Social practices, structure and agency: Effects on environmental management in a construction project

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ABSTRACT

This paper discussed social processes and practices associated with environmental management in project organisations. The focus is on the interplay between structural conditions and managerial agency and its effects. Drawing on a qualitative case study, organizational and social mechanisms that influence the interplay between environmental management and project management have been studied. Findings show the existence of built-in tensions in the relationship between how the environmental work respectively how the project is organized and managed. An effect from these tensions is that organizational units within the corporation, due to isolation, partly strive towards different goals. This way of organizing also restrains the environmental organizations ability to communicate environmental information as well as the project organizations ability to handle environmental issues properly. It is concluded that the way environmental issues are dealt with in construction projects largely depends on their legitimization in the project and how well socio-cultural communication processes succeeded in creating meaning and understanding for practitioners in relation to their specific practice, situation and context. It is also found that environmental work governed by a top-down controlled environmental management system match poorly with the decentralized and autonomous decision-making culture of project organisations, making them insufficient for situated project practice. It is concluded that top management need to support the establishment of communicative communities of practice by offering arenas where members from the two units can team-up.

Keywords: Project-based organizing, project organizations, environmental information, environmental management, organizational structures, social practice, communication

INTRODUCTION

> *"We have me [as environmental informer]. I write and send messages in paper documents. Everyone throws them away. Now e-mail is supposed to be more used; it is better for the environment, but getting the information is up to each individual. There is an infinite amount of information; I give them hints about what is realistic."*
> (Environmental Manager, Construction Company)

This quote highlights some critical issues concerning mediation of environmental information in projects. The most striking feature is the implied low status assigned this type of information. Another aspect that can be gleaned from the quote is the assumption that environmental issues can be itemised and sorted in categories of more or less "realistic," i.e. important. Furthermore, the criteria for the classification seem to be determined arbitrarily by one or a few people. On the basis of this person's world-view, situational context and preferred discourse, he/she interprets, evaluates and condenses what is thought to be realistic or important environmental information and mediates it to a group of heterogeneous users. How the information is then received and acted upon by these users largely depends on the needs of the receiver, the persuasive force of the mediator, the mediating tools used in the communication process and the urgency of the communicative situation.

Project-based organizing of companies, which is still an increasingly occurring mode of organizing (Bresnen et al 2003; Lundin and Steinthórnsson, 2003; Packendorff, 1995; Midler 1995), is mainly characterized by being permanent organizations that carrying out their core activities in temporary projects. The permanent organization and the project organization differ considering time-frames, tasks, organisational settings, and internally also in context. A challenge in project-based organizations is to align permanent structures of the company, e.g. management systems, with the temporary organisation and operational activities performed within projects. This alignment between the temporary and the permanent has been documented to be marred with problems; for example concerning knowledge management (Styhre *et al.*, 2004), organizational change processes (Bresnen *et al.*, 2005), management practices (Labuschagne and Brent, 2005) and adoption of innovation (Dubois and Gadde, 2002). All these examples affect how the permanent organization's long-termed environmental strategies and goals are implemented and realised in the projects as well as how these are interpreted and managed in the project settings.

To handle increasing societal environmental demands many companies, also those with project-based organizations, have adopted environmental management systems (EMS), methods and tools that were originally developed for organizations with more stable organizational structures (Baumann *et al.*, 2002; Ammenberg and Hjelm, 2003; Burström von Malmborg, 2002). However, in spite of academic, industrial and societal efforts and despite the availability of a multifaceted smorgasbord of systems, methods, and tools, there is a noticeable lack of enthusiasm among practitioners in project-based organizations to adapt, use or apply them in their day to day work (Gluch, 2000; Cole and Sterner, 2000, Gluch and Baumann, 2004). In addition, the academic debate on whether these means will ever be compatible with project-based organizing seems to be lacking or at least has not yet surfaced. Drawing on findings from a case study this paper makes an attempt to partly fill this gap. The aim of the paper is to increase the understanding of how organizational structures and management practice of projects influence on how environmental issues are managed in the project-based organization. The focus is on the interplay between structural conditions and managerial agency and its effects on communication of environmental concern.

IDENTIFYING A RESEARCH GAP

A majority of research and industry efforts addressing environmental management in projects share the same common objective, that of applying a normative theoretical perspective on projects (see overviews in Gluch, 2000; Gluch, forthcoming). This perspective assumes that projects are tools that are intended for goal achievement. It also means that projects are regarded as objects that can be controlled and manipulated through a prescriptive and normative set of methods and techniques. Important assumptions in this normative perspective are that a project is characterised by being unique, being goal-oriented, and, what is especially underlined, by having a measurable output (Maylor, 1996). However, methods and techniques developed based on this rather normative perspective on projects, disregard the organizational context and the inner work of a project. Recognizing this, an alternative theoretical perspective considering projects as "temporary organizations", emerged in the 90s (c.f. Engwall, 2003; Lundin and Söderholm, 1995; Packendorff, 1995; Kreiner, 1995). Besides the highlight on temporality, this perspective also stresses complexity and contextuality as important characteristics of a project. While the normative project management approach views the project as a universal tool that make things happen, this perspective on projects as temporary organizations focuses instead on understanding what happens inside the project, i.e. emphasis is on studying different phenomena and characteristics of projects, such as decentralization (Lindkvist, 2004; Dubois and Gadde, 2002), autonomy (Eskerød, 1996), complexity (Baccarini, 1996), differentiation (Lindkvist, 2004), bracketing (Kreiner, 1995; Dubois and Gadde, 2002), and operational and contextual uncertainty (Kreiner, 1995; Turner and Müller, 2003), organizational learning (Styhre et al, 2004; Bresnen et al, 2004), and standardization (Räisänen and Linde, 2004). So what about these and other organizational phenomena and their relation to corporate environmental management? In a review of topics of articles in the leading journal on project management, *International Journal of Project Management (IJPM),* 3 articles out of 339 addressed the topic 'safety, health and the natural environment' (Themistocleous and Wearne, 2000). This study covered the period 1984-1998, screening the journal for articles addressing this topic up to present adds three more articles to that list. However, except for one paper (Labuschagne and Brent, 2005), the articles applied the normative approach by suggesting monitoring or controlling tools for environmental management, failing to address organizational aspects related to this topic. Worth mentioning is nevertheless Labuschagne and Brent's conceptual article, which criticises current project management practice for having a time-frame that is not consistent with core principles of sustainable development. Even if it is not possible to make conclusions based on articles published in one single journal it undeniably indicates that the project management research community has paid little interest to phenomenon related to the greening of project-based organizations.

So, how about researchers on corporate environmental management, have they paid more attention? Organizational features influence corporations and professional organizations, this is a well acknowledged fact, and much research has been carried out on how different organizations manage the environmental challenge facing them. Most organizational studies concern strategic environmental actions and processes on a corporate organizational level (e.g. Atkinson *et al.*, 2000; Ransom and Lober, 1999; van den Bosch and van Riel, 1998; Burström von Malmborg, 2002; Blomqvist and Sandström, 2004). Although Atkinson *et al.* (2000) have explored how different organizational structures affect the way environmental aspects are perceived and managed in corporations, their conceptual discussion raise questions for debate rather than a thoroughly in-depth investigation. In addition, project-based organising, even though it may in part resemble matrix structures, is not issued in their article.

Research has also focused on inter-organizational activities, such as environmental networks (e.g., Clarke and Roome, 1999, Boons and Berends, 2004), cooperation between corporations and authorities (von Malmborg, 2004; Starik and Heuer, 2002), cooperation between corporations and non-profitable organizations (Starik and Heuer, 2002) as well as cooperation in the name of industrial ecology (Korhonen et al, 2004), or temporary green reform projects (e.g.; Dobers, 1999; Füssel and Georg, 2000; Bergström and Dobers, 2000). SMEs, similarly to project-based organizations, have been found to have problems in relation to implementation of environmental performance tools (e.g., Petts et al, 1999; Tilley, 1999; Ammenberg, 2003). In sum, it seems that the academic field of environmental management neither has paid much attention to studying project-based organizing.

THEORIES ON SOCIAL PRACTICE AND COMMUNICATION

Environmental performance of a product does not solely depend on technology but is also influenced by on-going acts of organising, e.g. the management of technology through for example management practices (Baumann, 2004). From an environmental perspective, the objectives in institutional theory are to create an understanding of how the natural environment enters the business agenda and how the environmental challenge is embedded into decisions, management practices and organisational structures (Scott, 1998). In the context of environmental management, this means that researchers explore mechanisms for greening and the greening of industry is regarded as a constantly on-going process of institutional change. The institutions are in turn created by people that interact within them. Institutions thus provide a pattern for behavioural norms that is often seen as so obvious that nobody questions them. The theoretical assumption made is that greening of industry is a process where people constantly are involved in the act of organising.

A basic assumption that unites institutional theories is that ideas are institutionalized through a process where individuals collectively create meaning of them based on their previous understanding set in relation to their social context. In this process, notions of for example the natural environment are verbalized and translated into objects that in turn are translated into action. The interpretation and translation of the natural environment is dependent on contextual organisational factors such as corporate identity and how the corporations have legitimated environmental aspects (Sharma, 2000). An implication for environmental management is that individuals interpret what is 'proper' environmental behaviour and behave thereafter. In so doing, individuals tend to overestimate their own input and want to determine their preference on the basis of self-interest (Wade-Benzoni *et al.*, 1996). They also use their own behaviour as a standard of what other people will do. This implies that people's behaviour may be characterized by what they want to do instead of what they should do. As a consequence, individuals create meaning based on their own personal interests and cognitive limits through a social process where new environmental information must compete with beliefs that people already hold (Eagly and Kulesa, 1997).

Bresnen *et al.* (2005), comment that new management initiatives, such as environmental management, are often deployed to challenge and reorganise organisational structures and practices. Kadefors (1995), in turn, discovered in her study of implementation of quality management practice that the construction process and the occupational roles where heavily institutionalised, and that changes in established practices were met with great resistance. Several researchers have pointed out that the construction industry relies on strong professional (e.g. Dubois and Gadde, 2002; Gherardi and Nicolini, 2000). Regarding each project as a collectivity where individuals are united by an endeavour to realize a project goal, the personnel employed in the project coheres to project practices that are set in the

community rather than for the firms as a whole. As such, these collectivities are composed of sub-cultures in which practitioners have their own orientations, which influence their understanding.

This indicates that when dealing with environmental management and communication of environmental issues, one has to balance between adjusting to common practice and culture on the one hand, and challenging practice and culture on the other (cf. Bresnen *et al.*, 2003 study on knowledge management). Studying implementation of new management practices (accounting models), Briers and Chua (2001) discovered a number of factors that influenced how well the practices survived in an organisation. They found that to keep the system alive it was necessary that promoting actors for the system were present on lower levels of the firm, it was also necessary that the system was made visible to the organisational members, e.g. through seminars and discussions. Moreover, it was important that the model was flexible enough so that it could be suited to the context and also that the model delivered data that made sense, for the organisational members.

Any collective action towards environmental sustainability entails that individuals, engaged in business, behave and make decisions that independently are pro-environmental. Knowledge on environmental issues plays here an important role for how individuals act (Kaiser *et al.*, 1999). Diffusion of knowledge is dependent on communication (Bresnen *et al.*, 2003). Co-ordination, in time and space, of multiple activities, highly distributed work practices, and a great number of involved persons, influence and put demands on communication in construction projects (Styhre *et al.*, 2004). Being a social process, the ability of project members to handle the rhetoric of the project organisation is very important, if one wishes to influence or govern it (Lundin and Söderholm, 1995). In order to make project members understand and apply new insight and knowledge to their own context it is important to develop a shared meaning (Bresnen *et al.*, 2003). As suggested by researchers (e.g. Stenberg and Räisänen, 2006; Häkkinen *et al.*, 2002), communication and information are crucial aspects for a corporation to manage environmental aspects in the construction industry. For construction projects, poor communication has in fact been recognized as a major cause for the construction industry's inefficiency (Kadefors, 2004). In the context of construction projects, individuals are highly dependent on timely and accurate information since they continuously make decisions that very often cause or may cause environmental impact. The communication of environmental information and knowledge is therefore a critical factor for environmental management.

In order to create a common understanding of construction work the project organisation needs to create a common reference frame (Bresnen *et al.*, 2003), which is done through a continuous process of communication. Scholars (e.g. Strannegård, 1998; Keogh and Polonsky, 1997) have emphasised that the way environmental issues are communicated in an organisation has a considerable influence on how environmental issues are managed. It has been shown that the choice of corporate communication mechanisms determine if environmental issues are to be interpreted as something that is purely for experts, as something that only involves costs, as something external, or if environmental issues are to be considered as a key concern for future development and business survival.

In a communication process language is used as a means for coordinating action (Orlikowski and Yates, 1992). Language is mediated though discourse and texts (Fairclough, 2003), as well as technical tools and genres (Orlikowski and Yates, 1992). Communication therefore is considered as an essential part of an ongoing organising process where social structures, practices and identities are produced, reproduced and changed (Orlikowski, 2002; Orlikowski

and Yates, 1994). Fairclough (2003) defines discourse as a particular way of using language and other symbolic forms to represent some part of the physical, social or psychological world. Genres in organisational communication are, in turn, defined as socially recognised types of communicative action. In construction projects knowledge and information is mediated through, for example, genres such as telephone calls, meetings, documents, talk, print-periodicals, and e-mail (Gluch, 2004). Genre repertoire consists of a mix of standardisation attempts, norms, rules and prescriptions (Joerges and Charniawska, 1998). However, genres do not only serve as mediating tools to regulate and legitimate interaction, but also to normalise and control (Räisänen & Linde 2004).

A QUALITATIVE CASE STUDY

This paper draws on a case study conducted over a one-year period in 2003-2004. By having a long tradition in carrying out their core business in projects and the organizational mode itself is well manifested in the organization, which make the construction industry is a relevant representative for project based organizations.

The study object and settings

The target of the present research was a large international construction company (IntCon). IntCon was chosen not only because it is a project-based organization but also due to its strategically pro-active commitment towards greening and the fact that the company is often seen as setting standards for Swedish construction industry. IntCon is certified according to ISO14001 and the company group supports the United Nations Global Compact and is, since 1999, listed on Dow Jones Sustainability Index. Although ratings in sustainability indexes have been questioned as a standard of value on environmental performance (Cerin and Dobers, 2001), they indicate that top management of IntCon has adopted an active environmental strategy.

The object of interest in the study was an inner-city tunnel project where IntCon was the contractor and the Swedish Road Administration (SRA), a public authority, the client.

The construction part of the Tunnel Project started in the autumn of 2001 and is planned for completion in 2006. The task of the Tunnel Project was to construct a four-lane car tunnel in a way that it could meet the demands set by the society, the client, the contractor, the project organization, the project members and the environment. The project has a high degree of complexity and is politically vulnerable. Thus it has had many project-specific technical and environmental difficulties to navigate and a multitude of unanticipated complications to solve.

The project was organized as a design-build contract. In design-build contracts, the client is only responsible for the briefing, where overarching specifications concerning different performance aspects are set. The contractor is thereafter responsible for the whole process of leading and co-coordinating the design and construction phases. The Tunnel Project employs approx. 120 people of which about one fourth are managers and foremen. The project team is varied, consisting of a number of specialists with different skills, education and market value. Moreover the team members change over time, which gives rise to disruptions and realignments throughout the project trajectory. Figure 1 provides a schematic organizational chart of actors that, in different ways, influence the Tunnel Project. There are, however, three main actors; IntCon, the project team and the client. An extended case description can be found in Gluch (forthcoming).
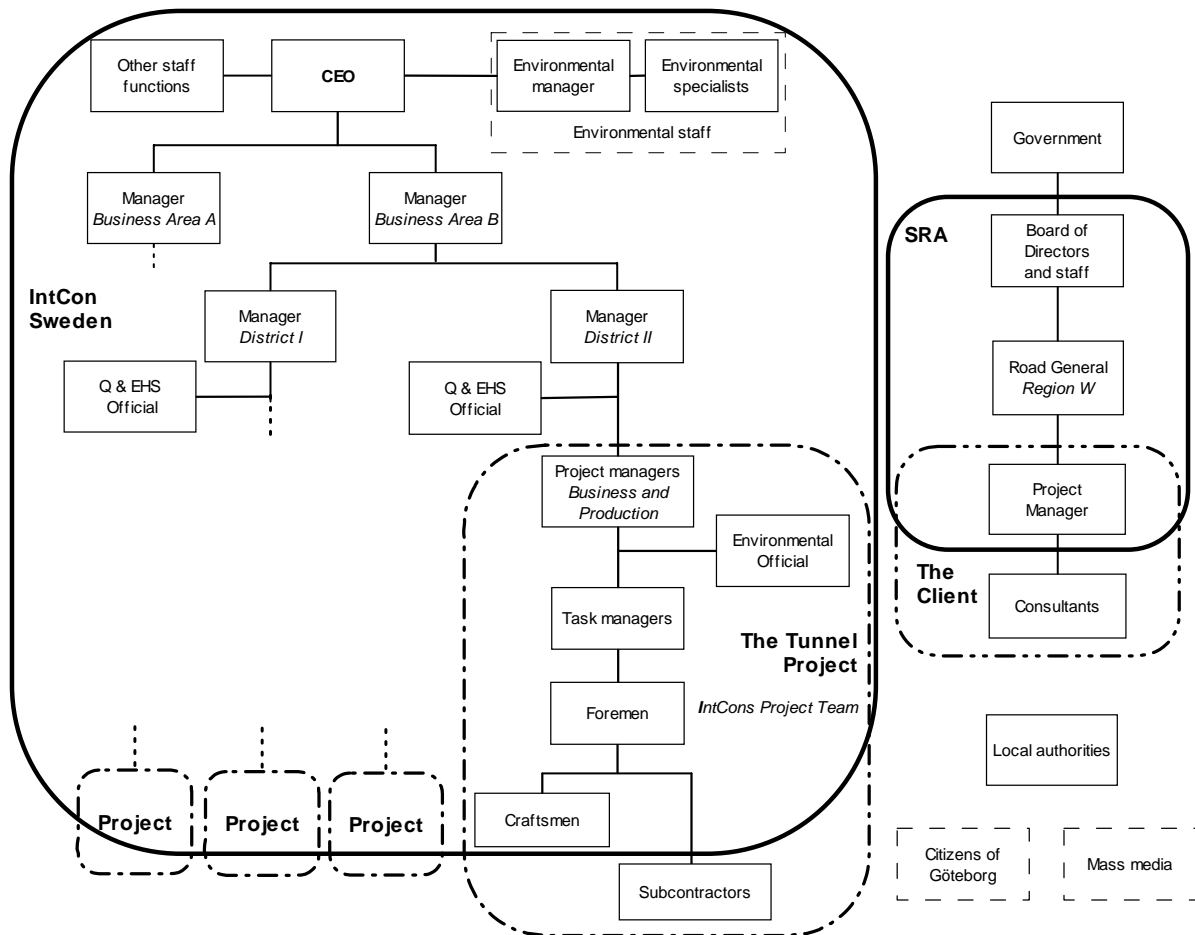
Figure 1: Schematic organizational chart of actors involved in the Tunnel Project.

Method

This paper draws on a qualitative study – comprising on-site observations, text analyses and semi-structured interviews – of a large inner-city tunnel-construction project, henceforth referred to as the Tunnel Project (TP), conducted over a one-year period in 2003-2004. Four weeks were spent on site to become familiarised with the context, the practices and the jargon of the project community. During this time, internal and external paper documents, the company intranet and the management control systems were scrutinised. Over 500 written and digital documents were screened for environmental information. In addition, over the year, 11 of the weekly environmental site inspections were monitored. These half-day inspections were photo documented.

Semi-structured interviews were made with 14 persons involved in the production and dissemination of environmental information to and from the project. These interviews lasted between one and two hours, and were recorded and transcribed in full. Interviewees were informed that the focus of the study, was on the communication practices concerning environmental information rather than communicative practices in general. However, we allowed space for the interviewees to elaborate on related issues raised during the conversations.

Since abstract and ambiguous terminology pervades the field of environmental concerns it is imperative that the denotations and connotations of the researchers match those of the interviewees. The knowledge acquired from the comprehensive field observations mitigated the risks of ambiguity and misunderstandings. On four occasions, informal conversations

were carried out with the environmental official on site (EO_{TP}). These provided rich material, which was documented in field notes.

The use of multiple sources, interviews, field observations, photo documentation, and text analysis provided a unique view of the project members' physical workspace and their social practices. Throughout this study we have tried to maintain a reflexive stance towards our study object and our own involvement.

ORGANIZING THE ENVIRONMENT IN INTCON

This section presents results from the case study on how the way environmental management was organized affected how environmental issues were handled in the Tunnel Project.

The environmental unit

The decision to obtain an ISO14001 certification was an immediate response to the company's involvement in an environmental accident, the Halland's Ridge Case (HRC), in 1997. In the Halland's Ridge Case, a toxic grouting agent injected in the tunnel walls leaked out to nearby watercourses killing fish and making cattle ill (Danielsson *et al.*, 1998). The certification process in 1998-1999 was very intense and affected IntCon's whole organization. In an initial phase IntCon mobilized with a strong environmental organization, managed by influential actors in the company. Environmental concerns became a guiding principle and were strongly promoted by top management.

After the environmental certification the substantial environmental unit was gradually reduced and the handful of people that remained from the former environmental unit were isolated and decoupled from where the production takes place, i.e. the projects. The following quote illustrates this isolation, were the environmental specialist, although his office is located 500m from the construction site, had no insight nor were informed of environmental activities in the project.

> *Interviewer: If there was a large oil leakage at the Tunnel Project and rescue-service had to be contacted, would you be notified? Environmental specialist: I guess I would not be informed about it, if I receive information about the incident it would probably be through the newspapers.*

This handful of people, with an environmental manager in charge constituted an environmental staff, and were appointed to be environmental agents for the organization (see Fig. 1). In their role as agents and as environmental specialists in the organization they had to be keen and open to societal changes as well as organizational needs. However, being decoupled from where the production takes place the interviewed expressed being torn by a situation where they, due to limited time-resources, was set in interdependence (Lewicki *et al.*, 1994). Being few also put them in a position of somewhat ambiguous role as both generalist and specialist. They perceived the situation as they were carrying out a balance act where on one hand they had to manage the difficulty of combining a strategic, policy-based, all-embracing and long-termed perspective relevant for IntCon's whole business and on the other hand they had to gain profound expertise within a targeted field of knowledge. The members of the environmental staff were also placed at different locations which not only decoupled them from the project organizations but also made them loosely coupled with each other, which did not nurture networking and the creation of a fruitful experience sharing community.

Maintaining the environmental management system needed extensive administration that exceeded the capacity of the handful people in the environmental staff. To handle the increased administration, environmental officials with a pure supporting role were assigned on operational level, on district and/or project, which created a satellite network of environmental administrators working rather independently from each other (see Fig. 1). The administrative environmental task was on this level also often combined with other administrative tasks, for example quality, safety and purchasing. To simplify routines IntCon had a management system that integrated quality and safety aspects with environmental aspects, which to a high degree determined how these administrative tasks were distributed on an operational level. Thus the officials' tasks were mainly administrative and as support, e.g. reviewing and summarising published environmental information and new governmental laws and directives. The EO on site (EO_{TP}) had however high visibility and access to all the sources of environmental information available in three relevant settings, in the project, from the construction company and with the client. He was therefore expected to act as support and filter of the environmental information to and from the project.

Furthermore, the persons in this administrative position had neither an influential authoritative position nor formal responsibility in the organization which undermined their role and their possibility to take action. This way of organizing also made these environmental officials loosely coupled from both the environmental unit and and the production focused project organization.

> "One disadvantage with this job is that you sometimes are regarded as a nag and as difficult because you make demands. You say: 'You cannot use this product.' 'Yes I know but only for this time, we are in a hurry, we have a deadline to meet' and, well, sometimes you have to turn a blind eye to it, but at least you try to make them think ahead so that it is not regarded as 'oops do we have to do that as well'. (EO)

As indicated by the quote there were indications that the environmental officials had to deal with situations in which their personal beliefs and ideology conflicted with the production-focused and time-pressed agenda of the project. Handling this balancing act between personal and professional convictions and fulfilling project-goals according to cost and time specifications, could put undue pressure on these officials, who perceived themselves to be rather isolated in the project milieu.

The organizational manoeuvre of having a centralized environmental staff with a distributed satellite network of administrative environmental officials was also perceived as a degradation of the former environmental unit. This in turn was interpreted as if environmental issues on a corporate level had shifted from being strategically important into bureaucratic administration of papers.

However, due to the different organisational structures and social processes of the involved parties, grounded on different ontologies and work-views, there was a lack of coherence concerning the status and definition of environmental activities. Rather than being anchors, the EOs often perceived themselves, and were indeed perceived by project members, as "nags" (see quote in table 1). Since the EO_{TP} wielded no power, he had little ability to influence managers or workers on site. The dismantling of IntCon's environmental division also meant that he lacked the support of an authoritative unit due to the de-coupling of the project. The building inspector, among others, described the EO_{TPs} job as something nobody wants to do; "it's not the most fun job. There is too much lecturing and that is not so popular […] They [construction workers] are very focused on the actual production and would gladly skip this environmental stuff".

Environmental management practice

By concentrating the environmental expertise in a few persons on a corporate staff level and distributing the administrative environmental work onto officials with foremost a building technology background, much reliance was placed on the internal web-based environmental management system as guidance for the project members to act pro-environmentally. Relying on a web-based EMS required that environmental routines and procedures were standardized. This standardization of the environmental work, however, conveyed that the environmental issue was controlled from top with very little room for flexibility.

As one of the pillars for ISO14001 is continuous improvements, it is important to find ways to measure and communicate environmental performance within the company. This requires well developed routines for two-way communication. The communication between the strategic level and the operative level was in the bottom-up direction foremost based on a mandatory yearly report, and in the top-down direction either through optional search on the intranet or through 'anonymous' send outs by e-mail (see also Gluch, 2004). As illustrated by the following quote, the organizational distance between the environmental organization and the project organizations made the environmental organization impersonal which hindered a smooth communication between the parts.

> *Sure, I can call some environmental dude on my division, I don't recall his name, but there are many that call him and he does not have time helping us. (Foreman)*

Being unfamiliar with the environmental unit, members of the project organization instead addressed inquires to persons that already were among their established personal network. As a consequence, inquires were addressed to people who did not have the most solid knowledge within a specific area.

The use of ISO14001 as a governing instrument also demanded extensive reporting which required a text based communication culture. This, however, was found to be conflicting with the oral face-to-face communication that was emphasised by the interviewed to be the most common and preferred mode of interaction in the Tunnel Project (Gluch, 2004), and reporting routines were perceived as unusual and bureaucratic.

ORGANIZING THE TUNNEL PROJECT

The preceding section presented how environmental management organizing and practice in IntCon affected how environmental issues were handled in the Tunnel Project. This section will instead focus on the influence of project organizing and practices.

The project organization

The project team at the IntCon's Tunnel Project consisted of approximately 120 persons, of which approximately 40 were managers and foremen. IntCon has a decentralized organization where each project is an autonomous unit with a project manager(s) that is held responsible for actions and decisions taken within the project, for example financial result and environmental performance. The project management of the Tunnel Project consisted of a one business manager, that had the contractual responsibility, and a production manager, that was responsible for the planning and control of production (Fig. 1). The Tunnel Project was a complex construction comprising many project-specific technical and environmental difficulties to navigate and a multitude of unanticipated complications to solve. Being a complex project the Tunnel Project also required a variety of technical experts that in the tunnel project were coordinated in specialised task groups each led by a task manager.

Although they possessed no formal responsibility they, due to their technical specialisation and/or expertise, were in a position where they possessed a mandate to take actions. To ensure that the client's demands on environmental reporting were met as well as to undertake administrative commitments with regard to the corporate environmental management system IntCon also had a person especially assigned to administrate environmental and quality aspects. However, this person did not have any formal environmental responsibility for the project's environmental performance.

While the project members were employed in the project they were also temporarily decoupled from the mother organization where they are employed between projects. The work by the technical task groups with 'traditional' construction work, for example concrete work, resembled Eccles' quasifirm (Eccles, 1981) by having tight organizational bounds between the members, i.e. the same persons were found to stay organizationally together from one project to another (see quote below).

> *I have worked with most of the foremen and workers in my task group for several years now. I know them inside and out; we're almost like a touring circus. (Task manager)*

These persons did not find the loose coupling from their mother organization as problematic since they perceived that they had all competence needed within their task group. Task groups, with a more specialised task, for example advanced foundation work, however, were more troubled by this double organizational belonging. These persons were found to be more negatively affected by the isolation in the project and thus expressed more explicitly that they experienced it as important to belong to, and keep up contact with, a knowledge sharing community. The notion in the following quote illustrates an almost resign acceptance of this situation.

> *The project is the project and, well, here you are... the project is very isolated. (Task manager with a specialist role)*

The project members' also perceived that the project had so tight time-frames that it did not leave much room for networking activities outside the scope of the project. So, they experienced difficulties in keeping up contact and previously established contacts faded. As an example, the environmental official in the Tunnel Project described his contact with other environmental officials at IntCon as 'occasional' in the beginning of the case study and 'hardly ever' a year later. Additionally, there was no systematic or controlled exchange of environmental information between different projects within IntCon. Except for what was examined in internal audits there were no routines for the project organization to communicate environmental experiences from the Tunnel Project to the rest of IntCon. Experience from the project thus stayed within the group of people involved in the project. Whether the members in the project organization got information from other ongoing construction projects depended to a high degree on the personal networks and on which kind of communities of practice one belonged to. Many of the interviewed project members also experienced it as being up to each and everyone to make contacts and to search for the right persons to communicate with. The members of everyone's personal network also seemed to be a result of coincidences rather than a deliberate move to find persons to exchange knowledge with. Consequently, most personal networks seemed to be homogenous groupings, i.e. a group of persons that share profession, educational background, gender and age.

Project management practice

Due to the Tunnel Projects environmental vulnerability the client demanded a lot of control over the project and had also especially pinpointed environmental issues as an important

issue. As a result the project to a high degree was regulated by the client's stipulated environmental demands. For example, detailed restrictions on levels of environmental impact on water, land, vegetation and air, levels of noise and vibrations, and handling of chemicals, material and waste were specified in a specific environmental control plan. This environmental control plan was a flexible document that needed to be promptly revised in accordance with societal changes and acquired experiences, which made it a 'living' document. This was found to invite the project members to contingently interpret environmental issues which in turn kept these issues alive throughout the project. In this way, and which the two following quotes illustrate, the contractual document in addition to being a control mechanism of the client also came to play symbolic role in the project.

> "I think the program is very good. This is the first time I work according to such a comprehensive environmental document. It is an advantage that all specifications can be found in one document." (Task manager)

> "... [with the ECP] it is not 'in section that and that' now it is simply 'in the ECP', that's make it easier [to communicate]." (EO)

However, the specification of environmental issues in the ECP entailed that project members including environmental officials had no need to seek environmental information proactively, for preventive or long-term purposes. Moreover, they seldom sought information outside the sphere of the project or company. This reliance on the client's classification of environmental priorities could lead to bias and lack of discrimination and complacency should unexpected symptoms of environmental ills arise.

Moreover, although symbolic power of the environmental control plan, the overall project plan was the TP's utmost steering document. The project plan embeds the client's on forehand stated environmental demands as well as IntCon's environmental norms and policies. One problem with the project plan is that it is established in the design phase of the construction process, based on a fixed project goal. It is therefore inflexible and may contradict the changes made in the ECP, and since it is a highly visible as well as influential document, these contradictions may cause conflicts.

The project organization members were not familiar with IntCon's environmental organization and whom to contact if they had queries either. A consequence from the organizational distance between the permanent organizations and the project organization was that it created mistrust towards the environmental staff's ability to understand the project members' reality and work situation. This in turn nurtured a defensive attitude and a resistance towards suggestions of changes in environmental routines. The project members expressed a wish that what had been outlined in project plans established before the project started was preferably not to be changed during the project time. As the next quote indicates, changes were thought to negatively affect practice within the Tunnel Project.

> It feels as there is too much that is foisted on us, checklists and demands and other things, 'now you have to check that and that', Sometimes I perceive it's only as a showcase, especially if you know that you will not be able to fulfill the demands set on you. (..) I mean, we do not only work with green issues, we also have to produce something and make money. (Foreman)

This perspective of 'living in different worlds' is further stressed by that the top-controlled environmental management system, did not agree with the culture of the decentralized and autonomous project organization. The result were found to be two communities with different worldviews were the environmental staff's holistic and all-embracing perspective does not

interplay with the project members' pragmatic, task-bounded and time-framed perspective, which the following quote demonstrates.

> *"When we are engaged in a project it is the project time that decides the environmental boundaries, we look at the small scope of the project." (Project manager)*

Additionally, despite the extensive project time of six years, many of the interviewed expressed that they did not have time for anything else but the immediate task at hand. For example, the interviewed seldom read environmental information that was not directly applicable to the project task at hand and due to perceived shortage of time they seldom or never searched for information or read anything for preventive purposes.

TENSIONS BETWEEN STRUCTURE AND AGENCY IN PROJECT-BASED ORGANIZING

Construction projects are characterized by being a combination of human capital and material-input, coordinated at a specific site. The primary task is to erect a construction, with a strong focus on production, for now there is still a prevalent notion that a successful project is the one that has achieved the highest quality with the lowest input of financial resources in due time. The case study has revealed that there are several in-built tensions between how the project is organised and how environmental issues are organised. The main findings from the analysis of the case study are summarized in Table 1.

Table 1: Summing up empirical evidence from the IntCon Case

	Organizing the Environment	Organizing the Project
Inter-organizational relations	Decoupled from the project organizations	Loosely coupled with the permanent organization
Intra-organizational relations	Loose couplings between members (network)	Tight couplings between members (team)
Organizational control	Centralized	Decentralized
Organizational dependency	High and integrated	Low and autonomous
Communication	Text-based	Face-to-face
Time perspective	Long-termed	Short-termed
Performance focus	Strategic policy making and continuous improvements	Resource efficient production (foremost financial) and coping with environmental demands embedded in plans
Environmental scope	All-embracing and integrated	Targeted or embedded
Regulations	Governed by corporate and societal environmental standards and norms	Governed by the client's demands

Being autonomous entities, the project organizations easily become decoupled from each other, which together with the decentralized organizing has the consequence that the projects are separated from the processes of the permanent organisation (Lindkvist, 2004). Thus, having a decentralised and autonomous organisational culture has the disadvantage that much experience gained in the organisation is also unavailable since it is difficult to make it common goods for the organisation. Similarly to what Dubois and Gadde (2002) suggested, the present study found that the loose coupling between the project and the permanent

organization resulted in that organizations outside of the project, for example the environmental unit, become anonymous to the project members.

Especially construction has a business culture that by long tradition is decentralised where business relations preferably are made with persons that are familiar (Eccles, 1981). Out of this perspective, an anonymous centralized environmental unit and the EMS governance, and especially the top controlled issue of chemicals, were perceived as an unconventional move that was met with a certain distance. However, limited environmental knowledge, especially in chemistry, together with a fear of repeating the Halland's Ridge Case, made the issue of chemicals especially easy to control from top. The effort has indeed resulted in an increased and much needed awareness on environmental impacts of chemicals in construction. On the other hand, the field studies revealed a side effect of this intense and authorized focus on chemicals; communication of environmental issues has come to solely concern chemicals in construction (see the following quote).

> In the minds of many [at IntCon] and also in mine, if you say environmental issues we automatically think: chemicals. Environmental issues equal chemicals. (Project manager)

Consequently, other environmental issues, for example waste management, were disbanded and/or neglected in favour of the handling of chemicals.

To comply with stated project goals the project organisation tends to isolate itself from its context. Temporary bracketing of the project decreases the risk of interventions and unwanted disturbances (Kreiner, 1995). However, the bracketing of projects as temporary has the consequence that when a project is finished it is laid aside and the next one starts. Often projects also overlap with an overhanging risk that the newer project attracts more attention than the older, resulting in that the evaluation-phase of the project, when reflections upon the project and collective experience can be gathered, is lost. Moreover, even though environmental impacts caused by the construction process may exceed the project closure, the environmental boundaries were, as found in present study, mentally restricted to the time span of the project. That is, in a project the environmental problems are regarded as 'momentary', i.e. they occur during the project time and when the project is finished, they are considered a closed chapter. As a consequence, the project members' commitment to environmental issues is constrained by the project's time and space boundaries. As also recognized by Labuschagne and Brent (2005) this restrains them from having the holistic and long-termed perspective that is necessary for a sustainable development of the business.

A way to make the project consider environmental impacts that occur outside the project's time boundaries, and that was also done in the Tunnel Project, is to consider these by embedding them in project plans and contractual documents. However, project plans are designed with respect to a set of assumptions based on a number of actors' idea about the world at the time of the textual inscription. Project plans also simplifies the world by making the future unusually explicit so that precise definitions of boundaries, tasks, resources and their allocation are enabled. Nevertheless, as we all know, the natural environment is not static, it changes. Contextual uncertainty is created outside the project span and authority, which makes it impossible to predict in advance (Kreiner, 1995). For the project this change causes problems since the assumptions made in the design phase may not be accurate at the time of delivery or at any time in between. For example the conception of needs, desires and requirements that the project is meant to meet may change in response to incidents that happen under the project time. In addition, too much trust in that environmental aspects are

included in project plans and other specifications also has the consequence that a set of green truths based on past experiences were sedimented and institutionalized in the organization.

Bracketing projects provide an identity and isolating project members allows them to focus on their task by minimizing any disturbance to plans or other threats to achieving their pre-defined tasks (Lundin and Söderholm, 1995). However, as has also been pointed out by (Christensen and Kreiner, 1997), bracketing means that the project manager can only be held responsible for the project's efficiency and not for its relevance since the effects from the project appear after the project's 'closure'. Striving to be as efficient as possible, requirements other than the minimum requirements are considered by the project members as an obstruction. Consequently, changes in environmental routines, irrespective of its influence on efficiency, may be regarded as a 'burden'. So, on the one hand the de-coupling of a project provides a good foundation for creating a project that meets its in advance stated goals. On the other hand, the bracketing in time and scope jeopardize its possibilities to cope with contextual changes (Kreiner, 1995).

The arrangement of having loose couplings (networking) in the permanent organisation and tight couplings in the projects has in previous research been found to favour short-term productivity of individual projects on the expense of long-term effects for the company (Dubois and Gadde, 2002). This phenomenon also appeared in the present study where pure production task was prioritized over all other issues. The incentive for devoting energy and time to environmental development and innovations was very restricted unless earmarked resources were allocated by the client. In addition, environmental issues crucial for the project's accomplishment, and thus closely related to production, were not considered by the project members as environmental. So, what is the problem with that?, one may think. The issues receive large attention, and are hopefully also handled properly in the project. No, the problem is rather on a motivational and authoritative level. By rhetorically detaching environmental issues that are defined as 'important' for production, this way of itemizing also sends signals that what is left is not. This marginalises and labels the 'remaining' environmental work as work added on the regular work, i.e. work that one preferably would be excused from. This biased notion on environmental issues made the environment a side issue not highly ranked by the project members, simply a detail that can be negotiated. This fact put the environmental official on site in an awkward position where he/she had to go in defence for the interest of environmental issues against the more powerful interest of accomplishing the project with as little interaction as possible.

DISCUSSION AND CONCLUSIONS

From this study it can be concluded that environmental work governed by a top-down controlled environmental management approach does not match with the decentralized and autonomous decision making culture of the project organization. The result was two "isolated" organizational units that used different 'language' and partly strove towards different goals. This isolation was accentuated by the decoupling of the Tunnel Project from the rest of IntCon, giving rise to structural contradictions in terms of both practice and communication (cf. Dubois & Gadde 2002). The project's traditional hierarchical chain of command contrasted with the contractor and client's flatter organisations resulting in re-routings of information through additional translators to comply with project practices. For example, environmental officials had to go via project managers or foremen to get an action point implemented, which accentuated their lack of authority and risked further distortions of the original message. This way of organizing was found to create a distance between the persons that make strategic environmental decisions and the persons that shall realize them

within the operative units of the projects. This made the project organisation a self-regulating environmental organization with the consequence that the project member's motives for behaving pro-environmentally were biased towards short-termed performance, which restrains flexibility and innovativeness. Moreover, the temporary bracketing of the project restricted the project member's ability and motivation to perceive and handle long-termed environmental impacts. Environmental issues not closely related to immediate production were marginalized which pinioned the environmental official on site's ability to authorize actions apart from the minimum. In fact, environmental issues seemed to be regarded as extra work on top of what is regarded as regular work. The implementation of administrative tools such as the EMS, checklists and chemical databases amplified the marginalisation of environmental concerns to purely be considered as administration of a few targeted issues, for example hazardous substances and energy efficiency. A consequence of this standardisation of environmental aspects was also a fragmentation of environmental concerns. Even though the EMS created a common environmental framework for the organisation as a whole, which facilitated communication and enabled managerial control of environmental activities, it also encouraged conformity and simplification of environmental complexity. Moreover, the embedment of environmental policies into predefined project plans, foremost based on the client's needs and interest, diminished the scope for the project organization to react on societal and environmental changes.

As a consequence of the relative communicative inertia in the TP, project members seemed to rely, directly or indirectly, on information conveyed through project officials. Thus these functioned as filters for the environmental information travelling in and out of the tunnel project, with the potential to influence environmental practices in the project. However, although some of them had high visibility in the project, they had little possibilities of mediating strong environmental identities for themselves through their discourse and actions since their authority was limited. Instead, their roles and positions in the project community were indeterminate, resulting in lack of engagement on the part of their interlocutors and a feeling of isolation on their own part.

Finally, it is strongly suggested that it is necessary to break the "isolation" between the environmental unit and the project organizations by finding ways where practices and professionals can team-up. Although the establishment of communities of practice is a bottom-up process (Wenger, 2000), the top management can encourage their vitality by supporting the project organisation member's participation in a variety of networking activities. Top management can also nurture the creation of these communities by offering communicative arenas where people can meet and exchange information and knowledge. However, to make it work two things have to be considered. Firstly, it is important to consider the communicative culture of the organization so that fruitful and equal discussions can be held. Secondly, equality in the discussion need that the authority of persons that belong to the environmental unit must be powerful enough so that environmental issues receive righteous legitimacy within the organization.

The study has shown that the organisational features and social practices of project-based organisations are mismatched with centrally controlled environmental management practice. In addition, the study has shown that today's prevailing project practices clash with the long-termed principles of sustainable development. To reach and suggest solutions to how the tensions between corporate environmental management and project management emphasised in this article are handled, more studies are needed. A majority of the research efforts up to date have held the normative perspective on projects, where projects are regarded as controllable and possible to manipulate through a set of prescriptive techniques. However,

since the outcome from environmental decisions most often are uncertain, irreversible and often happen outside of the boundaries of the firm, a normative perspective fails to acknowledge environmental issues properly (Gluch and Baumann, 2004). There is thus a necessity, not only among researchers but also among practitioners, to adopt a broader perspective on projects in order to grasp the whole picture. Adapting an extended perspective on projects reconciles that also the context is encapsulated in project theories and practice. The context may then also comprise a social construction of the natural environment. This is where researchers interested in organizational aspects related to the greening of industry can largely contribute. With the increasing 'projectification' of industry, scholars should pay closer attention to this area of research. The area has large improvement potential that especially would benefit from an inter-disciplinary approach where the two communities, project management and environmental management, could team up in a flourishing cooperation.

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