Establishing a Specialised Terminology of Forest Condition: a Team Effort

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Abstract
As part of the writing of the *Sanasilva report 1997* on forest condition in Switzerland, an attempt was made to clarify and harmonise the German →terminology on forest condition. A small team of forest scientists, assisted by a →terminologist, collaborated in a terminological project. They adopted the following procedure: 1) →definition of aims and coverage of our →terminology; 2) collection of →terms from the technical literature and development of a terminological database; 3) assessment of type (technical/non-technical →term) and status according to our purpose (recommended →term, recommended →synonym, recommended →quasi-synonym, non-recommended →term); and 4) →definition of →terms. Recommended →terms, →synonyms and →quasi-synonyms had to be in common use, short, as self-explanatory as possible, and constructed consistently throughout this →terminology. →Definitions had to be short, precise, and widely accepted in our field of study. Altogether 251 related German →terms were collected, and 156 of them were defined.
The →terminology developed in this project provided a useful framework for the *Sanasilva report 1997*, and allowed many basic issues related to forest condition to be clarified before the contributions to the report were written. The authors encourage readers to undertake similar projects and provide a list of recommendations.

Keywords: Sanasilva, forest condition, terminology, German, harmonisation, methodology, Switzerland

1 Introduction

For many scientists, communicating effectively with other scientists, practitioners and the public is a real challenge. One reason for this is the absence of widely accepted →definitions for most →terms. We are usually able to communicate effectively because a common understanding of →terms prevails. Often, however, different people associate different meanings with the same →term, according to their personal background. This causes misunderstandings and fruitless discussions.

Difficulties in communication are not only a consequence of the lack of binding →definitions. They are also due to the dynamic nature of language, to the frequent use of discipline-specific →terminologies by scientists, to their "creativity" in inventing new →terms and to the existence of different languages, which only share a few exactly matching →terms, not to mention conceptual differences between languages (see e.g. Vehmas-Letho, this volume).

Although it would be desirable to see the most important →terms defined in scientific publications, this does not often happen. In forestry, there is an increasing number of published →terminologies, for example Ford-Robertson (1983) or the newly revised edition (Helms 1998), Schütt *et al.* (1992), and a number of electronic glossaries (see "Related Web pages" hereafter). Within the International Union of Forestry Research Organizations (IUFRO) there is even a Working Party ("Trends in forest terminology," see IUFRO 1997) and a service unit (SilvaVoc) dealing with terminological issues. Published →terminologies seem, however, to be rarely used, and many scientists appear to attribute minor importance to terminological issues or even to consider them as annoying or irrelevant.

The first author of this paper is the editor of the *Sanasilva report 1997*, a report on forest condition in Switzerland published by the Swiss Federal Research Institute WSL (Brang 1998). The target readership of this report encompasses all stakeholders in forest condition in Switzerland, thus including both lay and professional readers. As the →terminology of forest condition is "diverse" and as 16 experts were to contribute to the report, misunderstandings among them and waste of time due to the necessary corrections were predictable in the absence of terminological standardisation, not to mention the potential confusion of the reader. A sub-group of experts therefore tried, in an early stage, to reach a consensus on →terms to be used in this report, as well as on their meaning in this context.

In this paper, we report on the process of →term selection and →definition. Our objectives are (1) to create awareness on how useful this process can be in facilitating communication among scientists and helping to clarify scientific →concepts, and (2) to facilitate similar projects by providing some advice based on our experience.

2 Methods

Our approach included six steps: We collected →terms, developed a database containing the →terms, their sources and any available →definition, distinguished between technical and non-technical →terms, established usage recommendations, defined some of the →terms, and checked the consistency among →terms and among their →definitions. Teamwork was prominent in the →definition step, and important in the recommendation step. The team consisted of six experts and a →terminologist (the co-author of this paper), but input also came from several other scientists.

2.1 First Step: Term Collection

Our corpus included forest condition reports published in German, especially the Swiss reports 1984–1993 but also reports from other countries (see References). We screened these reports for →terms related to forest condition. We retained →terms that we expected to be frequently used by the authors of the *Sanasilva report 1997*, that were used in the past or should, in our opinion, be used in the future. We also included complements or antonyms to retrieved →terms. We did not systematically sample all German sources on forest condition. We retained only nouns, adjectives and verbs, without prejudging their level of technicality or the usage recommendations to be made. We recorded as the source of a →term the document where it was found together with a →definition or the document where it was found the first time.

2.2 Second Step: Establishment of a Database

The collected →terms were managed in a File-Maker® database, a standard database software. This facilitated consistency checks, enlargements of the →term list and sorting according to various criteria.

2.3 Third Step: Differentiation Between Technical and Non-technical Terms

Technical →terms are those used in a specific discipline, either exclusive to that discipline or with a different meaning than in common language. Non-technical →terms are those that are part of the common language. Examples for technical →terms are *Kronenverlichtung unbekannter Ursache* (*defoliation due to unknown causes*) and *Deposition* (*deposition*), examples for non-technical →terms are *Beobachtung* (*observation*) and *Schaden* (*damage*).

2.4 Fourth Step: Usage Recommendation

We set recommendations as to which →terms should be used in the *Sanasilva report 1997* by assigning a specific status to each →term: "recommended term", (recommended) "→synonym for a recommended term", (recommended) "→quasi-synonym for a recommended term" and "non-recommended term".
To be recommended, →terms had to meet the following requirements, as far as possible:
- be in common use in the German-speaking countries
- be short
- be self-explanatory
- have at most one →synonym (with always identical meaning)
- belong to the same grammatical category (noun, adjective), and have the same morphology as any related →terms (complementary, opposite)
- have no misleading English equivalent (as e.g. *crown transparency*, see section 4 below).

We followed GOUADEC's (1990) →definition of a →synonym, namely a →term with identical meaning in any context. This →definition is so narrow that true →synonyms are rare. A →quasi-synonym to a given →term is a →term with identical meaning in many cases, or at least in a certain context (KAENNEL and SCHWEINGRUBER 1995). In technical and scientific language, clarity is so important that the use of →synonyms is not recommended (cf. ALLEY 1987: "Even when you find true →synonyms, using them often confuses readers").

For "non-recommended terms," "→synonyms" or "→quasi-synonyms," we made reference to the recommended →term with similar meaning if such a →term existed.

2.5 Fifth Step: Definition of Terms

Terminological →definitions must be as short as possible, precise, generally valid in a discipline and in agreement with the state of the knowledge.

We provided →definitions for all recommended →terms, using various sources for inspiration or, in a few cases, for borrowing. These sources included our corpus (see 2.1), →dictionaries and →terminologies in German and English. In addition, we screened several textbooks for explicit or implicit →definitions. For the sake of shortness, but at the expense of precision, we avoided excessively comprehensive →definitions. As an alternative, information which went beyond the scope of a →definition was given in notes, *e.g.*, providing examples of how to use the →terms in context, pointing out related →terms, or highlighting the use of the defined →term in the context of the Swiss Sanasilva inventory.

2.6 Sixth Step: Consistency Check

Finally, we validated our →definitions. First, we tested them in various semantic contexts. Second, we checked the consistency in style of related →terms. Third, we checked if we had provided the necessary cross-references to related →terms. Fourth, we also checked that →definitions were not repeated among →terms of the same "family," such as that derived from "*Belastung*" (*load*) that includes *kritische Belastungsgrenzen* (*critical levels/loads*) and *Ozonbelastung* (*ozone level*).

In a late stage of the writing of the *Sanasilva report 1997*, we checked whether our recommendations were being followed, how many new →terms had emerged, and how often the →terms had been used. We hypothesised that:

1) The proportion of unused →terms would be highest for not recommended →terms, intermediate for →synonyms and →quasi-synonyms, and lowest for recommended →terms.
2) The average number of occurrences of the →terms would be as follows: not recommended →terms > →synonyms and →quasi-synonyms > recommended →terms.

3 Results

Our terminological database included 251 →terms[1]. Eighty-three percent (208) of these →terms were technical, 17% (43) non-technical →terms. We recommended the use of 56% (140) of the →terms, including 5% (11) as →synonyms and 5% (13) as →quasi-synonyms. We recommended excluding the remaining 44% (111) of the →terms from the *Sanasilva report 1997*.

While we did not create any new →terms, we provided many original →definitions. Out of 156 →definitions in our database, we created 67% (105) and considerably modified 14% (22). Five →definitions (2%) were so obvious that we declared them to be "common sense →definitions". The remaining 15% (24) came from various sources. Ninety-five →terms remained undefined (→synonyms, non-recommended →terms).

The proportion of →terms that were not used in the *Sanasilva report 1997* is shown in Fig. 1.

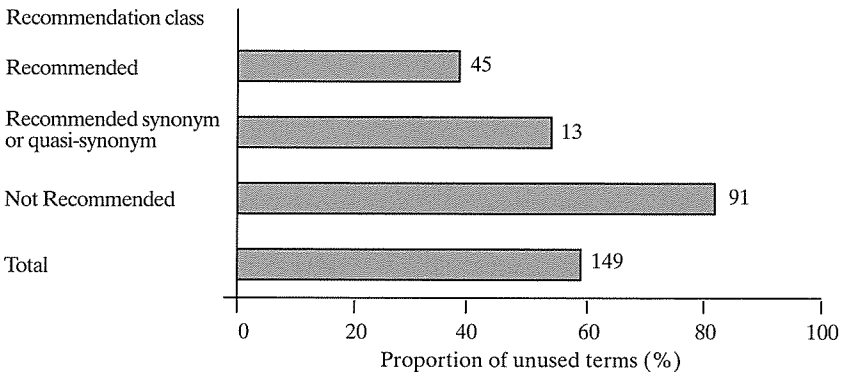

Fig. 1. Proportion and number of terms not used in the the *Sanasilva report 1997* (BRANG 1998), in different classes of usage recommendation.

[1] See full list at `http://www.wsl.ch/forest/risks/mexft/ssiterms.ehtml`

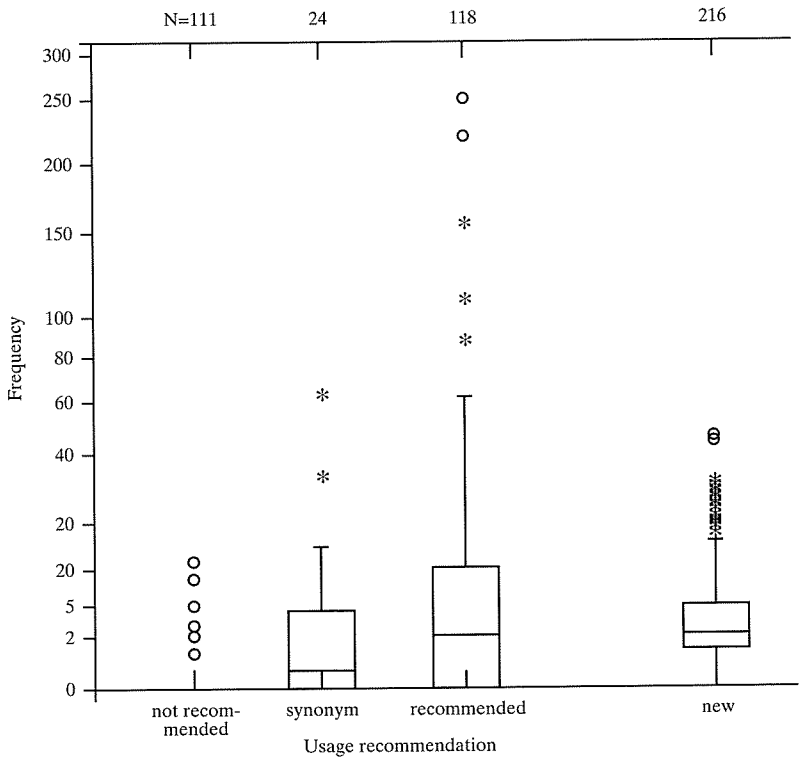

Fig. 2. Occurrence of selected terms in the *Sanasilva report 1997* (BRANG 1998) in different classes of usage recommendation. "Synonyms" include →quasi-synonyms; "New" terms are terms that had not been listed. Contributors to the report agreed on usage recommendation before the report was written. For the y-axis, a square-root scale is used. The horizontal lines in the middle of the boxes are medians, the horizontal lines marking the box ends are the upper and lower quartiles. * and o indicate values that are below the 1st quartile or above the 3rd quartile by at least 150% (*) or 300% (o) of the interquartile range (3rd–1st quartile).

The hypothesis that non-recommended →terms were less used than recommended →synonyms and →quasi-synonyms was rejected (chi-square test, $p<0.0003$), as was the hypothesis that recommended →synonyms were less used than non-recommended →terms ($p<0.0001$). However, the proportion of unused →terms was similar for recommended →terms and for →synonyms or →quasi-synonyms ($p = 0.2377$).

The number of occurrences of the →terms varied also among the recommendation classes (Fig. 2). Eight non-recommended →terms were used at least twice. This reflects deliberate choices that we made during writing and editing. During the year when the *Sanasilva report 1997* was completed, we thus overturned some of the decisions that we had taken before the writing process. Tests of our hypotheses yielded that (1) →synonyms and →quasi-synonyms and (2) recommended →terms occurred more frequently than non-recommended →terms (one-tailed Mann-Whitney test, in both cases $p<0.0001$). Occurrences of →synonyms and →quasi-synonyms vs. recommended →terms did not differ significantly ($p = 0.1390$).

4 Experience Gained and Discussion

Scientists who would like to embark on similar terminological projects may benefit from the following observations:

- Deciding which →terms to recommend often meant finding a compromise between tradition and self-evidence. For example, *Nadel-/Blattverlust* (literally *leaf or needle loss*) has been used for years, although it does not refer to actual loss (see *e.g.* SCHWEINGRUBER 1989). Therefore we replaced *Nadel-/Blattverlust* with *Kronenverlichtung* (*crown defoliation*), which refers less to the *process* of loss than to the resulting *state*. We rejected the apparently ideal →term *Kronentransparenz* (literally *crown transparency*) because crown transparency is a different parameter, assessed in the inventory of the United States (TALLENT-HALSELL 1994), but not in the Sanasilva inventory.
- It was often unclear which →terms deserved defining and which belonged to common sense and therefore did not need defining. We decided against defining general ecology →terms such as *Ökosystem (ecosystem)*. On the other hand, we defined many →terms from the general vocabulary which are sensitive and relevant in the context of forest condition, e.g. *Schaden* (*damage*), *gesund* (*healthy*) or *Sterberate* (*mortality*).
- Definitions should be stylistically homogeneous. The adopted style avoided examples and temporal modifiers such as "in general" or "most often," as they reduce the validity of →definitions. Instead we included complementary information and examples in notes.
- Existing →definitions that we collected from publications on forest condition or related fields were often too narrow or too broad, inaccurate or stylistically poor. Most →definitions from →dictionaries were too broad for our purposes. Nevertheless, available →definitions proved to be very useful source of inspiration, from which we built our own →definitions.
- The comparison of sources from various German-speaking countries revealed lexical differences: while a dead leader branch or upper part of the tree crown (*top drying* or *top-kill*) is known as *Wipfeldürre* in Germany, it is called *Gipfeldürre* in Switzerland. Similarly, a dead branch is called *Trockenast* in Germany, but *Dürrast* in Switzerland. We recommend highlighting such differences in similar terminological projects, rather than concealing them.
- We have signalled cross-references (*e.g.* among *Schaden, Schadstoff, Luftschadstoff,* and *Luftverschmutzung*) typographically. An alternative solution would have been to represent these relationships graphically.
- For similar projects, we strongly advise defining first which information will be compulsory and which optional, before even drafting a list of →terms. All the decisions taken, from →term selection to →definition, should be documented in order to guarantee the transparency of the process. Sources of →terms and of →definitions should be recorded (GOUADEC 1990).
- The assistance of lay persons can be helpful, particularly when deciding which →terms need defining. In our project, the →terminologist played that role.
- Our project cost the equivalent of 15 person-days. The most difficult and time-consuming steps were the →definition of →terms and the consistency checks between related →terms.
- Users who had not played an active part in the selection and →definition of →terms were obviously less respectful of usage recommendations. As they were uncommitted to the recommended →terms, they saw the list as a straightjacket, or had to be constantly reminded to check it. Providing →definitions also implies openness: due to the many choices involved in the process, the selection, assessment and →definition of →terms often turns into a matter of power. If these choices are to appear as objective as possible, they have to be transparent, and this can only be achieved through carefully documenting the whole process.

5 Conclusions

Efficient information processing has become a major issue, and →terminology provides tools for organising information. Terminological awareness should be part of a scientist's routine. The lack of widely accepted →definitions often induces terminological fuzziness, which may in turn express methodological or logical weakness. In contrast, terminological clarity expresses clarity of thought. We encourage readers to venture into terminological projects. All it takes is to clearly define the aim and extent of your work, gather a multidisciplinary group, use existing →definitions (at least) as an inspiration for your own →definitions, and carefully document all decisions. The knowledge that you will gain is worth the effort.

As the experts were compiling the list of →terms for the *Sanasilva report 1997*, they examined their views in an open discussion, weighing the best solution for each →term. In doing so they updated their knowledge of forest condition, which positively influenced the quality of individual contributions to the report. This alone should speak in favour of terminological activities.

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