



EFORWOOD
Sustainability Impact Assessment
of the Forestry - Wood Chain



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EFORWOOD

Tools for Sustainability Impact Assessment

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Data collection of harvesting processes to be provided for ToSIA at case study level

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Introduction

EFORWOOD aim is to provide methodologies and tools that will integrate Sustainability Impact Assessment of the whole European Forestry-Wood Chain (FWC), by quantifying performance of FWC, using indicators for all three pillars of sustainability; Environmental, Economic and Societal. The project will provide methods to assess the sustainability impacts of modifications of Forestry – Wood Chains as influenced by policy changes, market drivers, or technological innovations.

In order to test the feasibility of the approach and the functionality of the Tool ToSIA that is developed within the project three kind of case studies are performed. The report will describe how data from harvesting processes was collected and developed in order to suit ToSIA.

Background, the need of data to ToSIA in EFORWOOD

The EFORWOOD Projects develops the Decision Support Tool, ToSIA, which model European forestry on a general level. It represents dynamic sustainability impact assessment that is analysing the above mentioned impacts of changes in forestry-wood production chains. ToSIA, uses a consistent and harmonised framework from the forest to the end-of-life of final products. In order to enable this process, a series of data collection manuals has been developed by five data collection groups since May 2007 according to a IP board decision 28. The latest and final version (Skogforsk, 2008) encompass indicators that has been developed by Eforwood Indicator Task Force. (EFORWOOD, 2008). The data collection manual is put forward in order to safeguard that data are collected that is defined by its qualities, origin, temporal and spatial scales and relevant representativeness for the actual case.

Case studies data structure and Data Collection Manual

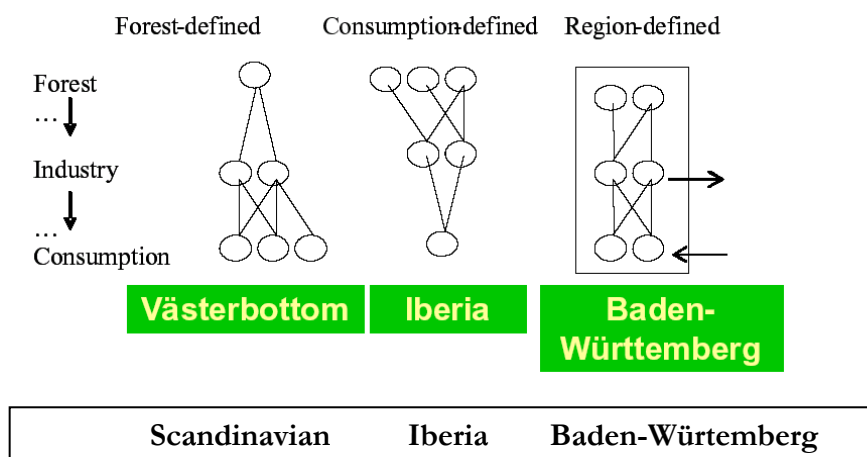


Figure 1. Three Regional Case Studies in EFORWOOD. There are three kind of regional case studies undertaken in EFORWOOD (Fig 1.):

Scandinavian Case – A forest defined raw material driven case that follow the wood from forest to industry and finally to end consumers. This is defined for Västerbotten County in The Northern Sweden. The case study is managed by Module 2 (SLU, 2008). The Forests, from which the raw material emerges, are based on Pine, Spruce and Birch that are dominantly managed as even-aged forestry. The logging systems are fully mechanised and consists of harvester and forwarders. Pre-commercial thinning is made with brush saws.

Baden -Württemberg Case – A region defined case that describes the network of Forest Wood Industry chains in Baden Württemberg. South Western Germany. These chains includes imports and export to the Region. The Case study is managed by Module 3. (ALUFR, 2008). The chains which are characterized by a large variation of forest types based on a diverse Silvicultural management, stands with mixtures of broadleaved and softwood species. The age range is wide. There is a variety of logging systems as described in Skogforsk, 2006. They are motor manual felling and forwarding with skidders or forwarders in mainly hilly terrain as well as fully mechanized harvesting in flat or undulating terrain. commercial thinning is made with brush saws.

Iberian Case – A consumption driven case that is integrating Forest Wood chains to end Consumers on The Iberian peninsula. The case study is managed by Module 5. (Aidima, 2008). The raw material in this case is emerging from Iberian forests and Scandinavian, the latter according to the Västerbotten Case. The former is wood from Maritime pine species and hardwoods as Eucalyptus (dominant) and other hardwood as Beech and oak in the area (Aidima, 2008). Iberian Forestry is managed according to the principle of even aged forestry. The main part of the harvested forest is composed of an intensive even-aged stands. Complete mechanized harvesting system are used, as different type of harvesters and forwarders.

In addition there is a **EU Case**. It covers the Unions 27 countries, not are all are represented in the case, rather the relevant forest and operation conditions are reflected in the data collection. This case contain felling systems as motor manual, partly mechanised fully mechanised operations and forwarding systems with skidder (with or without winch) forwarders and cable systems. Data is collected for the countries in question according to Table 1. This table covers also responsibilities for data collection reaching outside the harvesting operations. The full responsibilities for data collection in EU Case are not completely defined at the time when this report is written.

Table 1.
Preliminary responsibilities for data collection in different European countries. Excluded are countries 8, 23, 25 – marked.
(EU-FWC Task Force, 2008)

	Data from ¹ :	AFOCEL/FCBA	ALUFR	FR	FVA	Skogsforsk	STFI-Packforsk
1	Sweden					X	X
2	Finland					X	X
3	GB			X			
4	Ireland			X			
5	Denmark					X	X
6	Estonia					X	
7	Latvia					X	
8	Lithuania						
9	Germany		X				
10	Netherlands				X		
11	Belgium	X					
12	Luxemburg	X					
13	Austria				X		
14	Spain	X					
15	Portugal	X					X
16	France	X					
17	Italy	X					
18	Greece	X	X				
19	Poland	X		X?			
20	Slovakia				X		
21	Slovenia					X	
22	Czech Rep.		X				
23	Cyprus						
24	Hungary		X		X		
25	Malta						
26	Norway					X	X
27	Switzerland				X		
	Total contacts	8	4	3	5	8	5

¹ The Acronyms to the right applies to bodies mentioned in chapter 5.

Data collection for felling and forwarding were done for a relevant choice of indicators that reflects the organisation of operations at each case. This relevance addresses first the structure of operations but also availability of data. Data is stored in the Eforwood Data client (IFER, 2008). There are indicators for which values are calculated, indicator 7 and 8, which consequently have no collected input values. Some are not relevant or not even applicable from a pure harvesting process perspective as 3, 16, 22, 25, and 26. There have also been difficulties to obtain relevant data; this is valid for indicators 6, 9, 17, 21. The actual data collection situation is reflected at the genuine situation in the Data Client. Indicators that are incompletely fed with data because lack of relevance or data with sufficient quality (e.g. n.a. not available) is marked with brackets. E.g. Gross Value Added (1) in the Scandinavian chain is only reported as positive for forwarding since the wood is paid for at roadside after forwarding.

Table 2.
Indicators for data collection. For EFORWOOD case studies.

Revised FWC set 2008	Scandinavian Case	Baden-Württemberg	Iberian Case	EU Case
(1) Gross value added	x (forwarding)	x	x	x
(2) Production costs	x	x	x	x
(3) Trade balance			x	x
(4) Resource use, incl. recycled material	x	x	x	(x)
(5) Forest sector enterprise structure	x	(x) (n.a.)	(X)	(x)
(6) Investment and R&D	x			
(7) Total production				
(8) Productivity				
(9) Innovation				
(10) Employment (parts of: rurality)	x	X	x	x
(11) Wages and salaries	x	x	x	x
(12) Occupational safety and health	x	x	x	(x)
(13) Education and training	x	x		
(14) Corporate social responsibility			x	x
(15) Quality of employment	x	x		
(16) Provision of public forest services				(x)
(17) Consumer behaviour and attitudes			(x)	(x)
(18) Energy generation and use	x	x	(x)	(x)
(19) GHG emissions and carbon stock	x	x	x	x
(20) Transport			x	x
(21) Water use (parts of: ecosystem)		x		
(22) Forest resources		x		
(23) Soil condition	(x) (forwarding)	x	(x) (forwarding)	(x) (forwarding)
(24) Water and air pollution	(x) air	x		
(25) Forest biodiversity				
(26) Forest damage		x	x	x
(27) Generation of Waste	(x)	(x)	(x)	

Collected data in WP3.2

There are some general rules for data collection in general (Skogforsk, 2008)
One measurement unit per indicator and indicator subclass per processes. The process is the highest level of detail. All indicators included in the indicator framework have defined measurement units e.g. the measurement unit for the production cost indicator is €.

- One reporting unit per process. In M3 there are several reporting units (M2: ha*yr; M3-M5: m3 or tons). The indicators are calculated per unit of input material flow (the so called reporting unit). In ToSIA, indicators are linked to the material input flow of the process in the selected FWC to calculate the indicator value. E.g. The production cost indicator (subclass labour cost) is calculated for the process transportation of pellets to home scale use; – input material flow to this process = tons of pellets; – the measurement unit of the indicator = €;- the labour cost of transportation is 2,7 €/ton of pellets. The **reporting unit** in our example per **tons of pellets**
- Not explicitly covered in this protocol is the internal reference unit used in ToSIA is one ha for Module 2, forest resource management, and one ton of C content in the wood or wood product for all other processes of the project modules 3–5. The reference unit (ha in M2 and Tons of carbon in M3–M5) is the information carrier in ToSIA, is used internally by the application.
- Conversion factors are required to convert the product units in the database to different units. Each individual product needs several conversion factors. For conversion factors see the Data Collection Manual (Skogforsk, 2008).
- If data for a specific indicator is missing, set data availability not applicable in case the indicator does not make sense, (– example biodiversity in M4) or set a zero (0) value to indicator, if by a change of system (e.g. technical scenario) it could be something else than 0.
- If the indicator is relevant and exact data is missing, a rough estimate (“expert opinion”) is to be preferred instead of a missing value.

Data is coming from several sources and represents different quality. One way to sort origin and quality is according to the structure below.

A. Specific and empirical

- Follow up routines from enterprises.
- Data from experiments or scientific measurements.
- Branch statistics.

B. Generic and derived

- Official statistics
- Weighting or scaling factors relevant for adaption of generic data to specific data for the actual case. E.g. average data of costs per cutting form (final felling/thinning) is adapted to the case in question with the aid of case specific shares of cutting forms.

C. Model-based and estimated

- Modelling; e.g. harvest costs and time use model.
- Experts' judgement.

The final procurement of data to indicators for a process, may involve a combination of cluster categories. The scientist has the possibility to assign this process, origin and data quality the data Client.

Data collection for felling and forwarding were done for a relevant choice of indicators that reflects the organisation of operations at each case. This relevance addresses first the structure of operations but r also availability of data. Data is stores in the Eforwood Data client (IFER, 2008).

Data collection bodies for case studies

The Research bodies responsible for data collection are (in alphabetical order);

- Albert-Ludwigs-Universität Freiburg, Institut für Forstbenutzung und Forstliche Arbeitswissenschaften (ALUFR), Werthmannstrasse 6, 790 85 Freiburg, Germany.
- The Forest Research Institute of Sweden (Skogforsk), Uppsala Science Park, SE 751 83 Uppsala Sweden.
- Forest Research Northern Research Station Roslin, Midlothian Scotland (UK) EH25 9SY.
- Forstliche Versuchs- und Forschungsanstalt Baden-Württemberg Wonnhaldestraße 4, 791 00 Freiburg, Germany
- FCBA-AFOCEL, 10 Avenue de Saint-Mandé, 750 12 Paris, France.

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