

# Decision-Making by Private Forest Owners: Literature Review of Some Empirical Studies

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It is of a crucial importance to the forest owners and other key players in the forest sector that the basic determinants of the decision-making of forest owners were understood. This topic usually requires a set of complementary empirical studies both from economics and social fields. Empirical studies show private forest owners differ in their attitudes towards forest management and correspondingly, take different decisions on how to act at various situations, related to the different aspects of forest management.

In this paper, a literature review of some empirical studies, on decision making among private forest owners is provided.

**Key words:** private forest owners, decision-making, empirical studies

## Introduction

The theoretical background in decision-making processes in managing the forest or land holdings has been explored in the scientific literature during last decades. Many authors concentrate on investigating how farmers or private forest owners should make the decisions. What determines the decision to cut, why do private forest owners join co-operatives, how to finance a purchase of forest estate, or which aspect of Sustainable Forest Management is more important for the forest owner? Different types of scientific reports might help forest owners to change this attitude and pattern. The central factor in affecting the decision-making process is Environment in which the decision maker is acting. Below, I will review some examples of empirical research made by various researchers concerning the issues of decision-making by forest owners.

## Methods and Objective of the Study

The main objective of this literature review is based on empirical studies to analyse the processes of decision-making among private forest owners in different countries, particularly, Finland, Lithuania, Sweden, and USA. In this paper the special focus is on explaining the different economic and socially-driven perspectives applied by the forest owners making

a variety of decisions related to the management operations.

The main body of this paper is divided into three individual sections. The aim of these sections is:

- to survey the theoretical background on decision-making among private forest owners and farmers;
- to analyse the empirical studies which address specific decisions by variety of private forest owners;
- to summarise the literature review.

## Theoretical Background in Decision Making

The theoretical background for this study was a textbook on decision sciences written by Öhlmer *et al.* (1997). The farmers in this publication according to their perceptions were divided into two groups: quantitative and qualitative.

Quantitative farmers have quantified their perceptions about future price and support fluctuations and have estimation of consequences to the farm income. The qualitative type of farmers needs less information. They have a higher education, better understanding of the situation, higher level of dept, to a large extent budget their activities, devote more time for studying problems. Included variable “avoidance” is significant in describing models, as analysis shows that higher avoidance detects the problem later, or in other words – avoidance delays problem detection.

It may be summarised that management assistance should be directed separately to quantitative and qualitative type of farmers and designed to suite their needs and ability to absorb the given information.

Gow and Stayner (1995) in their critical review on farm adjustment (euphemism for farmers leaving agriculture) described how complex is decision making in farming and in forestry. They argue that there are numerous ways in which farmers respond to change in the economic, technical, and institutional environment. Globalisation or other powerful impacts influence or will influence the structures of the farms tremendously. Farm adjustment includes the way, in which farmers change the use of land, labour and capital in response to such factors as changes in prices of agricultural commodities, and farm inputs, opportunities for investment in agriculture and deployment of farm resources elsewhere in economy; the availability of new farm inputs, plant and machinery and new techniques of production; alterations to marketing arrangements and access to markets; variations in climatic conditions; and changes to legal restraints on the use of farm inputs and resources. Moreover, farm adjustment in agriculture takes place within a social context, and is accompanied by social stresses and disruptions.

The focus implied in the above definition was clearly on the actions taken at the individual farm level. It was said by the researchers, that adjustment in agriculture takes place within the social context, and is accompanied by social stresses and disruptions. Correspondingly, researchers have raised the hypothesis that non-economic factors impact significantly on the process of farm adjustment.

### Decision-Making Among Private Forest Owners

#### *Forestry Decisions Depending on Types of Forest Owners*

Some aspects of socio-economic environment, such as family, governmental policy, might be of a crucial importance in forest owners' decision making. It will be discussed values and objectives are dependent on cultural, institutional, social and economic environment of the country. It is also highlighted that different characteristics of forest holding, such as ownership type, holding size, type of stand, etc. differ.

Kurtz and Lewis (1981) in their study identified four types of private forest owners in USA: (1) timber agriculturalist (sustained growing and harvesting of timber is the most effective land use type), (2) timber conservationist (believe in managing for sustained production of timber while considering other aspects),

(3) forest environmentalist (regard forest as a reservoir for a variety of benefits), and (4) range pragmatist (a distinct business and production orientation). Nevertheless, the results have shown that timber production is an objective for the majority of private forest owners. Owners of all four types felt that their forest holding was increasing in value and could function as financial reserve.

Mizaraitė (2001) gave relatively similar outcome in her overview of forest owners in Lithuania. In fact, there were two relatively equal rationales for investing in forest property: desire to develop business and desire to develop estate.

Karppinen (1998) grouped Finnish private forest owners based on their objectives and characteristics of holding into: (1) multiobjective forest owners who valued both monetary and amenity benefits of their forests; (2) recreationists that emphasised non-timber and amenity aspects of their holdings; (3) self-employed, who valued regular sales and labour income as well as employment provided by their forests; and (4) investors, who regarded their forests as an asset and a source of economic security. It appeared that "economically oriented" forest owners (i.e. investors and self-employed) owners are production-oriented, while, recreationalists are mainly consumption-oriented. Nevertheless, self-employed owners also emphasise the importance of the consumption of household timber. Multiobjective owners, the most active group, which act responsively in silvicultural and cutting behaviour, represent the mixture of the two orientations. Results in this analysis suggested that the sole emphasis on economic benefits of forests does not lead to the most active silvicultural and harvesting behaviour. It also suggested that general forest values and long term forest objectives of forest owner are not strongly correlated. It appeared that recreationalists are mainly consumption-oriented, whereas investors and self employed owners are production-oriented. Nevertheless, self-employed owners also emphasise the importance of the consumption of household timber. Multiobjective owners, the most active group, with responsible silvicultural and cutting behaviour, represent the mixture of the two orientations. The results of this study suggest that non-timber objectives and humanistic values in particular would have a positive effect on silvicultural activity.

Lönnstedt (1989) argued that most of the private forest owners in Sweden, regardless of the type ownership, have a long time perspective (25 to 30 years) to hold their estate in trust and hand it onto the next generation. It slightly suggests that the owners are concerned about their property much more compared to how often the legislation is changed, market con-

ditions fluctuate. It is stable and sustainable way of management that comes out from same kind of way of decisions are taken.

Järveläinen (1982) and Lönnstedt (1998) argued that the number of the forest holdings used by non-farmers continues to increase. Results showed that allowable cut varies remarkably between different forest holdings at least during a short time period. In some holdings the actual cuttings greatly exceed cutting potentials, while in the other holdings cutting is carried out in accordance with allowable cut. In a great number of holdings cutting potentials are used only to a minor extent, if at all. This development does not, however, have any significant effect on the use of the allowable cut. Non-farmers can be considered as group of owners that overuse the cutting potentials on one hand, and underuse the cuttings on another one. The volumes of cutting are above average in forest holdings owned by non-farmers, but this does not increase the use of the allowable cut, because the frequency of timber trade is below the average.

The use of the cutting potentials follows the development of the owner's life cycle. According to the owners' own judgments, the need for money for investment, consumption, and silvicultural requirements is an important factor affecting the decisions of forest owner to sell the timber. The intensity of the use of allowable cut was especially high, when timber sales revenues were used for financing exceptionally large purchases, such as buying land or residences. The timber price level and the instructions given by forestry experts of the forest management associations also act as factors affecting the decision to sell timber.

#### *Forestry Decisions Depending on the Socio-Economic Structure of Private Forestry*

For the majority of private forest owners forest play only a slight, or even a negligible, role in the household economy. It is evident, that forest is very often a supplementary source of income, although there are exceptions. Despite this, forest is of strategic significance in the owner's decision about the place of residence, level of self-employment, mode of life and means of support.

Studying private forest owners in USA, Bliss and Martin (1989) identified several factors, which motivate their forest management activities - owners' ethnicity, family identity, and personal identity. The arguments for survey approach are given, such as effective way to quantify population, availability of analytical tools, tests can be replicated, high degree of acceptance, and ability to estimate the variance. However, this approach has several limitations: choice

of what questions to ask and what responses are appropriate; the unit of analysis is not the individual; it describes selected characteristics of a short period in respondent's lives; researcher must rigidly adhere to survey protocol throughout the study; and means for evaluation of data quality are limited.

Another important factor, which might influence the style of management is management as a challenge and legacy. According to the authors, their research is well suited to understand the attitudes and motivations of the owners. This scientific work contrasts with survey methodology and demonstrates the use of the latter with an example from research on management motives and completely suggests ways in which two methodologies can complement each other.

Törnquist (1997) explored socio-economic structure of ownership and forestry as a part of the household economy and suggested to divide forest owners' households into three categories: (1) farmer households where main income comes from the land, that is in agriculture and forestry (2) mixed households with different means of support inside and outside of the property and a variety of income from employment or enterprises, and (3) wage households where main income comes from the employment. In fact, there are two rationales for investing in forest property: desire to develop business and desire to develop estate.

Results of the study show that there are several patterns of socio-economic structure of the small-scale forest ownership in Sweden: self-employed mode of life, weakening connection with agriculture, mechanization, timber supply shortage, forest policy, loss of organizational strength and other determinants.

#### *Forestry Decisions Depending on Financial Risk of the Forest Owner*

Forest owners usually face a very difficult task: how to finance a purchase of forest estate. The complexity of the decision requires a decision-making tool to contribute to a financial solution in connection with the acquisition of a forest estate, which takes into consideration the estate's particular conditions as well as the buyer's (and the lender's) preferences.

Lönnstedt and Rutegård (2000) investigated different types of forest holding acquisitions, each focusing on a particular characteristic, that is, a large acquisition, an acquisition of additional forest area and an acquisition with the predominantly young forest. They found that a certain lowest amount of initial equity capital was essential for two of the model solutions. When assuming the similar harvesting level, as in the real case, the third solution also required a certain amount of initial equity capital. In contrast,

none of the three purchases were made using equity capital as a part of the total purchase sum.

Lönnstedt and Svensson (2000) argue that Swedish private forest owners regard forest holding as a safer investment than stocks or bank savings. Moreover, forest owners are risk averse in questions of larger sums of money, but are risk prone when it comes to smaller sums.

Thus, there are many factors, which affect forest owners' view of risk in his/her forest holding. Risk could be seen as key determinant in decision-making process. The risk factors could be direct - those having an economic dimension (mainly applied to price and cost), and indirect, natural risk factors (mainly applied to wind or insect damage and rotting). Moreover, investments in forestry can be seen as from of risk perspective in relation to other investment alternatives.

According to the authors of this empirical study there are many factors affecting forest owners' view of risk in his/her forest holding. Investments in forestry can be seen from the risk perspective in relation to the other investment alternatives. The conclusion made in a number of studies treating the problem of risk is that investments in forest holdings are quite risky, but nevertheless contribute toward reduction of the total risk in the portfolio. This survey confirmed that prediction of direct economic risk such as price and cost changes is seen by forest owners as much more important than indirect economic risks such as biological damage. Analysis of the results also provides a clear answer - forest owners who are less dependent on an income from their forests emphasize to a greater extent the importance of indirect economic factors for their view of forestry and the investment decisions they must make.

## Discussion and conclusions

The results further show that private forest owners, being among the main actors in the forest sectors of different countries, have been studied from the socio-economic point of view. Private forest sector consists of a heterogeneous set of firms and their associated householders, in varying stages of incomplete adjustment from previous decisions, simultaneously affected by a wide range of external events and changing internal needs and objectives.

Analysis of results showed that off-farming has become an important source of income for family farmers and part time farming has become a permanent, institutionalized feature. Moreover, many empirical studies have stressed that farm adjustment is not an occasional response, but instead encompasses continual responses to internal and external pressures to

farm family and business. This contrasts with a simplistic behavioral assumptions, which dominates the economic analysis of adjustment process. Very little is known about what happens on the individual farms on which adjustment takes place, that is, about how this process changes over time.

As discussed above, private forest owners differ in their values and attitudes, as well as objectives towards the management of the holdings. It should be noted that general forest values and long term objectives of forest ownership are not strongly correlated, although majority of forest owners in different countries express their strong commitment to manage their forests with a long-term perspective.

According to the above-mentioned researches, one of the major concerns to private forest owners was positive income. Hunting, fuel wood and lifestyle were less important goals. It could be argued that an overriding objective, influencing the management of the private forestry is to preserve and developed the holding. A variety of formal and informal economic, production and environmental, and intangible goals are influenced by this overriding objective. However, there is a distinction not only between forest owners, but between farmers and non-farmers, as well. Non-farmers can be considered as group of owners that overuse the cutting potentials on one hand, and underuse the cuttings on the other. The felling volumes are above average in forest holdings owned by non-farmers, but this does not increase the use of the allowable cut, because the frequency of timber trade is below the average. This could be interpreted assuming that forest management might differ starting with forest management planning and ending with sales channel of timber production.

The use of the cutting potential follows the development of the owner's life cycle. According to the owners' own judgments, the need for money for investment, consumption, and silvicultural requirements are important factors affecting the decisions of forest owner to sell the timber, often with the help of forest owners' co-operatives (or associations).

In addition to relying on their own observations of change in roundwood prices and the recommendations of the forest management plan, owners identify cutting opportunity through neighbours, friends, timber buyers, or extension rangers. Usually the owner uses the same selling channel (in most cases - forest owners' co-operatives) from time to time.

Empirical studies have shown that there is a difference between the potential harvesting level as considered by the forest owners and the assessments made the governmental institutions. It appears that this indicator is lower, with everything else being equal and

authorities that take decisions on policy formation and implementation in private forests should carefully consider this fact.

It is vital to note that reviewed results of the empirical studies in this paper could find the right place in processes of planning and implementation of public forestry policy and allocation of the resources of forestry extension services.

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## ПРОЦЕССЫ ПРИНЯТИЯ РЕШЕНИЙ У ЧАСТНЫХ ЛЕСОВЛАДЕЛЬЦЕВ: ЧТО ПОКАЗЫВАЮТ ЭМПИРИЧЕСКИЕ ИССЛЕДОВАНИЯ

А. Пиворюнас

Резюме

Для частных лесовладельцев, как и других ключевых игроков в лесном хозяйстве важно понять, как и почему работает основные процессы принятия решений. Это обычно требует дополнительных эмпирических исследований между экономистами и социологами. Эмпирические исследования показывают, что есть очень близкая связь между лесовладельцем и его собственностью. Кроме того, частные лесовладельцы отличаются друг от друга, также как и отличаются их принятые решения о том, как действовать в различных ситуациях, в отношении к различным аспектам лесного управления.

Эта бумага построена как обзор литературы эмпирических исследований, базирующийся в принятии решений среди частных лесовладельцев.

**Ключевые слова:** частные лесовладельцы, процесс принятия решений, эмпирические исследования.