# Small Farmer Development; Experiences in the Netherlands

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## Introduction

The equity issue is an important topic in rural development. Rogers (1983, p. 398) formulated the generalization: "The consequences of the adoption of innovations usually tend to widen the socioeconomic gap between the audience segments previously high and low in socioeconomic status". This generalization is not correct for some innovations in the Netherlands, making it interesting to analyse under what conditions successful small farmer development is possible. This is important for developing countries, where an important goal of the agricultural development policy is to employ as many people as possible in agriculture in order to reduce the migration to the cities.

This paper deals, firstly, with the development of agriculture in the Netherlands in this century focussing on differences between large and small farmers. Secondly, differences in development between regions with large and small farms are discussed. Next a summary is given of some studies on differences in the adoption of innovations and in managerial ability between small and large farmers. A discussion of different instruments used to stimulate agricultural development makes it possible to formulate some hypotheses for successful small farmer development. More research is needed to test these hypotheses in different countries.

## 1. Agricultural development

A century ago, Dutch farmers had great difficulty in competing with farmers from other countries. At present the Netherlands is the third largest exporter of agricultural products in the world, despite its small size. Between 1921 and 1938 the income from family labour in agriculture was only one third of the income from labour in industry (Bellerby, 1956), whereas now these income differences have become small.

Around 1850, the most up-to-date and prosporous farmers were to be found on arable farms on the rich clay soils in the north and the west. These farms were often large and employed five or more labourers. In this part of the country there was also modern dairy farming on non-arable peat and clay soils. Near the large cities in the west there were also small horticultural holdings. In the rest of the country there were mixed farms with crops, as well as sheep, cows, pigs, and poultry. The dung of these animals was needed to maintain the fertility of the arable land. Most of these farms were small and many farmers had to earn additional income as craftsmen or labourers. A few larger farmers belonged to the village elite. These farmers hoped that their sons would follow in their footsteps, whereas the small farmers accepted that their sons would not be able to become farmers.

At the beginning of this century, a process of change started on the sandy soils towards a type of agriculture where farmers got their income from the sale of animal products and

produced arable crops to feed their animals (van Zanden, 1985). Around 1900 this process was accelerated with the introduction of fertiliser and the development of efficient systems for input supply, processing, marketing and credit, largely by co-operatives, especially in the regions with poor sandy soils. This modernisation was very well suited to the needs of the small farmers.

The fertiliser made it possible not only to increase the yields and to overcome the problems of shortage of manure, but also to change heathland into arable land and pastures. In this way those small farmers and labourers who were prepared to live frugally and to undertake the hard work of land reclamation could become full-time farmers. Large farmers had little time for land reclamation work themselves. They could have hired labourers to do so, but would not have been able to compete with the small farmers, who did not calculate the cost of their own labour.

The dairy factories offered also the small farmers a good price for their milk and returned the skimmed milk to them, which they used in pig production. Many farms had been indebted to merchants. They could be liberated from these bonds through credit, input supply and marketing co-operatives. In this way they improved their position in the market (Bieleman, 1987).

This modernisation was not only caused by changes in production technology, but also by an increased demand for animal and horticultural products through rising incomes in Western Europe. As a result agricultural production could be intensified by expanding dairy farming, pig and poultry production. Especially pigs and poultry were concentrated on small farms without which these farmers could not make a living. In contrast to many large farmers they did not mind that pig and poultry production was considered to be of lower status than dairy and arable farming. Dairy production expanded on both small and large farms.

Farmers in the west and the north could improve their production and income too. However, the consequences of the modernisation of their agriculture were generally not as far reaching as for the small farmers on the sandy soils. The large farmers could continue with arable or dairy farming by increasing their yields. In the west the small horticulture holdings could expand their production mainly by enlarging the area under glass. Some of the small farmers both here and in the south switched to horticulture. Horticultural holdings were also often started by poor men who could rent a field from a large farmer in a poor location or with poor soil (Rietsema, 1950).

Dutch agriculture became to a large extent a processing industry importing large quantities of cheap inputs, such as animal feed and exporting more expensive animal and horticultural products. As a result of this development the number of farms on sandy soils and of horticultural holdings in the west increased up to 1940, enabling a growing number of farmers' sons to find employment in agriculture and horticulture. The desire of these sons to become farmers increased the need for intensification in regions with a high birth rate, as in the south.

After 1950, incomes in Europe rose much more rapidly than before the war, increasing sharply the demand for animal and horticultural products. This demand was further strengthened by improved transport facilities and the establishment of the E.E.C. Dutch farmers were able to capture a growing share of this market, largely because of an effective system of agricultural research, education and extension and an efficient marketing system.

Farmers wished to share in these higher incomes. This could, to some extent, be achieved by applying modern techniques, which improved their labour productivity and increased their yield, and by specialisation. On the sandy soils the changes have been spectacular, especially in the south of the country. Many formerly small farms there became very modern specialised pig, poultry or dairy farms, not seldom with investments of more than a million dollars. Cereal production nearly disappeared and was replaced by maize production for silage as cattle feed. Farmers realize that it is important for them to be well informed about new technologies and developments in their markets. Many farmers have learned how to programme their process computors for realising an optimal climate for growth in their glasshouses and their stables and for cost-effictive animal and plant nutrition.

The price of most agricultural products decreased, because the demand for these products grew much less than production. As a result of these technical and economic developments, the minimum size of a farm which could provide a farmer with an adequate level of income increased steadily, which meant, that it became impossible for many small farmers to continue farming. Other small farmers, however, could effectively increase their farm size, mainly by intensifying animal or horticultural production. In some branches, agricultural production rose rapidly, e.g. the acreage of flower production in glasshouses increased 14-fold between 1950 and 1985 and the number of pigs sevenfold. The farmers' managerial ability plus their sons' interest in farming to a large extent determined which farmers were able to continue in farming. The intensity of production also increased on large farms, but not as much as on those small farms which continued in farming. The large farms achieved an increase in labour productivity to a large extent by decreasing the number of farm workers.

As a consequence of these developments the number of people working in Dutch agriculture has decreased by 70 per cent since 1950. Over 50 per cent of the small farmers are now over 50 years old without a successor, compared to only 10 per cent of the large farmers (LEI, 1978, p. 41)[3]. A farmer with a medium-sized farm in 1970 is now a small farmer unless he has made investments which have increased the size of his farm. Farmers who realised that their sons would not follow in their footsteps, usually did not make these investments. The employment situation during the period 1955 – 1980 made it not very difficult for people leaving agriculture to find another job. However, this may not always have been the job of their preference.

In the terminology of Hayami and Ruttan (1985) the development of Dutch agriculture until 1950 was characterised by land-saving innovations and afterwards both by land-saving and labour-saving innovations. Another important aspect was that after 1950 farmers switched to higher priced products for which there was an increased demand. The process of agricultural growth on the sandy soils in the first half of the last century could be described by the model of traditional economic growth of Boserup (van Zanden, 1985). Labour supply increased through population growth. This forced farmers to intensify their production and decrease the area of fallow land, even if this resulted in a lower production per man hour (Boserup, 1965).

During the past 100 years the average number of people working on one farm has decreased from over 3 to 1.5 (Hofstee, 1963; Landbouwcijfers, 1987). Nowadays the vast majority of farms only provide employment for the farmer and his wife. Large-scale cor-

porate farming developed in the Netherlands only on a very limited scale. What we consider a large farm is a small firm when compared to other sectors of the economy.

The present Dutch agricultural is made up of:
43% dairing,
15% pigs and poultry,
28% horticulture and
13% crops.

At the beginning of this century the contribution from arable crops was much higher and from horticulture, pigs and poultry considerably lower. Large farms have now to be sought mainly in horticulture and also samewhat in pig and poultry production. Few arable and dairy farmers can now employ more than one labourer.

It is important to realize that the economic situation and technical development influence the position of small farms. Around 1900 the technical and economic conditions were favourable for small family farms. Moreover, during the depression family farms were better able to survive than farms employing farm workers. The family could limit their expenditure for a few years, whereas, understandably, workers insisted on continuing to receive their wages.

The situation in recent years has changed profoundly. Increased labour costs make a high level of labour productivity necessary; as a consequence of technological development, this can only be achieved on relatively large units. It is no longer possible to start farming without a large amount of capital. However, this does not alter the fact that at present many of the successful, large farmers were raised on small farms.

## 2. Regional differences

The development of intensive animal husbandry and horticulture on formerly small farms has occurred mainly in certain regions of the country. In the last decades, pig and poultry production has grown rapidly in the south, and also in several areas of the east and the centre. The development of modern horticulture is mainly concentrated in some parts of the west and to some extent in the south. This has been influenced by geographical factors such as access to markets, soil type and climate, but social factors and infrastructure have also played a role. In areas with many small farms and a high birth rate the need to increase production was high. Many input supply and marketing co-operatives and business firms arose there, as a result of the development of intensive agriculture in these regions. In turn these have stimulated further development.

Only the farmers with higher yields and lower costs than most of their colleagues can continue in agriculture. These lower costs can only be realised on a farm of sufficient size. Otherwise, farmers are not able to make the investments needed to increase their farm size sufficiently to keep up with increased income levels in the society and with technological developments.

Moreover, technical and managerial competence is of crucial importance. These skills are usually best developed in regions where the branch of agriculture is concentrated rather than in other areas. Diffusion research has shown clearly that farmers learn a great

deal from each other. In these regions they discuss their kind of agriculture whenever they meet. This exchange of ideas is supported by specialised farmers' organizations, e.g. a study club of tomato producers. Also in these regions agricultural research, vocational agricultural education and agricultural extension by specialised extension agents stimulate the growth of the necessary capabilities among farmers.

In regions where small farmers have developed successfully, further development is stimulated by group norms not only among farmers, but also among all kinds of agencies supporting or regulating agricultural development. For example, in a region with mainly large dairy farms a small farmer asking for credit to become a specialised pig producer, would probably be refused a loan by the local co-operative bank. In a region with many small farms he would be encouraged by the bank and by others to make such investments, if they are confident that he could be an efficient pig farmer. The successful development of other small farmers in their villages has also decreased farmers' resistance to borrowing money for large investments. As a result in a large part of the south and in horticultural districts in the west a highly innovative climate has developed.

In regions with few small farmers, they often copy the farming system of the large farms, whereas in areas with many small farmers they are able to develop their own intensive farming system. This is probably in part the result of the high status which large farmers enjoy in the former regions and partly of the institutional support system promoting the large farmers' system. From an area north of Amsterdam it has been reported that there were separate social systems for the relatively well-to-do dairy farmers and for the small market gardeners. As a result it took a long time before the dairy farmers realised that the market gardeners made good money from growing bulbs (Somers). Now market gardeners often enjoy higher incomes than dairy farmers.

On sandy soils in the north, where farms are also small, intensive animal husbandry developed during the last decades much less than in the south. It is not quite clear why, but some of the reasons are probably:

1. The birth rate there was much lower than in the south, so that the need to intensify production was less,
2. Pig producers in the north have a lower status than dairy farmers, whereas in the south their status is equal. Perhaps the cause is that nearby in Friesland on the clay and peat soils dairy farmers have a high status.
3. The distances to the markets are somewhat greater, making intensive agriculture somewhat less profitable,
4. Institutional support was organised less effectively in the north than in the south, partly for the reasons mentioned above, partly because of the role played by the clergy in the south, as will be discussed below.

Consequently large differences in agricultural development exist between regions. Between 1972 and 1982 agricultural production increased by 39 per cent in the formerly poor southern province North-Brabant and by only 11 per cent in the formerly rich nothern province Groningen. Also in North-Brabant the average farm size measured in terms of net added value of production has become larger than in Groningen, which used to be the province with by far the largest farms (LEI, 1983, p. 65).

The successful development of small farms in a region thus stimulates the further development of these farms, but how does it start? We have indicated that geographical

factors and a great need for this development in the region play a role, but social factors, are also important. The situation in the south is an illustration: here nearly all farmers were Roman Catholics. An important stimulating role was played by both the Church and the Catholic farmers' organizations. During the first half of this century many priests actively stimulated agricultural development, farmers' organizations, co-operatives and vocational agricultural education. They tried to keep as many people as possible on farms to prevent their moral decay in industry. In the mainly Protestant north of the country the clergy did not play a similar role.

## 3. Individual differences

We started this paper with a generalization from Rogers, based on studies within certain villages of individual differences in the adoption of innovations. Also in the Netherlands a positive correlation was found between farm size and adoption level (van den Ban, 1963), but as usual the correlation coefficients were relatively low. Farm size, in different villages explains only between 5 and 30 per cent of the variation in adoption level; the adoption index is based on innovations which are applicable on all farms and not on those which involve a major change in farming system. For these innovations, such as those in pigs, poultry and horticulture, the adoption level on small farms was often higher than on large farms (Rietsema, 1950, Maris, Visser en Scheer, 1951). Innovations towards the end of the last century were as a rule first adopted by large farmers. At that time most of the innovations, such as fertiliser, were very well suited to the needs of small farmers. They adopted these innovations soon afterwards; in some cases they were even ahead of the large farmers (van Zanden, 1985). Recent studies in developing countries come to similar conclusions (Lipton and Longhurst, 1985).

Managerial capabilities are a major factor influencing success in farming. One study in North-Brabant found that the adoption of innovations was more highly correlated with these capabilities than with farm size (Bauwens, Heunks en van de Sandt, 1963). Alleblas (1987) has found that in glasshouse horticulture the management level of the large growers is higher than that of the small growers. The same is probably true in dairy husbandry, where the large farmers produce about 10 per cent more milk per cow than the farmers with a small herd (LEI, 1985). In arable farming, however, there is no consistent relationship between crop yields and farm size. The reason for this difference between branches of agriculture could be the more rapid and far-reaching developments in both glasshouse horticulture and dairy farming than in arable farming. Farmers with a high level of management in the first two branches could become large farmers, even if they started out as small farmers, whereas in arable farming they could not achieve much change in farm size.

## 4. Institutional support

The development of small farmers has been supported by many different institutions. Some understanding of this support is required to be able to explain the successful development of many small farms in the Netherlands.

Credit, input, processing and marketing cooperatives are in a strong position in the Netherlands. Until recently the co-operatives charged both the small and large farmers with the same prices for their services. Now there is a difference to compensate for the higher costs involved in the handling of the small quantities small farmers buy or sell. Large farmers have, more often than small farmers, been members of co-operatives (Abma, 1958), but private business can no longer exploit the latter, otherwise they would join the co-operatives. One reason for the success of these co-operatives is that they are organised by the farmers and not by the government. This requires well-educated farmers.

Farmers' organizations also have played an important role in the development of Dutch agriculture, by organizing vocational and adult education, providing services to farmers such as milk testing and influencing government policies. There are no separate organizations for farmers of different social classes, but less small farmers have been members of these organizations than large farmers. In 1953, 37 per cent of the farmers with 5-10 ha land were not members of one of the general farmers' organization against only 11 per cent of those with more than 30 ha (Abma, 1955).

The leadership of co-operatives and farmers' organizations has mostly been held by large farmers (Abma, 1962). Members are inclined to elect high-status farmers in the village as their leaders. More well-to-do farmers and farmers employing workers also can better afford to spend some of their time as board members of organizations.

At the beginning of this century important roles in the development of these organizations were played by the rural elite: the priests, schoolteachers, public notaries, etc. Some large farmers and elite members have used their leadership positions to serve the interests of their families and their own social group, but many had a real interest in raising the status of small farmers. Only in exceptional cases board members have used the funds of co-operatives or other organizations for personal gain. Social control and moral values have prevented this misuse of funds.

Vocational agricultural education has also played an important role in increasing the managerial and leadership capacities of farmers. At present about 70 per cent of farmers have attended an agricultural school. Formerly poor farmers needed their sons to earn money; they could not afford to send them to school for a year or more. Therefore a system was developed in which boys could combine working on the family farm with attending courses and schools. Until about 1950 this system consisted of:

1. Evening courses for one year taught by primay school teachers who had received additional training to teach agriculture.
2. Lower agricultural schools which were attended by 12-year-old boys for three days a week and thereafter one day a week for three years.
3. Agricultural winter schools which were attended for two winters by 16 to 17 year-old-boys, when there was less work on the farm. These schools were mainly attended by sons of the large farmers.

At present, education is compulsory up to the age of 16; so most boys planning to become farmers now attend a full-time agricultural school. The interest in agricultural education was greater on poor soils; there farmers realised that a good knowledge of fertilisers was essential, more than in most regions with more fertile soils (van den Ban, 1957). Large farmers, also, made more use of this kind of education than small farmers, e.g. in 1955 71

per cent of the farmers with more than 30 hectares had attended some kind of vocational agricultural education compared to only 41 per cent on the farms with 5 to 10 hectares. However, for many small farmers this education has increased their managerial ability and their willingness to try new production techniques and production systems. Neighbours and relatives who had attended agricultural courses or schools helped to spread new methods amongst those who had not received this education.

The agricultural extension service has been another important factor in the development of small farms, expecially since paraprofessionals were appointed as local extension agents after 1935. These were usually farmers' sons who would have liked to become farmers, but who could not, as one of their brothers took over the farm. Some of them were the sons of small farmers at a time when many of the university graduates working in the extension service were sons of large arable farmers, who did not always understand the small farmers' situation and way of thinking. Although the extension service had more contact with large farmers than with small farmers, there has also been intensive cooperation with many small farmers.

Around 1960 the extension service began to provide extra help to backward regions (Penders 1963, p. 243/9). More extension agents were made available for these regions and some subsidies were given to stimulate farmers to make investments. These programmes probably have helped to alter the group norms which resisted change in agriculture.

For a period of 20 years after 1935 a programme of subsidies helped small farmers to invest. Later subsidies were in principle made available to all farmers. There have also been government guarantees for bank loans farmers needed to enlarge their farms to a size which could provide an adequate income. The applications for these subsidies and loans were made through the extension service. This stimulated small farmers to contact extension agents and to make investments they could not have made otherwise or did not dare to make. From 1972 to 1985 an EEC programme subsidised the interest which farmers had to pay on loans. This subsidy was given to those farmers with an income below parity level, who presented an investment plan which would enable them to raise their income to at least the level of farm labourers. Many farmers, including small farmers, have profited from this subsidy scheme (Hiddink and Wijnen, 1987). These various subsidy schemes may have helped the development of small farmers.

The metamorphosis of small traditional farmers into modern business managers has taken at least two generations of continued institutional support in the Netherlands. The development of modern agriculture has required major changes in the knowledge, skills and attitudes of farmers and the growth of many farmers' organizations and other institutions to support this development. With our present level of knowledge of and commitment to rural development some developing countries might be able to achieve similar changes somewhat more rapidly.

## 5. Conditions for small farmers' development

During the last 100 years Dutch agriculture has developed rather successfully. The small farmers have made major contributions to this development. They often made the most

effective use of new opportunities. In this way many small farmers or their sons could become large farmers. The number of farmers has decreased drastically, but the productivity and the incomes of those small farmers who could continue in farming, has increased considerably. The experience from the Netherlands suggests that the following conditions have made this development of small farmers possible:

1. Demand increased for products which large farmers did not wish to produce. This condition is probably fulfilled near the rapidly growing cities in many developing countries, where the demand for vegetables and animal products is increasing.
2. It was possible to start this production on a small scale without taking too much risk. If the productivity of labour and capital on a large farm is much higher than on a small farm, small farmers will not be able to compete.
3. An effective research, education and communication structure enabled small farmers to use efficient production techniques in these „new" branches of agriculture.
4. The marketing, input supply and credit structure did not excessively favour large-scale producers.
5. Agricultural development policy, farmers' organizations and the rural elite supported the development of small farmers. Subsidy and loan schemes assisted small farmers in developing.
6. Group norms and institutions supported the development of new branches of agriculture by small farmers.
7. Group norms stimulated hard work, a frugal way of life and a willingness to take risks.
8. Employment opportunities existed outside agriculture for small farmers and their sons who could not make a living in agriculture.

In studying the adoption of innovations we have to distinguish between innovations which increase the effiency of the existing farming system and innovations which cause a fundamental change in this system. These latter innovations are usually not in the first place adopted by those farmers who reached a high status in their community by performing well in the existing farming system, often the large farmers. This creates an opportunity for successful small farmer development. We predict that also in developing countries these opportunities will be realised in those situations where the above mentioned conditions are fulfilled. In many countries several, but not all of these conditions, are fulfilled. This makes some development of the small farmers in these countries possible, but not as rapidly as in the Netherlands. An increasing demand for horticultural and animal products is probably the most crucial condition. We find this in many, but not all, Asian and in some Latin American countries, especially around the cities. It is reported, for example from Gujarat in India that small farmers are better dairy farmers than large farmers. Small farmers need their cows to make a living, whereas large farmers have sufficient income from their arable crops (Rangnekar 1988).

That small firms make a more effective use of new opportunities than large firms is not restricted to agriculture. We find the same phenomenon for example, in the U.S. high technology industry (Rogers and Larsen, 1984).

## 6. Future

In the past, the development of small farmers in the Netherlands has been relatively successful, but what will happen in the future? There are several reasons to believe that the development of small farmers will become more difficult:

1. The surpluses of agricultural products make it difficult to find products which can be produced by small farmers in a profitable way. In theory it is always possible for an efficient farmer to make a profit by pushing other farmers out of business, but the political reality is that this is often not acceptable.
2. It is now necessary in agriculture to start on a large scale to be competitive. Thus the second condition given above is no longer fulfilled in the Netherlands.
3. The cost of past developments becomes high, especially through ecological problems caused by surpluses of manure.
4. In the past institutional support for agricultural development in the Netherlands was more effective than in most other European countries. However, will this continue to be so with, for example, a decreasing willingness on the part of the government to finance agricultural research and extension?
5. In the past, mainly farm workers and farmers' sons moved out of agriculture, but in the future this move will have to be made by farmers themselves, in a country which has now a high rate of unemployment and a slow economic growth. Few of them will be able to find another job.
6. Possibly, the development of information technology and of biotechnology will make it more difficult for small farmers to compete.

The Dutch historian Romein (1937) formulated the law of the retarding lead, which states that a group which is lagging behind has more chances to adopt innovations successfully than a group which is already ahead of others. He may be correct for small farmers' development in the Netherlands. It is also possible that Dutch farmers are again flexible enough to adjust to changing situations. Many young people now do not expect to stay in the same kind of job all their working life, and this may also become true of farming.

## Summary

Innovations which cause a basic change in a farming system are not rapidly adopted by large farmers, who got a high status in their community by performing well in the old farming system. This hypothesis is confirmed by the agricultural development in the Netherlands. During this century the possibilities for farmers to earn a good income from intensive animal husbandry and horticulture have greatly increased. These opportunities have mainly been grasped by farmers in regions with many small farms and within these regions it were often some of the small farmers who grasped these new opportunities. As a result, despite the sharp decrease in the number of farmers, many farmers from a small farm background have been able to continue in farming and even become large farmers. Some hypotheses are formulated under what conditions this kind of small farmer development is possible in other countries.

## Zusammenfassung

Innovationen, die eine grundlegende Veränderung des Betriebssystems bewirken, werden nicht so schnell übernommen von Großbauern, die in ihrer Gemeinde aufgrund guter Leistungen im alten Anbausystem einen hohen Status erworben haben. Diese Hypothese wird durch die Agrarentwicklung in den Niederlanden bestätigt. Die Möglichkeiten von Landwirten, mit Intensiv-Viehzucht und Gartenbau ein gutes Einkommen zu erzielen, sind in diesem Jahrhundert erheblich angestiegen. Die sich hierzu bietenden Gelegenheiten wurden hauptsächlich von Landwirten in Gegenden mit vielen Kleinbetrieben ergriffen, und innerhalb dieser Landesteile waren es oft Kleinbauern, die die neuen Möglichkeiten nutzten. So ist es vielen ehemaligen Kleinbauern trotz des starken Rückgangs der Zahl der Bauern insgesamt gelungen, weiter Landwirtschaft zu betreiben und sogar den Wandel zu Großbauern zu vollziehen. Der Beitrag bringt einige Hypothesen darüber, wie diese Kleinbauerentwicklung in anderen Ländern möglich ist.

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## Notes

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3 Large farmers are classified as the largest 30 per cent in farm size, small farmers as the smallest 50 per cent. Farm size is here not measured in hectares. Instead Standard Farm Units have been used, a measure based on net added value.

In order to distinguish between large and small farms one can use as a criterium either value of production, acreage or employment. In the Dutch situation, acreage is not a valuable criterium, because of large differences in intensity of production. The borderline between a small and a medium-sized farm is always arbitrary. One could for example, define a small farm as a farm which gives full employment to at least one person. According to this definition there are and there have always been many small farms in the Netherlands.
A subsistence farm could be defined as a farm in which over 75% of the production is used for consumption by the farm family. Also this borderline of 75% is arbitrary. Even a century ago there were only few of these farms in the Netherlands.

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