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AN INTEGRATED APPROACH TO CHAIN ANALYSIS FOR THE PURPOSE OF CHAIN MANAGEMENT BY COMPANIES

Summary

Levers for a Policy geared towards Sustainable Development

**Study for the DWTC (HL/DD/013)
Executed by the Centre for Sustainable Development
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AN INTEGRATED APPROACH TO CHAIN ANALYSIS FOR THE PURPOSE OF CHAIN MANAGEMENT BY COMPANIES

1 INTRODUCTION

The Centre for Sustainable development of the University of Ghent has finished A study concerning 'An integrated approach to chain analysis for the purpose of chain management by companies' ordered by the Belgian State, Prime Minister's Office, Federal Department for Scientific, Technical and Cultural Affairs (DWTC) .

The project was carried out within the framework of the "Plan for Scientific Support of a Policy geared towards Sustainable Development", within the section "Levers for a Policy geared towards Sustainable Development".

The project aims at an integrated approach, which implies here that it will focus on both environmental and social impacts. There is more to sustainable development than just environmental protection purely and simply: the social component (including the north-south question) is equally important.

When the attention of the company is not restricted to what happens within the company, but also includes the assessment and continual improvement in the other stages in the product's life (i.e. from the "cradle" to the "grave" - or from the raw material stage to the waste stage), it can develop a chain management. The analysis of sticking points which precedes this is known as chain analysis: by means of the chain analysis, a "snap-shot" is, as it were, taken of the development and use of a product from cradle to grave. "Flashing lights" are located at points along the chain where problems arise.

Underpinning the project are the following problem definitions:

- The lack of a simple, easy-to-use framework for businesses in the implementation of chain analysis as a basis for a systematic approach in the quest for chain management;
- The one-sided, environmentally related approach in cradle-to-the-grave evaluations from a product-based perspective (e.g. in the implementation of chain management) and the lack of consideration for the related social aspects.

2 GOALS

The precise objective of the project is to establish an initial framework for businesses in implementing a chain analysis as an instrument for generating options that enable chain management. This chain analysis entails an environmentally and socially based analysis of a manufactured product from a cradle-to-the-grave perspective.

Scientific objective:

- The development of a theory for taking into account social aspects in a cradle-to-the-grave approach from a product perspective;
- Build-up of experience and a critical evaluation of the methodology for the environmentally-based life-cycle analysis in the light of chain management, and using this in combination with the aforementioned theory for taking into account the social aspects. This combined approach shall be evaluated in practice using a case study;
- Build-up of know-how and experience with respect to the systematic approach of chain management as an instrument for business.

Support of environmental and social policies :

- The model developed during this project utilizing the methodology suggested above to explore both ecological and social impacts effected over the life cycle of a product, will provide a medium for product management. It might provide inspiration for instruments such as standardisation, eco-social labels , and product standards

Social objective:

- This study establishes a framework for businesses, making them able to implement a concise chain analysis. This analysis will enable them to trace both environmental as well as social problems in the product chain.
- The valorisation takes place through the creation of a brochure, articles and workshops.

3 METHODOLOGY

The first phase of the project involved the elaboration of a **theoretical model** to be developed for the evaluation of social and ecological aspects related to the life cycle of a product and its associated businesses. The aim was to arrive at an integrated approach. This theoretical phase focused mainly on a study of available literature. The initial step was to create an as broad as possible framework for a cradle-to-the-grave approach with respect to the social and ecological aspects.

The second phase aimed to put together a list of parameters, which could be used for establishing a checklist for a chain analysis. The checklist is required to identify the social and environmental aspects of the product's chain. The list is based on the theoretical exercise in the first phase.

Once the first two phases were completed, the checklist was sounded out in the real world (third phase). To this end, the theory was applied for two concrete case studies. On the basis of the findings of the case studies, both the model and the checklist were adjusted where necessary.

During the fourth phase attention was primarily focused on the valorisation of the study (brochure, workshop, publications,...).

4 STUDY

4.1 THEORETICAL PART

4.1.1 Model

A study of available literature formed the first part of the study. At the moment many initiatives are being undertaken with respect to the social aspects of business practice. The landscape of social business practice is in a constant state of flux. The theoretical study was continued and various initiatives and their developments were described and/or analysed. In addition to the literature study various interviews were also held in order to be able to follow the fast-moving developments in this field. For the environmental part, a survey was made of various initiatives.

A theoretical model was made for chain analysis as an instrument for analysing the decision-making process for chain management in businesses. In developing this theoretical model, the LCA method was used for the environmental part. This method was developed for environmental 'cradle to grave' analysis of products based on the flow of materials. During the study it was concluded that this LCA method was not applicable for analysing the social aspects. Social aspects depend on the management of companies and not on the flow of materials. They need a place specific approach.

The final model goes beyond a simple focus on the life span of the product by incorporating product based approach. It implies equally an organization-based approach. This twofold model outlines a step-by-step plan, the essence of which is to make a clear differentiation between criteria closely related to the product on the one hand, and organization-specific criteria on the other. For the analysis of the product related aspects a process tree is designed. The organization related aspects are studied within the framework of the production chain.

The product and proces related analysis concerns only the environmental aspects. The organization related analysis concerns both environmental and social aspects.

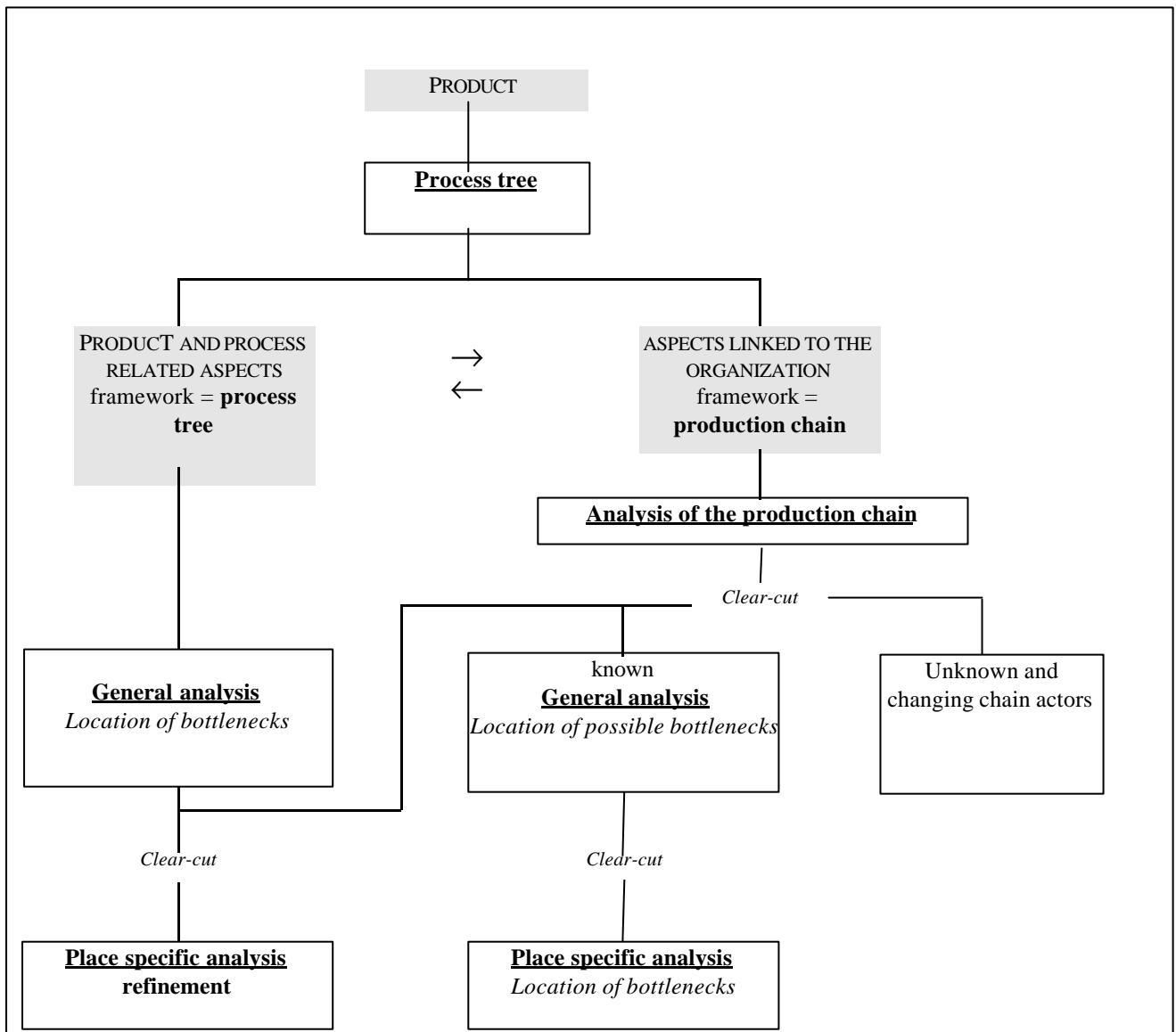


Figure: theoretical modal for an integrated approach of chain management

4.1.2 Impact categories

The study had to define the different impact categories to consider for the realisation of the chain analysis following the model.

For the environmental part the choice was based on the study of the different LCA's and the ISO 14040.

Environmental impact categories

Product related:

- climat change;
- stratospherical ozon depletion;
- smog;
- acidification;
- nitrification;
- renewable resources;
- non renewable resources;

- human toxicity;
- ecotoxicity;
- waste production;
- odour nuisances.
- Organization related:
- noise nuisances;
- affection of ecosystems and landscape.

For the list of the international recognised social impact categories, the study referred to the UN convention on the Rights of the Child, the Universal Declaration on Human Rights, the ILO Conventions and representative initiatives.

During the study of available literature, various initiatives relating to social management of companies, as well as different initiatives examining social policies were looked at more closely. One of the conclusions of this study was that there was a confused tangle of different initiatives undertaken from various perspectives, but that a gradual evolution could be identified. It can be said, for example, that the contents and/or the objectives of the various social business projects are all pointing towards an international consensus.

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- Social impact categories:
- freedom of association and protection of the right to organise;
- forced labour;
- discrimination;
- equal remuneration;
- child labour;
- wages;
- working hours;
- health and safety;
- social security and contracts.

The study proposes a concrete definition of the criteria that are to be satisfied in all those categories, if a company wants to go for a sustainable management system. For the social categories an overview was made of the criteria that are to be satisfied. The environmental criteria were more difficult to express concretely. Few international environmental standards give clear environmental criteria for companies. The evaluation of the environmental impact has to be done by normalisation, comparison and benchmarking.

4.2 CHECKLIST

A checklist was established within the framework created during the theoretical part of the project. This checklist was made for the use of organisations who want to make an integrated chain analysis of their products. This checklist contains a product related and a part related to the organisation. For each part a generic and a place specific approach are provided. The place specific approach is divided in function of the way the data are collected, and the persons that are asked to give the information.

4.3 CASE STUDIES

The checklist was evaluated in the real world. It was read through and discussed by various experts, and was evaluated and adapted by using two case studies in which several companies were visited.

The underlying principles in making a choice for the case studies had to be:

- The business must be motivated to such a degree that it is prepared to incorporate the concept of sustainable development within the business strategy;
- The business' own product is required to have "footprints" in the South or East;
- The preference is for a simple product;
- The business where the product is manufactured is required to be representative of the business community.

A case study that satisfied specific criteria was planned for the third phase (see theoretical framework). Given the reluctance of businesses to co-operate it was not possible to work with a partner who met all the criteria. For this reason it was decided to carry out two case studies. The first involved a washing-up liquid concentrate produced by a company that promoted sustainability as a sales argument. The second concerned a T-shirt with a fairly fixed chain structure in India and imported by an organization selling fair-trade products from third world countries in Belgium.

The first study was exceptionally time-consuming and provided an example of the complexity of a chain for a commercial product. Many players in the chain were contacted by letter or by phone, and a picture of the chain began to form. The majority of companies insisted on confidentiality of information and refused to co-operate to any great extent. Because of the time limit, only some companies were visited.

In the second case study, the greater part of those involved in the chain were visited. Most of these were situated in two regions of India. This case study highlighted the problems of monitoring in a third world country.

The checklist was also implemented in test cases by the Fair Trade Charter in the Netherlands (garment industry) and by the University of Guayaquil in Ecuador (banana plantations).

4.4 MONITORING

An additional far-ranging investigation was carried out into the way in which monitoring can be conducted. The way in which the case study was carried out, particularly with respect to the social part, was decisive for the quality of the results. To this end a study of literature was carried out. In view of the fact that few studies exist on the monitoring of the social aspects of a company, a diverse range of contacts were made with the various organizations who are tackling this problem. Interviews were taken, a workshop and a training course for auditors were assisted. Currently a number of organizations world-wide have implemented trial projects in order to gain a better understanding of these problems. A number of networks have been established to co-operate in this field. A general picture was drawn of these problems and a proposal for a global structure for general monitoring was established.

4.5 VALORISATION

A partnership with the Dutch Fair Trade Charter (Eerlijke Handelshandvest) was set up, and they used our checklist for carrying out the first case studies. A test will be carried out into how the monitoring of this Fair Trade Charter can be established in practice. They will ensure the necessary feedback.

Two workshops entitled '*Towards more sustainable development for businesses. Chain management and chain analysis*' were held that aimed at the main target group, the business community. Not only did businesses participate, but a great deal of interest was also shown from a variety of other disciplines, both from a social and an environmental perspective.

A project was worked out in collaboration with the University of Guayaquil at Ecuador. Some Ecuadorian banana plantations were monitored with the checklist. A report was written and the information was used to adapt the checklist.

The final report was distributed to different interested persons and institutes. It is available on the web site of the Centre.

A brochure was worked out in Dutch titled 'Chain analysis, a manual for companies'. It is available at the Centre.

Different articles were written and the project was presented at different lectures (annex 1).

Two conferences were organised titled 'The Companies aim to Sustainable development? Chain management and chain analysis.'

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The theoretical model developed during the study makes it possible to carry out a social and environmental chain analysis. The study concluded that product evaluation based on social and environmental criteria needs a twofolded analysis based on the process tree for the product-linked aspects (LCA method) and on the production chain for the aspects linked to the organizations. The workability of the model was confirmed by the case studies.

For the product related aspects software tools were used to determine (by approximation) of the most problematic links of the chain. This allows on short notice get a view of the generic analysis. The results of this analysis depend on the sector of production and the kind of product. One of the conclusions is that the generic situation can differ from the real situation. It is recommended that the results be refined through a place specific analysis.

The collection of the data came up to be one of the most important bottlenecks of the analysis. The existing databanks for LCA are not sufficient. Also for the general organisation linked aspects there is a lack of accessible databanks.

Social criteria are culturally linked. It is not possible only to refer to international standards. National law and local customs have to be taken into account. Some items need also sector specific criteria. The determination of those national and sector specific criteria takes time. The data cannot be consulted at a centralised place.

The checklist has been developed as broad as possible. It can be refined for more specific uses.

In formulating the social criteria for the checklist a number of organisations were contacted who set up criteria for socially acceptable management in different forms. It included codes of conduct, management systems, fair trade practices, etc. A trend was identified towards uniformity in the criteria.

For each social item specific criteria based on international standards could be found. These concrete demands are internationally recognised as essential for responsible entrepreneurship. This is not possible for the environmental aspects. The evaluation has to be done by comparison.

Detailed chain analysis can only be done if the chain is controlled.

It is important to keep in mind that the analysis is just a "snap shot" taken at a specific time. One has to take into account the evolution in time.

The study demonstrated that the way in which organisations are monitored is of crucial importance to the results of the analysis. A survey of the most important aspects of monitoring and a structure in which the monitoring can be carried out were worked out.

5.2 RECOMMENDATIONS

... for companies

In the business world few initiatives combine social and environmental chain analysis. The model elaborated by this study is unique and makes this kind of analysis possible. This was demonstrated by the case studies. The instrument is still new and can be refined. It is possible to differentiate the check list per sector and per country. The workability of the tool can be worked out in collaboration with enterprises, unions or federations.

...for companies and the government

There is a need for organised and accessible data banks for the social and for the environmental aspects. Data should be available by product, sector and country.

When a chain actor has very changeable suppliers it is more interesting to check the criteria that determinate the choice of the suppliers.

The way the monitoring of companies is done is of crucial importance to the results of the analysis. The study offers a structure and specific recommendations.

...for the government

The checklist can be refined per product group, sector and country. This will make it easier to do the generic part of the analysis. For the environmental part the existing LCA studies can be used. Research must be made possible to set up data banks and to update them.

Soft ware is mostly interesting for comparisons. A continuous qualitative survey of the existing software tools and data banks, and the publication of the results of those surveys is necessary.

For pragmatic reasons the chain analysis needs concrete standards for the environmental aspects that are based on international or European agreements, similar to the social part. They could refer to the international agreements of the UNEP (PIC list), OSPAR (lists of the North sea conference), etc... A permanently updated list is recommended. Scientific research concerning dangerous substances can be stimulated. The criteria of - for example - the eco-label could be used.

There is a need for an internationally recognised social standard, that gives minimum criteria for organisations that strive to a sustainable management.

In the same way that stimulation programs are issued for companies concerning innovation, ecodesign, and so on, there should also be programs that stimulate companies financially to accomplish chain analysis and chain management. There is an interest in 'sustainable entrepreneurship'. Companies have to take their responsibility and be partners in 'sustainable' initiatives.

The checklist is exhaustive and can be used as a basis for instruments of integrated product management. The future policies of the government concerning integrated product management have to consider social and environmental aspects, and can use the theoretical developments of the study.

One of the possible applications of product policies is related to the building up of a system for an eco-social label. The study worked out a model for this label, that can be resumed as followed. The general criteria on an international level have to be set up following a democratic system that includes all stakeholders. Those criteria can be refined on different levels:

- internationally per sector;
- nationally in general;
- nationally per sector.

The stakeholders will be involved at each level following a democratic system (with attention for minorities). There will be a feedback (concerning the criteria and the composition and procedures of the study groups) with the higher level.

APPENDIX

VALORISATION

PRESENTATIONS

- 8 March '00: theoretical phase (Prof. B. Mazijn), presentation on the project in the “sustainable development” course at the University of Ghent (tutor: Prof. B. Mazijn)
- 15 March '00: practical phase (E. Borgo and S. Spillemaeckers), presentation on the project in the “sustainable development” course at the University of Ghent (tutor: Prof. B. Mazijn)
- 23 March '00: contribution to the "responsible business practice", organised by ABVV (E. Borgo)
- 10 May '00: 'Towards de-materialisation?' contribution to the training course of the environment co-ordinator, KMO educational institute - Management, Club Environmental co-ordinator 1999-2000 in Bruges (Prof. B. Mazijn).
- 11 May '00: contribution to the "sustainable development ", organised by HIVA (E. Borgo)
- 17 May '00: 'Towards de-materialisation?' contribution to the training course of the environment co-ordinator, KMO educational institute - Management, Club Environmental co-ordinator 1999-2000 in Bruges (Prof. B. Mazijn).
- 25 May '00: Contribution to the “Sustainable Development” workshop, organised by LUC in the framework of the "Special training for environmental co-ordinators" programme (E. Borgo).
- 14 december '00 ': Contribution to the seminar "Bedrijven op weg naar duurzame ontwikkeling ? Ketenbeheer en ketenanalyse." CDO, Gent, Centrum voor Duurzame Ontwikkeling (B.Mazijn, S. Spillemaeckers).
- 11 january '01: contribution to the seminar "Mapping out strategies for sustainable development: the multi stakeholder dialogue and vision building in the textile industry and consumption cluster" (S. Spillemaeckers).

LIST OF PUBLICATIONS

BORGO (E.) & SPILLEMAECKERS (S.), “*Eén stap in de richting van duurzame ontwikkeling*”, in : *De Morgen*, 25/08/1999.

(Newspaper article: “A step in the direction of sustainable development”)

BORGO (E.), “*De LCA-methodiek : instrument voor het beoordelen van ecologische... én sociale criteria ?*” In : *Bedrijven op weg naar duurzame ontwikkeling ?* Informatiemap bij studiedag van 16 december 1998, Gent, Centrum voor Duurzame Ontwikkeling, 1998.

(“The LCA Method: an instrument for evaluating ecological and social criteria”, published in “Businesses on the way towards Sustainable Development”, a workshop information folder)

BORGO (E.), “*Integraal ketenbeheer is meer dan milieu alleen*”, in: MAZIJN, B., “*Duurzame Ontwikkeling : socio-ecologische aspecten in mondiaal perspectief*”, cursus, Gent, Universiteit Gent, academiejaar 1998 - 1999.

(“Integrated chain management involves more than just the environment” in course book “Sustainable Development: socio-ecological aspects in a global perspective”)

BORGO (E.), “*Naar duurzamere productie- en consumptiepatronen ? Over ecologische en sociale labels*”, in *Samenleving en politiek*, 6/1999, N° 7, pp. 36-42.

(“Towards sustainable patterns of production and consumption? A look at ecological and social labels”)

BORGO (E.), “*Theoretisch kader voor het ontwerpen van een checklist voor de uitvoering van een ketenanalyse*”, paper, Brussel, DWTC, 1998.

(“Theoretical framework for the design of a checklist for the implementation of a chain analysis”)

CDO, '*Internationale Handel*' in *Mens*, 1^e kwartaal 2000.

(“International Trade” in *Mens*)

DE MOOR (M.), “Het opnemen van sociale criteria in een van wieg tot graf benadering”, In : *Bedrijven op weg naar duurzame ontwikkeling ?* Informatiemap bij studiedag van 16 december 1998, Gent, Centrum voor Duurzame Ontwikkeling, 1998. (“The inclusion of social criteria in a cradle-to-the-grave approach” published in “Businesses on the way towards Sustainable Development”, a workshop information folder)

MAZIJN (B), SPILLEMAECKERS (S), "Ketenanalyse, een handleiding voor bedrijven", brochure, Gent, Centrum voor Duurzame ontwikkeling, december 2000.

SPILLEMAECKERS (S.), "Dringend gezocht: Handleiding duurzaam ondernemen", in *Arbeid en Milieu*, n°5, jaargang 2000, pp.12-18.

Articles by third persons

WOUTERS (K.), “Een kwestie van overtuiging : aandacht voor sociaal verantwoord ondernemen groeit”, In : *Vacature Magazine*, 01/05/1999.

(“A question of conviction: attention to socially responsible business practices grows”)

VAN DAELE (J.), "Checklist voor duurzaamheid", In: *De Morgen*, 13/12/2000