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Environmental Management – Capacity and Concept Development in Environmental Networks: Cases of Thailand, Costa Rica, and Denmark.

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Abstract

The three-year doctoral research project on environmental management and networking is shortly introduced. The project will explore the hypothesis that the introduction of formal environmental networks or partnerships will positively influence the dissemination of pro-active environmental measures, and thus be operational in bringing about higher environmental standards towards sustainability. The context of the project is presented including the three types of empirical approaches that will be applied.

Subsequently, a critical case of public-private partnerships to be studied further is presented.

Green Network is a Danish, regional network focusing on environmentally related activities in businesses and public authorities. The network has existed since 1994 and presently has more than 250 members.

The main activity carrying the network is the environmental assessment carried out at firm level in a co-operation between the public authority and the industry. Additional activities most often than not relate to this, but in the context of the network, it is evident that the concept of environmental management is developing and progressing towards a higher and higher level of awareness and "refinement" with sustainability being the ultimate step.

Finally, the paper reflects on further studies of the network of relevance to the PhD project.

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Introduction

This work in progress paper aims to shortly introduce the doctoral research project currently being carried out as part of two Danish aid projects on environment and development, DUCED-I&UA[i] and SUDESCA[ii]. For more information on the respective aid projects, please cf. DUCED-I&UA (2001), Picardo & Müller (1997), http://www.duced-iua.dk, and http://sudesca.una.ac.cr.

In addition, the paper presents and discusses a critical case that is being applied as part of the research.

Doctoral Research Project, 2002 - 2005

The doctoral research project is co-financed by DUCED-I&UA and is part of a joint effort of Thai, Malay, South African and Danish universities to conduct collaborative research on the overarching theme "Environmental Management: Globalisation and Industrial Governance in Developing Countries". The PhD project is expected to conclude in mid-2005.

Being part of both DUCED-I&UA and SUDESCA, ample opportunities to conduct comparative studies on Environment and Development on a global basis are provided. In this project, however, it has been chosen to focus on the Danish, Thai and Costa Rican contexts.

The overall objective of the research project – with special emphasis on Danish, Thai and Costa Rican conditions – is to contribute to new and enhanced knowledge within the area of environmental management, including:

- placing foreign experiences with environmental networks and management – quantitatively as well as qualitatively – in relation to ditto Danish,
- critically evaluating potentials for and barriers to concept development within environmental management in Denmark and in the co-operation countries respectively, including evaluation of what elements influence **choice** of environmental management and/or cleaner technology[iii] CT concept, and
- creating new knowledge in regard to networks' and network partakers' roles in connection with environmental capacity development, and dissemination of CT and environmental management in small and medium-sized enterprises[iv] (SME) in Denmark, Thailand and Costa Rica.

The research shall explore the hypothesis that environmental networks via capability & concept development, and institutionalisation of concepts influence the dissemination of cleaner technology and environmental management in SMEs, and that such networks can function as exponent of new types of governance/regulation and co-operation between public institutions and private enterprises and thus be instrumental in bringing about higher environmental standards, quantitatively as well as qualitatively.

The research will mainly be driven by the two questions below:

- What potentials, barriers and driving forces in culture, management culture, structure of society and legislation exist in regard to implementation of general CT and environmental management and in regard to a network based approach
- How can public network partakers employ alternatives to traditional "command & control", e.g. in the form of voluntary environmental agreements, the establishment of environmental networks, etc., and how can it be ensured that such initiatives be rooted in an existing system so that continuity is warranted?

Types of studies

Three main types of empirical studies that will be related to institutional theory and the theoretical framework of the Uppsala Actor Network will comprise the research. Studying networks while not being part of the network is very difficult, if not impossible, and the empirical studies on the extensive and intensive level will thus be action-oriented, cf. below.

The three types are:

- Exploratory studies to define the context (institutional, legal, social, cultural, etc.) in which SMEs operate and how this affects their environmental practices. Potentials, barriers and driving forces will be identified and discussed.
- Extensive studies of environmental networks in general, including a typology that shall be developed accordingly. The extensive studies will seek to define the network concept and components; the network partakers; how the network operates, with which means, and to what effect; and how the networks are being rooted/sustained. The extensive studies shall furthermore serve as background for:
- Intensive case-studies, both at a so-called network-level and at the firm-level.

The empirical analyses on the exploratory and intensive level will focus on the respective textile sectors in the three case-countries.

In the remainder of the paper, I shall discuss issues of relevance to the extensive studies of environmental networks and introduce what can be defined as a critical as well as extreme case in the Danish context.

Private-Public Partnerships in a Danish Context

Denmark has a close-to 30-year history of decentralised implementation of environmental initiatives in cities/local authorities since its first Environmental Protection Act in 1973. At that time, regulation more or less only applied a "command-and-control" approach with "end-of-pipe" – or even dilution – being the preferred solutions. During the 1980ies and the early '90ies the focus shifted. New regulatory approaches and instruments were applied, the "Polluter Pays Principle" became *the Principle* and in general, the tide shifted from end-of-pipe to Cleaner Technology (CT) and thus from an environmentally re-active industry to a more pro-active one. The principle of CT was implemented in the Danish environmental legislation, and industrial production licenses were more and more granted and regulated based on a CT and Best Available Technology (BAT) approach. In addition, environmental management found it's way to the scene, first as simple, but none the less quite systematic, approaches. Later on, during the mid and late '90ies formal environmental management systems such as the ISO14000 series and EMAS, were introduced and followed by changes in regulation style to a more self-regulative approach and even to what can be identified as dynamic or differentiated regulation, based more on dialogue within and between the industry and the corresponding, regulatory body, e.g. municipality, or, as shall be shown below, between different actors in a formalised network.

Following environmental management systems, frontrunners in Denmark are now focusing more and more on a life-cycle approach, However, the number of industries prepared to and knowledgeable about such tools are quite small, and the general shift from a focus on production to a focus on product has still to come.

In addition, it has become more and more evident that SMEs are not introducing preventive environmental measures to the same extent as larger companies. Evaluations and recent studies

show that SMEs experience significant both external and internal barriers in this connection. The largest barrier seems to be the lack of human resources and capacities (Christensen et al., 1997; Christensen et al., 1999; CASA, 2001).

The three major steps shortly described above are visualised in the figure below, with sustainability added as the final step.

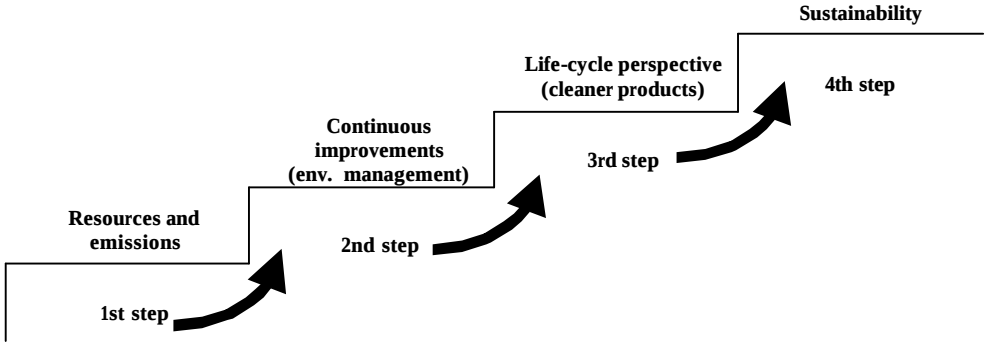

Figure 1 Environmental awareness and work visualised as a four-step staircase. In 1999 only 6 percent of companies in Denmark having prepared green accounts (environmental self-assessment) had incorporated the life-cycle perspective. 100 percent had a 1st step approach, 43 percent a second step approach and 0 percent a sustainability approach (Remmen, 1999).

Partnerships

In the Danish context, several evaluations, research projects, scientific papers etc. have emphasised that partnerships or networks, which focus specifically on environmental issues and involve both public institutions and private enterprises may be able to play a significant role towards SMEs in contexts such as raising awareness about "own impact on environment", available concepts and tools; actual implementation; and concept development, e.g. as shown in figure 1 (Remmen, 1998; Christensen et al., 1999; Vedstesen & Sonne, 2000). In this sense, it is positive that several such networks have actually been established and that work is in progress to sustain these initiatives, e.g. as a Danish Network for the respective networks (Miljøforum Danmark, 2002). As in many other cases, best practice is being sought out, attempted copied or appropriated, and disseminated, thus bringing about a general perception of a critical (and maybe an extreme) case. I will describe this case (Green Network) in the following sections, but first a basic description of five stereotype (or basic) models of government – business relationships shall be introduced.

Roles and Models of Government and Business Relations

A relationship means some degree of dependency or interdependency between two or more actors. Studying such relationships with a structural or a behavioural viewpoint is equally valid and relevant. However, if the development of the relationship and the learning processes are the focus of the study, a behavioural approach should be sought, as it is through the action/interaction the development and learning occurs. On the other hand, studying the organisation and thus applying the structural viewpoint is necessary to fully understand the relationship and be able to evaluate it and even compare it with others. Below, 5 models of relationships are shortly described.

Table I Stereotype models of government-business relationships, presented in order of increasing governmental authority; adapted from Sørensen (1994)

Type of Government	Public Authority (Public Sector)	Private Autonomy (Private Sector)
Laissez-Faire	Minimize.	Maximize
	The government must fight internal and external enemies to assure the survival of the nation, and assure the structural pre-requisites of perfect competition.	
Mixed Economy	Division of labour between Government and private sector based on effectiveness and efficiency. A borderline shall be defined linked to welfare considerations (Pareto-optimality).	
Partnership Model	Dialogue between government and private sector. The dialogue is taking place within a network of public and private institutions, and the borderline (cf. Mixed Economy) is replaced by a set of institutions that most probably will lead to a synergy (positive-sum) rather than just a division of labour (zero-sum).	
Public Policy Supremacy Model	The government represents unified political power and through policies, the government shapes or directs the actions for private business.	
Central Planning	Maximize	Minimize

Each of the five models presented in table 1 are distinct and in principle mutually exclusive. It is not possible to present one model as being the best model as this very much depends on social, cultural and historical contexts. In Scandinavia there is a tendency to favour the partnership model, while in Asia the public-private relationships are more in line with the Public Policy Supremacy Model. However, detailed analyses reveal that more than one model is most often being applied in the same country (Sørensen, 1994). The two extreme models, Laissez-Faire and Central Planning, can hardly ever be found in practice, and are thus conceptualised as reference models (Sørensen, 1999).

In the case of Green Network, I stipulate that the partnership model is being practised and it is thus relevant to elaborate on what constitutes the partnership model before presenting the case.

The Partnership Model

Based on the institutional approach and drawing on several theories, such as network theory, organisational theory and state theory, the Partnership model, in short, represents an institutional arrangement between public authorities and private enterprises that is able to handle a multiplicity of interests through interaction involving dialogue, negotiations and actions. The interaction process is essentially an institutionalisation and a learning process the outcome of which is new worldviews and new ways of doing things. The learning process, however, is not always smooth but paved with conflicts and power struggles (Sørensen, 1994).

Applying the Uppsala approach to networks (Håkansson, 1989; Håkansson & Snehota, 1995) actors in a network (or partnership) can be described using three dimensions: The activities they carry out and control, the resources they control, and the knowledge they possess about activities, resources and other actors in the network. For the individual actor, the network constitutes an expansion of the activity and resource foundation, and improving his position and exercising control will gradually enlarge this foundation.

The essential features of the Partnership model are: (adapted from Sørensen (1994))

- The principal actors are the private firms and their associations, the political bodies, and public authorities and institutions. Through interaction, intensive and often personal and long-term relations are developed.
- The relationship may be formalised by establishing specific institutions.
- The actors are not seen as unified decision makers but are characterised by a multi-centred power structure.
- In its pure form, the Partnership model is characterised by interdependence, trust, cooperation, and mutuality in the relations between government and business.
- Being political/economic institutions, the activities within the institutions aim at fulfilling ideological, strategic, and practical objectives. The activities comprise: policy formulation activities; campaigning activities; discourse activities; dialogues and negotiations, and implementation activities.
- The close interaction turn the institutions and the relations between the government and business in general into a learning process, i.e. the institutions can be looked upon as knowledge generating units opting for a plus-sum game instead of a zero-sum game.

With the Partnership model now presented, Green Network will be introduced along the line of organisation, activities and general results.

Green Network – a critical case

Green Network is a formalised Danish, regional network focusing on environmental matters. Members from private companies, institutions and public authorities comprise the network, which is firmly rooted in the county of Vejle and on West Funen.

The network was formed in June 1994 following a tender from the Danish Ministry of Commerce and Industry in co-operation with the Ministry for Energy and Environment for “Green City Denmark”, which should be the visible, international showcase for Danish environmental technology and know-how. Green City Network, as it was named at that time, was, however, not chosen. Nevertheless, the initiators decided to continue on their own and implement the idea behind the network, namely to set up – on a regional level – a professional forum for dialogue, the communication of knowledge and the exchange of ideas about environmental questions. Green Network now has approximately 250 members in four categories, cf. below.

Today, the overall mission of the network is to work towards sustainability with a focus on environment and social responsibility (Green Network, 2002). Further, the network must work in accordance with the global challenges in a voluntary and binding co-operation between enterprises and public authorities.

Organisation

Green Network is organised with four types of membership (Green Network, 2002):

V-member:
"V" is for "Virksomhed", the Danish word for an "Enterprise": Members who commit to preparing an environmental statement, which at a minimum fulfils Green Network's requirements. The environmental statement must be submitted to Green Network for evaluation three years at the latest after joining. V-members are mainly industrial enterprises.

Only companies who have their head-quarters in the County of Vejle or the Municipality of Middelfart can become V-members.

O-member:
"O" is for "Official": A fixed circle of public-sector members, consisting of the Municipalities of Fredericia, Horsens, Kolding, Middelfart and Vejle, as well as the County of Vejle.

K-member:
"K" for "Kommune", the Danish word for a "Municipality": K-members are the smaller municipalities in Vejle County, which are not O-members. K-members have agreed - in the same way as O-members - to co-operate with companies, to whom they are the environmental authority.

I-member:
"I" is for "Interested Party": Other interested companies, educational institutions, consultants, etc. who wish to follow the work of Green Network and who have the opportunity to participate in the activities of the association.

All companies - regardless of geographic location - can be I-members.

Membership of Green Network is of course voluntary but it is expected that all members will approach environmental work in a serious and positive way.

The fee for being a member is dependant on the type of membership. As an O member, the fee is calculated based on number of inhabitants within the municipality/county and is currently DKK 2 per inhabitant. For V and I members, there is a basic fee of DKK 2,000. For K-members, the fee is set at DKK 5,000.

The highest authority of Green Network is the general assembly, in which all members have the right to attend and speak, however only V-and O-members have the right to vote. A total of twelve representatives comprise the board, 6 elected from the V-members, which are subsequently joined by the mayors from the 5 municipalities and the county (the O-members).

The board works closely with a co-ordination group, the idea-forum and different ad hoc project groups. The Green Network Secretariat, which is hosted by the county of Vejle, assists all and services the network members.

The development of Green Network

The partnerships or co-operation promoted by Green Network are very much characterised by the incentives to join the network, and can be summarised as enterprise-enterprise, enterprise-authority, and authority-authority co-operation, with the two latter being the most out-spoken.

A recent study by Vedstesen & Sonne (2000) showed the major incentives for joining the network (O- and V-members, respectively):

O-members

- A possibility to influence the industries' behaviour in an environmental positive way
- A possibility to establish a professional network across public authorities in the region
- A possibility to develop and test new ways of co-operation adapted to industries and authorities [in the network]

V-members

- An expectation of improving the company's reputation

- A need to document environmental activities carried out at firm-level
- Environmental opinion/ideology at firm-level
- A possibility to obtain cost and resource savings

The incentives driving the public authorities must be seen in the light of their institutionalising role as administrators of regional, national and even international policies on environmental issues. Further, they supplement this by perceiving their own role rather as a catalyst towards awareness raising and change, and thus a consultant, instead of the traditional command-and-control type of regulation. By establishing the formal, and professional network, it is their evaluation that they can gain a stronger position when carrying out their strategies on environmental issues, and additionally can obtain an incremental learning process, thus strengthen own competences and capabilities. Finally, the necessity to develop new regulatory tools and concepts is recognised, not only as a means for coping with future legislative issues but also as an opportunity to be more cost-effective.

The economic aspect is also very much a factor when looking at the incentives for enterprises joining the network. Whether it is the company's reputation, the need to document activities (to a market or the regulating bodies), or cost saving it relates to the economic performance or even the raison d´être. In addition, the legitimacy of the company, e.g. in a local context, is also considered and underpinned by the statements represented by the above incentives.

However, the incentives on a firm-level to join the network is not static, on the contrary. The longer a company has been part of the network the more motivating factors are identified, indicating the learning process they are going through and the recognition of possible spin-off from membership (Larsen, 2002).

In lieu the above development, there is still no doubt that the driving factor in the partnership is the concept of an environmental statement. This concept was first introduced through a manual in 1996 but have since then been revised several times, and especially the demands to the statement have been enlarged, while the concept more or less has remained the same, based on traditional principles for environmental management systems, but being distinguished in at least two ways:

1. There are no demands as to how the environmental work is being organised at firm level, and
2. A co-operation (partnership) between the public authorities and the respective enterprises is actively promoted.

The following elements must be present (and publicly available):

- Environmental Policy
- Key Figures
- Prioritisation
- Environmental Goals
- Action Plan

Being certified according to ISO14001 or registered with EMAS will reduce the demands to the environmental assessment so as to not increase the administrative burden. Such companies can leave out key figures and prioritisation. In addition, these companies are not required to follow the 2-year cycle of the revision of the assessment, but instead follow the normal revision period of the environmental management system (3-year).

Notwithstanding that the most important activity to date has been the environmental statement, the network, and the projects and activities carried out, have developed. From being initiated mainly by the O-members, a shift towards a more even distribution in, so to say, relevance for the different member categories has occurred. This shift has mainly come because of the establishment of the Idea-Forum where O- and V-members in collaboration can suggest and establish projects and activities. The most significant are shown in table 1 along with a short introduction.

Table 2 Significant projects developed in Green Network in the period after1997.

LCA-project 1997	To make the concept of Life-Cycle Assessment operational in the co-operation with the V-members for the reduction of environmental strain in relation to their products (not only from the production) The results are presented in an LCA-Manual available to the members.
Green Purchases 1997	To strengthen the members' environmental activities through more environmentally friendly purchasing. Includes education of purchasers working for O-members, co-operation between the O-members on Green Purchasing etc. V- and I-members are to be included on a longer term.
Environmental Education Network 1998	To strengthen and focus the educational activities at firm level (V-members) on environmental aspects, and at the same time promote network and capacity development to the benefit of e.g. the industry's employees.
Environmental Forum Denmark 1998	Experience and knowledge sharing about public-private partnerships across regions in Denmark. This is sought through 1) support to existing environmental networks and the motivation of co-operation between these, 2) stimulating development of new networks, and 3) being the link between Danish actors in international networks.

These projects should be seen as supplements to the environmental assessment and relates to the opportunities for development or conceptualisation of environmental management when the companies are ready to progress, i.e. they are confident about their assessment, and the work this requires.

Other activities are:

- Transport consultants
- Environmental process consultants
- Environmentally friendly large-scale kitchens (e.g. cantinas)
- Sustainable Mobility

Some of the above activities and projects clearly relate to the environmental assessment concept and the development of this, and while the concept is still a cornerstone it is also the stepping-stone for many of the companies towards a higher level of environmental activity (e.g. as illustrated in figure 1).

This is also valid when looking at it from the perspective of the public authorities. The contact between these and the companies can be characterised as focussing on three pillars: the environmental assessment process, the approval and supervision, and the dissemination of knowledge and experience.

Accepting the fact that the dynamics of environmental management has become an almost integrated part at firm level, while not at governance level when seen in the supervision/approval perspective, it became obvious that a new form of interaction could prove beneficial for both parties. This resulted in a project called "The Developing Authorities" with a goal to define a new type of co-operation between industry and authority based on a dialogue on aims, prioritisation of work, and a follow-up on activities.

The county of Vejle has later introduced several principles that can be related to the above project and most of all a differentiated approach to regulation. However, it is also evident that since the establishment of these principles and a more dialogue based approach to the environmental regulation of companies, concepts and understandings are continuously changing, and that one of the main factors for this is the development of the professional network. The main principle carrying the differentiated supervision is thus to meet the company on it's current level of environmental understanding and work (Larsen, 2002).

Quantifiable Results at Network Level

As the current paper is focusing more on an introduction to Green Network, and the activities and developments related to this, results are mainly given as number of companies involved with the network and as a consequence, the number of environmental assessments. However, for these to even occur, the major result of the Network and the activities within this is the institutionalisation of internal and external conditions related to such distinct features as national and international environmental priorities and legislation, the learning organisation, culture, and society. It is evident that the institutionalisation has resulted in a legitimate and effective but rather simple way to operationally deal with systematic environmental management at both firm and authority level. And where certification is the guarantee in the context of international environmental standards, the formal public-private partnership is the verification of the environmental activities amongst Green Network's members.

Table 3 Green Network V-members as of May 2002 (Larsen, 2002)

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	29	41	57	66	104	122	146	167	174
Growth (%)		41	39	16	58	17	20	14	

Table 4 Number of certificates having been issued (Larsen, 2002; Green Network, 2002a)

Year	1995	1996	1997	1998	1999	2000	2001	2002	Total
1st time	8	10	26	25	31	40	31	15	186
2nd time			6	9	23	25	23	20	106
3rd time					6	8	20	10	44
4th time							6	1	7

Conclusion

A regional, Danish approach to a network between public authorities and private industries in the county of Vejle, and on West Funen, with focus on environmental matters. The network was initiated in 1992 and officially established in 1994. The key activity constituting the network is the private industries' environmental self-assessment.

The principal actors in the network are the public authorities of Vejle County; Fredericia, Horsens, Kolding, Middelfart and Vejle municipalities; and the more than 170 industries in the region, covering both service and manufacturing industries, farmers, and public institutions such as hospitals and harbours. In addition, other actors in the network are industries, institutions, and consultancies though their contribution and interaction in a networking context are peripheral.

The relationship is governed by the original obligations of the public authorities towards the private enterprises in regard to the Danish environmental legislation, in this case practised as a differentiated public supervision with a goal to meet the private actors at their present level of awareness and understanding of, and activity in environmental matters. Green Network as an institution, or even the institutionalisation of the activities in the network, is the formalisation of this relationship. One could argue that private companies that choose to be members of the network are met with this differentiated approach, while those that are not members are met with a more traditional "command-and-control"-type of regulation.

The collaboration is based on common values and mutuality that together form a strong, normative structure. Elements of common values include a regional centre of growth and exploitation of win-win situations with both economical and environmental gains. The common values have helped overcome barriers such as distrust and prejudices both between public partners, private partners, and public-private partners of the network (Larsen, 2002).

The incentives for joining the network range from pure ideology over learning to pure economic incentives, and both strategic and practical considerations guide the activities within the network.

As the incentives for joining the network, and implicitly also the needs, are governing the activities carried out in the network, the network as an institution has become a hub of learning, the result being continuous and incremental improvements rather than radical improvements with periods of stagnation. The constant knowledge process – as a variation between theory (or idea) and praxis – supported by positive feedback has created possibilities to always move forward. Bare in mind, this is related only to environmental activities (Larsen, 2002).

Perspectives

The way Green Network is organised, the activities developed and carried out by different actors in the network, and the interactions occurring, correlate with the formalised relationship between public authorities and industries as presented in the Partnership Model. Applying the Partnership Model for further studies of the industries, institutions and public authorities, including Green Network, in the region, is thus of relevance to this project.

Using the model involves identifying an industry or a specific functional area and to relate this to important dyadic areas such as identification of actors, the mode of operation, the structure of the relations, and the effectiveness with which the actors carry out the activities (performance). With this in place, the overall analysis of the partner network can be carried out.

In the context of this research project, the functional area is environmental activities, and looking for strength and weaknesses, potentials and barriers, dominance and dynamics etc. and relate this to comparative studies in Thai and Costa Rican contexts will enable us to determine a) whether a partnership approach is being used in the relationships between public authorities and business, b) whether a partnership approach is applicable in the local context, i.e. are all essential characteristics of the Partnership Model for government-business relations fulfilled, and c) if relevant, how can it be ensured that essential characteristics for a partnership approach are fulfilled, e.g. what competences and capabilities should be in focus.

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Notes

[i] Danish University Consortium on Environment and Development – Industry & Urban Areas (DUCED-I&UA) is a university consortium consisting of Aalborg University (AAU), Copenhagen Business School (CBS), Technical University of Denmark (DTU), Royal Danish Academy of Fine Arts – School of Architecture (RDA), og Roskilde University (RUC). The consortium was established in 1996 with official start via a DANCED supported pilot phase from 1998 to 2000. The Budget for the newly commenced consolidation phase is DKK 45 million. The consortium co-operates within research and education on environment and development issues in industrial and urban areas with counterpart consortia in Malaysia (MUCED), Southern Africa (SACUDE) and Thailand (TUCED), together they form LUCED-I&UA – Linked University Consortia on Environment and Development – Industry & Urban Areas. Homepage of DUCED-I&UA: http://www.duced-iua.dk

[ii] Sustainable Development Strategies for Central America (SUDESCA) was started in 1992 with a "pre-project" period of 4 year. Since 1996 it has been a project under ENRECA (Enhancing Research Capacity in Developing Countries), which is financed by DANIDA. The ENRECA programme was established in 1989 and its annual budget is now approx. DKK 60 million. The SUDESCA project is expected to continue until 2008. Its annual budget is DKK 2

million. SUDESCA has a focus on enhancement of the Central American research capacity on innovation systems and analyses as well as on the implementation of Cleaner Technology.
Homepage: http://cinpe.una.ac.cr/sudesca

[iii] Internationally, a number of definitions for Cleaner Technology exist, e.g. Cleaner Production (CP), Cleaner Technology (CT) Green Productivity and Eco-Efficiency. In this paper, the above are equated and defined as (UNEP, 2001):

> ”Cleaner Production is the continuous application of an integrated preventive environmental strategy to processes, products, and services to increase overall efficiency, and reduce risks to humans and the environment. Cleaner Production can be applied to the processes used in any industry, to products themselves and to various services provided in society.”

[iv] Defined as enterprises with less than 250 employees and an annual turnover of less than EURO 40 million, or an annual balance sheet total of less than EURO 27 million. In addition, no non-SME must own more than 25 % of the enterprise (in the form of capital or voting rights).