

Trefflich, Annette

**Working Paper**

## Support scheme of food processing firms: A driving force for rural development?

Discussion Paper, No. 105

**Provided in Cooperation with:**

Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Halle (Saale)

*Suggested Citation:* Trefflich, Annette (2007) : Support scheme of food processing firms: A driving force for rural development?, Discussion Paper, No. 105, Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO), Halle (Saale), <https://nbn-resolving.de/urn:nbn:de:gbv:3:2-3646>

This Version is available at:

<https://hdl.handle.net/10419/28455>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

## **SUPPORT SCHEME OF FOOD PROCESSING FIRMS: A DRIVING FORCE FOR RURAL DEVELOPMENT?**

TREFFLICH, A., UETRECHT, I., EFKEN, J., SCHÄFER, M., STEINBAUER, C., WENDT, H.<sup>1</sup>

### **ABSTRACT**

The agri-food sector was given remarkable amounts of funding by all German federal states in the framework of the Measure g ‘Improving Processing and Marketing of Agricultural Products’ within the rural development programs. Based on literature and data we obtained by evaluating this program we identified some indicators representative for illustration of sustainable development. Apart from project data we used the official statistics and the method of case studies.

Via selected indicators we received some signs of sustainable development in enterprises of the agri-food industry that also influence the development of rural areas. Some statements are restricted because net effects can not be determined. The need for subsidies is discussed as well as possibilities and limits of case studies.

**Keywords:** sustainability, economic development, case studies, subsidies.

### **1 INTRODUCTION**

Economic development and increase in employment are major priorities for the European Union and most European countries (EUROPEAN COUNCIL 2000). Both objectives are also deep-seated in the rural development programs. Furthermore, the principle of sustainability has grown in importance since the 1990s, and therefore has been increasingly integrated in political targets (BRUNTLAND ET AL. 1987; UNITED NATIONS 1992a,b). The overarching principle of sustainable development is “to meet the needs of the present generation without compromising those of future generations“ (BRUNTLAND ET AL. 1987). Furthermore, a common sense about the qualitative dimensions of sustainability exists, meaning that sustainability refers to activities with simultaneous consideration of the economic, ecological and social aspects. But there is no consensus about the weight and content of the three dimensions (DYBE AND ROGALL 2000, p12).

---

<sup>1</sup> Institute of Market Analysis and Agricultural Trade Policy of the Federal Agricultural Research Centre (FAL), Bundesallee 50, 38116 Braunschweig; Phone: ++49 (0)531 596-5311; e-mail: annette.trefflich@fal.de

The principle of sustainability also concerns the field of public support; i.e., public funds should initiate developments that continue creating their own dynamics after the support ends.

The agri-food sector was given a remarkable amount of funding by all German federal states between 1991 and 2006. The support is integrated in the EU rural development programs, currently according to Council Regulation (CR) 1257/1999 (and regarding Objective 1 regions to CR 1260/1999 (EUROPEAN COMMISSION 1999a,b)) under Measure g: 'Improving Processing and Marketing of Agricultural Products.' Support is financed jointly by the EU, and the national and federal states. Although the general objective of Measure g is to improve the economic situation of the farmers by supporting processing and marketing units, and thus promoting better marketing conditions for the connected farmers, from a more general perspective, funds are also aimed to

- preserve and provide new jobs in rural areas,
- give people in rural areas a prospective future, and
- avoid/ prevent migration from rural areas.

Apart from the challenge to determine the aspects mentioned above, it is not quite clear how changes and development can be made sustainable. In order to measure, or, moreover, to evaluate projects or regional developments or public interventions, it is necessary to have an appropriate concept about what sustainability actually means. Thus, we will try to give definitions of the three dimensions of sustainability, and compile them in an evaluation approach in order to assess projects supported by the measure concerning their impact on sustainable development.

We will not attempt to deal with the difficult task of how to design the institutional framework and political decision-making processes in order to achieve the promotion of the sustained development. We are well aware of the fact that under this point the need for new outcomes arises. This holds especially true for the framework conditions to make sure that sustainability does not become a temporary phenomenon of a political agenda, but rather forms the basic criteria for social strategies and currents (BRAND AND FÜRST 2002 , pp30ff).

There is a common sense that sustainability needs an integrated perspective (ZUKUNFTSKOMMISSION DER FRIEDRICH-EBERT-STIFTUNG, 1998). Maintenance or improvement of an environmental situation presumes corresponding economic and social circumstances that make these activities possible. Furthermore, sustainable development is not at all imaginable without human wellbeing. Schmitz goes one step further when he concludes that the achievement of social and ecological objectives requires a minimum level of economic power and welfare, respectively, since only people under these circumstances can produce preferences for non economic aspects (SCHMITZ 2003).

Or, stated vice versa, economic degeneration leads to a neglect or even a violation of ecological and social needs. Thus, difficulties arise in the assessment of the weighing and content of the three dimensions.

The intensity of efforts made for sustainable development varies greatly, mostly depending on the initial economic situation of the region. Even by neglecting the issue of the economic level at the beginning, one can find quite different definitions of sustainability, like Brand and Fürst who detect strong differences between political parties, industry, unions, environmental groups and ministries, etc. In particular, there is still a bias towards environmental aspects of sustainability. In their opinion, the main reason is the lack of integrated approaches which systematically connects all three dimensions of the problem (BRAND AND FÜRST 2002, pp22, 42).

In an attempt to 'use' the concept of sustainability, the point of view is supposed to be less important than the content, or respectively, the object of investigation: Global climate change demands another spatial dimension as well as a different set of criteria and methodological approaches than the analysis of sustainable regional development, or the examination of whether a single local project or even product is designed according to the principles of sustainability (BECKER 1997, p37; DYBE AND ROGALL 2000, p13).

Nevertheless, an objective within the research regarding sustainability is to find aspects and/or actions which generally should be present in sustainable development. The rationale behind this is not only the integrationist view one needs for an investigation in the field of sustainability, but also the interdependence of every object of investigation within the broader context, in a spatial sense as well as in an economic, social or environmental sense. This should include institutional settings on different levels, as well as the role and behavior of the various agents who influence the characteristics and intensity of sustainable development (BRAND AND FÜRST 2002, p39).

In this paper, we analyse whether, and to what extent, the support of the agri-food sector contributes to sustainable development in rural areas. According to our hypothesis, support for the agri-food sector only makes sense if sustainable impacts are produced in rural areas.

## 2 METHODS

Different methodological approaches were used for the analysis: (I) an analysis of concrete support data on project level compared with data from the official statistics and (II) an analysis of data from three case studies.

(I) In the framework of the mid-term and the ex-post evaluation of the Measure g 'Improving Processing and Marketing of Agricultural Products,' within CR 1257/1999 and 1260/1999, data about supported projects were collected and

analysed by our team. In order to evaluate the impact of the measure, it was necessary to develop a pragmatic evaluation approach. We designed an Excel-based questionnaire (EBQ) for a complete survey of the projects at two different phases:

- (a) baseline information as an element of application including data of the initial situation before starting the investment ( $t_0$ ),
- (b) realised results not earlier than one year after the investment is completed ( $t_1$ ).

This way, we got about 250 variables including processed raw material, products, employment and spent energy. Some of the data give information about the sustainability of supported projects. This approach allows a comparison of the initial situation and the results realised after three or four years, for instance in relation to changes in sales revenue or development of employment.

For the analyses presented here we used data of 282 supported projects from 14 German states and 13 different food sectors, further shortened as “EBQ”.

Data from the official German statistics refer to the local kind-of-activity units<sup>2</sup>. This section bears in mind that food production can also be part of a big company dealing with different products. Unfortunately, the attainment of these data does not completely match with our project data. For instance, the branch “processed fruit & vegetable” (WZ 15.33) excludes trade of fresh fruit & vegetables, but the latter is included in support by Measure g. Official statistics can not be divided between supported and not supported companies. This fact results in problems with the identification of net effects: Usually, economic development of companies means expansion and thereby influences the development of competitors and also of affiliated companies. Due to the lack of data about supported and non-supported enterprises and the different classification of branches, the official statistics can give only little evidence for development of branches in the food industry.

The period under consideration is relatively short as the evaluation has been carried out only over a seven-year period. In consideration of the short time between starting an investment in the agri-food sector and noticeable effects in rural areas, it is clear that conclusions about sustainable effects are difficult to draw.

(II) The analysis of case studies might represent a loophole and might be able to compensate for the lack of data. By means of successful projects, it should be possible to identify the factors of success for a sustainable development of rural areas through good practices of the supported companies of agri-food industry.

In the framework of the three case studies (Table 1), companies processing potatoes and vegetables were surveyed on the basis of a guided interview. Thus their development was accompanied and analysed over a time period of about 10 years.

---

2 Local kind-of-activity units (in German: fachliche Betriebsteile) are a section in the statistics of the producing industry classified according to the classification of economic activities, which are in German “Wirtschaftszweige” (WZ). We used the 4-digit level, i.e. WZ 15.xx (STATISTISCHES BUNDESAMT, 2005).

**Table 1: Attributes of the three case studies**

	Company A	Company B	Company C
Region	Goal 1	Goal 1	Outside goal 1
Organisation	Part of a big group	Medium-sized enterprise	Part of a big group
Sector	Vegetables	Potatoes	Potatoes
Products	Processing (deep frozen)	Packaging (fresh) or Processing (chilled or frozen)	Processing (ready to eat)
Sales	indirect	indirect or direct to large-scale consumers	indirect

Note: Goal 1 regions are the new federal states in the eastern part of Germany.

As a result of a literature survey and our evaluation approach, several factors were chosen from each of the three dimensions of sustainability as indicators to describe the important aspects of sustainability related to the business and its regional integration (Table 2).

**Table 2: Identified indicators to evaluate sustainable impacts of enterprises**

Economic	Social/ regional	Ecological
Sales revenue	Development of employment in relation to regional facts	Energy efficiency
Sales/ produced output	Apprentices/ employees	Waste management
Sales revenue/ employee	Local networking	Organic raw material/ input
Value added/ produced output	Supply of raw material	Organic Products/ output
Investments and subsidies	Long term prices	
	Long term contracts	

In doing so, we look at the characteristics of the region and the companies involved as a starting point. In a second step we try to analyse the development of different criteria relating to aspects of sustainability. Finally these analyses should enable us to answer the question asked at the beginning and to confirm or disprove our hypothesis.

### 3 RESULTS OF THE IMPACT ANALYSIS

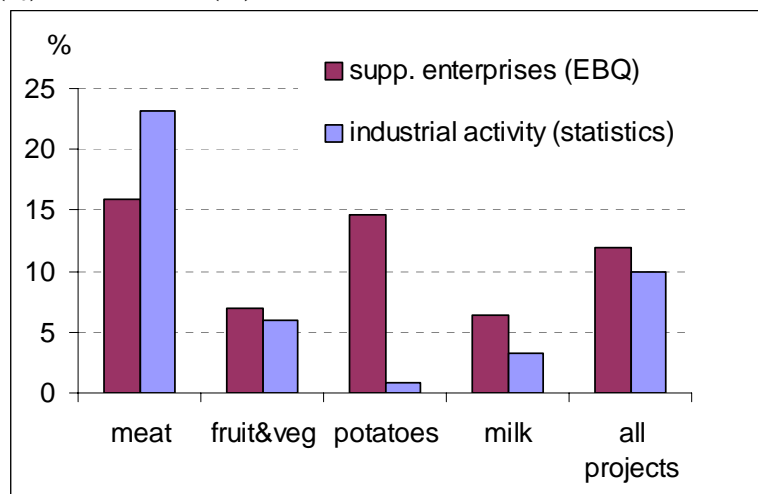
The sustainability of a company is evident in its economic and social stability. A company must be competitive, which becomes apparent on the basis of sustained production and employment in difficult economic times. From an ecological perspective, a resource-conserving and environmentally friendly production must be created for future generations.

Each of the indicators in Table 2 is analysed on basis of the evaluation data of 282 supported projects (EBQ). In a second step, the indicators of the three case studies are determined in a similar procedure.

### 3.1 Economic Developments

The sales revenue provides an important indicator for the valuable documentation of sales volume, since a stable development of this value serves as a prerequisite for the economic development of the company and its sustainable action on markets. In the enterprises supported in the Measure g, the sales volume could be increased by an average of 12 percent over all sectors within about four years. This increase is about the same as the increase shown by the official German statistics for similar industry branches (Fig. 1). Related to the individual sectors, the sector Meat shows the highest increase in sales volume (n=14). With the exception of this sector, the supported companies are slightly better in terms of sales volume increase than the average company in each industrial activity.

**Fig. 1: Changes in sales revenue [%] in the studied industrial activities between 2000 and 2004 and in the supported enterprises\* (EBQ) before ( $t_0$ ) and after ( $t_1$ ) investments**



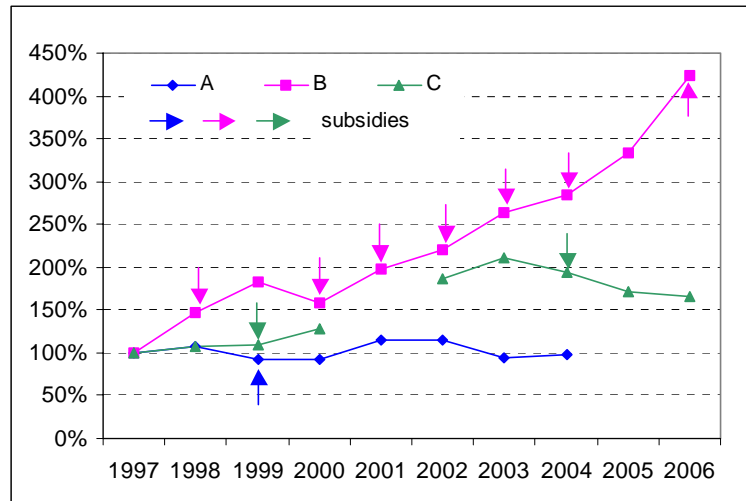
\*Number of cases in EBQ: Meat: n=14, Fruit&vegetables: n=52, Potatoes: n=25, Milk: n=18, all: n=282

Source: Own calculations based on EBQ, statistics (STATISTISCHES BUNDESAMT, 2005)

The case study in Company B shows that the sales volume was more than quadrupled in the period from 1997 to 2006 (Fig. 2). The much steeper growth in sales volume in comparison to the produced amounts was caused by an expansion of convenience production, which made a tripling in value creation possible. Since 1997, the value added has grown by 50 percent for each produced output unit. In Company C, the sales volume doubled from 1997 to 2003. Then the sales volume dropped again to a plus of 65 percent over the base year. As a consequence of high competition, significant losses have arisen in quantities sold and in the profits since 2003. Company A could not realise an increase in

sales volume during this time period. The competitive situation for Company A was difficult in an European and cyclical context. The implementation of a new company philosophy led to income losses. The production quantities have only increased since 2005 (sales turnover statistics are lacking) and seem to show a successful development.

**Fig. 2: Sales volume of the companies from 1997 to 2006 related to the base year 1997 and times of payments of subsidies\***



\*: Arrows mean times of subsidy payments to the companies. Overall, Companies A and B got subsidies at similar level, company C got about half of the previous.

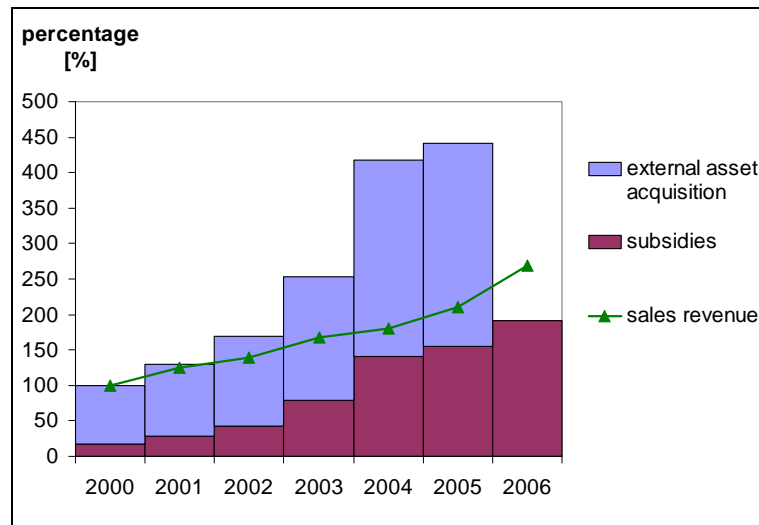
Source: Own calculations based on data of case studies.

The arrows in Figure 2 assign the dates the companies of the case studies got subsidies. The growth of Company B was a consequence from investments supported by public funding over the complete period (Figure 3). Company C invested in two steps. Company A expanded the production capacity and reconstructed the waste water treatment.

Comprehensive information is available from the case study on Company B. The net investments were annual from 2000 to 2006 and overall positive. The accumulated investments quadrupled from 2000 to 2006. The sales revenues increased to 270 percent. Here, public subsidies comprised a high percentage (Fig. 3). Without the continuing support, growth of this mid-size company would not have been possible to this extent due to the insufficient financial resources.



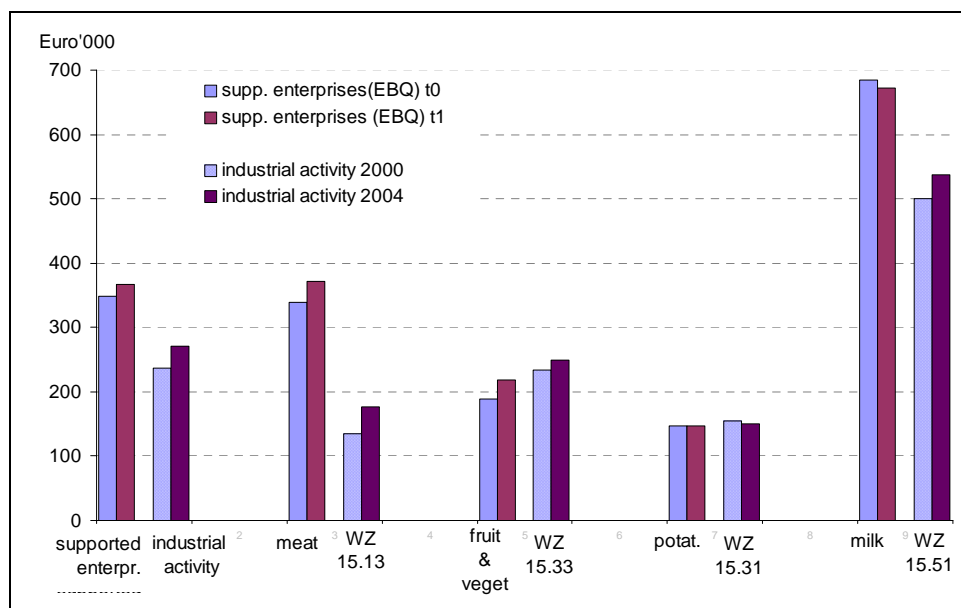
**Fig. 3: Development of sales, external asset acquisition and subsidies between 2000 and 2006 in Company B (investments and subsidies cumulated, base year 2000)**



Source: Own calculations based on data of case study B

High productivity is acknowledged as an important criteria for the estimation of the competitive ability of a company. As is shown by the analysis of EBQ (Fig. 4), the majority of the supported companies were able to increase their productivity in consequence of the supported investment.

**Fig. 4: Labour productivity: measured by sales revenue per employee in the supported enterprises\* before ( $t_0$ ) and after ( $t_1$ ) investment and in the industrial activities 2000 and 2004**



\*Number of cases in EBQ: Meat:  $n=14$ , Fruit&vegetables:  $n=52$ , Potatoes:  $n=25$ , Milk:  $n=18$ , all:  $n=282$

Source: Own calculations based on EBQ, statistics (STATISTISCHES BUNDESAMT, 2005)

In the three cases studied, each company increased the labour productivity significantly over the entire time period. Company C even doubled the labour productivity. Restructuring and outsourcing caused this productivity jump in Company C.

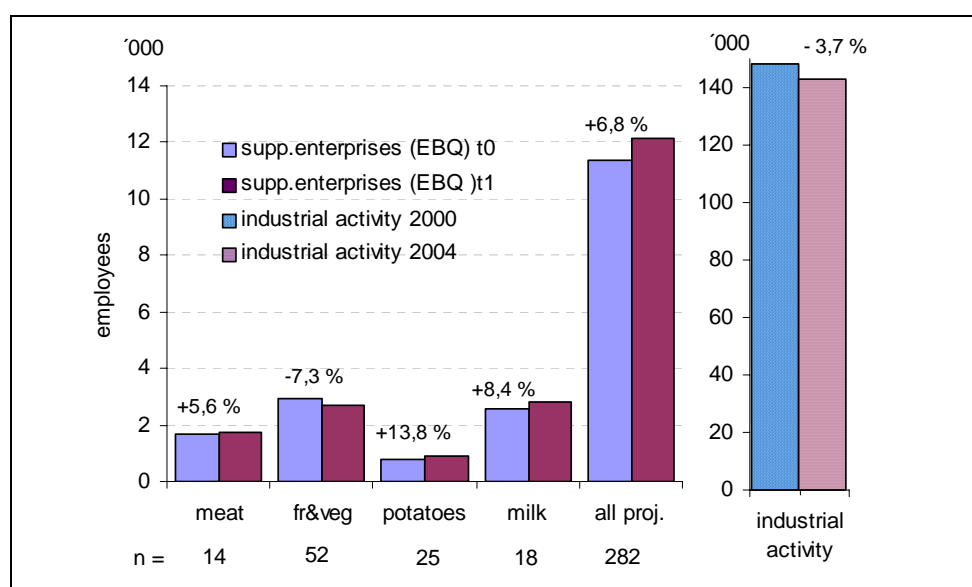
In the three case studies, the main investments were supported by Measure g (Fig. 2).

The economic development of the companies investigated in the three case studies and of the supported enterprises on EBQ basis was successful, during the monitored time period against the background of the simultaneous economic depression. In the analysis assessment, the work productivity had the disadvantage that a reduction in jobs through rationalisation or outsourcing as seen in the case studies increases productivity. Employment is considered in the following in detail.

### 3.2 Social and Regional Linkages

The creation and maintenance of jobs is a major goal in Measure g. On average, these 282 projects (EBQ) increased the gross number of employed by 6.8 percent. An increase occurred in the important sectors Milk and Meat as well as in Potato processing. Since pressure effects are probable here, the entire situation in this branch of the food industry shows a slight drop in employment of 3.7 percent (Fig. 5).

**Fig. 5: Employment change in the industrial activities 2000 and 2004 and in the supported enterprises before ( $t_0$ ) and after ( $t_1$ ) investment**

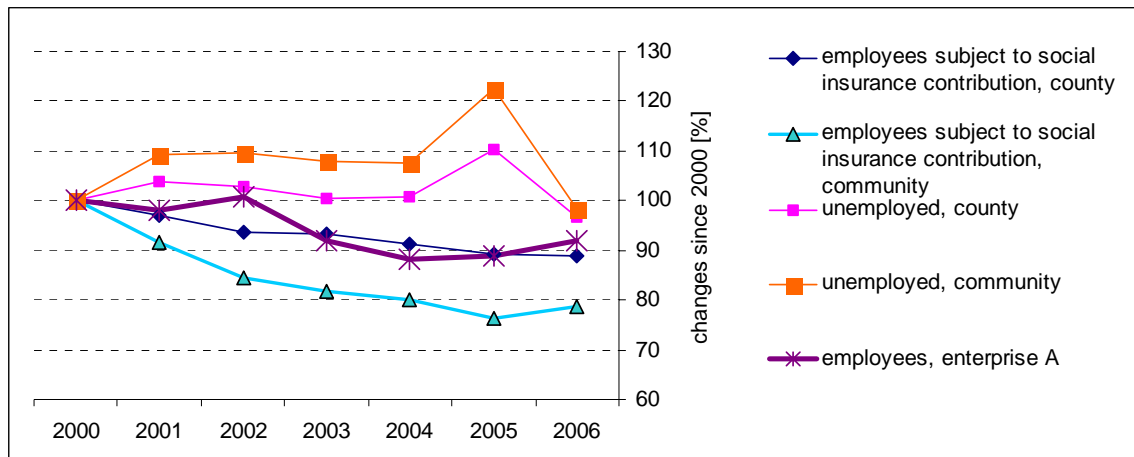


Source: Own calculations based on EBQ, statistics (STATISTISCHES BUNDESAMT, 2005)

In the case studies, Companies A and C reduced jobs. The identified causes in the case studies were cyclical influences as well as outsourcing of the service

sector (cafeteria, security) or management restructuring in the group. Figure 6 shows the unfavourable development of the employment situation in the community and the county where Company A is located. The situation of Company A has followed the development of the region.

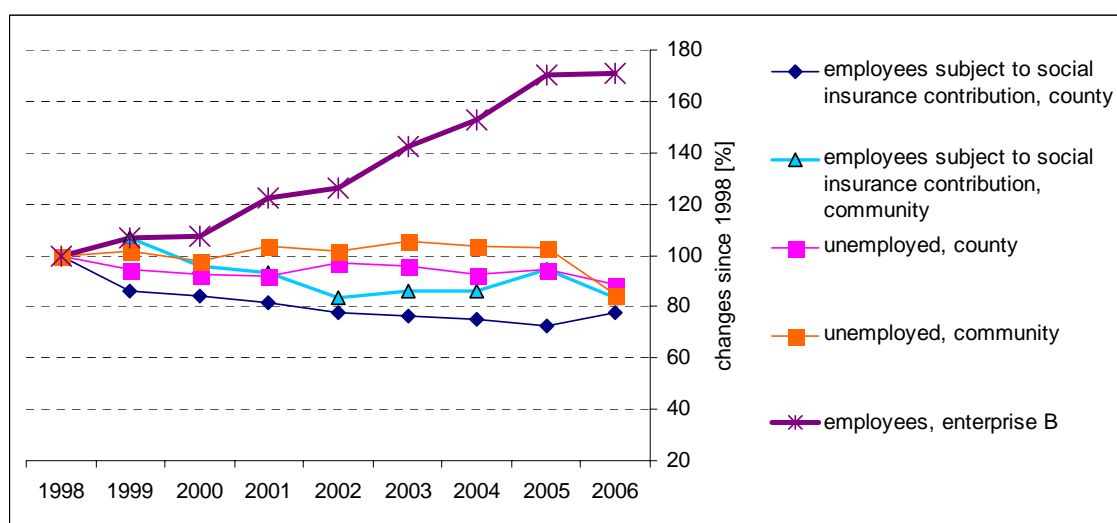
**Fig. 6 Changes in employment in Company A in relation to the employment situation in the affected region (base year 2000)**



Source: Own calculations based on data of case study A and regional statistics.

Due to the production expansion, Company B increased the number of employees since 1998 by 70 percent continuously (120 employees) (Fig. 7). Despite this, the situation of unemployed in the region (county and community) did not change for the better to the same extent. The number of employees subject to social insurance contribution dropped in the community and in the county by 20 percent since 1998, showing a more tense situation.

**Fig. 7: Changes in employment in Company B in relation to the employment situation in the affected region (base year 1998)**



Source: Own calculations based on data of case study B and regional statistics.

In the case studies of Companies A and B, the number of apprentices increased. In 2006, Company A accounted for ten percent of those employed in this company. Long term, permanent ties to the young people are desired by the company. In Companies B and C, the apprentice level is 3.5 percent of the employees. Despite seasonal differences in the raw material supply, the companies managed to retain the majority of their production employees for the whole year.

The three companies of the case studies use local craftsman's and repair establishments and service providers as much as possible. This ensures that many jobs are maintained in rural regions and the trade and service offerings remain available to local community residents.

Through the supply of raw materials a particularly narrow interlocking exists between processors and region, which can only be described through the case studies. Company A takes more than 80 percent of its raw materials directly from local vegetable farms. These vegetables must be transported and processed a few hours after picking and are 100 percent contractual. The other 20 percent of the raw materials come from a larger area or are purchased partially processed from foreign sources.

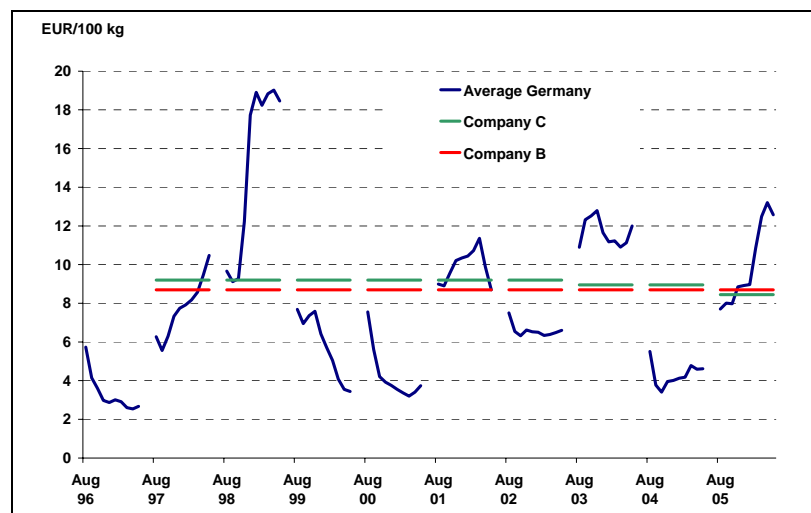
The potato processors in the case studies have different strategies. Company C relies almost exclusively on contractual production in the region since the quality of raw products is decisive for the quality of the final products. Through the direct contact to the producers, the processor can quickly communicate special needs and requirements and have them realised. The contractually linked raw material quantities varied up to 16 percent over the past fifteen years depending on the harvest. Company B strives to obtain only 60 percent of its raw materials through contractual arrangements. The company offers a wide assortment of packed fresh products, different processed products and convenience products for the food trade or for large scale consumers. For the continuous supply of the fresh product trade, early potatoes are bought on the international market. The purchasing of raw materials almost doubled since the year 2000.

The contracts for the raw materials are generally written so that a one to five year or unlimited framework contract for raw material delivery and purchase is signed. The deliverers guarantee a minimum quantity to be delivered and the processor guarantees purchase of the entire harvest from the contractually agreed area. Unlimited contract duration and three year cancellation periods are particularly favourable to the interests of the farmers tied to the producers association.

Annual crop contracts firmly set the details for crop (varieties, dates), harvesting and storage as well as the establishment of quality and price. Significant swings in production prices on the free market of food potatoes (See Fig. 8) make the prices inadequate to cover the variable costs of the producers in low price years. In high price years, prices endanger the profitability of the processing company.

Therefore, long term prices are set that vary in their individual form. Guaranteed contract prices for certain amounts and option prices for additionally delivered raw materials balance the strong swings in market prices. In the case of Company A, the prices are negotiated in a similar way.

**Fig. 8: Producer prices for food potatoes (Varieties 2 and 3) in EUR/100 kg for Trade Category I in the course of the season for the years 1996/97 to 2005/06 in comparison to contract prices in the case studies**



Source: HAMBLOCH ET AL. 2006, case studies

The contracts indicate that both partners are striving for contractual security on the one hand, and free dealings on the other. In all case studies, separation of the price from the market can mean foregoing higher yields at certain times, but at other times income is secured in periods when market prices are lower. From an economic and social perspective, the systems for the regulation of price and quantities are sustainable because they provide the contractual partners with a concrete, calculable financial planning framework for future production periods.

The analysis of the local networks is only possible in case studies. In all three companies, extensive services by local service providers were drawn in. Particularly craftsman and repair establishments, transport companies or storage associations are kept busy.

Each of the studied companies depends on a good regional image, which is why, for example, in the surrounding communities sport clubs and schools are sponsored. Local civic activity should strengthen the image in the region, which is an important factor for the recruitment of new employees. Participation in networks is more defined in Company B than in the two companies that are controlled centrally by a parent company. Here the parent company is responsible for co-operation above the regional level.

Contacts to scientific institutions and research centers are only carried out at the head offices. That means that no research and development is conducted locally

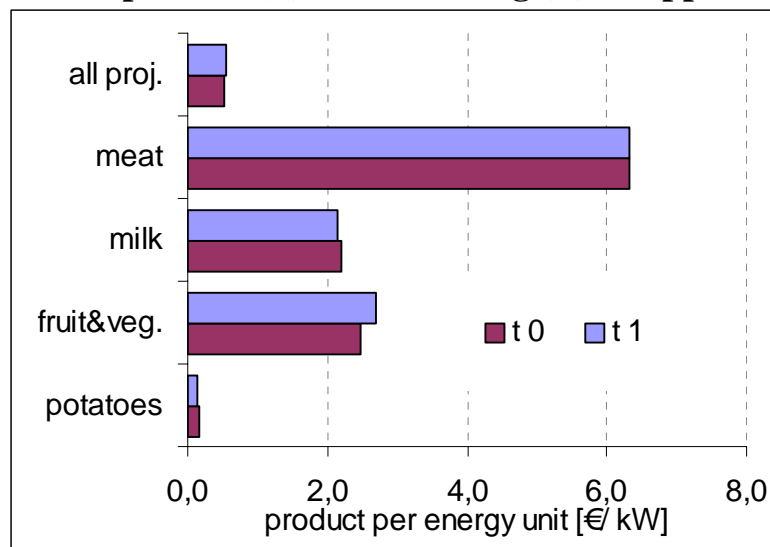
for companies A and C. Company B shows clear interest in cooperation in many areas of research and teaching. Due to the independence of the company the development of a research network is a central factor to cause synergy effects. The network secures the transfer of knowledge and flow of information between the partners and supports them sustainably by developing new ideas. This cooperation often leads to innovations which are of great importance in production or sales. In addition, the contacts help in acquiring professionals to manage the enterprise.

The regional ties of the case studies are targeted to a sustainable perspective. These are apparent through the contractual ties to suppliers and cooperation and networking at the local level. The social ties of the case studies are complex and difficult to analyse. During the interviews, we got the impression that the management has a responsibility to the employees. In particular, the training of young people is a sustainable activity if the young people can find permanent employment afterwards.

### 3.3 Ecological Aspects

Sustainability can be observed particularly in the dealing with resources and pollution left for further generations. The worldwide increase in energy needs and its impact on the global climate make energy efficiency an important indicator for sustainable business. The energy efficiency will become an important indicator for sustainable business.

**Fig. 9: Energy efficiency (production value/energy input) of the companies at the time prior to ( $t_0$ ) and following ( $t_1$ ) a supported investment**



Source: Own calculations based on EBQ

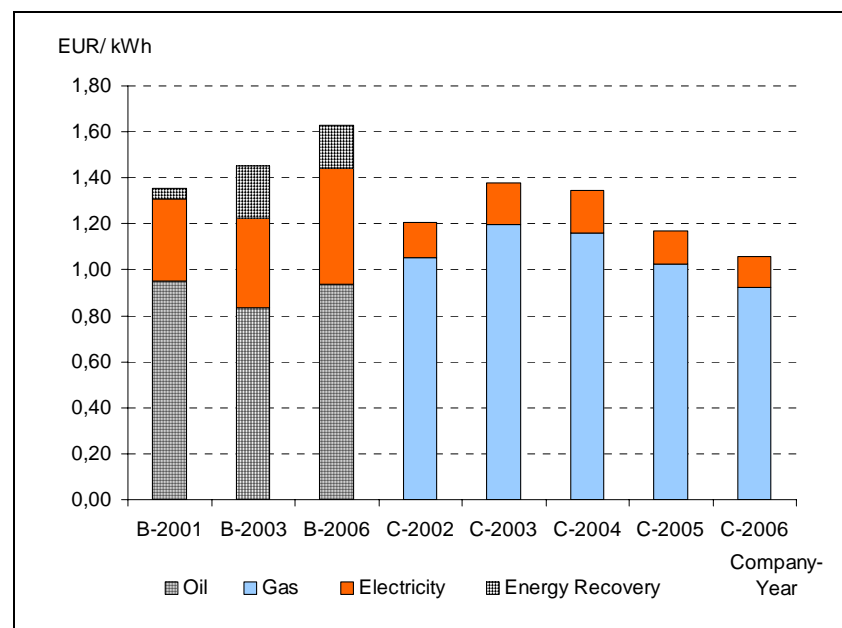
The energy efficiency is calculated for all supported projects from the value of the produced products and the energy used for its purpose (Fig. 9). On the average of all sectors, there was no change in the efficiency, meaning that in almost all areas, the absolute increase was compensated with an increased production

value. The sectors showed great differences in the use of energy. Thus in the sector Fruit and Vegetable Processing, the efficiency improved slightly, while in the area of Dairy Processing there was a slight worsening and in the sectors Meat and Potato Processing, the efficiency remained unchanged.

Uncertainty of the results stems in part from inconsistent data: thus the energy input is generally related to one part of the company, in some cases, however, to greater units (total company). Some other activities are also included in the energy calculations although they are not directly tied to the production (storage, service, sales), but they are not explicitly mentioned. Thus, the evaluation of the data for the supported companies provides only points of reference for changes spawned by the investment.

In the case studies, the energy efficiency – insofar as time lines are available – develops differently. The main sources of energy were electricity, oil or gas (Fig. 10).

**Fig. 10: Energy efficiency (production value/energy input) in Companies B and C**



Source: Own calculations based on data of case studies.

The energy efficiency (production value/energy input) in Company C has dropped steadily since 2003. The cause for this development could be found in the increasing energy input in reduced profit yields. In contrast, Company B increased its energy efficiency significantly. Despite more than doubly higher energy input in absolute term (the completion of a precooked product line) the efficiency improved through a more than proportionally high output. Electricity covered 31 percent of the energy needs, through the use of renewable energy resources, the consumption of heating oil was reduced from 70 percent of the total energy in 2001 to 58 percent (2006). In addition, since 2001, electricity is

fed into the electricity network from a biogas facility. Company A recovers five percent of its heat energy and could thus save 110 000 Liters of oil.

The indicator energy efficiency is a suitable parameter for evaluating the ecological dimension of sustainability, particularly in terms of the time development. With the help of this indicator, even companies with different products and processing methods can be compared in manufacturing and processing. But there are clear differences between branches in terms of energy efficiency (Fig. 9).

A further indicator for sustainable ecological business practices is the dealing with drinking and waste water as well as waste management. No commonly valid statements can be derived from the survey questionnaire (EBQ).

In the case studies it could be seen that Company A is extremely innovative in how it deals with the recycling of potable water. In a modern facility the processing water is recycled in such a way that 70 percent can be reused as potable water. The amount of waste water could be reduced by 60 percent in 2007 in comparison to 1998.

With regard to the waste management, Company B provides a positive example. It uses the waste products from potato processing completely in a biogas facility tied to a block heat and power plant. The electricity yielded is placed into the public network and the recovered heat used on site. The solid waste serves as fertilizer. Through this optimal use of garbage, a closed system results representing a sensible use of energy resources and sustainable business practices.

The manufacturing of products according to the rules for organic farming are recognized for the environmentally sound effects. The portion of organically produced raw materials can thus be a criteria for ecological sustainability.

The processing of organically produced products is traditional in Company A and in accordance with the company policy of the past few years to offer naturally prepared products. Thus the company almost doubled the processing of organically produced products in the past nine years and would like to increase the percentage further on. Despite intensive cooperation with the producers, problems do arise: No more agricultural producers than last year were prepared to convert to organic production. The production risks were seen as being very high in comparison to the cereal crops.

The supported companies have developed many effective methods to conserve resources and supported them with investments. The impacts are not consistently evident and are difficult to illustrate via a questionnaire. The case studies, in contrast, make an integrated view possible and clearly illustrate the striving of the company to use resources responsibly. Two effects are decisive here: first cost savings, which mostly accompany competitive advantages, and secondly an increase in the ecological thinking of the company managers.



The energy efficiency, as product value per used energy unit (kWh) is, with restrictions, a suitable criteria to evaluate the sustainable ecological impact. Here the price changes of the products should be considered in a time row. A relation to the produced quantities makes sense only for the single companies.

#### **4 DISCUSSION AND CONCLUSIONS**

The available data based on the EBQ survey allows a quantitative analysis of variables suitable to represent sustainable impacts, as outlined in the results. We found the indicator set shown in Table 2 to be practicable, even though not all aspects could be adequately evaluated. In many cases the availability of the data will be decisive for the selection of indicators.

HAHN ET AL. (2007) point out, that no matter which evaluation process is used, no assessment of sustainability is possible without a reliable data base. In their study, they use their own “sustainable value approach” to measure the efficiency of economic, social and ecological resource input by larger companies in comparison with the national economy as a benchmark. Unfortunately, the available data did not permit us to use this approach.

A number of approaches to formulate indicators, as well as complete indicator sets, can be found in the literature, which in most cases are either macroeconomic in approach (HAHN ET AL. 2007; HANLEY ET AL. 1999) or use parameters significant in a communal context to judge sustainability (LUBW 2007). HANLEY ET AL. (1999) point out in their analyses on the measurement of sustainability in Scotland, that the selection of indicators can lead to differing messages. Due to the fact that sustainability is affected by various factors in different dimensions like time, space, social context, i.e., in other words due to the fact that sustainability comprises a complex system with multiple interrelated elements, scientific examination has to be considered from an integrated view.

The effectiveness of enterprises in their regions can also be assessed through additional qualitative analyses, for example in the form of case studies, since the interactions and background can be more clearly presented. The view of the whole “system “ aids in defining the area of investigation, the relevant elements and impacts as well as trade-offs or synergies between elements, and can perhaps lead to an understanding of the influence that single or connected factors can have on sustainable development (BECKER 1997, p.15, 18).

The following practices, obtained from case studies, are able to provide an informative basis on sustainable systems:

- Closed ecological cycles (energy, waste, water)
- Dedicated management ensuring a successful economic development

- Apprentice level and permanent appointments
- Networks

Similar to our studies, the “Test Questions” drafted in Salzburger Land targeted the evaluation of single projects from the perspective of sustainability (GLAESER 2007).

Support within the framework of Measure g had a significant influence on the development of the studied enterprises. Based on the indicators “sales revenue” and “work productivity,” we were able to show that the supported enterprises developed in an economically stable manner at a time of economic depression. The region in which the company is located also profited from this economic development through multiple linkages with employees, raw material suppliers, repair businesses and service providers. The environment profited because ecologically relevant investments were supported.

And with regard to the occupational level, the enterprises supported within Measure g on average showed the tendency to increase the number of employees. This trend is in contrast to small drops in the number of employees in the food industry overall. It must thus be emphasized again, that our results are for gross effects: the expansion of supported successful enterprises probably caused the closing of other businesses or parts thereof. We have no data on these squeezing out of the market effects. Here, case studies offer the possibility to expand knowledge of individual cases. On the other hand, the case study method reaches its limits in an effort to obtain reliable facts outside of the published business reports.

The evaluation of the supported agri-food industry overall and detailed case studies show signs of sustainable development. It can, however, not be estimated if and to what extent the development would have proceeded without support funds. The funding could, in our opinion, speed up developments. From our experience, the rootage of the studied companies with a long tradition in the rural areas seems to be an important soft skill to ensure the location of agri-food industry in future. Consequently this may be an important factor for sustainable rural development.

## REFERENCES

- BECKER, B. (1997): Sustainability Assessment: A Review of Values, Concepts, and Methodological Approaches. *Issues in Agriculture* 10, 63. Washington, D.C.
- BRAND, K.-W., FÜRST, V. (2002): Sondierungsstudie: Voraussetzungen und Probleme einer Politik der Nachhaltigkeit - Eine Exploration des Forschungsfelds. In: Brand, K.-W.: *Politik der Nachhaltigkeit : Voraussetzungen, Chancen - eine kritische Diskussion*. *Global zukunftsfähige Entwicklung - Perspektiven für Deutschland* 3, pp. 15-109. Berlin.

- BRUNTLAND, G. H., World Commission on Environment and Development (WCED, 1987): Our common future. Oxford.
- DYBE, G., ROGALL, H. (2000): Einleitung. In: DYBE, G., ROGALL, H.: Die ökonomische Säule der Nachhaltigkeit: Annäherungen aus gesamtgesellschaftlicher, regionaler und betrieblicher Perspektive. fhw-Forschung 36/37, pp. 11-17. Berlin.
- EUROPEAN COMMISSION (1999a): Council Regulation (EC) No 1257/1999 of 17 May 1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF) and amending and repealing certain Regulations. Official Journal of the European Communities L 160/pp. 80-101.
- EUROPEAN COMMISSION (1999b): Council Regulation (EC) No 1260/1999 of 21 June 1999 laying down general provisions on the Structural Funds. Official Journal of the European Communities L 161/pp. 1-42.
- EUROPEAN COUNCIL (2000): Presidency Conclusions, Extraordinary European Council, March 23-24 Lisbon.
- Glaeser, O. H. (2007). Nachhaltigkeit von Projekten. Prüffragen zur Bewertung. Land Salzburg, Abt. 16 Umweltschutz. <<http://www.salzburg.gv.at/folder-nachhaltigkeit.pdf>>
- HAHN, T., LIESEN, A., FIGGE, F., BARKEMEYER, R. (2007). Nachhaltig erfolgreich Wirtschaften. Eine Untersuchung der Nachhaltigkeitsleistung deutscher Unternehmen mit dem Sustainable-Value-Ansatz. <<http://www.new-projekt.de/downloads/newstudielangversion.pdf>>
- HAMBLOCH, Ch., MENTH, H., STELZER, M., SCHAAACK, D. (2006). ZMP-Marktbilanz Kartoffeln. Bonn.
- HANLEY, N., MOFFATT, I., FAICHNEY, R., WILSON, M. (1999): Measuring sustainability: A time series of alternative indicators for Scotland. In: PEZZEY, J.C.V., TOMAN, M. (eds.), The Economics of Sustainability. Burlington, USA. pp 367-385.
- LANDESANSTALT FÜR UMWELT, MESSUNGEN UND NATURSCHUTZ BADEN-WÜRTTEMBERG (LUBW, 2007). Leitfaden zu kommunalen Nachhaltigkeitsindikatoren. <<http://www.lubw.baden-wuerttemberg.de/servlet/is/2170/?print=true>>
- SCHMITZ, P. M. (2003). Wirtschaftspolitische Rahmenbedingungen einer nachhaltigen Agrar- und Ernährungswirtschaft. In: GIRNAU, M., HÖVELMANN, L., WAHMHOF, W., WOLF, W., WURL, H. (eds.): Nachhaltige Agrar- und Ernährungswirtschaft : Herausforderungen und Chancen in der Wertschöpfungskette. Erich Schmidt Verlag, Berlin, pp. 8-12.
- STATISTISCHES BUNDESAMT (2005): Produzierendes Gewerbe, Beschäftigung und Umsatz der Betriebe des Verarbeitenden Gewerbes sowie des Bergbaus und der Gewinnung von Steinen und Erden nach Bundesländern. Fachserie 4/ Reihe 4.1.4 . Wiesbaden.
- UNITED NATIONS (1992a): Conference on Environment and Development: Agenda 21 - Global Programme of Action on Sustainable Development. UNCED.

UNITED NATIONS (1992b): Conference on Environment and Development. Annex I: The Rio Declaration on Environment and Development, 12 August 1992. UNCED, Rio Declaration.

ZUKUNFTSKOMMISSION DER FRIEDRICH-EBERT-STIFTUNG (1998): Wirtschaftliche Leistungsfähigkeit, sozialer Zusammenhalt, ökologische Nachhaltigkeit: Drei Ziele – ein Weg. Bonn: Dietz.