Guided tour on Life Cycle Management

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The program of the session

Presentation: Life Cycle Management in product chains – concepts and experiences (20 min)

Michael Søgaard Jørgensen, IPL DTU

Presentation and dialogue around case study experiences with LCM:

A) Implementation of RoHS in product chains with high quality demands from customers (15 min)

Lennart Swanström, ABB

B) Working towards sustainable forest management among suppliers in a pulp and paper product chain (15 min)

Kathrin Besch, Tetra Pak

Dialogue around other cases from the participants in the session in groups or plenary (30 min)

Life Cycle Management in product chains
- concepts and experiences

- Tour guides to LCM
- Complexity in product chain dynamics
- Types of environmental management in product chains
- Types of networks
- Shaping the practice of TNC management
- Capacity development in product chains
- Typology competencies relevant for environmental supply chain management

Guided tour on Life Cycle Management

- Life Cycle Management by **exploration**
- Life Cycle Management by **demand**
- **Deconstructing** the shaping of Life Cycle Management

Complexity in product chain dynamics

- A lot of products are manufactured in other countries than where they are sold
- A lot of products are manufactured or bought by transnational corp's - either for international, regional or national (host) market
- For some of the products social and environmental aspects have recently got importance; e.g. food, textiles

Practice: Danish companies and org. of international product chains (SUPPLY) (1)

- **Textiles:** Novotex has moved textile sewing of ’green cotton’ around to countries with cheap labour. Selling to the international market. Supply management system for gradual development of management of quality, env and work env.

- **Shoes:** Ecco has moved the production to countries with cheaper labour by building joint-owned facilities. Auditing of plants. Frames for env mgmt from central env dep, but co-shaping with plants. Applying STEP-model.

Practice: Danish companies and org. of international product chains (PARALLEL MANUFACT.) (2)

- **Packaging:** Hartmann has bought plants in other countries. Has developed a STEP model for gradually developing env. and social management based on the local cultural setting and the Danish experience

Practice: Danish companies and org. of internat. product chains (SALE) (3)

- **Beer:** Carlsberg has a long tradition for owning breweries in developing countries producing for the regional market. Heavy product which is expensive to transport.
- **Chemicals:** Cheminova selling pesticides to developing countries. Earlier critique for not (sufficiently) training the users of the chemicals.

Types of environmental management in product chains

- Life cycle management – the whole chain?
- Supply chain management – towards suppliers (upstream)
- Product stewardship – towards users (downstream)

=> *Shaping responsibility in time and space*

Types of networks (1)

In analyses and design of the external relations of a company **four types of networks** should be in focus:

- **the product chain** (the flow of resources, information and capital between the actors from cradle to grave)
- **the developmental network** (within the company, among suppliers and customers and R&D institutions, including banking, insurance etc.)

Types of networks (2)

- **the regulatory network<u>s</u>** (that is all types of regulations and the regulatory regimes: environmental approval, product standards etc.)

- **the local network<u>s</u>** (the policy cultures, the local labour markets, the neighbours etc.)

- *The interaction between the dynamics in all these networks are important in order to understand and change the environmental practice of a company*

Reasons and occasions for addressing environmental issues in product chains

- Governmental regulation
- Public debate
- Belief in market opportunities
- Customer demands *(maybe mediation of governmental regulation)*
- Damage control
- Companies' own values *(not direct external pressure - picked up from public debates?)*

Two dimensions of product chains

Material dimension:

- Material extraction
- Material processing into product
- Distribution
- Retail sale
- Use stage
- Product waste disposal

Organisat. dimension

- Farmers, company etc.
- Company x,y,z etc.
- Agent
- Retailer
- Consumer
- Waste handling agent

Textile product chain - environmental and work environmental themes

Function/Activity	Some environmental, occupational and social problems in focus
Fibre production	Chemicals in the growing and processing of natural fibres and in the manufactur. of synthetic fibres
Spinning, knitting, weaving	Chemicals Dusts from fibres, noise, accidents
Wet treatment	Chemicals (dyes, waterproofing etc.) in air, waste water, waste
Sewing and packing	Child work. Monotonous work
Distribution and sales	Energy consumption and emissions related to transportation
Use stage	Detergents. Chemicals in washing water
Post-use waste management	Loss of resources Competition with textile industry

Understanding the shaping environmental aspects in product chains (1)

DIRECT INFLUENCE:

- Materials and their quality influence other parts of the product chain
  - During further manufacturing
  - During use and waste management: content in product, resource consumption etc.
  - *What are the limits to the responsibility of the companies – in time and space?*

Understanding the shaping environmental aspects in product chains (2)

INDIRECT INFLUENCE – the role of e.g.

- A company influences other parts through demands to price, quality etc.
- A company influences user practice through product and service design
- Users influence through their domestication of products and services
- *What are the limits to the responsibility of the actors – in time and space?*

Considering the possibilities for environmental improvement in product chains (1)

- Differences in product chains: industrial markets (B2B) and consumer markets (B2C):
  - number of customers.
  - the possibilities for interaction and influence.

Types of product chain relations

- Continuum of organisational relations in product chains between *market conditions* and *hierarchies*:
  - adversarial leverage,
  - preferred supplier,
  - single sourcing,
  - network sourcing,
  - strategic alliances,
  - integration: subsidiary; affiliate

Considering the possibilities for environmental improvement in product chains (2)

- Textile: Many consumers. Retailers or industrial customers as mediators ? Frequent changes in fashion. Frequent changes in suppliers?
- Pharmaceuticals: Doctors and hospitals as mediators – in Sweden. Difficult for pharmaceutical companies to change suppliers due to GMP.

Three supply chain strategies on environment and work environment

- **Wake strategy**, where the customer does not raise requirements on environment/work environment to suppliers, but follows in the ”wake” of other companies that place the same requirements.
- **Asymmetrical partnership**, where a company wants long-term relationships with its suppliers in order to ensure that requirements are met.
- **Symmetrical partnership**, where a company wants long-term relationships and enter mutual partnerships with its suppliers.

Shaping the practice of TNC management (1)

- Developing countries are competing about attracting foreign enterprises and investments: IFZ, industrial parks
- Between local adaptation and global integration
- From local adaptation STEPping towards global integration?

Cross-border env mgmt (Hansen 1999)

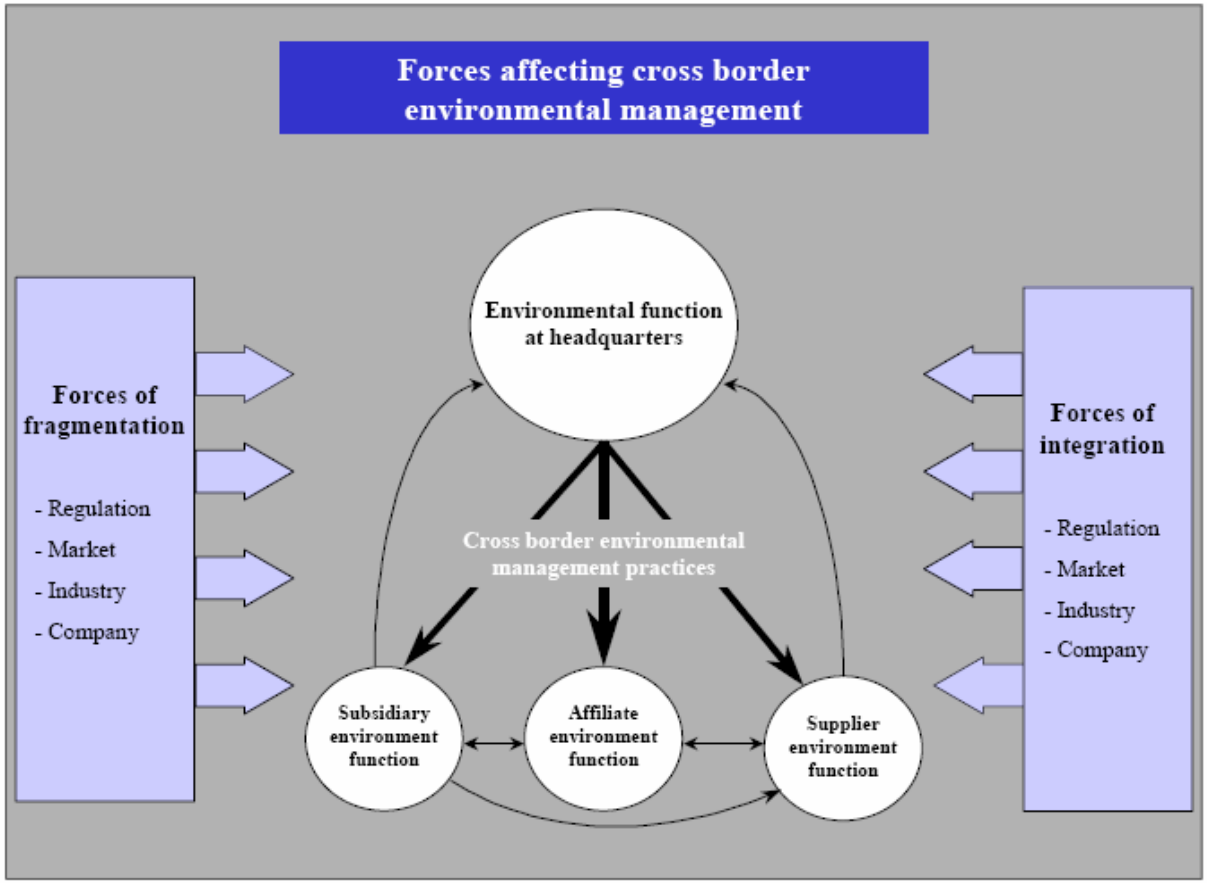
Table 1. A typology of TNC cross border environmental organization

	Decentralized environmental management	International compliance	Centralized environmental management	Globally integrated environmental management
Environmental management focus	Local adaptation	Host country legislation	Home country legislation/ company standards	Company standards/ International standards
Typical policy statement	None	"Meet and comply with all standards nationally and internationally."	"Employ the same standards and criteria world-wide."	"Strive to become global environmental leaders"; "Acknowledges responsibilities for the global environment "
Worldwide environmental policies and programmes	None	None	Pollution prevention; Waste minimization; energy conservation; safety zones in LDCs; toxic education programmes	Green R&D; Climate change policies; Bio diversity programmes; Dialogue with external stakeholder
Cross border environmental control procedures	None	Procedure to ensure compliance with regulations home and abroad: Pre acquisition assessments; regulatory compliance auditing; monitoring procedures	Procedures to ensure vertical integration: Auditing according to company internal standards; reporting, green accounting; training programmes	Procedures and activities to ensure horizontal integration: Information exchange; life cycle analysis; third party auditing;
Sectors	Industries with minor environmental risk; SME TNCs	Chemical (pre Bhopal); large diversified companies.	Chemical (post Bhopal)	Pharmaceuticals

Regulation of transnational companies

- International guidelines: OECD Guidelines for Multinational Enterprises; Basel Convention; Montreal Protocol; EU Energy Charter. Not agreement about **M**ultilat. **A**greem. on **I**nvestm.: protection and duties
- Home country regulation: environmental and work environmental conditions for FDI support in Denmark
- Host country regulation: import regulation; regulation of ownership to companies operating in the country

Cross border...(Hansen 1999)



Case: cross border analysis of textiles

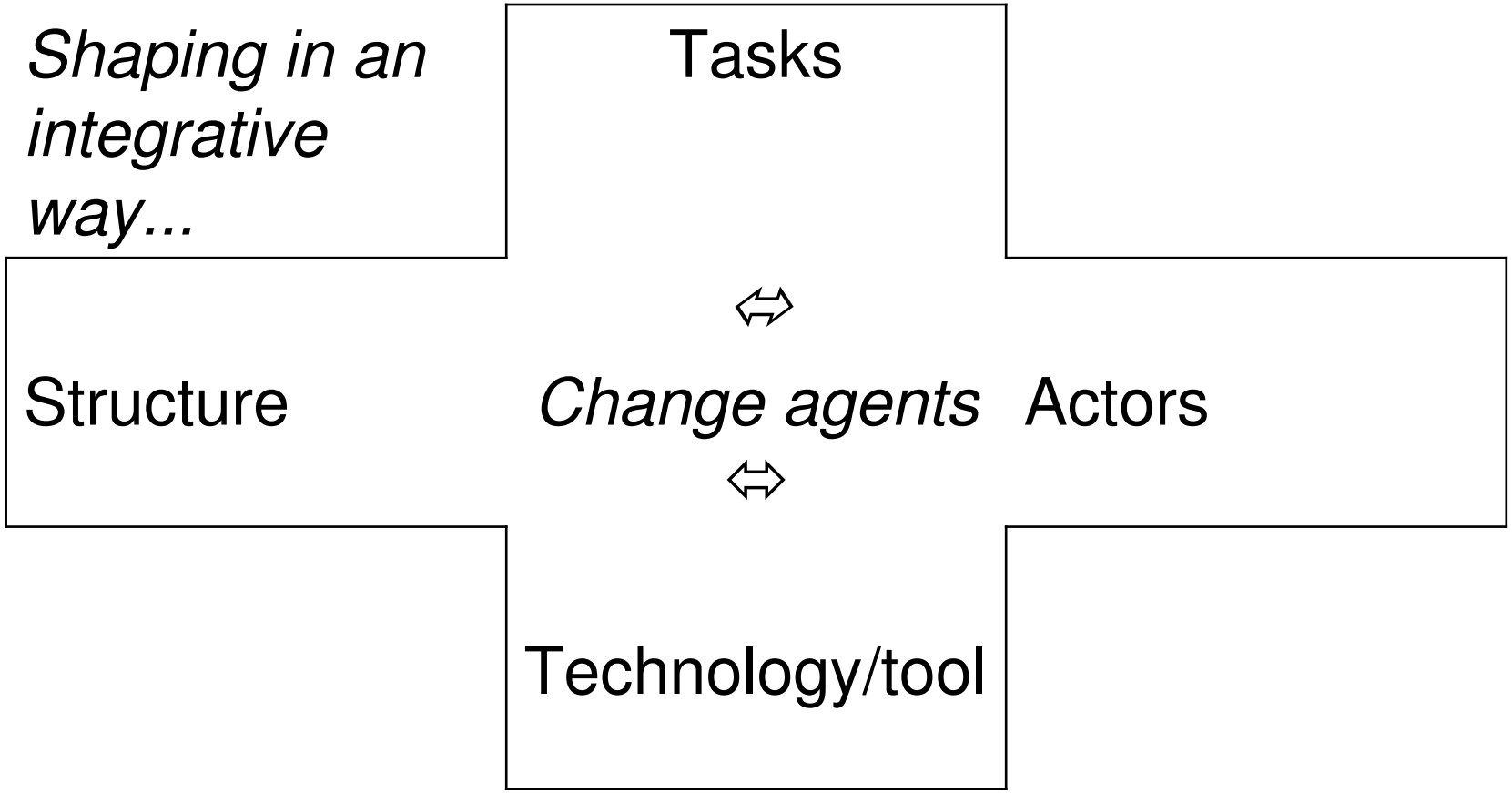
- Regulation: EU and US ban of some azo dyes. Health related quality: ÖkoTex 100
- Markets: cheap products; fashion products; environmentally improved products
- Industry: often long product chains; wake strategy; asymmetrical partnership; symmetrical partnerships
- Companies: a) “greener” as market strategy; b) concern in order to avoid problems; c) no concern

Shaping the practice of TNC management (2)

- **Important to distinguish between TNC *policy* and *practice*:**
  - same technology ?
  - same management practice ?
- **Cross border environmental management:**
  - transfer of policy
  - transfer of experience through networking
  - training and education
  - transfer of technology

Shaping the practice of TNC management (3): Leavitt's model for organisational development

Shaping in an integrative way...



Capacity development in product chains

- The handling of a topic in a product chain demands knowledge resources and structures, which enable the *translation* and *evaluation* of demands
- The role of international guidelines and standards: creating trust…
- The capacity development can take place
  - internally in a company
  - in a product chain in an trade organisation
  - in NGO's
  - in national and international institutions and authorities

Typology of environmental supply chain management relevant competencies

Interpretation competence

- The competence to understand external requirements from e.g. environmental agencies and customers,
- The competence to translate requirements into practice within the organisation

Technical environmental competence

- The insight into technical and chemical processes, etc.,
  - a prerequisite for the adjustment/reorganisation of a production process, a design scheme etc. in order to meet environmental requirements.

Documentation competence

- The knowledge about how to build and operate documentation systems and document handling routines, etc.

Control competence

- The knowledge about monitoring systems, management systems, auditing, etc. Can reside with the company, the supplier, or a third party – e.g. a certification agency.

Network competence

- The ability to create changes in a product chain through networking among customers
- The ability to motivate the companies in the chain to enter a dialogue,
- The ability to transfer technology and knowledge in or among product chains.

Networks: Benefit and burden

- Some problem **solving capacity**
- Some kind of **mutual benefit**
- Some kind of **dependency** (knowledge about each other; mutual adjustment of systems; access to resources: stabilizing) (**symmetric/asymmetric)**
- Some kind of **autonomy**
- Some **power content** (access to resources in focus: knowledge, goods, machinery etc.) (asymmetric, symmetric)
- Some **personal relations** (who is in contact with who)

Elements when shaping and analysing environmental management in product chains

- Existing discourses around the product area
- The interactive shaping of the product aspects related to the discourses
- Present relations and resources in product chains and other networks
- Capacity development around discourses – internally and externally
- Strategies upstream and downstream in the product chains

The idea with the presentation of the two case studies from ABB and TetraPak is to get descriptions of…

- changes in environmental management
- seen as processes over time
- triggered by certain occasions
- shaped in interaction between a number of stakeholders within the involved companies
- …and based on previous experience
- …and taking place within a certain context
- …and having environmental and organisational impact