

THE SMALL FARMERS PROBLEM IN THE
SANDY SOIL REGIONS

TREND DURING THE PERIOD 1949-1958

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SANDY SOIL REGIONS

TREND DURING THE PERIOD 1949-1958

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CONTENTS

Foreword	7
Introduction	9
The three enquiries	11
Number and size of holdings	12
Scheme of production and type of holding	14
Pattern of labour	15
Labour productivity	18
Future prospects of the family farm	20
Trend in the period 1958-1968	21
Concluding remarks	25
Table of appendices	27

FOREWORD

The small farmers problem is not a typically Dutch one. In almost every country in Europe agriculture is faced with serious structural problems. The ratio in which the factors of production are combined and the circumstances in which production is carried on represent weak spots in European agriculture. It can be said without exaggeration that in many countries in Europe the structure of farming has become antiquated.

Consciousness of this situation arose in many countries and efforts are being made to improve the structure of farming, the problem of the small farms playing an important role in this endeavour.

The Agricultural Economics Research Institute carried out a detailed enquiry into the small farmers problem in the sandy soil regions as early as 1949, also into the possibilities of finding a solution. In order to be able to follow the trend, stage by stage, the enquiry was repeated in 1953 and 1958.

In view of the great importance of the small-farm problem in Western Europe, the results of the research done in 1958 are now being published, in summarized form, in English, references being made, where required, to the results thrown up by the previous enquiries. In this way information regarding the methods employed and the results achieved will be made available to a wider group.

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The Hague, July, 1961.
175, Conradkade.

INTRODUCTION

There is nothing new in the presence of a large number of small farms in the Netherlands. As in other Western European countries, the size-composition of farms in the country is not, after all, the result of very recent developments but of a long historical process. By and large, it can be said that the present size-composition of Dutch farms was already discernible at the beginning of the century.

A remarkable fact, however, is that it was only after 1930 that the presence of a large number of small farms began to be looked upon as a problem. The chief causes of this awareness were more and improved means of communication and the economic depression of the 'thirties. As a result of the first cause, farming and the rural areas generally came into ever closer contact with urban ways of life and with the non-agrarian branches of industry, as a result of which there was a broadening of the country people's horizons and a rise in the level of their aspirations. The effect of the depression in the 'thirties was that this increasing contact failed to lead to a migration of agricultural labour from the farms into the urban industries. Accordingly, we see in the 1930-1947 period that the numbers employed in agriculture continue to increase while the area of land under cultivation remains practically the same. If we also bear in mind the sharp decline in agricultural prices, it will come as a surprise to no one that farming should in this period have found itself involved in a crisis, one in which the small farms particularly became a pressing problem.

For the time being a solution was sought along the lines of more intensive farming, while measures to aid agriculture were necessary to help farming through the first difficult period. Whereas the solution advocated was, in the prevailing circumstances, understandable - there was large-scale unemployment in the Netherlands at the time - after 1945 it gradually became clear that more intensive farming can make only a limited contribution towards finding a solution, while though aid for agriculture can indeed provide temporary alleviation, it can do little to bring about a permanent solution to the problem of the small farms.

This is why the Agricultural Economics Research Institute was requested, in 1948, to undertake another thorough investigation of the matter. The enquiry was to concern itself particularly with the real causes of the trouble and to indicate the principles on the basis of which a lasting solution could be arrived at.

Although large numbers of small farms were to be found in almost all regions of the Netherlands, they were especially plentiful in the sandy soil regions. Of the 123,500 agricultural and market gardening undertakings in the sandy soil regions in 1947 (almost half the total number of holdings in the Netherlands) 43 % were smaller than 5 hectares and

73 % smaller than 10 hectares. In 1948 it was therefore decided to restrict the enquiry to the sandy soil regions.

In table 1 and appendix 1 figures are given showing the trend in the number and size of holdings during the past 50 years. These figures relate to undertakings of those whose *main occupation* is in farming or market gardening.

All figures throughout this report are based on hectares. 1 hectare : 2.47 acres.

HOLDINGS OF LANDUSERS WHOSE MAIN OCCUPATION IS IN
FARMING OR MARKET GARDENING

TABLE I

Size group	Holdings in sandy-soil regions				Holdings in the Netherlands			
	in 1910 no.	in 1947 no.	in 1959		in 1910 no.	in 1947 no.	in 1959	
			no.	%			no.	%
1- 5 ha	36,000	42,500	24,800	26	64,800	87,000	56,000	29
5-10 ha	23,100	36,600	37,400	39	38,400	58,100	59,500	31
10-20 ha	13,500	25,300	27,400	28	29,700	48,500	53,200	27
≥20 ha	5,200	7,700	6,700	7	26,700	28,300	25,800	13
All size groups	77,800	112,100	96,300	100	159,600	221,900	194,500	100

Sources: Directorate of Agriculture (1910); Central Bureau of Statistics (1947 and 1959).

It may be as well to point out that it is not in the Netherlands alone that there is a large number of small holdings and that the man-land ratio is very high. Table 2 gives an indication of the size-composition and the volume of labour employed on farms etc. in the six countries of the European Economic Community (E.E.C.). Denmark has also been chosen since the structure of agriculture presents a different picture in this country.

If one compares the six E.E.C. countries with Denmark, it will be seen that in the former countries the structure of agriculture lags far behind that in Denmark. The average size of holding in Denmark is twice as large, while the density of labour is almost 40 % lower. It should be remembered, however, that farming here is highly intensive, almost as intensive as in the Netherlands.

These approximate figures show that it is desirable that the E.E.C. countries should pay great attention to the structure of agriculture. This seems all the more necessary when one notices that even in Denmark

HOLDINGS, LAND UNDER CULTIVATION AND MALE LABOUR EMPLOYED IN AGRICULTURE IN THE E.E.C. COUNTRIES AND DENMARK

TABLE 2

Country	No. of holdings x 1,000	Area in 1,000 ha	% holdings in size groups of				Av. size of holding in ha	Male labour employed in agriculture			Figures for the year	
			1-10 ha	10-20 ha	20-50 ha	≥ 50 ha		in 1,000	as a % of total male employed pop.	no. per 100 ha cultivated land	holdings	employed pop.
Netherlands	233	2,279	66	22	11	1	9.78	445	15	19.5	1957	1956
Belgium	252	1,795	81	13	5	1	7.12	352	10	20.5	1950	1956
Luxembourg	14	141	62	24	13	1	10.07	21	21	14.6	1950	1947
Western Germany	1,770	13,255	77 ¹	15	7	1	7.49	2,316	15	17.5	1957	1957
France	2,117	28,600	53	25	18	4	13.51	3,200	25	11.2	1956	1957
Italy	4,658	20,628	93 ¹	5 ²	1 ²	1	4.43	5,093	34	24.7	1955	1956
All E.E.C. countries	9,044	66,698	80	12	6	2	7.37	11,327	22	17.0	—	—
Denmark	199	3,105	47 ¹	41 ³	10 ³	2 ³	15.60	340	24	11.0	1956	1956

¹ Size group 0.5-10 ha. ² Size groups 10-25 ha and 25-50 ha. ³ Size groups 10-30 ha, 30-60 ha and ≥ 60 ha.

Sources: Central Bureau of Statistics and Ministry of Agriculture and Fisheries.

this structure is still undergoing change. Between 1950 and 1957, for instance, the population employed in agriculture decreased by almost 20 %.

THE THREE ENQUIRIES

After the enquiry for the year 1948 it proved desirable to be able to follow the further trend. Further enquiries were made, therefore, covering the years 1952 and 1957, from which a picture was obtained of the changes taking place on the small holdings. ¹

The terms of reference were more or less the same for each of these enquiries: what differences occur in labour productivity as between large farms and small farms and what trend is discernible in this respect? Great attention was paid here to the two factors which determine this trend, viz., the amount of labour employed and the scheme of production. Another important factor was the choice of occupation made by farmers' sons.

The available statistical data furnished no impression with regard to these problems and therefore an enquiry had to be made among the farmers for each research project. Among the questions put to the farmers were those regarding the labour employed (numbers employed, duration of their employment), the production scheme and farming

¹ See: „Het kleine-boerenvraagstuk op de zandgronden”, Assen, 1951, 254 pp., with English summary.

„De ontwikkeling van het kleine-boerenvraagstuk op de zandgronden in de periode van 1949-1953”, 's-Gravenhage, 1954, 84 pp.

„Het kleine-boerenvraagstuk op de zandgronden, ontwikkeling in de periode 1949-1958”, 's-Gravenhage, 1960, 66 pp.

methods (sort and acreage of crops grown, livestock numbers, use of artificial fertilizers and concentrates), methods used (machines employed and tractive power, use made of the services of wage-earning labour) and the choice of occupation and schooling of the children (appendix 2). A number of municipalities were chosen for making the enquiries which could, in the aggregate, be regarded as representative of the sandy soil regions as a whole. Thus in 1949 the enquiry was held in 13 municipalities (local government divisions), in 1953 in 5 and in 1958 in 10. As far as possible the same municipalities were chosen each time. The information obtained in this way referred in each case to the foregoing calendar year.

THE SAMPLES

TABLE 3

	Landusers in					
	1948		1952		1957	
	no.	%	no.	%	no.	%
With holdings of ≥ 1 hectare:						
in the sandy soil regions	123,500		122,000		117,500	
in the sample municipalities	9,780		4,389		6,071	
Covered by enquiry:						
in the sample municipalities		95		88		85
in the sandy-soils regions		7.5		3.2		4.4

The enquiry covering 1948 revealed that, given the customary scheme of production, the core of the smallholder problem lays in the unsatisfactory ratio between the amount of labour and the amount of land on the small farms, resulting in low labour productivity.

The conclusion was that in order to bring about an increase in labour productivity three solutions were, in principle, possible:

- a. increasing the intensity of farming;
- b. reduction in the amount of labour employed;
- c. enlargement of the farms.

When the enquiry was repeated once again to cover 1957, it became possible to study the trend over a longer period of years. This trend, reflected in the third report on the smallholder problem, will now be briefly discussed, some of the results of the enquiries covering 1948 and 1952 also being mentioned.

NUMBER AND SIZE OF HOLDINGS

Change and mobility are the features which can be said to characterize land use in the sandy soil regions during the postwar years.

Change is indicated by the fact that the total number of holdings, which continually increased from the beginning of the century on, due to land development and the splitting up of farms, has declined from 1947

onwards. In a sense, the year 1947 can be seen as a turning point in the trend of the number of holdings. If 100 is taken as the index figure for the total number of landusers in that year, then the figure for 1957 had decreased to 95. The figure for the number who also had their main occupation in farming or market gardening was, however, only 87 in 1957. Thus the number of "real" farmers and market gardeners has decreased relatively more quickly than the total number of landusers.¹ The obvious conclusion is, therefore, that some smallholders whose main occupation was formerly in farming (or at least according to their returns) now apparently earn their main income in occupations outside agriculture.

It has been particularly the (very) small holdings which have decreased in number. The number of those of 7 hectares and over has, however, increased (see table 1 and appendix 1). Thus, generally speaking, there is a tendency for farms to become larger in size. All the same, the splitting up of holdings still occurs. Unlike the situation in former days, this is now mainly confined to the larger farms.

An indication of *mobility* as regards land use is the relatively large number of holdings (43 %) whose size has changed as time has gone by. In the majority of cases these changes have meant an increase in size, in many cases (47 %) increases amounting to more than half the original size. Underlying this process of the gradual building-up (and partly of the breaking-down again) of the holding is an endeavour to adapt the size of the farm to the fluctuating numbers employed on it.

For the purposes of the enquiry the landusers were divided into the following four groups:

	1948	1957
A. farmers and market gardeners	67 %	66 %
B. farmers and market gardeners with a subsidiary occupation	13 %	8 %
C. landusers with their main occupation outside farming	15 %	19 %
D. non-active farmers and others on pension	5 %	7 %

These figures show certain shifts in the period 1948-1957. The groups of farms which were included in the three research projects are not, therefore, perfectly comparable. For instance, the percentage of small holdings in the sample has declined and this has undoubtedly had an effect on the total average productivity of labour and on the number of complete units of labour per 100 hectares of cultivated area.

In what now follows only the actual changes which have occurred will be mentioned. The question as to how far these changes have been

¹ The expression "farmers and market gardeners" is used for accuracy although the number of market gardening holdings proper is very small in the sandy soil regions.

influenced by the somewhat modified composition of the sample will be left out of account for the sake of brevity.

SCHEME OF PRODUCTION AND TYPE HOLDING

The scheme of production adopted on the mixed farm in the sandy soil regions varies considerably, largely dependent upon the district and the size of holding. Generally speaking livestock farming is the chief item and milk the main product. Arable farming on these holdings is almost entirely devoted to supplying the needs of livestock farming. In addition to the larger farms, where cattle farming is relatively the most important occupation, there are smaller undertakings with a relatively large number of pigs and hens or on which a good deal of market gardening is done. Branches of production not tied to the soil, such as pig and poultry keeping, provide the smaller farms with possibilities of arriving at a labour-intensive scheme of production.

In approaching the problem of raising labour productivity on small undertakings via the size in hectares, it should not be forgotten that the level of intensity is one of the factors which determine the size of farm. To arrive at this level, production on the farm (which is often highly varied) is expressed in standard hours. These are ratio figures derived from the amounts of labour which were necessary on mixed farms of 10 to 15 hectares for tending various types of animal and crop. The conversion standards used for this are given in appendix 3.

AVERAGE NUMBER OF STANDARD HOURS PER HOLDING AND PER HECTARE ¹
(1 hectare: 2.47 acres)

TABLE 4

Size group	No. of holdings in 1957	No. of standard hours in 1957 per		Percentage of standard hours for							Index figures in standard hours per ha (1948 : 100)	
		holding	hectare	arable land	pasture	market gard. land	cattle	horses	pigs	poultry	1952	1957
1-3 ha	170	2,641	1203	11	5	35	21	1	8	19	122	160
3-5 ha	379	3,390	838	17	8	13	31	3	11	17	116	137
5-7 ha	566	4,388	737	19	9	8	32	4	12	16	113	137
7-10 ha	848	5,950	648	23	10	5	33	3	13	13	117	130
10-12 ha	370	6,413	588	24	12	4	35	3	12	10	117	126
12-15 ha	331	7,482	565	25	12	4	36	3	11	9	116	124
15-20 ha	297	9,224	540	25	13	6	36	3	10	7	114	126
20-30 ha	179	11,933	504	25	15	8	38	3	8	3	110	124
≥30 ha	49	16,479	409	26	19	2	41	2	7	2	112	116
All size groups	3,189	6,075	603	23	11	7	34	3	11	11	115	129

¹ In calculating the number of standard hours the 1948 standards have been used.

The number of standard hours per hectare is considerably higher on the smaller farms than on the larger ones. Moreover, the differences in

the number of standard hours for farms within the same size group show a considerable spread. For instance, in 1957 the intensity level in the 7-10 hectare size group was as follows:

2 % of the holdings: less than 350 standard hours per hectare			
20 %	„	„	: 350-449
20 %	„	„	: 450-499
17 %	„	„	: 500-549
17 %	„	„	: 550-599
17 %	„	„	: 600-699
6 %	„	„	: 700-899
1 %	„	„	: more than 900

When one enquires into the reasons for this spread within a single size group, little relation is found to exist on individual farms of roughly the same size between the amount of labour and the intensity of the farming, although there did seem to be more relation when the last enquiry was made, as compared with the enquiries covering 1948 and 1952. Thus the spread of intensity per hectare must be influenced by other factors. It does not seem improbable that the capacities and disposition of the farmer himself are of great influence here.

A yardstick for judging the significance of the various sectors of production on the farm is the number of standard hours required for it (table 4). With the exception of holdings of less than 3 hectares (predominantly market gardening, pigs and poultry) cattle farming is still the most important type of farming done. It is true that as regards the 1948 figures a tendency can be discerned for the relative significance of cattle farming to decline and that of pig and poultry keeping to increase. A survey of the scheme of production of the individual farms by no means supports the view that there is any large-scale specialization in pig or poultry keeping. On the contrary, the farms in the sandy soil regions are still today variants of a single type, viz., the mixed sandy soil type with a strong emphasis laid on cattle farming.

PATTERN OF LABOUR

The agricultural undertaking in the sandy soil regions is predominantly a family farm. This is shown by the fact that, although 13 % of the holdings employed permanent or temporary outside labour in 1957, this labour did not account for more than 5 % of the total activity. It is mainly the larger type of holding on which the farmer has (as yet) no son to assist him that makes use of outside labour. The operators take a total of 51 % of the work for their own account, the wives and daughters 15 %, the sons 24 % and other members of the family (fathers, brothers) 5 % (see appendix 4).

In order to be able to compare the amount of labour employed per holding or per unit of land on farms of different size, the different



At busy activities "neighbourhelp" is still welcome; father, son and neighbour at silage making

Photo: Ministry of Agriculture and Fisheries

categories of labour have been converted into full labour units (f.l.u.). Appendix 5 shows how this has been done.

FULL LABOUR UNITS PER HOLDING ¹

TABLE 5

Size group	No. of full labour units						Index figures (1948: 100)	
	per holding			per 100 ha farmland			1952	1957
	1948	1952	1957	1948	1952	1957		
1-3 ha	1.3	1.1	1.1	55.7	46.8	49.2	84	88
3-5 ha	1.4	1.3	1.3	34.8	32.3	31.2	93	90
5-7 ha	1.6	1.5	1.4	27.2	25.7	24.0	94	88
7-10 ha	1.8	1.8	1.6	21.3	20.9	19.0	98	89
10-12 ha	2.1	2.0	1.8	19.1	18.1	16.5	95	86
12-15 ha	2.4	2.2	1.9	17.8	16.8	14.7	94	83
15-20 ha	2.6	2.5	2.2	15.2	14.8	12.7	97	83
20-30 ha	3.1	3.0	2.7	13.4	13.0	11.3	97	84
≥30 ha	4.0	3.9	3.6	10.0	10.0	8.5	100	85
All size groups	2.0	1.9	1.7	19.7	19.0	16.9	97	86

¹ Particulars of holders whose only occupation was that of farmer or market gardener.

In the period 1948-1957 the amount of labour employed declined on the average by 14%, the decline being rather less on the smaller holdings (10%-20%) than on the larger holdings (16%-18%).

Although on the mixed farm the work is mainly done by the farmer and the members of his family, a number of highly divergent patterns of labour can be distinguished. The family cycle is one of the primary influences on this, a secondary influence being the size of the holding.

LABOUR EMPLOYED ACCORDING TO TYPE ¹

TABLE 6

Type ²	Holdings		Average amount of labour in f.l.u. per holding					all size groups
	no.	%	in size groups of					
			1-7 ha	7-10 ha	10-15 ha	15-20 ha	≥ 20 ha	
Holder	1,717	44	1.2	1.2	1.4	1.4	1.3	1.2
Holder and son(s)	1,344	34	1.7	2.0	2.2	2.4	3.0	2.1
Holder and outside labour	511	13	1.4	1.6	1.7	2.2	2.9	2.0
Holder and family living in ³	383	9	1.6	1.9	2.0	2.1	2.8	1.9
All types	3,955	100	1.3	1.6	1.9	2.2	2.8	1.7

¹ Particulars of holders whose main occupation is farmer or market gardener.

² Possibly with wife and/or daughters assisting.

³ The other combinations, representing only 2% of all the types together, are included here as well.

The holdings where the farmer is the only male labour (assisted in most cases by his wife and/or daughter(s)) are the most important group numerically (44%). The majority are young families. Older families occur in this group too, either without sons or with all the sons working in non-agricultural occupations; also operators who are unmarried. This type can be called the one-man holding. Owing, however, to the assistance given by female members of the family, the average labour employed works out at 1.2 full labour units.

A second important group is formed by the father-son(s) holdings (34%). The spread as regards the number of full labour units is greater in this type than in the one-man holdings. The average amount of labour works out at 2.1 full labour units.

Finally, there are holdings where, in addition to the operator, outside labour is employed (13%) or that of members of the family living in, such as fathers, brothers and uncles (9%).

For sons of farmers working in agriculture an important point is their chances of becoming independent farmers some time in the future. The ratio between the number of sons "waiting" on a holding and the number of holdings becoming available to them in the future is called the "generation pressure". This concept is explained in greater detail in appendix 6.

On undertakings in the sandy soil regions the generation pressure proved to be as follows:

holdings smaller than 5 hectares: 0.8

holdings of from 5-10 hectares : 1.0

holdings of 10 or more hectares : 1.9

Although there was a great increase in migration from agriculture in the period 1948-1957 - the generation pressure decreased from 1.6 to 1.3 - there are still too many successors on the larger farms, compared with the opportunities for them to succeed their fathers.

On about three of every four father-son(s) holdings one son was working, and two or more on the rest.

One-man holdings and holdings employing members of the family living in are relatively the most frequent among the smaller undertakings. On the average the father-son(s) type and the holdings employing outside labour are rather larger than the first-mentioned types.

LABOUR PRODUCTIVITY

This is determined on the one hand by the number of standard hours and on the other by the amount of labour employed. We call the quotient of the number of standard hours and the amount of labour the "labour effect". The aim of calculating this "labour effect" is to measure, in simple manner, the productivity of labour on holdings for which no economic data are available and it actually indicates the number of units of production produced by one man.

The labour effect is determined to an important degree by the efficiency of labour (rate of working, division of labour, methods employed) and by the degree of mechanization which in turn are powerfully influenced by the quality of the labour and by the conditions of production. Particulars of holdings for which the Agricultural Economics Research Institute maintains the book-keeping and records throw up little difference over the course of the years in the average labour income per standard hour as between small and large holdings. It may be concluded from this that the figures showing the differences in labour effect are also a good yardstick for measuring the differences in labour income as between large holdings and small. Naturally, there are sometimes considerable differences between individual farms as regards labour income per standard hour, yet these latter differences prove to be independent of the size of the undertaking and of the labour effect.

On average, the labour effect, and therefore the labour income as well, is twice as large on the large holdings as it is on the small, and it is naturally important for a solution to the smallholder problem that wide differences in labour productivity as between large holding and small should disappear.

During the period 1948-1957 the labour effect in practically all size groups increased by 50 %, without doubt no small achievement. How-

STANDARD HOURS, AMOUNT OF LABOUR AND LABOUR EFFECT ¹

TABLE 7

Size groups	No. of holdings	No. of standard hours per		Amount of labour in f.l.u. per		Labour effect in st. hours per f.l.u. 1957	Index figures (1948: 100) of					
		ha of land 1957	holding 1957	100 ha land 1957	holding 1957		no. of st. hours per ha land		amount of labour per 100 ha land		labour effect	
							1952	1957	1952	1957	1952	1957
1-3 ha	85	1,007	2,235	49.3	1.1	2,044	122	156	84	88	145	177
3-5 ha	261	782	3,190	31.2	1.3	2,509	116	134	93	90	125	151
5-7 ha	402	728	4,331	24.0	1.4	3,037	113	137	94	88	121	156
7-10 ha	595	636	5,366	19.0	1.6	3,351	117	130	98	89	118	146
10-12 ha	277	581	6,339	16.5	1.8	3,524	117	126	95	86	123	146
12-15 ha	241	558	7,403	14.7	1.9	3,805	116	126	94	83	123	153
15-20 ha	208	533	9,075	12.7	2.2	4,214	114	127	97	83	118	153
20-30 ha	107	524	12,458	11.3	2.7	4,619	110	128	97	84	114	152
≥30 ha	31	417	17,778	8.5	3.6	4,929	112	118	100	85	111	140
All holdings	2,207	595	6,012	16.9	1.7	3,523	115	129	97	86	120	151

¹ 1948 standards; heads of holdings with main occupation exclusively that of farmer or market gardener.

ever, the differences in labour effect as between the larger undertakings and the smaller have not diminished to any degree worth mentioning. We may ask: what are the main factors which determine the labour effect? Table 7 shows that the labour effect increases as the holdings increase in size. This does not justify the conclusion, however, that it is the area under cultivation which determines the labour effect. Table 8 shows that it is much rather *the density of labour*, i.e. the number of full labour units per 100 hectares of cultivated area, which determines this.

LABOUR EFFECT AND SIZE OF HOLDING ¹

TABLE 8

Criterion	Size group	Employed labour in f.l.u. per 100 hectares						Average labour effect	No. of holdings
		≥ 30	25-29	20-24	15-19	12-14	< 12		
Labour effect	1-7 ha	1,797	2,284	2,660	3,162	3,725	—	2,305	
	7-10 ha	1,709	2,211	2,354	3,145	3,705	4,296	2,742	
	10-15 ha	1,660	2,064	2,300	2,836	3,462	4,475	2,997	
	15-20 ha	—	—	2,234	2,814	3,290	4,337	3,514	
	≥20 ha	—	—	—	2,977	3,174	4,465	3,993	
	all size groups	1,890	2,219	2,455	2,998	3,447	4,364	2,901	
No. of holdings	1-7 ha	252	139	175	129	23	2	720	
	7-10 ha	34	90	101	170	104	29	528	
	10-15 ha	7	24	53	153	118	113	468	
	15-20 ha	1	1	8	28	55	95	188	
	≥20 ha	1	—	—	11	22	84	118	
	all size groups	295	254	337	491	322	323	2,022	

¹ 1957 standards; main occupation of head of holding: farmer or market gardener.

Holdings with a high density of labour prove to have a low labour effect, which applies both to large and to small undertakings. On holdings with a low density of labour the labour effect is, on the contrary, high, both on large and small undertakings. This justifies the conclusion that the density of labour was the main determinant of the labour effect.

Table 8 also shows that there are wide variations in labour effect within each size group, and these are caused by the difference in labour density. Since in the smaller size groups holdings with a high labour density are greatly predominant, the average labour effect on the small undertakings is low. But a high labour effect is also possible on small holdings, provided the density of labour is low.

The phase reached by the cycle of the family besides the size of the undertaking exerts a great influence on the density of labour employed. Four patterns of labour are shown in table 6. In all the size groups smaller than 20 hectares, holdings on which a son or sons or members of the family living in assist the farmer show a much lower labour effect than holdings worked by the farmer alone. The figures are as follows:

1- 7 ha	with head of holding only:	2550;	with others:	1940;
7-10 ha	„ „ „ „ „	: 3310;	„ „	: 2260;
10-15 ha	„ „ „ „ „	: 3740;	„ „	: 2715;
15-20 ha	„ „ „ „ „	: 4825;	„ „	: 3175.

It is obvious that on the undertakings where a son or sons and/or other members of the family work in addition to the farmer himself there is a failure to bring the intensity of the farming and the type of production into line with the increased amount of labour used. One may ask how sons on the smaller farms who will eventually take over from their fathers can be provided with productive employment in the meantime. In view of the unfavourable ratio between small and large undertakings, this can only be partially achieved by having these sons work temporarily on larger farms instead of on their father's.

FUTURE PROSPECTS OF THE FAMILY FARM

The foregoing sections have shown that there has been a considerable increase in the productivity of labour in all size groups, but that the differences existing between undertakings of different size have not diminished. (See table 7).

What, now, are the prospects of a further raising of productivity generally, and of raising it to a higher degree on the small undertakings particularly? In principle, a further rise in the productivity of labour on mixed farms can be obtained by reducing the amount of labour employed and/or by intensification of the scheme of production.

On the small holdings, in contrast to the larger ones, there is little opportunity of reducing the amount of labour, since this has already

reached a minimum (see table 5). After all, on every undertaking where agriculture is the main occupation a farmer or market gardener is necessary as head of the undertaking.

As regards the intensification of the scheme of production, it can be said that the type of undertaking in the sandy soil regions still showed little sign of specialization in one or two branches of production in 1957, even on the smaller holdings. Inadequate adaptation of the number of standard hours to the density of labour is the reason for a relatively low labour effect on the smaller undertakings. In order to study the possibilities of intensifying the scheme of production, calculations will now be made of the consequences for the scheme of production of certain assumed trends as regards the productivity of labour, the amount of labour employed and the number of undertakings.

TREND IN THE PERIOD 1958-1968

To obtain an idea of the future volume of production in the sandy soil regions assumptions may be taken as a basis which link up with the trend shown in the period 1948-1957. Another point of departure is the technical potentialities of the present state of farming technique. Both approaches assume that the primary means by which an increase in the volume of production will be sought is an expansion in the size of the herd of cattle kept. It is only if this branch of farming has nothing to offer that endeavours will be made to increase production by keeping more pigs and poultry.

Confining ourselves to begin with to the first method of approach, the increase of labour productivity plays the main rôle here. The increase, necessary for the future too, can be brought by a reduction in the amount of labour and by intensification of the scheme of production. In addition to suppositions on these two points, it seems desirable to take into account changes in the size-composition of the holdings, i.e. the continued decrease in the number of small undertakings. As regards finding a solution to the smallholder problem, it is necessary to calculate a relatively greater increase in the productivity of labour on the smaller holdings, for it is by this means only that the differences in productivity can be reduced. Six assumptions have been made for the period, 1958-1969. They are:

1. Productivity of labour Increase of productivity by 3 or 5 % per annum. In the period 1948-1957 this figure was about 5 %.
2. Stepping-up of productivity on small holdings Raising of the labour effect on the smaller holdings to the level of the 10-12 hectare or of the 12-15 hectare size group.
3. Amount of labour On holdings in the 1-7 hectare group the same amount of labour is assumed; in the 7-15

hectare group, a decrease of 10 %, and a 20 % decrease on larger holdings. In the period 1948–1957 the decrease was on average 14 %.

4. Reduction in number of small holdings A 30 % decrease in the number of farms in the 1–3 hectare size group is assumed for the period 1958–1968; a 25 % decrease in the 3–5 hectare group, and 20 % in the 5–7 hectare group.
5. Scheme of production For holdings in the 1–7 hectare group it is assumed that the intensification of the scheme of production required for the above-mentioned assumptions will be achieved to the extent of 50 % by poultry keeping, 25 % by pig keeping and 25 % by other sectors. The following figures are assumed for the 7–15 hectare group: cattle 25 %, pigs 37½ %, and poultry 37½ %. On farms larger than 15 hectares: cattle 75 %, pigs 25 %.
6. Hours of work It is assumed that the number of hours worked by the farmer (at present still between 3200 and 3400 per annum) can be reduced by means of mechanization and rationalization.

In table 9 and appendix 7 the consequences of the assumed trend for the size of the stock of cattle, pigs and poultry are indicated.

EXPANSION OF THE LIVESTOCK IN THE PERIOD 1958-1969 ¹

TABLE 9

Description	Calculated increase in labour productivity (1957: 100)	Index figures (1957: 100) of the number of		
		dairy cows	porkers	laying hens
3 % per annum				
without small holdings catching up arrears including stepping-up of small holdings to level of holdings of:	130	101	145	149
10–12 ha	141	102	169	185
12–15 ha	147	104	186	206
5 % per annum				
without small holdings catching up arrears including stepping-up of small holdings to level of holdings of:	150	118	198	199
10–12 ha	161	119	225	241
12–15 ha	167	121	245	265

¹ In sandy soil regions

The increase in the number of livestock held is particularly important in the case of pig keeping and poultry keeping, where the maximum assumptions result in increases from 145 to 165 %. Another point which emerges is that the calculated increase in the number of livestock results to a greater extent from the general raising of the productivity of labour than from the extra increase on the smaller holdings. Besides this, a reduction of 16 % in the amount of labour employed is anticipated on the grounds of the third and fourth assumptions. This is partly why the rise in the volume of production remains within reasonable limits. Table 10 shows the consequences of the increase in the number of livestock per holding, the number of livestock being shown for 1957 and 1967. This is based on a 5 % rise in the productivity of labour, with the smaller holdings being raised to the level of holdings in the 10–12 size group, as a result of which the average productivity of labour in the sandy soil regions will rise by approximately 6 % per annum.

LIVESTOCK HELD IN THE SANDY SOIL REGIONS IN 1957 AND IN 1967 TABLE 10

Size group	No. of livestock per holding					
	dairy cows		porkers		laying hens	
	1957	1967	1957	1967	1957	1967
1– 3 ha	2.0	2.0	3.6	17.7	138	609
3– 5 ha	3.9	3.9	5.3	19.0	163	621
5– 7 ha	5.2	5.2	7.5	20.9	175	621
7–10 ha	6.6	8.5	9.4	23.7	180	418
10–12 ha	8.2	10.1	10.3	24.6	182	421
12–15 ha	9.5	11.7	12.4	29.1	189	467
15–20 ha	12.0	16.7	13.4	21.2	165	165
20–30 ha	15.8	22.1	14.4	24.8	110	110
≥30 ha	24.8	33.5	16.3	30.8	93	93

According to the assumptions made, the holdings smaller than 7 hectares will tend to become farms specializing in pig and poultry keeping. This applies also, though to a lesser degree, to holdings from 7 to 15 hectares, though for the time being cattle farming will continue to be the main branch, as it will naturally be on the larger undertakings.

As regards the second method of approach, this is based on the present technical possibilities, the present structure of farm sizes and the question as to how far the use of technical means of production are economically justified at present being left aside. Although views as to what is technically possible diverge, in our opinion the following figures afford a well-justified impression of the number of livestock and the number of hectares of farmland which can be tended by one man per annum (man-year):

poultry:	average number of laying hen, including rearing, augmentation etc.	4,000
pigs:	number of porkers delivered, including tending of breeding sows and piglets . .	500
cattle:	no. of dairy cows per man, including tending of pastureland and fodder production and breeding of young cattle .	15
arable farming:	no. of hectares of marketable crops . .	12
market gardening:	number of hectares	2.25

Compared with the present figures for the number of beasts kept and the number of hectares per man, these figures undoubtedly show a marked increase in labour productivity.



Pig holding is most important, because in Holland it does not require any cultivable land

Photo: Ministry of Agriculture and Fisheries

If, for the period 1958-1968, we take the volume of production as being at the 1957 level, then the result of the anticipated increase in the productivity of labour means that the number of full labour units will have to decline from about 170,000 to 100,000.

If, for this same period, the amount of labour employed is assumed to remain the same (i.e. the population employed in agriculture in the sandy soil regions), the increase in the productivity of labour could only be achieved by increasing the amount of livestock by 25 %, by replacing the cultivation of cash crops by the cultivation of fodder on about 100,000 hectares and by a further expansion, of about 600 % in the stock of pigs and poultry.

If, in this period, the amount of labour employed were to decline at the same rate as in the period 1948-1957, the requisite expansion of the stock of pigs and poultry would be about 400 to 500 %.

If one compares these figures with those produced by the first method of approach, the development based on the technical opportunities proves to lead to a far greater expansion of production or to a far more pronounced decline in the numbers employed in agriculture than that based on the recent trend.

CONCLUDING REMARKS

It can be said with justification that the stepping-up of the productivity of labour is essential in all branches of industry, agriculture included. If one takes into account a number of what, in our view, are realistic assumptions, such as a reduction in the amount of labour employed and in the number of small holdings, the desired increase in productivity in agriculture can only be brought about - without enlarging the size of the farms - by a large increase in the amount of livestock held, and especially of pigs and poultry. If one also takes into account a reduction in the differences in labour productivity as between small holdings and large, the necessary increase in the number of livestock becomes still more pronounced. According to the maximum assumptions in the model scheme developed to this end, the total increase would mean: a 21 % increase in the number of dairy cattle, a 145 % increase in the number of porkers and a 165 % increase in the numbers of laying hens.

The question is whether this increase in productivity can be met by profitable marketing. No answer can be given to this question since the future trends of the market have not been investigated. It should, however, be pointed out that the model scheme for which calculations have been given in the foregoing pages refers to a ten-year period only. Even after this period has expired, a further increase in the productivity of labour will be desirable, and failing the enlargement of the smaller holdings and an exodus from agriculture, this will result in the expansion of one or more branches of production and more far-reaching specialization in them.

As regards specialization, it should be emphasized that so far there has been no trend in this direction in practice, while specialization, moreover, implicates greater risks as a result of the more one-sided economic orientation. This leads us to the conclusion that migration out of agriculture and the enlargement of the size of holdings are always a safe way of raising the productivity of labour. The less one wishes to increase the volume of production, the more increased labour productivity will have to be achieved by means of migration from agriculture and larger holdings. Here attention should be drawn to the decline in the number of small undertakings since the war and the shortage of successors to the farmers on these holdings. In our view, it may be concluded from this that the spontaneous increase in the size of holdings will continue in the future. There are, of course, possibilities of stimulating this process.

Finally, stress should be laid on the desirability of greater mobility of labour and land. As far as labour is concerned, it is important to pay great attention to the arrangement by which the sons of farmers working on smaller holdings can go and work for a temporary period on larger undertakings and also to the reduction of the amount of labour used on the larger undertakings. Attention should also be paid to the phenomenon of the diminution of the productivity of labour when a one-man holding becomes a father-son holding. It is here particularly that greater mobility of land as a factor of production can make an important contribution. It does not seem improbable that the continuation of migration from agriculture will work in favour of greater mobility of land.

The way in which and the extent to which migration from agriculture and the enlargement of holdings is to be stimulated, or changes brought about in the scheme and volume of production and in the conditions of production generally are a matter of policy, of structural policy. The aim of the investigation made by the Agricultural Economics Research Institute is merely to indicate possibilities and to show what the consequences of a given policy will probably be.

TABLE OF APPENDICES

- Appendix 1 Holdings of 1 hectare and more on which the landusers main occupation is in farming or market gardening
- Appendix 2 Questionnaire
- Appendix 3 Standards for measuring the number of standard hours
- Appendix 4 Categories of labour
- Appendix 5 Calculation of the number of full labour units
- Appendix 6 Generation pressure and choice of occupation index
- Appendix 7 Expansion of the number of livestock held in the period 1958-1968

HOLDINGS OF ONE HECTARE AND MORE ON WHICH
THE LANDUSERS' MAIN OCCUPATION IS IN FARMING OR MARKET GARDENING

APPENDIX I

Size group	No. of holdings (x 1,000) in					% distribution over the various size groups in					Index figures (1910: 100)									
	1910	1921	1930	1947	1950	1955	1959	1910	1921	1930	1947	1950	1955	1959	1921	1930	1947	1950	1955	1959
Sandy soil regions																				
1-5 ha	36.0	38.7	37.0	42.5	39.3	32.8	24.8	46	45	39	38	36	31	26	107	103	118	109	91	69
5-10 ha	23.1	27.5	32.6	36.6	39.6	40.1	37.4	30	32	34	33	36	38	39	119	141	158	171	174	162
10-20 ha	13.5	15.1	19.9	25.3	24.5	25.2	27.4	17	17	21	22	22	24	28	112	148	188	182	187	204
20-50 ha	4.9	4.7	5.8	7.5	6.9	6.7	6.5	7	6	6	7	6	7	7	96	118	151	140	136	131
≥50 ha	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0	0	0	0	0	0	0	99	87	80	72	71	68
All size groups	77.8	86.3	95.6	112.1	110.5	105.0	96.3	100	100	100	100	100	100	100	111	123	144	142	135	124
Netherlands																				
1-5 ha	64.8	72.4	73.3	87.0	80.7	70.6	56.0	40	41	38	39	37	34	29	112	113	134	125	109	86
5-10 ha	38.4	45.8	52.4	58.1	62.5	63.9	59.5	24	26	27	26	29	30	31	119	137	151	163	167	155
10-12 ha	29.7	33.5	40.4	48.5	48.1	49.5	53.2	19	19	21	22	22	24	27	113	136	163	162	166	179
20-50 ha	23.3	22.2	23.6	26.1	24.0	23.8	23.9	15	12	13	12	11	11	12	95	101	107	103	102	102
≥50 ha	3.4	2.7	2.5	2.2	2.0	1.9	1.9	2	2	2	1	1	1	1	80	74	66	58	56	56
All size groups	159.6	176.6	192.2	221.9	217.3	209.7	194.5	100	100	100	100	100	100	100	111	120	139	136	131	122

Sources: Directorate of Agriculture (1910-1930); Central Bureau of Statistics (1947-1959).

(For every landuser with one or more hectare(s) of cultivated area)

- | | |
|---------------------------|--|
| Head of holding | <ol style="list-style-type: none"> 1. Name, address, domicile 2. Date of birth, place of birth 3. Civil status 4. Religious denomination 5. Post-elementary school education 6. Occupations since leaving elementary school 7. Present occupation and subsidiary occupation (if any). 8. If subsidiary occupation, how much time devoted to it? 9. Father's occupation and size of undertaking, if landuser |
| Wife | <ol style="list-style-type: none"> 1. Date of birth, date of marriage 2. Post-elementary education 3. Occupations since leaving elementary school 4. If assisting on holding, in what capacity and for how many hours? 5. Father's occupation and size of holding, if landuser |
| First and present holding | <ol style="list-style-type: none"> 1. Taken over when and from whom? 2. Size of holding 3. How did it become available? 4. Age of former operator at time of transfer |
| Present holding | <ol style="list-style-type: none"> 1. Was it involved in a splitting-up at the time of transfer or since then? If so, into how many holdings? 2. How did this splitting-up come about? 3. Who obtained the farmhouse and farm buildings belonging to the original holding? 4. Changes in size of holding since transfer, and reasons for this 5. Who will succeed you in due course? 6. Any plans for splitting-up present holding? |
| Children | <ol style="list-style-type: none"> 1. Dates of birth, sex, of children under 15
Children of 15 and over 2. Sex, date of birth, civil status 3. Living in, or municipality where living 4. Post-elementary education 5. Occupations since leaving elementary school 6. Present occupation, municipality and subsidiary occupation, (if any) 7. If not employed in agriculture of market gardening, since when? 8. If assisting on your holding, for how many hours? 9. If helping part-time, what other activities? 10. Married daughters: age and occupation of son-in-law |

If son or son-in-law an independent farmer or market gardener:

11. When and from who did he take over the holding?
12. Size of holding
13. How did it become available?
14. What will schoolgoing sons of 10 and over do after leaving school?
15. Has advice been obtained from a careers bureau?
16. Have your children been tested?

Other members of family living in

1. Age, family relationship
2. If assisting on the holding, for how many hours and in what capacity?

Outside labour

1. Type of employment contract, age
2. How many hours employed?

Organization and method of farming

1. Help from neighbours, how regular, when available
 2. Jobs done by wage earners
 3. Work done by farm machinery co-operatives
 4. Machines owned, joint-owned, or in use
 5. Is the holding connected to water and electricity mains?
 6. Out of how many lots does the holding consist?
 7. Site of lots in relation to farm buildings
 8. How many lots of arable land and pasture land?
 9. Has your pasture land electric current fencing?
 10. If so, do you ration pastureland use?
 11. Do you put calves and dairy cattle to grass together?
 12. After how many days do you change the pasture land used by your cattle?
 13. How much of your grassland and artificial pastureland do you mow (once or more) and how do you store the hay etc?
 14. Manuring of the grassland.
 15. Drinkingwater supply in the cattle stalls
 16. How much room in the stalls for dairy cattle and heifers?
 17. How many dairy cattle and heifers in stalls last winter?
 18. Are there manure pit(s) (capacity, manure trays and silo(s) (capacity)?
 19. Number of porkers delivered last year
 20. Average number of laying hens
 21. Use of approved sowing seed or seed potatoes, rye and oats seed and tubers
 22. Late (after) crops cultivated last year
- Agricultural Extension Service
1. Visit and/or advice from an assistant of the Agricultural Extension Service?
 2. Member of Farm Development Association?
 3. Members of any other associations?
 4. What farming periodicals do you read?

The standards used for determining the number of standard hours are derived from labour studies carried out by the Agricultural Economics Research Institute of well-run holdings.

It was desirable for the purposes of the enquiry to use both the old norms applied when making previous enquiries and new norms better adapted to present working methods and mechanization.

	No. of standard hours			No. of standard hours	
	1948	1957		1948	1957
<i>Arable land</i> (per hectare):			<i>Livestock</i> (per animal):		
grains	250	215	dairy cattle	275 ¹	210
maize	600	600	yearlings	—	30
pulses	500	400	fat cattle		
potatoes	700	575	(no fat calves)	—	120
fodder beets	700	650	porkers	40	25
sugar beets			breeding sows	100	75
turnips			draught horses	175	125
tubers			laying hens	4	3
green fodder crops	175	175	<i>Market gardening</i> (per hectare):		
later crops	175	175	apples, pears in grass orchards	700	700
<i>Grassland</i> (per hectare):			apples, pears in other orchards	800	800
care	55	50	plums	1000	1000
mowing	80	75	cherries	1500	1500
			strawberries	3000	2500
			currants	2500	2500
			raspberries	3500	3000
			early potatoes	1000	1000

¹ Including calves and fat cattle.

Size group	% share in the activities of the category						
	male operators	female operators and wives	sons	daughters	family living in	outside labour	
						living in	living out
1- 3 ha	68	11	11	2	5	0	3
3- 5 ha	64	12	17	3	4	0	0
5- 7 ha	60	13	18	4	4	0	1
7-10 ha	55	12	21	5	5	1	1
10-12 ha	49	10	26	6	6	1	2
12-15 ha	44	9	28	7	7	2	3
15-20 ha	38	7	32	6	6	4	7
20-30 ha	32	5	35	7	5	4	12
≥30 ha	24	3	35	3	5	6	24
All size groups	51	10	24	5	5	2	3

¹ On holdings of which the operator had his (or her) main occupation in farming or market gardening.

In order to be able to compare different types of labour, it is necessary to convert the various categories to the same unit. For this purpose the concept of the "full labour unit (f.l.u.)" has been devised. By a full labour unit we understand a unit of male labour at the full productive age (20-59), working on a holding all the year round.

In converting male labour to f.l.u., account is taken in the first place of the age, the following "full value" percentages being used:

15-17 years of age:	70 %
18-19 years of age:	90 %
20-59 years of age:	100 %
60-69 years of age:	70 %
70 years and over :	10 %

In addition to this adjustment based on age, another is made relating to the period during which work is performed. Thus a man in the fully productive age group working for six months in the year only is represented by 0.5 f.l.u.

Female labour is calculated on the following basis: for every hour per day that girls or women assist on the holding during one whole year, 0.1 f.l.u. are reckoned.

The possibilities of succession to a holding can be expressed by an index figure, the "generation pressure figure". This indicates the ratio between the number of potential successors of 15 years of age and over and the number of holdings which will be available for them to take over at some future date. The generation pressure reaches the value of 1 when all potential successors will be able to start on a holding of their own at a given age. As this figure rises, we can begin to speak of "pressure" for it means that there are too many successors among farmer's sons.

Very often the departure point for calculating the generation pressure is based on the view that the successor will have to be able to become the head of a holding within 15 years and that on average a man is head of a holding in the Netherlands for 35 years. This means that every year $1/15$ of the successors will be wanting to take over a holding and that $1/35$ of the holdings should become available.

Other points of departure may be taken, as circumstances demand. Should it be possible, for example, for the successors to take over their future holdings within 13 years, and if on average a man can run a holding for 37 years, then every year $1/13$ of the successors and $1/37$ of all the holdings would be the relevant figures.

The choice of occupation index is an attempt to investigate the correctness of the choice of occupation made by sons between the ages of 15 and 19. In doing this, the number of sons working in agriculture in the 15-19 age group is compared by yearly group with the average number of holdings becoming available every year. If the situation as regards succession is healthy, the borderline here, too, lies near the figure of 1.

The difference between this index figure and the generation pressure index figure results from the fact that in the case of the latter figure a possibly incorrect choice of occupation of all so far non-independent farmer's sons in the past has been discounted, while the former figure relates solely to sons in the 15-19 age group.

EXPANSION OF THE NUMBER OF LIVESTOCK IN THE PERIOD 1958-1968
(1957: 100)

APPENDIX 7

Intensification per annum	Catching-up with arrears of smaller holdings	Index figures dairy cattle				Index figures porkers				Index figures breeding sows				Index figures laying hens			
		size group				size group				size group				size group			
		1-7 ha	7-15 ha	> 15 ha	total	1-7 ha	7-15 ha	> 15 ha	total	1-7 ha	7-15 ha	> 15 ha	total	1-7 ha	7-15 ha	> 15 ha	total
3%	none	79	111	102	101	137	164	113	145	151	167	115	152	150	160	100	149
	to level of 12-15 ha holdings	79	114	102	102	103	175	113	169	232	180	115	178	230	170	100	185
5%	none	79	118	102	104	245	198	113	186	259	203	115	197	237	192	100	206
	to level of 10-12 ha holdings	79	124	139	118	176	231	147	198	199	239	151	210	197	224	100	199
5%	to level of 10-12 ha holdings	79	126	139	119	253	244	147	225	293	253	151	239	290	236	100	241
	to level of 10-12 ha holdings	79	131	139	121	278	271	147	245	324	281	151	262	321	261	100	265