

SOUNDSCAPE AND SOUND DESIGN - TUNING THE NEW ECOLOGY USING THE EXPERTISE OF PEOPLE'S MIND

Brigitte Schulte-Fortkamp,

Institute of Fluid Mechanics and Engineering Acoustics/ Psychoacoustics and Noise Effects,
TU Berlin,
Germany,
b.schulte-fortkamp@tu-berlin.de

ABSTRACT

The Soundscape concept was introduced as a scope to rethink the evaluation of "noise" and its effects. The challenge was to consider the limits of acoustic measurements and to account for its cultural dimension introduced by Schafer's neologism and research. Soundscape suggests exploring noise in its complexity and its ambivalence and its approach towards sound to consider the conditions and purposes of its production, perception, and evaluation, to understand evaluation of noise/ sound as an holistic approach. To discuss the contribution of Soundscape research means to focus on the meaning of sounds and its implicit assessments to contribute to the understanding that the evaluation through perceptual effects is a key issue. Analysis will place sound in context, with noise and sound linked to activity at realistic study sites. Besides the acoustical setting the listener sensational reality depends on the sociocultural background and the psychological dimension. The acoustical socialization (acoustical biography) and action frame of reference of the people concerned will influence environmental noise evaluation as well. Tools for the exploration of the Soundscape, microscopic as well as macroscopic, are needed. Beside the involvement of different disciplines it important to define areas that should built the platform in further development as economics, noise policy-standards, combined effects, common protocols, cross cultural studies, education about Soundscape, combined measurement procedures, qualitative and quantitative parameters, including the character of sounds and cross cultural questionnaires, and also the importance of survey site selection has to be emphasized.

1. BACKGROUND

Harmonization of indicators, noise mapping and action plans deliver basic administrative information not only for noise abatement in highly noise polluted areas but also for comparisons across European countries. However, such activities do not provide any tools or essential knowledge for more demanding tasks which are required for the design and planning of sustainable environments which are supportive to wellbeing and health. Without the knowledge of the determining factors behind the dose-response curves the decision process for the development of "action plans" is narrowed down. Furthermore, optional courses of action to handle the noise problem cannot be sufficiently considered. Therefore, there is the need for an approach which involves diverse fields of practice and diverse interdisciplinary interests related to people's expertise in the respected areas. The multidimensional Soundscape approach puts emphasis on the way the acoustic environ-

ment is perceived and understood by the individual and by society (ISO/TC 43/SC 1/WG 54). The implementation of the Soundscape approach accounts for people's concerns and integrates the exposed people as local experts.

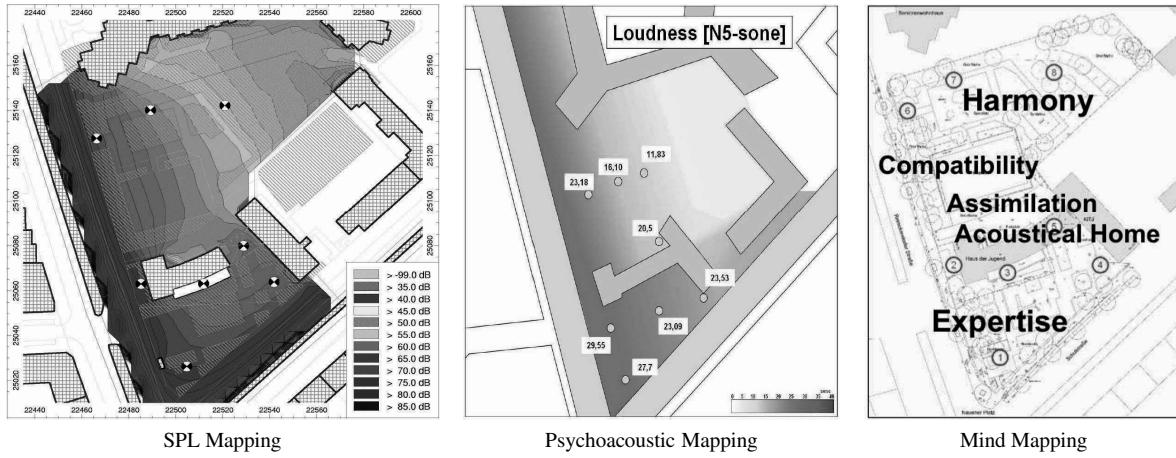
2. RECENT ACTIONS

Meanwhile, the Soundscape approach and its further development have been supported by countless research studies all over the world. Moreover, there is the European COST Action TD 0804 which creates a network among European "Soundscaping" by integrating Soundscape experts from all over the world. Also, the ISO/TC 43/SC 1/WG 54 has started to work on definitions which refer to evaluation procedures. (see paper by Schomer et al, Internoise 2010) With regard to application Soundscape is moving ahead in city planning and it's collaboration with the "local experts" and the "new" experts regarding sound design.

3. STRATEGIES

The process of tuning the new ecology with respect to the expertise of people's mind is related to the strategy of triangulation and provides the theoretical frame with regard to the solution of e.g. the change in an area. In other words: Approaching the field in this holistic manner is generally needed when research is concerned with unknown social worlds. For example, an effective and sustainable reduction of the number of highly annoyed people caused by noise is only possible with further scientific endeavors in the area of methods development and research of noise effects. Noise maps providing further information can help to obtain a deeper understanding of noise reactions and can help to reliably identify perception-related hot spots. Psychoacoustic maps are particularly interesting in areas where the noise levels are marginal below the noise level limits and offer an additional interpretation help with respect to the identification of required noise abatement measures. But, only the expertise of people involved can provide meaningful information.

So far, the realization of field measurements is indispensable for the determination of psychoacoustic and perceptual parameter values. Triangulation of data from SPL mapping, psychoacoustic mapping and mapping through the expertise of the local experts will help to develop models for the determination of certain parameters and indicators.



REFERENCES

- [1] D. Dubois, C. Gustavino, and M. Raimbault, "A cognitive approach to urban soundscapes: Using verbal data to access everyday life auditory categories," *Acta Acustica united with Acustica*, vol. 92, pp. 865–874, 2006.
 - [2] A. Fiebig, B. Schulte-Fortkamp, and K. Genuit, "New options for the determination of environmental noise quality," in *Proc. INTER-NOISE 2006*, 2006.
 - [3] W. Gaver, "What in the world do we hear? an ecological approach to auditory event perception," *Ecological Psychology*, vol. 5, pp. 1–29, 1993.
 - [4] K. Hiramatsu, "Soundscape: The concept and its significance in acoustics," in *Proc. ICA, Kyoto*, 2004.
 - [5] B Hollstein, "Qualitative approaches to social reality : the search for meaning," in *Sage handbook of social network analysis*, John Scott and Peter J. Carrington, Eds. London/Newcastle upon Tyne: Sage forthcoming.
 - [6] R. Klaboe et al., "Änderungen in der Klang- und Stadtlandschaft nach Änderung von Straßenverkehrsstraßen im Stadtteil Oslo-Ost," in *Fortschritte der Akustik*, 2000.
 - [7] P. Lercher and G. Brauchle, "Die wechselseitige Beeinflussung von externer akustischer und "natürlicher" Umgebung in einem alpinen Tal: umweltpsychologische und gesundheitliche Perspektiven," in *Fortschritte der Akustik*, 2000.
 - [8] P. Lercher and B. Schulte-Fortkamp, "Soundscape and community noise annoyance in the context of environmental impact assessments," in *Proc. INTER-NOISE 2003*, 2003.

- [9] W. Nitsch, "Verkehrsgeräuschprofile von Stadtvierteln. Erfahrungen mit sozioakustischen Feldbegehungungen i.R. einer Pilotstudie in Oldenburg und Schortens," in *Fortschritte der Akustik*, 2000.
 - [10] R.M Schafer, *The Book of Noise*, Price Milburn Co., Lee, Wellington, NZ, 1973.
 - [11] R. M. Schafer, *The Tuning of the World*, University of Pennsylvania Press, Philadelphia, 1977.
 - [12] B. Schulte-Fortkamp, "A concept of meaning - sound, sound quality and soundscape," in *Proc. INTER-NOISE 2008*, 2008.
 - [13] B. Schulte-Fortkamp, "How to measure soundscapes. a theoretical and practical approach," *J. Acoust. Soc. Am.*, vol. 112, 2002.
 - [14] B. Schulte-Fortkamp, R. Volz, and A. Jakob, "Using the soundscape approach to develop a public space in berlin - perception and evaluation," in *Proc. Acoustics 08*, 2008.
 - [15] K. Torigoe, "A study of the world soundscape project," Thesis for Master's Degree, York University, Toronto, 1982.
 - [16] R. Volz, A. Jakob, and B. Schulte-Fortkamp, "Using the soundscape approach to develop a public space in berlin - measurement and calculation," in *Proc. Acoustics 08*, 2008.
 - [17] B. Schulte-Fortkamp and D Dubois, Eds., *Special Issue: Recent advances in Soundscape research*, vol. 92 (6). Acta Acustica united with Acustica, 2006.
 - [18] B. Truax, Ed., *Handbook for Acoustic Ecology*, A.R.C. Publication, Vancouver, 1978.

BIOGRAPHY

Brigitte Schulte-Fortkamp is a professor at the Institute of Fluid Mechanics and Engineering Acoustics, Technische Universität Berlin Germany. Her main activities are in Soundscape and its relevance in community noise research by means of psychoacoustics and acoustic ecology. Further research activities deal with the impact of noise on sensitive groups but also with comfort related issues concerning defined acoustical environments. Current research is devoted to the application of soundscape research in city planning and sound design. Moreover, the field "Soundscape" was initiated and introduced by her in the area of community noise and also sound design in the end of the nineties by starting an international network through organizing structure sessions on this topic at the international acoustic conferences. Among others, she is a member of the ISO/TC 43/SC 1/WG 54 "Perceptual Assessment of Soundscape" Quality and Vice -Chair of the COST TD0804 "Soundscape of European Cities and Landscape" She has published more than 200 papers in Journals and Conference Proceedings as well as several book chapters. Prof. Schulte-Fortkamp is a member of the Executive Board EAA as Product manager and a member of the Technical Council of DEGA. She is a Fellow of the Acoustical Society of America.

ica since 2003, she served as ASA's Technical Council as Chair TC Noise 2006-2009, she is JASA Associate Editor for Noise and member of Editorial Board of "Acoustics Today", she is ASA -Vice President Elect and member of the ASA Executive Council 2010-2011.