

The Efforts of Private Forest owners to Enhance Forest Management – a Theoretical Approach

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SUMMARY

Small-scale private forest owners do not generate significant income from forest management alone. Private forest owners are therefore often looking for an alternative source of income outside forestry. As a result, a lower economic activity by these forest owners can be observed. In addition, the public increasingly demands non-market benefits from forest management such as carbon sequestration, air pollution control or recreation amenities. Furthermore, rural development depends on a successful agriculture and silvicultural management. For this reason, the European Union allocates substantial subsidies to enhance rural development.

This paper describes different opportunities to enhance the activity of forest owners. It builds on a theoretical approach that owners wish to maximize their utility from forestry. As a result of a marginal analysis, different opportunities to enhance or to diminish forest management activities will identify. A main result is that high transaction costs for small-scale forest-owners are responsible for a lower activity level in forestry and for a higher activity level in off forest jobs.

Keywords: Small-scale forest owner, benefit from forestry, forest subsidies, transaction costs in forestry

1 INTRODUCTION AND OBJECTIVES

The improvement of forest management activities in small-scale forests is the focus of numerous forest-political investigations. Several studies have

been presented to classify forest owners (Elands; O'Leary 2002; Schraml et al. 2002; Wiersum et al. 2004). Frequently mentioned groups are hobby owners, part-time owners, and full-time owners. Hobby farmers are particularly interesting from the activity point of view, because they are not willing to do more in their forests (Ota 2004). The reasons for their behaviour can be multifarious and not always easy to understand for researchers and forest politicians alike. From our point of view the question is not to understand why somebody does not manage the own forest. That's why researchers, politicians, and other forest interested people come in droves to activate the so-called hobby owners. Their arguments to activate the forest owners are more supply of timber and enhancement of a sustainable forest management (Bouriaud 2004). Especially in Germany, an exiting discussion has been started after the results of the second national forest inventory have been presented. According to this inventory, a huge unused growing stock is located in small-scale forests (Bundesministerium für Verbraucherschutz 2005). That's why, efforts have to be started to active this resource. But on the other hand, a large number of forest owners are not willing to undertake thinnings. After first contacts with the unknown subject frustration will arise: Hobby forest owners do not perceive that forest management is important and very fruitful for the society at large. On the other side, forest owners may ask why they are so interesting and subject of many investigations (Ziegenspeck 2004).

However, it is questionable why small-scale forest owners are inactive in their forest or why they are often not willing to join an association. One reason might be that these owners obviously derive another utility from the forests than full time

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forest owner (Harrison 2001; Matsushita 2004). Whereas for the last-mentioned group income achievement is a substantial incentive for the forest management, hobby owners predominantly receive the main household income from outside the forests. Efforts to motivate these owners for a stronger forest management have to consider the different utility.

The presentation aims to set up a simple economic model to explain why people are satisfied with the present situation where they may get a bit income from forests and an additional utility from other goods. By means of utility theory and microeconomic approaches, it will be shown which quite different possibilities exist to enhance the forest management activity of forest owners. Finally, practical recommendations are formulated.

2 THEORETICAL FRAMEWORK

2.1 Utility Maximization

In economics, utility maximization is assumed to explain the behaviour of people in general. For this reason, people are sometimes colloquially called “homo oeconomicus” in order to stress that people always try to maximize their utility (Blum 2004). Note that the utility can arise both from a composition of non-monetary as well as monetary benefits.

Private forest owners aim to maximize their utility, too, although they do not tend exclusively to get gross household income from forestry. In contrary to a full time forest owner, small-scale forest owners may get a high benefit from non-monetary utility like recreation or nature conservation. In Germany, a common reason of private forest owners is pride of having a private forest. Due to the low profitability of small-scale forests, these non-monetary benefits will probably be very valuable for the forest owners.

The activity, or, with other words, the willingness of a forest owners to manage his forests depends largely upon the benefits which will arise (Klemperer 2003). Assume a small-scale forest owner has a definite time budget per day for free disposal. In contrast to full time forest owners, small-scale forest owners primarily get their

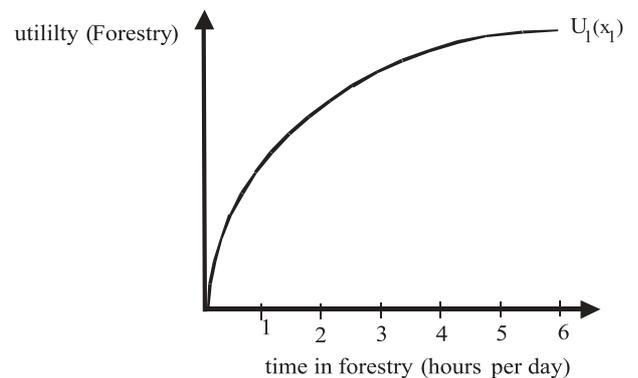


FIGURE 1: Utility function of a small-scale forest owner

household income from other activities than forestry. These can be from employment or as forestry only 6 hours per day leisure time if time for sleep is added. In other words, the small-scale forest owner can decide free about these 6 hours per day. This is leisure for the forest owner, who will use this bundle of activities that induce the highest utility.

The utility function of small-scale forest owners can look like the graph in FIGURE 1.

FIGURE 1 illustrates an increasing utility if the forest owner is more active in his forest but with diminishing rate. By the free disposal of 6 hours the forest owner can now balance how much time he wishes to use for each possibility of pastime. For example he can choose of 1 hour activity in forests and 5 hours outside or 4 hours in forests and 2 hours outside.

Due to the diminishing utility by increasing activities, the marginal analysis is an appropriate economic theory in explaining the behaviour of forest owners. The marginal utility function arises from the differentiation of utility by time spent for the activity. This function is shown in FIGURE 2 for two alternative choices of activities.

The optimum is reached where each marginal utility from the activity in forestry and the alternative activity equals. In other words: As long as the activity outside the forestry denotes a higher marginal utility than the use of time in the forestry as long as the forest owner will be active outside the forestry. Due to the decreasing of utility with a

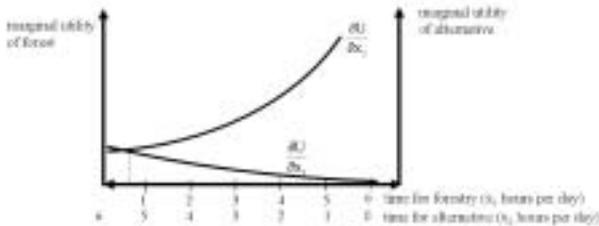


FIGURE 2: Marginal utilities of forestry and of an alternative time use

further activity (law of diminishing utility) there exists a point, where both marginal utilities are equal. Hence, if the marginal utility outside the forestry is lower than that from activities in forestry, a higher activity in forestry will be useful from a utility point of view. Maybe, this can be observed in small-scale forest owners. They spend a bit of time of their leisure in forestry but the main part outside. The forest owner will not move from this point because this is his economic optimum. A higher activity in forestry needs more time of the alternative so the new solution will not be optimal.

In order to change this situation, there are a bundle of different possibilities. Efforts to enhance the forest management should aim to increase utility of forests. FIGURE 3 illustrates the theoretical solution in the case where forest management activities are enhanced. As it is possible to see, the marginal utility for forestry will be higher and a new equilibrium for time use of forestry and alternative will appear.

FIGURE 3 shows two quite different approaches to change the present situation. Firstly,

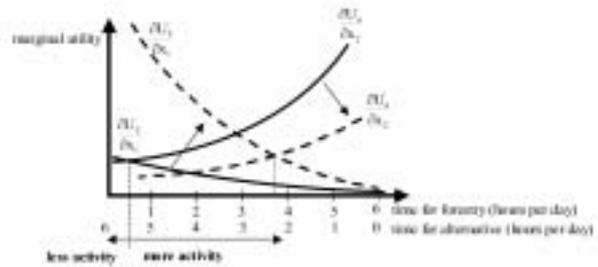


FIGURE 3: Theoretical possibilities to enhance forest management activities of forest owners

more activities can be reached by improving the marginal utility of forestry or impairing the marginal utility of the alternative. Secondly, a higher marginal utility in the alternative time use will cause less time spent on the activity of small-scale forestry. If the goal exists to motivate forest owners for more forest management, a substantial improvement of benefit sources is necessary. The forest owner needs a real opportunity to get a higher level of non-monetary or monetary benefits, because the hope to degrade marginal benefits of alternatives is a forlorn hope!

A higher activity in forestry does not mean that the forest owner works in his forest itself. In fact a higher activity could include a search for advice or join an association for a professional management of the forests too, because in this case, a professional management can ensure higher monetary benefits.

In summary from the theoretical point of view, recommendations for small-scale forest owners have to be justified to one of the both quite different possibilities (see FIGURE 4).

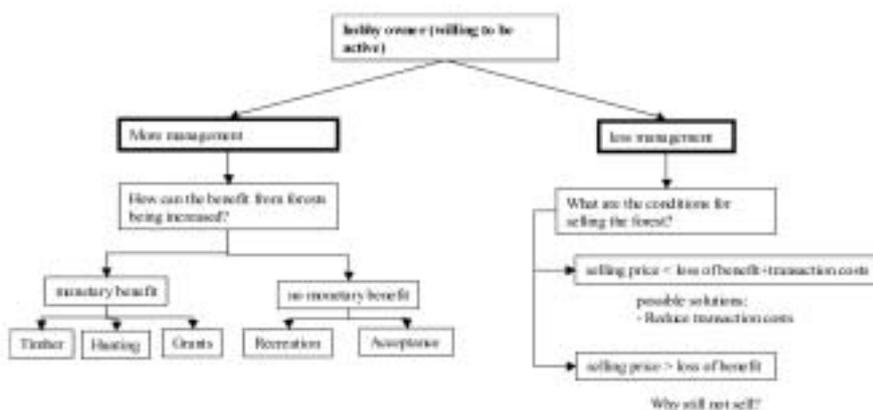


FIGURE 4: Practical possibilities to enhance forest management activities of forest owners

A more detailed examination of practical solutions is given in the next chapter.

3 PRACTICAL SOLUTIONS TO INCREASE FOREST MANAGEMENT ACTIVITIES

3.1 Enhance Forest Management Activities

An increase of the marginal utility from forestry is possible, as the monetary or the not-monetary use from forest management rise.

Monetary utility results mainly from the sale of wood or, from the sale of hunting rights, to extent allowed by legal regulations. However the question is why the owner did not take up these possibilities up to now. What are the conditions that have to be changed in order to enhance the utility of small-scale forestry? A first closer look to some potential opportunities shows some practical solutions:

- An increase in timber prices of common timber assortments will increase the profit of each forest measurement. In that case, a higher monetary utility can arise for the forest owner.
- Creating new products, which have a higher marginal profit. In recent years, an ongoing increase of demand of biomass could be observed. Assuming that also the future demand of wood for energy purposes increases and if political frameworks are adequate, new income sources can be established for the forest owners.
- A key point in forest management is cost reduction. Due to a low profitability of forest investments in many countries in Central Europe, a cost reduction of nearly 2% will have an enormous influence on the profitability of forestry. In other words: The improvement of efficient forest measurements will create positive effects on the activities of small-scale forest owners.
- Another point is the existence of subsidies. For example in Germany, many forest measurements like forest road construction, advance preliminary planting measurements, or stand tending measurements were subsidized. But it is important to recognize, that subsidies of such kind only helps the active forest owners

and not the inactive one, because if somebody obtains subsidies it has to achieve an equity ratio. In contrary to these coupled payments for measurements, a more flexible system has to be introduced like the reform of the common agriculture in the European Union. Payment could be linked to the respect of environmental, food safety, animal and plant health and animal welfare standards, as well as the requirement to keep all farmland in good agricultural and environmental condition ("cross-compliance"). With such a system, small-scale forest owners have the possibility to get income if they ensure a minimum of forest management. Depending of the level of such grants, hobby forest owners use few hours per month for forestry.

In the mentioned examples, only monetary benefits were observed. As mentioned above, non-monetary benefits can improve the forest management activities, too. So it is not clear at the beginning, whether a forest owner whose non-monetary benefit arises from tradition can be activated by more forest management. Indeed there is a chance to persuade this forest owner that a well-managed forest will create a bundle of new non-monetary benefits.

Another possibility is to offer a small-scale forest owner a professional forest management by a third party. With this approach, the forest owner can enhance his monetary and non-monetary benefit without own activity. The forest owner can get an annual fix termed cash flow of his forest and he will be the owner too. Note, the main condition for this is only the willingness of the forest owner to cooperate. But the key point is that the cooperation can accept all inconveniences related with the forests. Only due to the take-over of all relevant forest management activities, will the utility of forests increase for the small-scale forest owner. This would result in well-managed forests. Many studies have looked at this problem, and it is necessary to note, that cooperation is only one of a range of different possibilities.

At last, there exists yet another theoretical possibility to enhance to small-scale forest management activities. This possibility aims to cast a damning light on forest owners, who do not manage their forests. In such a case, the forest

owner would be perceived as a bad forest owner by the public and a non monetary damage would appear. Only a more efficient management of the forest could modify the public opinion. The price needed to be paid by the forest owner would be the price for a good public reputation.

3.2 Decrease of Forest Management Activities

3.2.1 Loss of Benefit

As shown in FIGURE 4, another approach aims to find out all relevant conditions, which are necessary for the willingness of the small-scale owner to sell the forest. In this case, forest owners could sell in stead of managing their forests. For example, a forest owner that has inherited a forest may perceive the forest and related activities as a real burden. The marginal utility of forestry activities is already in this situation very low. Is it useful to persuade this forest owner to manage his forest? Maybe, it is advisable to give recommendations to sell the forest.

From the practical point of view, several questions arise, such as when does a forest owner sells his forest, what should be the conditions for selling etc.? A main point in this context is the loss of benefit after selling. Loss of benefit will appear in case the forest owner got a non-monetary or monetary utility of the existence of the forest. The calculation of this loss is straight forward as the following example shows:

$$AB = 20 \text{ EUR/a}$$

$$i=2\%$$

$$MAP = \frac{20}{0.02} = 1.000\text{EUR} \quad /1/$$

where

AB = annual (non-montary or monetary) benefit

i = interest rate

MAP = minimum acceptable price for forest land

Assume, the (non-montary or monetary) benefit of the existence of a forest is 20 EUR per year. As a result of perpetual discounting, the present value of 1.000 EUR results. This is the loss of benefit, if the forest is selling. If the purchase price is smaller

than the bar value of this annual loss of benefit, the forest owner will not sell the forest. In the reversal conclusion this means, that forest owners do not sell their forest, because they their loss of benefit is more highly evaluated than the possible selling price.

Obviously, the forest owners achieve a high non-monetary benefit from the possession of the woodland, which is not compensated by the selling price. A reason for it can be that buyers calculate the maximum bid price on the basis of the forest value (e.g. stumpage value) and this is low according to experience in Central Europe. Typical frequent reactions of forest owners are: "For such a little amount I do not sell my forest". On the other hand, it also becomes clear that it will be very difficult to sell these forests because there is nobody at the market who would get a similarly high non-monetary benefit from the (foreign) wood and pay, therefore, a high purchase price. Merely for forests with a high stumpage value the purchase price could cover the loss of benefits by the seller.

3.2.2 Transaction Costs

However, besides the above mentioned problem, forest owner also consider transaction costs, which are connected with the sale of a forest. Depending on national regulations, forest sales can be connected with considerable transaction costs. All costs, which are related to the exchange of property rights between two trading partners, are understood by transaction costs. Transaction costs are defined as costs originating from the handing over of a good or service to another (Williamson 1985). Relevant variables on the height of the transaction costs are:

- uncertainty
- asset specificity
- frequency of transaction
- limited rationality,
- opportunistic behaviour.

For the sale of forests, uncertainty and frequency of transactions have certainly a special meaning. The forest owners, in particular small scale forest owners, who have not sold any forestland will encounter more uncertainty than somebody who very often buys or sells forests.

Transaction costs can be distinguished in (Crockett 1982)

- ex ante
 - Provision of information
 - Initiation costs
- Ex -post
 - Processing costs
 - Costs of control

It is not easy to predict, which transaction costs will appear within the scope of forest sales in detail. However, it can be supposed, that in particular ex-ante costs have an essential impact on transaction costs. Therefore, the existence of transaction costs causes the selling price of a forest to rise, in order to compensate the loss of benefit. This can be illustrated by using the following example:

$$AB = 20\text{EUR/a}$$

$$i=2\%$$

$$MAP > \frac{20}{0.02} + TAC = 1.000\text{EUR} + TAC \quad /2/$$

where

AB = annual (nonmonetary or monetary) benefit

i = interest rate

MAP = minimum acceptable price for forest land

TAC = transaction costs

Another aspect not to be neglected concerns the running costs, which are related to the ownership of a forest. Typical annual payments that are independent of any activities of the forest owner are land tax and insurance. If a forest owner does not sell his forests, the annual fixed costs can be interpreted as the price for the benefits derived from the forest. Only in the case that the fixed costs are higher than the benefits, the forest owner will sell. This kind of relationship could be well described by the following inequality:

$$FC < AB$$

where

FC = fix costs

AB = annual (non-montary or monetary) benefit

A forest owner will not sell his forest as long as the annual fixed costs are smaller than the loss of

benefits. Or, in other words, the higher the monetary or non-monetary benefits derived from forests, the lower the willingness of the forest owner to sell the forest in case of high annual costs. Thus high benefits from forests can compensate high fixed costs. With regard to transaction costs and annual costs, the following decision problem arises from the economic point of view:

$$(SP + TAC)i - FC < MAP = AB \quad \text{with } FC = \{x | x \leq 0\} \quad /3/$$

where

SP = selling price

TAC = transaction costs

FC = fixed costs

MAP = minimum acceptable price for forest land

AB = annual benefit

i = interest rate

If the left hand side of equation/3/is lower than the right hand side, the forest owner will sell. Note, the left hand side includes the capitalised sum of selling price and transaction costs as well the annual fixed costs. Furthermore, the fixed costs are every time negative, so that the second term of/1/will be positive. It follows that the willingness of a forest owner to sell the forest is greater in case the left hand side of equation/3/is high.

4 CONCLUSION AND RECOMMENDATIONS

4.1 Possibilities of Activating Small-scale Forest Owners

4.1.1 Subsidies

As already mentioned, forest owners can be stimulated from an analytic point of view to a higher activity if they can achieve a higher income from forests. One aspect could be coupling subsidies to forest management activities. If the society has a serious interest in a well-managed private forest, irregardless of how this interest is articulated, it could choose to pay subsidies for this public service of the forest owner. The forest owners can act as a provider of public goods like land management or recreation services. By interlinking forest measures and subsidies, a new subsidy system will be created. As above-

mentioned, the European Union already supports agriculture subsidies. The so-called first pillar of the common agriculture policy guarantee farmers an annual fixed income for public performances. Note, cross-compliance links direct payments to farmers to their respect of environmental and other requirements set at EU and national levels.

The enlargement of the existing agricultural subsidy system to forestry would offer income possibility for such forest owners who need a higher monetary benefit from forestry in order to undertake management activities. Practical minimum standards in forestry could be introduced such as a minimum of harvested timber or a minimum of thinning area. As demonstrated in FIGURE 3, a higher management activity level can be expected, if the monetary utility of forestry increases.

While the linking of payments ensures a minimum of forest management, a second possibility for subsidies forestry exists, too. According to the Council Regulation (EC) No 1698/2005 of the European Union on support for rural development 2007-2013 (European Commission 2005), a second pillar for subsidies was introduced. The key point of this issue is that forest subsidies will support only measures that aim to develop rural areas. For this reason, four axes were created:

- Improving the competitiveness of the agricultural and forestry sector
- Improving the environment and the countryside
- The quality of life in rural areas and diversification of the rural economy
- LEADER

This strategy aims to involve forestry particularly. Without any more detailed analysis, it can be noticed that these subsidies will not be an incentive for more forest management. Quite on the contrary because the grants are coupled with a heavy administration amount. In particularly small-scale forest owners avoid more amounts for forest management without an appropriate benefit. Another aspect concerns the measure itself. Subsidies will only be granted as a share of all eligible cost and the forest owners would have to pay an equity ratio. It is really hard to believe that

a small-scale forest owner can be motivated by investing money in his forest. Hence, especially already active forest owners would participate in the grant system

4.1.2 New income sources

The present possibilities for the income achievement are apparently not sufficient to generate an income that motivates the small-scale forest owner to undertake more forest management. Consequently, it should be checked which new income possibilities can be created. It is conceivable, e.g. that forest owners charge entry fee from forest visitors. But due to national regulations this is not possible at present. If the public wants to move the forest owner, however, into the position of generating new income, a political discussion should be led about the right of public access. Maybe, these existing regulations might have an essential influence on the inactivity of small-scale forest owners.

From the economic point of view, a more basic discussion about the regimentation of forest owners, especially in Germany, should be pushed.

4.2 Possibilities for Selling Forests

4.2.1 Transaction costs

Transaction costs have an important influence on the willingness to sell forests. Hence, new solutions to reduce these costs should be introduced. Due to the fact, especially information costs have a main part of transaction costs; new approaches to reduce these special costs should be created, e.g.

- Creation of platforms where forests can be simply offered to sales (e.g., Internet)
- Free support on forest valuation of the forests

4.2.2 Fixed Costs

As already shown, fixed costs have a heavy influence on the utility of forests for the owner. Therefore, with an increase of fixed costs, the willingness to sell the forests could be pushed. In such a case, the proportion of could be changed into. In this situation, the annual fixed costs are

higher than the annual benefit of the forest ownership. A practical solution can be, especially in Germany, a very strong increase of land tax.

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