

QUESTIONNAIRE SURVEY OF ENVIRONMENTAL ATTITUDES, MANAGEMENT AND PERFORMANCE OF SWEDISH ARCHITECTS AND TECHNICAL CONSULTANTS

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Summary

Why is it so difficult to incorporate environmental issues into mainstream business of architects and technical consultants? How do they actually deal with environmental issues? What are the obstacles? The objective of the paper is to provide some answers to this questions by empirically examine environmental attitudes, management and performance of Swedish architects and technical consultants. The study is based on a questionnaire survey carried out in autumn 2006 for the Swedish building industry.

Keywords: Environmental management, environmental attitudes, architects, technical consultants, questionnaire survey

1 Introduction

Over the last two decades the Swedish architects and technical consultants have made much effort to develop green building practices. Researchers within the field have provided theoretical knowledge on how to design green buildings and analytical environmental management tools have been developed to guide the practitioners. Information campaigns have raised the general environmental awareness among building practitioners. Despite of these efforts, mainstream building practices do not seem to have undergone any marked changes [2,3]. This raises the questions: Why is it so difficult to incorporate environmental issues into mainstream business of architects and technical consultants? How do they actually deal with environmental issues? What are the obstacles? Are there differences between the actors and differences to the building sector as a whole? The aim of the paper is to provide some answers to this questions by empirically examine environmental attitudes, management and performance of Swedish architects and technical consultants. The paper is based on a questionnaire survey carried out in autumn 2006 for the Swedish building industry, which also is an almost identical replication of the Environmental barometer survey carried out in 2002 [1].

2 The survey

2.1 The structure of the study

The Environmental barometer for the Building sector is a questionnaire study with the objective to survey the environmental challenges, attitudes towards these challenges, and the management and performances from environmental measures taken within the Swedish building and real estate industry. The structure has been developed from a questionnaire used by the International Business Environmental Barometer, which has measured the state of environmental management in industry since 1993.

2.2 The questionnaire and data collection

The Environmental barometer 2006 is based on the questionnaire from the survey 2002 to admit comparisons over time. The questionnaire contains a total of 39 questions, covering seven parts: business in general, environmental management, environmental impact, environmental measures, reflections on environmental measures, energy declarations and company information. The questionnaire, together with an introductory letter, was sent out to each company in the statistical population in September 2006 and directed at environmental managers or alike. Addresses were obtained from Statistics Sweden's company register. Three reminders were sent out. With the purpose of investigating dropout reasons an e-mail was sent to environmental managers in companies that had not answered the questionnaire after the second reminder. The data has been stored and analyzed with help of the statistical programme SPSS. A statistician has been consulted during data collection and analysis to secure the reliability and validity of the results. The responses have been compiled for the whole building sector but also allocated to the four actor groups: architects, technical consultants, building constructors, and property owners/managers.

Tab. 1 Total number of companies, response frequencies and response rates

	Total number of companies	Rate %	Number of responses	Rate %	Percentage of answers
Architects	36	6,6	20	8,1 %	55,6 %
Technical consultancies	55	10,2	25	10,2 %	45,5 %
Construction companies	300	55,4	123	50,0 %	41,0 %
Property owners and managers	151	27,8	78	31,7 %	51,7 %
Total	542	100 %	246	100 %	45,4 %

2.3 Statistical population

The survey covers all companies with at least 50 employees within technical consultants, buildings constructors, and property owners/managers and companies with at least 20 employees within architecture. According to the Statistics Sweden, 620 companies have a core business that falls into one of these categories. After a correction the final population, which the questionnaire was sent to, consist of 542 companies and/or

organizations. 246 companies answered on the questionnaire which corresponds to a response rate of 45,4 %. The response rate for architects is 55,6 % and for technical consultants 43,6 %.

3 Results

3.1 The environmental challenge

The environmental challenge is defined by how the companies see themselves contribute to environmental problems and how they experience environmental pressure from stakeholders. **Environmental pressure.** Both architects and technical consultants see landscape damage as their most serious environmental problem. Architects, then, experience energy use and technical consultants the use of non-renewable resources and toxic substances/chemicals as further serious environmental problems. The use of energy is the outstanding top issue the respondents put forward as the building sectors' major challenge now and in the future. **Stakeholder pressure.** Customer/clients, final customers, managers and employees are the four actor categories with the largest influence on environmental measures taken which is line with the sector as a whole, see **Fig 1**. Other actors, such as trade unions, banks, financial analysts, politicians and insurance companies, have very little impact on the environmental measures. However, in comparison to the sector as a whole, architects have been influenced more by for example consumer organizations (+13 %), environmental organizations (+10 %), trade associations and research institutes (+9 %), local groups (+8 %), and competitors (+6 %). Technical consultants, in contrary, have been influenced lesser by for example owners/shareholders (-13 %), national legislators (-10 %), environmental authorities (-8 %), consumer organizations and trade associations (both -7 %).

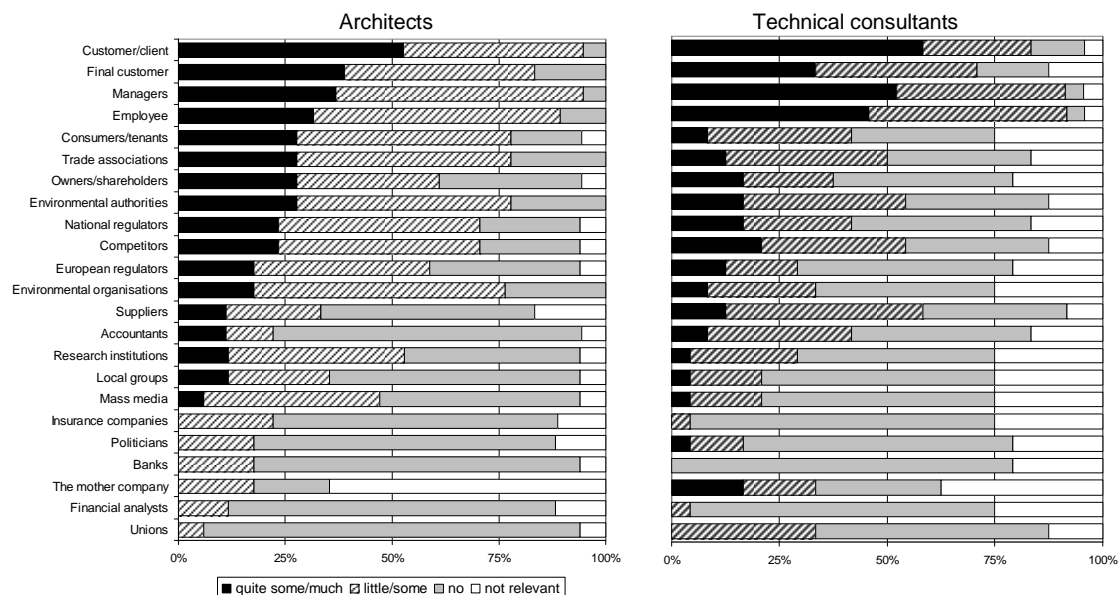


Fig. 1 Companies' rating of stakeholders' influence on environmental measures in the company.

3.2 Response to the environmental challenge

The companies' response towards their environmental challenge can take different expressions; employing personnel and create environmental working groups, cooperation with stakeholders, technical measures as well as managerial measures are some examples.

Personnel. The majority of architects (74 %) and technical consultants (87 %) have employees regularly dealing with environmental issues (building sector 81 %). Many of the respondents think to have enough knowledge to influence praxis (architects 79 % / technical consultants 92 %) or strategic decisions (63 % and 83 %). However, a relatively large share of the respondents, 30% of the technical consultants and almost 70 % of the architects, is not in a position to stop environmentally damaging processes and/or to influence strategic decisions.

Managerial measures. Today, 74 % of the architects and 88 % of the technical consultants work in accordance with an environmental management system (sector 73 %). Like for the whole sector, the most common measure is the establishment of a written environmental policy, 89 % of the architects and 96 % of the technical consultants have done that. Among product/market related measures, architects and technical consultants have implemented checklists, material guides and building material declarations, see **Fig 2**.

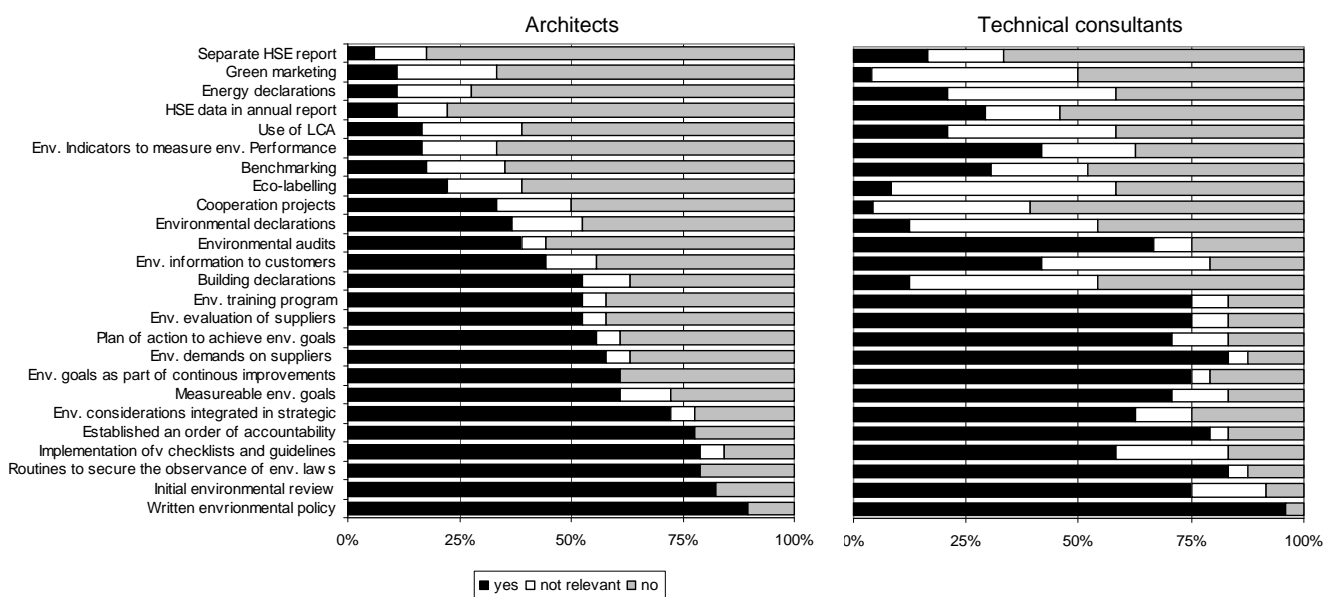


Fig. 2 Environmental management activities related to purchasing and market.

Technical measures. Like the building sector as a whole, for technical consultants the by far most common measure is waste separation (74 %). Architects, in contrary, have performed several measures with same importance: waste separation, material recycling within the company and accomplishment of environmental projects (56 %). In spite that many of the respondents emphasize energy as a major problem for the sector, there are only 33 % of the architects and 17 % of the technical consultants who have actively acted to substitute non-renewable energy sources. This is surprising given the importance of energy issues in the building sector.

3.3 Results from environmental activities

An indication of the success of the environmental work is obtained by looking at what extent environmental activities have had on environmental performance and business.

Environmental activities have had most impact on use of hazardous materials, as 17 % of the architects and 10 % of the technical consultants answered. Other areas which have been influenced are for technical consultants waste and contaminated soil (10 %) and for architects energy use, use of non-renewable resources, waste and risk of environmental accidents (all 6 %). For many of the problem areas the companies however state that there has been no effect or that they have no information about it.

Business related effects. A majority of the respondents answered that the environmental measures taken have had a positive influence on the company image and competitive advantages, however to a higher extent to the technical consultants (79 % / 74 %) than to the architects (53 %). Technical consultants also perceive pleased personnel as an important result (79 %), much more than architect (44 %). As the most negative effects of the environmental activities the respondents point out cost savings and productivity.

Among the **obstacles** which have impact on architects' environmental work the respondents see a lack of a market demand for green products/services, too costly and missing competitive advantages. Technical consultants experience mainly missing competitive advantages and lack of knowledge about available tools as obstacles, **Fig 3**.

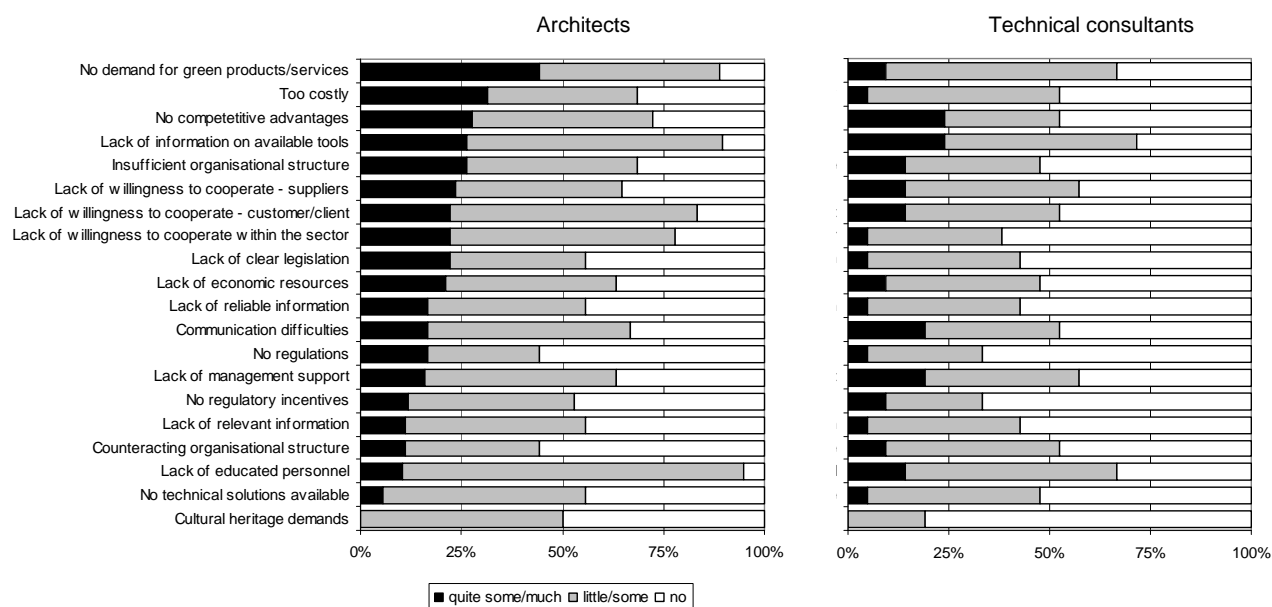


Fig. 3 Obstacles which have influenced environmental activities in the companies

4 Discussion and conclusions

Why, then, is it so difficult to incorporate environmental issues into mainstream business of architects and technical consultants? From the survey it is possible to conclude that both architects and technical consultants have an active environmental work with an

environmental challenge which is perceived and approached in a similar way by both actors, even if there are differences. However, there is an environmental inertia.

The building sector is struggling with energy aspects and use of non-renewable resources, the architects and technical consultants have a preference for waste management, and environmental activities of a managerial kind and they perceive that they have accomplished most results concerning the use of hazardous materials. Interesting here is that both architects and technical consultants have little control over the actual results of their environmental activities and that there is a discrepancy between environmental knowledge to influence and actually to do so, especially architects' environmental managers are not in the position to act. The technical consultants' (and the average of the building sectors') cooperation with R&D is much more limited than the architects, which creates a poor continuation of the development of pioneering green ideas, innovative green technique and new green business opportunities. Also, the especially architects' notion that the market for green products and services is dysfunctional does not stimulate innovation and new approaches. Further, the lack of cooperative actions between the actors involved in the building process limits the possibility to view the products and services out of a holistic perspective, even if this seems to be a larger problem for architects than technical consultants. Finally, the perception that banks and other financial institutions have little or no effect on the environmental work hinder that the issues are considered on the business agenda.

Regarding validity and reliability it must be emphasized that there is always a risk in surveys that intend to measure peoples' attitudes and values that the respondents may answer as they believe they should answer and/or try to place themselves and their companies in a favorable light. It is therefore important to acknowledge that this survey do not present an objective truth about the companies environmental work but rather measure what the respondent perceive as their environmental challenge, problems and so forth.

References

- [1] BAUMANN H., BRUNKLAUS B., GLUCH P., KADEFORS A., STENBERG A.-C., AND THUVANDER L. *Byggsektorns miljöbarometer 2002*. CMB-report, ESA Rapport 2003:2. Chalmers, Sweden 2003.
- [2] FEMENÍAS P. *Demonstration Projects for Sustainable Building: Towards a strategy for Sustainable Development in the Building Sector based on Swedish and Dutch experience*. Diss. thesis, Chalmers University of Technology, Sweden, 2004.
- [3] GLUCH P. *Building Green – Perspectives on Environmental Management in Construction*. Diss. thesis, Chalmers University of Technology, Sweden, 2005.

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