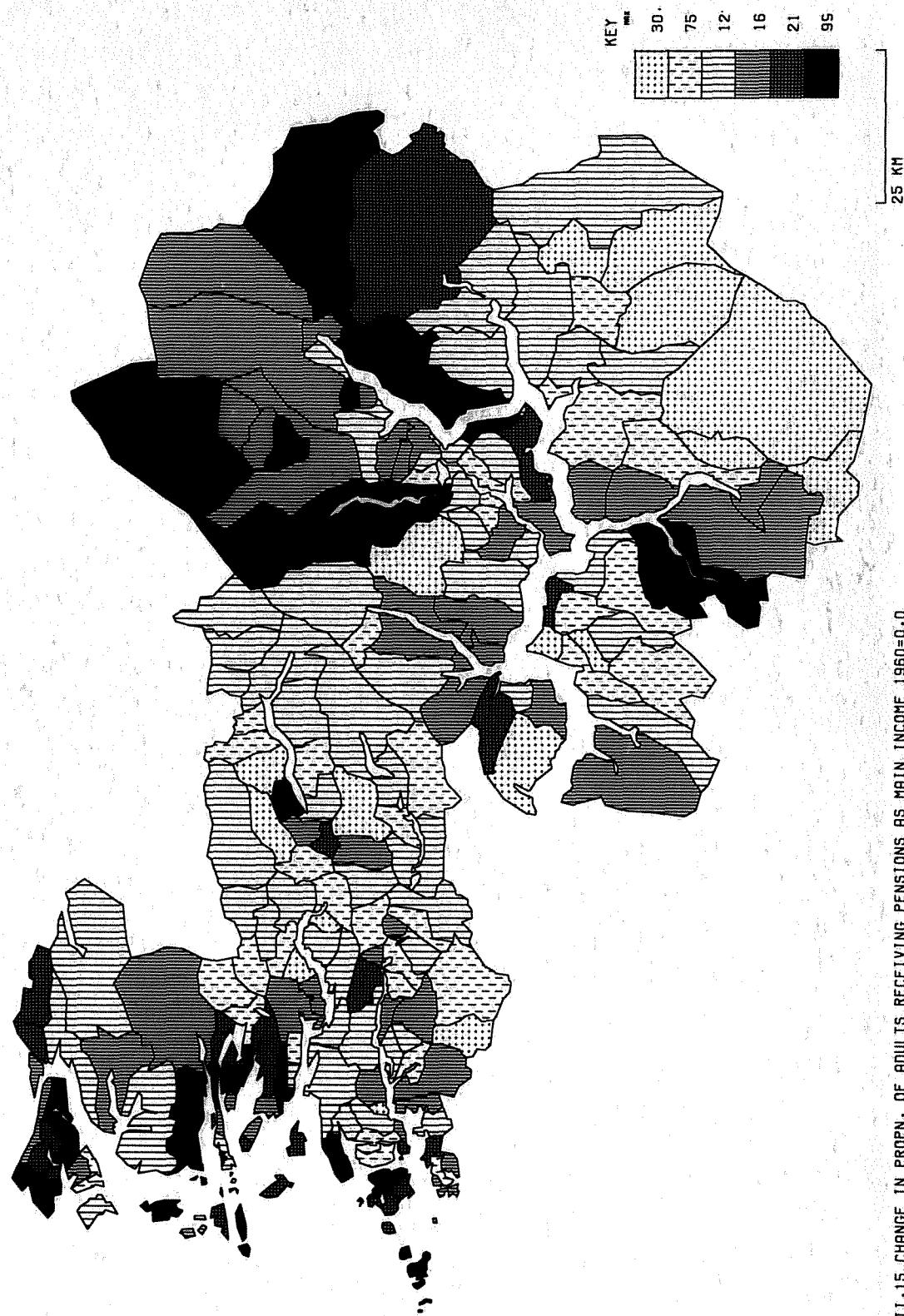




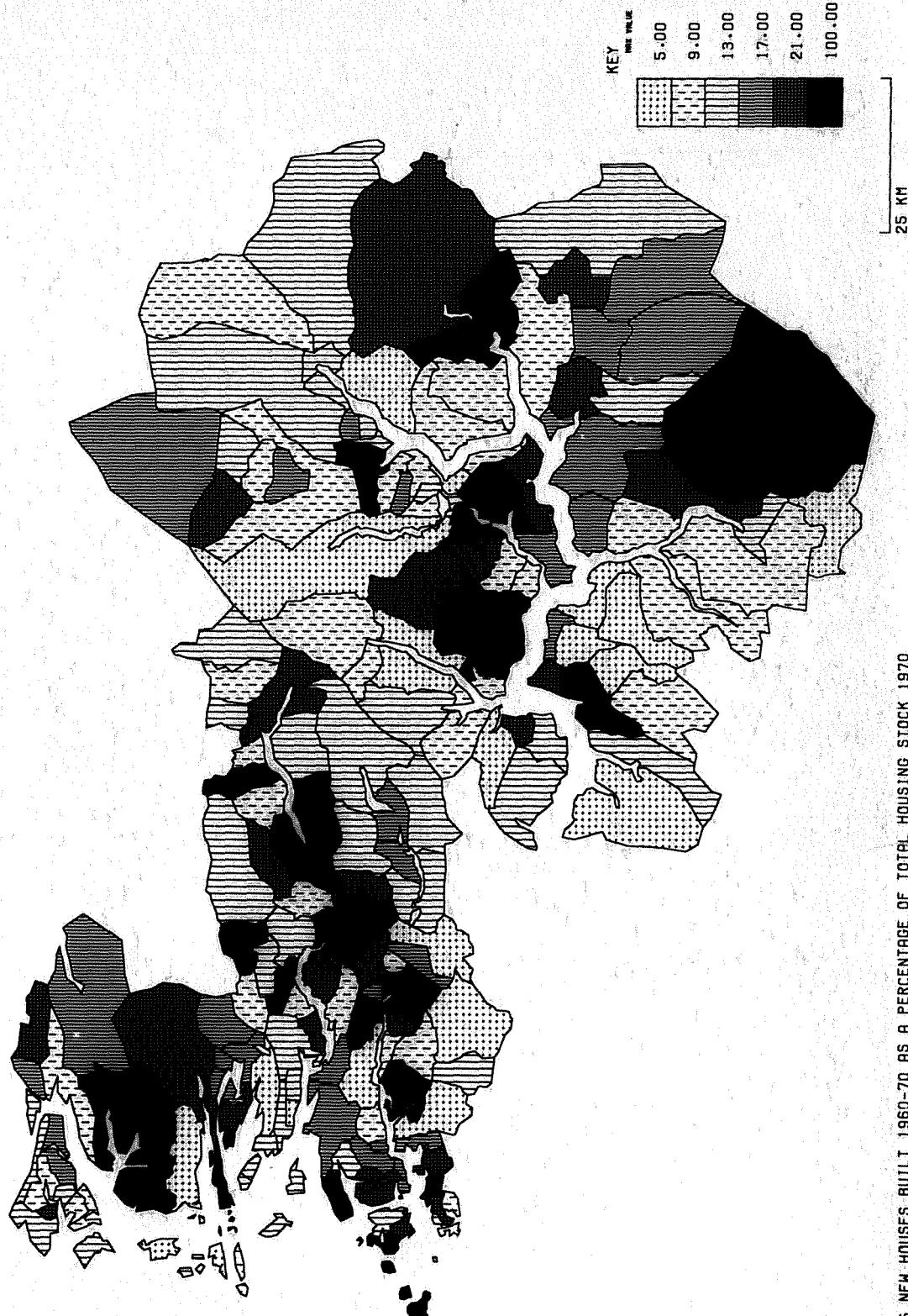
A.111.12 CHANGE IN PROPN. ECON. ACTIVE IN INDUSTRY AND CONSTRUCTION 1960-0.0



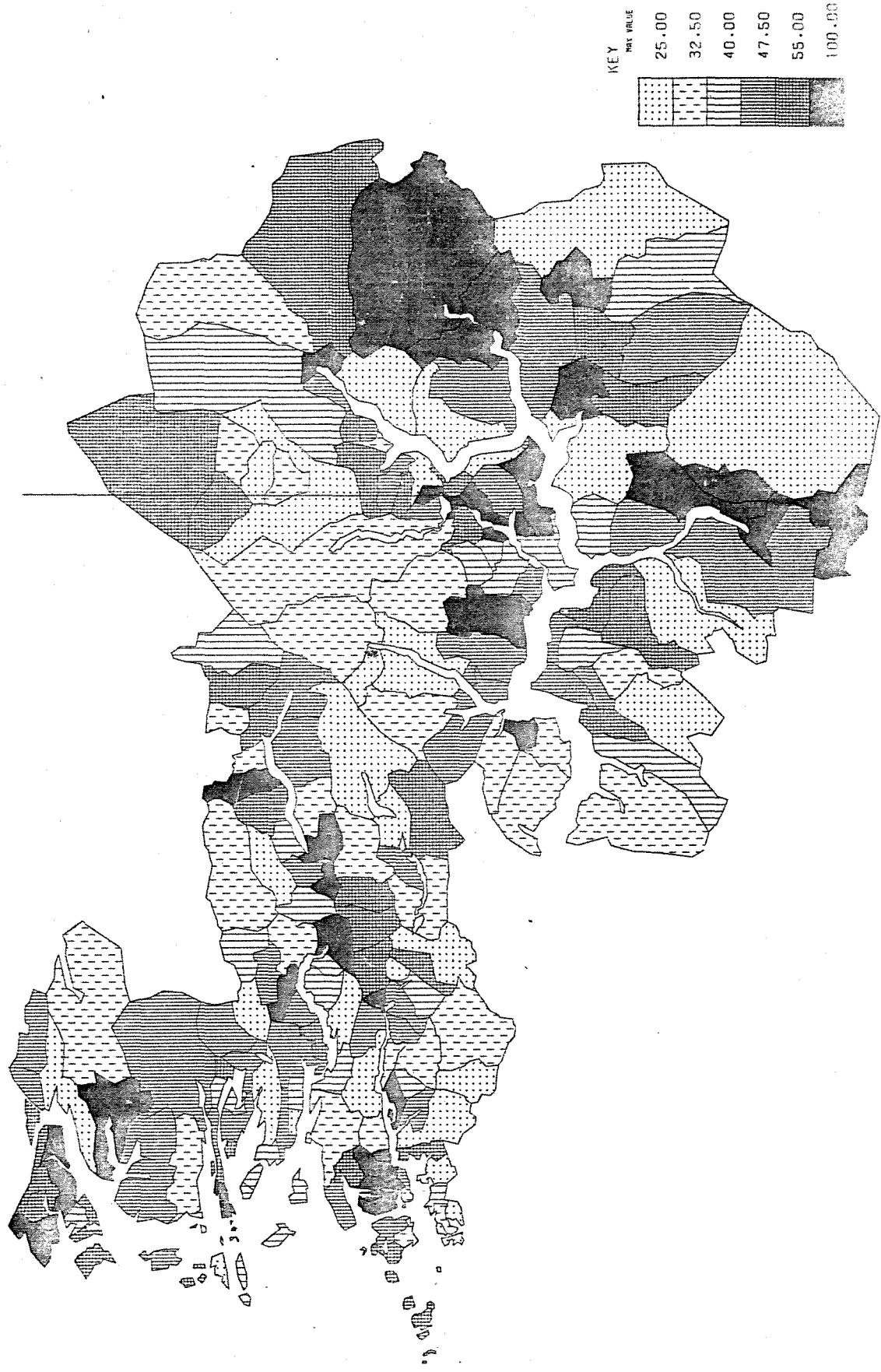




A.111.15 CHANGE IN PROPN. OF ADULTS RECEIVING PENSIONS AS MAIN INCOME 1960=0.0



A.111.16 NEW HOUSES BUILT 1960-70 AS A PERCENTAGE OF TOTAL HOUSING STOCK 1970



Appendix iv Detailed references to sources of data

A.iv.1:

All variables Statistisk Årbok 1971 NOS XII 269
 1972 NOS XII 274
 1973 NOS XII 276.

With the exception of:

B. Unemployment NOS A 479 Arbeidsmarkedstatistikk 1971
 I. All secondary teachers per 100 pupils
 NOS A 568 Utdanningstatistikk Folkehøg-
 skolar, realskolar, gymnas 1.10.1972
 N. All primary teachers per 100 pupils
 P. Percent pupils using Nynorsk
 NOS A 619 Utdanningsstatistikk Grunn-
 skoler 1.10.1972

A.iv.2:

NOS A 476 Folketallet i kommunene 1971-2
 NOS A 504 Flyttestatistikk 1971
 NOS A 552 Folketallet i kommunene 1972-3
 NOS A 577 Flyttestatistikk 1972
 NOS A 630 Folketallet i kommunene 1973-4
 NOS A 649 Flyttestatistikk 1973

A.iv.3:

NOS A 640 Statistisk Fylkeshefte 1973 Sogn og Fjordane
 p.109

A.iv.4:

NOS A 640, p.54-6

A.iv.5:

NOS A 376 Regionalt nasjonal regnskap 1965, p.80-3
 NOS A 640 p.104-108

A.iv.6:

- a. returns to employment exchanges of employment by sector to December 1970
- b. returns to employment exchanges of employment on notifiable construction projects
 manuscript, Fylkesarbeidskontoret, Leikanger.

A.iv.7:

returns of number of insured employees to social security authorities.
 manuscript, Trygdekontoret - kommunekasserar, Førde.

A.iv.8:

Since the population of enterprises in Førde is very small, any kind of sample survey is out of the question. However, the preparation of a structured format for the interviews proved to be of great value, and the points which emerged from the discussions revealed a great depth of feeling on the part of those interviewed. The anonymity of the respondents is slightly forced, in that anyone with knowledge of Førde will be able to identify them, but it is maintained in any case. Discussions with Hr. Asbjørn Steen of Førde Næringsamskipnaden in 1974 were very helpful in structuring the interviews, and Hr. Rolf Ovreliid provided much useful background information. I am very grateful for the helpfulness and understanding shown by the respondents.

A.iv.9:

Sparebankenes Årbok 1926-1939, 1951-1962. Series consulted at the library of Statistisk Sentralbyra
 Finansinstitusjoner 1963* NOS A 100
 1964 NOS A 130
 1965 NOS A 167
 1966 NOS A 207
 1967 NOS A 242
 1968 NOS A 295
 1969 NOS A 367
 1970 NOS A 501
 1971 NOS A 545
 1972 NOS A 610
 /1973 NOS A 674/

1973 accounts taken from local newspapers 'Firda' /Førde/, 'Sogn og Fjordane', 'Sogningen S-A' /Leikanger/ during February and March 1974. Balestrand and Leikanger savings bank accounts were obtained from the banks themselves. For all years the series for Fjærland Privatbank were obtained from manuscript bank records, by courtesy of Bonde Johs. A. Bøyum, bank administrator.

A.iv.10:

returns of number of insured employees to social security authorities.
 manuscript, Kommunekasserar, Sogndal

A.iv.11:

Statistiske kommunehefter include tabulated results of the Population Census for each commune; they are published for each commune.

A.iv.12

Folketellingen 1. november 1960
 'Tellingsresultater - tilbakegaende tall - Prognoser'
 1417 Vik 1429 Fjaler
 1418 Balestrand 1430 Gaular
 1419 Leikanger 1431 Jølster
 1420 Sogndal 1432 Førde
 1421 Aurland 1433 Naustdal
 1422 Lærdal 1434 Vevring
 1423 Borgund 1435 Eikefjord
 1424 Ardal 1436 Bru
 1425 Hafslø 1437 Kinn
 1426 Luster 1438 Bremanger
 1427 Jostedal 1442 Davik
 1428 Askvoll 1401 Florø

Folketellingen 1. november 1970
 'Statistiske Kommunehefter'
 1417 Vik 1428 Askvoll
 1418 Balestrand 1429 Fjaler
 1419 Leikanger 1430 Gaular
 1420 Sogndal 1431 Jølster
 1421 Aurland 1432 Førde
 1422 Lærdal 1433 Naustdal
 1424 Ardal 1438 Bremanger
 1426 Luster 1401 Flora

Kretsfile - maskintabell 201, Folketellingen 1960.
 data field

10-23	Age groups 10-14, 15-19 by sex
52-59	Age 60 and over by sex
60	Total economically active
65	Economically active in agriculture
67	Economically active in fisheries, sealing
122-125	Economically active in basic metals
135-136	Economically active in building and construction

A.iv.13:

The list consisted of a table by commune of 'Gard' numbers and 'bruk' numbers, beside the equivalent Agricultural Census reply serial numbers

A.iv.14:

Jordbrukssteljinga 20.6.1969 Fylkeshefte: Sogn og Fjordane
 NOS A 425

A.iv.15:

Jordbrukssteljinga 20.6.1969 1. Hefte NOS A 413

References to Skjema 1, appendix 3 of NOS A 413

page 1		age of holder
page 1, cols 36		farm area
1	65-8	total cows on 20.6.1969
1	69-70	total sheep on 20.6.1969
2	20-2,50	farm machinery
3	27-40	section M The holding as work place and source of income
4	30,31,43,57-9	Silos, huts on the holding
4	73-6	purchases of inputs in 1968

A.iv.16:

Jordbrukssteljinga 1959 1. Hefte NOS XII 40

Jordbrukssteljinga 1959 3. Hefte NOS XII 79

Jordbrukssteljinga 1969 fylkeshefte Sogn og Fjordane,
NOS A 425

A.iv.17:

Manuscript census records held in the state Archives, Bergen, for 1875 and 1900. The records consist of lists of household members for each household, with details of age, sex, relationship to head of household, occupation, and the social category of the household. For instance, the occupation of land-owning family heads is given as 'gardsbruker' and of husmenn families as 'husmann med jord'. The place of birth of household members is also stated for 1900.

A.iv.18:

Fjærland Privatbank manuscript records; yearly accounts and loan book.

A.iv.19:

Yearly records of Fjærland Fjøskontrollag 1959-74, containing summaries for all herds of fjøskontrollag members in Fjærland, and for all milch cows in these herds, from which tables were taken the averages by breed.

A.iv.20:

Information from Vik dairy - Sognemeieriet - provided by Hermod Hustveit, Sogn og Fjordane Landbrukselskap

A.iv.21:

Information from A/S Halvard Drægni, Hermansverk

A.iv.22:

Information from Vestlandske Salslag, Sogndal slakteriet, provided by Hermod Hustveit, Sogn og Fjordane Landbruks-selskap

A.iv.23:

Population census totals for the parish of Fjærland. 1801, 1865, and 1891 censuses, State Archives, Oslo.

A.iv.24:

Information from 1960 and 1970 Population censuses from districts 10-12 of file of data analysed in Chapter 4.

A.iv.25:

Numbers of births and deaths taken from Fjærland Parish register held by Bonde Anders Supphellen, Fjærland.

A.iv.26:

Annual meeting of the dairy co-operative in Fjærland, February 1974, and information from Meieristyrar Arne Bø

A.iv.27:

Quantities and prices from Vestlandske Salslag, with the assistance of Hermod Hustveit, Sogn og Fjordane Landbruks-selskap

A.iv.28:

Information concerning the subsidies received by Fjærland farmers came mainly from Heradsagronom Arne Sandnes

A.iv.29:

Annual accounts of Balestrand Trygdekontoret for 1973

A.iv.30:

Information from hotel and pensjonat proprietors

A.iv.31:

Information from Fjærland Billag L/L

A.iv.32:

Information from Balestrand kommune administration

A.iv.33:

Information from Hr. Kristian Höisaether, proprietor of
the shoe factory

A.iv.34:

Information from the two retail establishments,
Mundal & Vangenes, and Sogn Samyrkelag, avdeling pa
Fjærland

A.iv.35:

Consumption of postal services NOS A 640, p.141; telephone
usage from 'Televerkets statistikk' 1972 Teledirektoratet
Oslo.

A.iv.36:

Information from Balestrand Likningskontoret, provided by
Hermod Hustveit, Sogn og Fjordane Landbrukselskap.

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