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## **Organizational and Institutional Innovation in Companies for Resource Productivity**

Many concepts are able to initiate an increase in resource productivity in enterprises and supply chains – although some of these approaches do not directly address resource efficiency. From these instruments, we derived seven important set-screws, pointing at the most important starting points for resource productivity.

Considering the differences of the examined set-screws in general and of the approaches lying in the background in particular, the existing portfolio of instruments seems broad enough to successfully implement instruments aiming at an increase of resource efficiency in the enterprises. However, it is necessary to adapt the selection of instruments to the conditions of the specific enterprise.

The paper was presented at the Launch Conference of the Sustainable Consumption and Research Exchange (SCORE!) in Wuppertal, 23.-25.11.2006.

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Es sind bereits viele Konzepte existent, die Ressourceneffizienz in Unternehmen und Wertschöpfungsketten erhöhen können, obwohl einige dieser Instrumente Ressourcenproduktivität nicht direkt ins Visier nehmen. Im vorliegenden Papier wurden sieben wichtige Stellschrauben charakterisiert, die wichtige Ansatzpunkte für eine Steigerung der Ressourcenproduktivität darstellen. Die Instrumente sind dazu da, sich den jeweiligen Unternehmensbedingungen anzupassen.

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# Poster      Organizational      and      institutional innovation in companies for resource productivity

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## 1      **Background**

Natural resources are the basis of all economic activities. Thus, an optimal and efficient use of resources can increase the welfare of a society. Especially the management of natural resources has lately become a challenge. The continuous growth of the world population, as well as the increase of production worldwide and price increases for energy and raw materials create an urgent need for long-term adaptation as regards efficiency increases in the use of natural resources.

The project “Resource Productivity as Core Strategy for Sustainable Development”, supported by the German Federal Ministry of Education and Research, aims at demonstrating how organizational and sectoral strategies can create market conditions that lead to significant increases in resource productivity ([www.ressourcenproduktivitaet.de](http://www.ressourcenproduktivitaet.de)). One of the projects research question is: What are central starting points in management for organisational and institutional innovations that can lead to a successful increase of resource productivity? This paper outlines the strategy used in order to answer this question and presents a summary for the results.

Following a literature study on current management approaches and instruments about 20 were identified, which focus on a (parts of) sustainable and/or excellent management. The chosen approaches were screened with a consistent raster, covering:

- Basic data: name, literature / web links
- Intention: main idea, intention, target group
- Operating mode and effectiveness: design and operating mode, impact on resource productivity
- Realization: facts and figures about realization, best practice stories, general conditions / supporting und hindering conditions
- Evaluation: strengths and weaknesses, needs and opportunities for further development

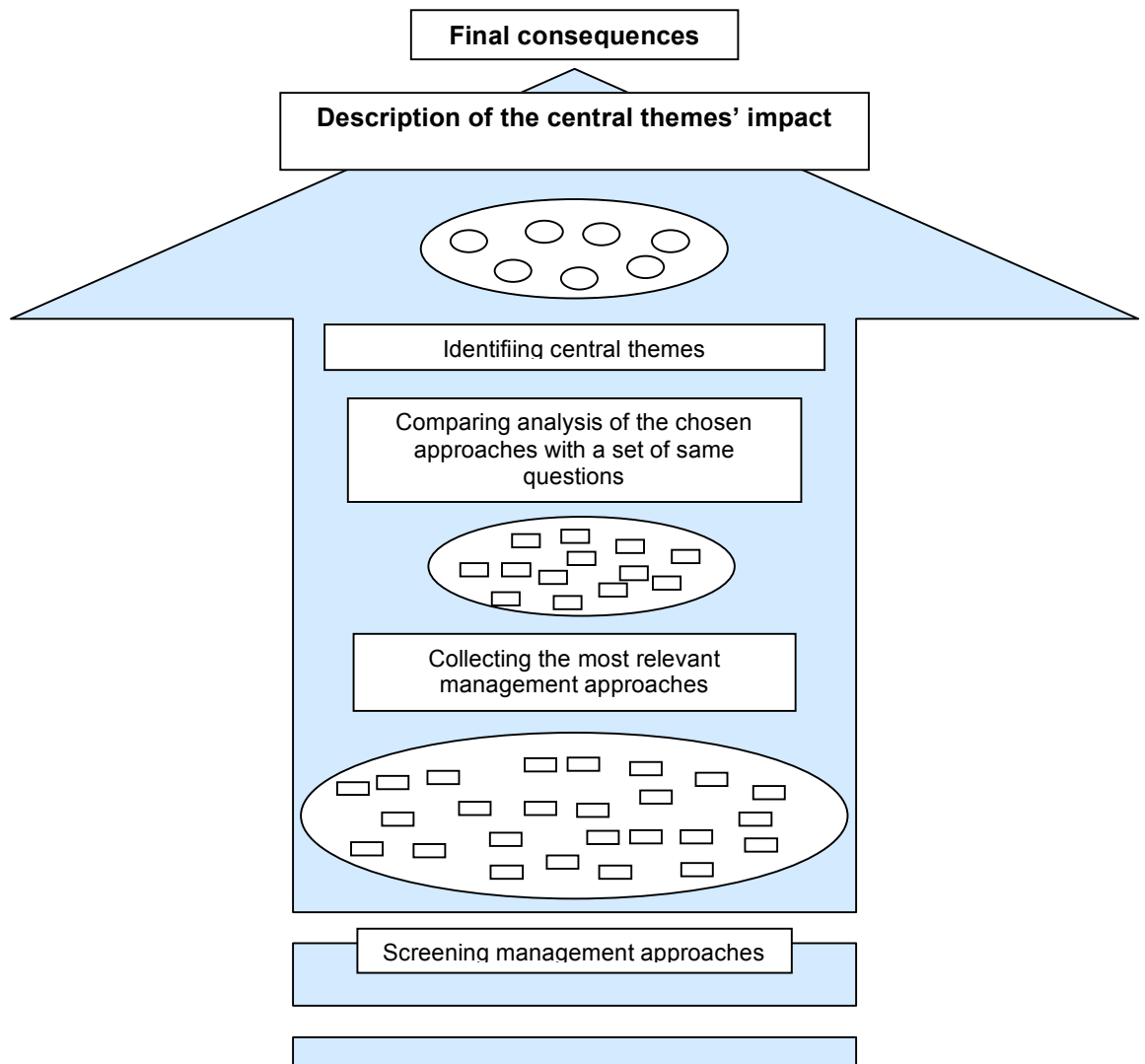


Fig. 1: Strategy

Based on the raster, the approaches and instruments were analysed and compared, and grouped according to central entry points or “themes” common to more than one instrument. The following seven themes resulted from the comparative analysis:

- Theme 1: action oriented status quo analysis,
- Theme 2: continuous data based information management,
- Theme 3: target definition,
- Theme 4: product / service analysis and development,
- Theme 5: quality management,
- Theme 6: external and internal learning processes of the companies,
- Theme 7: sustainability oriented holistic management systems.

For the themes, the **main idea** and the central starting point as well as the operating modes were described. Having understood the way things work, the concrete impact on resource efficiency can be inferred – whether their influence is direct or indirect and for which task and in which sector they can be used most effectively. Furthermore it was possible to assess the **impact on resource efficiency**. Since the themes are non-technical, quantitative conclusions on the overall impact were not possible, but only qualitative conclusions (e.g. addressing the theme is a „necessary, but not sufficient condition“, a „basic condition“ etc.). In the end, the **development potentials** of the seven themes are analysed, i.e. what changes can substantially increase the impact on resource productivity substantially and what **further research** is necessary.

## **2 Summary of Results**

The **overall interpretation of the research** leads to the following conclusion:

- Many instruments and approaches developed and used for sustainable as well as excellence management, are capable of initiating an increase in resource productivity – mainly within the company, but sometimes also in the supply chain -, although many do not seem to directly address resource efficiency at a first glance (e.g. quality management, sustainability reporting etc.).
- Among these instruments, seven important themes, which mark the seven most important starting points for increasing resource productivity, were identified:
  - **Theme 1 – Action-oriented Status-Quo-Analysis:** The approaches in this group start with analysing the status quo and then show adequate reactions. They are based on the idea that realizing the status-quo and the respective problems, disadvantages and unused opportunities makes you strive for improvement and thereby leads to action.
  - **Theme 2 – Continuous Data Based Information Management:** The basic idea of this approach is to continuously provide decision makers with processed information on the environmental impacts and efficiency potentials of organizations, processes or products and services.
  - **Theme 3 – Target Definition:** Here, the basic idea is the voluntary commitment of companies to reach goals that go beyond the respective legal minimum standards. Often, the enterprise intention is to provide an alternative to legal regulations, because they seem to be less flexible and more cost-intensive.
  - **Theme 4 – Product / Service Evaluation and Development:** The impact of products and services on the environment has to be examined, so that ways of improvement can carefully be derived. Theme 4 therefore addresses the core competency of the company.
  - **Theme 5 – Quality Management:** This theme aims at improving the quality of processes and products/ services.

This can refer to production and product quality as well as to consumer orientation or quality management itself.

- **Theme 6 – Internal and External Learning Processes of the Companies:** In order to use the potentials of employees and company networks effectively, learning potentials in and around the company have to be discovered.
  - **Theme 7 – Sustainability-Oriented Holistic Management Systems:** The goal is to integrate management systems into enterprises or to optimize existing integrated management systems, which aim at effectiveness and efficiency of industrial supply chains – while at the same time minimizing negative effects on the environment.
  - Qualitative and partially quantitative statements about impacts on resource efficiency are possible for all seven themes and can be used for models and scenarios (e.g. ordinal approaches). Tab. 1 provides an aggregated overview on the impact on resource efficiency; Tab. 2 provides information on whether resource efficiency is directly or indirectly addressed as well as the starting points for the instruments, i.e. where exactly they have impacts on the companies or company networks.
- Although the majority of the approaches have potentials for an increase of resource efficiency, very few do it explicitly and initiate action. The potentials of the seven themes have therefore to be carefully developed.
  - In order to increase the potentials, corporate culture and strategy have to be geared towards supporting and enabling successful approaches. The employees have to be enabled and supported to recognise and implement respective options.
  - Considering the differences and the different starting points of the themes in general and of the underlying approaches in particular, the existing portfolio of instruments seems broad enough to successfully implement instruments aiming at an increase of resource efficiency in the enterprises. Yet, a company-specific selection of the adequate instruments is necessary.

Tab. 1: Impact on resource efficiency of the seven themes

Theme	Impact on resource efficiency
Action oriented status quo analysis	Necessary, but not sufficient condition, because the recognition, that something has to be done, and the wish to do it, are not automatically connected with recognising, what to do and how to do it.
Continual data based information management	Necessary, but not sufficient condition, since the representation of material and energy flows, environmental figures and environmental impacts as well as identifying improvement potentials are a condition for a systematic and continuous improvement of resource productivity.
Target definition	The impact depends on the definition of resource efficiency as a target beyond the “business-as-usual” and on the effectiveness of the target realization.
Product / service evaluation and development	The impact depends on the definition of resource efficiency as optimization variable and on a life-cycle-wide optimization; Due to considering design, production process, use and recycling / disposal, a high interference width and depth is possible, if the consumer’s demand is secured.
Quality management	The impact depends on the explicit roll of resource efficiency and on the optimization throughout the supply chain; the efficiency potentials are estimated to be low, because resource efficiency is only an unpopular topic in the quality management of most enterprises.
Internal and external learning processes of the companies	Necessary but not sufficient condition, because without learning processes a systematic and strategic development and long-term realization of resource efficiency is not possible.
Sustainability oriented holistic management systems	The impact can be very high, if the use of resources is identified as a strategic variable – in enterprise and supply chain – and if the integration of management systems is successful

Tab. 2: Comparing overview over the main starting points for operational modes of particular instruments

Instrument / Concepts	Direct / Indirect Impact	Starting Points		
		Production (incl. Supply chain)	Product (incl. use)	Human (incl. culture, interaction)
Action oriented status quo analysis	indirect			X
Continual data based information management	indirect	X	X	
Target definition	indirect			X
Product / service evaluation and development	direct		X	
Quality management	direct	X	X	
Internal and external learning processes of the company	indirect			X
Sustainability oriented holistic management systems	direct	X	X	X

### 3 Needs of research

Further research need has been identified in the following areas:

- The seven themes' modes of impact on increasing resource efficiency has to be examined in detail – so that the mode of impact and the potentials for improvement can be better understood and gaps are recognized and shut. At this point, the different target groups in companies and networks have to be considered as well as the external factors and actors (e.g. politics, federations, other intermediates) that can have positive or negative influence (**Research on institutional and management innovations**).
- Additionally, the possibilities are to be examined, how to improve the use of the seven themes by integrating the day-to-day processes of the companies and the instruments that are already activated in organizations, so that the increase of resource efficiency can be implemented (**Diffusion research as regards institutions and management**).
- Considering the fact that the analysed instruments and approaches are primarily used internally, their potentials for use within the entire supply chain as well as the use phase should be analysed (**Research on supply chain management**).
- Another important research question is, how actors within the company or company networks can be enabled to recognize and realize the existing potentials. The role of qualification measures is to be examined and steps at conceptualizing such measures should be taken (**Qualification research**).