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Integrated, Participatory Sustainability Management in the Context of Functional Subsystems of Forest Enterprises

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Abstract

The sustainability issue has gained importance during the last two and a half decades, starting with the UN Report “Our Common Future”. As the transformation to a sustainable economy is far from being an automatism, instruments to foster sustainable development are required. This demand has led to a frighteningly high number of instruments. This paper introduces firstly, the concept of a comprehensive management system of sustainability in larger forest enterprises. After an introduction of the normative framework, the need for a participatory approach is described. The need for the use of different instruments is derived from the existence of various subsystems (Manufacturing / provision of services, Management, Communication and Information) in almost all kind of institutions and enterprises. A short overview about the general role of evaluation and former findings leads to the depiction of the two case study regions, from where the empirical results have been gathered. The specific concept of the integrated participatory sustainability managementsystem (IPSUSMAN) is then introduced. Secondly an advanced perspective on process of evaluation is introduced. It can be shown that the success of a management system is dependent on different influencing factors. From this it follows that a multi-perspective has to be used. A first outline of such an approach is given, the sub-methods are sketched and the complementary role of direct and indirect evidence in process evaluation is described. A small and therefore exemplary insight into some key findings from different surveys is illustrated. It can be shown that the acceptance of the Sustainability Balanced Scorecard (SBSC) is high amongst employees and when participation is encouraged it leads to a satisfying appraisal of the implementation process. With regard to sustainability reporting, it becomes evident that basic assuring technologies (e.g. certification) used in sustainability reports meet, at least partially, the expectations of readers that belong to different stakeholder groups. Strategic goals, based on participatory processes, reach a positive and mostly stable rating in the three pillars of sustainability (economic, ecological and social). Regional differences are of a lesser importance. In both case studies we find similar messages from indirect evidence (qualitative findings). The paper ends with a positive statement on the feasibility of the IPSUSMAN but also with a cautionary comment on the relative effort of time and money it takes to run such sophisticated systems.

Keywords: Sustainability, Sustainability Management Instruments, Sustainability Balanced Scorecard, Sustainability reporting, indicators for sustainable development, multi-perspective evaluation

1 Introduction

Three hundred years after its first appearance in the forest context (Carlowitz, H.C. 1713.) the term sustainability is used and partially misused today in almost all contexts and sectors. 25 years after the UN Report “Our Common Future” (UN 1987) and increasingly after the Rio World Summit in 1992, the need to transfer our economy and society to a sustainable system is seen as a major challenge. However, the real world seems to be far away from a turning point whilst the demand for energy and all kind of raw materials continues unabated. The world’s increasing population level can also be seen as a strong constraint for sustainability. The transformation is obviously not an automatism. Thus, a need for systems which are suited to foster sustainable development are basically required.

This need leads to various considerations of which management instruments are potentially suited to support sustainable development. As frequently observed in dynamic fields many new instrumental approaches have been introduced to the sustainability debate or traditional methods have been linked to sustainability. This results in a frighteningly high number of concepts and / or instruments related to sustainability-management. Schaltegger et al. (2002) gave one systematic overview and listed 9 concepts and 46 instruments which have been proposed as suited for the management of sustainable development. Their list of concepts and instruments (presented in Annex 1) is only a short excerpt of instruments that have been discussed during the last two decades.

They (ibid.) point out that even professionals tend to lose sight of the overall picture. This high number even shows that it seems to be attractive to develop new, or relabel old instruments, in order to make a mark as a sustainability professional. In many cases new instruments are especially, and frequently, introduced as unique and comprehensive instruments. It can be doubted that all these instruments are able to make substantial contributions to the sustainability movement in general or indeed to any situation. Schaltegger et al. (2002) confirm that the individual methods have to be selected properly for use in individual departments. But it can be assumed that the need for the adaption of sustainability management systems goes beyond a specific design if the system is used in individual divisions. Kopfmüller et al. (2001) emphasise the need for a so-called contextualisation in which a system has to be developed that puts the requirements of sustainability into the context of the individual organisation. Thus, it seems worthwhile to scrutinise which requirements can be used to analyse the feasibility of single instruments and the need for integrating approaches respectively.

The sustainability-management concept, formulated by the Helmholtz-Gesellschaft, which is a cooperation of 15 of the largest research organisations in Germany, lists four structural components that can be seen as essential parts of a sufficient sustainability management system. They are:

- Mission statement about the idea of sustainability
- Rules and concepts
- Constitutive elements
- Instruments

Of special relevance for the issue discussed in this paper are the constitutive elements and the choice of instruments applied.

2.1 Constitutive Elements

There is a wide consensus that a reliable sustainability concept is based on extensive internal and external participation. In combination with the sustainability debate, the gaining importance

of the role of stakeholder involvement increased rapidly from the middle of the 1980s (UN 1987). The agenda 21 concept (Agenda 21. 1993) has highlighted participation as a key concept on the way to sustainable development under chapter 23: “One of the fundamental prerequisites for the achievement of sustainable development is broad public participation in decision-making” (Agenda 21. 1993). Since then, a wealth of literature can be found about participatory processes in and outside of the forest sector (e.g. Forestry Commission, 2011; Smith and McDonough, 2001).

Another key issue is the demand for an integrated approach. However, it has to be kept in mind that the term integration in the context of SUSMAN is used in various ways. Despite various opinions as to how to manage sustainability, it can be said that a multidimensional approach, for instance in the form of the three-pillar approach, and multi-instrumental practices are frequently seen as best-practices.

2.2 Instruments in the Context of Functional Subsystems

One requirement that results from integration is that management systems should cover the whole enterprise and its activities. This leads to the question, what are the relevant components of entrepreneurial or institutional activities? Besides other concepts the approach of functional subsystems can be seen as an appropriate way to provide a structure for these activities (Oesten and Roeder, 2008). There are different structures but the following option, which defines four functional subsystems, can be seen as a synopsis of different structures. It consists of four subsystems: 1) the production / delivery of services; 2) the management system; 3) a system for information provision; and 4) a system for internal and external communication. The latter three can be seen as preconditions for an on-going business (Fig. 1).

Manufacturing / Delivery of services: Manufacturing or the delivery-of-services are the core-objectives of most enterprises or institutions in the world and in the profit or non-profit sector. Except for one-man or very small businesses these processes are not conducted by the owners themselves. Depending on the size of the enterprise, they will be embedded in a management system.

Management / Strategy: Every institution requires basic management processes, rules and a set of (strategic) objectives. Depending, for example, on the sector, the size of the organisation and the management philosophy, various management systems can be applied.

Information: On the one hand, all kind of management and productive activities rely on information. On the other hand, the relevant quantity of information results from the operative processes and has to be saved and used for different operative processes, e.g. managerial accounting and communication purposes. A sizeable share of this information is quantitative data, however progressively qualitative information ought to be used.

Communication: For internal and external communication, communicative processes and rules have to be defined and abided by. The larger the institution is the more important professional external communication becomes. The increasing societal control of entrepreneurial activities in the context of the sustainability debate creates, increasingly, a need for specialized instruments for communication.

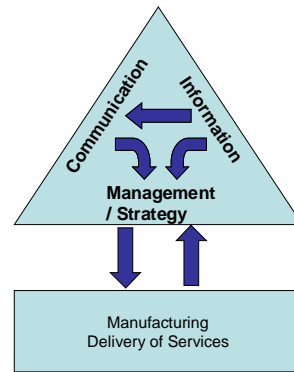


Fig. 1. Functional subsystems

2.3 Evaluation of SUSMAN Instruments

Evaluation of the instruments and their outcomes is seen as a part of sustainability management. With regard to different instruments, in general several evaluations have taken place during the last few years. Sustainability reporting was especially a subject of various research activities (e.g. Pleon, 2005., KPMG 2005). Cavalluzo and Ittner (2004) performed the first study to evaluate performance measurement systems, which can be seen as the basis for the SBSC approach. However, it has to be stated that an evaluation of specific systems or instruments is widely missing or has not yet been published. Thus, an estimate about the strengths or weaknesses of operating sustainability systems could not be identified before the case studies and related systematic research in this paper had started.

Moreover, the recent research focused on the instruments as such, highlighting technical or structural issues and the goals which are pursued with the individual instrument. With regards to communication theory, this approach must be seen as imperfect; because the success of such instruments is composed of more than just instrumental aspects. Of particular relevance are:

- Perception of the institution
- Development and implementation process
- Functionality of instruments
- Contents

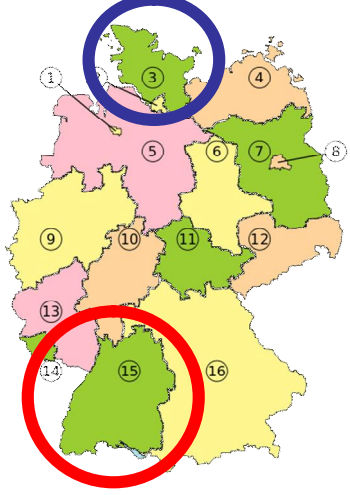
Perception: The perception of an institution (or a person) influences the appraisal of the management systems applied. A substantial sustainability management system used by an institution that is seen as sustainable, according to Küpper (2008), is seen as better than the same system used by a non-sustainable entity or person. Thus, one part of the evaluation must include a consideration of the institution as such.

Processes: Together with the term, sustainable development, it can be seen clearly that processes play a predominant role in SUSMAN. Therefore a part of the evaluation should focus on the development and implementation processes.

Functionality of instruments: The evaluation of the instrument should focus on the instrument and its topical design and functionality.

Contents: The fourth component consists of the contents, targets and indicators respectively. Even a perfect system where the goals are not designed to lead to a sustainable system will for obvious reasons not be accepted in the eyes of the public and by the employees. Thus, an evaluation of this aspect has to be integrated too.

Table 1. Core data of the case study regions

 <p>Germany</p>	State	Schleswig-Holstein (3)	Baden-Württemberg (15)
	Forest coverage	ca. 12 %	ca. 40 %
	Implementation	2008	2011
	Employees	< 200	ca. 2500
	Dominant Forest function	Recreation	Multipurpose Forestry with regional variations
	System structure	SBSC Business Reporting with SBSC No Sustainability Indicators	SBSC Sustainability-Reporting. Sustainability-Indicators

3 Case Study Regions

The findings are derived from the case study regions, where the development and implementation were intensively supervised. The core data are described in Table 1.

4 Concept of IPSUSMAN

4.1 Overview

The concept of the integrated sustainability management system consists of three components.








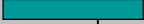




For strategic orientation and control (Functional subsystem: Management and Strategy) the Sustainability Balanced Scorecard is used. The number of strategic goals is 17 and 18 respectively and does not exceed the recommendations' of Kaplan and Norton (2001). In S-H the review of the goals was executed after three years, in B-W an amendment is planned for 2015, after a five year period of use of the IPSUSMAN.

The basis for the data is a set of 70 to 100 sustainability indicators, which has to be developed consecutively during the next few years (Functional subsystem: Information). The sustainability indicators will be made available on the internet and displayed mostly as annual values.

For the internal and external communication of sustainability issues a sustainability report was used and these topics are addressed respectively as a part of the annual business reporting (Functional subsystem: Communication). In B-W the decision was made to issue this sustainability report every three years due to the high cost and the expectation that the sustainability situation is not expected to change very soon.

Table 2 gives an overview of the different components with a special emphasis on the number of topics addressed, the scope of the main viewing direction, frequency of actualisation and the degree of annotation in the system.

Table 2. Overview of system components

Instrument	SBSC		Sust.-Report		Sust. Key-Figures	
N of topics	high	low 	high 	low	high 	low
Main viewing direction	internal 	external	internal 	external	internal 	external
Frequency of actualisation	frequent	seldom 	frequent 	seldom	frequent 	seldom
Degree of annotation	high	low 	high 	low	high	low 

4.2 Integration

The requirement of integration was covered through the use of the three pillar approach. In both cases, the whole institution was covered and the application of different instruments, covering the main functional subsystems of the respective institutions, was used.

4.3 Participation

Diverse methods of participation were applied. Table 3 subsumes the different ways of internal and external participation.

5 Methodology

The methodological setting was derived from communication theory. Thus, a multi-perspective approach was developed in which individual studies have been carried out. Table 4 gives an overview of the different sub-methods that were integrated into the overall evaluation scheme. As the research is based on case studies, a second pillar of evaluation can be used. Also, as the implementation takes place in a real world scenario, reactions from the different groups involved can be taken into account. Thus, the studies which provide results from direct evidence were combined with a constant monitoring of the reactions of various stakeholder groups. As a result of this, we received additional results which can be characterized as indirect evidence.

Table 3. Participation in different instruments

SBSC	Sust. Report	Sust. Key-Figures
System Structure: IWG Proposal goals: I+E WS Ranking of preselected goals (all employees): I+(E*) S Proposed final set of goals: IWG	Report Structure: I+E WS Report Contents: I+E S Assuring Tech's: I+E S and I+E WS (planned)	Selection of a set of key figures: I+ E S and I+E WS (planned)

IWG = Internal working group; I+E WS: Internal and external workshops; I+E S: Internal and external survey; * (external S-H)

Table 4. Overview of the methodological setting

Evaluation Perspectives	Direct evidence	Indirect evidence
Institution	Outcome analysis. Questioning of stakeholder perceptions, e. g. ecological image, strategic targets (in progress)	- / -
Processes	Continuous monitoring. Long term (repeated) opinion polls on acceptance of employees and stakeholder-groups.	Comments of stakeholder involved.
Instruments	Continuous monitoring. Long term (repeated) opinion polls on the system and instruments.	System stability in times of political change
Contents	Questioning the acceptance of goals selected and choice of topics in reports.	Involvement of political decision makers. Acceptance of contents in times of change.

6 Results

6.1 Direct evidence

Table 5 reveals the level of acceptance of the preselected and final goals that were set in different stages of the strategy-process. The three dimensions are equally ranked with regard to their importance. A revision of the final set of goals in S-H provides evidence that the preference for goals remains stable. The slightly better evaluation in the second column is the result of the fact that most of the preferred goals of the preselection are included in the final set.

The SBSC was widely accepted by the employees (Fig. 2). In general more than two thirds agree with the statement “The SBSC is an appropriate instrument for managing the [name of case study institution]” (+, ++). Employees accepted their extensive involvement. The long-term evaluation of S-H shows that the level of acceptance decreases slowly. However negative statements (-; --) remain very seldom (< 10 %). The implementation process was also evaluated positively (Fig. 3).

Table 5. Acceptance of participatory derived goal sets

Dimension	S-H Preselection during strategy development	S-H final goal set after three years use	B-W preselection during strategy development
Economy	*1.89	1.68	1.97
Ecology	2.02	1.77	1.63
Social	1.91	1.66	1.68

*Goals is esteemed being: 1.0 = important to 4.0 = unimportant
More information is provided in Hartebrodt and Scherer (2009).

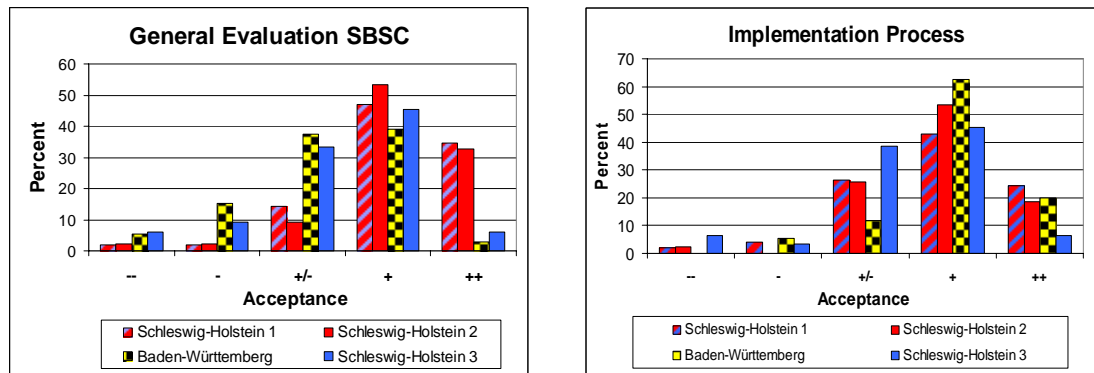
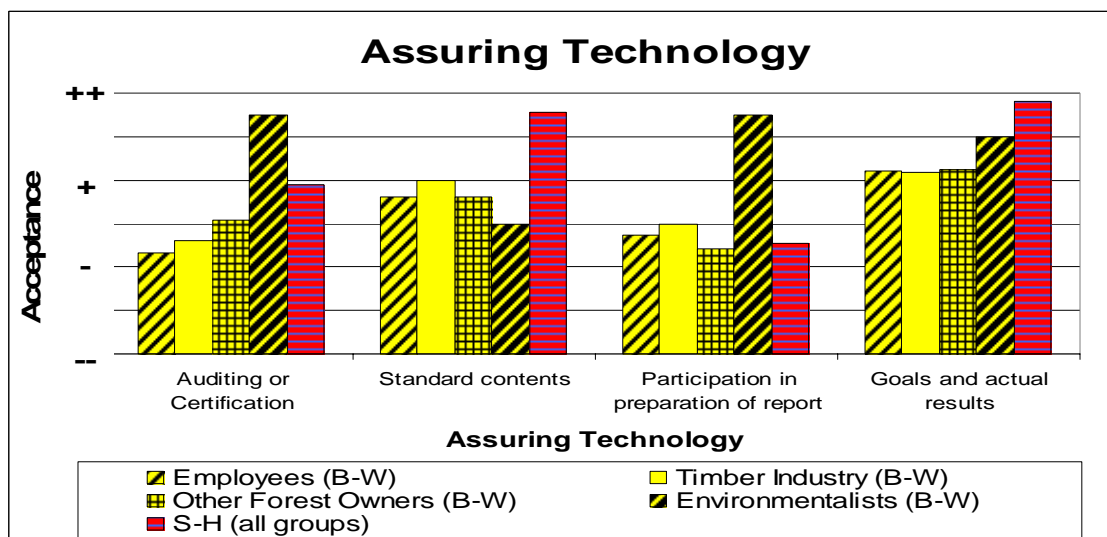


Fig. 2. and 3. General evaluation of SBSC and Implementation process

In depth information about the implementation of SBSC's in forest enterprises can be found in Hartebrodt et al. (2009 a, b, c).

In preparation for the development and introduction of the IPSUSMAN, an in-depth analysis of recent reports and their concepts was carried out. The readers of the reports of the case studies were, in addition to other questions, asked about their preferences with respect to assuring technologies (this means: auditing / certification of reports; use of standardized contents [e.g. GRI]; participation in preparation of reports; visibility and comparability of goals and actual results) which are applied frequently in sustainability reports. It can be shown that the acceptance of individual technology differs between various stakeholder groups. However, a report design that allows for a comparison of the enterprise objectives and the present situation on the one hand, and the use of standardized report contents on the other, reveals that these structural components of sustainability reporting meet the expectations of different stakeholder groups. (Fig 4). More information is given in Hartebrodt et al. (2009d, 2013).



(1.0 = agree definitively to 4.0 disagree definitively)

Fig. 4. Acceptance of different assuring techniques

6.2 Indirect evidence

Indirect evidence about the strength and weaknesses of the IPSUSMAN are up to now threefold. Although the strategic goals and situation became much more visible compared to past studies, there was almost no criticism about the set of selected and operationalized goals. Furthermore, it can be said that there was a lot of positive interest from different stakeholder groups. In B-W employees arguably widely accepted the system, but there was some remaining scepticism as to whether it will be successfully applied in the future.

It can be shown that it is possible to have a comparatively high involvement of political decision makers compared to other management approaches. In S-H a state board (including a state-secretary) approved the SBSC. In B-W it became possible to get the formal acceptance for the system, and the strategic goals, by the state cabinet, which is unique for German speaking countries (Germany, Switzerland, Austria).

Forest policy is frequently a target for budget cuts, as it does not affect many people. This has led to different reforms after regional elections in both states. Thus, it is more or less astounding that the SBSC and the IPSUSMAN remained stable after severe changes to the governing-majorities of both states (from conservative/liberal to socialist/green governments). In B-W the IPSUSMAN is seen as the most relevant pillar of sustainable development in the state forest by the new government.

7 Conclusion and outlook

Internal and external participation has proved successful in developing sustainability management systems. Integrated systems have met with wide acceptance. It can be easily explained how the instruments are in accordance with the functional subsystems of the enterprise / institution and that this bridges the gaps with the single instruments. Thus, an integrated approach, in terms of the use of different instruments, can be seen as a precondition for successful and publicly visible sustainability management.

A permanent evaluation of the different processes and outcomes during the implementation of IPSUSMAN proved successful. Based on explicit findings, it seems to be possible to optimize the functionality of these kinds of systems in the long run. It has to be kept in mind that this success is driven by different influencing factors. First, approaches that focus mainly on the instruments can be seen as fragmentary, due to that fact multiple methods are needed to assess effectiveness. In-depth research, providing detailed and quantified information about opportunities and threats from individual perspectives, allows for purposeful further development of instruments, processes, actors and institutions (direct evidence). This does not conflict with the experience that implicit findings (indirect evidence) can be used in addition to explicit ones. Up until now we have found a wide overlap between direct and indirect evidence.

The major constraint remains the amount of effort and money needed to develop and maintain these kinds of management systems. Participation and the use of a set of integrated instruments enhance the outlay for management. Thus, the trade-off between the outlay and the expected outcomes, which are only partially monetary, has to be discussed before implementing the IPSUSMAN concept.

In summary, such a kind of IPSUSMAN is a promising but challenging approach for larger, especially publicly owned, forest enterprises.

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Annex 1. List of concepts and instruments after Schaltegger et al. (2002)

Concepts	Instruments		
Environmental Information System	Incentive systems	Information-Systems	Project Management
Controlling	Worktime concepts	Investment appraisal	Public Private Partnership (PPP)
Marketing	Auditing	Sustainability Compass	Pilot-Projects
Accounting	Task reviews	Compensatory payments	Quality Management
Social management Systems	Open competitive bidding	Cost-benefit analysis	Strategic environmental assessments
Sustainability Balanced Scorecard	Balanced Scorecard	Cost-accounting	Sustainability Balanced Scorecard
Environmental Total Quality Management	Benchmarking	Loan-policy	Scenario-analysis
Environmental Management System	Reporting	Sustainability labelling	Assessment of technological risks of new tech's
	Balancing	Code of best practice	Environmental compatibility test
	Checklists	Supply chain management	Negotiations
	Controlling / internal Reporting	Material end energy flow accounting	Suggestion schemes
	Cross-Impact-Analyse	Participation of staff	Administrational processes
	Budgeting	Monitoring	Training
	Stakeholder-Involvement	Networking	Whistleblowing
	Efficiency-Analysis	Mission statements	Contract Management
	Evaluation	Sustainability management systems	Working Groups.
	Evaluation of new legislation	Sustainability Check	
	Indicators	Marketing	