

THE INFLUENCE OF SWEDISH FORESTRY POLICY ON THE ANNUAL CUTS OF PRIVATE WOODLOT OWNERS

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1. WOOD RAW MATERIALS NOW A SCARCE RESOURCE

The consumption of wood raw materials by the forest products industry in Sweden has increased rapidly during the last few decades. At the beginning of the century, the total annual cut exceeded the gross forest increment (Fig. 1). The problem presented by the imbalance in wood supply and demand was temporarily eased by the deep recession that followed. Nonetheless, the fact remains that the production capacity of the forest products industry exceeds the potential yield of the forests. Thus, both the authorities and the forest companies in Sweden are calling attention to the fact that the pulp industry and sawmills can no longer increase their production capacity. Moreover, new fields of application, such as wood energy, are now emerging to compete for the available resources.

Although the distribution of the scarce wood raw materials can be achieved by means of market forces, it would be wrong to assume that these forces could ensure that the annual cut is kept in line with the gross forest increment. Thus, in view of the strong institutional demand for sustained-yield

forestry and of the long-standing tradition whereby forestry is regulated by the authorities, it is likely that the authorities will supplement the market forces through the imposition of legal restraints. Furthermore, it is doubtful whether in future the authorities will be content to merely supplement the allocation of wood resources as determined by free market forces.

The purpose of this paper is to discuss, against a background of historical perspective, the effect that the various measures by society have on bringing the level of the cut by private woodlot owners in line with the forestry policy goal of a long-term sustained yield of wood.

To start with I will describe the objectives and measures of forestry policy in Sweden. Thereafter I will present an account of the various central relations, which, in my opinion, explain the development in the logging policies of the private woodlot owners. Finally, I will give my own assessment of the effectiveness of the various measures in achieving the objectives of forestry policy.

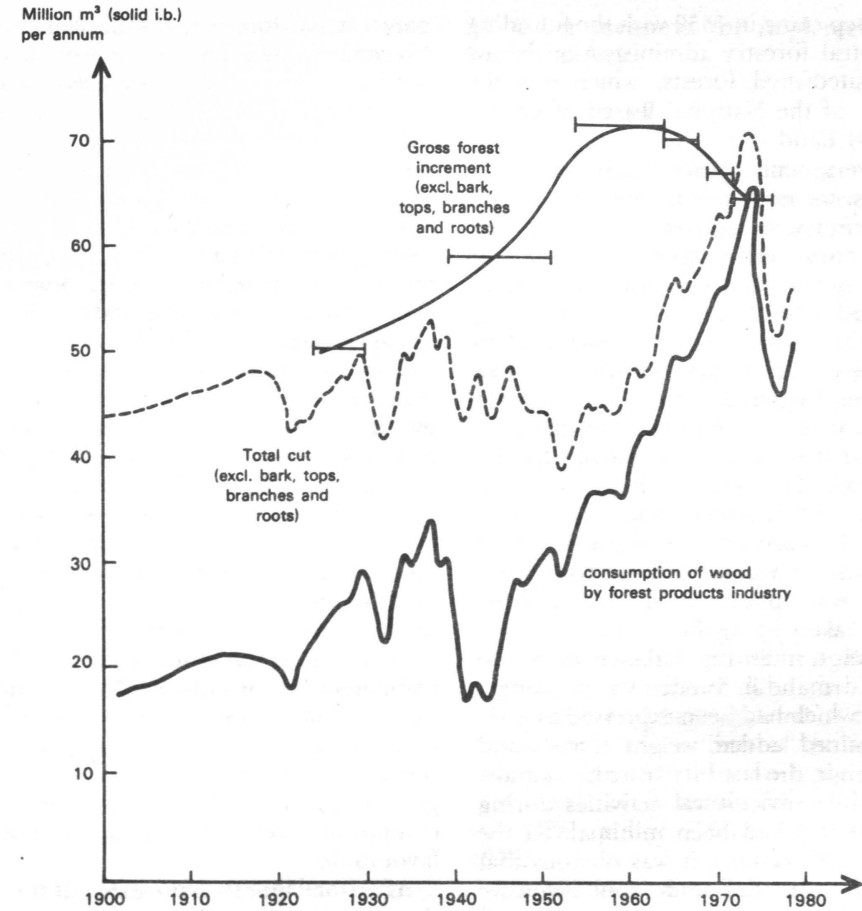


Figure 1. Forest increment, annual cuts and industrial roundwood consumption in Sweden, 1900-1977 (source: L. LÖNNSTEDT & J. RANDERS, "Wood resource dynamics in the Scandinavian forestry sector," 1979; Skogsstatistisk årsbok).

2. THE OBJECTIVES AND MEASURES OF FORESTRY POLICY IN HISTORICAL PERSPECTIVE¹

2.1 Silvicultural legislation as a means of implementing forestry policy

The 19th century

During the early part of the 19th century a wave of liberalization swept through Sweden and many of the regulations remaining from the mercantile age were abolished. However,

it was not long before people began to question whether this was the right way to achieve the goal of "avoiding a future shortage of wood". The goal was rephrased to become the furtherance of "a sustained yield of wood allowing regular felling".

The first step towards the realization of this goal was taken in 1828 with the founding of a forestry institute (the forerunner of the College of Forestry), which was to provide the "higher education necessary for forest management based on scientific grounds".

¹ This section is based largely on "Skogen genom tiderna" by E. STRIDSBERG and L. MATSSON, Stockholm 1980.

The next step came in 1859 with the founding of the central forestry administration board for the state-owned forests, which was the forerunner of the National Board of Crown Forests and Land.

The government agencies had very little direct influence over private forestry during the 19th century, except perhaps in that the public forestry sector tended to set the pattern. It is true that concern about over-felling had resulted in widesweeping proposals for legislation in 1856 and 1874 to regulate the private-sector forestry, but these were rejected by parliament. The reason for their rejection was undoubtedly attributable to the fact that the goal of wood-producing, sustained-yield forestry, which was pursued in the public sector, bore little resemblance to the rural communities' agrarian form of forest land use. It was not until the committee on forestry was appointed in 1896 that the matter was taken up again.

The opinion that the balance in wood supply and demand in Sweden was showing a deficit, and which had been expressed as early as 1850, gained added weight since wood consumption in the last fifty years had almost doubled, while silvicultural activities during the same period had been minimal. At the turn of the 20th century it was obvious that the Swedish forests had undergone extensive exploitation.

The 20th century

The report of the committee on forestry published in 1899 maintained that proper silviculture in the forests would enable the high level of the annual cut to be sustained. This resulted in the passing of the silvicultural act of 1903, which adopted the all-embracing but rather obscurely formulated principle that "forest land shall be used for the creation of forest". The means by which this principle was followed in practice in the large-scale forestry sector was through the formation of a team of highly qualified staff, who received the resources necessary for a silviculture-oriented forestry from the forest companies, which were now very interested in silvicultural activities.

In the small-scale forestry as practised by the farmers, the corresponding principle of

constructive forestry was implemented at a slower rate. The forestry boards, which had been formed as regional supervisory authorities responsible for seeing that the silvicultural legislation was observed, came to perform less of a watchdog function and more of a service one. Thus, the forestry boards were able in a harmonious way to promote the principle of silviculture by giving consideration to the actual state of the forest and to the resources at the disposal of the private woodlot owners.

Changes in the structure of production in the forest products industry, such as the establishment of a pulp industry, also helped to dispell the previously conflicting policies of society and the agroforestry sector. Society now felt that forest land use should be concentrated on the production of wood for industrial conversion and that the production of this raw material should be managed by the farmers. As a consequence of this, the further acquisition of forest land by the forest companies was prohibited. The production of wood for sale from the farmer-owned forests also increased at the beginning of the 20th century. Although the practice of forest grazing persisted for some time yet, the conditions were becoming steadily less favourable.

After the climate that existed at the turn of the century, people started to become increasingly concerned about the state of the Swedish forests. From the pressure created by forest dealings during the first world war, interim forestry legislation was enacted in 1918. In 1923 the act of 1903 was replaced by a more comprehensive silvicultural act, which, in addition to the reforestation requirement, also introduced a protective provision for "young stands", which prohibited all felling in such stands other than the thinnings necessary for the beneficial development of the forest.

During the 1920s it was still generally believed that the balance in wood supply and demand was in deficit. According to an estimate made by Tor Jonsson in 1923, an annual cut of 45 million cubic metres had to be set against an estimated forest increment of 33.5 million cubic metres. However, the first national forest survey in Sweden, which was conducted between 1923 and 1929, established that forest increment amounted to

56.6 million cubic metres – a complete swing from deficit to surplus in the balance of wood supply and demand. With the advent of the national forest survey, the objectives and the implications of the "sustained-yield principle" could be clarified and stated in precise terms.

In 1948 a new silvicultural act came into force in Sweden. This went even further towards meeting the demand that forest management should result in a sustained production of wood and thus a steady yield. A further addition to the act in 1975 stated that consideration must be given to the interests of conservation. The law applied to all privately owned forests and, according to the Ministry of Agriculture, all state and church-owned forests would be managed according to the same principles.

The silvicultural act that came into force in 1979 applies to all forest land in Sweden. Once again the act stresses the importance of aiming at a high and sustained yield but also emphasizes that the forest owner must also give consideration to nature conservancy and other public amenities.

Summary

In summary, then, we can say that the goal of Swedish forestry policy has long since been to safeguard a sustained yield of wood. Over the years this demand has successively been tightened, defined and detailed. The principle measure employed by the authorities to attain this objective has been the silvicultural legislation, which achieved a breakthrough with the passing of the silvicultural act of 1903. The silvicultural organization has been the authority responsible for supervising the observance of the legislation, although it is only in more recent times that this has become one of its chief tasks. As a provider of a service to the private forestry sector, its task over a long period of time was to act as the means for the practical implementation of silviculture.

2.2 Other measures for implementation of forestry policy

Structural policy

Commensurate with the general trend towards greater influence on the part of the various pressure groups, in recent years the responsibility for the practical implementation of forestry policy has to an increasing extent been transferred to the forest owner organizations. During the first half of the 20th century, the state, the large companies and the farmers were the three predominant categories of forest owner. Initially there was a wide difference in the policies of the three owner categories, but towards the middle of the century agreement between them grew steadily as regards the principle that the chief task of forestry is to produce wood for industrial conversion.

As mentioned earlier, land acquisition legislation, which prohibited the further acquisition of forest land by the large companies, had been enacted as far back as 1906. But it was as part of the agricultural policy of the 1940s that such legislation was first used as a means of furthering the structural policy (Mattsson & Stridsberg, 1979).

The intention of the land acquisition act of 1955 was to keep the land in the hands of the farming population and to encourage "external rationalization" of farming – i.e. getting the owned ground gathered. In 1965 a new land acquisition act was passed in Sweden, according to which the requirement of economic efficiency would largely be decisive to the acquisition position (i.e. whether permissible or not). In respect of forest land, priority would be given to owners who had both the intention and the ability to make best use of the land for the production of wood. (This new act superseded the earlier act prohibiting the acquisition of land by companies.) In many respects the land acquisition act of 1979 represents a return to the principles adopted in 1955. The land acquisition legislation is seen as an instrument of regional policy, designed to promote the combined operation, agroforestry.

An important point to note here is that the acquisition of land within families – the predominant form of land acquisition – falls

outside the scope of the legislation, although the 1979 act has tightened the rules governing the fact which forms of acquisition may be included in this category.

Forest taxation

Forest taxation is another measure that the authorities have at their disposal and by which means they can influence the woodlot owners and realize the intentions of the forestry policy. The theory behind current forest taxation is that all income that has accrued during the tax year, together with the value of the benefits-in-kind enjoyed during the year, will be liable for tax, after the deduction of all real costs, be they cash payments, outstanding accounts or depreciations. So far the authorities have not used income tax as a means of realizing the intentions of forestry policy.

3. HYPOTHESES IN RESPECT OF FACTORS INFLUENCING LOGGING POLICY²

This section has its point of departure in the preceding one. I shall therefore start my reasoning by considering the significance of the state of the forest and of the balance in wood supply and demand to logging policy, since this represents the main target of silvicultural legislation as a forestry policy measure. I will then go on to consider the influence that employment aspects and net returns may have on logging policy and will underline the importance of developments in the ownership structure. As mentioned earlier, the link between ownership structure and silvicultural legislation had a considerable impact on the direction of forestry policy during the first half of the 20th century. During the subsequent decades the private forestry sector has evolved from the farmer-owned forests. In the two remaining sections I will deal with the level of annual cut looked for by the forest products industry and with

² This account is based in part on "Varför avverkar den enskilda skogsägaren? En litteraturoversikt", by L. LÖNNSTEDT (1979).

Government grants

In the main government grants to forestry are given in respect of all activities that are deemed to be an important benefit to society but which are only likely to benefit the woodlot owner in the relatively distant future (e.g. forest land drainage). Grants may also be given in respect of activities that are prescribed in the silvicultural act, whose quality would be improved by the payment of such a grant (e.g. reforestation). Silvicultural grants and grants in respect of remedial action after damage to forests may be paid to all categories of land owner. Road-building grants, on the other hand, are only payable under certain specific conditions to bodies corporate. This latter owner category cannot receive grants in respect of forestry plans either. Government grants that directly influence the cut are not generally payable, although a special thinning grant has been made available for 1979 and 1980.

the net operating return, both of which are factors that I believe to have been of decisive importance to developments in the level of the annual cut in the long and short terms, respectively.

Figure 2 gives an outline of the contents of this section in the form of a cause-and-effect diagram, in which the assumed influence exerted by the various factors on the development of the level of the annual cut in the private forestry sector is shown. The effects that forestry policy measures are likely to have are dealt with in section 4.

3.1 The state of the forest and the balance in wood supply and demand

Since considerable space has already been devoted to silvicultural legislation, the state of the forest and the balance in wood supply and demand, I will confine myself here to a short account of the results of an investigation, conducted by means of the AID method (Automatic Interaction Detector), in which I

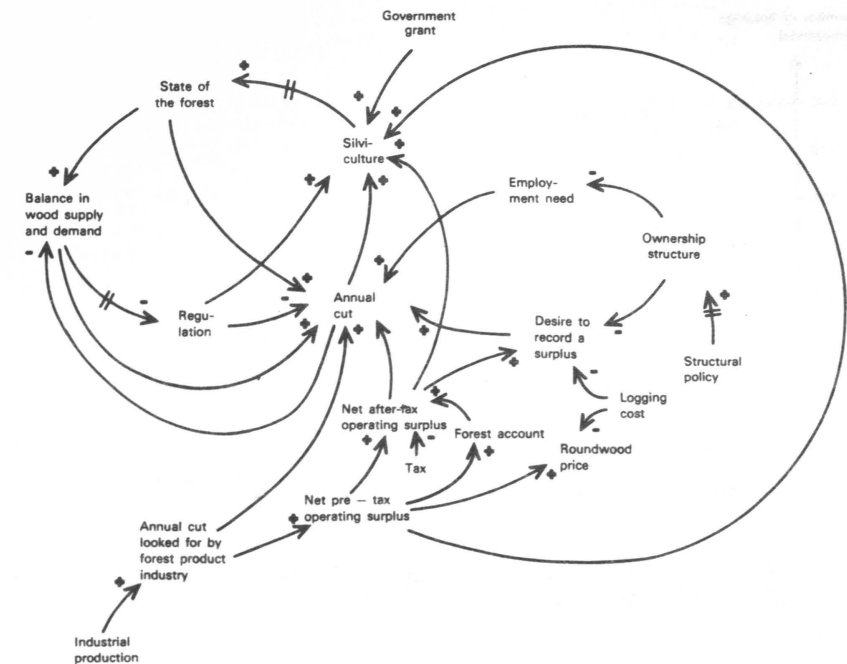


Figure 2. Some hypotheses in respect of factors influencing the annual cut of private woodlot owners. A "+" sign denotes a positive correlation between two variables and a "-" sign a negative one. "//" denotes elapsed time.

endeavoured to classify the private woodlot owners according to, e.g. their logging intensity (LÖNNSTEDT, 1976). From the results it is clear that the state of the forest is a more important explanatory variable than the category of owner (e.g. active farming, place of residence). However, the correlation was comparatively weak, even if it did strengthen with an increase in the size of the holding.

My hypothesis is:

that the state of the forest and the balance in wood supply and demand influence developments in the level of the annual cut.

3.2 Employment and net operating surplus

To understand the importance of "the annual cut looked for by the forest products industry" and the "net operating surplus" to the development in the level of the annual cut in the private forestry sector, I believe that consideration must first be given to the "employment need of the woodlot owner" and the "desire to record a surplus", which

vary according to the size of the holding. In the case of agroforestry enterprises, the seasonal variations in agriculture and forestry have tended to complement each other. Forestry has made a contribution to the economy of the holding and, likewise, to some extent it has been possible to compensate for a poor year in the farming side of the business through the extraction of a larger volume of wood from the forest.

The transition that the ownership structure has undergone in Sweden and which has meant that there are now a steadily increasing number of purely forest holdings and a steadily decreasing number of combined (agroforestry) enterprises, with a greater proportion of non-resident owners, has resulted in a much smaller number of woodlot owners depending on the forest as a source of employment (Fig. 3). A further implication of this is that logging operations are now being carried out to a much greater extent by contractors. The technological advances within agriculture and forestry are having a similar effect.

The role of forestry in the economy of

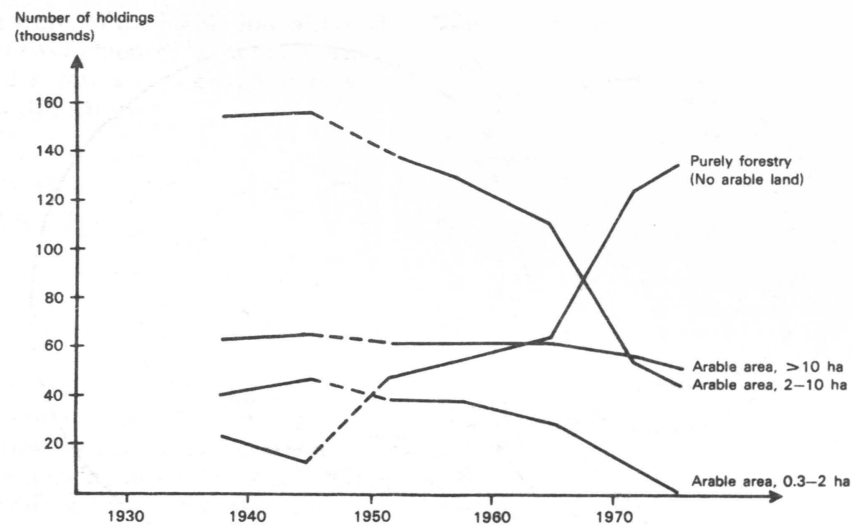


Figure 3. The number of private woodlot holdings with various areas of arable land, 1937–1976. (Source: B. ANDERSSON, et al, "Skogsägareföreningarna i ett historiskt perspektiv," 1980).

many woodlot owners has also changed. If one is receiving income from employment, then the income from forestry will be subject to a high rate of tax, as such income is added directly to the earned income and taxed accordingly. Opportunities to invest the money may be limited in the absence of farming operations. Because of inflation, in the medium range the money will retain its value better if invested in the standing crop rather than in a savings account.

My hypothesis is:

that, because of the change in ownership structure, the employment need and the desire to record a surplus in the case of small holdings will diminish in importance as the woodlot owners become financially more aware.

3.3 The annual cut looked for by the forest products industry

During the 1950s, 1960s and early 1970s, production in the forest products industry increased sharply, as did the level of the annual cut (Fig. 4). A major part of the increase in the annual cut was accounted for by the private woodlot owners. The 200 000 private woodlot owners own approximately one half of the total area of forest land in

Sweden (23.5 million ha), with the remaining half being divided roughly equally between the large companies and the state. However, if we consider the total volume of wood in the Swedish forests, then more than half of this is owned by the private woodlot owners.

During the same period the nominal price of roundwood and the net operating surplus were fairly constant (Fig. 5). In spite of the sharp rise in labour costs, this development was made possible through a sharp rise in the productivity achieved by forest workers.

My hypothesis is:

that it is the annual cut looked for by the forest products industry (which is governed by forest production among other things) that is of greatest significance in an explanation of the long-term development in the level of the annual cut.

3.4 Net operating surplus

As is illustrated in Figure 6, the share of the total annual cut accounted for by the private woodlot owners tends to increase with an increase in the net operating surplus and vice versa. My interpretation of this is that an increase in the net operating surplus is seen as

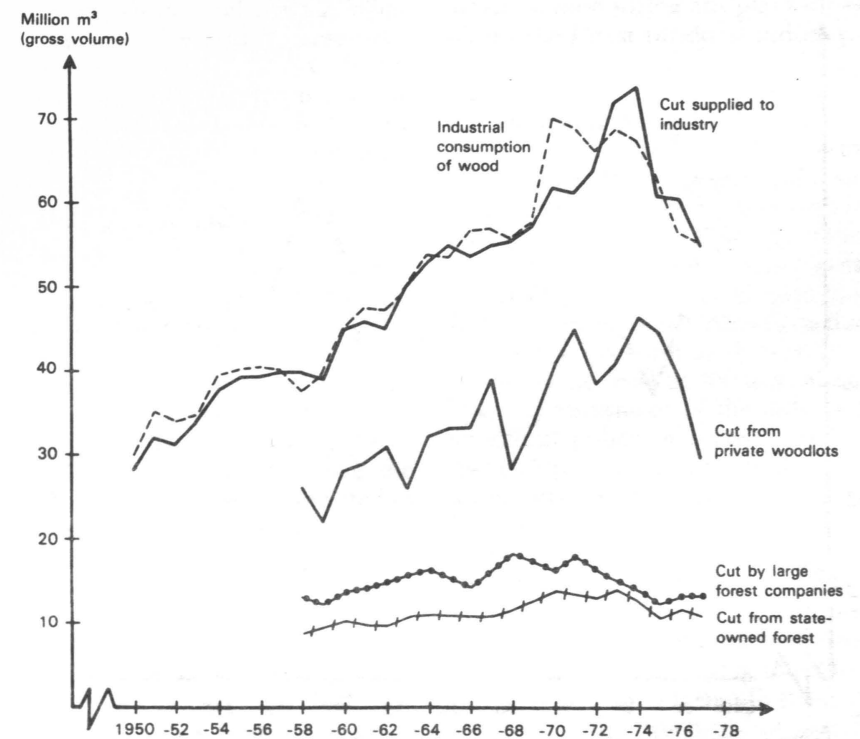


Figure 4. Industrial consumption of wood, 1950–1977, and annual cuts, 1958–1977 (Source: Skogsstatistisk årsbok).

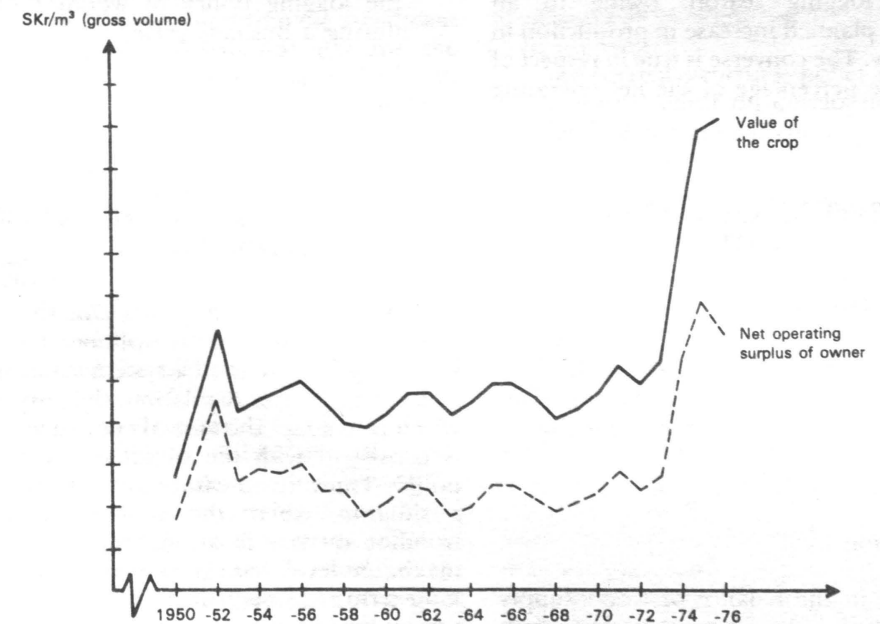


Figure 5. Value of the crop and net operating surplus of owner, 1950–1976.

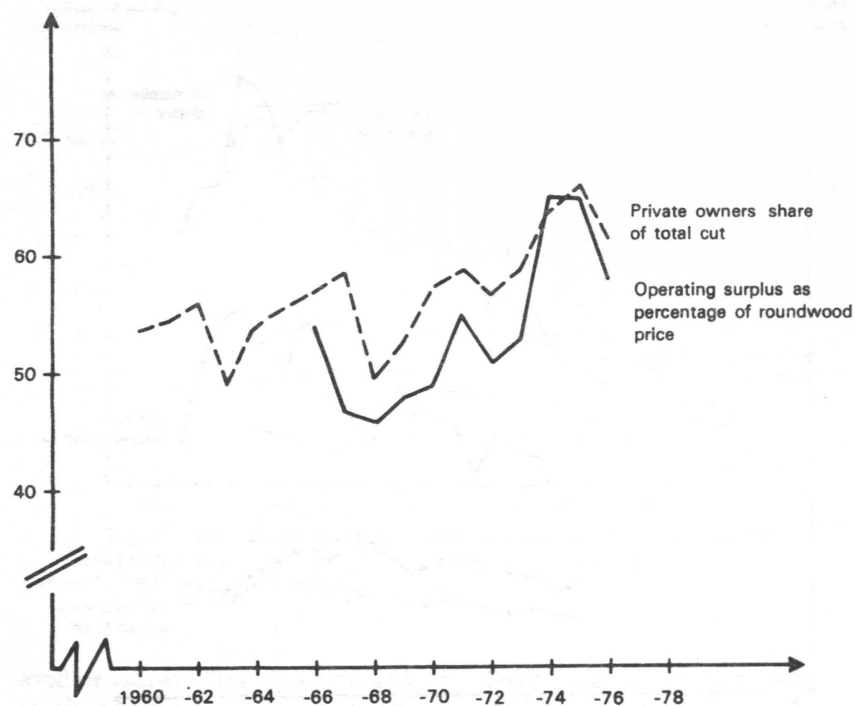


Figure 6. Operating surplus as percentage of the roundwood price and the share of the total cut accounted for by private woodlot owners.

a sign that the forest products industry wants to buy more roundwood than in the preceding logging season, owing to an increase or planned increase in production in the industry. The converse is true in respect of a fall in the percentage of the net operating surplus.

My hypothesis is: that the economic incentive influences the logging policy of woodlot owners during a business cycle.

4. THE EFFECT OF FORESTRY POLICY MEASURES ON THE ANNUAL CUT OF PRIVATE WOODLOT OWNERS

In my discussion of the influence exerted on the annual cut of private woodlot owners by the various measures that the authorities have at their disposal to realize the objectives of forestry policy, I will be referring to Figure 2.

4.1 Regulation

A change in the balance of wood supply and demand, i.e. a larger cut than that which can be maintained in the long term and which

is in response to the capacity of the forest products industry and the volume of wood it is looking for, the model system assumes will give rise to greater regulation, the purpose of which is to adapt the annual cut to a level that is consistent with the objectives of forestry policy. Thus, this measure attracts interest in a situation where the annual cut of the woodlot owners is at, or verging on, the maximum level that can be maintained in the long term. Although it is true that the level was nudged on occasion in Sweden during the 1970s, this regulatory measure has still not

been tested for any substantial period. What we do know is that the law and the resources available to enforce it cannot cope with any detailed regulation, such as which particular stand an individual owner decides to harvest or the extent of a particular thinning operation. We also know that the proportion of mature forest, particularly in the case of private woodlot owners, is higher than it should be with a view to the long-term, sustained yield policy. In this respect, then, regulation has proved ineffectual.

I believe:

that the silvicultural legislation and its enforcement by the silvicultural organization represent one measure at a time of wood shortage by means of which the level of the annual cut can be adjusted to suit forestry's long-term productive capacity.

I do not believe that any exact adjustment is possible because:

it is difficult in a short time to measure precisely the level of the annual cut and long-term increment; furthermore, during periods when wood is in short supply there would doubtlessly be moves to exploit this uncertainty in order to increase the logging intensity, and to attempt to regulate the operations of some 200 000 woodlot owners in precise detail would be extremely difficult.

Yet again I would underline the significant influence that the silvicultural acts and the silvicultural organization have had on silvicultural activities and, thus, on the level of the potential cut in the long run – were it not for the reforestation programme that was initiated at the beginning of this century, the balance in wood supply and demand in Sweden would have presented a very different picture.

One should not forget either the indirect effect of regulation on the annual cut that can be attributed to investment policy in the forest products industry and the industry's consequent expectations in terms of future annual cuts. Without doubt, the combined effect of stricter regulation and the debate that precedes the necessary legislation serves to restrain plans for growth in the industry. In this context one should bear in mind that the legislation governing new building projects in Sweden provides the government with a direct

means of monitoring any plans for expansion within the forest products industry.

4.2 Structural policy.

The structural policy of society as manifested in the land acquisition legislation during the 1950s, 1960s and much of the 1970s has contributed towards a shift in the ownership structure of private woodlots. I have already discussed the effects that the new ownership structure may have on developments in the level of the annual cut.

In an assessment of the influence that the structural policy of society has had on the ownership structure of woodlands, consideration must be given to the rapid change that has taken place in society at large during this period and also to technological advances in the agricultural field. Moreover, as I observed earlier, the majority of land acquisitions are exempt from intervention by the authorities. However, I am not saying that the structural policy of society is insignificant to changes in the ownership structure but that forces still exist which are more powerful. Indeed, any influence that the structural policy of society does have on forestry policy can only manifest itself in the long term, because of the small number of land transactions that can be influenced in any given year in relation to the total number of holdings.

In my view:

the current structural policy has only an marginal effect on developments in the level of the annual cut.

4.3 Taxation

The effect that the general increase in the level of taxation in Sweden has had on the level of the annual cut is related to the position of the woodlot owner in respect of income. In the short run a general and permanent increase in income tax is likely to result in a decrease in the annual cut. In the long run, however, it is doubtful whether the effect would be the same in the case of woodlot owners who depend on the forest for employment and income: income tax is unlikely to be reduced and the forest will have to be harvested in time to provide the owner

with employment and income. It follows then that forest owners who do not depend on the forest as a source of employment or income will presumably reason along other lines (see above). A certain amount of felling is necessary in mature stands for biological reasons. However, in view of the position of the woodlot owner as regards taxation and on account of inflation the woodlot owner will be financially better off if he conserves as much of the increment as possible in the form of standing crop, thereby allowing the value of his holding to appreciate.

I should mention, here, that a woodlot owner has the opportunity of investing the income from a logging operation in a special "forest account". The balance can then be withdrawn successively over a period of ten years. Given that income tax is applied at a progressive rate, the total tax payable would then be lower. It is interesting to note that a forest account with a healthy balance, thanks to previous high roundwood prices and/or large annual cuts, may tend to depress subsequent annual cuts, because the woodlot owner in this case already has an income from the forest to count on.

As an instrument to further the ends of forestry policy, taxation could be made effective through a change in the regulations. In 1973 the government survey on forestry policy proposed that an across-the-board tax be levied on forest increment, regardless of whether or not it had been capitalized. As a result logging operations would be intensified and the holding back of mature, merchantable timber would be discouraged. This proposal met with powerful opposition and was never enacted.

I believe:

that the structure of present forest taxation is of little help to the furtherance of the intentions of forestry policy.

4.4 Government grants

Government grants are intended to increase forestry activity by reducing the business costs and thereby improving the operating result. As I mentioned earlier, this measure in so far as it is applied to logging has only been employed in 1979 and 1980 in order to stimulate thinnings. The effectiveness of such grants has been contested. Spokesmen from the sawmills maintain that the result has been a reduction in the volume of sawlogs. For their part, representatives of the pulp industry claim that the final felling volume has fallen because resources in forestry have primarily been used for thinnings, which are more resource-intensive. However, since this form of grant is so new, it has not yet been possible to make any comprehensive assessment of its effectiveness.

In my opinion:

existing grants have had a negligible direct effect on the level of annual cuts.

4.5 Summary

It seems to me that of all the means available of influencing the logging policy of private woodlot owners the most effective is silvicultural legislation. However, when viewed in an historical perspective, the legislation has not been able to significantly regulate the level of the annual cut. Nevertheless, at a time when there is a shortage of wood raw materials, as we can reasonably expect to be the case in the future, the legislation will undoubtedly exert a greater influence. I imagine that when times are difficult, with greater competition for the wood raw materials, we must expect a greater degree of regulation of forestry and of the forest products industry.

Changes in forest taxation could prove to be an effective means in the future of, for example, achieving an increase in the annual cuts of private woodlot owners.

LITERATURE CITED

- ANDERSSON B, HÄCKNER J. & LÖNNSTEDT L.: *Skogsägareföreningarna i ett historiskt perspektiv*. SSR, Stockholm, 1980.
- Föreskrifter angående statligt stöd till skogsbruket. Skogsstyrelsen 1979.
- Föreskrifter m m till Skogsvårdslagen, Skogsstyrelsen 1979.
- LÖNNSTEDT L.: Varför avverkar den enskilde skogsägaren? En litteraturoversikt. Institutionen för skogsekonomi, Skogshögskolan, Rapport nr 23, 1977 (a).
- LÖNNSTEDT L.: The logging policy of private woodlot owners. An analysis of a data sample by means of the AID method. *Studia Forestalia Suecica*, nr 144, 1977, Swedish College of Forestry.
- MATTSSON L. & STRIDSBERG E.: Det industriella skogsbruket sett ur ett historiskt perspektiv. Rapport 8/79. Kulturgeografiska institutionen, Stockholms universitet.
- Mål och medel i skogspolitiken. Betänkande av givet av skogspolitiska utredningen. SOU 1973:14, Stockholm.
- STRIDSBERG E. & MATTSSON L.: *Skogen genom tiderna*. Dess roll för lantbruket från forntid till nutid. LT:s förlag, Stockholm 1980.
- Skogsstatistisk årsbok. SOS, Skogsstyrelsen.
- Wood resource dynamics in the Scandinavian forestry sector. Redaktörer: LÖNNSTEDT L. & RANDELS J. *Studia Forestalia Suecica*, nr 152, 1979. The Swedish University of agricultural sciences.