PROSPECTS OF INTERNATIONAL STATISTICS ON FARM FORESTRY

MOSEFA Concerted Action Project (FAIR-CT96-1414)

Proceedings of the International Workshop held in Freiburg, Germany 23-26 September 1998 and the MOSEFA Final Seminar held in Iisalmi, Finland 9-13 June 1999

Edited by Anssi Niskanen and Pentti Hyttinen

EFI Proceedings No. 31, 1999



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The Concerted Action project MOSEFA "Monitoring the Socio-economic Situation of European Farm Forestry" was launched in March 1997 under the European Union FAIR3 Programme. The main method for implementing the project was to arrange a set of workshops each aimed for examining a specific topic of interest. The four workshops arranged were:

- Workshop A: Methodological Issues of Cost Accountancy in European Farm Forest Enterprises, 28-31 August 1997, Zeist, The Netherlands;
- Workshop B: Sampling Schemes for Socio-economic Studies in Farm Forestry Accountancy Networks Under Various Conditions, 19-22 April 1998, Trento, Italy;
- Workshop C: Prospects of International statistics on Farm Forestry, 23-26 September 1998, Freiburg, Germany; and
- Final Workshop: Presenting the Final Results and Agreeing on the Future Cooperation, 9-13 June 1999, Iisalmi, Finland.

The proceedings of the first and second workshop have been published earlier in EFI Proceedings 20 and 28. This volume includes the keynote papers presented at the third and final workshops, which were attended by 30 participants from 12 countries, and 31 participants from 12 countries, respectively.

We would like to thank the Forest Research Institute of Baden-Württemberg, and especially Professor Helmut Brandl and Mr. Willy Nain for taking care of the practical arrangements of the third workshop. Likewise, our sincerest thank are to North-Savo Polytechnic, Rural Education, and especially to Mr. Miika Kajanus and Mr. Seppo Mönkkönen who took the responsibility for arranging the final workshop. We would also like express our gratitude to all the invited speakers and participants in these workshops. Finally, we would like to thank Ms. Johanna Väyrynen and Ms. Mari Pitkänen for their valuable contribution in arranging the workshops as well as for the swift editing of these proceedings.

The MOSEFA project will be completed after publishing the research report "Guidelines for establishing farm forestry accountancy networks".

Joensuu, Finland December 1999

Pentti Hyttinen Coordinator Anssi Niskanen Associate Coordinator

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EXECUTIVE SUMMARY

The Concerted Action project MOSEFA "Monitoring the Socio-economic Situation of European Farm Forestry" was launched in March 1997 under the European Union FAIR3 Programme. The project was carried out by 17 participating research institutes from 14 European countries.

The Concerted Action was established to harmonise the heterogeneous approaches of monitoring systems at the country-level and to produce generally applicable guidelines to build up forestry accountancy networks. The main method for implementing the project was to arrange a set of workshops each aimed for examining a specific topic of interest. The last two workshops arranged, of which presentations are presented in these proceedings, were:

- Workshop C: Prospects of International statistics on Farm Forestry, 23-26 September 1998, Freiburg, Germany; and
- Final Workshop: Presenting the Final Results and Agreeing on the Future Cooperation, 9-13 June 1999, Iisalmi, Finland.

Monitoring of the economics of farm forestry is needed to assess the profitability of forestry as well as the farm level impacts of the changes in economic and political environments. The most recent changes that have or will likely impact on the economics of farm forestry include the Agenda 2000, EU rural and regional development policies, demands for sustainable forestry, changes in national forest policies, forest certification requirements and EU's Common Agricultural Policy reform. The basic problem here is that the farm level impacts of these changes are not possible to estimate without a methodological sound monitoring system.

In conclusion of the proceedings, farm forestry accounting provides a methodologically sound and conceptual basis for monitoring the economics of farm forestry. In the papers of these proceedings, principles for forestry accounting, extension of accounting into social and environmental accounting, and the practises for forestry accounting to contribute to the task for monitoring the economic performance of farm forestry enterprises.

These proceedings will be followed by a report on the guidelines establishing farm forestry accountancy networks in Europe. The main aim of the forthcoming guidelines is to provide assistance for developing generally applicable monitoring system for the assessment of the socio-economic performance of farm forestry enterprises. These proceedings, the proceedings of the earlier MOSEFA workshops and the forthcoming guidelines form together a solid package of essential information necessary for developing accountancy networks in practise.

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SUMMARY OF MOSEFA AND ITS MAIN ACHIEVEMENTS

Pentti Hyttinen, Timo Kallio and Anssi Niskanen

European Forest Institute

1 PROJECT DESCRIPTION AND OBJECTIVES

The Concerted Action project "Monitoring the Socio-economic Situation of European Farm Forestry MOSEFA" was launched in March 1997 under the European Union FAIR3 Programme (Hyttinen and Kallio 1998ab). It was carried out by 17 participating research institutes in 14 European countries (Figure 1). 3 external participants from Estonia, Hungary and Spain were later on accepted to the project group.

The project was cooordinated by the European Forest Institute, which had the main responsibility to fulfill the objectives agreed in the project contract. The overall input for the project, realised in voluntary work of researchers at the partner institutions, cannot be defined in financial terms, but in terms of labour input it has been substantial.

MOSEFA was established to harmonise the heterogeneous approaches of monitoring systems at the country level and to produce generally applicable guidelines to build up forestry accountancy networks. The detailed objectives were to:

- make the existing experiences and expertise on farm forestry accountancy data networks generally available;
- outline approaches for an international socio-economic scheme of statistics on farm forestry;
- develop common guidelines for collecting socio-economic data of farm forestry enterprises adaptable to different purposes and various conditions; and
- identify the most essential research needs and prepare further research activities at the European level.

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4. University of Ghent, Belgium

1. 2.

3.

- 5. Royal Veterinary and Agricultural University, Denmark
- 6. University of Joensuu, Finland
- 7. Association Foret Cellulose (AFOCEL), France
- 8. Forstliche Versuchs- und Forschungsanstalt Baden-Württemberg, Germany
- 9. Aristotle University of Thessaloniki, Greece
- 10. Coillte Teoranta, The Irish Foresty Board, Ireland
- 11. Istituto Nazionale di Economia Agraria, Italy
- 12. DLO Agricultural Economics Research Institute, The Netherlands
- 13. Norwegian Agricultural Economics Research Institute, Norway
- 14. Escola Superior Agrária de Coimbra, Portugal
- 15. Skogsägarnas Riksförbund, Sweden
- 16. Institut pour le Développement Forestier, France
- 17. University of Wales, United Kingdom

External participants:

- 18. Consorci Forestal De Catalunya, Spain
- 19. Estonian Forestry Development Programme, Estonia
- 20. University of Sopron, Hungary

Figure 1. MOSEFA participants.

2 PROJECT CYCLE

The MOSEFA project was started in March 1997 – after a substantial amount of work and research (Hyttinen et al. 1997) conducted prior to the acceptance of the project. Since the project was started and the contract signed, the original plan was strictly followed.

Four workshops were arranged during 1997-99 focusing on (1) the methodological issues of cost accountancy, (2) the sampling schemes for socio-economic studies in farm forestry, (3) the prospects for international statistics on farm forestry, and (4) collating and reporting the project outcome. The publications were compiled from the workshop presentations and published as EFI Proceedings. Guidelines for Establishing Accountancy Networks which was set as the main outcome of the MOSEFA project, were prepared step by step by bringing in the various elements emphasised in the workshops (Niskanen and Sekot, Forthcoming). The four workshops arranged were:

- Workshop A: Methodological Issues of Cost Accountancy in European Farm Forest Enterprises, 28-31 August 1997, Zeist, The Netherlands
- Workshop B: Sampling Schemes for Socio-economic Studies in Farm Forestry Accountancy Networks Under Various Conditions, 19-22 April 1998, Trento, Italy
- Workshop C: Prospects of International statistics on Farm Forestry, 23-26 September 1998, Freiburg, Germany
- Final Seminar: Presenting the Final Results and Agreeing on the Future Cooperation, 9-13 June 1999, Iisalmi, Finland

A preparatory core group meeting was arranged prior to each workshop in order to make sure that all arrangements concerning the particular workshop were well prepared. During the last phases of the project when the final outcome of the project, the guidelines, was under writing process, the editorial small-group meetings formed an essential part of the action. These meetings, arranged twice before the final seminar, enabled the editorial team to fulfil the main objective. An additional small-group meeting for planning further co-operation was arranged in September 1999.

3 FULFILMENT OF THE PROJECT OBJECTIVES

In the final seminar, the participants conducted an informal self-evaluation mirroring the project achievements against the objectives. As a result, the objectives of the whole Concerted Action were commonly seen to be fulfilled.

The first objective was acknowledged to be fulfilled by e.g. the first workshop in Zeist, the Netherlands, the published workshop proceedings and the existing collaboration between the participants in the MOSEFA-group.

The second objective was considered fulfilled by e.g. the second workshop in Trento, Italy and the related proceedings. In these proceedings, it was concluded e.g. that a common scheme for farm forestry accounting should rather be based on harmonisation than standardisation at the Community level.

The third objective was met by the prepared guidelines presented and discussed in Iisalmi, Finland. The guidelines will undergo scientific review and will be published later on, thus finalising the successful implementation of the project.

The fourth objective was met by discussing the future research needs in the final meeting in Iisalmi, in the planning meeting in September 1999, as well as in many formal and informal occasions during the project lifetime.

4 FUTURE RESEARCH NEEDS

One of the objectives of this Concerted Action was to find out the future research needs and plan the possible next steps. In the discussion on the future project ideas during the final seminar, altogether eleven new research topics and other issues were raised. Due to the large amount of suggested ideas, it was agreed that each participant should name the three most important topics from his/her point of view. The results of this exercise indicated a few main topics which should be further elaborated. The preliminary discussions between key persons representing the main topics and the interests of their institutions have been made. In order to gather the common understanding together for further research activities, the key persons were invited to small-group meeting in Brussels.

The main topics, which were agreed to be further elaborated, were connected with general rural development. The international profitability comparisons to promote sustainable forestry with the links to social and environmental accounting and agricultural enterprises were the key ideas to be discussed. Furthermore, the EU policy implications should be integrated in the project especially with the interests of the countries in transition process to EU membership.

List of publications

- Hyttinen, P., Kallio, T., Olischläger, T., Sekot, W. and Winterbourne, J. 1997. Monitoring forestry costs and revenues in selected European countries. EFI Research Report No 7. European Forest Institute. Joensuu. Finland. 78 p.
- Hyttinen, P. and Kallio, T. (eds.). 1998. Cost accountancy in European Farm Forest Enterprises. Proceedings of the MOSEFA workshop A held in Zeist, the Netherlands 28-31 August 1997. EFI Proceedings No 20. European Forest Institute. Joensuu. Finland. 146 p.
- Hyttinen, P. and Kallio, T. (eds.). 1998. Sampling schemes for monitoring the socio-economics of farm forestry. Proceedings of the MOSEFA workshop B held in Trento, Italy 19-22 April 1998. EFI Proceedings No 28. European Forest Institute. Joensuu. Finland. 215 p.
- Niskanen, A. and Sekot, W. (eds.). Guidelines for Establishing Accountancy Networks. EFI Research Report. Forthcoming.

RATIO ANALYSIS FOR NON-INDUSTRIAL PRIVATE FORESTRY

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ABSTRACT

For non-industrial private forest (NIPF) owners, timber production can be seen as a form of ordinary business, and therefore, the economic results and facts of this business play an important role in their decision making. The economic performance of a woodlot can be monitored by the means of financial accounting. The developed financial accounting model gives a picture on the overall profitability, the financial situation and the assets value of an enterprise.

The results show that for everyday decision making forest owners need both enterprise and activity-level estimates which can be integrated both into the normal double-entry accounting and forest management planning practice. The procedures and measurements of general ratio analysis are also very practicable where the performance of forestry business is evaluated. In forestry, however, the distinction between profit (the real result) and cash flow (the liquidity) is more drastic than in many other businesses. A key contribution, a ratio analysis system covering volume, profitability, liquidity, solvency and productivity ratios has therefore been developed. The analysis, of which the main result is ratios proposed for the use of private forest owners, is presented in this paper. The results of the ratio analysis can be seen as an improvement of general forest management planning.

Keywords: ratio analysis, management accounting, forest management planning, nonindustrial private forestry

1 INTRODUCTION

1.1 Literature overview

The study is based on the applied results from three different sources:

- 1. The primary context has been the local Finnish experience in applying ratio analysis in firms where the results covering small and medium-sized industrial enterprises (SME) have been of special interest.
- 2. The strong tradition of applying ratio analysis to forestry developed mainly in German-speaking Europe.
- 3. General ratio analysis first developed for industrial SMEs in the USA. The profitability and other features and ratios in forestry have inspired research in Finland for more than 100 years, as shown in Heikinheimo et al.'s (1967) summary. The traditional Scandinavian literature has been presented in Hyder et al. (1994b).

A large amount of literature covers financial accounting generally. Report of the Committee for Corporate Analysis (1995) contains the most commonly used directions for accounting and corporate analysis for Finnish business enterprises.

Comparatively few studies have dealt with the methodological aspects of forest accounting (e.g. IUFRO 1966, Merlo and Defranceso 1980, Hyder and Lönnstead 1993), and all of them stress the specific problems of accounting for the purposes in question. One pan-European investigation on cost studies in forestry, mainly at the descriptive level, carried out already in the 1960s by Stridsberg and Algvere (1967) is also worth mentioning.

Forestry accounting principles are discussed in Penttinen (1992a), Kinnunen et al. (1993), Hyder et al. (1994a, 1994b), Hyttinen (1995) and Hyder et al. (1996). Accounting recommendations for forestry have already been published by Speer (1966), Deutscher Forstwirtschaftsrat (1980), Forstliche Bundesversuchsanstalt (1987) and the New Zealand Society of Accountants (Davy 1987), among others.

Ratio analysis specially for forestry enterprises has been studied by various researchers from the Germany and Austria. Brabänder (1967), Geiger (1967), Speidel (1970), Günther (1988), Sagl and Moser (1991), Hyder et al. (1994) and Jöbstl (1995a, 1995b) have studied forestry by using the corporate analysis methods.

1.2 Aim and scope of the study

The key notion of the ratio analysis study is described by Peter Drucker's (1985) idea that "more important than to do things right (efficiency) is to do the right things (effectiveness)". Effectiveness, efficiency and quality cause productivity of processes, which effects profitability (Rantanen 1995).

The aim of this study is to construct a ratio analysis system for non-industrial forest (NIPF) owners, applying the constructive business studies approach (Kasanen et al. 1991). Finally, a recommendation on which ratios to use in private forestry is made.

2 RATIO ANALYSIS

2.1 General ratio analysis

Analysis of a financial statement is an information-processing system developed to offer relevant data for decision-makers. Users of the financial statement analysis are investors, management, lenders, researchers, etc. (Yli-Olli and Virtanen 1985). Figure 1 demonstrates the relationship between corporate analysis, financial statements analysis and ratio analysis.

REASON	CONSEQUENCES	MEASURE
real process	monetary process	parameters
CORPORATE A	NALYSIS	
FINAN	ICIAL STATEMENTS ANALYS	SIS
]	RATIO ANALYSIS	

Figure 1. Relationship between the monetary and real processes of an enterprise and the types of economic analysis in an enterprise (Laitinen 1992).

Management accounting (MA) provides information to help to make better decisions. Financial statement analysis, a part of MA, is an information-processing system based primarily on the external information sources, developed to offer relevant data for decision-makers. The major tool of the financial statement analysis is financial ratio analysis. Financial ratios are defined as the relations between two items of accounting information – one number is divided by another to provide a percentage or a ratio. (Backer et al. 1988) It must be noted here that either or both of these items may itself be a sum, a difference, a product or a ratio. A proposal to classify the financial analysis figures is to use groups: (a) original physical items such as area or planned cut, (b) derived physical items such as sums, differences and averages, and (c) ratios such as disaggregation figures, e.g. silvicultural costs/total costs; ratios, e.g. hours/cubic meter wood, or (d) indices describing e.g. the trend in silvicultural costs (see e.g. Sagl 1981, Jöbstl 1995b).

Financial ratios are calculated, in addition to yearly figures, as continuous and moving averages. The use of moving averages may be a way to cope with the variations in the activities from year to year. However, they have the drawback because of deteriorating in a year, or in a sequence of years, that is better than the previous one, and vice versa. Thus they do not necessarily show the correct underlying trend without delay. The enterprise is compared both a) with other similar units of the sector and b) with itself, then first of all with its past development. It is normal to group financial ratios under categories which represent the properties to be measured, such as profitability, liquidity and solvency (Laitinen 1992). Recall that financing covers both liquidity and solvency. The categories of Committee for corporate analysis (1995) also contain the volume, and with it the growth category.

2.2 Ratio analysis for forestry

2.2.1 General

Accounting is limited to information expressed in terms of a monetary unit (the monetary-unit postulate), and revenue is triggered when goods are sold (the revenue principle); see Belkaoui (1985). It does not recognise changes which do not generate business transactions, such as the growth of the trees in forestry. In this study, the definition of a ratio is somewhat broader than generally. Ratios may also contain information which is not accounting information in the strict sense of the word. Figures describing the size of the forest holding, e.g. area, cutting volume, the change in the value of the standing timber (CVT) etc. are used as factors of ratios as well as financial accounting figures.

In forestry, the reasons for using ratio analysis are those mentioned in section 2.1, assuming that forestry is practised on a large scale in company form. However, the scope of this study is that of an non-industrial private forest (NIPF) owner. Typically NIPF small-scale forestry differs from a large company because:

- 1. the ownership of the forest holding is not on a secure basis and its price is not quoted,
- 2. the managers and owners of the holding are the same, and
- 3. the holding receives little or no external financing. Non-industrial private forest holdings typically have only subsidised loans granted by the state for forest improvement purposes.

Moreover, the volumes and growth of firms are limited mainly by natural production limitation of the fixed area and the resultant cutting opportunities in forestry as well as by the markets. Why then should NIPF owners use financial ratio analysis? The following grouping is thus proposed:

- (i) volume indicators including growth,
- (ii) profitability consisting of net profit and dividends per share (the last grouped into Foster's, (1986) share related ratios, both return on assets (ROA) and return on equity (ROE)
- (iii) financing covering liquidity and solvency,
- (iv) forestry specific ratios, and
- (v) efficiency ratios consisting of productivity ratios, and the owner's own work.

Note that the crux of the efficiency ratios is the turnover ratios such as total asset turnover (see Kanto and Martikainen 1991), which are ignored here because of their limited time horizon.

2.2.2 The change in the value of the standing timber

If the change in the growing stock is ignored the results may be highly misleading (see e.g. Kinnunen and Penttinen 1994, 1995, Hakkarainen et al. 1995). In forestry, additional items such as "change in the value of materials", especially change in the value of the standing timber (CVT), are needed. This can arise from: i) changes in the timber volume, ii) changes in the proportions of timber assortment iii) real changes in the market value of timber and iv) changes in money value, that is, inflation.

The six problems with the CVT are:

- 1. Whether or not to include it in the income statement.
- 2. Where to place it.
- 3. How to determine the roundwood assortment volume and change in the mix of the amount of standing timber.
- 4. What prices to use and how to determine the value of the change.
- 5. How to split the value change.
- 6. Whether to take the calculated CVT as such or to adjust it by a risk factor.

The first problem may be answered both by yes and no. Both have their interpretations and are used. Assuming the theoretical 'normal forest' inclusion is not needed (normal forest calculations, see Hämäläinen 1973). However, without the CVT the ratio analysis is in many cases badly misleading, which has been empirically demonstrated in Kinnunen and Penttinen (1994, 1995), Hyder et al. (1994a, 1994b) and Hakkarainen et al. (1995) among others.

As to the placement of the CVT, there are also two alternatives, to place the CVT in the variable costs like other changes in the inventory, or to place it after the overall profit and calculate the adjusted overall profit (see Hyder et al. 1994b, 1996). To disclose the realised overall result, it is placed at the end.

The change in the amount could be exactly determined by measuring the trees at the beginning and the end of the period, which is obviously too expensive for a method in normal cases. The traditional solution has been to use the difference between the actual cut and the planned cut. Here the estimate based on the growing stock at the beginning, the increment, and the amount harvested can be applied because the forest inventory data files of the woodlots have been available (see Hakkarainen et al. 1995).

The value of the change is estimated by using the average local timber prices and costs, or by using the prices and costs per timber unit of the forest holding in question. Both are approximations. This method, valuing timber according to current prices, produces considerable variations in the asset's value from year to year. These variations will be based on unrealised and often unrealisable expectations. Jöbstl (1981) has solved the problem by using the same prices both at the beginning and at the end of the period. To keep the variation more realistic, the price and volume changes are reported as separate items. Moreover, the timber could be valued by the average price for a number of years.

The definition of the value of the growth should always be based on an inventory. Paralleling the growing stock with the current forestry assets, the annual change, i.e. the timber balance, can be entered in the variable expenses column. However, it is reasonable to regard the timber balance as non-realised income or expenses after the results of the accounting period (see Table 1).

The timber balance value of the growing stock in the current assets can be formulated as follows (Hakkarainen et al. 1995):

$$T_{t} = \sum_{i=1}^{n} \left[(V_{t-l_{i}} + \Delta V_{t_{i}}) h_{t_{i}} \right] - \sum_{i=1}^{n} \left[(V_{t-l_{i}} + \Delta V_{t_{i}}) k_{t_{i}} \right]$$

where

T _t	=	current asset value of the growing stock in financial
		statement t
V_{t-1}	=	volume of the growing stock in financial statement t-1 by
		roundwood assortment
ΔV_t	=	volume increment for the accounting period by roundwood
		assortment
h,	=	stumpage price in financial statement t by roundwood
·		assortment
k,	=	probable selling expenses by roundwood assortment FIM/m3
i	=	roundwood assortment
t	=	accounting period

The traditional solution has been to use the difference between the actual cut and the planned cut (Tiilikainen et al. 1992). One weak feature of this traditional yield method is the dependence of the timber balance value of the growing stock on a somewhat subjectively determined felling plan. However, the objective of this felling plan is to develop the forest holding towards the targets outlined by the decision-makers, not to measure the actual results of the accounting period or change in value of the property (Hakkarainen et al. 1995).

2.2.3 Analytic financial statements

Traditional agricultural accounting has been limited to single entry book-keeping. Ijiri (1986) proposed triple-entry book-keeping with debit, credit and trebit, the last one used to measure the force of the entity. However, double entry book-keeping is assumed to be used in analysing the ratios here. Although "the objective of financial statements should be to provide useful information about an entity for those who make decisions based on such information" (Anthony 1987), the basic financial statement information will be refined. An income statement is used to calculate how much profit business economic activities have made. The income statement indicates how the result of an accounting period has been formed. It is a calculation in which expenses are deducted from income.

Table 1. Profit and loss account (Income statement in the US) for private forestry (see Aho and Rantanen 1994, Committee for corporate analysis 1990, Laitinen 1992)).

- + Stumpages sales revenue
- + Delivery sales revenue
- + Other sales revenue from wood
- Sales adjustment items

TIMBER SALES REVENUE

- + Sales revenue from other than wood
- Sales adjustment items including the value added tax (VAT)

NET TURNOVER

- Variable costs:
- Marketing costs
- Harvesting costs
- Silvicultural costs exceeding (-) or undercutting (+) the reserve for regeneration
- -/+ Change in the reserve for regeneration
- Other variable costs
- GROSS MARGIN ON SALES (MARGIN AFTER VARIABLE COSTS)
- Fixed costs

OPERATING MARGIN

- + Interest income
- Interest expenses
- Direct taxes
- Ordinary other expenses

+ Ordinary other income

INCOME BEFORE DEPRECIATIONS AND EXTRAORDINARY ITEMS

- Depreciation

NET PROFIT (LOSS)

- Extraordinary expenses
- + Extraordinary revenues Overall result
- +/- Increase/decrease of reserves
- +/- Increase(-)/decrease(+) depreciation
- Income taxes

PROFIT (LOSS) OF THE PERIOD

- Adjustment of net interest (+/-)
- + Change in the value of standing timber (+/-)
- Value of owner's own work

ADJUSTED PROFIT OF THE PERIOD

Table 2. Adjusted balance sheet for private forestry (see Teränne 1993, Committee for corporate analysis 1995, Hakkarainen 1996).

1 ASSETS

- 10-12 Fixed assets and other capitalised expenditure
- 10 Intangible assets 1000 intangible assets
- 11 Tangible assets
 - 1100 timber-growing land and
 - water areas
 - 1110 buildings and construction
 - 1120 plant and equipment
 - 1130 silvicultural improvements
 - 1140 advances paid
 - 1190 other tangible assets

12 Securities and long-term investments

- 1200 bonds and shares
 - 1210 other long-term investments
- 13 Valuation items
 - 1300 valuation items
- 14 Current assets
 - 1400 timber reserves
 - 1410 growing stock
 - 1420 advances paid
 - 1490 other current assets
- 15-16 Financial assets
- 15 Receivable
 - 1500 stumpage sale receivable
 - 1510 sales at delivered price receivable
 - 1520 other timber sales receivable
 - 1530 other trade receivable
 - 1540 loans receivable
 - 1550 prepaid expenses and accrued
 - income
 - 1560 value added tax receivable
 - 1190 other receivables
- 16 Cash on hand and in bank
 - 1000 cash on hand
 - 1010 bank giro account
 - 1620 bonds and shares
 - 1690 other securities

Table 2. (continued) Adjusted balance sheet for private forestry (see Teränne 1993, Committee for corporate analysis 1995, Hakkarainen 1996).

- 2 LIABILITIES AND CAPITAL
- 20 Capital
 - 2000 capital at the beginning of tht
 - accounting period
 - 2010 capital investment
 - 2020 value of ones own work
 - 2030 profit (loss) for the period
 - 2040 capital return
 - 2050 private return
 - 2460 revaluation
- 21 Capital correction
 - 2100 capital correction
- 22 Reserves
 - 2300 afforestation reserve
 - 2310 difference from depreciations

23 Long term liabilities

- 2300 interest subsidy loans
- 2310 other loans from banking establishments
- 2390 other long-term debt
- 24 Short term liabilities
 - 2400 trade payables
 - 2410 advances received from stumpage sales
 - 2420 advances received from sales at delivery
 - price
 - 2430 advances received from other timber sales
 - 2440 other advances received
 - 2450 accrued liabilities and prepaid income
 - 2460 value added tax liabilities
 - 2490 other short term liabilities

Another deviation from normal statements is that after the realised profit the unrealised items "change in the value of standing timber" and "value of the owner's own work" are included, and the profit is calculated (see Hyder et al. 1994b). The value of standing timber and its change as well as the owner's work are such large items in Finnish non-industrial private forestry that they should be taken into account when the performance of the unit is measured. The profit and loss account is presented in Table 1, following the terminology of 4th and 7th EU directives (see Teränne 1993).

Recall that the items after the profit for the period do not belong to traditional bookkeeping. The adjustment of net interest is included if we compare the profitability of forestry operations and ROA, but ignored if the ROE is considered. Note that although other reserves and over/underdepreciations are located after the overall result, as in firms, they hardly are needed in forestry.

The balance sheet shows the financial status of the business at the end of an accounting period. In order to ensure the requirement of consistency (Belkaoui 1985), the balance sheet for the next accounting period should be based on the previous balance sheet. The balance sheet is thus also a transition account between accounting periods, which is used to transfer funds and items of both liabilities and equities to the next accounting period. (Hakkarainen 1996).

A proposed balance sheet format for forestry according to the amended Finnish Accounting Act (1992) and recommendations of the Committee for Corporate Analysis (1995) are given in Table 2.

The Finnish Cash Stream System, first put forward by Prihti (1969), is based on the one hand on the concept of funds, quick assets and net working capital. It has been put forward (see Artto 1978) that cash flows contain information about the activities of the firm which is not presented in the accrual-based financial statement. Different cash stream types are:

- 1. cash streams based on payments
- 2. quick flows based on the accruals principle in accounting
- 3. working capital flows based on the accruals and the matching principle

Because the money flows of an enterprise describe the financial side of the enterprise's operations, it is natural that their utilization is also directed towards describing the enterprise's financial operations as profitability of the company and the financing of the company. (Artto 1978). In this study ratios based on cash streams adapted to forestry.

2.2.4 Profitability ratios

Profitability is the best overall indicator of company performance (Brozik 1984). It is applicable at the national economy, industry, enterprise, investment project and even individual product level (Airaksinen 1978). Here the enterprise or forest holding level is studied according to both the profit maximisation and a traditional forest economics firm approaches already proposed by Hahtola (1971). Through the use of profitability ratios insight into the enterprise level efficiency of the forest holding is gained. Comparisons between a firm's profitability ratios over time and those of other firms in the industry are particularly relevant (Lusztig and Schwab 1983), a discipline which has a long tradition in the German-speaking world and is called business economy statistics (Jöbstl 1995b). Profits can be related to the volume of sales, the value of assets employed to produce those sales, and to financing assets.

The various margins and profits can be used for profitability analysis (see chapter 2.2.2). The margins and profits are absolute figures. The ratios are calculated simply by dividing the profit by the sales figure. Gross margin, operating margin, net profit, overall result and adjusted overall result, and their direction provide a general picture of the enterprise. Gross margin is a measure of performance in the areas of harvesting, marketing and silviculture. Operating margin measures the overall operating

Table 3. The cash flow statement for private forestry is defined as follows (Hakkarainen 1998).

Cash from sales (Sa+)

- cash based direct materials (Ma-c)
- cash based direct labour (La-c)
- cash based direct travelling costs (Tr-c)
- other short term expences (OS-c)
- other cash based expences (MC-c)
- = Cash margin Ia (Cas Ia) (cash operating income)
- + other cash based net income (CI+c)
- = Cash margin Ib (Cas Ib)
- cash based interest (In-c)
- cash based direct taxes (Ta-c)
- cash based dividends (Di-c)
- = Cash margin II (cash net income) (Cas II)
- cash based investments (In-c)
- = Cash margin III (Cas III)
- +/- cash on hand and in banks (Ca)
- = Cash margin IV (Cas IV)
- +/- changes in long term liabillities (Ltl+/-c)
- +/- changes in short term liabillities (Ltl+/-c)
- = Cash margin V (Cas V)
- +/- changes in invested capital (Cap+/-c)
- = 0

Table 4. Corporate profitability measures as against forestry.

FIRM FORESTRY

1) Margin and profit percentages of turnover:

- Gross margin ratio
- Operating margin ratio
- Net profit ratio
- Overall result ratio
- 2) Adjusted overall result ratio with and without the wood price change

3) Cash-flow-based percentages of sales:

- Cash margin Ia to cash from sales
- Cash margin Ib to cash from sales
- Cash margin II to cash from sales
- Cash residual III to cash from sales
- Cash margins Ia (cash operating income) to cash from sales
- Cash margin II (cash net income) to cash from sales
- Return on investment (ROI):
- Return on equity (own capital) (ROE)
- Return to net assets (RONA)
- Return on total assets (ROA)
- Return on invested property
- The ROE and ROA, but including the change in the value of the standing timber to capital.¹

¹Both ratios are estimated with and without price change in the forest evaluation

performance of forestry, whereas the net profit and overall result measure the combined effect of operating performance and capital structure. The adjusted overall results recognise the change in the value of growing stock and the owner's own work, both of which are items outside accounting.

The turnover (=turnover/assets) ratios are commonly used in financial statement analysis. To measure profitability, the asset turnover ratio is defined as the ratio of sales to total tangible assets, and measures the sales generated by the investment in tangible assets, indicating the efficiency achieved in employing the assets to produce an output.

The cash-flow based ratios are relevant as an additional picture especially in forestry, because the sales of wood will typically be 20-25% paid in the purchase phase, and the remainder in two years time, in most cases after the final measure. Cash margin Ia (Table 3) measures the operating income after payments of short-term production factors. It is modified by adding other cash receipts such as subsidies in order to derive cash margin Ib. Cash margin II is cash margin Ib reduced by profit-sharing in the form of interest, taxes and dividends. Moreover, for cash margin III reduces the investment payments are reduced.

A firm's profitability can be measured by the relation between the net income and the shareholders' equity (ROE), or the net income related to the total assets (ROA). For private forestry, the realised rate of return on equity or capital is a useful ratio (Penttinen 1992a, Hyder et al. 1994b), where equity or private capital is defined as the sum of the invested capital and the reserves after tax. Another appropriate forestry profitability ratio related to financing is the rate of adjusted overall result on total capital (ROAc) (called calculated profit in Hyder et al. 1994b, 1995). The adjusted overall result includes the change in the value of standing timber, which is unrealised income (see chapter 2.2.2).

2.2.5 Financing ratios

According to empirical studies, only a small portion of forest holdings face situations in which financing is a relevant question, but in those cases financing information is often very critical (Kinnunen and Penttinen 1994, 1995). Financing ratios in forestry are divided into liquidity and solvency ratios as in firms, which concepts have been deduced from short-term and long-term solvency using factor analysis by Yli-Olli and Virtanen (1986). The value of the growing stock, however, and especially that of the merchantable growing stock emerges, however, as a special feature in forestry. Liquidity ratios measure ability to pay short-term debt. They are typically liquid funds related to short-term debt. Solvency ratios measure the ability to carry and to raise long-term debt. The share of borrowed and private capital are compared both to each other and to the total capital. In addition to these, various asset and liability turnover ratios can be grouped under financial ratios.

Liquidity can be seen from the going concern point of view. Cash flow (internal) financing is then relevant both after the short term cash payments and after profit-sharing. Traditional liquidity such as quick and current ratios are less meaningful in a typical Finnish forest holding. There are two problems with the relevance of these

ratios: (i) the forest holding as a whole is not the main source of income for the owner, and (ii) current liabilities are in most cases small. Further, there is the validity problem that on the one hand the monetary assets of forestry are constantly put into private use, and on the other hand investments of private capital are made to cover costs.

Recall that the EU-consistent terminology assumes that the concept 'current assets' consists of stocks, receivables and even cash (e.g. Teränne 1993). Note that the growing stock in included in stocks (finished products/goods and work in progress), which is required in forestry to provide a meaningful measure (see Hakkarainen et al. 1995).

Table 5. Liquidity ratios.

FIRM FORESTRY

1) Going concern approach:

- Cash margin Ia
- Cash margin Ia to cash from sales
- Cash margin Ib
- Cash margin Ib to cash from sales
- Cash margin II
- Cash margin II to cash from sales
- Cash margins Ia and II, and their derivatives

2) The liquidation approach:

- Quick ratio, also called acid test
- ((Current assets-stocks) / (current liabilities prepaid liabilities))
- Current ratio
- (Current assets/current liabilities)
- Current ratio (including the growing stock divided into the current assets)

Solvency ratios (also called leverage ratios) measure the debt and its relationship to funds that the owners contribute to the firm. The two aspects of solvency are the relationship between debt and equity and the ability to pay long-term debt (Lustzig & Schwab 1983). With the debt-to-equity ratio, the problem of preferred shares is not relevant in forestry. In a typical case, a Finnish forest holding does not have much borrowed capital except its state loans, or more precisely, the owner does not have much bank debt for forestry purposes. However, in cases where the purchase of the holding or the payments for siblings or other co-heirs has been financed by debt, solvency ratios become relevant.

Fixed charge servicing may be the most practical liquidity ratio for NIPF owner forestry. However, in addition to yearly "ex post" estimates, an "ex ante" long-term yearly average leverage is also needed for a long-term yearly average profit for the numerator to be estimated. This can be calculated on the basis of the allowable cut when the cost structure is known. Moreover, NIPF holdings typically have only the growing stock as the liquid asset, so that the debts can be related directly to the merchantable growing stock. Table 6. Solvency ratios.

FIRM FORESTRY

1) Going concern approach:

- Repayment ability (cash margin II / liabilities)
- Loan servicing margin (cash margin II [or income before extraordinay items]+interest expenses) / (interest expenses + amortization)
- Fixed charge servicing margin (cash margin II [or income before extraordinary items]+interest expenses) / (interest expenses+annual instalments)
- The same, but several years average prefered: the yearly figures might be missleading in forestry, because the forest owners don't sell timber in every year.
- Fixed charge servicing margin (cash margin II [or income before extraordinary items]+interest expenses) / (interest expenses+silvicultural fee+annual instalments+site-class-based tax)

2) The liquidation approach:

- Debt-equity ratio (liabilities / equity)
- The same, but in most cases a more relevant measure is:
- Debt-remaining allowable cut ratio (liabilities / the value of merchantable growing stock left in the valid 10 year period forest management plan)

2.2.6 Forestry-specific measurements

Forestry-specific measurements are grouped into three categories:

- income statement items related to area (forest land and total area) in hectares
- income statement items related to timber volume delivered m³
- figures describing the harvest, standing timber and the state of the forest

A common way to express the profitability of forestry is net income to area. Arearelated figures are suitable for comparing the mean results of different districts or groups of holdings. Income to area is questionable in expressing the profitability of a single holding in relation to others, because some factors that the owner cannot control such as the site-class and age-class distributions of the holdings may differ significantly. The cost items, however, produce measurements of cost accounting, rather than financial ratio analysis.

Another often used measurement is net income per cubic meter of sold timber. This explains one in terms of the other, more meaningful profitability ratios, showing the impact of timber prices on overall profitability. If the timber sales data is available by assortment, the ratio provides additional information, and can be used to evaluate the time series of a holding, or to compare different holdings.

A difficulty is that timber-related ratios cannot be calculated for years in which the holding has not been assigned any timber. This complicates the comparison both between holdings and between years. An average of the observed ratios is not valid as an average over a period of years. The incomes and expenditures of years in which no timber was assigned must be taken into account. The operating profit per cubic meter for holdings assigned a small amount of timber and with accrued fixed costs will be negative.

2.2.7 Productivity ratios, and the value of the owner's own work

Productivity is defined as the ratio between the output and the input. It shows how effectively the inputs are combined to produce the output and it can be surveyed at national level, by industry, operationally in an enterprise, or individually. Efficiency can be internal for productivity, or external for profitability (Economy Information 1991).

Forestry as an industry and a forest holding as an enterprise have specific characteristics which make the calculation of economic ratios complicated (see chapter 2.2.). Here all calculations are made assuming that the owner's work is the cost of the enterprise. Alternatively, the property and the work contribution form a private so-called "personal" enterprise, in which the profit centers property and work are calculated only as one entity (Schneider 1970). For productivity, the output can be measured both in volume and in monetary terms from the 'change in the value of standing timber' and from the realised sales revenues.

Productivity in forestry is affected by the circumstances – weather, terrain, tools and machinery, methods, timber, distances, etc. In addition, cost accounting in forestry has the problem of the 'value of the owner's own work'. In private forestry much of the silvicultural work and partly also cutting is done by the owner of the forest holding. This improves the volume and the cash receipts of the owner, but not necessarily the profitability where the work is priced using alternative external market signals. In order to calculate the costs and the real input, the value of the owner's own work has to be estimated. The most appropriate value for the owner's own work in forestry is based on the performance, e.g. per cubic meter, per plant or per hectare. This eliminates the differences between the productivity of the forest owners, and makes their inputs fairly comparable to each other. The profitability calculations would be on the same basis in spite of the workers' productivity.

Hyder and Lönnstedt (1993) have suggested three productivity ratios for forestry:

- 1. Direct cutting costs/cubic meter
- 2. Direct silvicultural costs/hectare
- 3. Forestry costs/hectare.

The first ratio measures efficiency in cutting, and is comparable to other forest enterprises. The ratio can also be compared with ratios in other time periods provided that inflation is eliminated by real costs. The second ratio shows productivity in silviculture. Only the area that has been under silvicultural operations during the year should be concerned, not the whole forest holding. The third ratio gives the average productivity for the whole forest holding.

3 EVALUATION AND COMPARISON OF RATIOS

The following criteria for the evaluation of the applicability of the financial ratios to private forestry are recommended:

- 1. The ratio must have a practical application
- 2. The ratio must measure the proper quality. This is the validity requirement
- 3. It must be possible to calculate the ratio using the empirical data available, and its elements must be uniformly specified in all units
- 4. The ratio must possess properties needed for tests and analysis. The standard deviation of the variables measured should be reasonably small. This is the reliability requirement.
- 5. The sensitivity of the ratio with respect to the background variables should be recognised, and ratios with high sensitivity remain outside the hard core (e.g. when including the price change the ROE and ROA may increase unreasonably).
- 6. The ratios should not be correlated, i.e. if ratios are highly correlated only one is needed.

3.1 Comparison of ratios

Two different uses of ratios can be distinguished. On the one hand, ratios are used in comparisons (ex post), on the other hand in forecasting. Both uses contribute to the control and management of the enterprise. (Yli-Olli and Virtanen 1985). In forestry, the estimated ex post results are typically used in forest management planning activities.

However, the most interesting theme of the ex post analysis among the forest owners has been the comparison. Actually, the key contribution, and for forest owners typically the most important result, has traditionally been the opportunity to compare individual figures with those of others.

There are various context opportunities such as the size of the forest holdings; for example, the category over 1200 hectares (Sekot 1990). Enk (1988) uses areal frame. Sagl (1981) sees ratio analysis (i) as an information system for enterprise statistical and (ii) as a means of enterprise management. Merkle (1982) compares (1) inside the enterprise directly as (a) time comparison (the same ratios in different time periods as development comparison), (b) actual vs. plan comparison, e.g. actual cuts vs. allowable cuts, and indirectly as (c) a comparison with other enterprise ratios (called policy of action comparison in Jöbstl 1995b), and (2) comparison, e.g. a forest holding result compared with that of all book-keeping forest holdings of the area, (b) different time period comparison, e.g. the result compared with the average result of all book-keeping forest holdings of the area during, say the last, two years, (c) actual vs. plan comparison with average figures of the same branch, of different branches, standard comparison with average figures of the same branch, (d) indirect comparison with other ratios of other enterprises (Figure 2).



Figure 2. Ratios comparison system (Merkle 1982).

4 DISCUSSION AND CONCLUSIONS

The opportunities to help the non-industrial private forest owner's management work were the objective of this paper. The focus of the development was primarily the enterprise, typically a small-scale or family forest holding level. The key notion was to "do the right things (effectiveness) not just things right (efficiency)", which leads to the search for bottlenecks – more generally, critical success factors (CSF).

One has to note that an industrial enterprise and a forest holding are completely different in many respects. The markets are the limiting factor of an enterprise, but the production capacity limits the business of a forest owner. The interest theory approach with its focus on return of investment (ROI) applied to forestry forgets that in forestry one is basically facing the completely different world of the economics of natural resources. The key difference between management of natural resources and a firm is sustainability – maintenance of the production machinery. A ratio analysis system covering volume, profitability, liquidity, solvency and productivity ratios has been developed here.

The forestry ratio analysis system proposed can be described as follows: the definition of a ratio is somewhat broader than is generally used in other businesses. Ratios contain information that is not simply accounting information in the very strict sense of the term. Figures describing the size and the production capacity of the forest holding, e.g. area, cutting volume, etc., are used as factors in the ratios as well as financial and managerial accounting figures. However, the procedures and measurements of general ratio analysis are also very practicable when the performance of forestry business is evaluated. The most important forestry- specific features which also affect the forestry ratio analysis system are that: (i) current liabilities are in most cases very small, (ii) forest holdings do not normally have many financial assets and the growing stock is the only item in current assets and (iii) in assets, the significance of the growing stock dominates.

References

Accounting Act. Kirjanpitolaki 1992/655.

- Aho, T. and Rantanen, H. 1994. Financial statement analysis of an enterprise [Yrityksen tilinpäätösanalyysi]. Otatieto, Espoo, Finland, 274 p. In Finnish.
- Airaksinen, T. 1978. Research on the measurement of profitability measurement and componing as application the factory industry of Finland in 1960-1975 [Tutkimus kannattavuuden mittaamisesta ja komponoimisesta sovellutuksena Suomen tehdasteollisuus vuosina 1960-1975]. Industrialization Fond [Teollistamisrahasto], series B: 1. 95 p. In Finnish.
- Anthony, R. N. 1987. We don't have the accounting concepts we need. Harvard Business Review 87 (1): 75-83.
- Artto, E. 1978. Money flow analysis. Journal of Business Finance and Accounting 5(1): 27-37.
- Belkaoui, A. 1985. Accounting theory. Second edition. Harcourt Brace Jovanovich Inc, San Diego. 484 p.
- Backer, M., Elgers, P. T. and Asebrook, R. J. 1988. Financial Accounting. Concepts and practices. Harcourt Brace Jovanovich, Publishers. 685 p.
- Brabänder, H. 1967. Zur Erarbeitung forstbetrieblicher Kennziffern und Aufstellung einer Betriebstypologie. [On the calculation of financial ratios for forestry and proposal for a enterprise typology]. Der Forst- und Holzwirt 23. Oktober 1967: 427-430.
- Brozik, D. 1984. Profit productivity: An operational productivity measure for financial institutions. University of South Carolina, Dissertation Thesis. University Microfilms International. 272 p.
- Committee for Corporate Analysis 1995. Financial statement analysis of enterprise research [Yritystutkimuksen tilinpäätösanalyysi]. Committee for Corporate Analysis [Yritystuskimusneuvottelukunta] / Gaudeamus, Helsinki. 93 p. In Finnish.
- Davy, A. R. 1987. Accounting for Forestry Activities in New Zealand. New Zealand Society of Accountants. Research Bulletin R-117. 48 p.
- Deutscher Forstwirtschaftsrat 1980. Empfehlungen zur Vereinheitlichung des forestlichen Rechnungswesens. Deutscher Forstwirtschaftsrat e. V., Münstereifeler Strasse 19, D-5308 Rheinbach bei Bonn. 35 p.
- Drucker, P. 1985. Management tasks, responsibilities practices. Harper & Row, New York. 839 p.
- Economic information. 1991. Taloustiedon taloussanasto. Helsinki, Economy Information. Taloustieto Oy. 417 p.
- Enk, H. 1988. 10 Jahre Kostenuntersuchung bei Tiroler Agrargemeinschaften und Gemeindewäldern. FBVA Berichte 33, Forstliche Bundesversuchsanstalt, Vienna. 124 p.
- Forstliche Bundesversuchsanstalt. 1987. Anleitung zur Kosten-Ertragsuntersuchung in Agrargemeinschaften un Gemeindewäldern. Institut für Waldwachstum und Betriebswiertschaft. Forstliche Bundesversuchsanstalt, 1131 Wien. 36 p.
- Foster, G. 1986. Financial statement analysis. 2 ed. Prentice Hall, New Jersey. 625 p.
- Geiger, F. 1967. Betriebliche Kennziffern als Mittel zur Rationalisierung des Forstbetriebes. [Financial ratios as a mean of rationalization of forest enterprises]. Der Forst- und Holzwirt. Oktober 1967: 430-433.
- Günther, M. 1984. Zum Problem forstlicher Betriebsvergleiche. Allgemeine Forst Zeitscrift 24: 603-604.
- Hahtola, K. 1971. Forest owner's decision making and theories of the firm. Work Efficiency Association, Publications N:o 158, Melkonkatu 16 A, FIN-002100 Helsinki, Finland. 25 p.
- Hakkarainen, J. 1996. Financial accounting model for NIPF. In proceedings of Symposium on Nonindustrial Private Forests: Learning from the Past, Prospects for the Future. February 18-20 1996, Sheraton Washington Hotel, Washington DC, USA. Pp 180-195.
- Hakkarainen, J. 1998. Classification of Financial Ratios in Forestry. Accounting and managerial Economies for an Environmentally-friendly Forestry. Économie et sociologie rurales Actes et Communications no 15. Mars 1998: 59-79.

- Hakkarainen, J., Hyttinen, P. and Tiilikainen, K. 1995. The value of the assets of the growing stock for final accounts – method comparison. [Puuston tasearvon käsittely metsälön tilinpäätöksessä – menetelmien vertailu]. Folia Forestalia – Metsätieteen aikakauskirja 1995(3): 179-197. In Finnish.
- Heikinheimo, L., Kuusela, K. and Sivonen, S. 1967. The price, cost and profitability estimate of forestry [Metsätalouden hinta-, kustannus- ja kannattavuusarvio]. The Bank of Finland, Publications of the Economic Research Centre [Suomen Pankin taloustieteellisen tutkimuslaitoksen julkaisuja], Series [Sarja] C 5, [Sanomapaino], Helsinki. 70 p. In Finnish.
- Hyder, A. and Lönnstedt, L. 1993. Ekonomisk resultatredovisning för privatskogsbruket förslag och exempel. [Accounting for nonindustrial private forest owners a proposal and a case study.] Sveriges lantbruksuniversitet SIMS. Rapport nr 29.
- Hyder, A., Lönnstedt, L. and Penttinen, M. 1994a. Accounting and economic analysis for nonindustrial private forest owners. In: Summaries of the Papers for the IUFRO Working Group P3-04-00 "Small-scale Forestry" Symposium, Krakow, 29.08.-02.09.1994.
- Hyder, A., Lönnstedt, L. and Penttinen, M. 1994b. Outline of accounting for non-industrial private woodlots. Silva Fennica 28(2): 115-137.
- Hyder, A., Lönnstedt, L. and Penttinen, M. 1996. Economic analysis of non-industrial private forestry. An example based on suggested accounting principles. Mitteilungen der Forstlichen Versuchs- und Forschungsanstalt Baden-Württemberg, Heft 195. Pp. 52-72.
- Hyttinen, P. (ed.) 1995. Profitability control of nonindustrial private forestry empirical experiment of accounting. [Yksityismetsätalouden kannattavuusseuranta – laskentatoimen empiirinen kokeilu]. University of Joensuu, Faculty of Forestry, Research notes 35. 132 p. In Finnish.
- Hämäläinen, J. 1973. Contribution profit analysis for a fully regulated forest and its empirical applications. Comminocationes Forestalis Fenniae 80(1): 1-47.
- Ijiri, Y. 1986. A framework for triple-entry bookkeeping. The Accounting Review 61(4): 745-759.
- IUFRO. 1966. Accounting System for Forestry Enterprises. International Union of Forest Research Organisations. Sekreteriat, München. 116 p.
- Jöbstl, H. 1981. Zum Problem des Vermögensveränderungen in der forstlichen Erfolgsrechnung. Allgemeine Forstzeitung 92(12): 411-412.
- Jöbstl, H. 1995a. Contributions to managerial economics in forestry. Reader. Kommissionsverlag: Österreichischer Agrarverlag, 1141 Wien. 119 p.
- Jöbstl, H. 1995b. Einführung in das Rechnungswesen fur Forst- und Holzwirtschaft. Studientext. Band I. 8. aktualisierte Auflage, Österreichische Agrarverlag, A-3400 Klosterneuburg, 194 p.
- Kanto, A. and Martikainen, T. 1991. A confirmatory test of a priori classification pattern of financial ratios: Empirical evidence with U.S. data. The Finnish Journal of Business Economics 40(1): 22-38.
- Kasanen, E., Lukka, K. and Siitonen, A. 1991. Konstruktiivinen tutkimusote liiketaloustieteessä. Summary: Constructive approach in business studies. Finnish Journal of Business Economics 40(3): 301-329.
- Kinnunen, M., Hakkarainen, J., Hyttinen, P., Penttinen, M. and Valkonen, J. 1993. Profitability control of nonindustrial private forestry. Bookkeeping and ratio analysis. [Yksityismetsätalouden kannattavuusseuranta. Kirjanpito ja tunnuslukuanalyysi]. University of Joensuu, Faculty of Forestry, Research notes 3. 31 p. + 5 app. In Finnish.
- Kinnunen, M. and Penttinen, M. 1994. On the profitability analysis of non-industrial private forestry. In: Summaries of the Papers for the IUFRO Working Group P3-04-00 "Small-scale Forestry" Symposium, Krakow, 29.08.-02.09.1994.
- Kinnunen, M. and Penttinen, M. 1995. On the profitability analysis of non-industrial private forestry. In: Brandl, . (ed.). Private Forstwirtschaft – Chancen und Herausforderungen für die mittel- und osteuropäischen Länder. Tagung der IUFRO-Gruppe P 3.04-00, "Small-Scale Forestry", Krakau, 29.08.-02.09.1994. Tagungsvorträge. Mitteilungen der Forstlichen Versuchs- und Forschungsanstalt Baden-Württemberg, Heft 186. 252-268 (abstr 28-29).
- Laitinen, E.K. 1992. Yrityksen talouden mittarit. (The indicators of the economy of an enterprise). Helsinki, Weilin & Göös. 377 p. In Finnish.

Lustzig, A. P. and Schwab, M. 1983. Managerial finance in a Canadian setting. Butterworth & Co. 1034 p. Merkle, E. 1982. Betriebswirtschaftliche Formeln und Kennzahlen und deren betriebwirtschaftliche Relevanz. Wirtschaftswissenschaftliches Studium 11(7): 325-330.

- Merlo, M. and Defrancesco, E. 1984. Accounting and planning in forestry. In: Proceedings IUFRO Symposium on Forest Management and Planning and Managerial Economics, October 15-19, 1984. University of Tokyo, Tokyo, Japan. p. 640-653.
- Penttinen, M. 1992a. Tulos- ja kustannuslaskentamallien soveltuvuus yhteismetsä-talouteen. Summary: Applicability of profit and cost accounting models to jointly-owned forest. Folia Forestalia 799. 60 p.
- Prihti, A. 1969. Rahavirtalaskelmat yrityksen kannattavuuden mittaamisessa. Helsinki.
- Rantanen, H. 1995. The effects of productivity on profitability. Lappeenranta University of Technology, Lappeenranta, Finland, Research Papers 45. 175 p.
- Sagl, W. 1981. Betriebsstatistik und Kennzahlen in Forstbetrieben, Centralblatt für das gesamte Forstwesen 98(3): 171-185.
- Sagl, W. and Moser, W. 1991. Betriebswirtschaftliche Kennzahlen f
 ür die F
 ührung von Forstbetrieben. [Financial ratios for the management of forest enterprises]. Österreichisches Forst-Jahrbuch 1991. Österreichischer Agrarverlag, Wien.
- Schneider, D. 1970. Investition und Finanzierung. Westdeutscher Verlag. Köln. 566 p.
- Sekot, W. 1990. Forstliche Testbetriebsnetze. Universität für Bodenkultur, Institut für forstliche Betriebswirtschaft und Forstwirtschaftspolitik, Band 9, Vienna. 109 p.
- Speer, J. (ed.). 1966. Accounting systems for forestry engerprises. International Union of Forest Research Organizations (IUFRO), München. 127 p.
- Speidel, G. 1970. Betriebswirtschaftliche Kennziffern I [Financial ratios for corporate analysis I]. Allgemeine Forst Zeitschrift 25: 424-425.
- Speidel, G. 1970. Betriebswirtschaftliche Kennziffern II [Financial ratios for corporate analysis II]. Allgemeine Forst Zeitschrift 25: 1064-1067.
- Stridsberg, E. and Algerve, K. (eds.) (1967): Cost Studies in European Forestry. Studia Forestalia Suecica No.49. Stockholm. 431 p.
- Teränne, P. 1993. Comparison between the present Finnish accounting regulations and the 4th and 7th directives. Commission of the European communities, Directore general, Internal Market and Financial Services, Company law and accounting standards, Brussels. 64 p.
- Tiilikainen, K., Sankari, M. and Torttila, A. 1992. Profitability calculations of farm-forestry. [Metsätalouden tuloksenseuranta maatiloilla]. Metsätalous tuotanto- ja palvelusuuntana [Forestry as line of production and service]. Research notes 9. Joensuu. 45 p. In Finnish.
- Yli-Olli, P. and Virtanen, I. 1985. Modelling a financial ratio system on the economy-wide level. Acta Wasaensia No 21. Business Administration No 6. Accounting and Finance. 74 p.
- Yli-Olli, P. and Virtanen, I. 1986a. Classification pattern of financial ratios. The Finnish Journal of Business Economics [Liiketaloudellinen Aikakauskirja] 35(2): 112-131.

ENVIRONMENTAL ACCOUNTING IN FORESTRY AND FARMING

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ABSTRACT

This paper proposes a framework for farming and forestry enterprise accounting where recreational and environmental values can be included. Several options are described which represent the progressive steps of sequential accounts:

- (i) identification of direct recreational/environmental expenditures;
- (ii) analysing and explicitly presenting the hidden environmental values;
- (iii) addition of off-site and non-market values estimated through consumer surplus measures.

The above steps of environmental accounting must be reflected both in the balance sheet and the profit/loss account. The most advanced steps require 'satellite' accounts to be integrated as addenda into the traditional accounting systems.

The proposed accounting scheme, previously applied to individual farms and forest enterprises, has been enlarged to a system of rural enterprises located within an area of outstanding beauty – a multipurpose public forest, dairy farms, agrotourism and recreational activities, including a golf course.

This consolidated area approach enables comprehensive accounting which shows the flow of costs and benefits of different activities within the area land-based benefits created by forestry and farming resulting in revenue for tourism and recreation activities. The conclusion stresses possible policies aimed at the remuneration of goods and services produced by the agricultural landscape and environment.

1 INTRODUCTION

Until recently, environmental accounting has been mainly applied in national accounts. It is acknowledged that an Environmental adjusted Net Domestic Product would be better in identifying true income, capturing environmental services, accounting for

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damage and depreciating of both man-made and natural capital stock, excluding defensive environmental expenditures (Lutz 1993). Accepting the concept of Sustainable Development, Peskin and Lutz (1990), followed by Sammarco (1993), classify four approaches to national environmental accounting with reference to various countries' experiences and ongoing development (Peskin and Lutz 1990):

- identification and reclassification of environmental expenditure (Leipert et al. 1989);
- physical resource accounting or approche patrimonial (INSEE 1986; Weber 1986; Archambault et al. 1988, Peskin and Lutz 1990);
- depreciation of marketed natural resources (Repetto et al. 1989); and
- full environmental and natural resource accounts (Hueting 1989; United Nations Handbook 1993).

This paper proposes a framework for farming and forestry accounting where environmental and recreational values can be included. Several options are discussed which represent progressive steps of sequential accounts:

- (i) identification of direct environmental/recreational expenditures;
- (ii) making explicit hidden environmental values;
- (iii) addition of off-site and non-market values estimated also through consumer surplus measures.

The above steps of environmental accounting must be reflected both in the balance sheet and the profit/loss account. The most advanced steps require 'satellite' accounts to be integrated as addenda into the traditional accounting systems.

The proposed accounting scheme, previously applied to individual farms and forest enterprises, has been enlarged to a system of rural enterprises located within an area of outstanding natural beauty – a multipurpose public forest, dairy farms, agritourism and recreational activities, including a golf course.

This consolidated area approach enables comprehensive accounting which shows the flow of costs and benefits among the different activities within the regional park e.g. landscape benefits created by farming and forestry resulting in revenue for tourism and recreation activities.

2 ENTERPRISE ENVIRONMENTAL ACCOUNTING

The issue of including recreational and environmental values in individual enterprise accounting has arisen only recently. Previously it was thought that non-market public 'goods' and 'bads', being part of social welfare, should have been considered, at most, in national accounts at a macro level rather than in individual enterprises. However, the growing awareness that environmental problems should be tackled at the basic level (individual production and consumption sites) has encouraged developments at enterprise scale. The market itself (green consumerism) appears to be pushing in this direction: for instance, the demand for goods produced respecting the environment and incorporating, at least in terms of image, landscape and environmental qualities. The acknowledgement of landscape values is supported, for instance, by legislation on appellation d'origine well established in Latin countries, and now extended to the whole European Union (EU) by Reg. 2081/92 and 2082/92 on product origins, quality and specificity. EU Regulations for eco-labels (880/92) and eco-auditing (1836/93) must also be mentioned. Recent proposals for stewardship certification in forestry and agriculture could also play a significant role. In addition, there is a debate on introducing tax declaration schemes which could identify the environmental impact of individual economic activities. Environmental auditing (Club de Bruxelles 1993) is now considered an essential condition for all enterprises aiming to maintain the confidence of their share-holders, to appeal to potential buyers and to merging partners (Bossi 1992), to satisfy financial institutions and insurance companies (Spasiano 1992), and finally, to meet the expectations of the customers and general public. Incidentally, competitive advantages seem to arise for economic systems and enterprises adopting environmentally friendly codes of practices (Porter 1991). Again, it has always been shown by land appraisal that properties located in attractive landscapes have higher values.

This movement is creating a growing need for information. Enterprise environmental accounting could make a substantial contribution. Developments are, however, tentative (Larini 1995). It is remarkable how enterprises are moving from a passive, if not a negative attitude where the environment is perceived as an external constraint, to a positive attitude where the environment is seen as a new opportunity (Owen 1992; FEEM-ISTAT, 1993). A growing number of enterprises try to anticipate institutional and social changes varying from restoration/defensive policies to prevention (Dente et al. 1992), if not ambitious strategies aimed at the complete management and control of the environment, adopting the sustainable development philosophy to achieve the best balance between economic growth and conservation (Marangoni 1994).

2.1 Methodologies and schemes

Methodologies and schemes for enterprise environmental accounting are far from being well tried and tested, let alone codified and unanimously accepted. Experience up to now is mainly based on voluntary adhesion and reflect the difficulties in the quantification and monetarization of environmental impacts of individual enterprises. It is clear that there is an on-going search for a compromise between the need to inform the external world (Company environmental reports) and the usual confidential nature of management accounting. Currently even a common terminology is lacking. On the other hand, there is a need to make the various proposed schemes homogenous for the sake of transparency and comparability among the enterprises and the consistency with national environmental accounting.

Structures – objectives and contents – of enterprise environmental accounting are outlined in Figure 1, which shows the two main approaches:

(i) The so-called ecobalances describe most importantly the use of natural resources. Physical accounts and input-output matrixes are used. The results are sometimes shown by environmental performance indicators (FEEM 1995b; Bartolomeo et al. 1995), obtained by normalizing physical information according to economic variables (e.g. revenue, value added) or to the environmental maximum carrying capacity, which is, of course, very difficult to define (Marangoni 1994). Sometimes environmental expenditure is also indicated (FEEM-ISTAT 1993).

(ii) The second approach is derived from conventional financial accounting and tries to express environmental values in monetary terms. This requires a full integration of the environmental values into the accounting system. The profit and loss account should therefore show the so-called 'green' result, that is, an environmentally adjusted result. Possible procedures are however poorly defined and sometimes the integration is achieved employing separate accounts – satellite and/or addenda to the main accounting schemes, where environmental values can be shown (De Backer 1992). However, the links between 'ecobalances' and 'environmental green accounting', as shown in Figure 1, that should be given by satellite accounts, remain uncertain and far from being widely accepted and used.

The pros and the cons of the two main options (ecobalances and environmental accounting) outlined in Figure 1 are well known. The various possible ecobalances present problems in the quantification of environmental values, which, moreover, remain confined to physical values. It has been therefore argued that resource accounting in physical terms simply avoids the problems of transforming resource quantities monetary terms (Dasgupta et al. 1995). Meanwhile, environmental accounting applied rigidly can produce results which are not always credible. First, there are serious problems in monetarization. Second, joint costs and revenues are



Figure 1. Enterprise Environmental Accounting Framework.
difficult to allocate to 'environmental/recreational' cost/profit centres, even within sophisticated management account systems. On the other hand, the integration of physical and financial values represents the only possible way to assess to what level profitability is environmentally sustainable and the real value of an enterprise's assets. Financial and economic analysis principles and methods are, however, flexible enough to allow the consideration of environmental values, according to various degrees of certitude and the specific needs of management and public control. A 'progressive' integration of ecobalances using satellite accounts into the financial accounts is part of this process which can create, gradually, a consistent environmental accounting. More specifically, traditional Net Profit/Loss can be transformed into Environmentally adjusted Net Profit/Loss. This process could be conducted stepwise, initially including the identification of environmental costs, then extended to resource accounting and to imputed costs, and finally considering off-site and non-market costs and benefits. It is rather interesting to note that the development from traditional to environmental green accounting is similar to National Accounts with regard to the whole economy, and to Cost-Benefit Analysis (CBA) with regard to investment analysis. In fact, Systems of National Accounting (SNA) have been developed into Systems of integrated Environment and Economic Accounting (SEEA), and CBA, initially based on market prices, has been 'extended' to non-market environmental values.

A recent proposal by FEEM (1995a) underlines the striking similarities of environmental accounting undertaken at the national and enterprise level. Bearing in mind the distinction outlined in Section 1 at the national level, the following four approaches (Gray 1993) to enterprise environmental accounting, ranging from 'light' to 'dark green' can be mentioned:

(i) Identification and reclassification of environmental recreational expenditures, already present in traditional accounting. Separate records are kept of expenditures undertaken for improvements (restoration and mitigation, stewardship, conservation, etc.), paying environmental fines and taxes, meeting standards or coping with conflicts promoted by green movements. This approach – strictly based on market values – only calls for the adjustment of existing accounting systems in line with a 'light green' option. Of course the approach is helped by the creation of specific cost centres where each type of environmental/recreational expenditure must be grouped. Allocation criteria for joint costs have to be defined, bearing in mind that several environmental/recreational services are produced jointly with marketable goods and services.

(ii) Making explicit hidden environmental liabilities/assets, such as future expenses for restoration, to meet more stringent legislation or to prevent future damage, as well as the imputed costs necessary to provide environmental/ recreational goods and services. This approach highlights possible losses (depletion and/or degradation), but also gains (e.g. increased landscape beauty due to afforestation), which have monetary value. The approach can require some use of satellite accounts and/or addenda to traditional book keeping and end-year accounts. Of course rapid and obvious depletion and degradation of natural assets (e.g. forest fires or dramatic cases of pollution), being immediately expressed by market values, are generally included in traditional accounts. In the meanwhile, less evident non-market depletion (such as gradual lowering of water table) and the degradation of natural assets (e.g. water pollution) or the improvement of natural assets (e.g. a fallow year, green manure production and the increase of forest growing stock) should be included in the satellite accounts.

(iii) Addition of non-market values, such as natural stock depletion/degradation shown by forest inventories extended to the quality of tree stands, biodiversity, landscape impact, etc. Thus the elements of the Total Economic Value (TEV) of environmental/recreational goods and services are taken into account. Measures can be referred to the variation of consumers surplus resulting from valuation techniques such as Travel Cost (TC) and Contingent Valuation (CV)¹. Satellite accounts become essential. The physical and/or monetary information provided by satellite accounts is attached to the accounting system mainly through addenda which supplement traditional accounting without altering its structure. It is quite interesting to note that satellite accounts and the various possible addenda can be to a certain extent assimilated to the memorandum accounts foreseen by EU Directive IV n. 660/78, including risks, obligations and warrants affecting the enterprise's assets. Memorandum accounts are therefore supplementary to balance sheets and should highlight items which do not affect the traditional profit and loss account but are important for the overall impact and image of the firm. This approach, though highly innovative, has the inherent advantage of ensuring continuity of traditional accounting and the management information system. However, it must be clear that managerial objectives are extended to include a public view of land-based enterprises;

(iv) Full integration of environmental and financial data, where an integrated information system aimed at complete environmental valuation of the enterprise is set up according to a 'strong' sustainability view (Victor 1991). In practice, this calls for a complete readjustment of accounting procedures and is the most radical, or 'dark green', approach. However, approach (iii) can lead to the same results, whenever the account is taken of natural capital depletion/degradation, along with environmental damage, as well as benefits. Therefore this fourth approach has been rarely, if ever, applied in its full extent and implications.

3 ENVIRONMENTAL ACCOUNTING: FROM INDIVIDUAL ENTERPRISES TO THE LAND-BASED BUSINESS SYSTEM

Individual forest enterprises and dairy-farms located in mountain areas of outstanding natural beauty, mainly regional parks have attempted to apply environmental accounting (Merlo 1996; Defrancesco et al. 1996). Especially in forestry it has been shown that the stepwise scheme, once adapted, can be a useful instrument for various managerial and policy purposes.

The conventional accounting results show the heavy financial losses of multipurpose public forestry: recreation, conservation and timber production. However, the first approach to environmental accounting based on the identification and reclassification highlights that financial losses are caused mainly by recreation and conservation activities – real expenditures which cannot be met by an adequate revenue. Timber production alone can often achieve a balance between costs and revenues.

¹ Of course, it must be accounted that CVM, at least theoretically, can estimate the whole TEV (use, option and existence values), while TC can estimate only use values.

The second approach referred to making explicit hidden environmental liabilities/ assets shows environmental values – positive and/or negative – neglected by traditional accounting. These are, for example, gains associated with the increased volume of growing stock, and liabilities from past afforestation, which created artificial stands susceptible to collapse in case of natural hazards and pest attacks.

It is with the third approach to environmental accounting based on the inclusion of non-market and/or off-site values – making use of the TEV concept, that the overall economic picture of multipurpose forestry is fully represented, and changed, highlighting its high social profit. In fact, the recreation and conservation benefits are explicitly shown, therefore modifying the overall economic picture of forestry. Unfortunately non-monetary benefits can only be measured through Travel Cost and Contingent Valuation methods – requiring consumer surplus valuation which is rather questionable according to the traditional economic wisdom.

The enterprise approach to environmental accounting fails, however, to show some possible internalization of public benefits attached to multipurpose forestry and agriculture. Rather significant is the case of recreational benefits 'captured' by other enterprises, especially tourist and sport related businesses, strictly based on agriculture and forestry so-called non-market benefits. Also revenue linked to landscape quality and the local environment are not explicitly shown, although they are accounted for as revenue of traditional market products as can be the case of appellation d'origine agricultural products. It has been demonstrated that their market value allows conservation of unique landscape as is often the case with mountainous less favoured areas where agriculture can survive only thanks to quality products (Ferro et al. 1995).

The problem can, however, be solved, as attempted in this paper, through an environmental accounting extended to all land-based businesses located in a certain area, a sort of enterprise group accounting, able to highlight the flow of public benefits and/or costs which go beyond individual enterprises. In other words, externalities (off-site and/or non-market effects), particularly those owning a use value, can be internalized at the area scale. This approach should, at the same time, avoid double counting and emphasise the real contribution of the environment and the landscape to the income of the area.

4 THE CASE OF CANSIGLIO

To illustrate environmental accounting enlarged to area scale, i.e. the system of landbased local businesses, an application is reported with reference to Cansiglio, an area of outstanding natural beauty, located in Veneto Region, North-Eastern Italian Alps. The enterprise system under accounting is given by the following units:

• the Regional Forest Enterprise producing timber, marketable recreation services such as mushroom picking permits, guided visits, 'green weeks', rent from tourism buildings and non-market services such as unpaid recreation and environmental protection;

- four dairy farms producing 'organic' milk according to techniques approved by National Organic Producers Associations, while fodder from meadows and pastures are produced according to EU Reg. 2092/91 on 'organic' farming;
- a milk processing co-operative producing 'organic' and appellation d'origine cheese, sold both on the wholesale market outside the area and directly to consumers inside the area -21% of the total;
- tourism activities including two hotels, two restaurants (one of which run by the milk-co-operative) and two 'agritourisms' run by two of the above farms;
- sports activities including mountain bike hire (run from one of the agritourism farm), a Golf Club and an environmentally friendly ski centre based on cross country tracks and alpine skiing without artificial snow and/or snow chemical treatment.

The above activities can be easily viewed as an 'enterprise group'. This character is stressed by the fact that 80% of the land is public (Region), local farmers own the co-operative shares, last, but not least, the enterprises in the area are strongly income-dependent by tourism activities, to the extent of almost 400,000 visits per year.

The values shown in the sequence of 1995 year end balance sheets and profit and loss accounts (Tables 1 to 4) use the existing enterprises' accounting systems re-classified following the mandatory layout prescribed to private enterprises by EU Dir. 660/78 as their basis. The year end enterprises' accounts have been consolidated following EU Dir. 349/83. Consolidation adjustments have been made in order to avoid double counting errors².

In particular, Table 1 gives the traditional profit and loss account and balance sheet at enterprise level and the consolidated one. Tables 2, 3 and 4 modify and enlarge the year end account according to the stepwise approach to environmental accounting previously described, ranging from 'light' to 'dark' green.

(i) Conventional accounts. The first profit and loss account and balance sheet (Table 1) refers simply to enterprises' year end accounts. In the case of public forest, valuations have been made of fixed assets with reference to the real market: values, however, are rather conservative (almost half the market price) given the public property status of all assets. Also farms year end accounts are based on simplified accounting and prudential assets estimates. From the consolidated balance sheet one can see that total assets (22 billion lire), mainly from forest stands (11 billion), buildings, meadows and pastures (5 billion), produce a 6.5 billion revenue, mainly due to cheese and timber production and tourism-based services. The operating loss is equal to 297 million resulting from the Forest Enterprise and the milk co-operative operating losses that are not balanced by the positive results of dairy farming and tourism. The pre-taxes result

³ Consolidated year end account has been obtained in two steps: (i) summing up enterprises' year end accounts, (ii) adjusting the sum in order to avoid overestimation of revenue, cost, assets and liabilities at consolidated level. Overestimation is due to double-counting of transfers of goods, services or money among enterprises of the same group, simply summing up the year end accounts. For example, milk produced by farms (706 million, included into farm revenue) and transformed by co-operative (706 million included into co-operative processing costs), must be considered as an intermediate product at group level. Its value must be subtracted from the sum both of consolidated revenue and to consolidated expenses. Similarly, the infra-group rents (91 million) have been subtracted from both total cost of production and total revenue. Following the same path, after summing up enterprises' balance sheets, have been subtracted: (i) the co-operative amounts due to affiliated farmers for milk payments (164 million) and the same amount from (farmer') receivables; (ii) the farms' shares of co-operative difference between such two values (60 millions) is accounted as consolidation reserve, according to EU Reg. on consolidation.

is negative (490 million), because the financial costs are not fully compensated by the increased value of fixed assets – growing stock and estate value. It is interesting to note that while the pre-taxes loss is caused by the Forest Enterprise, however, it is covered by what so-called compensations, i.e. various contributions coming mainly from the Region (600 million), justified on the grounds that the forest provides a large amount of free public services contributing to people's welfare. EU Reg. 2078/92 payments to organic farms (78 million) have been similarly added to the pre-taxes results, improving the farmers' income. It must be remarked, however, that the profit and loss account of Table 1, does not allow a clear distinction between the traditional activities (timber and dairy production) and the recreational environmental services. Nevertheless, these now typify the Cansiglio area and its economy.

(ii) Identification and reclassification of environmental and recreational expenditures. The following profit and loss account (balance sheet unchanged) shown in Table 2, refers to the first approach to environmental accounting as a starting point, where the traditional activity is separated from recreation and environmental Functions. It should be noted that the approach does not require new values external to the existing accounting system, being merely based on a new aggregation of expenditures and revenue able to distinguish the two main different activities. This problem regards mainly the Forest Enterprise, which does not fully distinguish the labour costs connected with environmental maintenance and the provision of recreational facilities from those directly connected to timber production. Labour costs have been allocated to ordinary activity and to recreation/environmental one adopting the relative contribution to revenue criterion. Tourism activities of both farms and the milk-processing cooperative are accounted separately, so, allocation criteria are needed only for overheads. This approach requires, or at least is helped by, a revision of the accounting system toward management accounting (Jöbstl 1995). As a result of this approach, it is possible to separate the heavy operating losses of the Forest Enterprise due to recreation and environmental activities (536 million) from timber production which presents a positive result, if the increased value of 'cuttable' growing stock is taken into account. The profit and loss account also shows that the negative result of recreational-environmental activities is balanced by public compensation. In fact, sales of environmental goods and services remain sporadic and scarce. The year end accounts clearly indicate the need for new environmentally oriented marketing strategies.

The farms positive operating results of ordinary activities are also separated from recreation. In the case of the milk processing co-operative, the ordinary activity (milk processing) is negative (-288 million) due to the high price of milk paid to affiliated farmers. This loss, however, is balanced by the results of a shop-restaurant, selling traditional dairy products (268 million). The overall result, as demanded by the co-operatives' statute, is therefore nil. This means that the operating result from the shop-restaurant has been included in the milk price. Remarkably, however, the price of milk paid to farmers is 38% higher than the market average. This milk price differential, together with EU Reg. 2078/92 aids, effectively contribute to farmers' income. Actually, they allow the continuation of farming in the Cansiglio area, assuring an average income of 18.5 million per farmer, almost comparable to non-agriculture income according to EU definition (EU Dir. 159/72 and Reg. 797/85).

Profit and Loss Account	Forest	Cheese co-operative (1 restaur.)	4 Organic Dairy farms (2 Agritour.)	3 Hotel/rest. and Skiing centre	Golf Club	Consolidated
A) Revenue from operating activities	813	2556	1767	1780	361	6479
Sales	787	2540	1092	1406	330	5358
Variation in stocks of finished goods						
and in work in progress		-29	587	332		890
Other operating revenue	25	45	88	42	31	231
B) Expenditure from operating activities	1339	2576	1679	1642	338	6776
Raw materials and consumables	68	1847	430	548	2187	
Services	550	124	207	205	17	1103
Rent		9	33	56	6	13
Wages, salaries, social security costs	579	456	304	242	145	1727
Depreciation of fixed assets	26	50	85	169	100	429
Variation in stocks of raw materials		36	569	336	940	
Allocation to risk provisions						
Allocation to other provisions				2		2
Other operating charges	116	56	51	85	67	375
OPERATING RESULT (A-B)	-526	-20	88	138	23	-297
C) Financial result	-40	-27	-63	-113	-20	-263
Financial revenue	2	4	2	1	6	
Financial costs	-42	-31	-65	-114	-20	-272
D) Value adjustments in respect of financial as	sets					

E) Extraordinary profit or loss	30	48	-11	4	-1	70	
(growing stock and estate value) (growing stock and estate value) (Extraordinary charges	30	58 -11	10 -21	6	-1	105 -35	
PROFIT/ LOSS PRE TAXES / COMPENSATION (A-B+C+D+E)	-536	0	15	29	5	-490	
Taxes Compensation (grants, subsidies and incentives)	600		78			678	
PROFIT OR LOSS FOR THE YEAR	64	0	92	29	7	187	
Balance Sheet							
Assets	15947	1642	2628	1933	510	22466	
A) Subscribed capital unpaid		0				0	
B) Formation expenses							
C) Fixed assets	15858	675	1331	1390	500	19724	
I - Net Intangible assets (improvements' value)	135	228	879	73	500	1816	
II - Net Tangible assets	15722	371	390	1310		17793	
1) High standing forest (ha 3197), meadows and pastures (ha 550), buildings	17980		35	117	520	18652	
2) Plant machinery and other equipment Depreciation provisions of fixed assets	162 -2420	539 -168	785 -430	2067 -873	220 -740	3773 -4632	
III - Financial assets (shares in participanting undertakings)		76	62	М		115	

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Table 1. (continued) 1995 Year end accou	nts (Millions Li	re; 1 ECU=1900 L	ire).			
Fores	t Cheese	4 Organic co-operative (1 restaur.)	3 Hotel/rest. Dairy farms (2 Agritour.)	Golf and Skiing centre	Consolidated Club	
D) Current assets	06	955	1283	510	10	2683
I - Stock		303	635	332		1271
II - Debtors	26	652	431	139	10	1093
III - Current financial assets						
IV - Cash at bank and in hand	64		217	39		319
E) Prepayments and accrued income	0	12	14	33	0	59
Liabilities	15947	1642	2628	1933	510	22466
A) Capital and reserves	13890	221	1350	360	70	15860
I - Subscribed Capital	13826	89	1188	202	68	15284
II - IV Reserves		131	76	139		345
Consolidation reserve						60
V - Profit or loss brought forward			-7	01-		-17
VI - Profit or loss for the year	64	0	92	29	7	187
B) Provision for liabilities and charges	0	0	3	0	0	ю
C) Provision for pensions and similar oblig	gations 256	99	28	26	0	376
D) Creditors	1802	1352	1204	1507	440	6141
a) Amounts payable within one year	416	1271	951	663	440	3576
b) Amounts payable after more than one y_i	ear 1386	82	254	844		2565
E) Accruals and deferred income	0	4	42	40	0	86

Table 2. Approach 1: Revenue/costs from ordinal	ry operat	ing activity separa	ted from recreation	and environment (M	illions lire; 1	ECU=1900 Lire).
Profit and loss Account (Balance Sheet: seeTtable	1)					
H	orest	Cheese co-operative (1 restaur.)	4 Organic Dairy farms (2 Agritour.)	3 Hotel/rest. and Skiing centre	Golf Club	Consolidated
A1) Revenue from operating ordinary activity (timber, milk,) B)1 Expenditure from operating ordinary activity	668 680	1762 2051	1515 1437	00	0 0	3240 3422
OPERATING RESULT FROM ORDINARY ACTIVITY (A1-B1)	-12	-288	78	0	0	-182
A2) Revenue from recreation and environment (see details)	145	793	252	1780	361	3240
(see details)	659	525	242	1642	338	3354
oferating result from recreation & ENV. (A2-B2)	-514	268	10	138	23	-115
OPERATING RESULT	-526	-20	88	138	23	-297
C) Financial result	-40	-27	-63	-113	-20	-263
 D) value adjustments in respect of financial assets Extraordinary profit or loss 	30	48	-11	4	-1	70
PROFIT/ LOSS PRE TAXES/COMPENSATION (A1-B1+A2-B2+C+D+E)	-536	0	15	29	5	-490
Taxes Compensation	0 009	0 0	0 78	0 0	0 0	0 678
PROFIT OR LOSS FOR THE YEAR	64	0	92	29	2	18

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Table 2. (continued) Approach 1: Revenue/costs from ordinary operating activity separated from recreation and environment (Millions lire; 1 ECU=1900 Lire).

DETAILS OF FOREST ENTERPRISE:	Forest
Revenue from recreation and environment	145
Rent and concessions from tourism buildings	103
Mushroom picking permits	17
Guided visits and green weeks	26
Expenditure from recreation and environment	659
Wages, salaries, social security costs	133
Depreciation	10
Row materials and services	419
Other cost	97
Services and other cost expenditures allocation to rec. and envir.:	
Landscape maintenance/improvements	138
Road and hydrological works maintenance / improvements	31
Tourism buildings maintenance/improvements	113
Protection forest maintenance/improvements	142
Production forest maintenance/improvements	91

Table 3. Approach 2: Hidden environmental valu	ies (mark	ed with §§) (Milli	ons Lire; 1ECU=190	00 Lire).		
Profit and Loss Account F	orest	Cheese co-operative (1 restaur.)	4 Organic Dairy farms (2 Agritour.)	3 Hotel/rest. and Skiing centre	Golf Club	Consolidated
A1) Revenue from operating ordinary activity						
(timber, milk,) B11 Evnanditure from oversting ordinary activity	668 680	1762 2051	1515 1737	0 0	0 0	3240 3777
DIJ LAPENDUM OPPLATING ACUVITY OPERATING RESULT FROM ORDINARY ACTIVITY (A1-R1)	-12	1007 -788	1 C+1 78			-182 -182
A2) Revenue from recreation and environment B2) Evenditure from recreation and environment	145 659	793	252 242	1780 1642	361 338	3240 3354
DE/ LAPENDINE NON TECLEAUDI AND ENVIRONMENT OPERATING RESULT FROM RECREATION • PANY (A) DO	600 ·		7	1042		+000 711
& FNV. (A2-B2)	-514	202	10	138	72	C11-
OPERATING RESULT	-526	-20	88	138	23	-297
PROFIT/ LOSS PRE TAXES/COMPENSATION (A1-R1+A7-R7+C+D+F)	-536	C	<u>کا</u>	66	6	-490
PROFIT OR LOSS FOR THE YEAR	6 7	0	92	59	1 0	187
§§ Hidden environmental costs Risk of artificial stands depreciation	6 6					66
§§ Hidden environmental income Non marketable growing stock increase	02 02	123			75	145 70
Hidden landscape revenue from Cansiglio cheese Hidden revenue from Golf		123			75	0 75
<pre>\$\$PROFIT/LOSS ADJUSTED FOR HIDDEN ENV. VALUES</pre>	15	123	92	29	ΤT	323

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Table 3. (continued) Approach 2: Hidden environmental values (marked with §§) (Millions Lire;1ECU=1900 Lire).

Assets	Consolidated
A) Subscribed capital unpaid	0
B) Formation expenses	
C) Fixed assets	19724
of which: §§ Landscape values from Cansiglio cheese	6
§§ C) Hidden fixed assets	145
§§ Golf fixed assets value adjustment from 'normal' depreciation	75
§§ Non marketable growing stock increase	70
D) Current assets	2683
E) Prepayments and accrued income	59
TOTAL ASSETS (sum A to E and §§C)	22611
Liabilities	
A) Capital and reserves	15825
of which: § Net profit/loss adjusted for hidden environmental values	323
B) Provision for liabilities and charges	3
§§ B) Provision for risk artificial stands	180
C) Provision for pension and similar obligations	376
D) Creditors	6141
E) Accruals and deferred income	86
TOTAL LIABILITIES (sum A to E and §§B)	22611

Balance Sheet (Consolidated)	0		
Assets		Liabilities	
Subscribed capital unpaid	0	A) Capital and reserves	15825
B) Formation expensesC) Fixed assets	19724	of which: \$§ Net profit/loss adjusted for hidden	323
of which: \$\$Landscape value from Cansiglio Cheese	9	environmental values	
§§C) Hidden fixed assets	145	B) Provision for liabilities and charges	ß
§§ Non marketable growing stock increase	70	§§B) Provision for risk of artificial stands	180
89 COLL ITXED assets value adjust. ITOM 'normal' deprectation	75	C) Provision for pensions and similar	976
C) Current assets D) Prepayments and accrued income	2683 59	D) Creditors E) Accruals and deferred income 86	6141 6141
TOTAL ASSETS (sum A to C and §§C)	22611	TOTAL LIABILITIES (sum A to E & §§B)	22611
Social Assets	ADDENDA	Social Liabilities	
\$\$ Protection forest ha 160		§§ Environmental debts toward society (pro and recreation forest, pastures, wildlife, biod	ection versity,
\$\$ Recreation forest and areas ha 800		game, euc.)	
\$\$ Wildlife (no of species/quantity)			
§§ Game (no of head)		§§ Net income/loss adjusted for non-market	
§§ Biodiversity meadows and pastures			

ental values through addenda (Millions Lire: 1ECU=1900 Lire). **Table 4** Ammark 3. I inkage of financial accounting to

Table 4. (continued) Linkage of financial accounting to environmental values through addenda (Millions Lire).

Profit and Loss Account (Consolidated)

A1) Revenue from operating ordinary activity	3240
B1) Expenditure from operating ordinary activity	3422
OPERATING RESULT FROM ORDINARY ACTIVITY	-182
	2240
A2) Revenue from recreation and environment	3240
B2) Expenditure from recreation and environment	3354
OPERATING RESULT FROM RECREATION AND ENV.	-115
OPERATING RESULT	-297
	100
PROFIT/LOSS PRE TAXES/COMPENSATIONS	-490
Compensation	678
<u>F</u>	
PROFIT OR LOSS FOR THE YEAR	187
88 Hidden environmental profit	136
55 maden en monnental prom	150
§§ PROFIT/LOSS ADJUSTED FOR HIDDEN	
ENVIRONMENTAL VALUES	323
ADDENDA	
Social profit and loss account	
§§ Recreation	1329
§§ Mushroom picking without permits	101
§§ Protection	320
less: Compensation	678
NON-MARKET BENEFITS NET OF COMPENSATION	1072
88 ΝΕΤ ΡRΟΕΙΤΊ OSS FOR THE VEAR ADJUSTED FOR	
NON-MARKET ENVIRONMENTAL BENEFITS	1396
TIOTI-MARKET EN VIRONWENTAL DENETTO	1320

(iii) Making explicit hidden environmental liabilities/assets. Table 3 shows hidden environmental values – specifically shadowed and marked with §§. An environmental adjusted profit is obtained equal to 323 million at group level. Various hidden environmental revenues have been considered, or highlighted, when already included in financial accounting: a) the non-marketable growing stock increase (prudentially valued), which has been added to the forest balance sheet as hidden fixed assets; b) hidden landscape revenue from Cansiglio cheese has been highlighted in the milk cooperative profit and loss account (123 million). In fact, the appellation d'origine Cansiglio cheese is sold at higher prices than similar cheeses. The price differential can be attributed both to product quality and to consumers' willingness to pay for the product image, therefore internalizing landscape quality³. Furthermore, it can be noted that the present value of this 'hidden landscape revenue' (2% rate of discount) is equal to 6.2 billion. Therefore, a substantial part of the assets, as indicated in the financial balance sheet, could be attributed to 'active' dairy farming; c) again, 'hidden landscape revenue' can be found in the Golf Club membership fees. In fact, the higher yearly fees (75 million) paid by members to balance an accelerated depreciation of fixed assets, can be considered as internalized recreation consumer surplus. Of course the same value has been accounted in the balance sheet as hidden fixed asset, being an adjustment of a 'normal' depreciation rate, with respect to tenancy's life.

The above environmental values are all positive. Rather interesting are the negative adjustments necessary to show the risks affecting existing artificial stands of spruce, which are liable to disease in plantation forestry, lacking biodiversity and natural protection. The artificial stand risk, shown in the profit and loss account as an hidden annual depreciation⁴, should be covered by a specific provision to be incorporated as a liability in the balance sheet. This provision should be used in case of actual collapse of the artificial stands. However, the risk is also covered by annual management expenditures aimed at improvement of the artificial stands through planting of indigenous broad-leaved species, such as beech. The growing stock increase imposed by management rules can also be seen as a concrete realization of a provision against this risk. It is interesting that this environmental accounting is supported by what can be seen as an old established satellite account, namely the forest inventory, which refers not only to stands' quantity but also quality.

(iv) Addition of non-market values. Table 3 takes into account enterprises' assets/ liabilities and products that have a market or can be easily expressed in market values. Meanwhile, Table 4 highlights non-market values, typically public goods. Therefore, the year end accounts assume a full public connotation open to welfare considerations. This means an enlargement of the balance sheet through shadowed addenda where natural resources received from society are indicated. These items are not quantified in monetary terms, but only physically according to the satellite accounts logic. Another

³ The *appellation d'origine* Cansiglio organic cheese is sold at 1,300 £/kg more than similar products (246 million in total). One half of this differential can be assigned to environmental quality.

⁴ Artificial stand risk depreciation covers 300 ha of artificial spruce stand, even aged 50 years old. Similar stands (ha 200) were attacked years ago by an insect (*Cephalcia Harvensis*), making early felling necessary with a loss per ha of 3 million lire, early cut and plantation of mixed forest. The probability of this occurrence within the next 20 years has been estimated at 20%, meaning that the risk depreciation amounts to 1%, so that the annual quota for 300 ha amounts to 3*0.01*300=9 millions. Although not applied the risk depreciation can express the yearly risk insurance premium to existing stands due to the lack of biodiversity and natural protection.

addendum integrates the profit and loss account. It represents an adjusted (or enlarged) profit, able to account for the non-market and off-site flows of services, i.e. the TEV. The operation seems acceptable to the extent that recreation and conservation increment social welfare, i.e. constitute a flow of utilities recorded in the same span covered by the profit and loss account. It should be noticed however that the net social profit is based on welfare estimation and derives from consumer surplus measures - obtained from TC and CVM. This flow of benefits is considered net of compensations, taken as an indemnity for the expenditures met to provide public goods and services⁵. This means that public compensations are omitted from the environmental adjusted profit reported in Table 4 equal to around 1.4 billion lire, taken as an intrinsic component of the social welfare function. Registration of this value in the profit and loss account of the Forest Enterprise, although as an addendum, can cause perplexities at least as far as the amount is concerned. It seems, however, very important to include it in order to show how the increased flow of services (annual welfare) contributes to society'capital, which in the end constitutes human capital. Some authors tend to argue that only welfare variations matter (Linddal 1995). Adger and Whitby (1993) propose to modify the British agricultural product by adding the value of carbon fixation and non-market services flows while deducting defensive expenditures. The arguments therefore are about the consideration of total flows or the limitation to variation. Apart from the arguments having a certain rationale at the nation-wide level and for services provided by natural resources as such, it must be remarked that in the specific case outlined in Table 4, inclusion of total yearly public benefits seems acceptable, because they correspond not only to the resources but to the environmental/recreational services which would be jeopardized by lack of landscape management - farming and forestry. Meanwhile, variation of stocks necessary to provide these services should be reported as assets variation in the balance sheets.

At the area scale, non-market benefits from recreation (1.3 billion) are obtained by subtracting the income already internalized by tourism and land-based enterprises (0.6 billion) from non-market benefit derived from consumers surplus measures (1.9 billion). In particular, non-market use-values from recreation have been monitored since 1975 using TC and CV methods and quantified in 1.9 billion – 5000 lire per visit on average. Prudentially, the portion of these benefits captured by farms and tourism enterprises has been obtained by summing the operating results of tourism-based activities and the hidden recreation revenue of the golf course to the hidden land-based revenue from Cansiglio cheese. The balance between the estimated benefits from recreation and those already captured by the market is equal to 3400 lire per visit. This amount could be, at least partially, transformed into a market value e.g. by measures, such as car parking tickets, able to capture consumers' surplus without altering the existing property rights.

This valuation has been possible thanks to the area-scale approach to environmental accounting. Its main advantage is certainly to show how landscape and recreational non-market benefits produced by certain enterprises have been, or could be, captured by others. In other words, the approach has highlighted how forestry and agriculture produce benefits that the consumers, at least partially, pay to other landscape-based enterprises – namely the tourism activities.

⁵ This implies a double entry of compensations in the profit and loss account: firstly is a revenue increasing enterprise's financial profit for the year, secondly as a society's expenditures to be deducted from the total value of recreational-environmental services (a sort of clearing transaction).

5 FINAL COMMENTS AND CONCLUSIONS

A number of comments concerning the economic, managerial and political issues may be drawn from the analysis and the tentative applications. At the economic level, it can be remarked that:

- environmental accounting allows internalization in the balance sheet of various near-market and non-market values connected with forestry and agriculture;
- such internalization may be achieved stepwise by producing sequential balance sheets and profit and loss accounts, starting from 'light' to 'dark green' options;
- options, however, can be separated allowing a clear demarcation between financial and environmental accounting, addenda to balance sheet and profit and loss account can be used to make clear differences, while satellite accounts can provide the necessary information;
- in any case, the various possible steps should reflect the growing emphasis on environmental and social values connected with forestry and agriculture, making it possible to account for use, option and non-use values, the so-called TEV;
- in the most advanced steps of environmental accounting, assets borrowed from society and services provided to society can be highlighted within the logic of the most traditional financial accounting;
- with specific reference to the Cansiglio area the consolidated approach allows to capture and show the flows of benefits which go beyond individual enterprises in monetary terms; an economic rationale is therefore found for the local compensation of environmental and land-based benefits.

At the management level:

- a functioning environmental accounting could allow a comprehensive analysis of the various aspects inherent to multipurpose forestry and agriculture and the related management objectives;
- financial ratios, cost-centres profitability and environmental indicators can be jointly developed, according to the same logic, allowing the appropriate scrutiny of forestry and agriculture; also multicriterial optimization models can be better supported;
- complete listing of forest and agriculture outputs within the profit and loss account opens up an opportunity to explore the potential markets for near market or non-market outputs;
- the overall marketing strategy of forestry and agriculture enterprises can therefore be re-examined, suggesting the best measures to achieve remuneration and/or compensations of all forest and farming land-based benefits;
- amongst such measures, appropriate means to capture consumer surpluses (environmental and other land-based products development) can also be devised, in order to take full advantage of 'green consumerism';
- the management of parks and protected areas whose governing bodies consist of local authorities, amenities societies and various environmental pressure groups

can be better informed on the conflicting objectives of different enterprises and actors, in order to find compromise solutions.

At the political and administrative level, environmental accounting

- can improve the public control of forestry and agriculture and help technical assistance to multipurpose landscape management;
- facilitates the definition of compensations, grants, and incentives such as those foreseen by EU Regulations 2080/92 and 2078/92, in addition local compensation amongst the various enterprises can be better informed and regulated;
- can provide substantial support to the application of *appellation d'origine*, the various quality labels, including eco-label and stewardship certifications;
- can help define option and non-use values, suggesting regulations and incentives for those land-based services lacking potential markets and direct remuneration from the consumers;
- can contribute to better informed definition and application of environmental policies, especially through the consolidation of the different year end accounts of all enterprises and activities operating in a certain area or region. Compared to individual enterprise application, the present area-scale approach has the main advantage to quantify the environmental-recreational non-market benefits produced by an enterprise that have been, or could be, captured by another one. This quantification facilitates the definition of compensation among the local enterprises and actors, according to the well known 'subsidiarity principle, applied to its lowest possible level.

Finally it should be remarked that boundaries between financial and environmental accounting, individual enterprise and area levels, cannot be strictly defined. They overlap and have to be seen as continuous rather than discrete categories. Incidentally, some environmental issues have always been incorporated to a certain extent in financial accounting. This development from financial to environmental accounting can therefore be seen, and better accepted, according to steps which acknowledge the private or public status and the objectives of different enterprises. Institutional issues and the state of property rights also contribute to defining boundaries and steps. The real world development is such that environmental off-site and non-market outputs and even traditional inputs to forestry and agriculture, like stewardship, are now becoming market outputs as far as payments are made, or can be made, by consumers and various other private, public or quasi-public bodies. Accounting, broadly speaking, has the task of registering, of promoting and of supporting this process.

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References

- Adger, W. and Whitby, M. 1993. Natural Resource Accounting in the Land Use Sector: Theory and Practice. European Review of Agricultural Economics 20.
- Archambault, E. and Bernard, J. 1988. Système de comptabilité de l'environnement et problèmes d'evaluation économique: l'approche française. Laboratoire d'Economie Sociale. Paris. In French.
- Bartolomeo, M. Malaman, R. Pavan, M. and Sammarco, G. 1995. Il bilancio ambientale d'impresa. Il sole 24 ore-Pirola. Milano. In Italian.
- Bossi, C. 1992. L'audit ambientale aiuta le imprese. L'impresa ambiente 1. Pp.38-41. In Italian.
- Club de Bruxelles, Stern, A. (ed.) 1993. La gestion de l'énvironnement en Europe. Guide de l'eco-audit et de l'eco-label. Bruxelles. In French.
- Dasgupta, P., Kriström, B. and Maler, K.G. 1995. Current Issues in Resource accounting. In: Johansson, P.O., Kriström, B. and Maler, K.G (eds.) Current Issues in Environmental Accounting. Manchester University Press. Manchester. Pp.117-152.
- Defrancesco, E. and Merlo, M. 1996. L'esposizione dei beni e servizi ambientali nel bilancio dell'azienda forestale. Genio Rurale 7/8. Pp. 50-62. In Italian.
- Dente, B. and Ranci, P. 1992. L'industria e l'ambiente. Il Mulino. Bologna. In Italian.
- De Backer, D. 1992. Le management vert. Dunot. Paris. In French.
- FEEM Fondazione ENI Enrico Mattei. Siniscalco, D. 1995a. La contabilità ambientale d'impresa. Il Mulino. Bologna. P. 44. In Italian.
- FEEM Fondazione ENI Enrico Mattei. 1995b. Company environmental Reports: Guidelines for preparation. Supplement to FEEM Newsletter 1.
- FEEM-ISTAT, Musu, I. and Siniscalco, D. (eds.) 1993. Primo rapporto intermedio della Commissione ISTAT-FEEM per lo studio di un sistema di contabilità ambientale, Ambiente e contabilità nazionale. Il Mulino. Bologna. Pp. 15-49. In Italian.
- Ferro, O., Merlo, M. and Povellato, A. 1995. Valuation and remuneration of countryside stewardship performed by agriculture and forestry. In: Peteers, G.H. and Hedley, D.D. (eds.) Agriculture Competitiveness: Market Forces and Policy Choice. Dartmouth, Aldershot, England. Pp. 415-435.
- Gray, R.H. 1993. Accounting for the environment. Chapman and Hall, London.
- Hueting, R. 1989. Correcting National Income for Environmental Losses: Toward a Practical Solution. In: Ahmad, Y.J., El Serafy, S. and Lutz, E. (eds.) Environmental Accounting for Sustainable Development. World Bank. Washington D.C.
- Jöbstl, H.A. 1995. Contribution to managerial economics in forestry. Österreichischer Agrarverlag. Wien.
- INSEE, Ministère de l'Environnement. 1986. Le comptes du patrimoine naturel. n. 535-536 des Collection de l'INSEE, serié D, n. 137-138. In French.
- Larini, S. 1995. I conti delle aziende vanno in verde. Largo consumo 6, pp.148-157. In Italian.
- Leipert, C. and Simonis, U. E. 1989. Environmental Protection Expenditure: the German Example. Rivista Internazionale di Scienze Economiche e Commerciali 36(3): 255-270.
- Linddal, M. 1995. Forestry: Environment cum Economics. PhD Thesis, The Royal veterinary and Agricultural University, Denmark. 186 p.

- Lutz, E. 1993. Toward Improved Accounting for the Environment: An Overview. In: Lutz, E. (ed.) Toward Improved Accounting for the Environment An UNSTAT-World Bank Symposium. Washington D.C. Pp. 1-14.
- Marangoni, A. 1994. La gestione ambientale. SPACE Security and protection against Crime and Emergencies. Milano. In Italian.
- Merlo, M. 1996. Non-Market Environmental Values in Forest Management Accounting. Finnish Journal of Business Economics 1: 29-47.
- Owen, D. 1992. Green Reporting, Accountancy and the Challenge of the Nineties. Chapman & Hall. London.
- Peskin, H.M. and Lutz E. 1990. A Survey of Resource and Environmental Accounting in Industrialised Countries. Environment Working Paper 37. World Bank. Washington D.C.
- Peskin, H.M. and Lutz, E. 1993. A Survey of Resource and Environmental Accounting Approaches in Industrialised Countries. In: Lutz, E. (ed.) Toward Improved Accounting for the Environment, An UNSTAT-World Bank Symposium. Washington D.C. Pp. 144-176.
- Porter, M. 1991. Il vantaggio competitivo delle nazioni. Mondadori. Milano. 757 p. In Italian.
- Repetto, R., Magrath, W., Wells, M., Beer, C. and Rossini, F. 1989. Wasting Assets: National Resources in the National Income Accounts. World Resources Institute. Washington D.C.
- Sammarco, G. 1993. Approcci alla contabilità: problemi e proposte. In: Musu, I. and Siniscalco, D. (eds.) Ambiente e contabilità nazionale. Il Mulino. Bologna. 72 p. In Italian.
- Spasiano, C. 1992. E'un primato italiano il pool antinquinamento. L'impresa ambiente 3: 23-29. In Italian.
- United Nations 1993. Handbook of National Accounting, Integrated Environmental and Economic Accounting, Interim version. Department for Economic and Social Information and Policy Analysis. New York.
- Victor, P.A. 1991. Indicators of Sustainable Development. Some Lessons from Capital Theory. Ecological Economics 4: 191-213.
- Weber, J.L. 1986. Le systeme de comptes du patimoine naturel. In INSEE Les comptes du patrimoine naturel. Les collections de l'INSEE, serie C, (137-138): 65-126. In French.

Appendixes

Approach 1: Revenues/costs from ordinary activity separated from recreation and environment



Approach 2: Hidden Environmental Values

Balan	ce Sheet
ASSETS	LIABILITIES
B) Fixed Assets	A) Capital and Reserves
Hidden Environmental Fixed Assets	Of which: Net profit/loss adjusted for hidden environmental values
Of which: Non marketable growing stock increase	B) Provision for liabilities and charges
	Of which: Provision for risk artificial stand
TOTAL ASSETS	TOTAL LIABILITIES
Profit and	loss account
Ordinary Activity	
(A1) Revenue	
(B1) Cost of production	
Operating result (A1-B1)	
Recreation and environment	
(A2) Revenue	
(B2) Cost of production	
Operating result (A2-B2)	
Total Operating Result	
(A1-B1) + (A2-B2)	
PROFIT/LOSS for the year	Profit/Loss adjusted for
Hidden Environmental Values	hidden environmental values
Benefits Costs	
Hidden Environmental Values	

Approach 3: Linkage of financial accounting to environmental values



THE VALUE OF SOCIO-ECONOMIC DATA COLLECTION: FOREST OWNERS' VIEWPOINT

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ABSTRACT

In most European countries, agriculture and forestry are seen as integrative parts of the rural areas and the bond between them is of great importance in many regions. Nevertheless, it would be inappropriate to consider them similar regarding their socioeconomic values. In comparison to agriculture, forestry and in particular small scale forestry is very complex and not at all homogenous concerning the management objectives: emphasis on economical, social or ecological values, the owners' attitude towards his/her property and the irregular intervals of income.

Keywords: family forestry, qualitative social research, socio-economic values

1 BASIC INFORMATION ABOUT THE CEPF

The Confederation of European Forest Owners was founded in 1994 as a successor organisation to the CCPF (Comité Central des Propriétaires Forestiers) which was established in 1961.

At present, the CEPF brings together forest owner organisations from 13 EU member states (Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Greece, Ireland, Luxembourg, Netherlands, Portugal and Spain) and 5 countries outside the EU (Czech Republic, Hungary, Lithuania, Norway and Switzerland). CEPF policy serves the interests of approximately 12 million forest owners who own 65% of the forest area within the EU.

The task of the Confederation of European Forest Owners is to represent the interests of forest owners in Europe orientated to the private sector vis-à-vis the institutions of the EU. Recently, there has been an increasing interest to bring the views of European forest owners to the global forestry policy process (e.g. COFOR-FAO, IFF-UN). The CEPF formulates a common forestry policy strategy of the national member organisations with

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the aim of achieving a balance, on a socially responsible basis, between the interests of the forest owners on the one hand and the social demands on forests on the other.

2 STRUCTURE AND FUTURE DEVELOPMENT OF FOREST OWNERSHIP IN EUROPE

In Europe, approximately 80% of the forest holdings are between 2 and 20 ha, another 16% between 20 and 50 ha. There are also some significant differences between the different parts of Europe. In the north and south of Europe there is a rather even distribution on the different size categories whereas in the mid-Europe (including France), there is a peak in the category of 2 to 5 ha.

Unofficially the category between 2 and 50 ha is often defined and described as farm forestry, or nowadays family forestry if the bond to agriculture does not exist any longer (unofficially because in most European countries there is no exact definition for farm forestry) (Hyttinen and Kallio 1998).

Who are the owners of these small scale forest holdings and what are their aims? It is possible to approach this question from the viewpoint of qualitative social research. Judmann (1998) describes six different types of forest owners, including the following four:

Wood sellers: The majority of these forest owners draw their main income from agriculture. Forestry is understood in the classical way with the emphasis on wood selling. Due to the common agricultural policy (CAP) of the EU and its negative impacts on family owned agricultural holdings, the share of wood sellers will decrease in the future.

Self-reliants: Activities in agriculture serve as a second occupation. Forestry is equally understood in the classical way with an emphasis on self-reliance for household and hobbies.

Landowners: Forests are seen as assets and property. Active forestry is less important than the joy of possessing a forest, the personal knowledge about the forest, the forest as a guarantee against hard and poor times and the wish to pass on the forest to the next generation. Only few members of this group are farmers, most of them live in an urban environment.

Forest owner for recreation: The forest is almost exclusively used for the own recreation and leisure activities. Wood selling is generally refused. Self-reliance with wood is not very common. The main reasons for forest property are seen in the special suitability and low costs for recreation. An above-average part of this group are classical "urban" forest owners.

Although Judmann defined these categories in a comparative study of small scale forest holdings between Baden-Würrtemberg, Germany and Pennsylvania, the United States, these types of forest owners can surely be found in any European country in varying percentages.

Bringing the qualitative social evaluations together with some figures in EUROSTAT (Forestry statistics 1992-1996) leads to the conclusion that about 7% of European forest holdings (excluding the ones over 50 ha) fit the conditions for farm forestry as they are still linked to agriculture. This figure does not at all reflect the great regional importance of farm forestry e.g. in Austria, Finland, Germany, Italy, Portugal, Sweden, to name but a few. In these regions, farm forestry has very long traditions and is an indisputable part of the economical, social and ecological balance of the rural areas. The remaining 93% of small scale forest holdings can be described as practising family forestry which arises from the roots of farm forestry.

The impact the common agricultural policy had in the recent past on family owned farms leads to the assumption that in the next few years the number of farm forests with a bond to agriculture is going to decrease. There will be a transition to family forestry. However, the spirit and the attitude of the former farm forest owner to manage the forest will adapt slowly to the changed external conditions.

3 DIVERSITY IN EUROPEAN FORESTRY AND A VIEW ON SOCIO-ECONOMIC VALUES

For a holistic picture of European forestry, it must be taken into account that apart from a variety of forest owners, European forests are characterised by a diversity of climatic, soil and relief conditions. Due to the natural prerequisites, a wide range of forest types, and equally of forest management, can be found. In the north of Europe, the economical function of the forest is more important, whereas in the south the environmental function has a higher impact on the management. In the north it is mainly the wood production and in small amounts non-wood products which account for the income. In the south, however, non-wood products play an essential role in the income of the small forest owner. Each country, and sometimes even single regions, have their own history of forest management which includes the multifunctional aspects in different extents. Does this variety and diversity stand in contradiction to the harmonisation and standardisation of the monitoring of the economic performance of farm forestry enterprises?

The socio-economic values of farm/family forestry vary with the respective viewpoint. The public values the forests by the free acess to them and the guarantee to enjoy the non-market benefits. It does not cause them any costs and they do not get any revenues, beside the unique (100%) profit of fresh air, clear water, natural music and pleasant smell of trees.

The forest owner knows about this social responsibility of his/her property. To fulfil the demands of the public and for his/her own benefit the forest owner invests in his/her forests might it be for economical, social or ecological reasons. The unique advantage of these investments in small scale forest holdings is that the labour is carried out by the forest owner and his/her family. If he/she had to pay others for this work there would be no profitability at all.

4 SOCIO-ECONOMIC DATA COLLECTING

First, one should keep in mind that forestry generates no regular income for any of the mentioned size categories (2-50 ha). Forest management takes place at shorter and longer intervals depending on the forest owner's needs. This entrepreneurial liberty is the backbone of the variety and diversity in European forestry.

With the basic information of the first two MOSEFA workshops, a little survey on CEPF members associations to learn about their attitudes to socio-economic data collecting was carried out. The survey is surely inappropriate concerning statistical reliability but it serves well as another proof of diversity in European forest ownership and forestry.

The reactions of the survey can be assigned to three different categories:

The Experienced: Those forest owner associations who have experience in collecting socio-economic data mostly appreciate the provided information on local and regional level. The main advantage of these statistics is seen in the comparative results of profitability between agriculture and forestry. However, it would be too speculative to deduce from these results that a small scale forest owner changes his/her management in order to increase his/her profit. For farm forest holdings bigger than 50 ha this might be totally different.

The Unexperienced: Collecting socio-economic data has only recently found its way to the practical application for these forest owner associations and the individual forest owner. The experiences are from the scientific level and the forest owner has not yet been able to discover the advantages or disadvantages of these statistical surveys. Generally, this group is open-minded for further developments under the precondition that the results are to their benefit.

The Indifferents: This category of forest owners has, on the one hand, no explicit likes or dislikes to a statistical survey. On the other hand, they do not see any need for them as the economical side of forestry has less importance for them.

Some essential points have been stated unanimously by all three categories. Firstly, the benefit of socio-economic data collecting is seen in the frame of local, regional and national level. To establish a network on the European level is considered very sceptical and inappropriate, as international comparative statistics are of no explicit interest for the individual forest owner. As mentioned earlier, farm forestry has very regional aspects and forest owners have different attitudes towards their property. Therefore the principle of subsidiarity as outlined in the Forestry Strategy of the European Commission should be fully respected (Communication from the Commission, COM(1998) 649 final, 18.11.1998, II.1).

Secondly, on national/regional level the preconditions for a voluntary contribution from forest owners' side to the establishment of socio-economic data networks are anonymity, excluding of data misuse and an adequate compensation for the additional work. There also should be a legal binding declaration that none of these figures will be used as a base for taxation or any other additional financial regulations.

5 CONCLUSION

Within the EU, collecting socio-economic data varies greatly. Some EU member states have for a long time carried out surveys on socio-economic data, while others are not aware of their possible advantages or disadvantages. In these countries, forest owners and research should make an effort to develop a data system which reflects the socioeconomic characteristics of forest management in the respective country.

The most difficult problem will be to get representative data which reflects the variety of small scale forest holdings. Using calculation models instead of extensive costly surveys could be a possible solution.

Yet there are so many more aspects to take into consideration e.g. the value of nonmarket benefits. How can this be respected in national surveys? What is the information quality for the forest owner at the end?

Two questions to be asked concerning the Guidelines are:

- How can the complexity of forest management in Europe be reflected?
- What is the objective by providing these data?

The individual characteristics of farm/family forestry in the different regions in Europe should be valued and respect and kept in mind that the small-scale forest owners do not base their decisions necessarily only on data and the results of socio-economic surveys.

References

European Commission 1998. Über eine Strategie der Europäischen Union für die Forstwirtschaft. Mitteilung der Kommission. COM (1998) 649 final. In German.

Eurostat. Forest Statistics 1992-1996. European Commission. Luxembourg.

- Hyttinen, P. and Kallio, T. (eds). 1998. Sampling schemes for monitoring the socio-economics of farm forestry. EFI Proceedings No. 28. European Forest Institute. Joensuu, Finland.
- Judmann, F. K. L. 1998. Die Einstellung von Kleinprivatwaldeigentümern zu ihrem Wald. Eine vergleichende Studie zwischen Baden-Württemberg und dem US-Bundesstaat Pennsylvania. Dissertation University of Freiburg, German. In German.

FUTURE CHALLENGES FOR THE NORDIC FAMILY FORESTRY IN MONITORING THE SOCIO-ECONOMIC SITUATION OF PRIVATE FOREST OWNERS

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ABSTRACT

In 1996, the private forest owners' federations from Denmark, Finland, Norway and Sweden opened a lobbying office, the Bureau of Nordic Family Forestry, in Brussels. The main objective of this office is to inform the European Union institutions of the interests of the small-scale forest owners. In the Nordic countries, forestry is seen as an independent, self-financing and income-generating sector. This means that instead of monitoring only costs, it should be possible to monitor the holistic concept of economically, ecologically, socially and culturally sustainable forest management and its profitability. In the future, the biggest challenge for the forestry sector will be to fight against the climate change. An integral approach to consider the forests as a sink of CO_2 is therefore needed.

Keywords: family forestry, sustainable forest management, profitability

1 BACKGROUND OF THE BUREAU OF NORDIC FAMILY FORESTRY

The private forest owners federations from Finland, Norway and Sweden started their co-operation on the Nordic level as early as in 1946. An organisation of the Nordic forest owners was created and Denmark joined this organisation later. After the latest enlargement of the European union, when Finland, Sweden and Austria became Member States of the EU, the importance of the forestry sector and the interest in forests grew in the EU. This is why, in autumn 1996, the Nordic countries opened their small lobbying office, the Bureau of Nordic Family Forestry, in Brussels. These four Nordic countries are all also members of the European Forest Owners Federation, the CEPF. However, as forestry is of great importance to the Nordic countries, they decided also to open an office of their own in Brussels, working closely together with the CEPF.

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The duties of the Nordic forest owners' office include informing the various EU institutions of the concept of family forestry, lobbying the interests of the small-scale forest owners, and most importantly, being the ears and the eyes of the home organisations. Despite the fact that the EU has no forestry policy, a number of actors in Brussels influence the sector directly or indirectly. There are various Directorate Generals within the European Commission that deal with forestry sector issues, such as DG VI for agriculture, DG III for industry, DG XI for environment or DG XII for research. The office as the representative of the private forest owners tries to lobby for an integral approach for this sector. It is essential that there is good co-operation and co-ordination inside the Commission.

The Nordic Family Forestry office also co-operates with other European interest organisations such as CEPI, Confederation of European Paper Industries and CEI-Bois, European Confederation of Woodworking Industries. WWF and other environmental NGOs are also active in forestry questions at the EU level and the office aims to have a good working relation with them.

2 FORESTRY IN THE NORDIC COUNTRIES

Forestry in the Nordic countries, or at least in Finland, Norway and Sweden, has many similarities, as these countries are operating mainly within the boreal zone and their forestry production is based almost exclusively on a few domestic tree species. In Norway, 80% of forest land is privately owned, in Finland two thirds and in Sweden a half. As privately owned land is generally more productive, family forestry is responsible for close to 75% of all timber production in the Nordic countries. This means that family forestry is the backbone of the Nordic forest industry. Although the climactic conditions in Denmark are more favourable for forestry than in the other three Nordic countries, forestry does not play such an important role in Denmark.

Historically, farm forestry has been very important in the Nordic countries. There has, however, been a clear reduction in the proportion of privately owned forest land managed in conjunction with farming during the last years. Nowadays it may be preferable to talk about family forestry to illustrate the specific characteristics of families owning the forests generation after generation.

Transferring the agricultural model for producers associations to forestry has been successful. Strong central organisations have facilitated this development. Therefore, also these existing associations' structure might be helpful in building accounting networks for monitoring.

3 PROFITABILITY OF SUSTAINABLE FOREST MANAGEMENT

European forests vary greatly in ecological terms. This is why we do not have a European forest policy in the European Union as it is difficult to create common guidelines for an accounting network suitable for all the European countries. Conditions

in southern Europe are very different from the northern conditions. Also the economic importance of the forestry sector varies a lot within Europe.

In various European countries, monitoring the socio-economic conditions of forests is closely linked with agriculture. This means monitoring costs mainly. In the Nordic countries, however, we see forestry as an independent, self-financing and incomegenerating sector. This also means that forestry has to remain an independent sector from agriculture. Instead of monitoring costs, we should be able to monitor the holistic concept of economically, ecologically, socially and culturally sustainable forest management and its profitability.

The common European agricultural policy is based on heavy subsidies to farmers to compensate for bad weather conditions or low market prices. This no longer stimulates European farmers to cultivate their land. Nowadays it is more important to know how and when to fill in the right form to get as much money in subsidies as possible. Do we want forestry to go in the same direction? At least in the Nordic countries we think that the sustainable forest management (SFM) should not be maintained in Europe through subsidies or grants, but through real profitability.

In SFM, the role of a well-functioning competitive timber markets is essential to make the forest owners reinvest in forestry and to advance efficient forest resource use and processing. In the Nordic countries, the wood prices are higher than in the rest of Europe. This is because about 15 to 20% of stumpage income is reinvested in forestry to guarantee the sustainable use of these forests. This means that the wood price, the sustainable stumpage price, is in a very close relation to SFM. Without the economic use of forests it will be impossible to take care of the other important functions European forestry has. We can say that profitable forestry and thus the forest-based industries are also a vital basis for sustainability.

In order to have well-functioning timber markets, it is important for the forest owners also to have good a knowledge of the market situation and actual prices when they want to sell timber. In the Nordic countries, there are already at the moment various ways of collecting and analysing data. The profitability networks have long-term data on the evaluation of profitability that can also be useful to stimulate the development of SFM.

4 FUTURE CHALLENGES

The world is changing, even the climate is changing. Some scientists say that the globe can only survive another 30 years before a major ecological disaster. Justified and unjustified pressure from environmental organisations is getting stronger. Furthermore, during this decade the notion of sustainable forest management has been introduced to European forestry. Forestry and the forest industry have become more important to the European Union after the last enlargement. New Community documents, such as the EU forestry strategy and the Agenda 2000 package, influence the forest owners actions.

All these changes and predictions mean that European private forest owners are facing many new challenges and that these changes are influencing their socioeconomic situation. New data is needed, for instance, on ecological and biodiversity values of forests and their valuation in money terms. The private forestry sector has already responded to some of the challenges or at least the process of meeting these challenges has begun. The European private forestry sector has created, for instance, a forest certification system which is suited to the specific conditions of small-scale forestry, namely the Pan-European Forest Certification System, the PEFC. Forest certification should be cost-effective. That is why the socioeconomic aspects of forestry are included in the PEFC.

The biggest challenge of the next century for the whole globe will be to fight against the climate change. In Rio de Janeiro in 1992, a UN Framework Convention on Climate Change was signed to combat climate change. The objective is to stabilise greenhouse gas concentrations in the atmosphere.

We all know that forestry merits a great deal of attention in this process. A holistic approach to consider the forests as a sink of CO_2 does not yet exist. At the moment the so-called Kyoto Protocol, which is an addition to the Framework Convention, does not discuss the important role forests play concretely enough. It does not recognise the forest products as a long-term sink of carbon.

However, the socio-economic situation of a forest owner remains unclear. Who owns the carbon in the forest? How will the forest owner be credited for the sustainable carbon management he does at the same time as he does the sustainable forest management?

5 CONCLUDING REMARKS

There are different ways of collecting and analysing data not only in the Nordic countries but also all around our continent. There is a lot of available information already at the moment. Is this information used and analysed effectively enough?

Many forest policy and research discussions lately, at least in Finland, have concentrated too much on the ecological side of the SFM. Forest ecology has been studied for hundreds of years. The real problems, however, lie elsewhere. There is a link to be made here with the socio-economic aspects of SFM. More and more people are moving away from rural areas because they can no longer earn their living in the countryside. Forestry has traditionally been a very important source of employment in the rural areas and it should continue to be so, also in the future. The socio-economic aspects of SFM must therefore be better integrated in the future. 12 million private family forest owners in Europe are dependent on their profitable forestry – in the Nordic countries to a greater extent than in other European countries.

It might be a too big a challenge for the political decision-makers to reach consensus over common accountancy networks on the European level. There are, however, other ways of collaborating in the future, for instance, on an academic level. Many interesting comparisons can be made based on the data and analysis different countries make on a national level.

The research work done under the MOSEFA-project with creating guidelines for monitoring the socio-economic situation of forest owners is therefore fundamental and such research must continue.

NEED FOR LONG-TERM DATA FOR MONITORING FARM FOREST ENTERPRISE PROFITABILITY

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ABSTRACT

Although the forests in Finland are of financial importance, bookkeeping activities of individual forest owners are not a usual practice. Interest in the profitability of the forestry sector among public forest extension and research has also been rare. At the end of the 1980s, the profitability of forestry started again to gain more interest especially in forestry research. Today, the worsening socio-economic situation of rural areas has increased the concern regarding forestry profitability. The objective of this study is to show, by using a small sample of forestry bookkeeping data kept by active forest owners, how this kind of information can be used in both the private and public sector decision making. The results of this study give evidence that the non-industrial private forestry of the 1990s provides a remarkably weaker income base for forest owners than it did in previous decades. With these facts we further argue that if farm forest enterprise investments and the cuttings alone are used in public extension, in order to contribute to vital rural development, this should be done with care by taking the economic environment into account.

Keywords: socio-economic sustainability, bookkeeping, timber balance, rural development

1 PRIVATE FORESTRY - A LONG TERM CAPITAL INTENSIVE BUSINESS

In Finland there are 440 000 non-industrial private forest holdings, – "family forests"– having an average forest area of 26 hectares (Ripatti 1996). These holdings represent 80% of the roundwood supply used by forest industries (Finnish Statistical ... 1998). In addition, the importance of forestry income is remarkable for rural areas (Järveläinen et al. 1998). From non-industrial private forest land about half is owned by farmers. In 1996 the gross stumpage earnings of forest holdings were 1.2 billion euro and the net

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earnings 1.0 billion euro after estimated costs and before direct taxes and interest expenses (Finnish Statistical ... 1998).

Although forests are of financial importance, the bookkeeping activities of individual forest owners are not a usual practice in Finland. The reasons for this might be that private forestry has been taxed on the basis of average net yield, and that specific forestry accountancy frameworks were limited in their availability after the 1960s. Little weight has been given to forestry bookkeeping in publicly organised forestry extension or research. It was not until the end of the 1980s that profitability of forestry started again to gain more interest especially in forestry research (e.g. Simula and Keltikangas 1990). Today, forest taxation has been renewed based on the timber sold. In addition, the worsening socio-economic situation of rural areas has increased concern on forestry profitability.

The objective of this study is to show, by using a small sample of forestry bookkeeping data kept by active forest owners, how this kind of data can be used in both the private and public sector decision making. Monitoring the annual costs and revenues in forestry is at some aggregate or ownership levels quite common in many countries (Hyttinen et al. 1997). Private forest owners are monitored normally using annual cross-section data, although this data in some cases allows also time series or the so-called panel data settings. However, monitoring a long-term profitability time series of individual farm forest enterprises can provide very useful information for the better understanding of the causality in forestry economics.

At the individual forest-owner level, recorded data allows the forest owner to follow the performance of his forest compared to previous years within his ownership. It can be imagined that in some cases the comparisons could even be made with the years of the previous generation's ownership. A forest owner faces problems like how to organise his forest management, whether he should increase his investments into forestry, or at which level to put his requirement on returns and how to operate if the forestry capital has alternative uses and functions. Forestry needs a lot of fixed capital to be cost-efficient in harvesting operations as well as in taking reasonable silvicultural measures. The average rotation time for fixed forestry capital in the climate of Southern Finland is approximately equal to that of the forest owner with his farm forest enterprise: the average ownership period according to Ripatti (1996) is 30 years. The physical rotation from afforestation to final cut is even longer, from 60 to 120 years.

At the public decision-maker level, firstly, the data allows monitoring of how forest policies, subsidies and taxation affect the profitability and incentives of private forest ownership in order to receive policy feedback, and secondly, it allows to find out what kind of trends and economic cycles are present in order to focus on forest policy guidelines more suitable to the economic environment. To some extent the spillover between different sector policies can also be investigated, especially regarding forest and social policies for rural areas. For example, is it profitable to invest in forestry or in another sector and what assistance should be given in public interventions. Some aspects of environmental questions can also be investigated.

From the results of the empirical part of this study it is evident that non-industrial private forestry of the first half of the 1990s provides a remarkably weaker income base for forest owners than it did in previous decades. With these facts we further argue that if farm forest enterprise investments and the cuttings alone are used in public extension,
in order to contribute to vital rural development, this should be done with care by taking the economic environment into account.

2 MATERIALS AND METHODS

2.1 Case material through economic cycles

The empirical study is based on bookkeeping data collected from active forest owners during 1996-1998. With the help of the public and private forest extension organisations, and with announcements and articles in professional newspapers, approximately 30 bookkeeping and forest inventory data sets were collected. The data, on average, was over a 20-year time span. The sample of forest owners is subjective in the sense that they are not statistically picked out from the population. On the other hand, the forest owners have independently collected their bookkeeping information and they are located in different parts of Southern Finland (Appendix 1) and are unconnected with each other.

For this study, 15 farm forest enterprises were selected, the oldest bookkeeping data starting already from the year 1955. In order to retain the confidentiality of individual farm owners, the first period analysed here starts from the year 1960 with three farms aggregated together. The last period ends in 1996. Average length of the time series is 25 years and each farm is equally weighted regardless of the varying forestry area, which at the end covers 625 hectares.

In addition to annual figures, the results are presented using aggregated profiles of four different economic periods in Finland (Figure 1):

- a) 1960-1972, years of constant growth before oil crises, inflation 5.1% p.a.;
- 1973-1978, years of and after first oil crisis, nominal timber price shift, inflation 13.6% p.a.;
- b) 1979-1990, years of comprehensive timber price agreements, inflation 7.2% p.a.;
- c) 1991-1996, years of recession, forest tax reform and EU-membership, inflation 1.9% p.a.

Inflation, measured with the cost-of-living index (consumer price index), was quite moderate but unstable in the 1960s. The first oil crisis of 1973-74 started a period of high inflation level, which continued over the second oil crisis of 1979 to the beginning of the 1980s. The first oil crisis had an impact also on the nominal timber prices, which first peaked strongly and then stabilised at a new higher level. During the 1980s, inflation was slowing down and relatively moderate. The 1990s has been a decade of exceptionally low inflation rate.

The real interest rates were moderately positive in the 1960s before the first oil crisis, but then were strongly negative until after the second oil crisis. In the 1980s, the real interest rates were variable and yet positive. In the beginning of the 1990s the real interest rates were very strongly positive because of the economic crisis. In the mid-1990s, the real interest rates have been positive although decreasing.



Figure 1. Annual number of sample farm forest enterprises and the study profile periods.

Already in the 1950s and especially in the 1960s the comparison of overcuttings and the cutting budget initiated the public financing and extension of expanded investments in forest improvement. After the 1970s, there was a need to stabilise the timber market and a period of comprehensive timber trade negotiations were carried out during 1979-1990. The national-level negotiation parties were the Central Union of Agricultural Producers and Forest Owners (MTK) and the Central Association of Forest Industries. Negotiations increased especially the supply and demand of pulpwood (Toppinen and Kuuluvainen 1997). The system broke down in 1991 when the recession diminished the profits of forest industries. Timber prices went down and the forest owners had a selling strike as a protest. In recent years, negotiations concerning price expectations have been carried out in accordance with the rules of free competition, which have allowed some cooperation between forest owners but not between forest industry companies.

The 1990s were a time of structural change in the Finnish economy because of the recession. In forestry, new environmental values renewed forest management recommendations. In 1993, the forest tax reform was a major issue starting a transitional stage of two systems being applied at the same time until the end of 2005.

2.2 Accounting framework

From the bookkeeping data, collected from active forest owners, different types of accounts were formulated. In individual farm forest enterprise profitability reports, we constructed four types of calculations:

- a) Profit (loss) account on an accrual basis;
- b) Cash flow account;
- c) Net present value calculations for the return on farm forest enterprise investment;
- d) Cost and revenue accounts with estimates of the value of forest owners work.

In this presentation, only the first calculation – the profit (loss) account (Annex 1) – is used in the aggregated results. Although the balance sheet is used in the calculations, the profitability ratios are not reported. The profit (loss) account and the balance sheet are adapted from Hakkarainen (1997, 1998). They have been later further developed by Penttinen and Hakkarainen (1998) with more sophisticated results on ratio analysis. The money flow entries have been adjusted to inflation for 1996 using the cost-of-living index (consumer price index). The prices are converted to euro by using the official conversion rate published on December 31 1998 by the European Union. The profit (loss) for the period is considered to be a return on the forestry assets and for the compensation of the owners personal work.

Because the materials were collected afterwards, some problems and advantages were seen. With careful analysis and discussions with forest owners attempts were made to minimise the problems. However, some information is missing or had to be re-organised by replacing some data. The advantage is that afterwards many details are already known, the annual accounting is comparable between the years and it has not been necessary to do any adjustment tricks used in accounting e.g. because of taxation.

2.3 Timber balance

A practical way to calculate the value of growing stock and its value change is to multiply the volumes of timber assortments by their respective prices. The formula used to calculate the change in the value of growing stock is called timber balance.

When forest bookkeeping and inventory information is not originally collected for research purposes, notes cannot be expected to be accurate in every detail. Most of the dynamic bookkeeping data exists only at the whole farm forest enterprise level, not at the compartment level, which is normally used in forestry planning. Therefore, new methods for calculating the growth and harvests in order to generate the annual growing stock assortment distributions were needed for the farm forestry enterprise level.

During the analyses, a population-based simulation model was developed for the farm forest enterprise level to use available growing stock volume data from the forest management plan and harvesting volume data from the forest owner's balance book. With help of fixed inventory points and annual harvesting volumes, the annual estimates for growth were generated in order to establish a continuing time series of growing stock assortments for farm forest enterprises.

Using the simulated data for volume of growing stock assortment, the next step is to use timber balance formulas (see Hakkarainen 1995, 1997) to calculate first the value of growing stock (1) and second the change in the value of growing stock (2 and 3):

(1)
$$S_t = \sum_{i=1}^n (V_t^i p_t^i)$$

⁽²⁾
$$T_t(\mathbf{I}) = \sum_{i=1}^n \left[\left(V_t^i - V_{t-1}^i \right) p_t^i \right]$$

(3)
$$T_t(II) = S_t - S_{t-1} = \sum_{i=1}^n \left(V_t^i p_t^i - V_{t-1}^i p_{t-1}^i \right)$$

where:

S_{t}	= Value of the growing stock at the end of year	
i		

- V_t^i = Volume of growing stock timber assortment at the end of year
- p_t^i = Average regional stumpage price of a timber assortment in year
- T_t (I) = Change of growing stock value calculated by timber balance (I) in year
- T_t (II) = Change of growing stock value calculated by timber balance (II) in year

In this study, a division has been made to use two formulas for the timber balance calculations. Timber balance adjustment in a profit (loss) account is not a formal accounting measure, but especially in small-scale forestry this adjustment is necessary to find out the forestry capital fluctuations. In a profit (loss) account, the timber balance (I) is used to find out if the annual result of a farm forest enterprise is reached on a economically sustainable basis or if the forestry capital has been increasing or decreasing. Also the concepts of sustainable cuttings, undercuttings and overcuttings are used in this context.

The timber balance (II) completes the transaction between the profit (loss) account and balance sheet, adding the economic cycle component to timber balance (I). Because the timber balance (II) reflects the changes in timber prices in the whole growing stock, it describes the importance of the economic environment for forest property management.

3 RESULTS

3.1 Annual and periodic turnovers, expenses and results

The results are presented in three different ways. Firstly, the formal profit (loss) accounts are divided into two components, result and expenses, together summing up the turnover. These are compared to cutting levels. Secondly, in the next chapters timber balance adjustments are used to show the importance of forestry capital for business decisions.

In the annual performances (Figure 2) changes notably occurred in the years 1967 (devaluation of Finnish markka by 31%), 1974 (the first oil crisis) and 1992 (the tax reform leading to a cuttings record of 7.1 m³/ha). If general timber market cuttings of farm forest enterprises in Finland are examined (Finnish Statistical...1998), the main features are quite common with this small sample. In the sample timber market cuttings still vary more and in 1992 the tax reform speculations can be seen more clearly than in



Figure 2. Annual turnover (height of the column) divided into result and expenses, euro/ha, and compared to cutting levels, m³/ha.



Figure 3. Periodic turnover (height of the column) divided into result and expenses, euro/ha, and compared to cutting levels, m³/ha.

general statistics. Although, accrual based profit (loss) accounts are not available in general statistics, it can be assumed that these figures do to some extent indicate also the development of average results.

The best year ever measured for turnover or result was 1974 because of the first oil crisis. Turnover reached a level of 400 euro per hectare which was equal to net result of 360 euro per hectare. Another very good year was 1967, but the turnover and results

were gained by selling a record amount of wood, 7.0 m³ per hectare. In general, the years after the first oil crisis were problematic for the timber markets (Finnish statistical... 1998). Comprehensive timber trade negotiations, started in 1979, increased the selling volumes and turnover of the farm forest enterprises. The recession broke down the negotiations system, and led to the selling strike in 1991, but speculations due to the forest tax reform increased sales temporarily again in 1992. The sample cutting record reached in 1992 produced a turnover of 180 euro with the resultant 135 euro per hectare.

When looking at the periodic turnovers, results and cuttings (Figure 3), an increase in expenses can be seen. The average turnover and results decreased in the first half of the 1990's despite a higher level of cuttings compared to previous periods.

3.2 Measuring the economic sustainability of forestry

By adjusting the results from farm forest enterprises with timber balance (I), an economic sustainability check for farm forest enterprises can be calculated. This still does not fulfill the requirements of forest property value accounting, and timber balance (I) should be considered only as the first part of the change in balance sheet value of the growing stock. The value change calculation will be completed in the next chapter.

Figure 4 presents the annual adjusted results (I). The years 1974 and 1967 can still be seen as the most successful for economic performance. The comprehensive timber negotiations period can also be seen, even when annually studied, as a very steady time. When examining the whole period (Figure 5), during 1979-1990 the growing stock volume and volume of valuable assortments increased. During this period, discussions concerning undercuttings took place. In the first half of the 1990s, the adjusted results (I) are at the lowest level of the study periods. The value of the timber balance (I) is still positive creating a future cuttings potential on an economically sustainable basis.

3.3 Measuring the external economic shocks on forestry

In forestry, economic cycles are often neglected in extension work. In Figure 6 the whole growing stock has been taken into account by using the timber balance (II). The economic cycles and the increase in fluctuations caused by the first oil crisis can be seen quite clearly. The peak of 1973-1974 was not unduly long, and the real property values quite rapidly declined, although still staying at a significantly higher nominal level than in 1972. Generally, the cycles seem to be on the basis of "three years up, three years down", with few exceptions.

When the periodically adjusted results (II) are studied, a clear tendency can be found: due to the recession, real timber prices collapsed in 1991 and consequently forced the real forest property values to a new level. This decrease in the value of growing stock is equal to the calculated result, and in property based calculations this would mean forestry gaining no profit at all during the first half of the 1990s (Figure 7).



Figure 4. Annual adjusted result (I), its components result and the change in the value of growing stock, here measured with timber balance (I), euro/ha.



Figure 5. Periodically adjusted result (I), its components result and the change in the value of growing stock, here measured with timber balance (I), euro/ha.



Figure 6. Annual adjusted result (II), its components result and the change in the value of growing stock, here measured with timber balance (II), euro/ha.



Figure 7. Periodically adjusted result (II), its components result and the change in the value of growing stock, here measured with timber balance (II), euro/ha.

4 DISCUSSION

Traditionally, forest owners have not been active in forestry bookkeeping. When collecting the self-implemented forestry bookkeeping data, only approximately 20 forest owners contacted us. Those forest owners who participated in this research were quite often professionals in the forestry sector or farmers carrying out also farm bookkeeping. The style of bookkeeping entry notes varied a lot. The best notes were obtained from bookkeeping forms published already in the 1960s when the financial ex post calculations of forestry were popular in Finland.

The most information can be found in the forest management plans, which have also had a strong position in forest policy and have additionally been subsidised from public funds. The policy choice in publicly financed forestry extension at the farm forest enterprise level has, therefore, been strongly based on ex ante information detailing timber supply and ex post information with links to the economic environment has been mainly neglected.

The forest owners, however, are not ignoring the financial facts. For example, in the 1990s, activity in silvicultural works has been decreasing in Finland. This may be caused by the weaker profitability prospects in forestry than before. Also when compared to other investment possibilities (Penttinen et al. 1996), forestry has lost its position and therefore a rationally thinking person should have postponed even the fundamental forestry investments for the maximal period allowed. Another often mentioned reason for the silvicultural problems might be the legislative changes and new forest management recommendations.

There has been some development in forestry bookkeeping. Today two thirds of the forest owners and over 60% of the forest area are in a taxation system based on realised timber selling revenues and forestry costs (Pesonen and Räsänen 1994). They are obliged to run simplified bookkeeping, which still does not provide complete information. For example, their own labour is not included and the timber selling volumes by assortments are not collected. The remaining one third of the forest owners are staying in the former yield based taxation system because of a transitional stage continuing to the end of 2005.

However, the current situation without correct forestry bookkeeping is quite satisfactory if public resources are limited: The ex ante approach implemented initially has been the right way to proceed. Without a continuum of forest inventories and management plans, a proper forestry bookkeeping system cannot be established. But today, when considering rural development, a stronger extension work to promote forestry bookkeeping and accounting could also reduce the obstacles of rural entrepreneurship. The structural development of the 1990s has brought quite dramatic changes for rural areas in Finland. Regardless of the expanded timber sales, the long time series of the sample forestry bookkeeping indicates that the forestry income of the 1990s cannot contribute to vital rural development as well as in the past decades.

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References

Finnish Statistical Yearbook of Forestry 1998. Finnish Forest Research Institute. 344 p.

- Hakkarainen, J., Hyttinen, P. and Tiilikainen, K. 1995. Puuston tasearvon käsittely metsälön tilinpäätöksessä – menetelmien vertailu (The value of assets of the growing stock for final accounts – methods comparison). Metsätieteellinen aikakauskirja – Folia Forestalia 3: 179-197. In Finnish.
- Hakkarainen, J. 1997. Financial accounting model applied to nonindustrial private forestry. In: Saastamoinen, O. and Tikka, S. (eds.). Proceedings of the Biennal Meeting of the Scandinavian Society of Forest Economics. Mekrijärvi, Finland, March 1996. Scandinavian Forest Economics 36: 43-61.
- Hakkarainen, J. 1998. Finland (B) Country report: methodological issues of cost accountancy in farm forest enterprises. In: Hyttinen, P. and Kallio, T. 1998. Cost accountancy in European farm forest enterprises. EFI Proceedings 20. European Forest Institute. Joensuu, Finland. Pp. :51-59.
- Hyttinen, P., Kallio, T., Olischläger, T., Sekot, W. and Winterbourne, J. 1997. Monitoring forestry costs and revenues in selected European countries. Research Report 7. European Forest Institute. Joensuu, Finland. 83 p.
- Järveläinen, V.-P., Karppinen, H. and Ripatti, P. 1998. Yksityismetsien puunmyyntitulot omistajaryhmittäin ja alueittain. (Stumpage earnings from the non-industrial private forests by ownership categories and by regions) Folia Forestalia – Metsätieteen aikakauskirja 4/1998: 555-565. In Finnish.
- Penttinen, M., Lausti, A., Kasanen, E. and Puttonen, V. 1996. Risks and returns of forestry investments in Finland. Liiketaloudellinen aikakauskirja 45(1): 111-124.
- Penttinen, M. and Hakkarainen, J. 1998. Ratio analysis recommendations for non-industrial private forest owners. Proceedings of the University of Vaasa. Research Papers 221. 65 p.
- Pesonen, M. and Räsänen, P. 1994. Yksityismetsänomistajien metsäverovalinnat ja arvioita metsäverokertymistä 1993-2005 (The non-industrial private forest owners' selections for the forest taxation system and estimates for forest tax revenues 1993-2005). Metsäntutkimuslaitoksen tiedonantoja 535. 57 p. In Finnish.
- Ripatti, P. 1996. Factors affecting partioning of private forest holdings in Finland. A logit analysis. Acta Forestalia Fennica 252. 84 p.
- Simula, A.-L. and Keltikangas, M. 1990. Profitability of private forestry in Finland. Proceedings of the IUFRO XIX World Congress Montreal, Canada. Division 3: 309-319.
- Toppinen, A. and Kuuluvainen, J. 1997. Structural changes in sawlog and pulpwood markets in Finland. Scand. J. For. Res. 12: 382-389.

Appendix 1. Locations of the 15 farm forest enterprise cases in the Southern Finland



Appendix 2. Profit and loss account for private forestry (adapted from Hakkarainen 1997, 1998, Penttinen and Hakkarainen 1998)

- + Stumpage sales revenue
- + Delivery sales revenue
- + Other sales revenue from wood
- + Value of own use of wood
- Sales adjustment items
- = TIMBER SALES REVENUE
- + Sales revenue other than wood
- Sales adjustment items including the value added tax (VAT)
- = NET TURNOVER
- Harvesting costs
- +/- Change in timber reserves
- = PROFIT I
- Timber selling costs
- Silvicultural costs
- +/- Change in afforestation reserve
- +/- Change in current assets
- Other variable costs
- = GROSS MARGIN ON SALES (MARGIN AFTER VARIABLE COSTS)
- Fixed costs and expenses
- = OPERATING MARGIN
- Interest expenses
- + Interest income
- + Subsidies
- + Indemnities
- Direct capital or income taxes
- Silvicultural fee for forest management associations
- Other ordinary expenses
- + Other ordinary income
- = INCOME BEFORE DEPRECIATION AND EXTRAORDINARY ITEMS
- Depreciation
- +/- Increase (-) /decrease (+) depreciation
- = NET PROFIT (LOSS)
- Extraordinary expenses
- + Extraordinary revenues
- = PROFIT (LOSS) FOR THE PERIOD (OVERALL RESULT)
- 1) Economic sustainability adjustment:
- +/- Change in the value of standing timber (timber balance I)
- = ADJUSTED RESULT (I) FOR THE PERIOD
- 2) Economic environment adjustment:
- +/- Change in the value of standing timber (timber balance II)
- = ADJUSTED RESULT (II) FOR THE PERIOD

ESTABLISHING A FOREST ACCOUNTANCY NETWORK IN HUNGARY WITH THE HELP OF THE MOSEFA GUIDELINES

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ABSTRACT

Due to the recent changes in the ownership structure of forests in Hungary, there is a considerable demand to establis a forest accountancy network. The establishment process is based on the Guidelines of the MOSEFA project. The main aim of this paper is to present how the Guidelines can be applied in the current situation.

Keywords: forest accountancy network, private forests, accounting, monitoring, Hungary

1 INTRODUCTION

As a result of the social and economic changes in Hungary in the 1990s, 40% of the forests that had once been owned entirely by state came under private ownership. The privatisation process was carried out with different procedures in the different regions of the country. While in some villages the new owners have already established joint tenures and they are managing the forests, in other regions the majority of the owners do not even know exactly where their forests are situated. Another typical feature is the heterogenity of private forest owners with very different knowledge and intentions about forestry and forest management.

2 FOREST OWNERSHIP STRUCTURE IN HUNGARY

The number of private forest owners is about 246 000 with property rights at 1.4 places per one owner, therefore the average parcel is 1.2 ha. This property structure has mainly developed through the compensation process. With the former forest co-operatives the

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ownership ratio was 3 ha/parcel. The number of individual smallholders (individual and joint representation) was 29 000, the average managed area was slightly above 3 ha. The number of associated smallholders was 1352 and the average forest area managed by them is 170 ha (Annual Reports of the Ministry 1993-98).

The huge number of new forest owners causes several problems to the forest authorities. Strict rules of Forest Act which were applicable when there were 3000 forest managing state enterprises are property rights at 1.4 places difficult to apply for a quarter of million forest owners.

In order to solve the emerging problems and ensure the professional character of the forestry activities the state supports joint forest management of private forests. Or as Forest Act states:

In case a physically contiguous forest-land is owned by several owners, the owners shall, if the conditions set forth by the Minister in an order exist, and on the basis of the resolution of the forestry authority conduct joint forestry activities on it and assign a forest-manager to perform these tasks.

The distribution of different ownership and management forms of private forests in Hungary can be found in the Table 1.

	1996	1998
Private management ¹⁾	40	47
Shared forests ²⁾	58	84
Enterprises	17	28
Forest joint tenures ³⁾	65	92
Co-operations ⁴⁾	62	15
Old type co-operations	103	51
Unsettled	138	141
Unknown owners	246	203
Total	730	730

Table 1. Forest ownership and management forms in Hungary, 1000 ha.

¹⁾ Private forests: the owner and the forest manager is the same person.

²⁾ Shared forests: small forest lots which cannot be divided, jointly owned by several forest owners. One of them is appointed as forest manager, who takes the whole responsibility for the forest.

³⁾ Forest joint tenures: historical ownership form of jointed forests. Owners vote according to their proportion of forest area.

⁴⁾ Co-operations: the main difference to forest join tenures that in a co-operation every owner has one vote.

Historical background and privatisation

With the political changes, the ownership structure was changed dramatically after 1945. As the first step, the forest estates of more than 100 hectares were taken into public ownership in 1946. In the early 1960s, a "socialistic reorganisation" of agriculture was decided, when the so-called farmers co-operatives were established. It was obligatory to join them and the farmers lost their land and the legal body of co-operative was registrated as the new land owner. Within these co-operatives the farmers were only employees, and they had no rights to participate in the decision making. After the establishment of the co-operatives the number of forest management companies was reduced to 3000 (Halasz 1994).

Establishment of private forests in Hungary

As a consequence of the political changes land privatisation started in 1991 including about 700 000 hectare forests. Therefore the area of private forests has grown from 1% to 40% within a short period and there are approximately 250 000 new forest owners. In case of forests there were two main methods of privatisation: compensation and reprivatisation.

Reprivatisation

One of the main aims of the new political regime was to establish a clear ownership structure. As a part of this process, old type agricultural co-operations were dissolved and reorganised. Within this process it was necessary to revise land register in order to give back the cultivate land and forests to natural persons from former co-operatives. The process was coordinated by rural property committees, and decisions were made according to the claims of the original owners.

Compensation

Every natural person who had suffered damage, hurt or had lost his property after 1945 was entitled to get compensation tickets up to USD 20 000. Compensation tickets could be used to buy state property, cultivate land or forest. Generally state assets were sold to foreign investors in order to decrease the state deficit. Hungarian citizens could mostly buy agricultural land and forest, since it was prohibited to sell them to foreign investors. In the process of forest privatisation, the land register was used as the legal basis of ownership. However, this register had not been used in the last 40 years in case of forests, and its structure quite differs from the actual borders of forest plots and sections, which are the basic units of forestry activities and forestry administration. The value of forest area was calculated using a more than 100 years old 'golden crown' evaluation system. Within the evaluation process the value of standing timber was not considered. Therefore the average selling price was under USD 15 / ha. The forests were sold at auctions. The starting price was determined in USD 20 /ha. The special rules of these auctions allowed to the participants to reduce the starting price if there was an agreement between them. Because of the great interest, the low price and the special rules of the auctions the number of the new forest owners exceeds 300 000. Therefore the average forest property is under 2 ha.

3 OBJECTIVES AND FRAMEWORK OF ACCOUNTANCY DATA NETWORKS

3.1 Farm forestry in Hungary

Definition

As in many European countries, there is no commonly agreed definition of farm forestry in Hungary. The rural population lives mostly in villages. Classical agricultural farm structure can be found mainly in the Great Hungarian Plain where forest cover was under 5% and private forestry had only small importance in the last centuries.

Thus the expression 'farm forestry' is not frequently used in Hungary. Instead, private forestry is applicable containing urban forest owners as well. However, most of the rural forest owners live in the same village where their forest are, therefore farm forestry is in accordance with rural forestry in Hungary.

Typology

According to the guidelines, it is essential to have a clear picture about property descriptors. In the case of the Hungarian forest accountancy network, the main descriptors are ownership, size and stand-forming tree species. Since the average size of private forests is under two hectares, cut-offs cannot be defined clearly. First of all, because of the fragmented ownership structure many rural owners possess a forest less than one hectare. These small forest estates have mainly social functions with a smaller economic importance. Therefore small scale forestry has to be investigated with other tools and surveys instead of accountancy network. Considering the actual situation, the lower limit of forest estates will be determined in 5 hectares.

3.2 Overview of information needs

The main users of the information produced by the accountancy network will be governmental institutes, such as policy makers and Forest Authority. Forestry experts agree that private owners will take advantage of accountancy network in the long run, but they hardly reach considerable benefits in a short time. Presently forest owners look for elementary information, like actual prices of forest products and available subsidies. However, forest accountancy network can help to promote forestry advisory system which is essential to promote private forestry.

3.3 EU FADN extending to forestry

The Hungarian FADN system is currently under development. Therefore the harmonisation of the two networks can be easier, since both of them are adaptable in this stage of development. However, forestry has a small economic importance compared to the agricultural sector in Hungary, therefore forest accountancy network has also a smaller political interest. Agricultural state subsidies exceed 160 billion HUF from which forestry has an approximately 1% share.

3.4 Alternative methods

The forestry authorities are essentially interested in the results of a country survey. Since 1995, several surveys have been carried out to collect reliable information about private owners to determine their basic knowledge about forestry and intentions regarding forest management.

Most of them have been co-ordinated by University of Sopron, Department of Forest Policies and Economics. In the first phase of this project, two questionnaires were compiled and distributed in three villages in 1995. The primary aims were to develop and test the questionnaires and the distribution methods for a country survey. In the second year, a country-wide questionnaire complied and 1000 new forest owners living in rural areas were interviewed. Finally, the aims and knowledge of urban forest owners were surveyed with a questionnaire: 300 interviews were carried out in 1998.

These surveys investigated mainly the opinion and intentions of new forest owners and the emerging social questions and did not provide exact economic results.

4 CREATING THE SAMPLE

4.1 Information on the population of private forests

If the parameters of the total population are known, it is easier to develop the sample. In Hungary, all the main descriptors of private forests are registered by the forest authorities, therefore the descriptors of the population can be summarised or calculated as forest area, number of owners, volume of standing timber and age distribution. In the Forest act it is stated that:

§ 13 (1) In the application of this Act forest-manager shall be: the forest-owner or the lawful user performing forestry activities (hereinafter: forest-manager), and

(2) The name (company name), domicile of the forest-manager, and the name of its representative shall be registered by the forestry authority competent by the domicile of the forest-manager.

Therefore, it makes easier to develop a sample that not only the forest manager (forest enterprise) but the yearly activities have to be registered. According to the Forest Act,

§ 60 (1) Wood-felling and cutting in the forest ... shall only be allowed on the basis of the permission granted by the forestry authority even if it is in accordance with the provisions of the operational plan.

Moreover, rules have to be applied in the case of small, fragmented forests as well, since in the application of Forest Act forest-land is defined as area of 1500 m^2 or more covered with wood.

When the sample has been selected, the operational plan of each private forest entity can be used as the information of private forests. According to the Forest Act:

§ 27 the operational plan shall contain:
a) the property registration data of the forest-land, the forestry identification codes of the forest plots and forest sections, and the extract copy of the related forest plan map (operational plan map);
b) in respect of each forest section the data on habitat and forest stand, the description of the condition of the forest biocoenosis, the tasks of forest cultivation in compliance with the primary purpose of the forest, the restrictions effecting the forestry activities, the manner of the approved wood-felling and cutting and its extent by tree species, the tasks related to afforestation, the conditions for exercising each forest usufruct;
c) the work portions of evaluation and control required for planning and supervising the sustainability of the forestry activities;
d) the records kept annually of the activities conducted in the forest and the changes taking place in the condition of the forest.

4.2 Developing a sampling frame

When the useful information on the population of the private forests has been selected, a sampling frame has to be established. Hungarian Forest accountancy network is planned to contain not only the private management forests, but other jointed forests as well. The interest will focus on private forests and forest joint tenures, because these have gained special public interest.

The initial conception is to use a two level selection method. In the case of private forests and shared forests, the sample will contain 1% of the total population, while the small number of other forms allows a higher selection rate up to 5% (Table 2).

Forest ownership and management form	1000 ha	number of entities	number o er	of selected ntities
			1%	5%
Private management	83	23900	239	-
Shared forests	80	2913	29	-
Enterprises	28	243	-	12
Forest joint tenures	92	868	-	43
Co-operations	80	342	-	16
Total			app. 1	300

Table 2. Sampling frame for forestry accountancy network in Hungary.

Because of the small number of selected items, random sampling is the only acceptable selection method. Questions of validity, reliability and representation have to be calculated and evaluated using the information from the Guidelines and statistical handbooks. Fluctuations of the sample must be checked carefully.

5 ORGANISATIONAL ARRANGEMENTS

5.1 Policy tools for encouraging participation

Considering the actual financial status of the project 'Hungarian Forest Accountancy Network', it is clear that participants will not be paid for their data. However, there are several other ways to encourage participation.

Previous surveys and initial investigations have proved that private forest owners are usually proud to be selected to provide information about their forest. Also the prospect of free consultation can be an additional motivation to encourage participation, because private owners usually lack information about taxation and timber trade. Provision of a management plan, on the other hand, cannot serve as an incentive because of the obligatory forest planning regulation.

5.2 Data collection and processing

There are special features in data collection and processing in the Hungarian setting. The initial survey completed by the University of Sopron proved that only specialised staff could collect valuable information from forest owners. Forest owners sent back questionnaires at such a low rate that the survey could not be evaluated. In Hungary the following institutions will organise the forest accountancy network activities:

- University of Sopron, Institute of Forest Assets Management will mainly deal with scientific background and development of the sampling frame.
- Forestry Research Institute possesses the necessary technical and personal background, and it will be responsible for the yearly activities.

5.3 Questions of tax secrecy and data protection

It can be a key question whether data network can guarantee protection of data of forest owners against tax administration. Special methods should be established to deal with tax-evasion and concealed incomes. However, even the taxation authorities have not been able to determine the rules of taxation methods of private forests.

6 ACCOUNTING OF SOCIO-ECONOMIC VARIABLES

Due to the strict rules of the Hungarian forestry administration (yearly forest plan, registration, forestry data base), authorities have a clear picture about forests, standing volume and felling in every year. Therefore, the main objective of the forestry accountancy network will be to prove economic, monetary information about private forests. Non-monetary information, like changes in forestry assets can be evaluated using the data of National Forest Data Base, which contains

- the data on forest sections contained in the forest plans;
- the forestry activities performed annually in the forests; and
- the changes occurring in the quantity and quality of the growing stock of forests.

The database is renewed annually and 10% of the sample is checked by measurement every year, the remaining part is calculated.

Accounting of socio-economic variables can be found in every detail in the Guidelines. In some questions, the Hungarian network will avoid the complicated solutions in the first years. As an example, the changes in the value of the standing timber will not be considered. In the first years only actual price and costs can be registered. Final methods and solutions will have to be determined after a few years, when aggregated data and results can be evaluated.

7 SUMMARY

Nearly 300 000 people are now registered forest owners in Hungary. If family members and employees are counted, the number of people engaged in private forest management in Hungary totals at least 1 million (10% of the population). The political significance of this fact cannot be ignored. In accordance with the policy whose goal is to create multifuncion forests and at the same time to protect and sustain their natural resources, it is important that owners of private forests are motivated and encouraged to observe the pertinent regulations and support the relevant policies.

The establishment of an appropriate forestry support system is also of great importance, because private companies tend not to apply for the financial grants on which the present support system is based, and the goals that might help these privatelyowned companies have yet to be devised. (Teosz et al. 1999)

Within the planning and developing stage of the Hungarian forest accountancy network the Guidelines was proved efficient and useful. In spite that the Hungarian network will have to deal with not only farm forestry, but other management forms of private forestry, there are no great differences in the developing stage. The Guidelines could demonstrate all the problems which will emerge in the long run. Furthermore the MOSEFA project could prove the international importance of accountancy networks, and it was a strong argument in the final decision about establishing the Hungarian accountancy network. The Hungarian translation of the Guidelines will be available in the near future.

References

- Halasz, A. 1994. 70 years of Hungarian Forestry in Numbers. State Forest Service publication, Budapest. 96 p.
- Hungarian Parlament. Act No. LIV. of 1996. on Forests and the Protection of Forests. 1996
- Hungarian Central Statistical Office. Statistical Yearbook of Agriculture. 1997.
- Izinger, P. 1997.Future prospects of Hungarian agriculture. In: Hungarian Agriculture. vol. XLI. (3.): p. 27-31.
- Lett, B. 1997. Organisational Transformation of Forestry. In: Beszteri, B., Nagy. G. Conference Proceedings of Hungarian Academy of Sciences, Veszprém Academic Committee, p. 176-181.
- Lett, B. and Stark, M. 1998: Acountancy Obligations and Possibilities in Hungarian Forest Management. In.: Joebstl, H.,Merlo, M., Venzi, L. (eds.). Proceedings of IUFRO 4.04.02.-4.13.00 Symposium on Institutional Aspects of Managerial Economics and Accounting in Forestry. p. 167-188.
- Ministry of Agriculture Forestry Authority. Annual Reports of the Ministry. 1993-98.
- Teosz et al. 1999. Hungarian private forests and the European Union. In: Hungarian Forestry Journal, vol. CXXXIV. p. 3-7, 33-37.

Appendix: Hungarian farm forestry socio-economics

Table 1. Ownership of forest land (1000 ha).

Denomination	1938	1946	1970	1990	1998
Publicly owned	345	868	1 485	1 685	1 139
Total forest land area	889 1 234	337 1 205	15 1 500	15 1 700	732 1 871

Source: Annual Reports of the Ministry of Agriculture, Forestry Authority 1993-98.

Table 2. Change in area by land use (1000 ha).

Land use	1950	change 1950 - 1986	1986	change 1986-2030	2030
Arable land	5518	-887	4631	-1240	3391
Garden, orchard, vineyard	382	+277	659	+153	812
Meadow and pasture	1475	-241	1234	-334	900
Forest area	1166	+493	1659	+1100	2759
Total agricultural area	8570		8249		8029
Total land area of the country	9299	0	9303	0	9303

Source: Izinger, P. 1997.

Table 3. The contribution of agriculture to GDP and its annual changes	(previous)	year = 100%)
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Year	GDP	Change	Agriculture ¹	Change	in % of GDP	Industry	Change
	Billion HUF	%	Billion HUF	%	%	Billion HUF	%
1991	2299	100.0	195	100.0	8.5	666	100.0
1992	2624	94.9	190	83.5	7.2	717	93.3
1993	3142	95.5	206	76.9	6.6	824	96.1
1994	3919	99.6	262	76.5	6.7	994	101.8
1995	4933	100.1	333	78.5	6.7	1296	108.8
1996	6061	102.3	402	81.8	6.6	1591	112.3

¹ including forestry, hunting and fishing

Source: Statistical Yearbook of Agriculture, 1997.

	Area (1000 ha)	Forest management	Area (%)	Number of management organisations	Average area (ha/unit)
Publicly owned	1139	Forestry PLC	56.7	22	48 000
Individually privately owned	86	Individual	2.2	13 900	3
		Joint representation	2.1	10 000	4
Associated privately owned	281	Forest owners' association	4.5	868	98
		Forest co-operative	7.3	342	263
		Joint commissioned	1 2.1	2913	13
Unable to operate	e 365		20.6		
Total	1871		95.5		

Table 4. Ownership and management after the social-economic transformation in Hungary.

Source: Annual Reports of the Ministry of Agriculture, Forestry Authority 1993-98. Budapest, Lett, B. and Stark, M., 1998.

Table 5. Land area by farm size categories (1000 ha).

Denomination	Agricultural area	Forest	Productive land area
Economic organisations	2838.8	1312.0	4194.8
- large size	2613.1	1236.0	3885.7
- medium size	53.9	4.3	59.8
- small size	39.3	8.7	48.2
Private farmers	3345.7	452.5	3822.4
- large size	66.8	2.5	69.8
- medium size	630.1	29.8	662.7
- small size	1972.2	207.9	2192.3
Total	6184.5	1764.5	8017.2

Source: Statistical Yearbook of Agriculture, Hungarian Central Statistical Office 1997.

Forest ownership	Oak	Beech	Turkey oak and other hardwood	Black locust	Poplar	Conifers
State-owned	509	307	541	387	545	226
Privately owned	61	31	70	734	595	49
Total	570	348	611	1121	1140	275

Table 6. Species composition of harvested wood in final cuttings in 1997 (1000 m³).

Source: Annual Reports of the Ministry of Agriculture, Forestry Authority 1993-98.

Table 7. Agricultural subsidies (Million HUF).

	1993	1994	1995	1996	1997
1. Market access supports		46731.9	47530.5	45078.9	38564.9
2. Support to reduce costs		9909.3	11620.3	16387.9	18348.6
3. Other subsidies	1023.6	966.6	214.4	32.7	114.0
4. Support to eliminate forest damages	100.0	100.0	200.0	129.1	201.3
5. Reorganisation support	1225.2	4978.8	7453.3	10878.0	4147.0
6. Target supports of investment programmes	1429.5	2432.9	2445.2	2282.8	2476.1
- Afforestation	450.0	572.0	999.6	1000.0	1300.0
7. Target supports and other subsidies	5445.0	9305.2	3619.0	17909.2	23225.9
- Public tasks of forestry		200.0	300.0	200.0	200.0
- Local forest railway operation	n 20.0	45.0	51.0	58.0	65.0
- Park forest area maintenance	65.0	65.0	68.0	79.0	85.0
8. Expenditure covered by own payments		9502.5	8087.7	6522.8	5398.5
- Public tasks of forestry	530.6	2012.6	2358.0	2301.2	3176.5
- Hunting	71.6	90.1	134.4	202.6	286.9
Total	52212.2	83927.2	81170.4	99221.4	92776.3

Source: Statistical Yearbook of Agriculture, 1997.

REQUIREMENTS OF THE MOSEFA GUIDELINES AND THE EXPERIENCES IN BADEN-WÜRTTEMBERG

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ABSTRACT

The conditions and constraints of a real running Accountancy Network in Baden-Württemberg are compared with the requirements of the "Guidelines for establishing farm forestry accountancy networks", also known as the MOSEFA Guidelines. The paper shows that many of the requirements can be fulfilled in practice. The main problem in establishing a statistically correct sample of farm enterprises was that as no one could be obliged to participate, the survey in Baden-Württemberg had to be based on voluntary participation. Consequently, the sample is biased towards better results and influenced by other factors. In comparing the different needs for information about the economics of farm forestry and the results presented by the accountancy network in Baden-Württemberg, it can be noticed that a majority of these needs can be met with the data from this survey.

Keywords: accountancy network, private farm forest enterprises, economic results

1 INTRODUCTION

The basis of this comparison are the MOSEFA Guidelines, which are the main results of the, EU Concerted Action FAIR-CT96-1414, Monitoring the Socio-economics of Farm Forestry Enterprise.

The other source of information is the experiences of the authors with the task in running an accountancy network in farm forest enterprises in Baden-Württemberg. This network was established in 1975, some modifications have been made in the course of the project and the current design was set in 1979.

The contents of the Guidelines will normally not be cited, repeated or even recapitulated in this paper. The comparison will show mainly the current real situation in the running network with reference to the requirements of the Guidelines.

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The structure of this paper is following the structure of the Guidelines, mainly with the subtitles of the chapters, but not every subtitle is mentioned here: each of the headlines of this paper is followed by a reference to the Guidelines.

2 CONCEPT OF FARM FORESTRY (2.1)

Within the broad conceptual definition of farm forestry of the Guidelines, the main conditions for a farm or a forest owner in Baden-Württemberg to join this running network can be found. These are:

- 1. Ownership: Individuals, families or corporations of individuals such as old cooperatives (German right).
- 2. Type of farms: Not only combined farms with agricultural and forest land are allowed, but also pure forest enterprises. This exception from the requirement that an owner should be engaged in agriculture as well as in forestry is based on the major structural change in farm enterprises in Germany. When mixed farms were given up, normally the agricultural areas had been sold or rented out, but the forest part remained in the ownership of the present individual or family. So the share of pure forest enterprises with farm background had increased and they should not be neglected. Also members of the running network should not be excluded when the agricultural part is given up. Normally the person or family who runs the farm also lives on the farm.
- 3. Size: 5-200 ha. The lower limit had to be reduced because of the demand that normally every year an economic output by timber harvesting could be expected. The upper limit was fixed based on the previous experiences that show that above this limit the farmer and his family are not longer able to carry out the forest work by themselves. With more than 200 ha forest land the work is done more and more by contractors or employed workers. One important characteristic of farm forestry the owners own work in the farm is thus disappearing, and the enterprise is getting another kind of management. To exclude such "large scale forest enterprises", the limit of 200 ha was set.

All together, the requirements of the guidelines can be seen as fulfilled with the exception of pure forest farms.

3 OVERVIEW OF INFORMATION NEEDS (2.2)

The experience with the running network shows that all actors which are listed in the Guidelines, did and do use the results of our network. The following statements, listed in the Guidelines as necessary and desirable for different kinds of clients, were ratified in the case of Baden-Württemberg:

- The running network proves that on the long run the participating forest owners have learned to manage their forests in a better and more effective way.
- The function of multipliers of information to other woodlots owners can be found.
- The forest owners associations use the data in different ways.
- Forest advisory and extension organisations could base their work in relation to economic questions on these results and the additional information.
- Policy makers and the state administration have used the data to decide the amount of special financial subsidy for woodland owners in Baden-Württemberg.
- Also as a secondary follow-up, a lot of research work has been carried out using the data of the running network.

4 PROSPECTS FOR EXTENDING EU-FADN TO FORESTRY (2.3)

In Germany, like in Austria, a sub-sampling within the FADN-system was established. The results are the same as in Austria: this sub-system is not suitable for the purposes of economic evaluation of farm forestry.

Therefore and also for other reasons this special running network in Baden-Württemberg was established separately and was developed in numerous respects outside of the system of FADN.

5 ALTERNATIVE METHODOLOGIES (2.4)

The one alternative which was taken into consideration and was also realised in earlier times in northern Germany (Westfalen-Lippe) is to develop models. The basis of the one realized model was a complete survey of the natural situation of all farms in this region (forest area, distribution of tree species and age classes, average standing volume and yield a.o.). All economic data had been then derived from calculations and other statistical sources, mainly from other types of owner-ship and added into the model. What in the case of the AN in Baden-Württemberg had been considered not to overtake this method was, that the direct connection to all what is going on economically and regarding the labour organization had not been subject of this way. So it was decided to go the other way over an accountancy network.

6 INFORMATION ON THE POPULATION OF FARM FORESTS (3.1)

The information basis about the total population which should be included in the survey in Baden-Württemberg is very good. The agricultural census provides every 2-3 years the results of a total inquiry on farms, and within that separately the number of farms, their agricultural and forest area for mixed enterprises (agriculture in combination with forestry) and for pure forest enterprises, divided after size-classes of forest areas (e.g. 5-20, 20-50, 50-200 ha). With this information the whole population for the survey is very exactly defined.

7 SAMPLING TECHNIQUES AND QUESTIONS OF ACCURACY, VALIDITY, RELIABILITY AND REPRESENTATION (3.3, 3.4)

One of the goals of the running network – as mentioned in the Guidelines – is to establish a network in a way that gives results that can be interpreted as representative for the whole population as possible. The normal method to reach this goal is to design a sampling method according to the statistic necessities. The requirements for such standard sampling approaches are on a high level if scientific criteria are used. In the Guidelines, all requirements and conditions for such a standard sampling approach are listed. When drafting and establishing the running network of Baden-Württemberg, not all of these requirements could be met. In reality the persons dealing with this problems had been confronted with a mixture of positive and negative conditions and aspects which had to been taken into account.

These aspects include the following:

- a) The whole population for the survey is known very well by number of enterpriseunits, by the owned area and also in sub-units as size-classes of the forest area (see above). The conditions for stratification into typological sub-units had been quite good. As main sub-units could be defined 1) differentiation into 4 regions, each of them contaning a local typical concentration of farm forests and 2) differentiation into 4 size-classes: 5-10 ha, 10-20 ha, 20-50 ha, 50-200 ha.
- b) Based on an earlier phase of the running network (1975-77) there had been a lot of information about the variability of the main target variables. With this information it was possible to calculate the necessary number of farms in the total running network and also in the sub-units. The result of such calculations had been: the running network should contain at least 160 enterprises in total and at least 20 in each sub-unit. The distribution of the enterprises in the survey into the sub-units could be then carried out according to the distribution of the total population into this sub-units.
- c) One basic requirement for real random sampling or systematic sampling could not be fulfilled: that each person in the whole population can be chosen with the same probability. Participation is voluntary, therefore a selection by pure chance is not possible because it is not possible to oblige anybody to participate. Another self selection bias is that those respondents who are more interested in the performance of their business are more likely to agree to participate. Consequently, the sample would be biased towards better results in economic terms (see Guidelines):

- d) The criteria for the quality of the measurement as accuracy, validity and reliability can be evaluated as realized to an high level in the running network. Calculations about the standard error or the coefficient of variation brought for key variables quite satisfying results (standard error less than 10%). All variables which are measured are operationally defined and documented. Data collection is done by a specialized staff with the help of the farmers. Data collection is also independent to a high extend from individual characteristics. Therefore validity and reliability reach a high level.
- e) Fluctuations of the sample. It can be noticed, that the fluctuation in the running network during 20 years had been very low. The fluctuation rate had been constant during this time with 2-3 farms per year. As a result, the constant part of the sample contains after 20 years 110 enterprises (~63% of the total sample).

8 POLICY TOOLS FOR ENCOURAGING PARTICIPATION (4.1)

The most aspects listed up in the Guidelines are realized in the running network. These include:

- a) Data feedback to the farmer: The farmer is getting each year a set of economic ratios about his forest property, also the same ratios about the region, and the size-class where he is included, the average result of the total survey and the general yearly report. A yearly consulting by the specialists free of charge is included.
- b) Forest management plan: Each participant has the right to claim for a management plan free of costs. In fact, this advantage gives a great incentive to participate in the survey.
- c) Monetary contribution: Each farmer is getting a certain amount of money (presently 480 DM per year) as a payment for his additional work with bookkeeping and also as a reflection of gratitude for his participation.

9 DATA COLLECTING AND DATA PROCESSING AND QUESTIONS OF TAX SECRECY AND DATA PROTECTION (4.2, 4.3)

All activities regarding the running network are concentrated in the Forest Research Institute of Baden-Württemberg in the Department of Forest Economics.

The sector "Data collecting" in the field is organized in a combined way. The farmer collects the data throughout the year (all required figures, including his working hours and those of his family) in specialized bookkeeping sheets, and each farm is visited by a researcher of the department at the end of the forest year (30. Sept.). The researcher collects the records of the farmer, checks them and also fills in special forms.

The data processing is carried out in the mentioned department. The participants are informed that no individual data is going outside, all data are processed into average figures where no individual farm can be reconstructed and that no individual information is given to the financial administration which is responsible for taxation. This information is important for the participants and so far they have found the process trustworthy.

10 ACCOUNTING IN FARM FORESTRY (5.1)

The accounting of socio-economic variables in the existing test-network of Baden-Württemberg is focused on the income situation. In the financial accounting (5.1), the view of the test-network is focused on information coming directly from the activities of the farm forest enterprise.

The following aspects are not integrated into the test-network of Baden-Württemberg:

- the silvicultural costs are not divided into parts which are exceeding or undercutting the reserve for regeneration and the normal activities for regeneration;
- the change in the reserve for regeneration is not included;
- interest incomes as well as interest expenses are not included in the financial accounting; and
- the change in the value of standing timber is not included.

So there is no financial accounting in the test-network of Baden-Württemberg. Cost accounting (5.13) is the main objective of the farm-forestry-network in Baden-Württemberg. The division into 5 cost-centres and types of cost is shown in Figure 1. In Baden-Württemberg the harvesting activities are divided into timber harvesting and other harvesting activities as for example christmas trees.

The silvicultural treatment is not so carefully divided as in the Guidelines proposed. There is no cost centre for forest improvement because there are only few activities in this sector. They are put to the cost-centres of silvicultural treatment. The types of cost in Baden-Württemberg are following the Guidelines.

In management accounting there are many variables to get to ratio analysis. They strongly depend on the situation of managing a farm forestry enterprise on a national level. In Baden-Württemberg the most important parameters are:

- cut m³/ha;
- m³ standing volume/ha;
- family income per family working hour;
- family income per m^{3;}
- family income per ha;
- timber sellings per ha; and
- timber sellings per m³

The accounting for forest services is nowadays mainly oriented on how effective the support of the forest administration and its extension service to the farm forest enterprises is. The running network can be a very useful instrument for monitoring those aspects.

Baden-Württemberg	Guidelines
timber harvesting other harvesting	harvesting
silvicultural treatment	regeneration cleaning, pruning and pre-commercial thinning
road construction	road construction forest improvement
administration and other costs	administration taxes+fees other costs

Figure 1. Comparison of cost centres between Baden-Württemberg and the Guidelines.

The accounting of the total economy of farms (5.4) as explained in the Guidelines is no objective of the test-network in Baden-Württemberg. Because of the sectoral view on the forest part of the farm forest-enterprise, the member of the test-network has to give information about the assets of the farm forestry enterprise only as they are used in the forest part of the farm. Thus, the willingness to give information by the farmer is higher than when he has to give the total information on his income situation.

11 OUTLINE OF A DATABASE SYSTEM AND OUTPUT (6, 7)

For the purpose of the running network of Baden-Württemberg, a special database system was developed and adjusted during the project to new needs. It would take too much space to describe this system in detail.

The output is concentrated, on the one hand, on the individual sets of information to the farmers and on the other hand on the yearly report, which is published in the series of reports of the Forest Research Institute and available there.

For the 20-year anniversary a special report with reference to the developments and events of the project will be published.

COST ACCOUNTANCY NETWORK IN FARM-FOREST ENTERPRISES IN BADEN-WÜRTTEMBERG

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ABSTRACT

This paper presents the experiences and results of a 20-year long economic survey with an accountancy network in Baden-Württemberg with more than 170 participants. First, the general structure of forests in Baden-Württemberg and the natural conditions of small-scale private forests, such as location, distribution of tree species and age-classes, standing volume, annual increment, and cutting volume are described. Second, the economic results from the 20 years are presented together with illustrative graphs. The importance of the results and the development during the period for different uses on a microeconomic and on a macroeconomic level are discussed.

Keywords: farm forestry, accountancy network, Baden-Württemberg

1 INTRODUCTION

The state of Baden-Württemberg is a densely wooded area of the Federal Republic of Germany, with a forest cover of 38%. Forest resources are very high (about 500 mill. m³ in total, 361 m³/ha), especially those of the privately owned forests that have a high percentage of conifers.

Table 1. Structure of land use in private forests.

Private forests > 1000 ha	151 000 ha	29%
Private forests 200-1000 ha	28 000 ha	5%
Private forests 5-200 ha	154 000 ha	30%
Private forests <5 ha	187 000 ha	36%
Private forests total	520 000 ha	100%

Anssi Niskanen and Pentti Hyttinen (eds.) Prospects of International Statistics on Farm Forestry EFI Proceedings No. 31, 1999 The distribution of forest ownership is dominated by community (38%) and private forests (37%), of the total forest area. State forests cover 25%, about 24% is owned by the federal land of Baden-Württemberg and only 1% is federal forest and of minor importance. About 85% (130 000 ha) of private forests with 5-200 ha are owned by farmers.

2 NATURAL CONDITIONS OF SMALL-SCALE PRIVATE FORESTS OF 5-200 HA IN BADEN-WÜRTTEMBERG

Private forests in this category are predominantly located in mountainous regions, such as the Black Forest, the Swabian Mountains, the Swabian-Franconian Forest and the forest called "Odenwald", and also in other densely wooded rural areas, e.g. in the region north of the Lake Constance. This means that the rural area characterises all of these forests. Most of the forest owners live either in farm-holdings or as a pure forest owners in nearby villages or small towns. Also the type of management is shaped by these conditions. The owners' families do most of the work (85-90%) in the forests. Also the machinery in the forests is dominated by the machines which are also used in agriculture: tractors with radio-steered winches for hauling the trees to the forest roads and chain-saws for tree-felling operations. It is relatively scarce that a contractor with greater machines, e.g. harvesters or wood processors is hired.

The natural conditions for tree growth and forestry are comparatively good, depending on mostly fertile soils and sufficient precipitation. Only steep hillsides and very high mountain areas reduce the possibility of tree production or make it more expensive.

Coniferous trees, mainly Norway spruce, dominate the distribution of tree species. The main tree species and their share are presented in Table 2.

Table 2. Main tree species and their shares in Baden-Württemberg.

Norway spruce (<i>Picea abies</i>)	63%
Silver fir (<i>Abies alba</i>)	12%
Pine (incl. larch: <i>Pinus silv.</i> and <i>Larix dec.</i>)	7%
Douglas fir (<i>Pseudotsuga dougl.</i>)	2%
Coniferous trees (total)	84%
Beech (Fagus silv.)	13%
Oak (Quercus spec.)	3%
Broadleaved trees (total)	16%

This percentage of conifers is the highest in comparison with all other categories of forest ownership – also with the private forests with more than 200 ha size.



Figure 1. Age classes in the test network Baden-Württemberg 1998.

Two main developments are the reasons for this result:

1. In rural areas, the conversion of poor agricultural land into forests by afforestation has been carried out for 150 years. The most suitable species for this work has been Norway spruce: these "new forests" show a percentage of 90-100 of Norway spruce.

Another method used has been the conversion of coppice and other unproductive deciduous tree stands into coniferous forests – also here the Norway spruce had been used as the main tree species.

Altogether, it is estimated that in smaller private forests about 30-40% of the existing forest areas had been established by afforestation or conversion.

2. The high productivity of Norway spruce and the high prices for this timber let also to a favorite role of Norway spruce then in old forests clear-cuts had to be reafforestated. Norway spruce was also favoured in the time after planting by weeding and thinning against beech and silver fir.

The composition of age-classes and of the tree species within the age-classes show that in the last 20 years there has been a new strategy in silviculture: the percentage of beech and silver fir is increasing. Nowadays more mixed and more varied stands are strived for by the forest owners.

Another speciality in these private forests is the so-called "Plenterwald", this means stands which are managed by selective cutting or single tree cutting. 13% of the forest area belong to this category.¹

The standing volume of all units has increased since the start of this network. Now it has reached an amount of 337 m³ per hectare, starting with about 256 m³ in the year 1979. The average increment per year is also quite good: 9.2 m³ per ha and year. The tree species show the normal differences:

¹ All figures are the result of the analysis of the management plans of 172 forest farms in the test network. They are very near to the figures of the whole entity of all private forests in the size of 5-200 ha.

• Norway spruce:	10.3 m ³ per ha and year
• Pine and Larch:	5.6 m ³ per ha and year
	50 2 1 1

• Beech: 5.2 m³ per ha and year

The allowable cutting volume is laid down in the management plans with an average of 6.0 m^3 per ha and year. This allowable cut does not exhaust the real capacity of the stands. Therefore the volume of harvested timber is the average slightly higher: on about 7 m³ per year and ha. This harvested volume does not break the law of sustainability because it is fixed due to the purpose of taxation and therefore on a lower level then it could be regarding the real possibilities.

3 THE NETWORK OF FARM FOREST AS AN ECONOMIC MONITORING SYSTEM

3.1 Network monitoring forest enterprises

The accountancy-network of small-scale private forests ("Testbetriebsnetz Kleinprivatwald") mostly owned by farmers is developed and organized by the Forest Research Institute of Baden-Württemberg. It is to be seen as an addition to the federal forestal test network monitoring forest enterprises of more than 200 ha and also an addition to the agricultural monitoring network of the federal German government in Bonn. The yearly results form the basic information for the agricultural report of Germany and for agropolitical decisions.

In Baden-Württemberg teh network is an important addition to the forest and agricultural network of the German government in Bonn. This federal forest network includes private and community forests with more than 200 ha. The aim of this kind of sampling data is to get information about the economic situation in form of annual results. Better knowledge of economic data of small-scale forestry makes the consultation to the farmers by Federal Forest Service of Baden-Württemberg more effective. Another aim is to have good figures at its disposal, so forestry subsidies can be justified and pushed through in an economical way by the ministry of agriculture. For their co-operation forest farmers have the following advantages:

- an annual bonus
- a free forest management plan every 10 years
- an annual analysis of their own economic data
- · figures of the region and categories to compare with

3.2 Methodology of the yearly data recording

The data recording of voluntarily cooperating forest farms uses especially developed booking receipts. The owners of the farm forests are visited every year for 2-3 hours for data collection and control. All information and figures are handled confidentially and the electronic processing is carried out anonymously. During the visit the first thing is
to check out the change of structural data (change of the agricultural and forestal area, main agricultural crops etc) and of personal data (important for the bonus: bank code and account). Then the real data recording for the past year can be done.

3.3 The annual data recording

Revenues

The revenues from the forest that is part of the farm is registered according to the following structure, including own consumption:

- timber crop (amount, assortments, kind of use, kind of utilization)
- accessory production (Christmas trees, branchwood used for decoration)
- further gross yield (above all hunting leasehold, reimbursement for damage caused by game)
- subsidies and financial support for various measures (investments are divided up into periods)

Costs

The registration of the following expenses is divided into four different cost centres (harvesting, silvicultural-treatment, roads, administration and others). Full costs and the full revenues are booked, the VAT is included.

Human labour input and use of tractors in hours

- The work input is registered as hours and cost centres including:
 - owners own work with calculated wages (all family members)
 - workers with contract of employment
 - seasonal workers without a contract
- Hours and costs of each tractor working in the own forest

In addition to detailed registration of hours worked in the forest, also total working hours, including farming of the farm forest enterprise, are registered.

The remaining costs are registered according to the following types of costs, also divided into cost centres:

- material (e.g. plants, spare parts, small tools...)
- costs for contractors
- costs for hired machines
- depreciations and new investments
- variable machine costs
- losses (e.g. caused by theft, damage...)
- costs for administration assigned to the owners' forest (eg. land tax, farm insurances, accident insurance, costs for the building, charge for individual advice from the state forest administration, contributions to forest cooperatives, costs for the car...).

The evaluation methodology

The yearly analysis is based on a calculation of the net return from the forest part of the farm. Some costs of the total farm enterprise are calculated within the forest part of the farm. Following limitations are made for the conduct of results:

- there is no assessment of the property of forest stands or soils;
- there is also no interest rate for the invested capital;
- the calculation model is based on a fiction of a farm without leaseholds and debts without any liabilities, just like in the federal agricultural test network; and
- interest charges for loan capital or leasehold for forest areas must be paid from the net profit of the farm.



Figure 2. Correlation between costs, revenues and success dimensions such as family income and net income accounted within the network of small-scale forestry in Baden-Württemberg.

4 RESULTS FROM THE NETWORK OF SMALL-SCALE PRIVATE FORESTS

The main result achieved over the 20-year period (1979-1998) is that the owner's family is able to earn an income of 635 DM per year and hectare (Fig. 3). The main reason is the work of the owner's family which contributes 63% to the result. The net income from forestry is not very bad at 235 DM/year/hectare, even considering that there are subsidies of 89 DM/ year and hectare. The costs for material, contractors, depreciation



Figure 3. Gross income, family income and net income in the test network of farm forests in Baden-Württemberg



Figure 4. Revenues in farm forests - Baden-Württemberg 1979-1998 (DM/ha).

		net income	302	393	445	258	225	405	143	203	166	104	311	1074	-54	40	-77	112	206	-20	170	284
<u>results</u>	family income	per working hour, DM	36	42	48	36	37	46	32	38	36	32	46	78	26	35	27	47	54	40	56	67
			587	719	767	599	525	755	465	532	490	479	704	1631	284	412	293	644	807	481	712	823
		non labour	182	203	220	211	220	249	239	296	290	302	345	473	342	327	329	285	299	269	311	331
costs		wages	41	35	31	31	33	39	29	22	30	29	32	74	20	26	27	28	31	19	26	25
		family labour	285	326	318	347	301	351	322	329	324	375	393	557	337	372	368	532	601	501	542	538
		other revenues	42	47	63	68	34	31	30	47	47	51	49	48	49	46	43	47	43	49	41	42
revenues		subsidies	0	0	4	S	33	36	50	70	75	72	83	198	211	183	182	145	133	131	81	94
		timber sellings	768	910	947	774	712	976	653	733	688	687	949	1932	386	536	422	765	961	590	927	1042
		cutting Jume, m ³ /ha	6.1	6.5	6.2	6.0	5.3	6.9	5.4	5.9	5.6	5.9	7.2	14.7	4.0	4.6	4.6	6.9	8.5	6.0	8.2	8.5
		VC	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998

Table 3. Revenues, costs and results in farm forests in Baden-Württemberg, DM/ha.



Figure 5. Costs in farm forests - Baden-Württemberg 1979-1998 (DM/ha).

and wages are at 317 DM/year/hectare not very high. In the last 20 years, the gross income was 953 DM/year/ha. The portion of timber selling was 818 DM/year and hectare that means 86% of the gross income, while the subsidies were about 9% of the gross income. Only 6% of the gross income does not depend on timber or subsidies. The results have been published since 1984 as a yearly report. A comparison of the annual accounts is made by the evaluation of the results according to different points of views and different stratification. Some examples include:

• the regional evaluation (according to four regions Black Forest, Oberland-

- Ostalb, Schwäbisch-Fränkischer Wald, Odenwald-Hohenlohe) • an evaluation according to four different size-classes of forest areas (5-10 ha, 10-
- 20 ha, 20-50 ha, > 50 ha-200 ha)

The family income is the most important economic result (gross income minus material costs, costs for contractors, wages for employed workers- as to say gross income minus all costs except of calculated wages for owner's own work and work of the family). The family income gives an idea of the available money gained by the forest part of the enterprise. The up and down from year to year is shown in Figure 6.

The net income (family income minus calculated wages for family labour) is shown in Table 3. It is used above all for the comparison with other mostly larger forest ownerships with paid workers.



Figure 6. Economic results in farm forests – Baden-Württemberg 1979-1998.

The main event was the windfall in 1990. The high amount of windfall-timber caused a peak of family income in 1990. But the years after that show a deficit for 4 years. The reasons for these deficits were low cutting volume, high costs for replanting and deep market prices for timber. The peak in the year of the windfall should also be classified not as a normal result of sustained forestry and so regarded as regular income, but more as a loss of forest capital in form of thrown immature stands which is transferred by windfall into money capital. So that parts of this net income should be regarded as financial capital and should be not used as normal income.

It is also remarkable that the family earns 26 to 67 DM per hour, in the average about 44 DM by working in their forest. This is much more than the result for a working hour spent in farming. (Figure 6).

5 DISCUSSION

The family income per ha from forests is quite favourable, but the same income from the agricultural part of the farm enterprise in the average is reaching more than the double amount (ca. 1500 DM/ha). In the family income from agriculture depends more than 40% on direct or indirect subsidies.

When these figures are transferred to the average total size of the farm enterprises (ca. 21 ha forests, ca. 26 ha agricultural land), the forest area contributes to the total family income of the farm with 25%.

Another relation between forestry and agriculture is showed in the amount of family income per working hour: the running of the agricultural area needs 80-150 working hours per hectare, the forests only 10-20 h/ha. So the possible family income per hour from agricultural activities is much more lower (10-20 DM/ha) than the work in the forests (20-67 DM per ha). These figures give good support for decisions about investments and the use of the own labour capacity: if there is free labour capacity in the farm, it is better to intensify the forest sector (if possible) than the agricultural sector.

In the case of scarce capacity, it could be better to organize the agricultural sector more extensively.

In regions with a high concentration of farm forests, e.g. the Black-Forest, the contribution of the forests to the total income of the farms reaches a share of 30-60%, in the mean ca. 40%. There the forests play an important part in the management of these farms, and the families are depending on timber selling and therefore on the market prices for timber.

The social and the economic structures of rural regions are also depending on farms which are capable of surviving. The maintenance of a beautiful landscape – important for touristic purposes, especially in top regions as the Black-Forest – is also a function of good situated and vital farm enterprises. In the Black-Forest only 2.3% of all working persons in the region are cultivating and tending 86% of the total area. The importance of farm forestry and the income from this part of the farm cannot be overestimated.

During the last 20 years of existence the Cost Accountancy Network on Farm Forest Enterprises has been developed to a very important and very useful instrument for different purposes.

At first it puts lot of figures and information at farmers disposal so that they have a very detailed analysis of the economic situation of their forests. With this information they are able to look for better ways to manage and organize the work in their forests and the marketing of their products, mainly timber.

Another group who are using the information very intensively are all persons of the state forest administration who are involved in extension work for private forest owners. They find a lot of data about the economic situation and about economic problems in the forests of their clients which are helpful for their extension service.

The data are also used for macroeconomic purposes such as regional structure analysis and as basic information for policy makers who will be informed about the economic situation of a part of the rural population.

This information could be used for more and better directed public support to the forest owners – by indirectly given extension services or by direct financial subsidies – who are contributing with the sustainable and tending management of their farm forests to the public welfare.

References

- Brandl, H. 1994. Income-effects of a new type of financial support to forest owners in mountainous and disadvantaged regions in Baden-Württemberg. IUFRO- and COST-Workshop, Gmunden, Austria, 26. September 1994. In: Solberg, B. and Pelli, P. (eds). 1995. Forest Policy Analysis Methodological and Empirical Aspects. EFI Proceedings No. 2. European Forest Institute. Joensuu, Finland. pp. 173-179.
- Brandl, H. 1997. Farm Forestry in the Black Forest: The Role of the Forest Sector for the Family Income of Farm Holdings and the Effect for Regional Employment. In: Murashima, Y. (ed.) Proceedings of IUFRO-Symposium in Kyoto 1997 "Sustainable Management of Small Scale Forestry", IUFRO-Groups 3.08.00 and 6.11.02.
- Brandl, H., Hercher, W., Löbell, E. and Nain, W. 1996. Betriebswirtschaftliche Untersuchungen im bäuerlichen Privatwald in Baden-Württemberg. Mitteilungen der Forstlichen Versuchs- und Forschungsanstalt Baden-Württemberg, Heft 196. In German.
- Bundesministerium für Ernährung, Landwirtschaft und Forsten. 1997. Agrarbericht der Bundesregierung 1997. Bonn. In German.
- Hyttinen, P., Kallio, T., Olischläger, T., Sekot, W. and Winterbourne, J. 1997. Monitoring Forestry Costs and Revenues in Selected European Countries. Research Report No. 7. European Forest Institute. Joensuu, Finland.
- Nain,W. and Schmid S. 1995. Wie repräsentativ sind forstliche Testbetriebsnetze in Baden-Württemberg bezogen auf die Bundeswaldinventur 1987? Forst und Holz, 600-605. In German.
- Nain, W. 1998. Methodological issues of Cost Accountancy in Farm Forest enterprises. EFI Proceedings No. 20. European Forest Institute. Joensuu, Finland.



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Workshop C: Prospects of International Statistics on Farm Forestry Freiburg, Germany September 23-26 1998					
Wednesday	23 September				
19.30	Registration and welcoming buffet at InterCity Hotel, Freiburg				
Thursday 24	1 September				
8.30	Opening of the Workshop C Prof. Helmut Brandl, FVA Baden-Württemberg, Germany Progress report Dr. Pentti Hyttinen, Project coordinator, Finland				
Session 1: Pr	ospects for international statistics on socio-economic situation of farm forestry				
Chairman: I	Dr. Jan Luijt, LEI-DLO, The Netherlands				
9.00	Results of the feasibility study on further developments and needs in the FADN <i>Mr. Bernard Brookes, EC DG VI</i>				
	Discussion				
Session 2: G	uidelines for establishing accountancy networks under various conditions				
Chairman: I	Dr. Pentti Hyttinen, Project coordinator, Finland				
11.00	Current version of the structure of the guidelines Dr. Walter Sekot, Austria Mr. Raymond Schrijver, The Netherlands				
	Discussion				
14.00	National definitions of farm forestry Mr. Timo Kallio or Dr. Anssi Niskanen, EFI, Finland				
	Small group discussions				
15.30	Discussion cont.				

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Friday 25 September

Session 3: Methodologies capable of taking into account the heterogeneity of farm forest enterprises as well as of the respective policy background

Chairman: Mr. Olivier Picard, IDF, France

8.30	Alternative ways to collect information on the socio-economic performance of farm forestry <i>Mr. Sven Hogfors, Sweden</i> <i>Mr. Terry Thomas, The United Kingdom</i>
10.00	Forestry ratios Mr. Miika Kajanus, Finland Green accounting Prof. Edi Defrancesco, Italy
11.00	General discussion
13.30	Field excursion to a farm forestry enterprise

Saturday 26 September

Final session

Chairman: Dr. Pentti Hyttinen, Project coordinator, Finland

8.30 Agreeing on the steps required for the guidelines Necessary measures for an international database Compliance with IUFRO guidelines Conclusions of the workshop Tasks before the final seminar MOSEFA Final Seminar Iisalmi, Finland June 9-13, 1999

Wednesday 9 June: Arrival

Thursday 10 June

9.30	Opening of the final seminar Pentti Hyttinen
10.15	Monitoring the Socio-Economic-Situation of European Farm Forestry Anssi Niskanen and Walter Sekot
11.00	Future challenges for the nordic family forestry in relation with monitoring the socio-economic situation of private forest owners <i>Tiina Rytilä, Bureau of Nordic Family Forestry</i>
11.30	Positive and negative viewpoints of forest owners concerning the value of socio-economic data collecting Natalié Hufnagl, Confederation of European Forest Owners CEPF
12.00	Discussion
14.00	Need for long-term data for monitoring non-industrial private forestry profitability Jussi Leppänen, Finnish Forest Research Institute
14.30	A database application for monitoring the economic situation in private forestry <i>Raymond Schrijver</i>
15.00	Discussion

Friday 11 June

8.30	Comments on the Guidelines by MOSEFA members
13.30	Field trip: farm forestry enterprises

Saturday 12 June

8.30	Discussion and conclusions of the MOSEFA project
10.15	Final business meeting of the MOSEFA project

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