

Employee and Consumer Related Aspects of  
Socially Sustainable  
Organizational and Business Development of  
Horticultural Enterprises in Germany

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## Kurzfassung

Eine nachhaltige Entwicklung wird häufig basierend auf den drei Säulen der Ökonomie, Ökologie und der sozialen Entwicklung beschrieben. Die soziale Dimension der Nachhaltigkeit von Unternehmen ist in der Wissenschaft weniger häufig untersucht worden als die anderen beiden Dimensionen der Ökologie und Ökonomie. Zu Beginn der Arbeit wird eine Definition einer sozial nachhaltigen Organisation zur Diskussion gestellt. Der Ansatz wird mit drei existierenden Nachhaltigkeitsbewertungssystemen verglichen, um Lücken in den Letzteren zu identifizieren. Bereiche, in denen Verbesserungspotential besteht, werden aufgezeigt. Diese Lücken weisen darauf hin, dass soziale Nachhaltigkeit nur durch die zusätzliche Verwendung subjektiver Indikatoren bewertbar ist.

Der Nutzen von sozial nachhaltigen Produkteigenschaften für den Konsumenten wird anschließend untersucht. Antworten von 645 Konsumenten wurden mithilfe der auswahlbasierten Conjoint-Analyse und Stated-Preference-Ansätzen ausgewertet. Die Ergebnisse zeigen einen wesentlich höheren Teilnutzenwert für das Produktmerkmal Regionalität als für Bio sowie dass das Carbon Footprint Label im derzeitigen Design kein geeignetes Marketinginstrument darstellt. Des Weiteren wird die Bedeutung einer Verwendung kombinierter Methoden deutlich, da Ergebnisse von Stated-Preference-Ansätzen durch den Effekt der Sozialen Erwünschtheit verzerrt sein könnten.

Eine weitere Studie identifiziert Organisationsthemen, bei denen eine Lücke zwischen erwarteter zukünftiger Bedeutung und wahrgenommener eigener Kompetenz deutlich wird, basierend auf den Antworten von über 150 Entscheidungsträgern. Dies trifft insbesondere auf die Unternehmenskultur und das Führungsverhalten zu.

Die nächste Studie testet das Vitamin-Modell von Warr (2007) für die Messung der Arbeitszufriedenheit mithilfe eines Strukturgleichungsmodells auf Grundlage von über 200 Datensätzen von befragten Mitarbeitern. Die Ergebnisse unterstützen die Operationalisierung des Vitamin-Modells durch eine hohe Anpassungsgüte und die unterstellte Nichtlinearität der Nutzenfunktionen der Beziehungen zwischen den Merkmalsausprägungen der Arbeitsmerkmale und der subjektiven Arbeitszufriedenheit. Basierend auf diesen Daten und weiteren 400 von Berufsfach- und Meisterschülern sowie Studierenden der Gartenbauwissenschaften wird ein detailliertes Bild der Präferenzstruktur und der Beziehungen zwischen den Arbeitsmerkmalen und der Arbeitszufriedenheit bereitgestellt. Die Ergebnisse zeigen die hohe Bedeutung von guten Zukunftsaussichten und der Vereinbarkeit zwischen Beruf und Familie als auch eine wachsende Präferenz für Work-Life-Balance der jüngeren Generation.

Der letzte Teil der Arbeit identifiziert Gründe und Erfolgsfaktoren von Veränderungsinitiativen in deutschen Unternehmen des Produktionsgartenbaus. Hierzu wurden über 150 Entscheidungsträger mittels eines Onlinefragebogens befragt. Die Ergebnisse zeigen, nach Umweltthemen und dem veränderten Konsumentenverhalten werden insbesondere Personalthemen durch den demografischen Wandel und den Fachkräftemangel zu den Ursachen für fundamentale Veränderungsprozesse in Gartenbauunternehmen gehören. Die Studie weist des Weiteren auf die hohe Bedeutung von weichen personalorientierten Erfolgsfaktoren von Veränderungsprozessen hin.

**Schlagwörter:** Soziale Nachhaltigkeit, Konsumenten Marketing, Human Resources Management

## Abstract

Sustainable development is considered to be based on the three pillars of economy, ecology and social development. Research has not yet addressed the social dimension of sustainability of an enterprise as in much detail as the other two dimensions ecology and economy. In the first part of this thesis, a definition of a socially sustainable organization is provided as a basis for discussion. The approach is then compared with three existing sustainability assessment systems to identify gaps in the latter. The areas in which potential for improvement is identified, such as job autonomy, emotion and family friendliness, indicate that social sustainability can only be assessed by including subjective measures.

In the second part the value of social sustainability properties of products (labels) to the consumer is evaluated. Data from 645 surveyed consumers were examined using choice-based conjoint analysis and two stated preference approaches. The results indicate that local origin is more preferred than organic but also that the carbon footprint label in the current design is not a suitable marketing tool. Furthermore the use of a combination of methods is important, since stated preference approaches might be biased by social desirability effects.

Another study based on data from more than 150 decision-makers indicates organizational issues where a gap between future importance and perceived competence is present, which is especially the case for soft subjects such as corporate culture and leadership.

The next study tests Warr's (2007) vitamin model for the assessment of job satisfaction in German horticulture with covariance structure modeling and evaluates the possibility of nonlinear relationships between job characteristics and job satisfaction using about 200 data sets from surveyed employees. The results support the operationalization of the vitamin model by a good model fit and the supposed nonlinearity of utility functions of the relationships between job characteristics values and subjective job satisfaction. Based on the same data and an additional 400 vocational and master craftsman scholars as well as horticulture students, a detailed picture of preferences as well as relationships between job characteristics and job satisfaction is provided. The results indicate the importance of good future prospects, work-family conflict and the employer's morality towards society, as well as a shift towards a preference for an increased work-life balance among the younger generation.

The last part of the thesis identifies reasons for and success factors of the change initiatives needed for sustainable corporate development in German horticultural production companies. For this reason, more than 150 decision-makers were surveyed using an online questionnaire. After environmental issues and changing consumer demand and behavior, particularly employee-related issues, such as demographic change and skilled labor shortage, are named as causes for fundamental transformation processes in horticultural companies in the next decade. The study also indicates the significance of "soft" employee orientated success factors of organizational transformation processes.

**Keywords:** social sustainability, consumer marketing, human resources management



# 1 General Introduction

Sustainable development is defined in the Brundtland Report as "(..) development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987, p. 41). Generally, sustainability is considered to be based on the three pillars of economy, ecology and social issues. The three-pillar model finds its application in the UN resolution in the wake of the World Summit on Sustainable Development in September 2002 in Johannesburg (South Africa). It reads in point 5: "Accordingly, we assume a collective responsibility to advance and strengthen the interdependent and mutually reinforcing pillars of sustainable development – economic development, social development and environmental protection – at the local, national, regional and global levels." (United Nations, 2002, p. 55).

The subject of sustainability shows an ever-growing importance on the political level in Germany. This circumstance is reflected for example in the institutionalization in the form of the Council for Sustainable Development (Rat für Nachhaltige Entwicklung) and the research initiative FONA (Research for Sustainable Development – Forschung für Nachhaltige Entwicklung, Bundesministerium für Bildung und Forschung, 2012). Consultants also increasingly recognize the importance of sustainable development as a cultural change in companies is observed at KPMG (Pampel, 2011). If the commitment to ecological and social responsibility some years ago was more ethically motivated, it has now become an economic necessity. Therefore, nearly half of the 250 largest companies in the world recognize that their efforts to achieve sustainable management goals also pay off monetarily. For example, through a rising brand image, which has a positive effect on revenues and share price development (Pampel, 2011).

In agriculture, a number of sustainability evaluation systems have been developed on the three-pillar model. These are designed in the major part for specific types of farms and production processes and cannot easily be transferred to horticultural companies. The developed systems for agriculture meanwhile aim at corresponding certification of companies. The motivation of this certification is the latest development in the food retail sector. All major food retailers have themselves committed to the issue of sustainability (Heck, 2010, pp. 119–128). Horticulture companies will also increasingly have to deal with sustainability issues in the future, in co-operation with retailers. Horticultural companies therefore need to develop concepts to measure their sustainable development, to be able to build up a sustainable controlling and –management system.

The current state of research is as follows: The majority of the existing evaluation systems in agriculture focus only on one of the three dimensions (Christen, 2009). The existing general evaluation systems address mostly large enterprises of industries other than agriculture or horticulture (Meyer & Schulz, 2011, pp. 3–11). Research in the field of small and medium enterprises (SMEs) is still at an early stage (Meyer & Schulz, 2011, pp. 3–11). To the authors knowledge there is no holistic sustainability assessment system for horticultural companies, which could support sustainability management and thus a sustainable corporate development. The prioritization of dimensions is handled differently (Hülsbergen, 2003; Grimm, 2009; Hauff & Kleine, 2009; Meyer, (Ed.) 2011). For agriculture, sustainability models and evaluation systems are available (e.g. KSNL, REPRO, DLG, see Christen, 2009). Sustainability can only be assessed within an industry (Boyd, 2007). The developed methods for measuring the indicators, as well as the selection of indicators are not designed for the horticultural industry. In particular, the social dimension of sustainability has not yet been addressed as detailed in sci-



that level would lead to an economic crisis in the mid-21st century. On the first UN Environmental Conference in Stockholm, the United Nations Environment Programme (UNEP) in 1972 was launched, after that environment ministries were established in many countries. In the World Conservation Strategy of the International Union for the Conservation of Nature (IUCN), the term sustainable development was first introduced in science and politics. The strategy focuses on the economic and environmental dimension of sustainability; the social dimension was still negligible at this time (Grunwald & Kopfmüller, 2012, p. 18). Since the publication of the Brundtland Commission in 1987 (Brundtland, 1987) sustainable development has become a global political model. This model includes at international level, the three dimensions of sustainability: economic growth, environmental protection and social responsibility. Sustainable development, as defined in the Brundtland report takes into account both the satisfaction of needs of the present generation as well as those of future generations. The consideration of the dimensions, accordingly, has to be aligned in the long term.

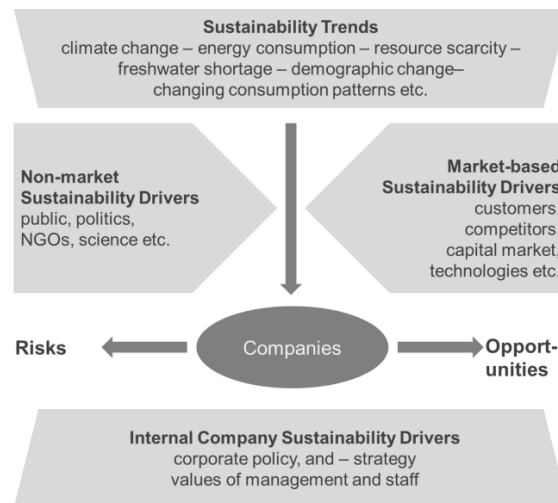
The Brundtland report (Brundtland, 1987, p. 54) puts human beings and their needs in the center of view; here the growing importance of the social dimension in the understanding of sustainability becomes part (Hauff, 1987, p. 46). The aim of the Brundtland commission was to develop a global strategy of sustainable development. The commission submitted the proposal to establish a world conference in order to pursue an international strategy. This proposal resulted in the initiation of the Rio process in 1992. In 1992, representatives from 178 countries on the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro committed to sustainable development. The outcome of the Rio conference was a catalog of measures, which is known as Agenda 21. This catalog contains environmental and development programs, which should align the interests of the first and the third world. The focus of the industrial nations was a common environmental policy, whereas the emerging and developing countries defended their right for economic development, by arguing that increased environmental regulations would inhibit their growth.

Agenda 21 (Robinson, Hassan, & Burhenne-Guilmin, 1992) involves decisions such as the Declaration on Environment and Development (intra- and intergenerational justice), the Convention on Biodiversity, Climate Convention and the Convention on Forests. Neither of these decisions contains binding quantifiable targets. Rather they form a normative framework (Volkman, 2002, p. 19). To initiate sustainable development at the international level, quantified targets are needed, which need to be implemented at national level. This circumstance followed a number of conferences (Hauff & Kleine, 2009, p. 8).

In the sustainability debate disagreement continued on the prioritization of dimensions. One group sees ecology as the basis of all existence and thus considered to be the highest for weighting. The other group considers that all three dimensions must equal each other to ensure sustainable development. The differences between views of groups indicate the importance of considering stakeholders when dealing with sustainability. In the case of the social sustainability, the most important stakeholders to consider are consumers, decision-makers in horticultural companies and of course the employees and future employees in German horticulture.

## 1.2 Indicators for the Evaluation of Corporate Sustainability

The normative guiding idea of sustainability based on the three pillars of ecology, economy and social issues gains more and more attention in business administration and also in research on small and medium enterprises (SMEs) (Meyer & Schulz, 2011, pp. 3–5). The integration also of primary objectives of all dimensions in addition to classical target dimensions of business administration such as revenue and return on investment, can develop into a new holistic management concept (sustainability management). Some authors such as Hauff, Kleine, and Jörg (2005, p. 29) see no trade-offs for the different requirements of sustainability management, they suspect long-term goal conformity at least of ecological and economic sustainability goals. Dyllick (2003, pp. 235 ff.) assumed that SMEs use sustainability management as a quasi-intuitive approach and thus act per se in a sustainable way. Morsing and Perrini (2009) summarize that after more than 30 years of research, the relationship between sustainability and economic success is not conclusive. In empirical studies by Hammann, Habisch, and Pechlaner (2009) and Behringer and Meyer (2011, pp. 19–20) of German SMEs, it was studied which impact sustainable actions show on different stakeholder groups (employees, customers and society etc.) and ultimately on the enterprise value. It has become clear that sustainable management behavior, either by reducing costs or increased profit, shows a positive impact on the company's value. In particular, the treatment of employees as an essential stakeholder group appears to be a critical success factor for SMEs. The potential of sustainability management is located mainly in the internal perspective of the company, since for example, although many potential customers specify that they are willing to pay a higher price for environmentally and socially responsible products, this indicated willingness to pay can be observed rarely in real purchasing situations (Mohr, Webb, & Harris, 2001). Figure 2 shows the drivers, risks and opportunities for sustainability management in horticultural companies.



**Figure 2.** Drivers, risks and opportunities for sustainability management. Cf. Dyllick (2004, pp. 75 ff.).

Sustainability management in horticultural companies is to be understood as a comprehensive, systematic, goal- and result-oriented management approach to proactively shaping the framework of entrepreneurial activity for the enforcement of the sustainability paradigm. This strategic approach looks for a long-term continuous improvement as well as the initiation of organizational learning and requires a normative paradigm and a

focus on operational objectives of the three dimensions of sustainability (Mao & Ai, 2009; Kerr, 2006; Rabbe & Schulz, 2011).

Internal potential through strategic sustainability management for companies can be distinguished in (Rabbe & Schulz, 2011, p. 62):

- ▶ Organizational potentials, mainly due to optimization of the quality and professionalism of management, increase of the quality of environmental information and their implementation such as due to the anticipation of political and legal framework changes, in compliance with existing environmental regulations or in the procedures for identifying of rationalization and optimization potentials and sources of operational innovation (Arnold, Freimann, & Kurz, 2003, Steinle, 2002; Böttcher, 1999).
- ▶ Financial potentials, such as cost savings by reducing the material and energy consumption and waste or by increasing the efficiency, which can lead to an improvement in the economic out-turn.
- ▶ Potentials with respect to its own employees, such as, increased motivation, enhanced skills and qualifications or an improved corporate image among employees, increasing the attractiveness in recruiting new employees.

External potential generating business and communication advantages for horticultural companies (Rabbe & Schulz, 2011, p. 62):

- ▶ Business potentials are expressed in new customers/business opportunities, being preferred as a supplier, a clear corporate social responsibility profile, which contributes to competitive or marketing advantages or increases the satisfaction of existing customers. Of note are further generating benefits for the environment, mainly due to improved environmental impact, increased energy and material efficiency, recycling and reduced pollution (Dyllick, 2003; Rosenstiel, 1989).
- ▶ Communication potentials arise in horticultural companies e.g. from a positive corporate image in the public, better relationships with customers, better access to capital from environmentally conscious investors and improved co-operation and relations with authorities through regional confidence building (Porter & Linde, 1995).

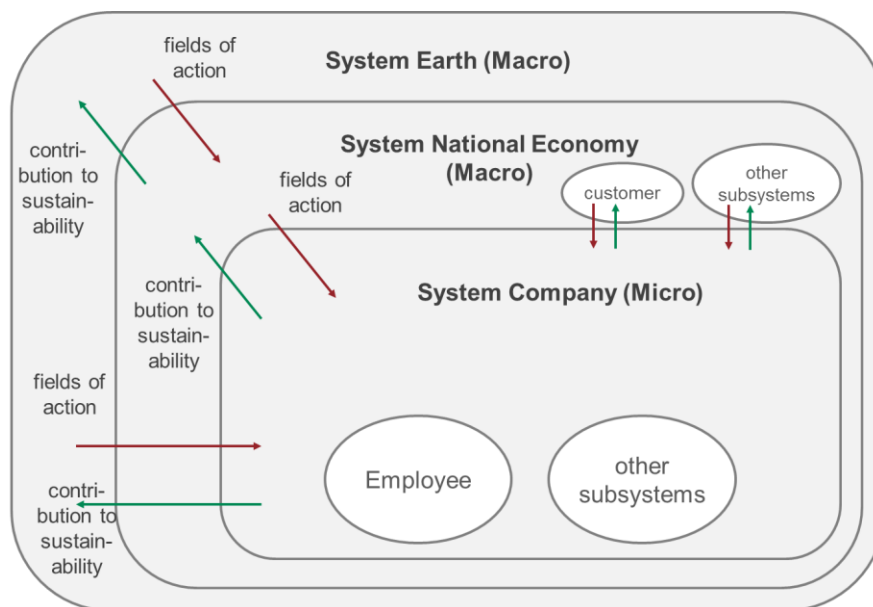
With sustainability management fundamentally different corporate strategies can be pursued. While some companies see sustainability management primarily as an instrument of risk management and for reducing costs, others see the opportunity for differentiation and entering new markets (Haanaes et al., 2011; Schaltegger, Harms, & Windolph, 2010). The objective in the latter case is to achieve revenue growth and a higher reputation and improve competitiveness.

A systematic approach should be the basis when selecting and assessing goals of sustainability and the indicators for the evaluation of this goals. It may be useful to work from the macro to the micro level, to address sustainability issues, which are the result of long stakeholder negotiations and are important for systems, where the horticultural companies are part of (see Figure 3). First, fields of action at the global level should be identified (United Nations, 1996; United Nations, 2001; United Nations, 2007; United Nations Conference on Sustainable Development, 2012); at the same time indicators established for this level should also be considered. A typical field of activity on a global scale would be, for example, climate change with the indicator greenhouse gas emissions (expressed as CO<sub>2</sub> equivalents). This can be transferred to the corporate level,

keeping in mind the aim of the contribution, it should be considered to what extent a change in the indicator at the company level can contribute to the target value (in this case, the concentration of CO<sub>2</sub> in the atmosphere). It does not matter how high this contribution is, the decisive factor is whether the contribution exists. Unless some other indicator or derivative from its actions can make a more decisive contribution to the target dimension. In this case, the more efficient indicator is preferable.

The demographic development is (yet) at the global level characterized by overpopulation or too high fertility rates. Germany (fertility rate of 1.39 (2010, 2.09 would be consisted preserving; The World Bank, 2012) shows a different picture, so family friendliness and diversity (older people, people with an immigrant background etc.) are key action areas of sustainability on a national level (socially and economically). Thereby further indicators for the company level can be derived (for the areas of activity at the national level, see: Bundesrepublik Deutschland, 2012). Again, it must be critically questioned whether the company can contribute to the target value of the field of action. An indicator should not be collected for its own sake, provided that a professional analysis is sought. Should the indicators serve communication purposes so the actual effect of the indicators is secondary and they must be understood and seen as significant by the receiver in the first place.

Finally, the company itself and its preservation has to be considered. Here again arise fields of action, indicators and corresponding targets. Sustainability indicators refer to areas of activity, which are essential for the survival or the success of a system. The fields of action and the resulting indicators give an indication for possible indicators at the company level. Figure 3 visualizes the relationships described. Ultimately it must be evaluated if a change in the indicator value (at company level) can make a contribution to the target value of the field of action at the level of a higher system (often a condition indicator), for example can a higher energy efficiency lead to less energy consumption in an economy?



**Figure 3.** Effect relationships of a sustainability indicator catalog.

The procedure described for deriving an indicator catalog was used to prepare a proposal for an indicator catalog for assessing the sustainability of horticultural companies.

For this purpose, after the global and national level, general indicator catalogs (e.g. GRI (G3)) and indicator catalogs from the agricultural sector (RISE (Grenz, Studer, Stämpfli, & Thalmann, 2009), REPRO (Hülsbergen, 2003; Grimm, 2009), KUL (Eckert, Breitschuh, & Sauerbeck, 1999), and DLG (Deutsche Landwirtschafts Gesellschaft (DLG), 2009)) were considered.

Many factors for success are not apparent from the balance sheet and income statement of conventional external accounting. Soft topics (such as corporate culture, innovation management and employee motivation and leadership) are on average around 50 % more frequently named among the five most important issues of the future by executives in Germany than hard topics (Roghé et al., 2009). A sustainability indicator catalog and a sustainability management approach (incl. sustainability controlling), provides an opportunity to draw the attention of corporate management to corresponding areas. The indicators help to identify untapped potential for the company and to counteract the undesirable developments and to respond proactively to corporate environmental changes.<sup>1</sup> For example, areas such as innovation with the indicator implemented suggestions per FTE (full time employee, excl. seasonal workers), employee management and leadership with the employee satisfaction measurement as well as the review of the product portfolio in the BCG (Boston Consulting Group) matrix can be named.

Another field in particular concerning companies in Germany, is the socio-demographic change (the median age of the German population will be 50 years in 2030 (2011, 45 years; United Nations, 2011) previously often overlooked in sustainability indicator catalogs, (Hülsbergen, 2009; Deutsche Landwirtschafts Gesellschaft (DLG), 2009; Breitschuh, 2008; VDI 4070) is the issue of diversity, a future challenge for all companies in Germany (in 2032 40 % of all new entrants will have a migration background; Piopiunik & Wößmann, 2011). This development brings opportunities and risks for businesses. One indicator in this area is the share of employees (excl. seasonal workers) with an immigrant background.

Based on the eco-efficiency indicator energy efficiency, it must be critically questioned whether indicators that appear as target-oriented at company level (within the meaning of the environmental dimension of sustainability) withstand at macroeconomic level (Meyerding, 2016a, 2016b, 2016c). Rebound effects can, e.g. in the case of energy efficiency, lead to the situation where technical efficiencies are not leading to a lower energy consumption at macroeconomic level, or backfire resulting from economic growth can lead to an increased consumption (Madlener & Alcott, 2009). Energy efficiency is here an example that propagated indicators in the public and of those viewed as purposeful indicators often do not contribute as expected. This can be true for the ecologic dimension of sustainability and does not necessary limit the contribution of energy efficiency for the economic dimension. It is therefore essential to define the objective of an indicator and to demonstrate its degree of achievement as scientifically sound. An indicator catalog that is based only on stakeholder surveys resembles a "wish list", but nevertheless stakeholder participation and communication is essential in order to identify potential areas for action and future trends for sustainability indicator catalogs and thus for the sustainability management system.

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<sup>1</sup> These include demography, complexity, environment, labor market, acceleration, Asia, IT flexibility, resource shortages/prices, corporate governance, internet, forms of work, global sourcing, new technologies, division of labor, work ethic, financial markets, the end of national states, urbanization and women (in descending importance) (Claßen & Kyaw, 2007).

Tables 1 to 3 show the indicator catalog to assess the sustainability of horticultural companies in Germany. In this thesis the indicator catalog should be listed only for completeness. This will not be discussed further and serves only for classification of the issues of social sustainability, which the present work focuses on. The sustainability indicators SPI (social performance indicator) 13 (employee satisfaction) and BPI (business performance indicator) 8 (ability to change) in the catalog are based on the results of this thesis. These indicators were selected, because they are very challenging to define and to measure. They are also assumed to be critical for the social and economic dimension of sustainability and assumed to be highly correlated with other indicators in the respective dimension.

**Table 1.** Indicators of the Social Dimension

Social dimension			
Theme	Subtheme	Sustainability indicator	
Social responsibility	Family friendliness	SPI1	"Company kids" up to 16 years per female worker
	Distributive justice	SPI2	Gini index salaries (excluding seasonal workers)
		SPI3	Diversity (women, people with an immigrant background etc.)
		SPI4	Work-related illness on the duration of industry membership
	Health	SPI5	Quality assurance (Globalgap certification)
		SPI6	Complaints from the neighborhood
	Social cohesion	SPI7	Legal violations (penalties)
	Future generations	SPI8	Training rate
Work practices and employment	Safeguarding	SPI9	Employer-funded pension
		SPI10	Occupational safety (accidents)
		SPI11	Employee turnover
	HR development	SPI12	Further education
		SPI13	Employee satisfaction

**Table 2.** Indicators of the Economic Dimension

Economic dimension			
Theme	Subtheme	Sustainability indicator	
Economic stability	Financing	BPI1	Equity ratio
	Liquidity	BPI2	Financial strength 1 and financial strength 2
	Profitability	BPI3	Profitability coefficient and output per FTE
Economic development	Production factors	BPI4	Capital per worker
	Product-market combination	BPI5	Product portfolio (assessment by BCG matrix)
	Innovation	BPI6	Proposal-oriented innovation rate
	Investment	BPI7	Net investment
	Development	BPI8	Ability to change



**Table 3.** Indicators of Ecological Dimension. EPI (Ecological Performance Indicator)

Ecological dimension			
Theme	Subtheme	Sustainability indicator	
Eco-efficiency	Resource productivity (efficiency)	EPI1	Energy efficiency
		EPI2	Nitrogen balance
		EPI3	Substrate use (peat)/turnover
		EPI4	Use of pesticides (standardized treatment index and SYNOPS index (optional))
	Damage efficiency	EPI5	Sewage
		EPI6	Soil erosion
		EPI7	Waste (recycling)
		EPI8	Soil compaction
		EPI9	Land use (ha)/value added
		EPI10	Humus balance
Specific indicators of ecology	Biodiversity	EPI11	Biodiversity index
	Climate change	EPI12	Carbon footprint
	Recycling	EPI13	Recycling rate products (incl. package)

### 1.3 Outline of the Doctoral Thesis

A lot of indicators of general and agricultural indicator catalogues can be used also in horticulture, with some adjustments. But for the social dimension of sustainability the indicator definition is especially challenging. For this reason the thesis focuses on the social dimension and aims to contribute to the socially sustainable development of horticultural companies in Germany. The dissertation consists of seven articles (chapter two to eight), which consider different aspects of a socially sustainable organizational development in horticultural companies. For this purpose, five quantitative studies with a total of 2,500 study participants were carried out.

As mentioned above the social dimension of sustainability is not sufficiently defined. This is depicted only rudimentarily in particular in sustainability assessment systems in agriculture. For this reason, a modified extended capability approach (MECA) is presented and provided for discussion as a guide and as a definition of social sustainability in organizations in chapter two. The MECA is then faced with three scientific sustainability evaluation systems in agriculture to identify gaps and potentials with respect to the social dimension of sustainability.

The sustainability performance of a horticulture company can be communicated to the consumer using labels. The social dimension is displayed in the study in chapter three with the Fairtrade and “Ein Herz für den Erzeuger” (A heart for the producer) label. Consumer preferences for food labels are evaluated using the example of tomatoes in Germany and a comparison of a quasi-experiment with two stated preference approaches were made. Another objective of the study was to quantify the part-worth utilities of product characteristics such as origin, price and food labels. The real purchasing situation was simulated and evaluated in a quasi-experiment using the choice based conjoint analysis.

In chapter two a definition of social sustainability is provided for discussion for the concretization of the social dimension at company level and the gaps of existing evaluation systems are pointed out. In chapter three the importance of different product characteristics, which reflect the social dimension of horticultural products for the consumer is quantified. Chapter four is dedicated to the importance of individual organizational subjects (including the area employees) for organizational design from the perspective

of horticultural entrepreneurs. The aim of the study in chapter four is to identify issues that will shape the organization design in the future from the perspective of decision-makers in German horticultural companies. The study is also done to show overriding trends and to collect the perceived current competence of decision-makers in the different areas, as well as their previous experience. The study in particular has the goal to identify areas in which there is a gap between the future importance of the issue and the perceived competence of the horticultural companies.

The measurement of employee satisfaction can close many gaps identified in other sustainability evaluation systems (see chapter two). Furthermore, the social dimension of sustainability has potentially a higher value for the consumer, as it is the case for example, for certain aspects of the environmental dimension. To measure subjective job satisfaction, Warr's (2007) vitamin model was used. The vitamin model and its operationalization were tested in German horticulture in the study in chapter five. Chapter six deals more descriptively with the impact of the identified job characteristics in chapter five on work and life satisfaction and the preferences regarding the job characteristics of employees in German horticulture. In addition, personal characteristics are examined. For sustainable development of a horticultural company, not only the needs of the present generation (chapter six) are important, but also the needs of future generations. For this purpose, the vitamin model was also tested by specialized vocational and master scholars in chapter seven. Furthermore, the preferences of students of horticulture sciences and of specialized vocational and master scholars are compared in chapter seven with those of today's employees in horticulture (chapter six). As a result, differences between the groups become apparent.

To become more sustainable, the horticultural company itself must also change. The experience of decision-makers in horticultural companies, when it comes to change processes, is examined in chapter eight. To this end, the study identifies the causes of fundamental change processes in horticultural companies, shows overall trends and identifies the success factors of change initiatives in German horticulture production companies from the perspective of the decision-makers participating in the study. This thesis ends in chapter nine with a general discussion. The questionnaire for each study can be found in the appendix.

The chapters of this cumulative dissertation are published, accepted for publication or currently under review at international journals. Table 4 summarizes the current status and additional information, such as authorship and sample size, for all chapters.

**Table 4.** Publications of the Chapters of this Dissertation

Chapter	Title	Author	Sample	Journal	Status
2	The 14 Aspects of the MECA Framework for the Concretization of Social Sustainability in Organizations	Stephan Meyerding	N.A.	Berichte über Landwirtschaft (German version), DOI: 10.12767/buel.v93i3.86.g221	published
3	Consumer Preferences for Food Labels on Tomatoes in Germany – A Comparison of a Quasi-experiment and two Stated Preference Approaches	Stephan Meyerding	645 consumers	Appetite, DOI: 10.1016/j.appet.2016.03.025	published
4	Organization 2020 – An Empirical Study of the Current and Future Importance of Organizational Issues for Horticultural Companies and their Perceived Competence in Germany	Stephan Meyerding	150 entrepreneurs and executives	Acta Horticulturae (earlier version), DOI: 10.17660/ActaHortic.2016.1132.3	published
5	Job Characteristics and Job Satisfaction: A Test of Warr's Vitamin Model in German Horticulture	Stephan Meyerding	280 employees	Russian Journal of Agricultural and Socio-Economic Sciences, DOI: 10.18551/rjoas.2016-03.06	published
6	Job Satisfaction and Preferences of Employees of Horticultural Companies in Germany	Stephan Meyerding	200 employees	Schriften der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues (earlier German version), ISBN: 978-3-7843-5463-7	published
7	Job Satisfaction and Preferences Regarding Job Characteristics of Vocational and Master Craftsman Scholars and Horticulture Students in Germany	Stephan Meyerding	200 vocational and master craftsman scholars; 200 horticultural science students	The Psychologist-Manager Journal, DOI: 10.1037/mgr0000029	published
8	Change Management Study of Horticulture 2015 – Conditions and Success Factors	Stephan Meyerding	150 decision-makers	Acta Horticulturae (earlier version), DOI: 10.17660/ActaHortic.2015.1103.31	published
				International Food and Agribusiness Management Review	accepted
				Review of Agricultural and Applied Economics, DOI: 10.15414/raae/2016.19.01.30-49	published
				Journal of Organisational Transformation & Social Change, DOI: 10.1080/14779633.2016.1192811	published

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## 2 The 14 Aspects of the MECA Framework for the Concretization of Social Sustainability in Organizations

### 2.1 Abstract

So far, the social dimension of sustainability has been inadequately defined at the organizational level. It lacks concrete ideas regarding which objectives should be pursued in this area. Without sufficient concretization, it is difficult to distinguish purposeful indicators and to identify and exploit the potential of this dimension. In this article, a modified extended capability approach (MECA) is provided as a suggestion for discussion to serve as a guideline and definition of the social sustainability of organizations. The capability approach of Nussbaum (2003, 2010), which describes a good life, was extended for this purpose to the aspects of "future generations," "improvement," "law" and "cultural diversity." It was subsequently modified to apply to all organizations. The MECA was then compared with three selected sustainability assessment systems to identify gaps and potential regarding the social dimension of sustainability. The indicator employee satisfaction, if measured properly, can make a major contribution to closing the identified gaps.

**Keywords:** capability approach, social sustainability, evaluation, measurement, indicators, horticulture

### 2.2 Introduction

The social dimension of sustainability has not yet been addressed in research in as much detail as its other two dimensions, economy and ecology (Hauff & Kleine, 2009, p. 21). The reason is partly the abstractness of the term social; on the other hand, the origin of the sustainability debate has also evolved from environmental movements. In agriculture and horticulture, mostly natural scientists deal with sustainability issues (Bundesministerium für Bildung und Forschung, 2012). Here, an interdisciplinary deficit becomes apparent that is a hindrance when approaching sustainability holistically.

According to the frequently cited Brundtland report, the definition of sustainable development includes intra- and intergenerational justice (Brundtland, 1987, p. 54). The justice claim of future generations is in accordance with the prevailing ecocentric perspective equated to the conservation of natural resources. At the macroeconomic level, justice is to be achieved within a generation by an equitable distribution of and equitable access to resources. This definition does not apply the intuitive idea of what is social; it is also not very helpful in concretizing the social dimension for a horticultural company and on this basis deriving indicators of social sustainable development.

Natural science and econometric methods are unable to fill out the social dimension of sustainability in a satisfactory manner. Their research objects are too far away from normative justice and human psychology. It is most likely that economic science can make a contribution here through the concept of individual utility maximization. Nevertheless, philosophy and psychology will be more able to fill purposefully the core of the social dimension. Why these two disciplines attain favorable results will become clear in the course of this article. The main subject of this article is the equity within the present generation and, based on the horticulture company in Germany, its employees.

The fundament and intention of this article is the recognition that the primary objective of the social dimension of sustainability must be to enable people to live a good life and that a good life is defined by the amount of positive emotions rather than by tangible goods alone, such as salary, or other easy-to-quantify indicators, such as the entitlement to leave. If happiness is the essential driving force of human activity, the absence of pain and a key factor in a good life, the social dimension of sustainability must aim to maximize human happiness.

### **2.3 Philosophical Foundations of Social Sustainability**

The following approaches have in common that they are more likely to define social sustainability and justice at the macroeconomic level, as they make a significant contribution to the design of social sustainability at the company level. Nonetheless, they should be included in further considerations.

The basic needs approach calls for all people to have equitable access to basic social goods but also equality of opportunity and the chance to realize themselves, that is, the possibility to shape their lives freely. At the same time, human dignity must not be questioned. This requirement is also reflected in the German basic law in article one, paragraph one: "The dignity of man is inviolable (...)." (Di Fabio, 2007, p. 1) Among the basic social goods are legal issues and a sense of justice, tolerance, solidarity, common good orientation and integration capability. These basic social goods are a prerequisite for lasting social peace and thus also for the stability of a society.

Fischer-Kowalski summarizes social sustainability as follows: "(...) Solution to the problems of distribution between regions (...) social classes, genders and age groups, and solutions to the problem of cultural integration, of affiliations and identities." (Fischer-Kowalski, 1995, p. 5) Von Hauff criticizes this approach for failing to give recommendations for policy making in relation to the unclear needs of future generations (Hauff & Kleine, 2009, p. 21). Fischer-Kowalski considers two areas that can be implemented at the company level. She talks about distribution problems, which can target an extreme unequal distribution of income. Even if the demand for equality at this point has to be viewed critically, extreme inequality can be assessed as unsustainable in the normative sense. The indicator "Gini coefficient of the salary structure" herein may contribute to an improvement. However, this indicator will not be discussed in detail at this point. Another issue is cultural integration, which could be displayed by diversity indicators such as the proportion of permanent employees with a migration background.

The concept of social capital is to be mentioned only in passing. Its meaning is, as in the case of environmental and economic capital, not uniformly defined. Haug and Gerlitz understand social capital to mean the sum of social networks and the existence of cooperation-promoting ethics within a society (Haug & Gerlitz, 2007, pp. 189 ff.). The cooperation-promoting ethics mentioned here can be implemented at the company level. The implementation may use the indicator employee satisfaction to support a change in the management and corporate culture of a horticultural company.

In recent times, the question of what makes people happy has been asked. The positive psychology founded by Seligman and Csikszentmihalyi does not address the classic examination subject of psychopathology; rather, it examines the psyche of healthy people. The author sees in this approach the greatest potential for the social dimension but also considerable potential for the economic dimension of sustainability in companies. Hap-



piness and satisfaction as weakened vocabulary should be considered synonymous at this point. Happiness and justice are two basic requirements of social sustainability. The issue of satisfaction or happiness is considered in detail elsewhere.

The Brundtland Report has already underlined the importance of inter- and intra-generational equity. One characteristic of justice is that it is difficult to specify. Politics puts people at the center of attention, occupying an enlightened anthropocentric perspective. The Western culture considers justice from its enlightened Christian history; this understanding includes certain approaches to justice and excludes others. Ethics tries to develop standards that are shared by all people around the world. Nevertheless, the question of what is fair and what is good or bad cannot be clarified. If Western ethics is postulated, then it is relatively concrete for justice between people (intra-generational justice), whereas the discussion on inter-generational justice in the case of different utilization demands is not yet at an advanced stage. The problem is that forecasts of the needs of future generations are hardly possible; thus, it is difficult to make a decision today and estimate the impact on future generations. For example, the current consumption of resources could reduce the ability of future generations to satisfy their needs, or it could appear to be necessary to build the capacity to satisfy the needs today and in the future (Hauff & Kleine, 2009, pp. 101–102).

Many of today's discussions on justice, especially in the Anglo-American world, are based on the theory of utilitarianism. Classical utilitarianism dates back to Bentham (2009) and Mill (1871). Bentham advocates the maximization of happiness by maximizing the tangible and intangible satisfaction of needs of the individual on the basis of rational action (Bentham, 1789, pp. 14–18). Bentham assumes in the sense of classical economic theory that the aspiration of the individual to maximize his/her personal utility also maximizes the benefits to the general public. If two equally weighted benefits are compared, this means that the distribution of benefits between individuals is not important, only the sum for society as a whole. This understanding of utilitarianism can lead to a severe imbalance within a society. The approach has to be assessed as ineffective from the perspective of sustainability, since intergenerational justice is neglected. However, extreme inequality can threaten the social peace within a country and an organization.

Particular attention in the recent debate on justice has been paid to the theory of justice by Rawls, which is based on the theory of the social contract of Locke, Rousseau and Kant. The essence of the "Theory of Justice" by Rawls is the principle of fairness, which models the conventional idea of a social contract more abstractly. In this way, every individual has an inalienable inviolability that cannot be annulled on behalf of the best interests of the whole society (Rawls, 1971, pp. 93 ff.). It is necessary that in a fair society everyone has the same civil rights and duties. At this point, it should be noted that Rawls explicitly includes the same duties. This requirement can be operationalized at the enterprise level with the job feature "fair treatment" of the employee satisfaction vitamin model by Warr (2007). The features should not be discussed at this point. In addition to the same rights and obligations, guidelines are needed on how to choose between different ways of achieving good distribution and how to reach an agreement between the various stakeholders. Thus, Rawls describes the principles of social justice and social market economy. In the area of global justice, he propagated the principles of international law, such as freedom, justice and independence, the right to self-defense, the principle of non-intervention and the compliance obligation of contracts and agreements. In the economic context, he demands fair trade standards and recognizes the

principle of food aid at the international level in the context of humanitarian assistance (Hauff & Kleine, 2009, p. 104 and Rawls, 2000). The welfare of a society is, according to Rawls's ideas of justice, determined by the benefit of the weakest individual. Thus, inequality can be justified if the concentration of the benefits and power in one individual leads to the situation that the weakest member of society is better off than he or she would have been in the case with a uniform distribution. Rawls's idea of justice would probably find broad support at the macroeconomic level as well as for the definition of a fair society or state. Few would deny principles such as freedom, justice and independence at this level.

Other more recent approaches have emerged in the context of the debate about sustainable development. One of the newer approaches is the principle of citizenship and partnership. Peet and Bossel, representing a partnership principle, formulate three goals and derive appropriate indicators to monitor the degree of target achievement (Peet & Bossel, 2000):

- ▶ The natural environment must be regarded as having its own identity; it includes ecosystems and biodiversity and has an inalienable right to exist in the present but also in the future. This goal contradicts the view that considers nature only as a source of resources.
- ▶ The right of equal treatment for all living people must be respected by all people, regardless of their gender, social class and wealth.
- ▶ In addition, future generations and ecosystems have the right to existence and long-term development.

Peet and Bossel are more application-oriented in their approaches to intra- and intergenerational equity than Rawls in his abstract theory of justice. Brown-Weiss continues this concretization with an application covering the macroeconomic level with "planetary trust." This means that every generation enjoys collective rights but also has collective obligations (Hauff & Kleine, 2009, p. 109). The collective rights and obligations are operationalized through three action rules (Brown—Weiss, 1988, pp. 40 ff.):

- ▶ The "conservation of options" has the aim of obtaining natural and cultural diversity so that the options of future generations to implement their preferences and solve their problems will not be peripherally restricted.
- ▶ The "conservation of quality" states that each generation should not pass on the inventory of natural and cultural resources found in a worse state.
- ▶ The "conservation of access" requires each generation to give its members fair access to the common heritage and secure this for future generations.

The approach by Peet and Bossel combines the concept of justice with the ecocentric perspective on sustainability; the same applies to the planetary trust by Brown-Weiss, but this involves a cultural aspect, which was neglected in the previous considerations. However, these claims remain too abstract for application at the company level. Only the cultural reference can be found, for example, in the form of an indicator of ecologically and culturally significant areas (ökologisch und landeskulturell bedeutsame Flächen, ÖLF). For substantive improvement of the social dimension of sustainability, they are unhelpful.

The approach of the Helmholtz Society appears to be more suitable. The Helmholtz Association of German Research Centers (HGF) has developed an integrated understanding of sustainability with its multidisciplinary approach and three general and mutually reinforcing substantive sustainability rules (Kopfmüller, 2001, pp. 190–271):

- ▶ The securing of human existence includes the protection of human health, the provision of basic services, an independent livelihood, the equitable distribution of environmental usage possibilities as well as a balance of extreme income and wealth differences.
- ▶ The preservation of social production potential calls for the sustainable use of renewable and non-renewable resources and the environment as a sink, avoiding unreasonable technical risks and sustainable development of physical, human and knowledge capital.
- ▶ The preservation of development and possibilities of a society includes equal opportunities, participation in social decision-making processes and the preservation of cultural heritage, cultural diversity and the cultural function of nature, but also the preservation of social resources.

The concepts of the World Bank (International Bank for Reconstruction and Development (IBRD)) thematize equal opportunities and development. In addition, a high degree of concretization of justice appears, for example, in the World Development Report from 2006 (The World Bank, 2006). The starting point of understanding justice in the report is equality of opportunity and the prevention of extreme poverty. It provides tangible examples, such as the possibility that inequality may also occur when equal opportunities exist. This makes it clear that equal opportunities are an important but not a sufficient basis for more justice. In the World Bank report, real examples of countries' internal inequalities are outlined as well as inequality on a global scale, which can occur both in developing and in industrialized countries. Examples include unequal health care, educational opportunities and income and unequal distribution of influence and power. The promotion of greater justice includes the establishment of balanced economic and political conditions. This applies to equality of opportunity within and between countries and regions (Hauff & Kleine, 2009, pp. 111–112), in which a certain degree of inequality in specific areas such as income is essential for the functioning of a society and economy, whereas, representing equality under the law, equal educational opportunities and minimum subsistence are clear requirements of social sustainability.

The approaches listed offer indications of a concrete definition of social sustainability at the corporate level; however, they are still too abstract for operationalization. Below, an approach that is partly based on the illustrated approaches is introduced for discussion as a guideline for every organization.

## **2.4 Concretization of Social Sustainability Based on the Capability Approach**

For Sen, the contractarian approach of Rawls is missing the inclusion of freedom: "(...) the appropriate area is neither the benefits as welfare theorists argue, nor the basic goods, such as Rawls calls it, but the fundamental rights, the liberal ways of selecting an estimable reasoned life." (Sen & Goldmann, 2002, p. 94). Sen thus establishes a relationship between freedom and sustainable development. By freedom, he understands the actual chance of a person to do what he/she wants to do for an important reason. Sen's concept of justice expands the institutional perspective of Rawls with the social context (Hauff & Kleine, 2009, p. 107). Nussbaum, Celikates, and Engels (2010) concretizes the statements made by Rawls and Sen by providing a list of criteria for a good life for discussion and tries thus to close the gap of a contract theory of justice. People with severe disabilities are excluded from the structures of the present contract theories of the definition of fundamental political principles; their citizen status remains uncertain and

thus endangers their right to full equal treatment. Other problem areas of classical contractualism are issues of global justice, freedom and equality in a globalized world, which extend beyond the limits of the nation state, the relationship between humans and a dynamic environment and how to deal with the interests of non-human species. These three justice issues are addressed by Nussbaum in her work on "frontiers of justice." Unlike Sen, Nussbaum does not leave liberal contractualism behind but designs a value-saturated substantive justice concept with the capability approach (Kemmerer, 2010). She provides the criteria for a good life as follows (Nussbaum, 2003; Spieß, 2011):

- ▶ *"Life."* The ability to live a normal-length life without dying early, unless it is reduced so that it can no longer be worth living.
- ▶ *"Bodily Health."* The opportunity to enjoy good health, which includes adequate nutrition and shelter.
- ▶ *"Bodily Integrity."* The ability to move freely, which involves certain mobility. Protection against violent attacks, including sexual and domestic violence. The opportunity for sexual satisfaction and free decisions about parenting.
- ▶ *"Senses, Imagination and Thought."* The possibility to use one's senses and imagination. To think and to form one's own opinion, namely in a "truly human" way. This includes an adequate education, including, but not limited to, literacy and mathematical and scientific literacy. The possibility to use one's imagination and thought in connection with experience of one's own work and events in an independent manner. Being able to express one's opinion without restrictions. The freedom of worship and the ability to feel pleasure and to avoid unnecessary pain.
- ▶ *"Emotions."* Feelings for things and people beyond our self: to love those who love us and care for us, to grieve at their absence and to experience longing, gratitude and justified anger. Emotional development must not be hindered by fear and anxiety. To support these opportunities is to support forms of human coexistence that do not suppress these feelings and do not cause them in the case of fear and anxiety.
- ▶ *"Practical Reason."* The ability to form a conception of the good and to reflect critically on the planning of one's life. This also means protecting the freedom of conscience and of worship.
- ▶ *"Affiliation."* 1. The ability to live with others; to take care of other people; to participate in various forms of social interaction; and to be able to empathize with the situation of others. Protecting this opportunity also means protecting institutions that take care of others to support the sense of belonging and protection of freedom of assembly and political speech. 2. The possibility of the social bases of self-respect and non-humiliation, of being treated as a worthy equivalent character and of treating others in this way. This includes non-discrimination on the basis of gender, social class and national origin.
- ▶ *"Other Species."* Being able to live with concern for and in relation to animals, plants and nature.
- ▶ *"Play."* The opportunity to laugh, to play and to enjoy recreational activities.
- ▶ *"Control over One's Environment."* 1. "Political." The ability to participate effectively in political decisions that affect one's own life; the right to political participation and the protection of freedom of expression and freedom of association. 2. "Material." To have the option to own property (immobile and immovable property). To have property rights on the basis of equality. The right with others to look for work on an equal basis. The freedom from unwarranted searches and seizures. In working life, the opportunity as a human being to work

with the exercise of practical reason and the possibility of meaningful relationships, on the basis of mutual recognition, with other workers.

The capability approach includes the requirements of the basic needs approach (equal opportunities, freedom, dignity, rights and sense of justice, tolerance, solidarity, common good orientation and integration capability). The definition of social capital by Haug and Gerlitz (promotion of cooperation and social networks) is also considered. Happiness research finds its way into the points "emotions" and "play." Sen's ideas of liberty and independence are the foundation of Nussbaum's approach. Peek and Bossel's points (environmental understanding, fair treatment and respect, irrespective of gender and social origin or wealth) are addressed. What is lacking is the aspect of future generations, which is also demanded by Brown-Weiss and Fischer-Kowalski. For this reason, the capability approach is supplemented with this point:

- ▶ *"Future Generations."* The ability to decide to have children and to look after them adequately and to promote them without any disadvantage. The ability of future generations to be able to live a good life, which implies that the good life of the present generation must not detract from that of future ones (including the avoidance of unreasonable risks).

Furthermore, the question of distributive justice remains elusive. Here, the idea of utilitarianism with unrestricted individual utility maximization and Rawls's theory of justice are faced. The following point also needs to be added:

- ▶ *"Improvement."* The ability to grow and develop. This includes the ability to maximize individual utility, without essentially reducing the benefits of others. Inequality is hereinafter justified only if it is well founded and the most vulnerable members of the community participate in the successes of the powerful.

Rawls's demands for equal rights and equal duties in particular remain unexplained in the capability approach in the case of obligations. For this reason, an item entitled "law" is added to the approach:

- ▶ *"Law."* The possibility to conclude contracts. The obligation to comply with the existing law, unless this restricts no other points of the good life in an extreme way. Compliance with obligation of contracts and agreements.

The question raised by Brown-Weiss about cultural diversity finds its way into the following new aspect of a good life:

- ▶ *"Cultural Diversity."* The possibility to be aware of one's own history. The ability to preserve traditions and cultural achievements. This includes the possibility to deviate from the norm and to be in this sense "different." These possibilities are unlimited, provided that no other aspects of a good life are limited in a substantial manner.

The extended capability approach provides a concrete definition of a good life for the present and future generations and thus also of social sustainability. The goal of socially sustainable development must be to help all people to live a good life and respectively to improve their living conditions. As a result of the advanced capability approach, social sustainability becomes tangible and operational for the first time. A socially sustainable organization or company must permit the people inside and outside its system limits to live as good a life as possible. In the following section, the advanced capability approach is transferred to the enterprise level.

## 2.5 The Modified Extended Capability Approach (MECA) as a Definition of an Organization's Social Sustainability

Below, the extended capability approach is modified so that it can also be used for all organizations and accordingly for all companies as a definition of social sustainability. Nussbaum's ideas of a good life defined by the capabilities of the individual must be changed for this purpose so that the organization grants or supports these capabilities. The modified extended capability approach therefore involves opportunities and demands as well as restrictions. The newly developed approach can be used as a guideline for companies around the world. In addition, it is useful for checking existing sustainability assessment systems for completeness and for identifying areas for improvement. In the modified extended capability approach (MECA), the word 'organization' is used; it applies equally to the situation of companies.

- ▶ *"Life."* The actions of the organization, its production and procurement processes and its products and services do not affect the ability of people to live a normal-length life, unless it is reduced so that it can no longer be worth living. A socially sustainable organization supports people in living a long life.
- ▶ *"Bodily Health."* The actions of the organization do not endanger people's health. A socially sustainable organization supports people in leading a healthy life, eating healthily and sufficiently and inhabiting adequate accommodation (including sanitary facilities).
- ▶ *"Bodily Integrity."* The organization gives people the greatest possible degree of free choice of location and the ability to move freely, which involves certain mobility. The organization offers people the greatest possible degree of free time control, protects them from violent and sexual assaults and does not limit their opportunities for sexual satisfaction and reproductive freedom.
- ▶ *"Senses, Imagination and Thought."* The organization supports people in the use of their senses and imagination. This also includes the promotion of creativity and innovation. The organization allows and calls on people to think and to form their own opinion in a "truly human" way. The organization actively promotes an adequate education, including, but not limited to, literacy and mathematical and scientific literacy. This also includes transparent information and communication and the promotion of knowledge about the organization, the individual's own tasks and the organizational objectives and their relationship. The organization supports the ability to use human imagination and thought in connection with experience, one's own work and events in as independent a manner as possible and to experience such. The organization gives people the opportunity to express their views without restrictions; this is true for internal communication, but limited in external communications if this means that the organizational goals are at risk. The organization does not limit the freedom of worship. It actively promotes people's ability to feel pleasure and to avoid unnecessary pain.
- ▶ *"Emotions."* The organization recognizes humans as emotional beings and does not hide this fact deliberately. It gives people the opportunity to love, to grieve and to feel longing, gratitude and justified anger. Emotional development must not be hindered by fear and anxiety or excessive pressure. A goal of a socially sustainable organization must be to promote positive emotions actively. Supporting these capabilities means promoting forms of human interaction that do not suppress these feelings or cause them in the case of fear and anxiety.

- ▶ *"Practical Reason."* The organization supports people in forming a conception of the good and planning their own lives, but also reflecting on them critically. This also includes the protection of freedom of conscience and of worship, that is, the organization must not encourage people to act against their conscience and conviction. At the same time, it offers people the security and freedom of being able to plan their lives. The organization actively encourages people to make sense of their actions.
- ▶ *"Affiliation."* The organization promotes the sense of belonging, the ability to live and to work with others, taking care of other people outside the organization, participating in various forms of social interaction and empathizing with the situation of others. This also includes the protection of freedom of assembly and political participation. The organization establishes a culture that enables each individual to be treated on the social bases of self-respect and non-humiliation as a worthy equivalent character and to treat others like this. This includes non-discrimination based on gender, sexual orientation, ethnic or national origin and social class.
- ▶ *"Other Species."* The organization is conscious of its responsibility towards the natural environment. It supports people in living with concern for and in a relationship with animals, plants and nature. (For animals, the criteria of a good life are, with limitations, applicable.)
- ▶ *"Play."* The organization actively supports people's ability to laugh, to play and to enjoy recreational activities.
- ▶ *"Control over One's Environment."* 1. "Political." The organization includes stakeholders in the strategic decision-making process and takes their demands into account. It grants the members of the organization the highest possible degree of individual freedom (with respect to the way in which they carry out their work duties and the role they play within the organization). 2. "Material." It creates a transparent remuneration system. It pays its employees fair market wages and salaries, which are sufficient for an independent livelihood, that is, in the case of Germany, higher than the basic security. The organization trusts its members and minimizes controls to the necessary minimum. Disparity in remuneration is justified provided that the degree of inequality does not accept extremes and all members of the organization participate in the success. The organization provides its members with the opportunity as human beings to work with the exercise of practical reason and the possibility of meaningful relationships, on the basis of mutual recognition, with other workers.
- ▶ *"Future Generations."* The organization provides and promotes the ability of people to have children without disadvantage and to care for and promote them adequately. It fosters the ability of future generations to be able to live a good life; this implies that the good life of the present generation should not affect that of future ones.
- ▶ *"Improvement."* The organization supports its members in their personal growth and development. This includes the possibility to maximize their individual utility, under the limitation that this does not substantially reduce the benefit of others or the organization itself. Inequality is thereafter justified as long as it is well founded and the most vulnerable members participate in the success of the powerful.
- ▶ *"Law."* The organization is obliged to comply with the existing law, including the tax legislation, as long as compliance with the law does not limit any other aspects of social sustainability in an extreme way. The organization complies with contracts and agreements.

- ▶ *"Cultural Diversity."* The organization is aware of its history in a transparent manner. It preserves traditions and cultural achievements; this also includes historic buildings and cultural landscapes. However, the organization also grants its members the ability to deviate from the norm and to be in this sense "different," if this does not limit other aspects of social sustainability in a substantial manner.

The 14 aspects listed concretize the vision of a socially sustainable organization and business. They cover the idea of social sustainability in as complete and holistic a manner as possible and can thus serve as guidelines for a socially sustainable company management and culture. The social sustainability of the MECA also offers the opportunity to assess existing evaluation systems and uncover untapped potential. Nevertheless, the MECA cannot claim to be exhaustive. Each organization must assess itself regarding whether it needs to make additions to meet the requirements of its individual situation and individual environment. Furthermore, the MECA is not a checklist that can be "checked off," but a fan of target dimensions. These goal dimensions expressed in the 14 aspects of social sustainability serve as a guide for a continuous improvement process to be socially sustainable in the long term. The accusation of a utopian idea is unfounded; indeed, all organizations to different extents limit the capability of people, but minor changes in the management and corporate culture can cause significant improvements. These cultural changes are often not even cost-intensive, as praise, appreciation and discussion at eye level are free. In addition, greater alignment of processes, at least partially, with the needs of employees is not necessarily associated with higher costs. A socially sustainable operating company improves, through a stakeholder dialogue, not only its external communication, but also its acceptance, its customer satisfaction and thus also its corporate value. Last but not least, the organization secures public acceptance. It will not always be a win-win situation between the social and the economic dimension,<sup>2</sup> as this is not the idea of a sustainable economy and it may lead to higher costs or lower profits. In the following section, examples are provided of the indicators of the social dimension of three sustainability evaluation systems compared with the 14 aspects of the MECA to identify the unexploited potential of social sustainability.

## **2.6 Identification of the Potential of Social Sustainability**

This section exemplarily describes the indicators of the social dimension of assessment systems for sustainability; KSL, RISE and the DLG sustainability certificate are juxtaposed with the MECA framework and thereby highlight the untapped potential. Basically, whether the evaluation systems set out in their present form are at all able to detect social sustainability should be open to discussion. The following Table 1 summarizes the 14 aspects of the MECA, together with its sub-items.

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<sup>2</sup> Conflicts with respect to the environmental dimension of sustainability may also occur.



**Table 1.** Summary of the MECA Framework

MECA	
Aspect	Sub-points
"Life"	Long life
"Bodily Health"	Healthy living
"Bodily Integrity"	Freedom in place, mobility, time; protection from violent and sexual assault; sexual and reproductive freedom
"Senses, Imagination and Thought"	Creativity, innovation, freedom of opinion and opinion formation; education, transparent information and communication; independence of the solution path; freedom of worship; joy and pain prevention
"Emotions"	Acceptance of emotion; leadership without fear, anxiety and excessive pressure; positive cooperation; happiness and satisfaction
"Practical Reason"	Life planning security and freedom; critical reflection also on work processes; freedom of conscience and corresponding freedom of action
"Affiliation"	Affiliation and togetherness; public interest orientation; promotion of self-respect and non-humiliation; non-discrimination
"Other Species"	Relationship to living environment
"Play"	Leisure "work-life balance" (including a sense of humor at work)
"Control over One's Environment"	Stakeholder participation in strategic decision-making; individual discretion over work execution and role in the organization; transparent remuneration system; market-oriented minimum living wages; proportionate income differentials; profit sharing; appreciation of work
"Future Generations"	Appreciation and non-discrimination of parents; family friendliness; responsibility for future generations and their development; avoiding unreasonable risks
"Improvement"	Individual development promotion (perspectives); individual utility maximization, taking into account an improvement for the weak
"Law"	Law abiding; compliance with contracts and agreements
"Cultural Diversity"	Transparent historical consciousness; protection of tradition and cultural achievements (including historic buildings and cultural landscapes); acceptance of norm deviation (tolerance)

The environmentally compatible agriculture rating system criteria (Kriterien Umweltverträglicher Landwirtschaft, KUL) have been developed since 1994 by the Thuringian State Institute for Agriculture (Thüringer Landesanstalt für Landwirtschaft, TLL). In its early days, it aimed to record and evaluate the ecological damage caused by farms. The scoring system has been further developed with regard to the methods of measurement and the selection of indicators by the Association of German Research and Development Institutions (Verband Deutscher Landwirtschaftlicher Untersuchungs- und Forschungsanstalten, VDLUFA). KUL forms the basis for the environmental management system VDLUFA agriculture (Umweltsicherungssystem Landwirtschaft, USL). The main objectives of the USL system are firstly the expansion of the KUL system for nationwide application in Germany and secondly the creation of a certification system with regard to the environmental impact of agricultural systems. Until 2009, the KUL was developed further with a view to a holistic assessment including the economic and social dimensions of sustainability by the TLL. From this, complementary approaches, the criteria for economic friendly agriculture (Kriterien einer wirtschaftsverträglichen Landwirtschaft, KWL) and the criteria for socially responsible agriculture (Kriterien einer sozialverträglichen Landwirtschaft, KSL), emerged. The whole system consisting of KUL, KWL and KSL is summarized under the designation criteria system for sustainable agriculture (Kriteriensystem nachhaltige Landwirtschaft, KSNL) (Ehrmann & Kleinhanß, 2008, p. 2).

The criteria for socially responsible agriculture (KSL) are based on the same principles of the TLL, like the KUL system. The social criteria include the areas of labor input, the operating structure of employment (number of employees, age structure, proportion of women, education) and participation in social life (social activities, share of owners of the company). The calculation bases and threshold values for the newly proposed indi-

cators are described by Breitschuh (2008). Table 2 summarizes the social criteria of the KSL.

**Table 2.** Evaluation Criteria of Social Sustainability (KSL)

Criteria	Unit	Rating		
		1	6	10
Job offer	%	$\geq 100\%$	$\geq 70\%$	$< 70\%$
Age structure	% distribution of groups	A1 $> 15\%$ and $> A3$ (A1 + A2) $\geq 70\%$ (A3 min. 10%)	(A1 + A2) $\geq 50\%$ ; dA $< 55$ years	$\neq$ criteria for 1 and 6
Percentage of women	% share	min. 43% and max. 57%	min. 23% and max. 78%	$< 23\%$ or $> 78\%$
Qualification	% distribution of groups	Q1 = 100% and Q2 min. 80%	Q1 min. 75% and Q2 min. 50%	Q1 $< 75\%$ and Q2 $< 50\%$
Working conditions	points	12 points	min. 6 points	$< 6$ points
Vacation	days	$\geq 30$ working days	$\geq 20$ working days	$< 20$ working days
Level of income	%	$\geq 95\%$	$\geq 70\%$	$< 70\%$
Social activities	points	min. 11 points	min. 6 points	$< 6$ points
Share of ownership	%	share of ownership $\geq 66\%$	share of ownership $\geq 51\%$	share of ownership $< 51\%$

Note. Compiled from Breitschuh and Eckert (2006, pp. 7–15).

The labor supply is the ratio of actual employees and the sum of the operationally necessary employees. The age structure divides the employed persons into age groups<sup>3</sup> and reports their ratio; the same applies to qualifications.<sup>4</sup> The working conditions are evaluated by selected aspects of work organization; in particular, the time constraint, the technical and social work protection and the mental stress are considered. The criterion vacation constitutes realized vacation days in relation to the vacation entitlement. The level of income is based on the gross wages per employee in the German economy. For every social activity within a period of two years, a point can be earned (Breitschuh, 2008).

The German Agricultural Society (Deutsche Landwirtschaftsgesellschaft, DLG), in cooperation with the Technical University of Munich, the Martin Luther University of Halle-Wittenberg and the Institute for Sustainable Agriculture Halle, developed the DLG sustainability standard "Sustainable Agriculture – Viable for the Future (Nachhaltige Landwirtschaft – zukunftsfähig)." With the indicator catalog of the DLG, the three dimensions of sustainability can be quantified and operationalized for farm management; furthermore, sustainability can be communicated via a certificate. At the same time, the optimization potential in production and management are shown through the indicators. The ecological indicators are based on the REPRO system by Hülsbergen (2003) and are complemented by the DLG for the economic and social dimensions (Schaffner & Hövelmann, 2009, p. 161). Table 3 provides an overview of the indicators of the social dimension of the DLG sustainability standard.

<sup>3</sup> A1 =  $< 30$  years; A2 =  $> 30 \wedge < 50$  years; A3  $> 60$  years; dA =  $\emptyset$  age.

<sup>4</sup> Q1 = completed training; Q2 = completed agricultural training; Q3 = higher education (master, specialist school, college, etc.).

**Table 3.** Indicators and Analysis Areas (Areas of Activity) of the DLG Sustainability Standard

	Analysis section	Indicator	Operation analysis
Social	▶ Labor and employment	▶ Wage and salary ▶ Average workload ▶ Vacation ▶ Training ▶ Occupational safety	▶ Remuneration of employees ▶ Work hours of employees ▶ Vacation days of employees ▶ Training of employees
	▶ Social commitment	▶ Social commitment ▶ Public relation ▶ Regional engagement	▶ Activities of the company
	▶ Quality assurance	▶ Use of quality assurance systems	▶ Ensure product quality and food safety

*Note.* Compiled from Deutsche Landwirtschafts Gesellschaft (DLG) (2009, p. 8).

The remuneration of employees is assessed on the basis of the collective agreement for agriculture. The average workload is measured by the normal working hours of employees and evaluated by a comparison with the working hours act (Arbeitszeitgesetz, ArbZG) and the collective agreement. The evaluation of the vacation days of the employees is carried out in accordance with the federal vacation act (Bundesurlaubsgesetz, BUrlG), the framework collective agreement for employees in agricultural holdings and possibly the protection of young workers (Jugendarbeitsschutz, JArbSchG) and the disabilities act (Schwerbehindertengesetz, SchwbG). Furthermore, training is taken into account. The issue of participation is listed on the website of the DLG (Deutsche Landwirtschafts Gesellschaft (DLG): <http://www.nachhaltigelandwirtschaft.info/mitbestimmung.html>, Date 25.04.2013.); however, it is not applicable to the audit specifications (Deutsche Landwirtschafts Gesellschaft (DLG), 2009, p. 8). The same applies to occupational safety and health. Among the activities of the company in the analysis area of social engagement are social benefits, communication of the company with the public and engagement in the community (Deutsche Landwirtschafts Gesellschaft (DLG) (2009, p. 8); Deutsche Landwirtschafts Gesellschaft (DLG): <http://www.nachhaltige-landwirtschaft.info/mitbestimmung.html>, Date 25.04.2013.).

RISE (Response-Inducing Sustainability Evaluation) is an indicator-based approach to the holistic assessment of sustainability of agricultural production at the farm level. RISE was supported by the Swiss College of Agriculture (SHL) working in cooperation with public and private institutions. The current version of RISE 1.0 was released in spring 2005. RISE was tested by 2009 in approximately 450 companies and used for contract work (Grenz, Studer, Stämpfli, & Thalman, 2009, pp. 1 and 8). Table 4 lists the status and driving-force parameters.

**Table 4.** Social Indicators and Parameters in RISE

	Indicator	Status parameter (SP)	Driving force parameter (DP)
Socio-eco-nomics	▶ Local economy	<ul style="list-style-type: none"> <li>▶ SP1: Proportion of regional labor force and wages</li> <li>▶ SP2: Lowest wage in the company in relation to the regional average wage</li> </ul>	▶ DP1: Output per hectare in the year of assessment
	▶ Working conditions	<ul style="list-style-type: none"> <li>▶ SP1: Emergency/medical care on location</li> <li>▶ SP2: Safe water supply</li> <li>▶ SP3: Accommodation and sanitation</li> <li>▶ SP4: Working hours</li> <li>▶ SP5: Wage discrimination</li> <li>▶ SP6: Child labor</li> <li>▶ SP7: Forced labor</li> </ul>	<ul style="list-style-type: none"> <li>▶ DP1: Training</li> <li>▶ DP2: Stressful work</li> <li>▶ DP3: Assessment of the work situation</li> <li>▶ DP4: Wage disparity</li> <li>▶ DP5: Working to achieve the minimum wage</li> </ul>
Society	▶ Social security	<ul style="list-style-type: none"> <li>▶ SP1: Social security                             <ul style="list-style-type: none"> <li>▶ Insurance for old age, unemployment, sickness, accident and disability</li> <li>▶ Protection against dismissal and loss of earnings in case of sickness, accident and maternity</li> </ul> </li> <li>▶ SP2: Livelihood security</li> </ul>	<ul style="list-style-type: none"> <li>▶ DP1: Potentially payable wage</li> <li>▶ DP2: Succession plan</li> <li>▶ DP3: Legality and documentation of employment                             <ul style="list-style-type: none"> <li>▶ Immigration status of employees in the country</li> <li>▶ Contract of employment</li> <li>▶ Work permit</li> </ul> </li> </ul>

Note. Compiled from Grenz, et al. (2009, p. 7).

The aspect "*Life*" in the MECA along with the sub-item long life is partly included in the KSL in working conditions; it is not covered by the DLG and is partly covered by RISE in the aspect emergency/medical care on location and social security. For the core of this aspect, namely supporting people in living a long life, however, the indicators are insufficient.

The aspect "*Bodily Health*," with the sub-item healthy life, is displayed in the KSL partly with the working conditions and in the DLG by contrast in a satisfactory manner with occupational safety and ensuring product quality and food safety. RISE considers this aspect with the indicators supply of clean drinking water, shelter and sanitation, social security and stressful work. Here it becomes clear that RISE claims international validity.

The aspect "*Bodily Integrity*," with the sub-items freedom of place, mobility, time and protection from violent and sexual assault, is addressed neither by the KSL nor by the DLG. RISE considers at least forced labor as a criterion.

"*Senses, Imagination and Thought*," with the sub-items creativity, innovation, freedom of expression and opinion-forming ability, education, transparent information and communication, independence of the solution path, freedom of religion, joy and pain avoidance, is considered to be very inadequate in all three rating systems. The DLG at least acknowledges it with indicators of participation and of education and training.

The item "*Emotions*," with the sub-items acceptance of emotion, leadership without fear, anxiety and excessive pressure, positive cooperation and happiness or satisfaction, is hardly considered. It could have been operationalized in RISE by the working conditions and in KSL through the job offer and the evaluation of the work situation. Thus, a job offer >100 % could point to reduced pressure.

The aspect "*Practical Reason*," with the demands for life planning security and freedom, critical reflection on work processes, conscience and corresponding freedom of action and support in finding meaning in one's own work, is considered most by RISE through the indicators social security, legality and documentation of employment. The KSL and DLG neglect it completely.

"*Affiliation*," with the specific aspects belonging and togetherness, public interest orientation, promotion of self-respect and non-humiliation and non-discrimination, is adopted in parts in the KSL by the proportion of women, qualifications, age structure and social activities. The DLG considers social engagement. RISE refers to it only vaguely with the indicator wage discrimination.

The item "*Other Species*," that is, the relationship with the living environment, is ignored in all three rating systems, but could be implemented under certain circumstances in the indicators for environmental sustainability.

The aspect "*Play*," with the main demand for leisure or a "work–life balance," is sufficiently integrated by the indicator vacation in the KSL and the DLG or by working longer hours in RISE.

"*Control over One's Environment*," with the points stakeholder participation in strategic decision-making, freedom of individual choice about the work execution and the role in the organization, a transparent remuneration system, market-driven existence securing salaries, proportionate income differentials and profit sharing and appreciation of the work, is considered by the DLG only in the remuneration of employees. In addition, the KSL remains patchy with its indicators level of income and fraction of ownership. RISE is more concrete here, with the points share of regional labor and wages, lowest wage in the company in relation to the regional average wage, wage discrimination (wage disparity) and work hours to achieve the minimum wage and the indicator livelihood security.

The aspect "*Future Generations*," with the appreciation and non-discrimination of parents, family friendliness, responsibility for future generations and their development, including avoiding unreasonable (technical) risks, is merely implemented by the DLG in the point training. In RISE it is partly incorporated into the indicators child labor and succession plan. The KSL disregards this aspect.

"*Improvement*" in the MECA, characterized by individual development promotion and utility maximization, taking into account an improvement for the weak, is operationalized in RISE and the DLG by continuing or further education. The KSL does not consider this point.

The aspect "*Law*," with the demands for legality and the obligation to comply with contracts and agreements, is not addressed by the KSL and the DLG. Only RISE calls for the legality and documentation of the employment.

"*Culture Diversity*," characterized by a transparent sense of history and the protection of tradition and cultural achievements with acceptance of norm deviation, is not found in any of the three indicator catalogs considered.

Table 5 depicts the results of the juxtaposition of the MECA framework with the KSL and RISE rating systems and the indicators of the DLG.

**Table 5.** Results of the Comparison of the KSL, RISE and DLG with the MECA Framework

MECA	Rating		
	KSL	DLG	RISE
"Life"	Gray	Red	Gray
"Bodily Health"	Gray	Green	Gray
"Bodily Integrity"	Red	Red	Red
"Senses, Imagination and Thought"	Red	Red	Red
"Emotions"	Red	Red	Red
"Practical Reason"	Red	Red	Gray
"Affiliation"	Gray	Red	Red
"Other Species"	Red	Red	Red
"Play"	Green	Green	Green
"Control over One's Environment"	Gray	Gray	Gray
"Future Generations"	Red	Gray	Gray
"Improvement"	Red	Gray	Gray
"Law"	Red	Red	Gray
"Culture Diversity"	Red	Red	Red

*Note.* Own illustration and evaluation. Green represents adequate coverage through indicators, gray partial cover and red no cover.

The table shows the significant gaps in the assessment systems. Social sustainability must pursue as a priority objective the enablement of the present and future generations to live a good life. Quantifying a good life and therefore the social dimension of sustainability with indicators such as income, vacation entitlement and training is an idea that is not adequate for humans. They can only make a small, albeit important, contribution. The decisive potential of the social dimension is not considered in the current indicator catalogs; this is especially true for companies in Germany. Objectifying and quantifying all aspects of a good life with its different facets would probably produce a system containing hundreds, if not thousands, of indicators. The data collection and control effort would be impossible for practical application. Therefore, the challenge is to identify indicators that enable a good life to be reported with a few parameters and a low collection effort. Nussbaum's considerations form the basis for the MECA as the definition of a socially sustainable company in her capability approach objectifies a good life based on capabilities. To make a good life measurable, one must partially return to the subjective area. A good life's consequence is the satisfaction of humans. Thus, employee satisfaction can be used as an indicator of social sustainability to include a substantial portion of the identified gaps, if it – and this is an absolute requirement – is measured "properly." Nonetheless, other indicators will still be necessary to constitute the social dimension of sustainability in an adequate manner. The areas of potential identified, such as autonomy of decision-making, non-discrimination, emotion and family friendliness, show that an improvement is achieved only by a change in the management and corporate culture. These changes do not necessarily lead to higher costs.

## 2.7 Conclusion

The social dimension of sustainability has so far been defined only insufficiently at the organizational level. It lacks concrete ideas regarding the objectives that should be pur-

sued in this area. Without sufficient concretization, it is difficult to distinguish purposeful indicators and to identify and exploit the potential of the dimension. The indicators that have been used so far in sustainability assessment systems are of a technical nature, that is, they quantify material variables such as leave entitlement, employees' income or the organization's donation activities. These approaches to solutions are based on natural science and economic problem-solving strategies that do not consider people as emotional beings, so they do not reflect the reality of their daily life. The overriding objective of the social dimension of sustainability must be to enable the present and future generations to live the best possible life. The challenge in capturing a good life is not new and can already be seen in the long tradition of criticism of the gross domestic product as a welfare indicator.

In this article, the modified extended capability approach (MECA) is put forward for discussion as a guideline for defining the social sustainability of organizations. It can be used for all organizations, including horticultural companies. The capability approach of Nussbaum, which describes a good life, was extended for this purpose to the aspects of "future generations," "improvement," "law" and "cultural diversity." It was subsequently modified to be applicable to all organizations. The MECA creates, as an application-oriented, normative framework, the basis for an assessment of social sustainability, which takes into account the reality of people's life. The juxtaposition of the MECA with the scientific sustainability indicator catalogs KSNL and RISE and the DLG sustainability certification demonstrates the potential of the social dimension that remains as yet unused or not considered. In the future, it is important to fill these gaps. In this case, indicators need to be developed that can be captured with a low collection effort and at the same time can show concrete opportunities for improvement and measures. For the social dimension of sustainability, the author sees the greatest potential in the optimization of the management and corporate culture. The indicator employee satisfaction, if measured properly, can at this point make a significant contribution.

The 14 aspects of the MECA framework provide a comprehensive, application-oriented basis on which to assess social sustainability. However, they do not claim to be exhaustive and must be partially adapted to the individual situation of the organization. Their superiority is apparent when the 14 aspects are used to examine practical examples. For example, the employees in organization A have higher incomes and a larger vacation entitlement than those in organization B, but the leadership in organization A is characterized by pressure and fear. In contrast, in organization B, a cooperative management style is maintained, in which a balance between work and family is made possible. Organization A has a high amount of donations, but does not stick to contracts and agreements. It is possible to find more of these examples, which are not considered in the previous evaluation approaches to social sustainability.

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### 3 Consumer Preferences for Food Labels on Tomatoes in Germany – A Comparison of a Quasi-experiment and Two Stated Preference Approaches

#### 3.1 Abstract

In many studies, consumer preferences are determined by using direct surveys. For this method social desirability is problematic. This leads to the effect that participants answer in a way that they perceive as desired by society. This leads to the stated importance of certain features in these studies not being reflected in real purchasing decisions. Therefore, the aim of the study is to compare consumer preferences measured by a quasi-experiment to those quantified by direct questions. Another objective is to quantify the part-worth utilities of product characteristics such as origin, price and food labels. Part-worth utilities are estimated on an interval scale with an arbitrary origin and are a measure for preferences. The real purchasing situation was simulated in a quasi-experiment using a choice-based conjoint analysis. The part-worth utilities were then compared with the results of a conventional preference assessment (Likert scale). For this purpose, 645 consumers from all over Germany were surveyed in 2014. The participants were on average 44 years old and 63 % were women. The results of the conjoint analysis report the highest part-worth utility (2.853) for the lowest price (1.49 €), followed by the characteristic “grown locally” (2.157). For the labels, the German organic label shows the highest part-worth utility (0.785) followed by Fairtrade/“A heart for the producer” (0.200). It is noticeable that the carbon footprint labels have negative part-worth utilities compared to tomatoes without a label (-0.130 with CO<sub>2</sub> indication, -0.186 without CO<sub>2</sub> indication). The price is ranked 12<sup>th</sup> in the importance of the characteristics of purchasing tomatoes in the survey with a Likert scale, whereas it is first in the evaluation of the quasi-experiment (conjoint analysis), which supports the assumption of a social desirability bias.

**Keywords:** conjoint analysis, consumer marketing, sustainability, social desirability, purchasing behavior, carbon footprint label, local production

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#### 3.2 Introduction

Changing consumer preferences is the second most frequently mentioned cause of fundamental changes in German horticultural companies expected for the next decade. Trends in consumer preferences for horticultural products, especially for fruits and vegetables, are convenience, functional and natural food. Natural food includes aspects such as food safety, consumption with quiet conscience (sustainability) and organic products. One way of communicating these characteristics to the customer is by labeling the product.

The carbon footprint label is one of the most recent efforts to characterize a product in terms of climate friendliness. There is a variety of studies that claim to show the market potential of climate-friendly products using a carbon footprint label (Laroche, Bergeron, & Barbaro-Forleo, 2001; Dirks, Kaiser, Klose, Pfeiffer, & Backhaus, 2010; Schlich,

2012; Vanclay et al., 2011; Lal Bhardwaj, 2012). The same applies also for organic food labels (Stolz, Stolze, Janssen, & Hamm, 2011; Janssen & Hamm, 2014; Hempel & Hamm, 2016) and the Fairtrade label (Andorfer & Liebe, 2015; Ladhari & Tchegnna, 2015; Rousseau, 2015). In these surveys, participants are asked about, for example, the importance of climate change in general or about the importance of a climate-friendly production (Stocke, 2004; Dirks et al., 2010, p. 21). However, this is not reflected in buying decisions. For example, Tesco, the world's third largest retailer, stopped its carbon-labeling program in 2012 after five years due to insufficient demand.

One reason for the gap between some results of consumer research and observed buying behavior could be the effect of social desirability. Social desirability refers to the tendency of individuals to behave or respond in a way they believe society considers desirable (Crowne & Marlowe, 1960). This effect leads to the problem that the potential consumer says he/she would prefer climate-friendly products, but does not show this behavior in the real purchasing situation without being observed. One approach to solve the problem of social desirability is to perform an experiment with real purchase decisions. While the realization of an experiment is very time-consuming and cost-intensive, it also faces some legal issues and retailers would have to agree with it. Another way is to simulate an experiment. Conjoint analysis is one way to implement such a simulated experiment (Green & Srinivasan, 1978, 1990; Green, Krieger, & Wind, 2001).

Basically, conjoint analysis is a multivariate method for the analysis of preferences and benefit structures of individuals. It works with decompositional processes in which the product is first judged completely (considered jointly). Starting from this overall assessment, the importance of individual characteristics of the product is determined. Thus, the overall analysis of the products is divided into so-called part-worth utilities, which reflect the relevance of a product's characteristics for consumers. The participants are presented with a selection of products in a category (for example, tomatoes), each of which possesses different properties (characteristic values). These are generally referred to as "stimuli." Participants are then requested to choose one from among these alternatives.

There are some widely recognized shortcomings of conjoint methods in general. One example is that respondents sometimes use simplification strategies to answer difficult full-profile tasks. Respondents may consider only the most important attributes; this would result in exaggerated differences in importance between the most and least important factors. Particularly in high-involvement purchases, respondents exert more effort making real-world decisions than they do making judgments in a conjoint online survey. However, for an everyday purchase decision on comparatively low-value (and low-involvement) products such as tomatoes, the effort will be limited also in real purchase decisions. Thus, the hypothetical choice will not differ that strongly in our case as for high-involvement purchases.

The aim of the study is to compare consumer preferences measured by a quasi-experiment to those quantified by direct questions to examine the assumption of social desirability and to quantify the part-worth utilities of product characteristics such as origin, price and food labels. As there is a wide discussion about the use of the relatively new carbon footprint label in Germany, this label is under special consideration in the present study.

This paper presents a study with 645 consumers participating in a quasi-experiment using a choice-based conjoint analysis, to identify the part-worth utilities of different food labels and compare them to those of other characteristics such as the price and the origin of the vegetable (in this case tomatoes). In this study design the participant has to choose between products with different characteristics, in this case origin, price and a variety of food labels. He/she may also choose not to buy any of the products. The part-worth utilities of the characteristics are then calculated based on the decisions of all participants. Participants were also asked to rate the characteristics on Likert scales and to sort the labels according to their importance for the purchasing decision. The findings show differences between the results of the choice-based conjoint analysis and the other elicitation methods, which are possibly caused by socially desirable answering behavior.

### **3.3 Materials and Methods**

Vine tomatoes were used as an example product in the quasi-experiment, because they are a common vegetable in Germany and are produced both domestically and abroad. The current investigation involved a survey with (in this order) 25 choice sets to perform a choice-based conjoint analysis and measures such as a ranking task and the evaluation of different product characteristics on a Likert scale (Likert, 1932) to evaluate the importance of product characteristics such as price, the origin of the product and different food labels. In addition, participants were asked to provide some sociodemographic data, such as their current employment situation, the number of adults as well as number of children under 12 living in the household, the place of residence, net household income, gender, age, level of education and the residential neighborhood (urban or rural).

#### **3.3.1 Description of the Sample**

To evaluate consumer preferences for purchasing vine tomatoes, a questionnaire with 40 questions was provided in both paper-and-pencil and web-based formats. The questionnaire was distributed through social media, personal contacts and several e-mail lists, and was also administered in personal interviews. About 300 participants were recruited via social media and through personal contacts. Approximately 500 participants were recruited via the e-mail lists, which included about 7,000 e-mail addresses from German households; the participants from this channel were mainly women. Around 100 interviews with mainly older participants were performed personally. This was done to collect data from older people, who are generally less familiar with online surveys and/or not able to handle an online questionnaire. Another point was that older people could not easily be reached through social media and e-mail channels. The participants were not compensated for participating in this study. The survey was conducted from June to December 2014 in Germany.

In total, 925 consumers participated in the study. As conjoint analysis can be performed only on complete data sets, all reported data/results including the sample description and also the ranking task and Likert scale parts are based on the sample of 645 choice set completers. No significant differences, in terms of socio-demographic characteristics, were found between completers and non-completers of the quasi-experiment (choice sets). For the sample of completers the socio-demographic characteristics shown in Table 1 apply. Among the choice set completers, the majority were female. The average age of the completers was 44.1 years, which is very close to the population mean of 44.9 years in 2011. The bulk of the completers came from western and northern Germa-

ny. Lower Saxony is overrepresented in this study. A proportion of 38.3 % of the completers graduated from a technical college or university, which is more than twice the proportion of the total population in 2012 (14.7 %).

**Table 1.** Summary Statistics of the 645 Choice Set Completers

Characteristics	Characteristic specifications	Frequency	Percentage	
Gender	Female	403	62.5	
	Male	186	28.8	
	Missing	56	8.7	
Mean age		590	44.14 (15.76)	
Education	Did not finish graduation	5	0.8	
	Still pupils	2	0.3	
	Certificate of secondary education	56	8.7	
	General certificate of secondary education	141	21.9	
	High school graduation or equivalent	126	19.5	
	Technician/specialist degree	48	7.4	
	Technical college/university degree	247	38.3	
	Missing	20	3.1	
	Residential area	Rural region	255	39.5
		Urban area	337	52.2
Missing		53	8.2	
Employment status	Full-time employee	256	39.7	
	Part-time employee	110	17.1	
	In education	112	17.4	
	Retired/pensioner	69	10.7	
	Housewife/homemaker	42	6.5	
	Unemployed	8	1.2	
	Missing	48	7.4	
Mean persons in household		612	2.59 (2.20)	
Mean children in household		532	0.21 (0.61)	
Net household income	Refuse to answer	109	16.9	
	< 500 €	31	4.8	
	500 - 900 €	53	8.2	
	900 - 1,300 €	46	7.1	
	1,300 - 1,700 €	61	9.5	
	1,700 - 2,000 €	49	7.7	
	2,000 - 2,600 €	88	13.4	
	2,600 - 4,500 €	128	19.8	
	> 4,500 €	47	7.3	
	Missing	33	5.1	
Tomatoes bought in the last 2 weeks	< 500 g	225	34.9	
	500 g - 1,000 g	253	39.2	
	1,001 g - 1,500 g	55	8.5	
	> 1,500 g	32	5	
	Missing	80	12.4	
Place of purchase (multiple choice)	Supermarket	312	51.1	
	Discount stores	444	72.7	
	Farmers' markets	119	19.5	
	Wholefood shops	65	10.6	
	Missing	34	5.3	

Fifty-two percent of the completers were living in larger cities. Most of completers were fully employed. The proportions of employment status reported in Table 1 are very close to the total population. Most of the completers lived in households consisting of

two persons. In the majority of cases there were no children under 12 in the household. In the present study, the main share had, as in the entire German population, a net household income of between 2,600 and 4,500 €. The distribution is also comparable.

Some 77.8 % (1.1 % are missing) of the completers bought vine tomatoes in the last two weeks. Most completers buy less than 500 g or 500–1,000 g vine tomatoes within a fortnight. Most completers buy their vine tomatoes at discount stores, followed by supermarkets, farmers' markets and wholefood shops.

### 3.3.2 Choice-based Conjoint Analysis

Among the two existing standard methods, the traditional conjoint analysis (TCA) or preference-based conjoint analysis and the choice-based conjoint analysis (CBCA) are distinguished. The TCA directly asks for preferences, whereas the CBCA mimics the consumer's purchase decision more realistically by observing a number of selection decisions (Green & Srinivasan, 1978, 1990; Green, Krieger, & Wind, 2001).

For the implementation of the CBCA in this study seven steps had to be performed: design of the stimuli, design of the selection situation, specification of a utility model, specification of a selection model, estimation of the utilities, interpretation and implementation and disaggregation of the utilities.

**Table 2.** Characteristics and Their Specifications of Vine Tomatoes Analyzed in the Choice-based Conjoint Analysis

Characteristics	Characteristic specifications
Origin	Morocco, Germany, Spain, the Netherlands, Local
Price	1.49 €, 1.99 €, 2.49 €, 2.99 €, 3.49 €
Label	German organic label, Fairtrade/"Ein Herz für den Erzeuger" label (Engl. A heart for the producer), no label, carbon footprint (with the amount of CO <sub>2</sub> emitted), carbon footprint (without the amount of CO <sub>2</sub> emitted)

The combination of the characteristics and their specifications shown in Table 2 finally result in 125 (5<sup>3</sup>) different stimuli (characteristic profiles). The characteristics used in the conjoint analysis are those that are usually shown on the display on the packages of vine tomatoes in Germany. The grade of goods (Klasse 1) and the amount of 500 g were fixed to limit the combinations of characteristics. The countries of origin in the study were chosen to reflect the actual choices the consumer has in Germany. Most tomatoes in Germany are imported from other European countries. More than the half of imports

in 2012/2013 came from the Netherlands (56 %) and Spain (26 %). Most tomatoes from non-European countries were imported from Morocco (6 %) in 2012/2013. Only about 9 % of all tomatoes on the German market are grown in Germany. The labels used in the study reflect different categories of labels available. In terms of organic labeling, there are many organic labels in Germany, some of them are from non-governmental organizations such as Demeter, Naturland or Bioland, others are state-controlled like the European organic label and the German organic label. The best-known (72 %) and most trusted (54 %, Eberle et al., 2011) is the German organic label, which was also used in the present study. Organic vegetables have a market share of 14 % in the fresh vegetable segment in Germany (Behr, 2015, p. 139). To evaluate the social dimension, the Fairtrade and “Ein Herz für den Erzeuger” (A heart for the producers) label was used. The Fairtrade label is known by 61 % and trusted by 50 % of the participants in a study by von Meyer-Höfer and Spiller (2013). In the case of tomatoes of German origin the Fairtrade label cannot be used and is replaced by the “Ein Herz für den Erzeuger” label, which is also well known in Germany.

Tomatoes have attained the highest market share among fresh vegetables for many years in Germany. Average prices range from min. 1.47 € to max. 2.56 € (2009–2013) for 500 g of organic vine tomatoes and from min. 0.65 € to max. 1.47 € (2009–2013) for 500 g of conventional vine tomatoes (Behr, 2013). The prices in German stores are usually close to the 50-cent or one-euro mark, for example 1.49 € or 2.99 €, and for this reason a price range from 1.49 € to 3.49 € is used in this study to reflect real prices in stores as customers would expect them. The slightly higher price range was chosen as the focus of this study is mainly on tomatoes with special features such as the food labels, and these tomatoes are more expensive than without those features.

The selection situation (step two) was designed by creating an orthogonal reduced factorial design (using SPSS, orthoplan), which lead to 25 cards. To build the final choice design the factorial design (after shifting (cyclic variation)) was loaded into SPSS and the 25 choice sets were created using the plancards function. The first of these choice sets can be seen in Figure 1. After three initial questions on recent purchases and where vine tomatoes were bought, the participant was asked to perform a quasi-experiment, where he or she had to choose between five different products (stimuli) and the none option (see Figure 1).



**Figure 1.** The first of the 25 choice sets in the questionnaire for the choice-based conjoint analysis.

In step three (specification of a utility model), the part-worth model was used because the characteristics of origin and labels have individual benefits for each respondent and cannot be predicted. As in the CBCA, choices made by respondents are observed. In addition to the utility model, a behavior model or choice model is needed (step four). This is to describe and explain the decision-making process of a person. As is usual, we used the multidimensional logit choice model for the CBCA. In the logit choice model the selection probability is determined just by the differences in the utilities. The estimation of the utilities (step five) is done by maximizing a log-likelihood function (to estimate the parameters of a density or probability function) using a quasi-Newton method

(for solving nonlinear minimization problems). Step six is the interpretation and implementation. The absolute amount of the estimated part-worth utilities and total utility values are not relevant when using the present value model. As mentioned earlier, only the differences matter. The part-worth utilities are a dimensionless measure indicating the utility of a characteristic specification relative to a base specification.

After the survey was conducted, part-worth utilities were calculated using a Cox regression. To prepare the data for the Cox regression a variety of tasks have to be performed (Backhaus et al., 2013, pp. 227 ff.). In this procedure, a structure with the same model is used for the logit choice model, which maximizes the same likelihood function in the implementation of the layered Cox regression, as it occurs also in the CBCA.

For the likelihood ratio statistic, which is chi-square distributed, the value is 21,711.239 (degrees of freedom (13)). The origin “Morocco,” the price level “3.49 €” and the characteristic specification “no label” were chosen as the base categories in the Cox regression to calculate the part-worth utilities in the choice-based conjoint analysis. Their part-worth utilities are therefore set to zero. Based on these basic categories, the part-worth utilities of the other characteristics can be interpreted. With a p-value of 0.00 the estimated model is highly significant. Every part-worth utility is also highly significant ( $p < 0.01$ ), except for the carbon footprint with CO<sub>2</sub> emission indication ( $p = 0.02$ ) and the origin Spain ( $p = 0.36$ ).

### **3.3.3 Ranking of the Labels**

In preference ranking, participants order characteristics (for example labels) according to their preferences from more important to less important. Ranking involves performing a succession of choices where the participant is forced to discriminate between characteristics, without, however, revealing the degree of appreciation (Hein, Jaeger, Tom Carr, & Delahunty, 2008). Rating and ranking methods have previously been compared in a number of studies (Kozak & Cliff, 2013; Lagerkvist, 2013; Villanueva, Petenate, & Da Silva, 2005), often with a general focus on mean population results comparisons (Almli, Øvrum, Hersleth, Almøy, & Næs, 2015). As described earlier, the participants were also asked to rank the labels, when buying vine tomatoes, from rank one for most important to rank four for least important; this was done when viewing the labels alone. The labels were shown in a randomized order for each participant in the online survey. Using their computer mouse the participant had to drag and drop the labels in their preferred order on the right-hand side of the question.

### **3.3.4 Evaluation of Consumer Preferences Using Likert Scales**

Another common way to determine the preferences of consumers is Likert scales. A variety of characteristics, including the characteristics also used for the CBCA, had to be rated on a scale with six items from unimportant to essential. As previously mentioned, the characteristics to be rated using Likert scales include those that were also covered by the conjoint analysis. These are origin (regional, Germany, Europe), value for money, climate and/or environmentally friendly production and labeling. These characteristics were found to be important in studies among consumers in the US (Oltman, Jervis, & Drake, 2014; Carroll, Bernard, & Pesek, Jr., 2013). Furthermore, the present study includes Likert scales for characteristics that can be observed by the customer at the point of sale, such as the size and packaging as well as the color, the smell of tomatoes and whether they are too hard or too soft. Other characteristics, e.g. the taste, the saltiness

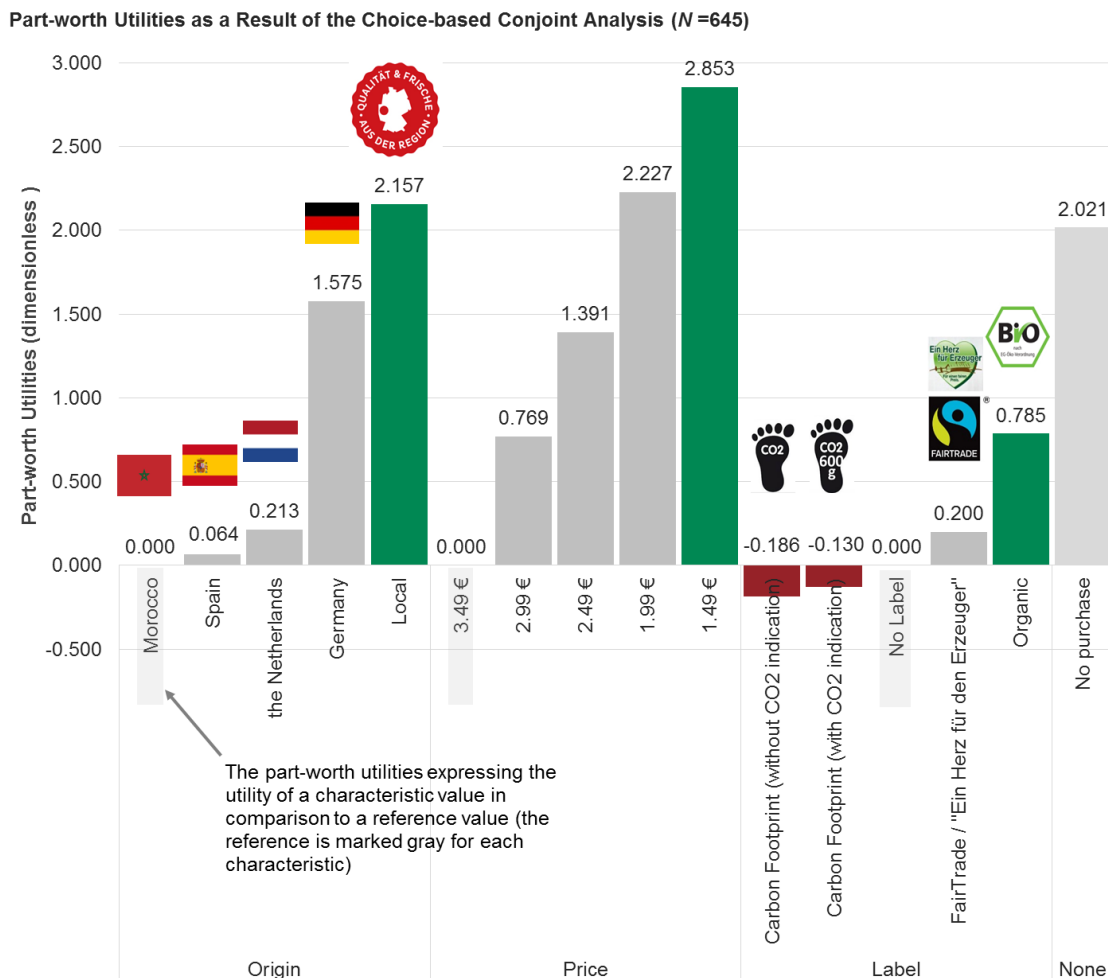


and the skin thickness, are relevant for the consumer as well (Causse et al., 2010) but cannot easily be evaluated at the point of sale and are therefore not included in the present study.

### 3.4 Results

#### 3.4.1 Part-worth Utilities of Product Characteristic Specifications as a Result of the Choice-based Conjoint Analysis

The resulting part-worth utilities are presented in Figure 2. The lowest price has the highest part-worth utility of 2.853 followed by the second lowest price (1.99 €) with 2.227. After the price, the origin “grown local” yields the third highest part-worth utility (2.157), followed by the origin Germany (1.575) and the price 2.49 € (1.391). Only after the prices below 2.99 € and the domestic origin does the German organic label exhibit a high part-worth utility of 0.785. As mentioned earlier, only differences matter, which means the part-worth utilities have to be interpreted in comparison to the reference value in the first place.



**Figure 2.** Results of the choice-based conjoint analysis.

Out of the four origins under investigation, participants prefer the local product most, followed by the domestic product. The difference between the part-worth utilities of these origins and vine tomatoes from the Netherlands is very high. Not surprisingly, the participants prefer the lowest prices of 1.49 € for 500 g vine tomatoes. When it comes to

food labels, the German organic label is ranked highest, followed by Fairtrade and “Ein Herz für den Erzeuger” (Engl. “A heart for the producer”). Most remarkably, both carbon footprints (with and without a CO<sub>2</sub> emission indication) are attributed a negative part-worth utility compared to a product without any label.

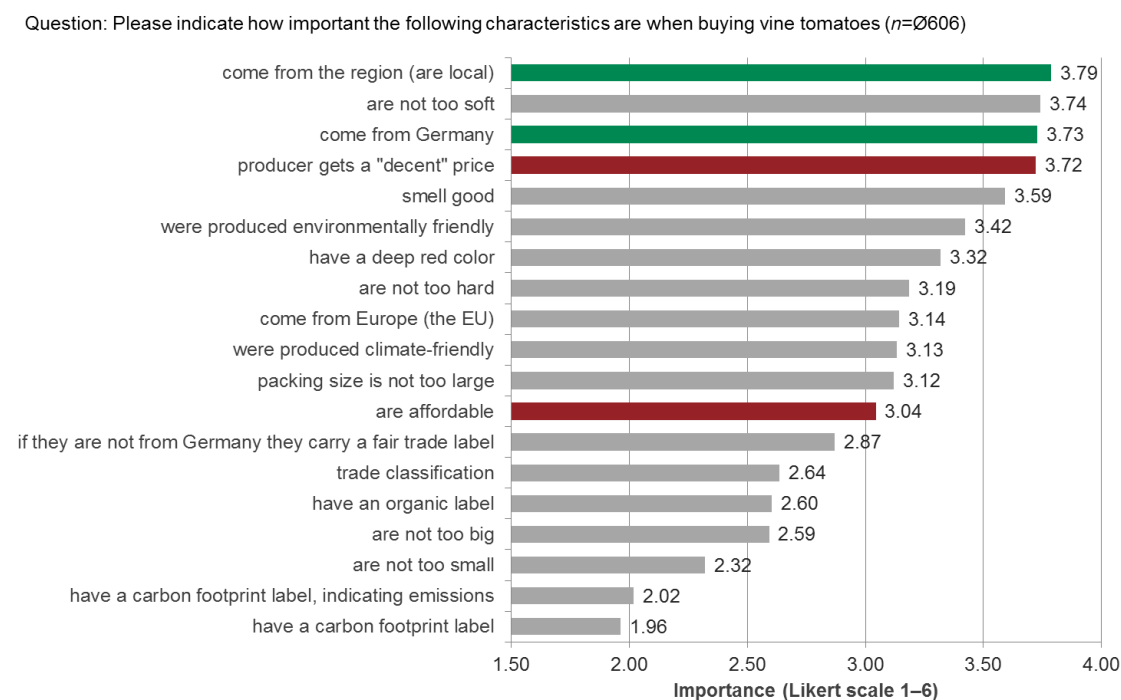
### **3.4.2 Resulting Order of the Ranking Task**

If we rank the part-worth utilities, price is the most important characteristic of vine tomatoes, followed by the domestic origin. After these characteristics the German organic label is preferred by the participants and even Fairtrade and “Ein Herz für den Erzeuger” yield a higher part-worth utility than the origin Netherlands. In a second task, participants were asked to rank the labels. Rank coefficients were calculated by multiplying the number of participants who assigned a particular label to a rank by four for the first place, three for the second, two for the third and one for the fourth place. The results of the ranking task show a different picture than the choice-based conjoint analysis. In the ranking task the highest rank coefficient is observed for Fairtrade/“Ein Herz für den Erzeuger” (1,851), followed by the German organic label (1,604), the carbon footprint without a CO<sub>2</sub> emission indication (979) and the carbon footprint with a CO<sub>2</sub> emission indication (790,  $N=534$ ).

This result is surprising as the German organic label showed a four times higher part-worth utility than the Fairtrade/“Ein Herz für den Erzeuger” label in the quasi-experiment, which might be an indicator of socially desirable behavior in the ranking task.

### **3.4.3 Consumer Preferences Measured by a Likert Scale Compared to Those of the Other Methods**

The third method used to determine consumer preferences for vine tomatoes in Germany was the classical Likert scale (1=unimportant to 6=essential) – the most commonly applied method. Figure 3 presents the results (average values) of the evaluation of characteristics preferred by consumers when purchasing vine tomatoes.



**Figure 3.** Results of the evaluation using a Likert scale.

The participants' answers measured using a Likert scale are in line with the results of the choice-based conjoint analysis for the characteristics "grown locally" and domestic origin (marked green in Figure 3). After this, the third most important characteristic is that producers get a fair (decent) price for their products (marked red in Figure 3).

### 3.5 Discussion

As previously mentioned, both carbon footprints are attributed a negative part-worth utility compared to a product without any label, and "grown locally" showed a more than two times higher part-worth utility than the German organic label. These results support the conclusion that "local (regional) is the new organic," but also indicate that the carbon footprint label in the current design, which is also used by Fresta and had been used by Tesco (2012), is not a suitable marketing tool (Gadema & Oglethorpe, 2011; Schlich, 2012). To put it more clearly, it is not only the design of the carbon footprint label but also the difficult interpretation (Schlich, 2012) and its unclear message (Hartikainen, Roininen, Katajajuuri, & Pulkkinen, 2014; Rööös & Tjärnemo, 2011). It may also be the case that consumers prefer first and foremost an affordable, safe and healthy product and only after that are they willing to pay for social and climate issues, with the former playing a much bigger role than the latter. Respondents also might view "climate issues" as not controllable through purchasing packages of tomatoes or by reducing their carbon footprint. The negative part-worth utilities for the carbon footprint label show a clearly different picture for its market potential than the majority of other studies in this field (Dirks et al., 2010; Schlich, 2012; Vanclay et al., 2011; Lal Bhardwaj, 2012). In a study by Dirks et al. (2010), consumers responded that climate issues are very important (37.8 %) or important (38.4 %) for their food purchase decisions, a very different picture to the present study (Figure 3) where climate-friendly production lies in the middle and the carbon footprint in the lower ranks. This might be another example of social desirability, but other possible effects might also play a role.

In the present study the results of all three approaches are comparable in the case of the carbon footprint label (lowest rank in quasi-experiment, ranking task and Likert scales). But when participants are asked about the importance they attach to a climate-friendly production, the average is much higher (Figure 3). This may be due to multiple reasons, such as social desirability in the case of the importance of a climate-friendly production and/or a lack of knowledge, and understanding of or trust in the carbon footprint label.

The participants' answers measured using a Likert scale are comparable with the results of the choice-based conjoint analysis for the characteristics "grown locally" and domestic origin. After this, the third most important characteristic is that producers get a fair price. This result is comparable to the result of the ranking task, where the Fairtrade/"Ein Herz für den Erzeuger" label ranks first, but cannot be observed in the quasi-experiment (Figure 2). In the choice-based conjoint analysis this is attributed only a part-worth utility of 0.200, which is only 9 % of the part-worth utility of the characteristic "grown locally" or 7 % of the part-worth utility of the lowest price.

Most notably, the Likert scale elicitation ranks the low price 12<sup>th</sup> (marked red in Figure 3) whereas the lowest price (1.49 €) showed the highest part-worth utility in the quasi-experiment (Figure 2). At this point it can be concluded that there are major differences in the results of direct questions such as with the Likert scale or a ranking task and the quasi-experiment performing a choice-based conjoint analysis. One possible reason for these differences in the same sample is the effect of social desirability, which leads to answers to direct questions that the respondent believes to be socially favorable. The results of studies investigating consumer preferences in terms of food labels based on direct questions are, then, questionable. The use of a combination of methods to get an understanding of the true behavior of consumers is important, as demonstrated by this study. For examples of other methods and a discussion of conjoint analysis see Beckley, Paredes, and Lopetcharat (2012).

### **3.5.1 Strengths and Limitations**

Bearing in mind some limitations in the sample composition as mentioned above, the findings of the present study are to some extent transferable to Germany. This might not be the case for Europe as a whole given that, for example, the popularity of organic food differs a lot between countries. In Germany, organic food is popular (as well as in Denmark, Luxembourg, Austria and Switzerland) but it does not play a significant role in other European countries (e.g. in Portugal, Greece, Ireland or Turkey).

One limitation for the evaluation of the carbon footprints is that only one number (600 g CO<sub>2</sub>) is shown on the carbon footprint label indicating CO<sub>2</sub> emission, which represents an average of the results for fresh tomatoes of Tesco's (2012) measurement. This limitation was accepted to reduce the choice sets included in the conjoint analysis. Only giving one value to the participants, however, precludes an evaluation of how people might use this label to compare across products, which might lead to an underestimation of the label's impact.

Other explanations beyond the possible social desirability effects suggest to be the main explanation of the differences between the results of the different methods need to be mentioned. For example, the choice of item wording in the Likert scale element may influence the rating.

Another limitation for the quasi-experiment in this study was the relatively high number of choice sets (25), which was challenging for the participants and led to a number of noncompleters, who, however, do not differ in terms of demographic attributes from the group of completers.

### 3.5.2 Future Research

An interesting challenge would be to evaluate the different part-worth utilities of different label designs, especially in the case of the carbon footprint label.

A follow-up study might also be suggested where consumers are given either real or virtual money and asked to vote through their purchases or repeated purchases. Also, analogous studies of other types of products might be required to corroborate social desirability effects in direct preference elicitation.

### 3.6 Conclusion

At this point it can be concluded that there are major differences in the results of direct questions such as with the Likert scale or a ranking task and the quasi-experiment. One possible reason for these differences in the same sample is the effect of social desirability. Thus results of studies investigating consumer preferences in terms of food labels that mainly use direct questions might be biased towards the preference for socially valued characteristics. The use of a combination of methods to get an understanding of the true behavior of consumers is important, as demonstrated by this study.

The results show a rather different picture for the market potential of carbon footprint labels than many other studies in this field. The finding that carbon footprint labels are associated with negative part-worth utilities shows that confronted with connected choices involving price, production location etc., consumers do not find a benefit in such a label. This is contrary to evidence from direct measurements as reported, for example, by Dirks et al. (2010). It also implies that there may be less scope for acting on climate change when purchasing food items than is advocated by activists and media promoting carbon footprint labeling.

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## 4 Organization 2020 – An Empirical Study of the Current and Future Importance of Organizational Issues for Horticultural Companies and their Perceived Competence in Germany

### 4.1 Abstract

Structural change, the increasing concentration of industry, and environmental issues are changing the competitive landscape in German horticulture. As in other fields of corporate management the priorities of organizational design are constantly changing. The aim of the present study is to identify issues which will characterize organizational design in the future from the perspective of decision-makers in German horticultural companies, to identify overarching trends and to capture the currently perceived competence of the decision-makers in different fields, as well as their past experience. The study specifically aims to indicate issues where a gap between future importance and perceived competence is present. For this purpose more than 150 entrepreneurs and executives from horticulture participated in an online survey in 2014. Most participants in the study were from ornamental horticulture, tree nurseries and vegetable farms. The main finding was that soft issues such as *employee motivation/employee engagement/empowerment* and the *design of corporate culture* are approximately 50 % more often considered one of the five most important organizational issues in 2020 than hard issues such as general *cost reduction and restructuring*. Moreover, there is a critical gap in the perceived competence in future issues such as the *optimization of leadership levels*, and issues that are already of substantial importance, such as the *design of corporate culture* and *performance management*. A significant positive relationship was observed between self-evaluated *economic success* and today's subjective importance of *optimization of leadership levels*, *innovation management* and *project management*. According to the participating horticultural companies, there is a perceived need for action, especially in the soft subjects: *organization of the corporate culture*, *cross-divisional collaboration/cooperation behavior*, *leadership* and *process management*.

**Keywords:** organizational design, business development, economic sustainability, future issues, human resource management, change management

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### 4.2 Introduction

Demographic change (Bundesministerium für Ernährung, 2012), environmental issues<sup>5</sup> and the concentration of the industry (Dirksmeyer, 2009) are changing the competitive landscape in German horticulture – and they have dominated the agenda of the industry for many years. The focus is on environmental regulations and costs, and company-wide *cost-cutting and restructuring*. While some major issues for corporate success re-

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<sup>5</sup> In a separate survey of horticultural entrepreneurs ( $n=124$ ) replied to the question “Which five ‘mega-trends’ will be the cause of fundamental change processes in your company in the next decade?” 63.7 % said environment (e.g. climate change, requirements, costs). Environmental issues are thus the mega-trend in German horticulture, beside the labor market (for example, “war-for-talent” shortage of skilled workers) with 39.5 %.

quire a more long-term perspective (Bitsch, 1994; Kölbel 2012) – e.g. from *leadership* to *employee satisfaction and motivation* – many of them are not the first priority for many horticultural companies.

Horticulture companies in Germany have been increasing in their organizational size for decades (Dirksmeyer, 2009). This growth has led to an increasing need for professionalization in many areas of the company. The organization of the horticultural company is also likely to change. Organizational design has the objective to optimize structures and processes.

The focus of organizational design is on strategy, structure and systems (Vahs, 2007, p. 359). The organizational structure of a horticultural company could continue to differentiate in the course of growth and be characterized by increasing standardization and specialization. This raises questions about the present and future importance of certain organizational issues for horticultural companies, from the perspective of horticultural entrepreneurs and executives. The evaluation of the self-assessment of decision-makers with regard to the competence of their company in the respective organizational issues can be an indication of where future gaps between importance and their competence exist. As in other areas of business management, the focus is always changing in organizational design (Lechner & Hettich, 2014; Anderson & King, 1993; Battisti & Stoneman, 2005; Betcherman, 1997), however, overarching trends can be identified.

This study attempts to answer the following questions in a broader perspective:

- ▶ What issues of organizational design are considered particularly important for the future (in 2020) by decision-makers in horticultural companies?
- ▶ Where can overriding trends be identified – within the plurality of individual subjects?
- ▶ What are the competences of horticultural companies in different areas of organizational design?
- ▶ What measures have been carried out by horticultural companies in the respective areas of organizational design, in the last three years?

### 4.3 Materials and Methods

The study is based on an online survey of more than 150 horticultural entrepreneurs and executives in Germany, which was supplemented by interviews with business consultants.

A total of 23 organizational issues were examined (Figure 1), as identified in empirical studies as parent organizational issues (Krüger, 1994, pp. 13 ff.; Krüger & Bach, 2015, p. 24) and assessed by horticultural entrepreneurs and executives as to their current and future importance. The respondents were presented with issues and then chose those that applied to their company. Executives and entrepreneurs were also asked which issues they viewed as competences in their company. All questions allowed the respondent's own ideas and opinions to be provided. The technical terms used were partly English, and explained in the questionnaire for the participants, who were provided with practical examples. The spectrum of organizational issues analyzed in the study can be divided into "hard" and "soft" issues (Krüger, 1994, pp. 13 ff.; Krüger & Bach, 2015, p. 24; see Figure 1). The costs and benefits of appropriate measures for hard organizational issues can be more clearly quantified than those for soft issues. Thus among the hard issues, are issues of structure (*cost reduction and restructuring, optimization of manage-*

ment levels as well as margins) and control (*degree of centralization, corporate governance, decision-making*), as well as the processes (*process management, out/co-sourcing, innovation management*). The soft issues include all issues related to employees, cooperation and transformation. Some of the issues are naturally both hard and soft, and include both components. This is particularly true for *project management*. To allow comparison of this study of the horticultural industry with other industries in Germany, the systematic, classification and selection of organizational issues were adopted from a study by the Boston Consulting Group (BCG) in collaboration with the Society for Organization (GFO), the Austrian Association of Organization and Management (ÖVO) and the Swiss Society for Organization and Management (SGO) (Roghé et al., 2009).



**Figure 1.** Hard and soft organization issues compiled from: Dalton, Todor, Spendolini, Fielding, and Porter (1980), Krüger (1994, pp. 13 ff.), Cartwright and Cooper (1995), Gadenne and Sharma (2009), Roghé et al. (2009), Krüger and Bach (2015, p. 24).

Horticultural entrepreneurs and executives were interviewed in the period from June until December 2014 via an online questionnaire on the topics listed in Figure 1. Socially desirable or self-justified motives should be avoided through the use of multiple choice answers. For example, participants were asked to select five subjects in which they perceive their company as very competent, and not asked separately about the degree of competence in each subject. Structural data on the *number of employees* and the *number of seasonal workers* was also collected, since it can be assumed that the size of the organization has an effect on the answers. This influence was examined for each question. Since the company's business situation has an impact on the importance of different organizational issues, the study participants were asked how *economically successful* their business is compared to direct competitors. Study participants were asked to participate in the online survey via a personalized letter (by mail or email).

The study participants represent the broad diversity of horticulture: floriculture, 33.1 %; tree nurseries, 31.4 %; vegetable farms, 27.8 %; and fructiculture, 7.7 % ( $N=169$ ). Tree nurseries and vegetable farms are over-represented in the sample, and fruit growers are

underrepresented.<sup>6</sup> The focus of the sample was on production horticulture, so service companies are not included. Of the surveyed companies 74.1 % employed less than ten employees ( $N=166$ ) and 62.3 % below five seasonal workers ( $N=138$ ); only five companies surveyed had more than 50 seasonal workers. The proportion of companies in the sample with more than ten employees is larger than in the population, where about 80 % of the horticulture production companies have fewer than ten employees, but the Horticulture Census 2005 does not distinguish between seasonal workers and permanent employees (Statistisches Bundesamt, 2006, pp. 72–73). The horticultural companies in the present study reported an average operating income of about 750,000 euros ( $N=83$ ), which corresponds approximately to the average operating income of participating companies in the farm comparison of the Centre for Business Management in Horticulture and Applied Research (777,582 Euro,  $N=837$ )<sup>7</sup>.

Of the respondents, 89.9 % were owners, executive committee members, managing directors or factory managers; 0.8 % were the directors of a company or senior heads of department; 7.6 % were department heads and 0.8 % were project managers ( $N=119$ ). Most participants in the study (89.1 %,  $N=128$ ) had worked more than ten years in the company.

## 4.4 Results and Discussion

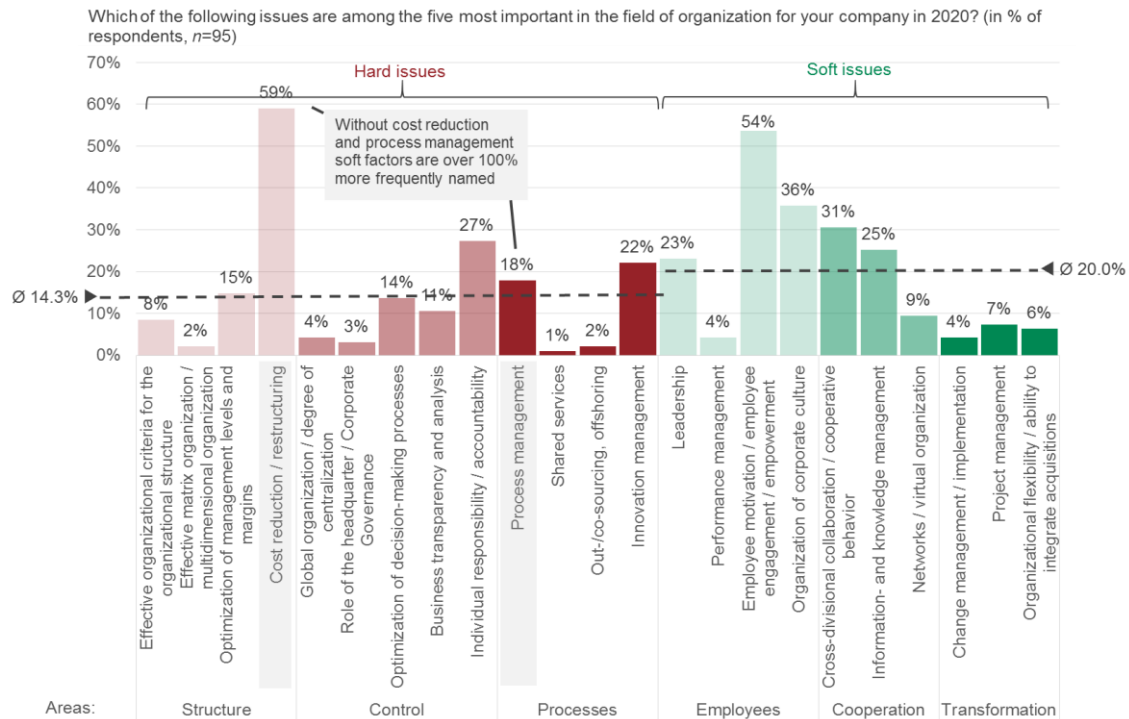
### 4.4.1 Comparison of the Current and Future Importance of Organizational Issues

The study shows the issues that are increasingly important for the future and how companies perceive their current competence in the different areas, from the perspective of horticultural entrepreneurs and executives. When asked what issues will be the five most important for their company in 2020, both hard and soft issues were mentioned (Figure 2). There is one recognizable trend: soft issues were on average about 50 % more often named than hard ones by respondents in the study, as the five most important issues of the future. If the classic hard issues such as *cost reduction* and *process management* are excluded, then soft issues are classified as particularly important for the future (2020) more than twice as often than hard issues (Figure 2).

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<sup>6</sup> Population: fruticulture 31.9 %, floriculture 25.5 %, vegetable farms 17.6 %, tree nurseries 9.8 % and others 15.1 %. Cf. Gurrath (2006, p. 1039).

<sup>7</sup> In the Horticultural Census 2005, operating income is not queried. Own calculation: floriculture, 823,559 euros,  $n=472$ ; vegetable farms, 928,213 euros,  $n=142$ ; tree nurseries, 550,112 euros,  $n=38$  and fruticulture 591,381 euros,  $n=185$ ; Cf. Zentrum für Betriebswirtschaft im Gartenbau e. V. (2014, pp. 48–50).



**Figure 2.** Top issues for the future of organization in German horticulture - importance of soft factors (green).

As shown in Figure 1, the 23 organizational issues analyzed can be subdivided into six overarching areas. Most frequently organizational issues were named by the field employees of the five most important organizational issues in the future. After the area of personnel issues (employees) is the area organizational structure (structure), where the organizational issue of *cost reduction/restructuring* is particularly important. In third, fourth and fifth place were areas of cooperation, control and processes. The area of transformation, including organizational issues *change management/implementation*, *project management* and *organizational flexibility/ability to integrate acquisitions* was least mentioned by respondents.

The area of employees (consisting of four organizational issues, see Figure 1) is rated as the most important area of future organizational design. Around half the respondents (53.7 %) expect that organizational management and the practical promotion of the organizational issues *employee motivation*, *employee engagement* and *empowerment* (delegating responsibility and freedom of choice to the employees) within the company will be the main issues of organizational design in the future.

*Change management*, as a transformational organizational issue, is surprisingly of minor importance. Perhaps this is attributable to the term used in the survey and/or a lack of acceptance and presence of change management in horticulture, although the term was also noted as synonymous with ‘organizational change’ and explained in several places in the questionnaire.

The employee-oriented aspects of organizational design only follow after the major cost and structural issues (*cost reduction/restructuring*, 58.9 %). After *employee motivation/employee engagement/empowerment* (53.7 %) 35 % of respondents noted the *organization of corporate culture* as an important issue for the future. Slightly fewer (30.5 %) expect that issues such as *cross-divisional collaboration/cooperative behavior* and *leadership* (23.2 %) will develop further in the coming years.

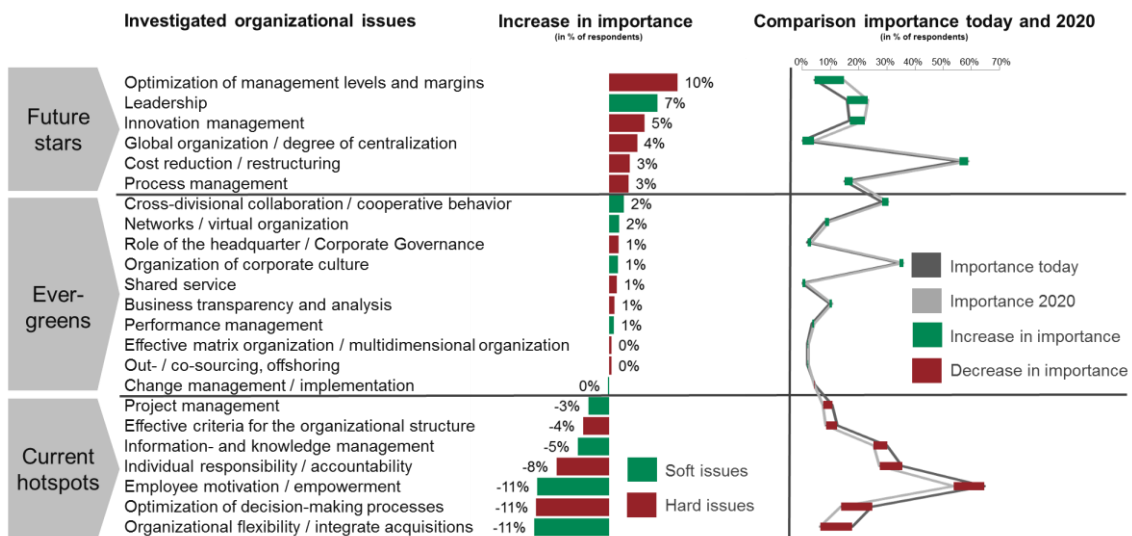
Relationships between different other variables were also examined. Since the multiple responses produced dichotomous variables, Kendall's tau-b ( $\tau_b$ ) correlation coefficient was used (Field, 2009, pp. 181–182). The significance level ( $p$ ) and the number of records used for the calculation ( $n$ ) is also indicated in the text. The structure and number of employees is also noted here, as these have an impact on the choice of topics. The complexity of the value creation process also has an impact on the importance of various organizational issues. This has not been investigated in the present study.

German horticulture production companies, which employ many seasonal workers, noted *individual responsibilities/accountability* less frequently among the five most important organizational issues today ( $\tau_b=-.19$ ;  $p<0.05$ ;  $n=138$ ). The same applies to *employee motivation/employee engagement/empowerment* ( $\tau_b=-.22$ ;  $p<0.01$ ;  $n=138$ ) and *cross-divisional collaboration/cooperative behavior* ( $\tau_b=-.19$ ;  $p<0.05$ ;  $n=138$ ). The current importance of *project management* ( $\tau_b=.16$ ;  $p<0.05$ ;  $n=138$ ) increases with the number of seasonal workers.

Horticultural companies with many seasonal workers note the issue of *global organization/degree of centralization* more frequently as a major organizational issue in the future (2020) than their counterparts with fewer seasonal workers ( $\tau_b=.18$ ;  $p<0.05$ ;  $n=138$ ), whereas they named issues such as *leadership* ( $\tau_b=-.17$ ;  $p<0.05$ ;  $n=138$ ), *cross-divisional collaboration/cooperative behavior* ( $\tau_b=-.17$ ;  $p<0.05$ ;  $n=138$ ) and *network/virtual organization* ( $\tau_b=-.16$ ;  $p<0.05$ ;  $n=138$ ) significantly less frequently as among the most important organizational issues in 2020. Here the relative exchangeability of seasonal workers and the high degree of standardization in their tasks becomes visible. The complexity of the work increases the coordination and management effort needed, and therefore this is relatively low for seasonal workers.

Figure 3 compares the importance of organizational issues today and in 2020. The increase in importance is illustrated in the middle of Figure 3. This results from the difference between the percentage of respondents who described an issue as important for their business in 2020 and the percentage who considered the topic as important today. Based on the survey results, it is shown that – considering the current dominant priorities of organizational design – cost pressure remain significant, and the need for increasing business transparency and analysis is an important field, but soft issues are also gaining more in importance. It can be concluded that the current hotspots such as *employee motivation/employee engagement/empowerment*, *organizational flexibility/integration of acquisitions* and *information and knowledge management* should become standards in organizations.

The absolute percentage of responses for each organization issue is presented for today and 2020 on the right side in Figure 3. At this point it becomes clear that, for example, the issue of *optimizing management levels as well as margins*, shows the highest increase in importance (10.3 %), but that this increase is at an overall low level. Thus today 4.4 % of respondents include this topic as the most important for their business, whereas the figure is 14.7 % for 2020, regarding the most important organizational issues.



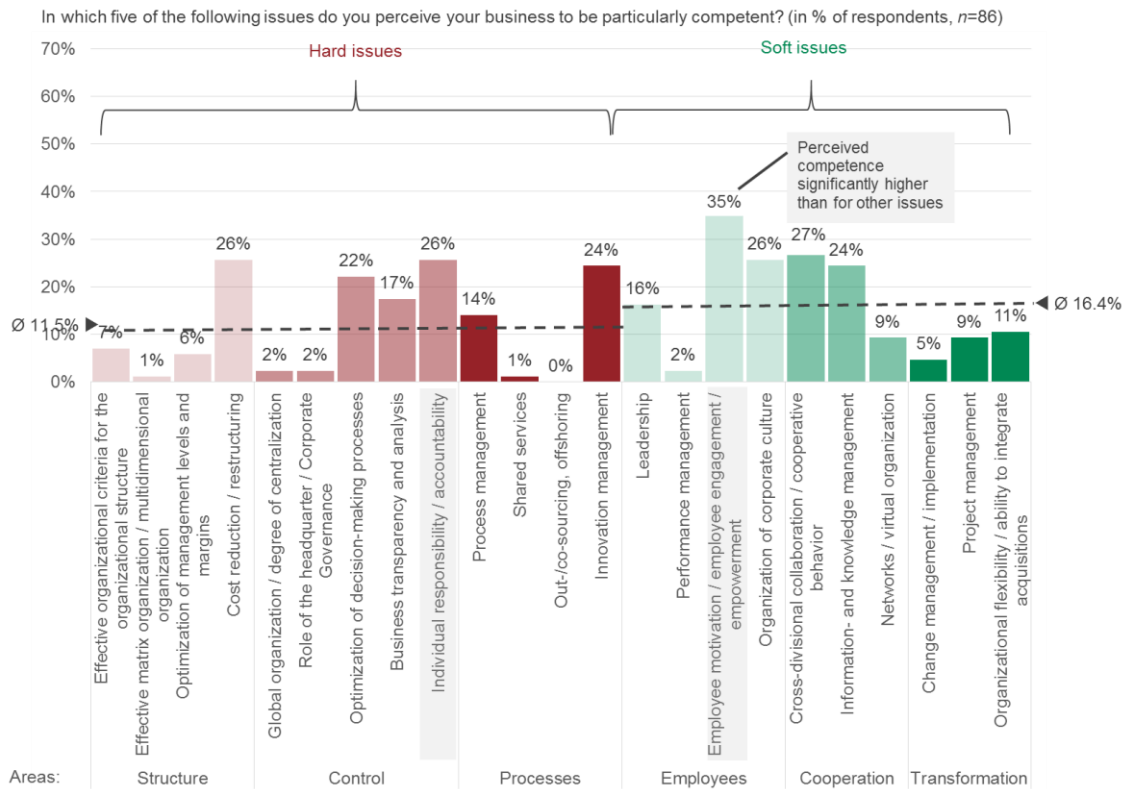
**Figure 3.** The six most important issues in the field of organization today and 2020.

Efficient decision-making processes and competitive cost structures are expected to be mandatory – even beyond current hotspots. Issues such as the *optimization of management levels, as well as margins, innovation management, process management* and *leadership* are the future stars of the surveyed horticultural entrepreneurs and executives. The increase in importance of these issues, comparing today and 2020, is pronounced most clearly.

Unchanged on the agenda are a series of issues which are considered relevant today and in the future. These include the *design of corporate culture* and the *cross-divisional collaboration/cooperative behavior*. The organizational issues that represent current hotspots today will need to be solved from the perspective of decision-makers in order to continue succeeding on the market in the future.

#### 4.4.2 Perceived Competence of Decision-makers with Respect to the Examined Organizational Issues

In the next question, respondents were asked to select five organizational issues where they perceive their company as very competent. Overall, many executives perceive their companies less competent in hard than in soft issues.



**Figure 4.** Perceived competence of the entrepreneurs with respect to the 23 selected organizational issues.

With regard to the hard issues, capabilities in the field *individual responsibilities/accountability* (25.6 %) were assessed as particularly good. Almost every third person considers their company as particularly competent in the area *cost reduction and restructuring* (25.6 %). Similar proportions can be observed for *optimizing decision-making processes* (22.1 %) and *innovation management* (24.4 %). The issues of *business transparency and analysis* (17.4 %) and *process management* (14.0 %) were awarded almost average values. Horticultural entrepreneurs perceive their companies as less competent on issues such as *effective organization criteria for the organizational structure* (7.0 %), *optimization of management levels as well as margins* (5.8 %) and *global organization/degree of centralization* (2.3 %). In areas found more often in larger organizational units, as they can be found in horticulture such as *effective matrix organization/multidimensional organization*, *role of headquarter/corporate governance*, *shared services* and *out/co-sourcing/offshoring* almost none of the companies surveyed perceived themselves as particularly competent. These topics are, however, considered of little relevance both today and in the future.

With regard to the soft issues, respondents feel especially competent regarding *employee motivation/employee engagement/empowerment*: almost 35 % of respondents perceived their businesses as particularly competent in this area – a significantly higher proportion than for all other issues. This result is in contrast to statements in interviews with business consultants, where this issue alone was often described as having great potential for development. *Project management*, in 9.3 % of respondents perceives themselves as being particularly competent, was assigned as a soft issue in the analysis, however, it also has major hard components, such as project planning and project controlling. In the field of transformation skills, just over a tenth of the horticultural entrepreneurs and executives see their own company as especially competent in terms of or-



organizational flexibility/ability to integrate acquisitions (10.5 %); and even fewer in project management (9.3 %) and change management/implementation skills (4.7 %).

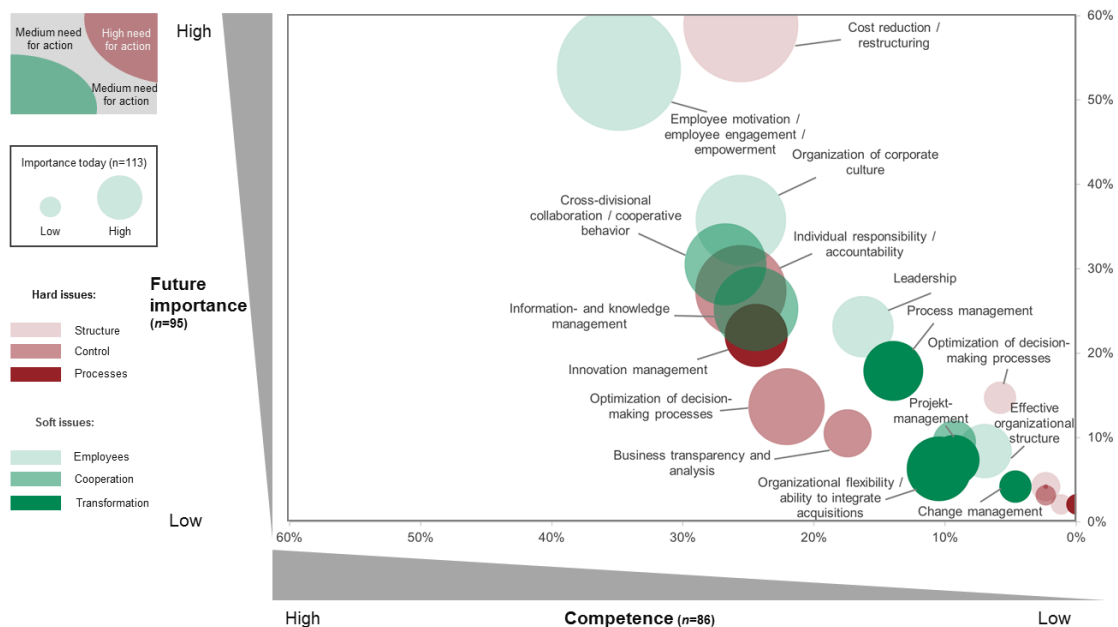
As less problematic among the soft issues applies information and knowledge management (24.4 %), which is positive because great importance is attached to this issue today (today 30.1 %; 25.3 % in the future); even if the information and knowledge management will lose some of its relevance in the future from the perspective of the horticultural entrepreneurs.

Companies with many employees (excluding seasonal workers) often feel especially competent in the issue of optimizing management levels and margins ( $\tau_b=.18$ ;  $p<0.05$ ;  $n=166$ ), whereas the design of the corporate culture ( $\tau_b=-.17$ ;  $p<0.05$ ;  $n=166$ ) was significantly less frequently named among the five core competencies in organization, as in the case of their counterparts with fewer employees.

### 4.4.3 Comparison of Current and Future Importance and the Perceived Competence

Apart from the expected weighting of hard and soft issues in the future, the results of the survey suggest that there is a gap in many horticultural companies between their own competence and the relevance of issues. This gap indicates that action is needed (see Figure 5).

**Questions:** "What are the five most important issues in the field of organization in your company today?", "Which of the following issues are among the five most important in the field of organization for your company in 2020?" and "For which five of the following issues would you perceive your business to be particularly competent?"



**Figure 5.** Comparison of current and future importance and the perceived competence with respect to the 23 organization issues.

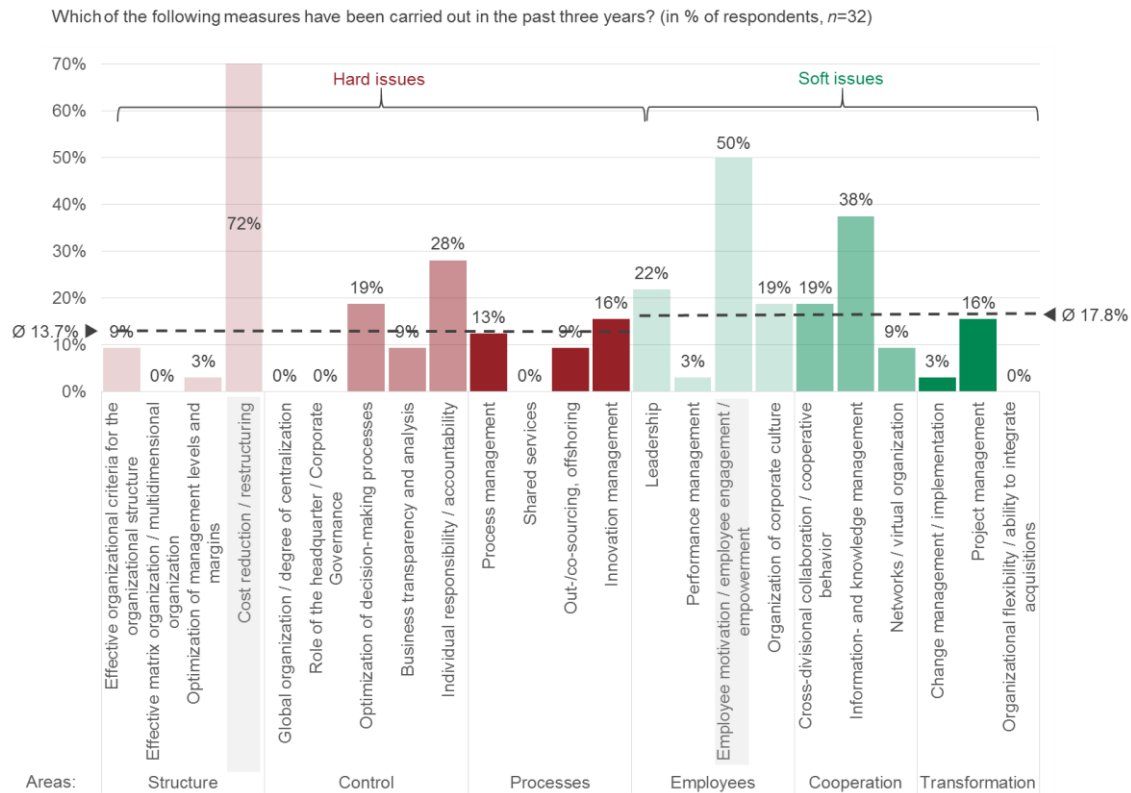
Apart from cost reduction/restructuring and individual responsibilities/accountability there is only a small need for action on hard issues in the companies. The picture is different for the soft issues: with respect to the soft issues process management, leadership, cross-divisional collaboration/cooperative behavior and design of the corporate

*culture*, the situation is critical, since perceived competence and the assessment of future importance are not pronounced to the same extent.

In addition to the importance of individual organizational issues the survey also includes other subjects, including how economically successful the horticultural companies judge themselves in comparison with their direct competitors (Likert scale from 1=not at all successfully to 5=very successful). If the self-assessment with regard to competency in organizational issues is analyzed using perceived *economic success* compared to that of their direct competitors, then no significant relationship can be shown. A different picture emerges when comparing perceived *economic success* and the current subjective importance of organizational issues. Thus there is a significant positive relationship between subjective *economic success* and the current importance of *optimizing management levels as well as margins* ( $\tau_b=.17$ ;  $p<0.05$ ;  $n=114$ ) and a significant negative correlation with the current meaning of *cost reduction/restructuring* ( $\tau_b=-.17$ ;  $p<0.05$ ;  $n=114$ ). Another positive correlation was observed for today's importance of *innovation management* ( $\tau_b=.15$ ;  $p<0.05$ ;  $n=114$ ) and *project management* ( $\tau_b=.15$ ;  $p<0.05$ ;  $n=114$ ) and the current subjective *economic success*. There was also a significant relationship between the future importance of *project management* ( $\tau_b=.17$ ;  $p<0.05$ ;  $n=114$ ) and the present perceived *economic success*. Here horticulture is different from other industries. In the comparative study (Roghé, et al., 2009) the correlations with soft issues such as *leadership, employee motivation, individual responsibilities, organization of corporate culture and change management* were particularly high. Companies that perceived themselves as particularly competent in these aspects of their organization were subjectively *economically more successful* than others. In contrast, a low correlation between some classical subjects on the agenda of organizational design and the *economic success* of the company was shown: a minor influence on business success resulted – in contrast to the results in German horticulture – from the perceived competence in *cost reduction/restructuring, role of headquarter/corporate governance* and in *out-/co-sourcing and offshoring* issues (Roghé, et al., 2009). It should not be concluded from this that the soft issues of organizational design in German horticulture would be more negligible than in other industries.

#### 4.4.4 Measures in Practice

The experience with measures to increase competency in individual organizational aspects are showing in a similar direction in the comparative study (Roghé, et al., 2009): the results of measures in the field of soft issues were significantly more positively judged as such measures in the field of hard issues. Thus more than half the respondents said that they have had good experiences with measures to improve *leadership* skills, as well as with measures to promote *employee motivation* and to *improve the cross-divisional cooperation* in the comparative study. As Figure 6 shows, "hard" measures for *cost reduction and restructuring* (71.9 % of respondents) and only after that soft measures to *motivate staff/employee engagement/empowerment* (50.0 % of respondents) are mostly carried out in practice in German horticulture.



**Figure 6.** Measures carried out in the last three years.

After the top issues, *cost reduction/restructuring* and *employee motivation/employee engagement/empowerment* was the soft issue *information and knowledge management*, with 37.5 % of respondents. The hard topic *individual responsibility/accountability* 28.1 % and the issue *leadership* with 21.9 % followed.

Overall, a surprisingly positive picture is shown in the frequency of measures on soft topics. This is also due to the fact that the hard thematic areas in which no measures have been carried out are more likely to come into question for larger organizations than for the respondent smaller horticultural companies. Included here are *effective matrix organization/multidimensional organization*, *global organization/degree of centralization*, *the role of headquarters/corporate governance* and *shared services* each with 0 %. Attention should also be paid to the results for the issue *business transparency and analysis* with 9.4 %, in which the farm comparison of the Centre for Business and Management in Horticulture and Applied Research can be located. This may indicate that for many horticultural companies the benefit of such an analysis is not communicated clearly enough or is considered to be relatively low.

German horticulture production companies with many employees (excluding seasonal workers) have carried out more measures in the field of *information and knowledge management* in recent years, then their counterparts with fewer employees ( $\tau_b = -.14$ ;  $p < 0.05$ ;  $n = 166$ ). Horticultural companies that perceive themselves as particularly economically successful compared to their direct competitors, have in the past three years more frequent performed measures towards *process management* ( $\tau_b = .24$ ;  $p < 0.01$ ;  $n = 114$ ) and *innovation management* ( $\tau_b = .29$ ;  $p < 0.01$ ;  $n = 114$ ).

#### 4.4.5 Differences Between Horticulture and Other Industries in German-speaking Countries

The results of this study can be compared with a comparative study (Roghé, et al., 2009) by the Boston Consulting Group (see Table 1). The comparative 2008 study is based on a survey of more than 1,000 executives and organization experts in Germany, Austria and Switzerland, which was supplemented by interviews with top managers. The respondents represented a wide variety of sectors: banking, insurance, service provider, automotive manufacturers, industrial goods manufacturing companies, technology and communications companies, retail, healthcare and pharmaceutical industry, energy, media, logistics, tourism and public administration. The average future importance of soft (20 %) and hard issues (14 %) is the same in the comparative study and the present study, however, there are significant differences within the superordinate areas. The hard issues *cost reduction/restructuring* (27 %), *process management* (27 %) and *innovation management* (21 %) are ranked most highly in the comparative study. In the sample of the present study, *cost reduction/restructuring* are even more important (58.9 %) and in second place are the *individual responsibilities/accountability* (27.4 %), followed by *innovation management* (22.1 %) and *process management* (17.9 %). With the increase of importance from today to 2020 many more soft issues are considered topics for the future in the comparative study, as in the sample of horticultural companies. In perceived competence, soft issues such as *employee motivation/employee engagement/empowerment* (34.9 %) and the *cross-divisional collaboration/cooperation behavior* (26.7 %) occupy the top places among horticultural companies. In the comparative study, perceived competence in *project management* (46 %) is significantly higher than for all other subjects.

**Table 1.** Comparison of the Results with Those of the Comparative Study

Study	Present study	Comparative study
Industry	Horticulture	Diverse industries
Country	Germany	Germany, Austria, Switzerland
Top three issues of the future (in % of respondents)	59 % Cost reduction / restructuring 54 % Employee motivation / employee engagement / empowerment 36 % Organization of corporate culture	27 % Cost reduction / restructuring 27 % Process management 26 % Change management/implementation
Top three increase in importance (in % of respondents)	10 % Optimization of management levels and margins 7 % Leadership 5 % Innovation management	8 % Innovation management 6 % Networks / virtual organization 6 % Information- and knowledge management
Top three perceived competence (in % of respondents)	35 % Employee motivation / employee engagement / empowerment 27 % Cross-divisional collaboration / cooperative behavior 26 % Cost reduction / restructuring & individual responsibility / accountability & organization of corporate culture	46 % Project management 32 % Process management 31 % Cross-divisional collaboration / cooperative behavior

Note. The results in the right column are from Roghé et al. (2009).

The top issues in terms of competence in horticultural companies are only in the average range in the comparative study. In the comparative study a similar need for action is shown when perceived competence and future importance are compared. An important exception is *change management and its implementation*, which is a subject in the comparative study where special action is required. Another major difference marks the is-

sue *individual responsibilities/accountability*; on this issue almost no action is reflected in the comparative study, whereas it belongs to the hot spots for horticultural companies in the present study. The need for action on issues such as the *role of headquarters/corporate governance, shared services, out/co-sourcing/offshoring* and even *business transparency and analysis* can be evaluated as low in both studies, although in the comparative study, large companies in particular were surveyed, and their focus should be accepted as more strongly on the mentioned topics.

## 4.5 Conclusion and Outlook

Overall, the survey results suggest that a competency assessment based on the 23 organizational issues considered can reflect the situation of an organization, although with varying relevance for individual issues depending on company-specific factors. This can be seen in that study participants rarely suggested their own issues (with the exception of termination of the business). The study shows a comprehensive picture of the current and future importance of different organizational issues and the perceived competence found in German production horticulture. Limitations arise from the number of participants ( $N=169$ ), so that the study can not claim to be representative. The overall result of the study shows that, from the perspective of managers and horticulture entrepreneurs, there is a need for action in many areas – this is especially true for soft issues in the field of organizational design, such as the *design of the corporate culture, cross-divisional collaboration/cooperative behavior, leadership* and *process management*. This result is gaining weight, as implemented measures on *cost reduction and restructuring* in the last three years in the field of hard organizational issues with 71.9 % still have the highest distribution. *Cost reduction/restructuring* and *employee motivation/employee engagement/empowerment* with 58.9 % and 53.7 %, will be ranked most highly in 2020, followed by the *design of the corporate culture* (35.8 %). The importance of the fields of *optimization of management levels and margins, leadership, innovation management, global organization/degree of centralization, cost reduction/restructuring* and *process management* will particularly increase. The horticulture companies perceive themselves as particularly competent in *employee motivation/employee engagement/empowerment*, however, this contradicts the reports of the expert interviews with business consultants.

The present study has demonstrated organizational issues where, from the perspective of corporate practices, action is needed in German horticulture production companies. This need for action should lead to change processes in the structural and procedural organization of horticultural companies. These change processes are themselves major challenges for companies. This leads to the question of how these change projects can be successfully performed. A change management study for horticulture will analyze the success factors of change processes as well as the current situation in German horticulture. The results of this study have underlined the particular relevance of the area of employees. The factors that have a significant impact on employee satisfaction in German horticulture are shown in an employee satisfaction study of the Centre for Business Management in Horticulture and Applied Research (Meyerding, 2015a; Meyerding, 2015b).

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## 5 Job Characteristics and Job Satisfaction: A Test of Warr's Vitamin Model in German Horticulture

### 5.1 Abstract

Personnel costs are accountable for 40 % of all expenses in German horticulture. The importance of human resources management and leadership is growing through demographic change and social sustainability issues. The aim of this study was to investigate the relationships between job characteristics and job satisfaction and the shapes of their utility functions, in German horticulture. A study was conducted, with a paper-and-pencil and web-based questionnaire, using a modified Kunin scale and items representing nonlinear relationships. Responses from 280 employees (average age 35 years) from different business lines were analyzed. In conclusion, this study supports the assertion of Warr's vitamin model (1987, 2007) that nonlinear relationships exist between job characteristics and job satisfaction and presents a detailed view of these relations in German horticulture. A linear regression of job satisfaction on 28 job features attained a high  $R^2$  of .64, and covariance structure modeling (CSM) with full-information maximum likelihood (FIML) reported a reasonable model fit (RMSEA .08). The highest correlations were found with items measuring good future prospects ( $r_s=.58$ ), work-home-conflict ( $r_s=.51$ ), the availability of adequate equipment ( $r_s=.51$ ), and organization's morality in society ( $r_s=.50$ ). This identifies potential to increase job satisfaction and social sustainability and, most notably, that nonlinear evaluations of job features are superior to the assumption of linearity.

**Keywords:** employee well-being, horticulture, human resources management, job satisfaction, social sustainability

**Acknowledgments:** Thanks to Bernd Hardeweg for statistical assistance and Katherine Bruns for professional advice.

### 5.2 Introduction

Personnel costs are accountable for approximately 40 % of all expenses in German horticulture (own calculation based on the farm comparison statistic in October 2012 of the Centre for Business Management in Horticulture and Applied Research). The importance of human resources management will increase through the demographic change in most industrialized countries, which often imply a war-for-talents and a more diverse workforce (Bauernschuster, 2011; Montén, 2011). People-focused topics have been forecast to be initiators for fundamental business transformation processes in German companies for the next two decades in general (Claßen & von Kyaw, 2007, p. 17) and as a key-issue for the future success of horticulture in Germany (Schreiner et al., 2013, pp. 73–76). Another aspect is the increasing awareness of customers and society as a whole for the social dimension of sustainability (Lacy, Cooper, Hayward, & Neuberger, 2010, pp. 46 ff.), which has potential that is not yet addressed by a variety of sustainability evaluation systems in agriculture (Meyerding, 2014b, p. 23). The indicator subjective job satisfaction can be used as a key indicator for social sustainability and has many advantages compared with objectively measured indicators (Meyerding, 2014a).



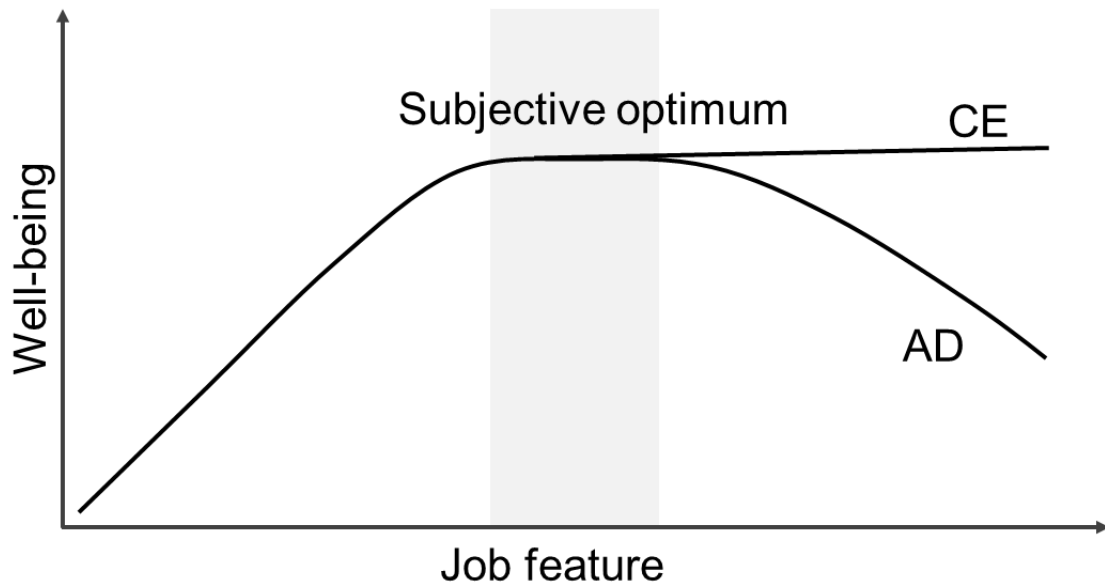
“In essence, stable wellbeing is when individuals have the psychological, social and physical resources they need to meet a particular psychological, social and/or physical challenge. When individuals have more challenges than resources, the see-saw dips, along with their wellbeing, and vice-versa.” (Dodge, Daly, Huyton, & Sanders, 2012, p. 230). Subjective well-being can be measured context free as life satisfaction, context based as, for example, job satisfaction (a facet of employee well-being), and facet specific, for instance, as satisfaction with payment. Job satisfaction can be seen as an indicator for social sustainability (Meyerding, 2014a), and measuring this supports companies by providing valuable information to cope with changes in their business environment (Meyerding, 2014b, p. 23).

There are different approaches regarding how to think about and measure psychological well-being at work (for a general overview see Eid & Larsen, 2008 and von Rosenstiel, Kehr, & Maier, 2000). If job satisfaction is measured through a variety of facets the decision as to which facets are included in the evaluation model is critical, in particular whether environmental features alone, or additional personal characteristics should be examined (Warr, 2013, 2012). One way of evaluating job satisfaction is by using Herzberg's two-factor model (Herzberg, 1966; Herzberg, Mausner, & Synderman, 1959). For example, Bitsch (2007) and Bitsch and Hogberg (2005) used parts of the Herzberg model for a qualitative study in U.S. horticulture based on 31 interviews, and more recently Reiche and Sparke (2012) performed a quantitative study among 446 vocational school and technical college students in Germany, partly based on Herzberg's model but with an innovative analytical approach.

Even though Herzberg's model (Herzberg et al., 1959) is common in business management research (and human resources literature), it is not state of the art in psychology and has almost no empirical backing (von Rosenstiel et al., 2000). To the author's knowledge, there is no quantitative research in the field of German horticulture that examines the nature of employee well-being and reports the impact of different job facets on job satisfaction. Furthermore, the shape of the utility function of these job attributes is also unknown in German horticulture. It can be assumed that the utility functions are not linear (Warr, 1987), but empirical evidence for nonlinearity is still lacking.

As outlined, the aim of the present study was to examine the relationship between 28 job features, which were carefully chosen from the literature, and job satisfaction. These job features can be assigned to Warr's 12 vitamins and their associated utility function (additional decrement [AD] or constant effect [CE]; see Figure 1 and Table 1). Previous studies in horticulture (e.g., Bitsch, 2007; Reiche & Sparke, 2012) were based on Herzberg's model (Herzberg, 1966; Herzberg et al., 1959) and assumed a linear relationship between job characteristics and job satisfaction. During the past decades, two theoretical frameworks have been successful in guiding empirical research: The job characteristics model (Hackman & Oldham, 1980) and the demand-control support model (Johnson & Hall, 1988; Karasek & Theorell, 1990). Although these models differ in scope and complexity, they also assume linear relationships. Cross-sectional studies have investigated the proposed patterns of the vitamin model (e.g., De Jonge, Reuvers, Houtman, Bongers, & Kompier, 2000; De Jonge & Schaufeli, 1998; De Jonge, Schaufeli, & Furda, 1995; Fletcher & Jones, 1993; Parkes, 1991; Rydstedt, Ferrie, & Head, 2006; Xie & Johns, 1995; Warr, 1990; see also De Jonge & Schaufeli, 1998). But for example De Jonge and Schaufeli (1998), who tested the vitamin model used an early version of the model with nine vitamins (Warr, 1994), the current model includes 12 vitamins (Warr, 2007). To date a comprehensive empirical test of this vitamin model is still needed, and

little can be said about the validity of the model. Therefore, the current article presents also an overall test of Warr's model.



**Figure 1.** The vitamin analogy: proposed additional decrement (AD) and constant effect (CE) relationships between job features and well-being (context free and/or context based). Adapted from “Jobs and Job-Holders: Two Sources of Happiness and Unhappiness,” by P. Warr, in *The Oxford Handbook of Happiness* (p. 735), edited by S. A. David, 2013, Oxford, UK: Oxford University Press. Copyright 2013 by Oxford University Press.

**Table 1.** The 12 Vitamins of Warr's Model and Their 28 Features to be Rated by Job-holders

Vitamin model	Job features in the present study	Utility function
1 Control (AD)	1a Task discretion	AD
	1b Influence over the wider organization	AD
2 Skill (AD)	2a Skill use	AD
	2b New learning	CE
3 Goals (AD)	3a Number of job demands	AD
	3b Difficulty of job demands	AD
	3c Task coherence	CE
	3d Conflict between job demands	CE (inverse)
	3e Conflict between work and home	CE (inverse)
	3f Emotional dissonance (inverse)	AD
4 Variety (AD)	4a Range of different tasks	AD
5 Clarity (AD)	5a Future predictability (excludes job tenure)	AD
	5b Clear role requirements	AD
	5c Availability of feedback	AD
6 People (AD)	6a Amount of social contact	AD
	6b Quality of social contact	AD
7 Money (CE)	7a Pay level	CE
8 Physical security (CE)	8a Pleasant environment	CE
	8b Safe work practices	CE
	8c Adequate equipment	CE
9 Significance (CE)	9a Value to society	CE
	9b Significance to self	CE
10 Supervision (CE)	10a Supervision is considerate	CE
	10b Supervisor is supportive	CE
11 Career (CE)	11a Job security	CE
	11b Good future prospects	CE
12 Fairness (CE)	12a Fair treatment of employees	CE
	12b The organization's morality in society	CE

*Note.* There are two possible utility functions for the vitamins and features, additional decrement features (AD) and constant effect (CE). The vitamins and most of their features are from *Work, Happiness, and Unhappiness* (pp. 239–240), by P. B. Warr, 2007, Mahwah, NJ: Lawrence Erlbaum & Associates. Copyright 2007 by Taylor & Francis.

This article presents a quantitative study that examines the relationship between 28 job attributes and job and life satisfaction in German horticulture. Additionally, Warr's (2007, 1987) vitamin model is tested. The theoretical background and the methodology of the study is based on Warr's latest version of the vitamin model (Warr, 2007), which provides 12 job features (vitamins) and their hypothetical utility functions describing the nature of the relationship of the job features and forms of happiness (job satisfaction is one of them). The vitamin model and further literature was used to generate a paper-and-pencil and web-based questionnaire. The collected data were then analyzed using descriptive statistics, calculating correlations between job aspects and job and life satisfaction. Covariance structure modeling (CSM) with full-information maximum likelihood (FIML) estimation was used to assess the fit of the proposed vitamin model and its operationalization in this study. To evaluate the nature of the assumed utility functions, different parts of the features' characteristics were analyzed, as well as linear and non-linear regressions were calculated. The main findings show that 27 of the 28 attributes are significantly correlated with job satisfaction. The highest correlation coefficient is found for good future prospects and job satisfaction. Job satisfaction (context specific

well-being) is significantly related to life satisfaction (context free well-being). The data support Warr's (2007) vitamin model, as nonlinear regressions with the assumed utility functions led to a greater or equal coefficient of determination ( $R^2$ ) than linear regressions. Further, the covariance structure modeling (CSM) reported a reasonable model fit (RMSEA .08).

## 5.3 Method

### 5.3.1 The Vitamin Model

To examine the relationship between different job attributes and job satisfaction, a survey was carried out among employees of various German horticulture companies. A questionnaire was designed and implemented both on paper and in a web-based format (using the online survey tool Lime Survey) to ensure as many different distribution channels as possible while allowing flexibility to include different groups of participants. The survey covered German horticultural companies, but the design could also be used in other countries and industries. The theoretical background of the present study is Warr's (2007) vitamin model, which uses two different types of utility functions when it comes to job features. As shown in Figure 1, the first type presents an inverse U-shaped (additional decrement), and is seen mostly in intrinsic job features like job autonomy. At low levels of these features, the satisfaction (context based and/or context free) is also low and increases as the level of the feature increases. However, after a moderate level (subjective optimum) is achieved, the vitamin becomes toxic and a further increase in the level of the job feature leads to a decrease in well-being (AD). In Figure 1 moderate levels of job features are labeled "subjective optimum," because the feature level at which the optimum is attained is determined by individual preferences. The second form of utility function tends to apply to extrinsic job features such as payment. At low levels of these features, satisfaction is also low and increases as the level of the feature does. Beyond a moderate level (subjective optimum) the marginal utility decreases (constant effect). These vitamins do not become toxic at very high levels but their additional effect on subjective well-being (including job satisfaction) becomes very small, to almost zero. They show a constant effect (CE) on subjective well-being for high levels of these kind of features.

The present study contains 28 job features (job aspects), which can be assigned to Warr's 12 vitamins (Meyerding, 2014a). These job features are used to operationalize the vitamins and are chosen from the literature. In addition, overall subjective job satisfaction and life satisfaction were collected. Table 1 shows the vitamins, their related aspects in the present study, and the underlying utility function.

### 5.3.2 Questionnaire Design

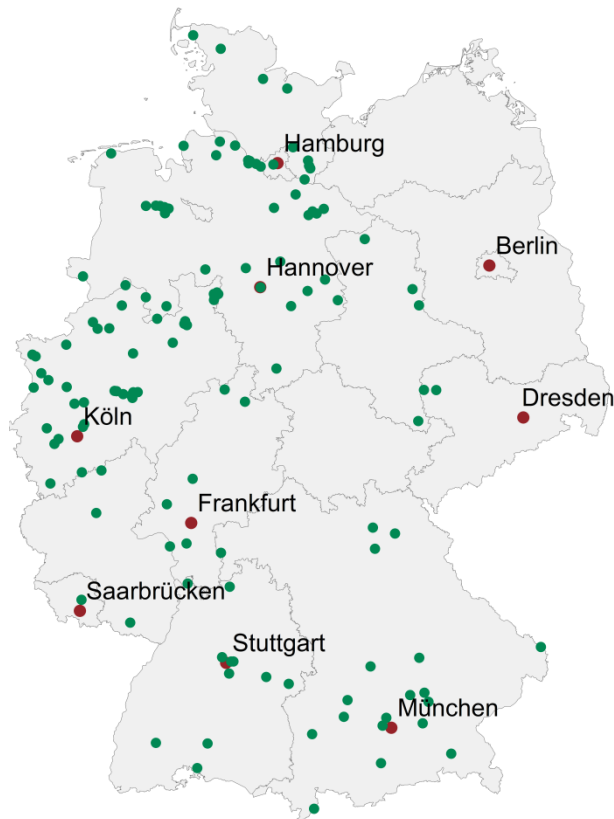
The questionnaire consists of four sections. The first section asks the employee about their dream job and the importance of all 28 job features, to detect individual preferences. The response options in this section are 1=*unimportant*, 2=*somewhat important*, 3=*important*, 4=*very important*, 5=*extremely important*, and 6=*essential*. The second section asks about the feature characteristics of their current job. The participants were requested to evaluate these features based on the past four weeks. To assess the features a modified Kunin scale (Kunin, 1955) was used, to make it easier for the participants to grasp the nature of the values of the feature in question. This is particularly necessary because the values are often assumed to be linear (more is better). The Kunin scale uses

faces with emotions to represent the evaluations in each cell. A description of the value can still be found in the top of each column. The symbols (smileys) used were adopted from Salcher and Hoffelt (1995, p. 95). Response options in these section were 1=*extremely low*, 2=*very low*, 3=*quite too low*, 4=*about right*, 5=*quite too high*, 6=*very too high*, 7=*extremely too high*; for features with an additional decrement (AD) effect. For constant effect (CE) features the following response options were given 1=*extremely too low*, 2=*very too low*, 3=*quite too low*, 4=*about right*, 5=*quite acceptable*, 6=*very acceptable*, and 7=*extremely acceptable*. For the features 3d and 3e (CE inverse) *extremely too low* to *quite too low* were replaced by *extremely too high* to *quite too high* but coded inversely, indicating that lower levels of conflicts are more desirable than higher ones. The third section contains characteristics of the company such as the line of business it belongs to, the size in terms of staff employed and whether the farm produces in a greenhouse or on open field area and so forth. The last section of the questionnaire includes personal demographics such as gender, age, and level of education.

### 5.3.3 Participant Characteristics and Research Design

After cognitive testing and five interviews, the cross-sectional survey was conducted between August 2013 and September 2014 so that different seasons were covered, which might differ significantly in terms of the workload on employees. Because of budget and organizational constraints, it was not possible to generate a set of panel data, which would have allowed for fully attenuating these seasonal effects. To collect the data at different times in the year is particularly important in horticulture because the workload for employees can differ a lot through the year. To fully attenuate seasonal effects longitudinal data would be desirable, the cross-sectional nature of the present design is one of its shortcomings. Participants were recruited through presentations of the research on a horticultural trade fair (IPM 2014 in Essen, Germany), at growers' meetings and a national farm consultants' meeting (Gartenbautag Mecklenburg Vorpommern in Güstrow, Germany, 2013), the First Symposium of Economics in Horticulture (in Göttingen, Germany, 2014), and in front of the expert conference meeting of the Center for Business Management and Applied Research (in Hannover, Germany, 2013). In addition, there were two reports published in the horticultural trade press (TASPO, Meyerding, 2014c; Meyerding, 2014d) and through social networks. The different channels were used to generate as diverse a sample as possible. In total, 503 employees participated in the survey. Only records with more than 10 completed questions were considered in the analysis; 280 questionnaires could be used for the analysis (171 were filled out completely).

The map in Figure 2 shows the origin of the participants based on their zip code, indicating that participants come from all over Germany with a higher amount from the west than from the east, which is in line with the distribution of horticultural activity in Germany.



**Figure 2.** Participants' origin ( $N=138$ ).

The majority of participants work for horticulture service companies (35 %), followed by floriculture (18 %), multiline companies (12 %), tree nurseries (12 %), fruit farms (6 %), retail horticulture companies (8 %), vegetable farms (4 %), and wholesale (4 %,  $N=154$ ). These shares are close to those in the population at the most recent horticultural census date (Gurrath, 2006) except for vegetable farms, which are underrepresented. Their employers had in most cases less than 20 employees (without seasonal labor; 78 %,  $N=181$ ) and less than five seasonal workers (78 %,  $N=180$ ), which is nearly the same as the population means (Statistisches Bundesamt, 2006). Of the sample, 42 % were women ( $N=160$ , 28 % in the population; Statistisches Bundesamt, 2006, p.144) and 18 % were self-employed ( $N=161$ ). Most participants were fulltime employees (81 %,  $N=129$ ; 51 % in the population where seasonal laborers are included; Statistisches Bundesamt, 2006, p. 144) and had a permanent employment contract (76 %,  $N=117$ ). Only 6 % were seasonal workers ( $N=125$ ). The level of education is distributed as follows: 1 % had no professional graduation, 20 % were apprentices, 30 % had a completed apprenticeship, 23 % an advanced training, and about 25 % graduated from college ( $N=151$ ); 61 % of the participants had a kind of managerial responsibility ( $N=151$ ). The youngest participant was 17 and the oldest 69 years old (average 35, standard deviation 12,  $N=159$ ). There is a slight accumulation of participants between the age of 20 and 30, which might be caused by the use of social media as a distribution channel. Information about the educational and age structure of the employees in German horticulture is not available for the population.

After the survey was conducted, the paper-and-pencil– based questionnaires were entered into the online interface (Lime Survey). Afterward the structure and the data were transferred to IBM SPSS and IBM SPSS AMOS for statistical analyses. The data were

tested for completeness and consistency, and only records with more than 10 completed questions were considered in the analysis.

### 5.3.4 Methodological Limitations

Providing the questionnaire as a paper and web-based version increased flexibility and possible distribution channels, but responses might differ because the web-based questionnaire can possibly be answered in more privacy. Another limitation of this survey is that participants may not always fully understand the differences between particular attributes. Even if there are examples for some situations occurring at the workplace, an interviewer could provide more detailed information to the participant. The focus of this research is on the environmental features, the characteristics of the job that can generally be influenced by the organization. To fully understand employee well-being it would be necessary to also examine personal characteristics such as age, gender, personal judgment processes, and the levels of psychoticism, extraversion, and neuroticism and so forth (Warr, 2013). A bigger data set would be desirable to take a detailed look at for example the differences between business lines or groups of people. As a large share of employees in German horticulture are seasonal workers, the questionnaire should also be translated into Polish and Romanian to address these important labor groups. Job satisfaction is only one dimension of the broader concept of subjective employee well-being, which also contains levels of anxiety and exhaustion (De Jonge & Schaufeli, 1998; Warr, 1987, 2007, p. 22). Two of the vitamins (4 Variety and 7 Money) and the dependent variable of job satisfaction are based on a single questionnaire item; more items for each construct would produce a more stable image. In the last 15 years the psychological literature has moved beyond job satisfaction and focused on employee engagement because employee engagement has been demonstrated to relate to organizational success and/or profitability. A strong analytical approach to employee engagement was first outlined by Maister (2003). A broader conceptual framework as subjective employee well-being or employee engagement would probably lead to more significant findings. One of the major limitations is the cross-sectional design. Constructs such as subjective well-being, job satisfaction or employee engagement should not only be captured at one point in time (Mulinge, 2000). These constructs need to be collected over time and on a regular basis.

## 5.4 Results

The model was tested by performing covariance structure modeling (CSM) with full-information maximum likelihood (FIML) estimation and comparing different specifications. One specification only includes the increasing part of utility function values whereas another includes the decreasing part. There should be a positive correlation below the subjective optimum (Figure 1, left side) and a negative correlation above the optimum (Figure 1, right side). In a second specification, the AD-features were transformed so that values above the feature's optimum were recoded to the corresponding values of the increasing part. The correlation between the transformed variables is expected to be stronger than without the transformation. Finally, a linear regression of each feature was compared to a nonlinear specification, where the nonlinear model is expected to show a higher  $R^2$  than the linear one.

### 5.4.1 Relationships Between Job Features and Job and Life Satisfaction

Table 2 shows the spearman correlation for all 28 job features with job and life satisfaction. Note that for the AD features (1a, 1b, 2a, 3a, 3b, 3f, 4a, 5a, 5b, 5c, 6a, 6b) the transformed variables, as mentioned earlier, are listed.

As can be seen in Table 2, most job features (27 of 28) show a significant relationship with job satisfaction. As expected, the relationships are stronger with context based than with context free well-being. Job features are also interrelated, as can be seen, for example, between influence on work content (1a task discretion), conflicts between tasks (3d,  $r_s=.31$ ,  $p<.01$ ), workload (3a,  $r_s=.29$ ,  $p<.01$ ), task difficulty (3b,  $r_s=.20$ ,  $p<.01$ ), and less work-home conflict (3e,  $r_s=.25$ ,  $p<.01$ ). The strongest relationship with job satisfaction among employees of horticultural companies participating in this study were reported for items measuring good future prospects (11b,  $r_s=.58$ ,  $p<.01$ ), work-home conflict (3e,  $r_s=.51$ ,  $p<.01$ ), the availability of adequate equipment (8c,  $r_s=.51$ ,  $p<.01$ ), the organization's morality in society (12b,  $r_s=.50$ ,  $p<.01$ ), pleasant environment (8a,  $r_s=.50$ ,  $p<.01$ ), and the job's significance to self (9b,  $r_s=.48$ ,  $p<.01$ ). Job satisfaction is highly correlated ( $r_s=.52$ ,  $p<.01$ ) with life satisfaction, which is in line with values reported by McFarlin and Rice (1992) ( $r=.49$ ) and Heller, Judge, and Watson (2002) ( $r=.46$ ).



**Table 2. Spearman Correlations of all 28 Job Features and Job and Life Satisfaction (N=190)**

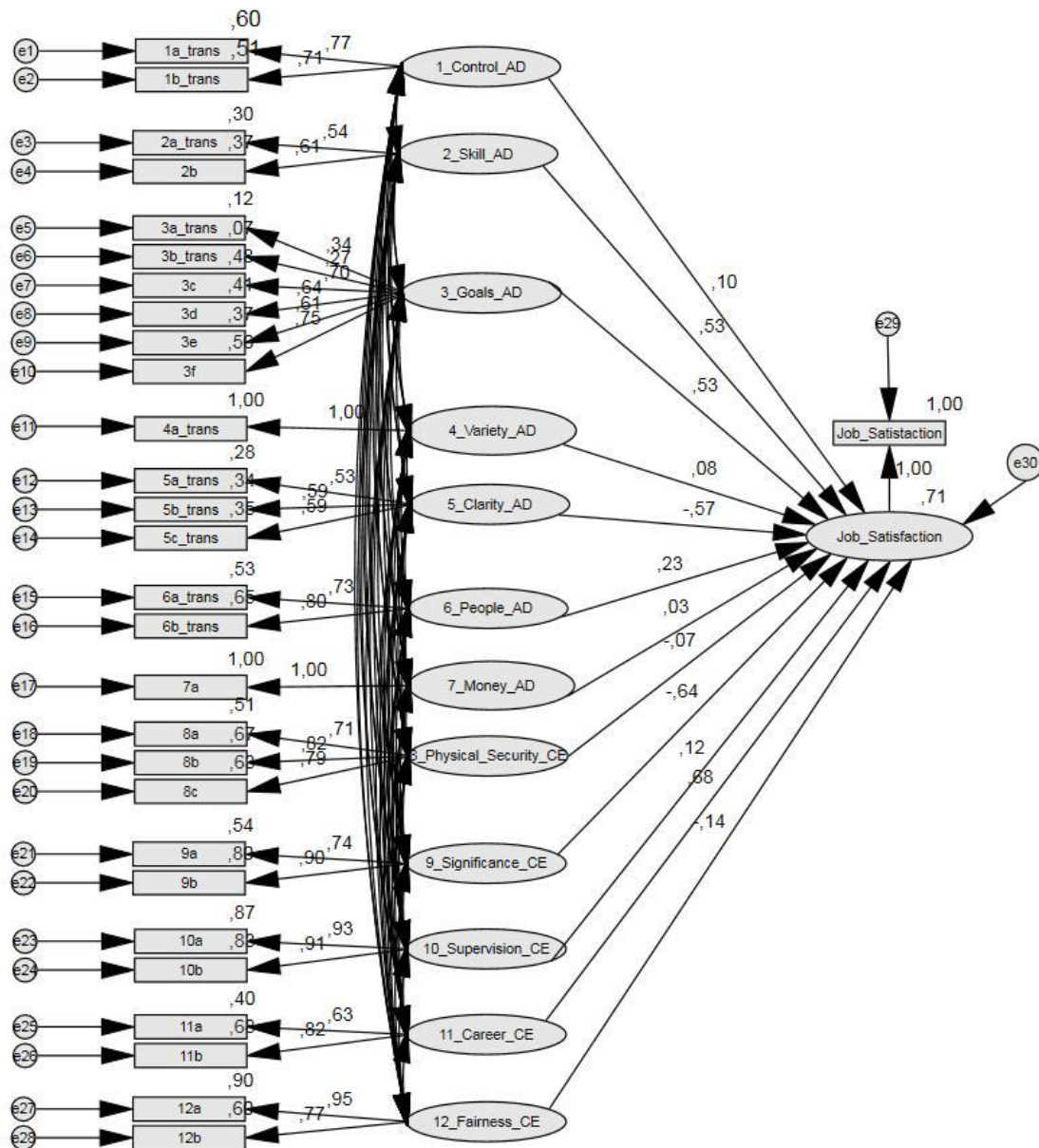
	J	L	2b	3c	3f	7a	8a	8b	8c	9a	9b	10a	10b	11a	11b	12a	12b	3d	3e	1a	1b	2a	3a	3b	4a	5a	5b	5c	6a	
J Job satisfaction	1																													
L Life satisfaction	.52**	1																												
2b New learning	.40**	.20**	1																											
3c Task coherence	.37**	.17*	.58**	1																										
3f Emotional dissonance	.45**	.28**	.47**	.59**	1																									
7a Pay level	.45**	.26**	.28**	.30**	.36**	1																								
8a Pleasant environment	.50**	.25**	.35**	.33**	.32**	.36**	1																							
8b Safe work practices	.44**	.24**	.36**	.34**	.29**	.41**	.58**	1																						
8c Adequate equipment	.51**	.20**	.34**	.35**	.38**	.40**	.56**	.65**	1																					
9a Value to society	.44**	.24**	.36**	.34**	.42**	.34**	.37**	.41**	.34**	1																				
9b Significance to self	.48**	.29**	.45**	.57**	.46**	.26**	.37**	.45**	.41**	.63**	1																			
10a S.vision behave considerate	.44**	.18*	.43**	.41**	.44**	.38**	.34**	.34**	.37**	.36**	.48**	1																		
10b Supervision is supportive	.45**	.24**	.41**	.40**	.39**	.31**	.30**	.27**	.37**	.37**	.51**	.81**	1																	
11a Job security	.46**	.24**	.24**	.31**	.30**	.33**	.38**	.32**	.39**	.38**	.46**	.40**	.38**	1																
11b Good future prospects	.58**	.38**	.41**	.32**	.36**	.27**	.39**	.37**	.31**	.46**	.52**	.34**	.34**	.54**	1															
12a Fair treatment of employees	.47**	.23**	.34**	.40**	.54**	.37**	.33**	.35**	.44**	.36**	.44**	.73**	.72**	.42**	.38**	1														
12b Orga. morality in society	.50**	.25**	.28**	.34**	.41**	.31**	.29**	.40**	.53**	.41**	.49**	.58**	.61**	.43**	.36**	.73**	1													
3d Conflict between job demands	.42**	.23**	.24**	.36**	.33**	.29**	.24**	.34**	.35**	.33**	.34**	.32**	.35**	.24**	.27**	.40**	.41**	1												
3e Work-home-conflict	.51**	.34**	.24**	.33**	.34**	.42**	.31**	.42**	.33**	.41**	.38**	.40**	.31**	.29**	.34**	.43**	.42**	.56**	1											
1a Task discretion	.33**	.23**	.27**	.23**	.25**	.27**	.26**	.27**	.24**	.38**	.31**	.34**	.38**	.23**	.26**	.33**	.33**	.31**	.25**	1										
1b Influence over the wider orga.	.36**	.20**	.21**	.12	.20**	.22**	.19*	.23**	.32**	.25**	.26**	.31**	.14	.24**	.26**	.34**	.20**	.29**	.49**	.49**	1									
2a Skill use	.34**	.07	.29**	.20**	.18*	.19**	.12	.16*	.20**	.23**	.17*	.29**	.34**	.21**	.19**	.26**	.22**	.26**	.19**	.40**	.36**	1								
3a Number of job demands	.22**	.11	-.04	.08	.13	.22**	.05	.05	.18*	.17*	.06	.07	.10	.04	.08	.12	.17*	.21**	.22**	.29**	.35**	.21**	1							
3b Difficulty of job demands	.06	-.06	.17*	.10	.06	.21**	-.01	.11	.09	.15*	.06	.05	.10	.08	.06	.03	.07	.15*	.03	.20**	.08	.35**	.26**	1						
4a Range of different tasks	.25**	.01	.07	.10	.08	.16*	.12	.15*	.24**	.15*	.12	.20**	.17*	.18*	.16*	.15*	.30**	.15*	.15*	.12	.22**	.25**	.38**	.42**	1					
5a Future predictability	.26**	.19**	.04	-.02	.07	.20**	.11	.08	.22**	.17*	.11	.19**	.19**	.32**	.19**	.18*	.22**	.21**	.19**	.23**	.29**	.21**	.29**	.24**	.34**	1				
5b Clear role requirements	.30**	.08	.13	.13	.27**	.29**	.19**	.19**	.33**	.22**	.19**	.17*	.20**	.17*	.10	.22**	.24**	.20**	.17*	.40**	.29**	.31**	.27**	.13	.19**	.25**	1			
5c Availability of feedback	.29**	.13	.36**	.30**	.18*	.24**	.25**	.17*	.12	.21**	.22**	.30**	.32**	.14	.15*	.28**	.25**	.21**	.28**	.36**	.37**	.31**	.06	.18*	.12	.13	.29**	1		
6a Amount of social contact	.20**	.10	.10	.10	.10	.10	.14	.08	.09	.17*	.18*	.17*	.11	.04	.05	.05	.10	.16*	.22**	.14	.18*	.14	.19**	.17*	.14	.23**	.14	.26**	1	
6b Quality of social contact	.22**	.00	.11	.18*	.16*	.13	.19**	.12	.23**	.20**	.20**	.21**	.17*	.19**	.11	.13	.15*	.13	.21**	.30**	.28**	.28**	.21**	.16*	.17*	.26**	.20**	.35**	.52**	1

\*\* The correlation is significant at the 0.01 level (two-tailed)

\* The correlation is significant at the 0.05 level (two-tailed)

## 5.4.2 Covariance Structure Modeling

Covariance structure modeling (CSM) with full-information maximum likelihood estimation was used to assess the model fit of the vitamin model and the aspects in the present study. CSM is a multivariate instrument which combines methodological and statistical contributions from psychometric as well as econometric theory (Diamantopoulos, 1994). CSM represents an integration of two models (Backhaus, Weiber, & Erichson, 2013, pp. 63–118): (a) the measurement or confirmatory factor analytic model, which examines the contributions of the performed measures (aspects) to the hypothetical latent vitamins, and (b) the structural equation model, which defines (causal) relationships among these latent factors (the vitamins and job satisfaction). The corresponding analyses were performed using IBM SPSS AMOS. Missing observations were handled by listwise deletion. Figure 3 shows the path diagram of the performed structural equation model. The intercorrelations between the vitamins are not shown in this diagram for reasons of readability; they can be seen in Table 3. The vitamins 1 through 12 are latent variables which are operationalized by the 28 aspects in the present study. The factor loadings (printed on the arrows from the vitamins to the aspects in Figure 3) indicate the contribution of each aspect to the factor (vitamin). As the factor loadings are mostly above .63 they can be seen strong (Comrey & Lee, 2013, p. 243). The hypothetical vitamins are then associated with job satisfaction. In this model the transformed variables for the additional decrement (AD) features were used. In other words, nonlinearity is not tested. The model is recursive ( $N=227$ ), it is identifiable with degrees of freedom of 302. The assessment of normality reported acceptable values of kurtosis  $|<2|$  and skewness  $|<7|$  (Weiber & Mühlhaus, 2014). This is essential to perform maximum likelihood estimation.



**Figure 3.** Path diagram of the covariance structure modeling (standardized estimates). The intercorrelations between the vitamins are not shown in this diagram for reasons of readability.

The factor loadings of all aspects of the vitamins are significant as the critical ratios (CR) are all above 1.96 (Backhaus et al., 2013, p.141). Chi-square (CMIN) equals 779.369 for the default model divided by the degrees of freedom ( $df$  302) equals 2.58 (CMIN/ $df$ ), which represents a good model fit for the whole structural equation model (Backhaus et al., 2013, p. 147). Because chi-square is problematic especially for complex models (Reinecke, 2005, pp. 116 ff.), the root-mean-square-error of approximation (RMSEA) was calculated, which measures how well the model fits to the “reality” of the empirical data. A value of about .08 or less for the RMSEA would indicate a reasonable error of approximation, a value of .10 and above represents an insufficient model fit (Browne & Cudeck, 1992). The RMSEA of the default model is .084.

**Table 3.** Correlation Matrix for the 12 Estimated Vitamins

	1	2	3	4	5	6	7	8	9	10	11
1 Control (AD)											
2 Skill (AD)	.88										
3 Goals (AD)	.61	.92									
4 Variety (AD)	.37	.39	.26								
5 Clarity (AD)	.91	.92	.64	.47							
6 People (AD)	.51	.57	.43	.33	.68						
7 Money (AD)	.36	.43	.53	.20	.42	.29					
8 Physical security (CE)	.49	.75	.73	.15	.47	.38	.51				
9 Significance (CE)	.55	.79	.80	.22	.50	.40	.67	.34			
10 Supervision (CE)	.56	.83	.67	.23	.60	.34	.52	.36	.63		
11 Career (CE)	.55	.82	.68	.27	.58	.29	.43	.63	.77	.58	
12 Fairness (CE)	.53	.75	.74	.18	.57	.28	.40	.58	.59	.87	.63

### 5.4.3 Linear and Nonlinear Relationships of Job Features with Job Satisfaction

A linear regression, with all job features (see Table 1 and 2, AD were transformed as described earlier) as explanatory variables was able to explain job satisfaction to a substantial extent as expressed by an  $R^2$  of .64. The remainder may be explained by personal characteristics of the employees, such as age or neuroticism, and judgment processes in the experience of subjective well-being (Warr, 2013). Additional explanations include measurement error, difficulties in understanding survey questions, and other methodological issues, such as mixed modes of survey delivery (paper-and-pencil and web-based). Table 2 shows the relationship between job features and job satisfaction in German horticulture – the main objective of this study. A further question that was investigated was whether the shapes of the utility functions assumed by Warr can be supported. If this is the case then the vitamins with an additional decrement effect should have a positive relationship with job satisfaction below the subjective optimum and a negative correlation with job satisfaction above the subjective optimum (above a moderate level of the vitamin; see Figure 1). In addition to the correlations, linear and nonlinear regressions were calculated for all job features (and job satisfaction). For the nonlinear regressions the following functional forms were fitted:

Concave with saturation limit (exponential model, CE features):

$$\text{job satisfaction} = M - a * e^{(-b*x)}$$

Where  $x$  is the value of the job feature and starting values were selected as follows:

$$a = 1, b = .5, M = 10$$

Concave with downturn (quadratic model, AD features):

$$\text{job satisfaction} = a + b * x - c * x^2$$

Where  $x$  is the value of the job feature and starting values were as follows:

$$a = 5.6, b = 5.3, c = 10.0$$

A higher  $R^2$  of the nonlinear regression compared with those of the linear ones would provide support to the assumed nonlinear relationship (Backhaus et al., 2013, p. 35 and 38). It has to be noted that using the  $R^2$  for nonlinear regressions can be problematic especially for higher parametrized models (Spiess & Neumeyer, 2010), in our case the nonlinear regressions include only three parameters. Therefore the comparison of  $R^2$  is supplemented by other methods. For that reason also the results of linear regressions in-

cluding the original variables and squared variables explaining job satisfaction as the dependent variable are provided. A negative  $\beta$  value for the squared variables implies a CE or AD effect of the variable in question (Thornhill & Gangestad, 1994). This is the case for 25 of 28 job features. Table 4 summarizes the Spearman correlations of all features with job satisfaction, without transformation, and for the transformed variables in the case of the AD features. For the AD features the split correlations for low and high values (left side and right side of Figure 1) are also presented. As mentioned earlier, the  $R^2$  of the linear and nonlinear regressions are shown in columns six and seven. The standardized  $\beta$  as well as the standard error are shown in the two rightmost columns for the original and squared variables (aspects).

It is evident from the results that the assumed curves describing the relation of the job features and job satisfaction provide a better description of their true nature than a linear relationship (see Table 4). In all cases, using nonlinear regression results in a greater or equal  $R^2$  than using the linear regression. The transformed variables for the additional decrement vitamins provide much higher and more significant Spearman correlations than their nontransformed counterparts (first column). If the additional decrement features are split into two variables each, one for the left and one for the right side of Figure 1, they show the expected directional effect on job satisfaction. Increasing a specific feature to a moderate level is related to higher job satisfaction, but after a subjective optimum, the reported correlations become negative. This indicates that at high values the vitamin becomes toxic and related to a decrease in job satisfaction. In linear regressions with job satisfaction, squared variables show the expected negative sign of the  $\beta$  estimate, which also supports the hypothesized concave functional form (Thornhill & Gangestad, 1994). De Jonge and Schaufeli (1998) also showed that the fit of the nonlinear model is superior to that of the linear model for aspects of three vitamins (i.e., job demands, job autonomy, and workplace social support). The results presented here support this approach for aspects of all 12 vitamins.

Spearman's rho and linear and nonlinear regressions were used to analyze the data, where subjective job satisfaction is the dependent variable. In the present study job satisfaction was operationalized through a single question. Other researchers as De Jonge and Schaufeli (1998) used more characteristics (i.e., job satisfaction, job-related anxiety, and emotional exhaustion), which may lead to a deeper understanding of the job features effect on context based and context free subjective well-being. As Table 4 reports, additional decrement features show a less strong relationship with job satisfaction than most constant effect features. This could indicate that even though a Kumin scale was used, not every participant fully understood the nature of the items.

**Table 4.** Comparison of Spearman Correlations ( $r_s$ ) of High and Low Feature Values and  $R^2$  of the Linear and Nonlinear Regression as well as the Standardized  $\beta$  of the Original Variables and Squared Variables to Support the Vitamin Model

Job feature	$r_s$ with job satisfaction	$r_s$ trans-formed (AD)	$r_s$ low (AD)	$r_s$ high (AD)	Linear regression $R^2$	Non-linear regression $R^2$	Standardized $\beta$ original variable (standard error)	Standardized $\beta$ squared variable (standard error)
2b	.40**	-	-	-	.176	.192	1.24** (.34)	-.77** (.04)
3c	.37**	-	-	-	.148	.152	.67 (.41)	-.24 (.04)
3f	.45**	-	-	-	.257	.279	1.40** (.31)	-.88** (.03)
7a	.45**	-	-	-	.219	.233	1.07** (.28)	-.64* (.04)
8a	.50**	-	-	-	.250	.250	.25 (.34)	.21 (.04)
8b	.44**	-	-	-	.193	.201	.80** (.33)	-.36 (.04)
8c	.51**	-	-	-	.258	.263	.51 (.29)	-.02 (.03)
9a	.44**	-	-	-	.207	.213	1.01** (.37)	-.57 (.04)
9b	.48**	-	-	-	.229	.232	1.00** (.43)	-.52 (.04)
10a	.44**	-	-	-	.234	.237	.89** (.25)	-.36 (.03)
10b	.45**	-	-	-	.237	.237	.67** (.22)	-.16 (.03)
11a	.46**	-	-	-	.201	.201	.18 (.29)	.28 (.03)
11b	.58**	-	-	-	.348	.354	1.03** (.26)	-.41 (.03)
12a	.47**	-	-	-	.273	.273	.65* (.23)	-.10 (.03)
12b	.50**	-	-	-	.276	.276	.53 (.29)	-.04 (.03)
3d	.42**	-	-	-	.203	.204	.43 (.34)	.02 (.04)
3e	.51**	-	-	-	.293	.298	.60* (.27)	-.09 (.03)
1a	.27**	.33**	.37**	-.11	.082	.161	1.29** (.39)	-.98** (.05)
1b	.32**	.36**	.39**	-.10	.100	.149	1.12** (.31)	-.79** (.05)
2a	.31**	.34**	.42**	-.09	.081	.173	1.51** (.36)	-1.19** (.05)
3a	-.06	.22**	.20*	-.19*	.000	.070	1.50** (.53)	-1.56** (.06)
3b	.07	.06	.08	.01	.027	.045	.92** (.43)	-.86** (.05)
4a	.05	.25**	.24**	-.17*	.008	.052	1.23** (.58)	-1.16** (.07)
5a	.23**	.26**	.29**	-.06	.053	.092	1.05** (.36)	-.81** (.05)
5b	.18*	.30**	.35**	-.13	.026	.139	1.63** (.43)	-1.44** (.06)
5c	.26**	.29**	.30**	-.07	.049	.084	1.18** (.33)	-1.03** (.05)
6a	.13	.20**	.22**	-.11	.031	.048	1.15** (.54)	-1.02** (.07)
6b	.10	.22**	.20**	-.14	.012	.069	1.22** (.43)	-1.15** (.06)

Nevertheless, these results support the assertion of the vitamin model that nonlinear relationships exist between job characteristics and employee well-being whereas traditionally linear relationships are assumed. Furthermore, the results offer a detailed impression regarding the relationship between job features and job satisfaction, which can be an advantageous indicator for social sustainability (Meyerding, 2014a).

## 5.5 Discussion

The major aim of this study was to identify the relationship of job characteristics and job satisfaction in German horticulture. Traditionally, linear relations are assumed in psychological research. Warr (1987) challenged this belief by presenting the nonlinear vitamin model.

Prior work in horticulture is partly based on Herzberg's model (Herzberg, 1966; Herzberg et al., 1959), which is criticized by many authors (e.g., Gebert & Rosenstiel, 2002; Locke & Henne, 1986; von Rosenstiel, et al., 2000; Vroom, 1967). Furthermore, former work is either qualitative (Bitsch, 2007; Bitsch & Hogberg, 2005) or the sample is constrained to apprentices in a more advanced quantitative study (Reiche & Sparke, 2012). Both studies in horticulture did not consider nonlinear relationships. De Jonge and Schaufeli (1998) and De Jonge et al. (1995) tested three vitamins, a comprehensive empirical test of the latest version of the vitamin model (Warr, 2007) was pending up to this date. The present study investigated the possibility of nonlinear relationships between job characteristics and job satisfaction, and all participants were employees of horticulture companies, differing in age, hierarchy level, origin of business line, and level of education.

In this study 28 job aspects, representing the 12 vitamins of Warr's model, were analyzed and their relationship with job satisfaction were investigated. The model was tested by performing covariance structure modeling (CSM) with full-information maximum likelihood estimation. As the factor loadings of the 28 aspects are mostly above .63 they can be seen as strong (Comrey & Lee, 2013, p. 243), which supports the usage of the measures in the present study. The assumed latent vitamins and job satisfaction showed a reasonable model fit with further potential for improvement. Comparisons between the results of linear and nonlinear regressions, as well as between the correlation coefficients for different sections of the curves of additional decrement features, were undertaken to examine the true nature of the relationship between the job aspects and job satisfaction. In virtually all cases the assumed nonlinear shapes were superior to the linear model. A linear regression, with transformed additional decrement features for the whole model used in this study, reported a high  $R^2$  of .64. These findings extend those of De Jonge and Schaufeli (1998) to all vitamins of Warr's (2007, pp. 239–240) model (with some adjustments).

In addition, most job aspects were significantly correlated with job satisfaction. This study provides a detailed picture of job characteristics and job satisfaction in German horticulture. The highest significant correlation with job satisfaction was good future prospects (excluding job tenure),  $r_s=.58$ ,  $p[\text{two-tailed}]<.01$ , which indicates the importance of informing and communicating future plans to employees, as well as align the goals of the company and the employees. Having the feeling that one is making progress toward a better future has a major influence on job satisfaction. There was a significant relationship between the organization's morality in society and job satisfaction ( $r_s=.50$ ,  $p[\text{two-tailed}]<.01$ ). This result presents a link between job satisfaction and sustainability. It might be the case that the more sustainable the employees believes the company they are working in is, the higher their job satisfaction is.

The significance of the job to one self was significantly related to job satisfaction ( $r_s=.48$ ,  $p[\text{two-tailed}]<.01$ ). This indicates the importance of communicating the significance of every job to the employees. It might be helpful to give them an understanding of how their work fits into the whole production process, and the effects of their work on the next in line, and who is directly reliant on their work. In this study in German horticulture a lack of work–family conflicts is strongly significantly related to job satisfaction ( $r_s=.51$ ,  $p[\text{two-tailed}]<.01$ ). Improving this job feature in German horticultural companies could therefore lead to higher job satisfaction and could also be of importance for attracting new qualified employees. Another interesting result is the highly significant and relatively strong correlation of adequate equipment and job satisfaction

( $r_s=.51$ ,  $p$ [two-tailed] $<.01$ ). This feature has been identified previously as especially important in jobs where primarily physical work has to be done (Salvendy, 2012, p. 708; Wyatt & Langden, 1938).

Most notably, this is the first quantitative study to the author's knowledge to investigate the relationship of job characteristics and job satisfaction in German horticulture, with participants who differ in age, hierarchy level, origin of business line, and level of education. Additionally, it is the first study to the author's knowledge to test all vitamins of the latest version of Warr's vitamin model. The results provide compelling evidence of the superiority of nonlinear models in the field of psychological research when it comes to subjective job satisfaction. The results of this study provide a deeper understanding and new insights into job satisfaction in German horticulture. They also support the approach of using employee subjective well-being as a key indicator for social sustainability in German horticultural companies (Meyerding, 2014a).

Some limitations, however, are worth noting. Although 27 of 28 job aspects were found to be related to job satisfaction in German horticulture, a larger sample of participants would be desirable. Additionally, it is clear that job satisfaction depends on both jobs and job-holders (Warr, 2013), therefore future research will analyze the impact of personal characteristics on job satisfaction in German horticulture. It is also evident that the importance of job features differ between individuals. Future work will therefore compare the relationship with job satisfaction, and the preferences of different groups. It is essential to know what is important for the next generation of employees in German horticulture. One additional decrement feature (3b, Difficulty of job demands) in this study is not significantly correlated with job satisfaction, and the correlations of additional decrement features were not as high as in the cases of constant effect features. This is maybe because that not every participant fully understood the meaning of the items even though a modified Kunin scale was used. Future work should therefore help to improve the questionnaire design used to collect data for nonlinear, especially inverted U-shaped utility functions. One of the major limitations of the present study is the cross-sectional design. A construct such as job satisfaction or employee well-being cannot be fully captured at one point in time. Those constructs might change over time and should ideally be collected repeatedly. One of the future areas of research would be collecting longitudinal data. Research opportunities also lie in the identification of differences between objective measurements of job characteristics and the subjective evaluations reported in this study.

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## 6 Job Satisfaction and Preferences of Employees of Horticultural Companies in Germany

### 6.1 Abstract

Traditional linear relationships between environmental characteristics and subjective job satisfaction are assumed in psychological research. Warr (1987, 2007) challenged this belief by presenting the nonlinear vitamin model. A comprehensive description of the preferences for and influences of specific job characteristics on job satisfaction in German horticulture is still needed. For this purpose, a survey was undertaken from August 2013 to February 2015 through an online and paper-and-pencil questionnaire examining the preferences of employees ( $N=200$ , focus of this article), vocational and master craftsman scholars ( $N=200$ ) and horticultural science students ( $N=200$ ) regarding job characteristics. The strongest connections with job satisfaction among employees are with future prospects and conflict between work and family. The study is the first of its kind to provide a detailed overview of job satisfaction of different groups in German horticulture.

**Keywords:** social sustainability, human resources management, employee well-being, horticulture, vitamin model

### 6.2 Introduction

Personnel costs account for approximately 40 % (own calculation based on the analysis of the main operational comparison in October 2012 by the Centre for Business Management in Horticulture and Applied Research e. V.) of all costs in German horticulture. Employee-related topics will be the cause of fundamental transformation processes in German companies in all industries in the next two decades (Claßen & von Kyaw, 2007, p. 17), and are seen as key to the future success of horticulture in Germany (Schreiner et al., 2013, pp. 73–76; Meyerding, 2015). Another aspect is the growing attention of consumers and society on the social dimension of sustainability (Lacy, Cooper, Hayward, & Neuberger, 2010), the potential of which has not yet been addressed by a number of sustainability rating systems in agriculture (Meyerding, 2015). Therefore knowledge of the preferences of different groups regarding certain job features and the characteristics values of these job features is significant for the development of German horticulture.

There are diverse approaches to the measurement and understanding of psychological satisfaction at work (Eid & Larsen, 2008; von Rosenstiel, Kehr, & Maier, 2000). If job satisfaction is to be measured by the subjective assessment of the values of different aspects of the work, it is essential to determine what aspects should be included in the valuation model. Specifically, it is necessary to decide whether environmental characteristics (aspects of the work) alone or additional personal features are to be included in the analysis (Warr, 2012, 2013). One way of evaluating job satisfaction is to use Herzberg's (Herzberg, Mausner, & Synderman, 1959; Herzberg, 1966) two-factor model. For example, Bitsch and Hogberg (2005) used parts of Herzberg's model for a qualitative study in U.S. horticulture based on 31 interviews. More recently, Reiche and Sparke (2012) performed a quantitative study with 446 vocational and master craftsman scholars, adopting an innovative analytical approach, but also mainly based on Herzberg's model (Meyerding, 2015).

Although the theoretical use of Herzberg's et al. (1959) model is widespread in business administration, personnel management literature and relevant studies, it is not supported by empirical studies (von Rosenstiel, et al., 2000). According to the author's knowledge, there has been no other quantitative investigation in German horticulture that has analyzed the nature of job satisfaction and personal characteristics.

The objective of this study is to examine the relationships between job aspects and job satisfaction in German horticulture, to show the preferences of different groups of people according to the job aspects in question, and investigate the likely effects of personal characteristics. At the same time, it demonstrates that a job satisfaction indicator, based on the survey method used here, contains the most important aspects relevant to job satisfaction in German horticulture. In addition, the preferences of future generations with respect to the job characteristics investigated are considered. This is intended to show which areas in particular need to be considered by horticultural companies to be attractive employers in the future.

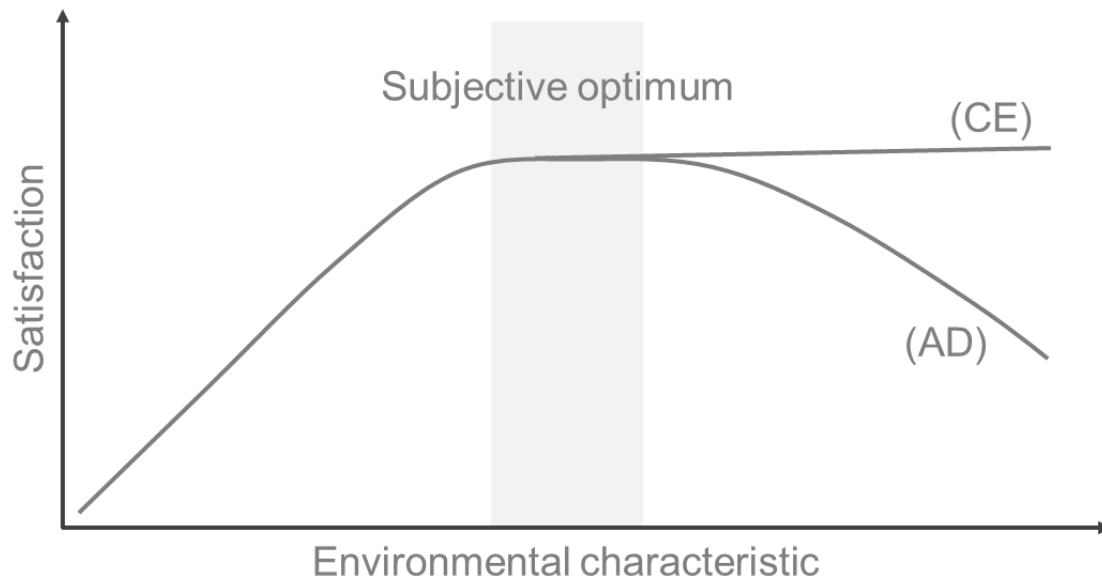
This empirical quantitative study examines the relationships between 28 job characteristics and job and life satisfaction in German horticulture. Furthermore, the differences in preference structures between generations with respect to the job characteristics investigated are clarified. For this purpose, more than 600 complete records of more than 1,300 study participants were examined. There were three groups: employees, vocational and master craftsman scholars, and horticultural science students, each with over 200 full records evaluated separately. This article focuses on the employees. The theoretical background and the methodology of the study are based on the current version of Warr's (2007) vitamin model, which provides 12 job features (vitamins) and their hypothetical utility functions. The utility functions describe the nature of the relationship between job features and different forms of satisfaction. The operationalization of the vitamin model and the curves of the utility functions in German horticulture have previously been tested by Meyerding (2015).

In principle, satisfaction measures aim to make human emotion observable. To investigate why some people are happier than others, this article considers perspectives that are either "eco-centric" or "person-centered." In the first case, the influence of the environment on the satisfaction of an individual is analyzed. In the second case the influence of a person's own characteristics on individually experienced satisfaction is analyzed.

## **6.3 Material and Methods**

### **6.3.1 Job Satisfaction Measurement Based on the Vitamin Model**

The main difference between Warr's vitamin model and other models (Herzberg, et al., 1959; Weiss, Dawis, England, & Lofquist, 1967; Brayfield & Rothe, 1951) is not the choice of features, but the idea that the expression of the characteristics does not have a linear relationship with satisfaction. Consequently, there are features that have diminishing marginal utility or negatively affect satisfaction despite showing very high values (Figure 1).



**Figure 1.** The vitamin analogy: bell-shaped curve of the utility function (AD) and diminishing marginal utility (CE). Cf. Warr (2013).

Satisfaction and the course of the utility function vary from person to person. A stronger link between low values for environmental aspects and subjective satisfaction has been shown in several studies. Cummins (2000) argues that subjective satisfaction is maintained at a stable individual level as long as the values of environmental characteristics are in the moderate range. Within this range, it is to be expected that people adjust their expectations and feelings, and so maintain their individual equilibrium (Headey & Wearing, 1992, pp. 39 ff.). For each of these characteristics, a deficit is perceived as an active threat and does not represent a desirable goal.

Table 1 lists the 12 features of the vitamin model. The operationalizations of these latent variables are identified by lowercase letters. The type of utility function is given by the abbreviations (CE) for diminishing marginal utility and (AD) for a bell-shaped curve (Warr, 2013). The vitamins are operationalized in this study through their 28 aspects. Meyerding (2015) has successfully tested the operationalization through confirmatory factor analysis, and the validity of the entire model in the context of German horticulture using a structural equation model.

**Table 1.** The 12 Vitamins of Warr's Model and Their 28 Aspects for Evaluation by Employees

Vitamin model	Job features in the present study	Utility function
1 Control (AD)	1a Task discretion	AD
	1b Influence over the wider organization	AD
2 Skill (AD)	2a Skill use	AD
	2b New learning	CE
3 Goals (AD)	3a Number of job demands	AD
	3b Difficulty of job demands	AD
	3c Task coherence	CE
	3d Conflict between job demands	CE (inverse)
	3e Conflict between work and home	CE (inverse)
	3f Emotional dissonance (inverse)	AD
4 Variety (AD)	4a Range of different tasks	AD
5 Clarity (AD)	5a Future predictability (excludes job tenure)	AD
	5b Clear role requirements	AD
	5c Availability of feedback	AD
6 People (AD)	6a Amount of social contact	AD
	6b Quality of social contact	AD
7 Money (CE)	7a Pay level	CE
8 Physical security (CE)	8a Pleasant environment	CE
	8b Safe work practices	CE
	8c Adequate equipment	CE
9 Significance (CE)	9a Value to society	CE
	9b Significance to self	CE
10 Supervision (CE)	10a Supervision is considerate	CE
	10b Supervisor is supportive	CE
11 Career (CE)	11a Job security	CE
	11b Good future prospects	CE
12 Fairness (CE)	12a Fair treatment of employees	CE
	12b The organization's morality in society	CE

*Note.* There are two possible utility functions for the vitamins and relevant job characteristics: decreasing marginal utility (CE) and a bell-shaped curve (AD). The vitamins and many job characteristics are from Warr (2007, pp. 239–240); cf. Meyerding (2015).

*Job characteristic 1: the possibility of personal influence.* Two aspects of this job characteristic must be considered: intrinsic and extrinsic (Karasek, 1979). The intrinsic aspect (1a) involves the adaptation of other job characteristics, such as the opportunity for self-determination in the level of skill use, objectives, and variation from time to time. The extrinsic aspect (1b) relates to one's influence on the organization as a whole. High perceived responsibility can lead to fears of bad decisions, cognitive overload, and fear of unpredictable events.

*Job characteristic 2: the possibility of using one's skills.* There is a range of evidence that employees who are limited in the use of their skills are less satisfied than others. The personal appreciation of own skills (2a) is illustrated by the study of Lewin, Dembo, Festinger, and Sears (1944). The ability to learn (2b; Patterson, Warr, & West, 2004), i.e., to acquire new skills, is a key feature in the model of positive progression in work presented by Spreitzer, Sutcliffe, Dutton, Sonenshein, and Grant (2005).



*Job characteristic 3: external goals.* At low levels of this job characteristic, few demands are placed on the individual and there is little external pressure to carry out an activity. Very high levels of externally set goals require attaining many and/or difficult goals; this can lead to feelings of being badgered, inability to maintain the quantity or quality of work output required, and possibly fear of failure (Warr, 1987, as cited by Warr, 2007). This third job characteristic has six aspects. The first aspect (3a) concerns the number of tasks. The second aspect (3b), which is associated with the first, is the possibility of requirements that are too demanding. This results in dissatisfaction according to the bell-shaped utility function. Thus, an individual optimum exists: a certain amount of goal setting, which requires a degree of effort, is desirable. However, increasing demands lead to overload (MacDonald, Karasek, Punnett, & Scharf, 2001). The third aspect (3c) is task identity. A specific aspect of goals in a work environment is the degree to which the individual tasks are positively related. Hackman and Oldham (1975) defined work identity as the degree to which it requires doing a task “completely,” that is performing something from the beginning to the end with a visible result. The fourth aspect (3d) is role conflict. High demands are observed to result from a conflict of roles. Another form of role conflict occurs between working life and private life, and is described as work–home conflict and work–family conflict (3e; Greenhaus & Beutell, 1985). The sixth aspect (3f) is emotional dissonance. A special form of high job demands arises in situations in which the employee is expected to show an emotion without actually feeling it (Glomb, Kammeyer-Mueller, & Rotundo, 2004).

*Job characteristic 4: variety.* This feature of the vitamin model includes variations (4a) in the conditions of the workplace and in the activities which are carried out by the employees. People prefer change in their experiences to find a balance between comfort and relief from repetitive routines and behaviors (Kornhauser, 1965).

*Job characteristic 5: clarity of the environmental situation.* A lack of clarity in the environmental situation is undesirable in itself. Caplan (1975) developed a “job-futures-ambiguity” scale for the first of the three aspects of this characteristic; this includes the security of career development (5a) and the expected future value of one’s own abilities. The second aspect is the clarity of the role (5b), which includes the amount of information provided on what behavior and performance levels are required (Glazer & Beehr, 2005). The third aspect is feedback (5c) on one’s own performance, which is essential to gain or maintain the personal ability to influence the environmental situation, as well as for the development and use of one’s own abilities.

*Job characteristic 6: contact with other people.* Two aspects of this feature should be considered: first, the quantity (6a) of contact and second the quality (6b) of the contact.

*Job characteristic 7: money.* The amount of salary is of personal importance, not only to secure one’s existence or a particular lifestyle, but for its social importance, “equal” treatment, and as a sign of personal success (Srivastava, Locke, & Bartol, 2001). The relationship between income and satisfaction is higher in low-income groups than at a moderate level (Kornhauser, 1962). Studies in this field are often based on a version of equity theory (Adams, 1963). This implies that people compare their ratio of input and income to the input–output ratio of other people. Inputs are usually defined in terms of skills, effort, qualifications, working conditions, and working hours, etc.

*Job characteristic 8: physical security.* At work, central issues of physical security (8) are the absence of danger (8b) and the presence of good working conditions, ergonomi-

cally appropriate equipment (8c), and comfortable and safe levels of temperature and noise exposure (8a), for example. Inadequate equipment can be both intrinsically undesirable and a cause of dissatisfaction, resulting in errors and interruptions in the working process (Salvendy, 2012, p. 708).

*Job characteristic 9: valued social position.* Professions and jobs differ in the value that is attributed to them by society but also within an organization. It transpires that job satisfaction is related to this subjective value (Bradburn & Caplovitz, 1965). The “task significance” scale of the job diagnostic survey (Hackman & Oldham, 1975) records the importance that employees attach to their work tasks (9b; Hackman & Oldham, 1975). This job characteristic is open to subjective interpretations to a greater extent than others.

*Job characteristic 10: supportive leadership.* Between 1950 and 1970 (Ronan, 1970), studies of aspects of leadership were often carried out using interviews and questionnaires containing items addressing the perceptions of staff concerning the extent to which the behavior of executives was considerate (10a). The questions concerned the support (10b) and the respect shown to the employees, compliance with the welfare of employees, and the tendency to praise and value their work. Behavior that can be defined as considerate includes a willingness to listen and to accept suggestions from employees.

*Job characteristic 11: career prospects.* A career (11) is often understood as upward advancement in the job hierarchy. Careers can, however, also develop positively for the individual in other ways, such as through career changes, or assuming an alternative role or teaching activities. Two aspects of career prospects should be considered. First, jobs differ in their job and income security (11a). The second aspect of career prospects is the possibility of taking on another role (11b).

*Job characteristic 12: equality.* The last job characteristic with diminishing marginal utility in the vitamin model includes two aspects of equality (12): fairness in the relationship between an employee and employer (12a), and fairness of the company toward society as a whole (12b).

The relations to be examined may be influenced by third factors. Third factors, which only have an impact at a single point in time, can include current mood, the social environment, or even the weather, and have an impact on both variables under observation. Long-term variables include demographic characteristics, such as age, education, gender, skills, and the character of employees. The characteristics also have a tendency for constant evaluation, so a person perceives both the environmental situation and subjective satisfaction more positively or more negatively at different times. In addition, the different selection of jobs as a third variable could be responsible for an observed correlation. For example, less satisfied people might tend to choose jobs with certain characteristics or not to change jobs (“drift hypothesis”), so that a recorded association between these characteristics or characteristic values and dissatisfaction will be due, at least in part, to differences in the sample, rather than to the job characteristics themselves. Other third variables that may have an impact on an observed correlation are additional job features not included in the study.

To evaluate the characteristics, a modified Kunin (1955) scale is used to make it easier for the respondents to grasp the nature of the range of values. The Kunin scale uses

emotion icons (faces) to assess the values of characteristics. This is especially necessary as they are often assumed to be linear. In addition to the evaluation of the characteristics, the individual preferences concerning job characteristics are examined.

### **6.3.2 Personal Characteristics and Their Influence on Subjective Satisfaction**

Environmental features are only partly responsible for satisfaction. Understanding the influence of personal characteristics is important to ensure proper interpretation of the results of the measurement.

*Different individual comparison processes and reference values.* When employees are asked to evaluate a particular job characteristic, they turn to comparisons and look for reference values with which they compare their individual situations. Depending on which reference values are used, the subjective evaluation and therefore the level of satisfaction change, regardless of the objective value of the characteristic.

*Demographic characteristics and their influence on subjective satisfaction.* Overall, women tend to exhibit higher job satisfaction than men (Grandey, Cordeiro, & Crouter, 2005). Whether a causal relationship between gender and satisfaction can be determined here is questionable. However, with regard to job characteristics, differences between the genders can be observed (Grandey, et al., 2005). It has frequently been observed that older people are more satisfied than younger (Mroczek & Spiro, 2005). The reasons for the higher satisfaction of older people could be changes in their evaluation processes, but also various aspects in the values of job characteristics.

*Different forms of employment and their influence on subjective satisfaction.* A third group distribution could relate to different forms of employment with different characteristics, for example, part-time and full-time jobs, or fixed and temporary employment (Trzcinski & Holst, 2003). It is also useful to distinguish between core workers and loan or seasonal workers as seasonal workers occupy a special position in German horticulture and contribute significantly to the performance process.

*Influence of individual personality on subjective satisfaction.* Other personal factors that have an impact on subjective satisfaction are personality and innate cognitive differences. Although these personality traits are not considered in this study, but it is crucial to note that these partly innate character traits have an influence on perceived subjective satisfaction.

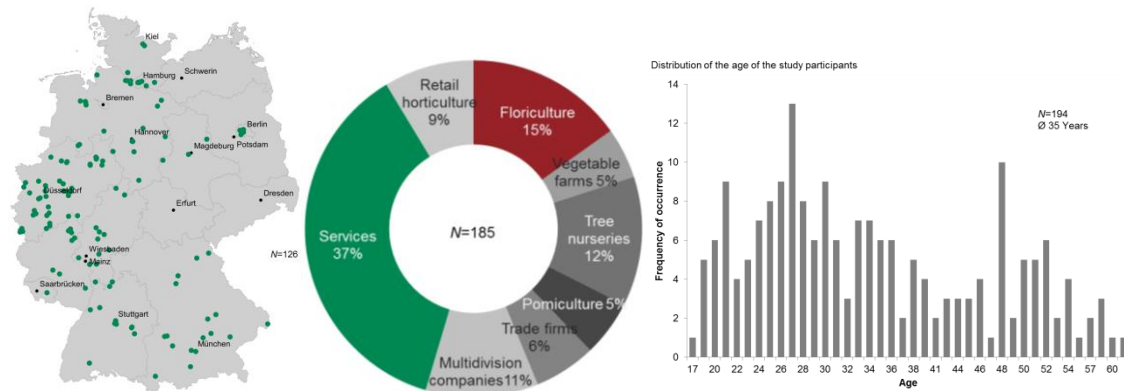
*Influence of individual abilities and level of education.* Also, one's own abilities and level of education could affect subjective satisfaction (Ganzach, 1998). However, a higher level of education increases the likelihood of having a job that has beneficial levels of different job characteristics (Ganzach, 2003).

## **6.4 Results and Discussion**

### **6.4.1 Sample Description**

More than 750 employees of horticultural companies took part in the study from August 2013 to February 2015; more than 200 full records are included in the analysis. Only questionnaires with more than 10 complete responses to items were included in the data

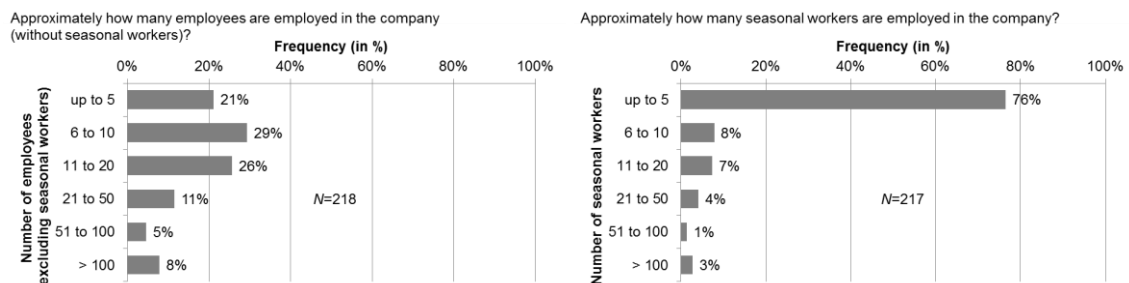
set. In Figure 2 (left), the origins of the participants are shown on a map of Germany, using the respondents' zip codes. A total of 126 zip codes were used. The distribution on the map shows that the study participants come from all over Germany, with the eastern part less well represented than the western part.



**Figure 2.** Sample description.

Participants in the study represent the diversity of the sectors in German horticulture (see Figure 2, center). Thus, vegetable farms and fruticulture are underrepresented in the study. They account for 59 % (vegetable farms) and 22 % (fruticulture) of the population of workers in German horticultural production (Statistisches Bundesamt, 2006). The age distribution, shown in a histogram in Figure 2 (right), shows that the study participants are (as expected) not normally distributed: there are two accumulations around 27 years and 51 years. The first accumulation, as well as the low average age of 35 years ( $N=194$ ), can be explained by the use of social media as a distribution channel, social media being predominantly the province of younger workers (Busemann, 2013).

Overall, the level of education in the sample is slightly higher than would be expected in the population. The relatively high level of education within the sample can be explained by the fact that young participants have a higher level of formal education than older participants (Piopiunik & Wößmann, 2011), and the average age of respondents is relatively low at 35 years. Furthermore, it can be suggested that people with a higher level of education are more likely to be willing to participate in an online survey generated by a university institution (Häder, 2015, pp. 180 ff.).



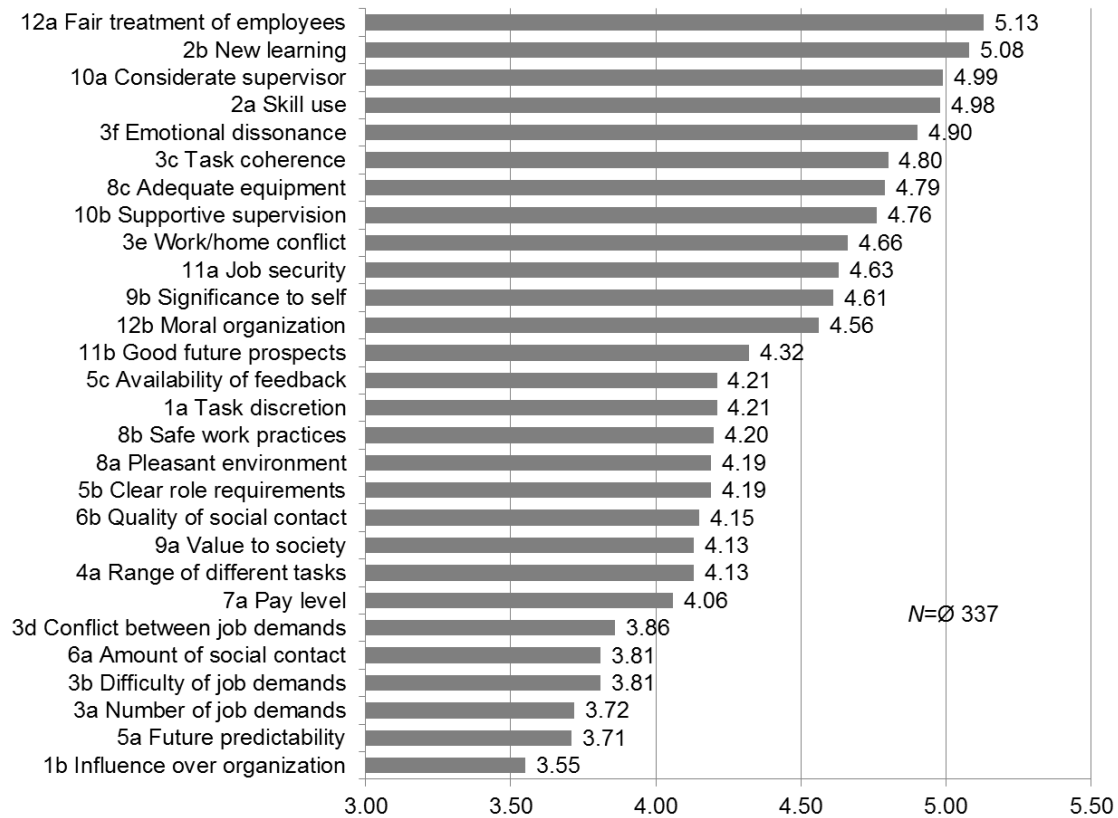
**Figure 3.** Distribution of the number of employees and seasonal workers in the horticultural companies.

In the sample, the proportion of companies with more than 10 employees is slightly larger (see Figure 3) than in the population as approximately 80 % of the horticultural production companies have fewer than 10 employees, but the horticulture census of 2005 does not distinguish between seasonal workers and permanent employees (Statistisches Bundesamt, 2006, pp. 72–73).

Of the study participants in the observed group of employees, 42 % are women ( $N=193$ ). The vast majority (82 %,  $N=196$ ) are not self-employed, have a permanent contract (74 %,  $N=144$ ), and work full time (84 %,  $N=158$ ). Only 6 % ( $N=152$ ) would call themselves loan or seasonal workers. Many of the study participants have a form of management responsibilities (61 %,  $N=184$ ).

#### 6.4.2 Preferences of Employees Regarding Job Characteristics

The study participants were asked to evaluate the 28 aspects of the 12 job characteristics on a six-point Likert scale (from 1=unimportant to 6=essential). For this purpose, they should imagine their dream job and evaluate the aspects that would be particularly important in their fictitious dream job. This wording was chosen to gain distance from their current position. The aim of the question was to determine the general preferences of employees, regardless of their current work. Figure 4 shows the mean values of these evaluations ( $N=337$ ), with a small standard deviation of 1.0 to 1.2.



**Figure 4.** Preferences regarding aspects of job characteristics.

In first place is the employer's fair treatment of its employees (12a), followed by opportunities to expand one's abilities and learn (2b), the considerate behavior of the supervisor toward staff (10a), and the use of one's own skills and experience (2a). Also, emotional dissonance (3f), operationalized with the statement "in my work I can be completely myself" and task identity (3c) "to perform tasks from the beginning to the end with a visible result," are very important for the participants. The work in horticulture is often of a physical nature, so appropriate equipment (8c, tools and machines) is strongly preferred by the employees. Also, the sustainability of the employer (12b), operationalized by the statement "the company's dealings with society as a whole (suppliers, cus-

tomers, and the environment),” is of great importance to the employees. The amount of salary (7a) is in the middle and is of moderately minor importance. This is remarkable as one would have expected that in a low-wage industry, such as horticulture, available income should have a higher priority (Diener & Biswas-Diener, 2009). In relation to other aspects, the predictability of the future with respect to the job (5a, without career prospects) and one’s impact on the organization as a whole (1b, also through trade unions or works councils) are of minor significance for the employees in German horticulture.

### 6.4.3 Influence of Job Characteristics on Job and Life Satisfaction

The main objective of the study is to investigate which job characteristics or aspects show the strongest influence on employee satisfaction in German horticulture. For this purpose, the relationship between the subjective evaluation of the characteristics and subjective job satisfaction was observed. Table 2 lists the correlation coefficients. As normal distribution cannot be assumed, Spearman's rho ( $r_s$ ) correlation coefficient was used (Field, 2009, pp. 179–180). Also the directions of the relationships are unknown; therefore the correlation coefficients are two-tailed (Field, 2009, p. 176). From Table 2, it can be seen that the job aspects also correlate with each other. Thus, an employee with a high evaluation of job autonomy (1a), for example, may be able to exert a positive influence on its variety (4a,  $r_s=.22$ ;  $p<0.01$ ;  $n=229$ ), as well as influencing working time to a greater extent, which then leads to a lower conflict between work and family life (3a,  $r_s=.28$ ;  $p<0.01$ ;  $n=229$ ; reverse coded, so higher values reflect less conflict).

In the case of aspects for which a bell-shaped curve of the utility function is assumed (AD) (1a, 1b, 2a, 3a, 3b, 4a, 5a, 5b, 5c, 6a, and 6b), the transformed variables have been used, in this case very high characteristic values were coded as very low, as both should have a negative impact on job satisfaction. Accordingly, for AD aspects, the coding for the transformed variables is as follows: 1,2,3,4,3,2,1. The two aspects concerning conflict (3d and 3e) are inversely coded due to their relationship, so that high conflict levels are indicated by low codings.

**Table 2. Relationships Between Aspects of Job Characteristics and Job and Life Satisfaction (N=Ø229)**

	J	L	2b	3c	3f	7a	8a	8b	8c	9a	9b	10a	10b	11a	11b	12a	12b	3d	3e	1a	1b	2a	3a	3b	4a	5a	5b	5c	6a	
J Job satisfaction	1																													
L Life satisfaction	.53**	1																												
2b New learning	.45**	.20**	1																											
3c Task coherence	.44**	.23**	.56**	1																										
3f Emotional dissonance	.50**	.29**	.47**	.59**	1																									
7a Pay level	.44**	.28**	.28**	.28**	.34**	1																								
8a Pleasant environment	.48**	.22**	.38**	.32**	.32**	.34**	1																							
8b Safe work practices	.46**	.25**	.39**	.37**	.32**	.38**	.63**	1																						
8c Adequate equipment	.51**	.20**	.35**	.37**	.41**	.36**	.57**	.65**	1																					
9a Value to society	.44**	.20**	.37**	.39**	.42**	.35**	.37**	.41**	.42**	1																				
9b Significance to self	.49**	.27**	.47**	.57**	.48**	.27**	.38**	.47**	.45**	.66**	1																			
10a Considerate supervisor	.50**	.19**	.46**	.42**	.48**	.37**	.34**	.38**	.37**	.39**	.50**	1																		
10b Supportive supervision	.50**	.22**	.45**	.41**	.43**	.30**	.32**	.32**	.40**	.42**	.53**	.82**	1																	
11a Job security	.46**	.20**	.27**	.31**	.30**	.33**	.41**	.36**	.40**	.41**	.46**	.41**	.39**	1																
11b Good future prospects	.62**	.38**	.46**	.37**	.41**	.31**	.40**	.41**	.32**	.48**	.54**	.41**	.40**	.55**	1															
12a Fair treatment of employees	.51**	.24**	.42**	.42**	.55**	.37**	.35**	.39**	.42**	.36**	.45**	.74**	.71**	.42**	.45**	1														
12b Moral organization	.49**	.24**	.30**	.36**	.46**	.30**	.30**	.43**	.53**	.41**	.50**	.58**	.58**	.42**	.39**	.72**	1													
3d Conflict between job demands	.44**	.28**	.26**	.37**	.39**	.29**	.26**	.36**	.37**	.33**	.36**	.34**	.37**	.22**	.31**	.43**	.42**	1												
3e Work/home conflict	.51**	.36**	.23**	.32**	.3**	.41**	.31**	.42**	.35**	.39**	.37**	.39**	.32**	.27**	.35**	.40**	.39**	.55**	1											
1a Task discretion	.39**	.23**	.30**	.24**	.27**	.26**	.27**	.31**	.28**	.35**	.33**	.38**	.41**	.23**	.29**	.33**	.32**	.32**	.28**	1										
1b Influence over organization	.39**	.21**	.28**	.18**	.23**	.25**	.24**	.24**	.26**	.33**	.29**	.27**	.31**	.19**	.29**	.28**	.34**	.24**	.30**	.52**	1									
2a Skill use	.35**	.09	.31**	.23**	.23**	.17*	.16*	.24**	.24**	.26**	.24**	.34**	.37**	.23**	.23**	.28**	.27**	.30**	.19**	.42**	.36**	1								
3a Number of job demands	.26**	.13*	-.01	.09	.19**	.24**	.09	.10	.20**	.20**	.10	.11	.14*	.07	.12	.15*	.20**	.27**	.23**	.29**	.34**	.23**	1							
3b Difficulty of job demands	.12	-.04	.21**	.14*	.14*	.18**	.01	.13	.12	.20**	.16*	.12	.17*	.09	.10	.06	.11	.16*	.04	.22**	.10	.39**	.24**	1						
4a Range of different tasks	.28**	.02	.13	.12	.10	.16*	.10	.15*	.23**	.22**	.19**	.23**	.23**	.19**	.19**	.15*	.25**	.16*	.14*	.16*	.22**	.27**	.36**	.43**	1					
5a Future predictability	.27**	.13*	.08	.03	.10	.17**	.12	.10	.23**	.21**	.13*	.23**	.24**	.34**	.21**	.17*	.20**	.16*	.15*	.23**	.27**	.21**	.26**	.26**	.34**	1				
5b Clear role requirements	.32**	.07	.17*	.17**	.33**	.23**	.19**	.20**	.34**	.24**	.23**	.22**	.26**	.19**	.14*	.25**	.27**	.22**	.16*	.37**	.29**	.32**	.26**	.20**	.20**	.29**	1			
5c Availability of feedback	.34**	.16*	.39**	.34**	.23**	.24**	.24**	.21**	.19**	.22**	.25**	.33**	.36**	.15*	.20**	.30**	.27**	.25**	.28**	.37**	.38**	.31**	.09	.22**	.14*	.16*	.31**	1		
6a Amount of social contact	.24**	.13*	.11	.12	.12	.15*	.18**	.16*	.15*	.23**	.22**	.18**	.15*	.10	.10	.10	.10	.17**	.22**	.15*	.17**	.19**	.23**	.18**	.17*	.23**	.11	.25**	1	
6b Quality of social contact	.25**	.05	.15*	.19**	.21**	.16*	.22**	.18**	.26**	.24**	.22**	.24**	.21**	.21**	.17*	.18**	.17*	.17*	.18**	.30**	.27**	.32**	.24**	.19**	.19**	.26**	.19**	.37**	.54**	1

\*\* The correlation significant at the 0.01 level (two-tailed)

\* The correlation significant at the 0.05 level (two-tailed)

The strongest connection with job satisfaction is observed for future prospects (11b), i.e., feeling that one is moving in a positive direction. This aspect is affected by the subjective perceptions of the employee more strongly than others. The employer can influence this aspect positively through positive communication, the demonstration of prospects, and active staff development.

Following closely in second place comes the conflict between work and family life (3e), followed by the employer's fair treatment of employees (12a) and appropriate equipment (8c) with the same correlation coefficient. Having adequate equipment available in horticulture, with its primary physical work, is more important than in other industries, in which the influence of this aspect on job satisfaction is lower (Salvendy, 2012).

The aspects supportive leadership (10b), considerate leadership (10a), and emotional dissonance (3f) can be found in the third place. The leadership style and the possibility of being oneself at work without having to make too great an adjustment show a strong influence on employee satisfaction in German horticulture.

Ranked high in fourth place are (12b) the employer's dealings with society as a whole (customers, suppliers, and the environment) and the personal value of the work (9b), that is, the extent to which the employees identify with their work. The sustainability of the horticultural company thus has a strong relationship with employee satisfaction. Employees in horticulture want to work for the "good," because this increases one's social position (9a; value of the job for society;  $r_s=.41$ ;  $p<0.01$ ;  $n=229$ ) and the personal value of the work (9b;  $r_s=.50$ ;  $p<0.01$ ;  $n=229$ ).

Only after these aspects are classic job features, such as adequate working environment (8a), job security (11a), and safe working processes (8b). Of these, safe working processes (8b) have a stronger impact on job satisfaction in German horticulture, as in other industries (Barling, Kelloway, & Iverson, 2003). This is partly due to the predominantly physical work, but also the handling of hazardous materials, such as chemical pesticides. In midfield are aspect (2b) skill learning and the aspects (3d) task conflict, (9a) the value of the job for society, (7a) the salary and (3c) the job integrity, i.e. to carry out a task from the beginning to the end with a visible result. That salary can be found in the middle of the influence on job satisfaction in horticulture seems surprising because in a low-wage sector such as horticulture, it could be assumed that the influence of the amount of salary, especially for low-income people, has a relatively high impact on job satisfaction (Lazarus, 2006, pp. 165 ff.).

In the bottom midfield, there are aspects such as (1b) the impact on the organization as a whole and (1a) working autonomy, (2a) being able to use one's own abilities, (5c) the availability of feedback, and (5b) clear definition of what is expected in the respective role. The difficulty of tasks (3b) shows no significant relationship with job satisfaction in the sample. Few employees in German horticulture seem to be underutilized or overburdened with respect to this aspect.

Table 2 also shows the relationships between the individual job aspects and life satisfaction as a whole. This shows a different picture from the case with job satisfaction. Here also, (11b) good prospects has the strongest correlation, but this is not as high as for job satisfaction. In second place, just as for job satisfaction is (3e) conflict between work and family life. The following points, however, differ. The third strongest connection is



(3f) emotional dissonance, followed by (3d) task conflict, and (7a) salary. The results show a familiar pattern, according to which the correlation coefficients between the job aspects and context-bound satisfaction (job satisfaction) are higher than for the context-free satisfaction (life satisfaction; Faragher, Cass, & Cooper, 2005).

#### **6.4.4 Influence of Personal and Structural Characteristics on Job and Life Satisfaction, as well as on Job Preferences**

The values of the aspects of job characteristics examined explain approximately 65 % of job satisfaction in German horticulture (linear regression,  $R^2=.65$ ). The rest could possibly be explained by personal characteristics. Furthermore, it is necessary to check whether different groups of employees have different preferences regarding job characteristics and whether the differences are pronounced. The following personal characteristics were analyzed: age, existing management responsibilities, education level, core workforce or loan or seasonal workers, self-employment, gender, number of employees (excluding seasonal workers), and the number of seasonal workers in the participants' companies.

Older employees in German horticulture are more frequently dissatisfied with their working lives ( $r_s=-.15$ ;  $p<0.05$ ;  $n=194$ ) and their lives in general ( $r_s=-.21$ ;  $p<0.01$ ;  $n=193$ ) than younger employees. Here, horticulture is different to other industries; on average, satisfaction increases with age (until 65; Mroczek & Spiro, 2005). The different values in horticulture could be due to physical stress, which leads to difficulties with age. Thus, a negative correlation between age and job aspect (8a) pleasant working environment (buildings, rooms, noise, temperature, etc.) can be observed. The same applies to considerate leadership (10a), working safety (8b), and own future prospects (11b, Table 3).

**Table 3.** Relationships Between Personal and Structural Characteristics and Job Aspects

Personal characteristics	Job aspect	Effect size ( $r_s$ )	Sample size ( $n$ )
Age	8a Pleasant environment	-.19**	194
	10a Considerate supervisor	-.14*	194
	8b Safe work practices	-.19**	194
	11b Good future prospects	-.24**	194
	12a Fair treatment of employees	-.18*	194
	12b Moral organization	-.15*	194
	3b Difficulty of job demands	.24**	194
Managerial responsibility (no=1, yes=2)	2b New learning	.20**	184
	3c Task coherence	.20**	184
	9b Significance to self	.22**	184
	10a Considerate supervisor	.16*	184
	10b Supportive supervision	.15*	184
	1a Task discretion	.16*	184
	1b Influence over organization	.19**	184
Temp. employment (y=2)	5c Availability of feedback	.19**	184
	11a Job security	-.21*	144
Self-employed (no=1, yes=2)	2b New learning	.29**	196
	3c Task coherence	.24**	196
	3f Emotional dissonance	.23**	196
	8c Adequate equipment	.18*	196
	9a Value to society	.19**	196
	9b Significance to self	.17*	196
	11b Good future prospects	.17*	196
	1b Influence over organization	.14*	196
	2a Skill use	.15*	196
	Gender (w=1, m=2)	2b New learning	.15*
9a Value to society		.14*	193
11a Job security		.18*	193
1b Influence over the wider orga.		.18*	193
Number of employees	2b New learning	-.16*	218
	3c Task coherence	-.24**	218
	3f Emotional dissonance	-.18**	218
	9a Value to society	-.15*	218
	9b Significance to self	-.18**	218
	12b Orga. morality in society	-.21**	218
Number of seasonal workers	5a Future predictability	.16*	218
	2a Skill use	-.14*	217

\*\* The correlation significant at the 0.01 level (two-tailed)

\* The correlation significant at the 0.05 level (two-tailed)

Men more frequently carry leadership responsibility than women in the sample ( $r_s=-.18$ ;  $p<0.05$ ;  $n=175$ ).

Female employees are more likely to have a temporary contract than their male counterparts ( $r_s=.20$ ;  $p<0.05$ ;  $n=137$ ). Temporary employees report low values more frequently for job security (11a). Women are also more often employed part-time ( $r_s=.21$ ;  $p<0.05$ ;  $n=148$ ).

Self-employed horticulture entrepreneurs are more often males ( $r_s=.20$ ;  $p<0.01$ ;  $n=186$ ), have more opportunities to expand their own abilities and learn (2b), are able to conclude a task from beginning to end with a visible result (3c), and can be more complete-

ly themselves at work (3f). Self-employed persons are happier with their working lives than employees ( $r_s=.15$ ;  $p<0.05$ ;  $n=196$ ). However, no significant relationship between self-employment and life satisfaction can be observed.

Workers in horticultural companies with more employees (excluding seasonal workers) report fewer opportunities to expand their own abilities (2b), and with the higher degree of specialization in larger organizations, perceive fewer opportunities to complete a task from beginning to end with a visible result (3c). In larger organizations, employees may be less completely themselves (emotional dissonance, 3f).

It is also possible to observe connections between personal and structural characteristics and preferences with regard to job characteristics (see Table 4). Executives favor aspects such as job autonomy (1a), the impact on the organization as a whole (1b), and the difficulty of the task (3b). Employees with a higher level of education put astonishingly less emphasis on the compatibility between work and family life (3e), adequate equipment (8c), and own job security (11a), probably because their chances in the labor market can be assessed more positively (Häublein, 2014; Piopiunik & Wößmann, 2011).

**Table 4.** Relationships Between Personal and Structural Characteristics and Preferences for Job Aspects

Personal characteristics	Job aspect	Effect size ( $r_s$ )	Sample size ( $n$ )
Age	8c Adequate equipment	-.19**	194
Managerial responsibility (no=1, yes=2)	1a Task discretion	.16*	184
	1b Influence over organization	.26**	184
	3a Number of job demands	.17*	184
	3b Difficulty of job demands	.15*	184
Education level	3e Work/home conflict	-.20**	184
	8c Adequate equipment	-.15*	185
	11a Job security	-.17*	185
Fulltime employees (yes=2)	8c Adequate equipment	.17*	158
Self-employed (no=1, yes=2)	1a Task discretion	.15*	196
	1b Influence over organization	.16*	196
	5b Clear role requirements	-.19**	196
	2b New learning	-.16*	193
Gender (w=1, m=2)	3e Work/home conflict	-.27**	193
	3f Emotional dissonance	-.17*	193
	3c Task coherence	-.14*	218
Number of employees	3c Task coherence	-.14*	218
Number of seasonal workers	8a Pleasant environment	-.14*	217
	8b Safe work practices	-.17*	217
	12a Fair treatment of employees	-.20**	217

\*\* The correlation significant at the 0.01 level (two-tailed)

\* The correlation significant at the 0.05 level (two-tailed)

For women, compared to their male counterparts, the development of their own skills (2b), the compatibility of work and family life (3e), and being able to be completely themselves at work (3f) are more important than other elements.

Table 5 shows the results of the linear regressions for the complete model; they are listed once without the inclusion of personal characteristics and structural variables, and once with these additional variables. The model consisting only of job aspects has an  $R^2$  of .65, and thus shows only a slightly lower degree of explanation than the model that

includes additional personal features and structural variables for each job and the company ( $R^2=.69$ ).

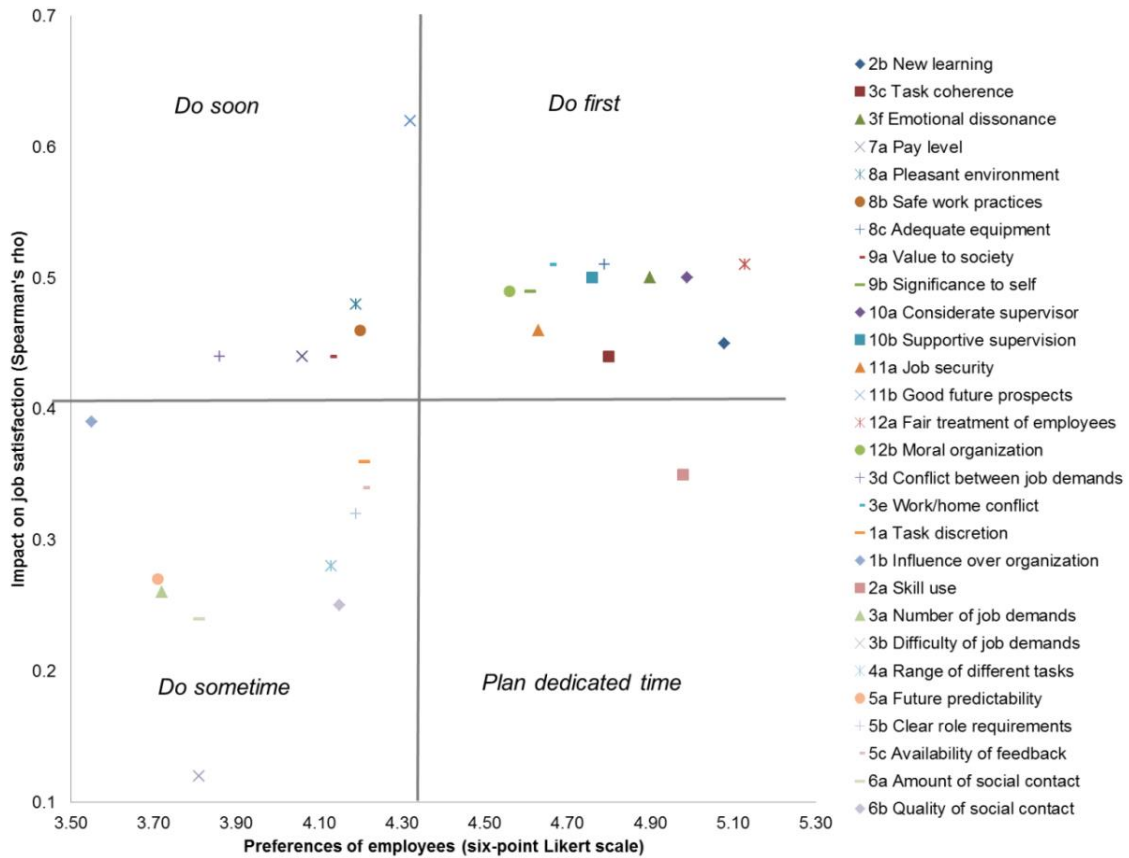
**Table 5.** Results of Linear Regressions

	Model job aspects ( $R^2=.65$ )				Model job aspects + personal characteristics and structural variables ( $R^2=.69$ )			
	B	S	Beta	Sig.	B	S	Beta	Sig.
(constant)	-1.515	.526		.004	-1.231	1.536		.425
2b New learning	.062	.070	.058	.381	.106	.105	.100	.317
3c Task coherence	.013	.072	.012	.857	.088	.125	.080	.484
3f Emotional dissonance	.103	.066	.105	.120	.006	.134	.006	.962
7a Pay level	.081	.055	.081	.143	.061	.093	.058	.515
8a Pleasant environment	.126	.067	.116	.062	.163	.116	.147	.162
8b Safe work practices	-.070	.076	-.064	.353	-.204	.152	-.173	.183
8c Adequate equipment	.057	.068	.059	.400	.083	.109	.083	.447
9a Value to society	-.017	.066	-.016	.801	-.048	.112	-.042	.671
9b Significance to self	-.103	.083	-.092	.216	-.040	.156	-.032	.798
10a Considerate supervisor	.014	.084	.016	.865	.025	.136	.027	.852
10b Supportive supervision	.125	.075	.151	.096	.139	.123	.152	.265
11a Job security	.032	.056	.033	.568	.131	.118	.122	.271
11b Good future prospects	.316	.059	.331	.000	.363	.121	.355	.004
12a Fair treatment of employees	-.054	.076	-.064	.478	-.102	.116	-.119	.383
12b Moral organization	.072	.072	.075	.320	.021	.128	.020	.868
3d Conflict between job demands	.028	.068	.024	.683	.124	.120	.105	.306
3e Work/home conflict	.196	.060	.198	.001	.180	.100	.177	.074
1a Task discretion	-.096	.115	-.051	.403	.054	.213	.026	.801
1b Influence over organization	.026	.091	.017	.776	.166	.184	.108	.370
2a Skill use	.125	.104	.069	.232	-.030	.189	-.015	.875
3a Number of job demands	.032	.111	.017	.774	-.079	.186	-.042	.674
3b Difficulty of job demands	-.097	.122	-.049	.429	-.091	.213	-.044	.671
4a Range of different tasks	.252	.131	.113	.056	.166	.214	.071	.442
5a Future predictability	-.050	.095	-.029	.600	-.185	.183	-.096	.317
5b Clear role requirements	.164	.112	.083	.143	-.000	.208	.000	1.000
5c Availability of feedback	.009	.092	.005	.926	.143	.165	.090	.390
6a Amount of social contact	.090	.122	.041	.464	.140	.241	.063	.564
6b Quality of social contact	.061	.120	.030	.613	.027	.236	.012	.908
Number of employees					-.009	.083	-.009	.910
Number of seasonal workers					.066	.102	.052	.519
Gender (w=1, m=2)					-.096	.244	-.031	.695
Fulltime employees (no=1, yes=2)					-.224	.398	-.046	.576
Temporary employment (yes=1, no=2)					.582	.373	.165	.122
Core employee (yes=1, no=2)					-.859	.559	-.141	.128
Education level					-.061	.093	-.060	.509
Managerial responsibility (yes=1, no=2)					.218	.256	.070	.396
Age					.018	.013	.129	.172

Note. Dependent variable: job satisfaction.

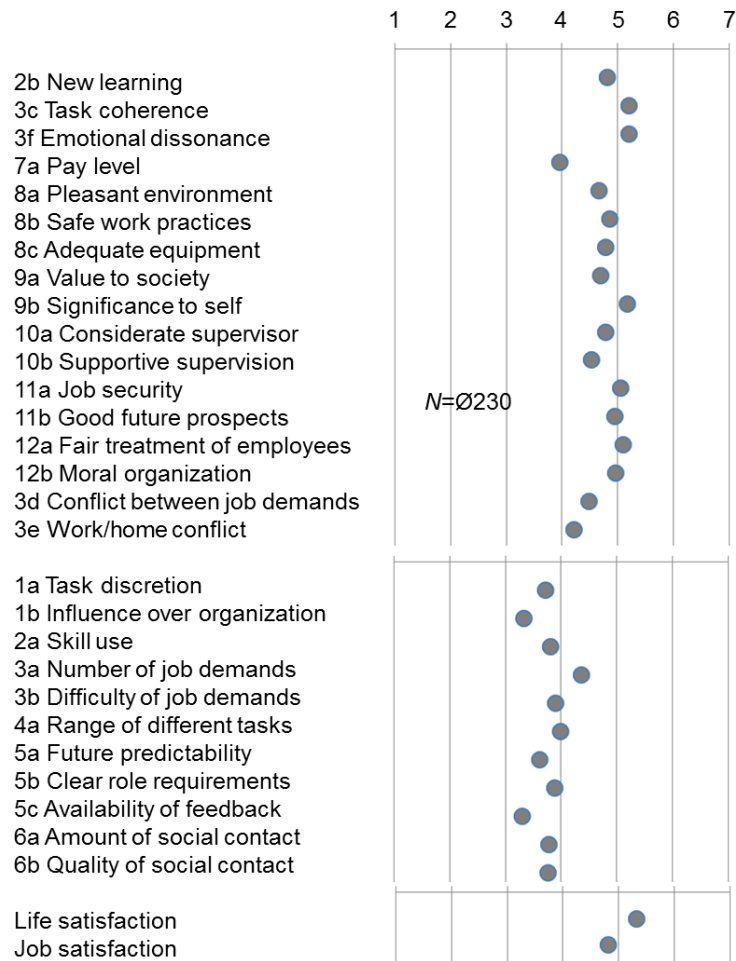
### 6.4.5 Comparison of Influence of Job Aspects on Job Satisfaction and Preferences

In Figure 5, the preference measures and the impact of each job aspect on job satisfaction are juxtaposed (importance grid). Special attention should be paid to the job aspects in the top right field (do first). This is where both a high influence of the aspect on job satisfaction and a high preference of employees regarding this aspect come together.



**Figure 5.** Importance grid. Cf. Reiche and Sparke (2012).

In Figure 6, the mean values of the characteristics investigated are presented.



**Figure 6.** Average values of job features.

The CE aspects were rated by the study participants on a seven-point Kunin scale, from 1=extremely low to 7=highly acceptable. On average, the aspects of task integrity (5.21), emotional dissonance (5.21), importance of the work to oneself, and the company (5.17) and the employer's fair treatment of employees (5.10) were rated most positively. In the lowest positions are pleasant working environment (buildings, rooms, noise, temperature, etc.) at 4.66, supportive leadership (4.53), conflict between different tasks (4.48), conflict between work and family life (4.21), and finally, salary level (3.96).

For the AD aspects, transformed variables were used; therefore, the averages reported are not comparable to those of the CE aspects. The aspects number of tasks (4.36), variety (4.00), difficulty of tasks (3.90), and role clarity (3.89) were assessed most positively by the study participants. In the lowest positions are job autonomy (3.72), the predictability of the future with respect to the job (without career prospects; I know what will happen in the near future) at 3.62, the impact on the company as a whole (also through trade unions and works councils) at 3.34, and the availability of feedback at 3.30.

However, as Figure 6 shows, the average values are within a narrow range and there is little differentiation between the individual aspects, so that meaningfulness is very limited. This phenomenon is frequently observed in the measurement of satisfaction (Warr, 2012).

### 6.4.6 Comparison of the Different Groups

In this study, more than 600 complete data sets were analyzed. Three heterogeneous groups were studied, each with around 200 full records. The groups comprised employees, vocational and master craftsman scholars, and horticulture science students, distinguished based on their different living circumstances, but also by characteristics such as age, level of education, and professional experience. For each group, the results of the preference measurement and the influence of the different job aspects on job and life satisfaction were examined. To gain a complete picture of the situation in German horticulture, the results of the three groups need to be compared. For this purpose, Table 6 compares the results of the various satisfaction and preference measurements.

**Table 6.** Comparison of the Results for the Three Different Groups

Group	Employees	Vocational and master craftsman scholars	Students
Average age	35 years	24 years	25 years
Sample size	337	205	204
preferences			
Preferences top five	12a Fair treatment of employees (5.13) 2b New learning (5.08)  10a Considerate supervisor (4.99) 2a Skill use (4.98)  3f Emotional dissonance (4.90)	12a Fair treatment of employees (5.21) 3f Emotional dissonance (5.11)  2b New learning (5.07)  8c Adequate equipment (4.98)  3e Work/home conflict (4.91)	12a Fair treatment of employees (5.32) 3e Work/home conflict (5.13)  3f Emotional dissonance (5.05) 10a Considerate supervisor (5.02)  10b Supportive supervision (4.70)
Sample size	229	200	N / A.
Effect on job satisfaction top five	11b Good future prospects (.62**)  8c Adequate equipment (.51**), 12a Fair treatment of employees (.51**), 3e Work/home conflict (.51**) 10b Supportive supervision (.50**) 9b Significance to self (.49**), 12b Moral organization (.49**) 3f Emotional dissonance (.50**), 10a Supervision behaves considerately (.50**)	3f Emotional dissonance (.52**)  10a Considerate supervisor (.50**)  10b Supportive supervision (.49**)	N / A.  N / A.  N / A.  N / A.

\*\* The correlation is significant at the 0.01 level (two-tailed)

\* The correlation is significant at the 0.05 level (two-tailed)

All three groups show the strongest preference for the job feature that concerns an employer's fair treatment of employees. In second place, employees rank the opportunity to learn new skills, followed by considerate leadership, the use of their own abilities, and low emotional dissonance.

For the vocational and master craftsman scholars, learning new skills and emotional dissonance are in second and third place, respectively. In fourth place is the provision of suitable equipment and in fifth is conflict between job and family. At this point, it is clear that job aspects such as emotional dissonance and conflict between work and family life, reflecting an altered job setting and a preference structure that requires a cultural change within the company, become more important. The younger generation, with a higher formal education level (Piopiunik & Wößmann, 2011), exhibits a change in work attitude and favors work aspects accompanied by an increased work–life balance.

The trend described is also reflected in the students' results. Here, conflict between job and family is the second most important job feature, followed by emotional dissonance, i.e. being completely oneself at work. In fourth and fifth place are considerate and supportive leadership, respectively.

From the results, it can be deduced that for well-trained young professionals, the work-life balance and transformational employee-oriented leadership are particularly important, and that horticultural companies need to change these aspects – in particular their management culture – to ensure they are attractive employers for the new (Y) generation.

Overall, for all the groups investigated, it is particularly important that the employer deals fairly with employees and maintains supportive, considerate behavior, that they do not have to adjust too greatly at work (emotional dissonance), that they have opportunities to develop and use their skills, that adequate equipment is available, and that the conflict between work and family is as low as possible. It is interesting that the provision of appropriate equipment is given such high priority. This result has not commonly been observed in other industries (Salvendy, 2012) and indicates the high physical stress in horticulture.

For the group of employees, the strongest influence on job satisfaction is exerted by good future prospects. In second place, are three aspects: suitable equipment, the employer's fairness toward employees, and conflict between work and family life. In third place is supportive leadership and in fourth place the personal value of work and the fairness of the employer towards society. Emotional dissonance and considerate leadership are in fifth place. In this group, the aspect that stands out especially is the availability of good future prospects, underlining the importance of the employee's feeling that he/she is moving in a positive direction (toward fulfillment of personal goals). Also, as with other groups, the provision of appropriate equipment plays a strong role, seeming to be a special feature of the industry.

For the group of vocational and master craftsman scholars, the strongest connection is with emotional dissonance. In second and third positions are considerate and supportive leadership, respectively, followed by the fairness of the employer to employees, but also to society as a whole, i.e., also to customers, suppliers, and the environment.

These results show that the sustainability of the horticultural company positively affects employee satisfaction (and/or vice versa). Furthermore, they provide an indication that "soft" job aspects, which include a special form of corporate and leadership culture, show the greatest effect on employee satisfaction, particularly among the younger, highly educated employees. The results also show that the influence of "hard" job aspects, such as salary, difficulty of tasks, variety, and job security, are not as highly valued.

The twelve job characteristics could affect not only the satisfaction of employees, but also their ability to provide high performance. For example, supportive leadership (job characteristic 10) increases the satisfaction of employees and at the same time creates the conditions for high performance. In this case, higher values for supportive leadership lead to increased job satisfaction and performance (Lyubomirsky, King, & Diener, 2005).



In establishing the relationships between job characteristics, job satisfaction, and work performance, the employees' satisfaction survey is a tool both for improving employee satisfaction and optimizing the use of human capital, thus serving company profitability. For horticultural companies, in which staff costs account for 40 % of the overall costs, this potential for optimizing human resource management and personnel management is particularly interesting, especially as its importance has thus far received insufficient emphasis. There is a possibility that the utility functions of the job characteristics apply equally to the employees' performance as well as to their levels of satisfaction, so that optimal values for satisfaction are close to the optimum long-term utilization of the performance potential of each employee. For example, underload and overload both lead to dissatisfaction and in the long-term, to suboptimal performance. This possibility of using the vitamin model has not yet been studied empirically.

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## 7 Job Satisfaction and Preferences Regarding Job Characteristics of Vocational and Master Craftsman Scholars and Horticulture Students in Germany

### 7.1 Abstract

Labor costs account for 40 % of all the costs in German horticulture. Employee satisfaction has a significant impact on the economic and social sustainability of horticultural companies. Traditional linear relationships between environmental characteristics and subjective job satisfaction have been assumed in psychological research. Warr (2007) challenged this conception with the nonlinear vitamin model. The present study examines the possibility of non-linear relationships between job characteristics and job satisfaction. For this purpose, a survey was carried out using an online and a paper-and-pencil questionnaire from August 2013 to February 2015. In addition, the preferences of employees ( $N=229$ ), vocational and master craftsman scholars ( $N=205$ ) and students of horticulture science ( $N=204$ ) regarding job characteristics were examined. This article focuses on the later two. The relationships between characteristic values and work and life satisfaction are analysed and the results of the three groups are compared. The strongest relationships with job satisfaction can be observed for vocational and master craftsman scholars for the job features emotional dissonance and considerate leadership. Additionally, employers' fair treatment of the society as a whole has a strong impact on job satisfaction. The salary can be found only in the lower middle range. The data support the assumption of nonlinear relationships between job characteristic values and satisfaction. Furthermore, the personal characteristics of the study participants are included in the analysis. The study indicates a change in the preference structure of employees, who in the future would prefer a good work–life balance in particular as well as other "soft" factors.

**Keywords:** employee well-being, horticulture, human resources management, job satisfaction, social sustainability

### 7.2 Introduction

Personnel costs account for about 40 % of all the costs in German horticulture. The importance of human resource management will increase in most industrialized countries in the wake of demographic change, which is often associated with a war-for-talents and a more diverse workforce (Montén, 2011; Meyerding, 2015a). Employee-related issues will be the cause of fundamental transformation processes in the next two decades in German companies of all industries (Claßen & von Kyaw, 2007, p. 17) and are considered as a key factor in the future success of horticulture in Germany (Schreiner et al., 2013, pp. 73–76). Another aspect is the increasing attention of consumers and society to the social dimensions of sustainability, the potential of which has not yet been addressed by a number of sustainability assessment systems in agriculture. Subjective job satisfaction can be used as a key indicator of social sustainability and has many advantages compared with objectively quantified indicators (Meyerding, 2015a, 2015b).

"In essence, stable well being is when individuals have the psychological, social and physical resources they need to meet a particular psychological, social and/or physical challenge. When individuals have more challenges than resources, the see-saw dips, along with their well being, and vice-versa." (Dodge, Daly, Huyton, & Sanders, 2012,

p. 230; Meyerding 2015a) Subjective satisfaction can be measured context-free as life satisfaction and context-based as job satisfaction and facet-specific, for example satisfaction with one's salary.

There are diverse approaches to the measurement and understanding of psychological satisfaction at work (von Rosenstiel, Kehr, & Maier, 2000). If job satisfaction is to be measured by the subjective assessment of characteristic values of different facets of the job, it is essential to determine which facets (aspects) are to be included in the valuation model. Specifically, it is necessary to decide whether environmental characteristics (facets of the job) alone or additional personal characteristics should be included in the analysis (Warr, 2013). One way to evaluate job satisfaction is to use Herzberg's two-factor model (Herzberg, Mausner, & Synderman, 1959; Herzberg, 1966). For example, Bitsch and Hogberg (2005) used parts of Herzberg's model in a qualitative study of US horticulture based on 31 interviews. More recently, Reiche and Sparke (2012) performed a quantitative study among 446 specialized vocational and master craftsman scholars that followed an innovative analytical approach but was mainly based on Herzberg's model (Meyerding, 2015a). Although the use of Herzberg's model (Herzberg et al., 1959) is widespread in business administration, the personnel management literature and relevant studies, it is not supported by empirical studies (von Rosenstiel et al., 2000). To the author's knowledge, there was no quantitative study on German horticulture for the group of vocational and master craftsman scholar that is not based on Herzberg's model and considers the possibility of nonlinear relationships (Warr, 1987; de Jong & Schaufeli, 1998; van Vegchel, de Jonge, & Landsbergis, 2005).

This empirical quantitative study examines the relationships between 28 job aspects and job and life satisfaction for vocational and master craftsman scholars in German horticulture. In addition, Warr's vitamin model (Warr, 1987, 2007) is tested. Furthermore, the different preference structures between generations regarding the job aspects investigated become visible. For this purpose, more than 600 complete records of more than 1,300 study participants were examined. Three groups – employees, vocational and master craftsman scholars and students of horticultural sciences – each with over 200 full records, were evaluated separately. This article focuses on the vocational and master craftsman scholars and students of horticulture science. The theoretical background and the methodology of the present study are based on the latest version of Warr's vitamin model (Warr, 2007), which provides 12 job characteristics (vitamins) and their hypothetical utility function. The utility functions describe the nature of the relationship of job characteristics and different forms of satisfaction.

Previous studies in horticulture (Bitsch & Hogberg, 2005; Reiche & Sparke, 2012) have been based on the Herzberg model (Herzberg, 1966; Herzberg et al., 1959) and have assumed linear relationships between job characteristics and job satisfaction. In recent decades, two theoretical approaches have been successful in guiding empirical research: the job characteristics model (Hackman & Oldham, 1975) and the demand control support model (Karasek, 1979). Although these models differ in purpose and complexity, they assume linear relationships too, although different studies (de Jong, Schaufeli, & Furda, 1995; Warr, 1990; de Jong & Schaufeli, 1998; de Jonge et al., 2000) have partially supported the assumed types of utility functions of the vitamin model (de Jong & Schaufeli, 1998). However, De Jonge and Schaufeli (1998), who tested the vitamin model, used an earlier version of the model with nine vitamins (Warr, 1994), and the current model contains twelve vitamins (Warr, 2007; Meyerding, 2015a). The current model was tested by Meyerding (2015a), whose study showed the validity of the model

for employees in horticulture. The utility functions can differ between groups. For this reason, the individual utility functions are analyzed for vocational and master craftsman scholars.

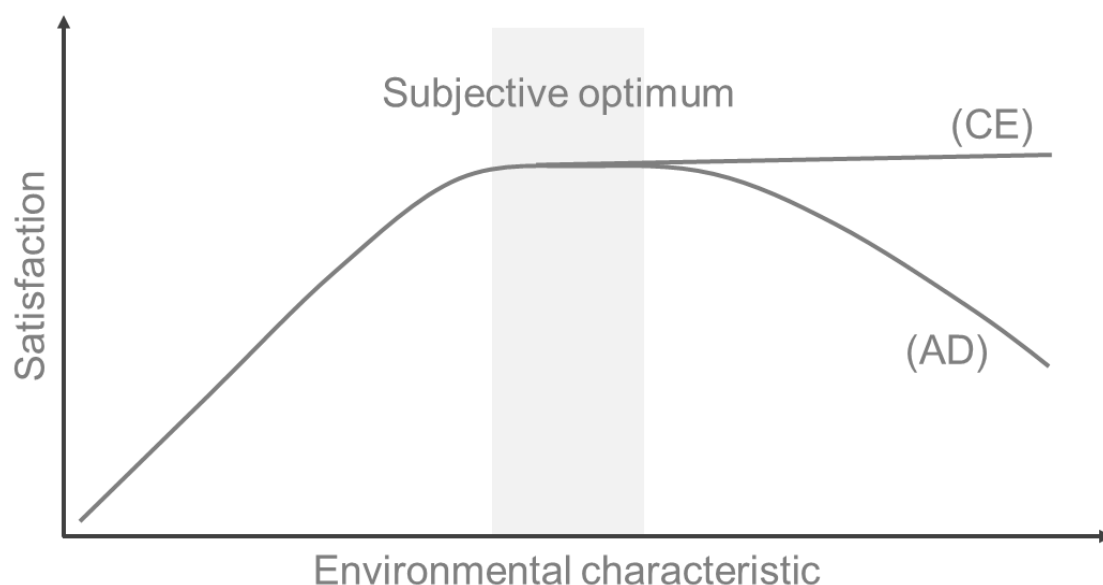
The objective of this study is to identify the relationships between job aspects and job satisfaction in German horticulture and to verify the assumed utility functions as well as indicating the effects of personal characteristics. At the same time, it will demonstrate that the job satisfaction indicator based on the survey method used here covers the most important aspects that are relevant to job satisfaction in German horticulture. In addition, the preferences of future generations concerning the job characteristics examined will be considered, with the intention of highlighting the areas to which horticultural companies need to pay particular attention to be attractive employers in the future.

In principle, the satisfaction measurement aims to quantify and evaluate human emotions. To investigate why some people are happier than others, this article includes perspectives that are either "environment-centered" or "person-centered." In the first case, the influence of the environment on the satisfaction of an individual is considered. The second case investigates the influence that the person's own characteristics have on the individual's experienced satisfaction.

### **7.2.1 Job Satisfaction Measurement Based on the Vitamin Model**

Research models that help to examine the causes of satisfaction and dissatisfaction show three different points of view: the first is based primarily on the environment, the second is based on the person himself and the third combines the environment and person perspectives. To gain a complete understanding, a model has to be chosen that involves both the environment and the person himself. An emphasis on one or the other point of view does not necessarily deny the need for a combined approach. In principle, there is no single "correct" number of categories in a model of this kind. Increasing accuracy can be achieved by incorporating a higher number of specific characteristics.

The major difference between Warr's vitamin model and other models is not the choice of features, but the idea that the expression of the characteristics does not have a linear relationship with satisfaction. Consequently, there are features that have diminishing marginal utility or that affect satisfaction negatively at very much higher characteristic values (see Figure 1).



**Figure 1.** The vitamin analogy: the bell-shaped curve of the utility function (AD, additional decrement) and diminishing marginal utility (CE, constant effect). Cf. Warr (2012) and Meyerding (2015a).

Table 1 lists the 12 features of the vitamin model. The subdivision into sub-features (aspects) is indicated by small letters. The nature of the utility function is given by the abbreviations CE for diminishing marginal utility and AD for a bell-shaped curve (Warr, 2013). In this study, the vitamins are operationalized through the model's 28 aspects.

**Table 1.** The 12 Vitamins of Warr's Model and its 28 Aspects for the Evaluation.

Vitamin model	Job features in the present study	Utility function
1 Control (AD)	1a Task discretion	AD
	1b Influence over the wider organization	AD
2 Skill (AD)	2a Skill use	AD
	2b New learning	CE
3 Goals (AD)	3a Number of job demands	AD
	3b Difficulty of job demands	AD
	3c Task coherence	CE
	3d Conflict between job demands	CE (inverse)
	3e Conflict between work and home	CE (inverse)
	3f Emotional dissonance (inverse)	AD
4 Variety (AD)	4a Range of different tasks	AD
5 Clarity (AD)	5a Future predictability (excludes job tenure)	AD
	5b Clear role requirements	AD
	5c Availability of feedback	AD
6 People (AD)	6a Amount of social contact	AD
	6b Quality of social contact	AD
7 Money (CE)	7a Pay level	CE
8 Physical security (CE)	8a Pleasant environment	CE
	8b Safe work practices	CE
	8c Adequate equipment	CE
9 Significance (CE)	9a Value to society	CE
	9b Significance to self	CE
10 Supervision (CE)	10a Supervisor behaves considerately	CE
	10b Supervisor is supportive	CE
11 Career (CE)	11a Job security	CE
	11b Good future prospects	CE
12 Fairness (CE)	12a Fair treatment of employees	CE
	12b The organization's morality in society	CE



For all these aspects of the work environment, an increase from a low to a moderate level leads to increasing satisfaction. Research sometimes deals with the "intrinsic" characteristics of the task itself. The vitamin model assumes these intrinsic features to have a bell-shaped profile of the utility function, such that it can lead to "too much of a good thing" (features 1 to 6). On the other hand, the extrinsic characteristics, as a result of the working conditions (features 7 to 12), show diminishing marginal utility above a moderate level.

*Job feature 1: The possibility of personal influence (control).* Research from many areas of psychology has confirmed the far-reaching importance of personal control over aspects of the environment (Thompson, 2009). This work feature depends, like others, on individual cognitive processes and the conditions of the environmental situation. Two aspects of this work feature should be considered, which are of an intrinsic and an extrinsic nature (Karasek, 1979). The intrinsic aspect contains the adaptation of other job characteristics (1a, task discretion), such as the level of skill use, objectives and variety, whereas the extrinsic aspect relates to the influence on the organization as a whole (1b, influence over the wider organization). In the vitamin model, a bell-shaped profile of the utility function is assumed for this work feature: very high values lead to dissatisfaction (Burger, 1989).

*Job feature 2: The possibility of using skills (skill).* There is a variety of evidence that employees who are limited in the use of their skills are less satisfied than others. The personal appreciation of skills (2a, skill use) could be illustrated by the study by Lewin, Dembo, Festinger, and Sears (1944) The opportunity to learn (2b, new learning, Kornhauser, 1962) and to acquire new skills is a key feature in the model of positive progressive work by Spreitzer, Sutcliffe, Dutton, Sonenshein, and Grant (2005). In the vitamin model, a nonlinear bell-shaped curve of the utility function is assumed for this job feature.

*Job feature 3: Externally given goals (goals).* Environmental situations differ in the requirements that they place on the physical and mental activity of a person. At low levels of this job feature, few demands are placed on the individual and there is little external pressure to carry out an activity. At moderate levels, the individual is prompted by his or her environment to work towards goals that involve different levels of difficulty. Very high levels of externally set targets require the individual to achieve many and/or difficult goals, leading to feelings of oppression, the inability to maintain the quantity or quality of work and possibly the fear of failure (Warr, 1987). Work feature 3 has six aspects. The first aspect deals with the number of requests (3a, number of job demands) made of the employee. As with other primary features, short periods with low requirements are quite attractive, as they offer rest periods or the possibility to carry out another activity. However, a non-changing situation with low requirements has a negative impact on subjective satisfaction (Wyatt & Langden, 1938). The second aspect is the ability to cope with difficult requirements (3b, difficulty of job demands). Thus, there is an individual optimum of requirements: a certain degree, which also requires effort, is desirable. However, increasing demands lead to excessive demands. The third aspect is task identity (3c, task coherence). A specific aspect of goals in a work environment is the degree to which the individual tasks are conclusively related. Hackman and Oldham (1975) defined task identity as the degree to which it is required to fulfill a task "completely," that is, to perform a job from start to finish with a visible result. The fourth aspect is role conflict (3d, conflict between job demands). This is the case in which in-

compatible demands are made of different environmental sources. Another form of role conflict is described between roles in private life and roles in working life, known as work-home conflict or work-family conflict (3e, conflict between work and home, Greenhaus & Beutell, 1985). The sixth aspect is 3f, emotional dissonance. A special form of high job demands arises in situations in which the employee is expected to show or simulate an emotion without actually feeling it (Glomb, Kammeyer-Mueller, & Rotundo, 2004). The vitamin model assumes job feature 3 to have a bell-shaped profile of the utility function. In a nationwide study among British workers, Warr (1990) observed a nonlinear relationship.

*Job feature 4: Variety (variety).* This feature of the vitamin model contains variations (4a, range of different tasks) in the conditions of the workplace and in the activities that are carried out by the employees. A low variety leads to dissatisfaction for two reasons. First, the absence of variety is undesirable in itself. People prefer a change in their experiences, to find a balance between comfort and relief from repetitive routines and behaviors (Kornhauser, 1962). The bell-shaped curve of the utility function implies that very high variety leads to dissatisfaction. Two reasons for this are feasible. First, very high variety leads to harmful levels of other job characteristics, for example by increasing the number of different external requirements (job feature 3). The second negative aspect of high variety lies in the fact that the individual must constantly draw his concentration and attention to other matters.

*Job feature 5: Clarity of the environmental situation (clarity).* A lack of clarity of the environmental situation is experienced as undesirable in itself. Uncertainty regarding one's own situation leads to anxiety. A low level of predictability reduces the subjective competence in a situation as it is less possible to assess risks and opportunities. Caplan (1975) developed a "job futures ambiguity" scale for the first of the three aspects; this contains the security of career development (5a, future predictability) and the expected future value of one's abilities. The second aspect of clarity of the environmental situation is the clarity of the role (5b, clear role requirements), which contains the amount and availability of information about which conduct and performance levels are required (Glazer & Beehr, 2005). The third aspect of clarity of the environmental situation is feedback (5c, availability of feedback) about one's own performance, which is essential for an employee to acquire the personal ability to influence or maintain the environmental situation as well as for the development and use of his or her own abilities. There is little information about situations with very high clarity. However, it appears likely that these seriously reduce surprises, risk and different results.

*Job feature 6: Contact with other people (people).* For job feature 6, contact with other people, a bell-shaped profile of the utility function is assumed. Two aspects of this feature should be considered: on the one hand the quantity (6a, amount of social contact) and on the other hand the quality (6b, quality of social contact) of contact. The quantity of social contacts and interactions is desirable only up to a certain point (Hackman & Oldham, 1975). A very high value of this aspect prevents privacy and may lead to excessive demands and aggression and thus to dissatisfaction (Fried, Slowik, Ben-David, & Tiegs, 2001). Dissatisfaction is due to higher noise levels, more frequent interruptions and distractions from other employees, a sense of overcrowding, insufficient privacy and less friendly conversations due to a lack of discretion (McCoy & Evans, 2005). For all the environmental characteristics, what is a possibility or option at moderate levels is an unavoidable imperative requirement at very high levels. Being forced to seek help may be harmful in this respect (Deelstra et al., 2003).

*Job feature 7: Disposable income (money).* The availability of financial resources (7a, pay level) has been widely studied in the context of employees' salary. The amount of one's salary is of personal importance, not only to secure a livelihood or a particular lifestyle, but also for social significance, "equal" treatment and as a sign of personal success (Srivastava, Locke, & Bartol, 2001). The feature disposable income has a non-linear character. The utility function shows diminishing marginal utility. The relationship between income and satisfaction is higher in low-income groups than at a moderate level (Kornhauser, 1962). At higher income levels, income has only very little or no effect on satisfaction (Sibbald, 2003). Studies in this area have often been based on a version of the equity theory (Adams, 1963), which implies that people compare their ratio of input and income with the input–output ratio of other people. The inputs are usually defined in terms of skills, effort, qualifications, working conditions, working hours and so on.

*Job feature 8: Physical security (physical security).* The central issues of this feature are the absence of danger (8b, safe work practices) and the presence of good working conditions, ergonomically appropriate equipment (8c, adequate equipment) and safe levels of, for example, temperature and noise (8a, pleasant environment). The aspects of physical security have often been neglected in studies regarding job satisfaction (Taber, Beehr, & Walsh, 1985). The key features of physical security were identified by Carolpio (1996) as the environment design (lighting, air quality, surface condition, etc.), machines and tools, sources of danger, sanitation, food and relaxation areas. A low level of physical security will reduce employee satisfaction in three ways. First, there are direct effects, unwanted physical conditions that probably give rise to negative feelings themselves. Second, an indirect effect can occur as a result of an activity-induced deterioration of physical health. Insufficient equipment can be both intrinsically undesirable and the cause of dissatisfaction due to subsequent errors and interruptions in the working process (Salvendy, 2012, p. 708).

*Job feature 9: Valued social position (significance).* Professions and workplaces differ in the value that is attributed to them by society but also by the organization. The "task significance" scale of the job diagnostic survey (Hackman & Oldham, 1975) includes the importance that employees attach to their work task (9b, significance to self, Hackman & Oldham, 1975). This work feature is more open than others to subjective interpretation. The value that is attached to a particular role may vary widely between individuals in the same role (Wrzesniewski, McCauley, Rozin, & Schwartz, 1997). The studies reviewed have consistently demonstrated a linear relationship between appreciation of the role and job satisfaction. At the conceptual level, it remains unlikely that in jobs that all have a high social value, small differences in the expression of this feature may be associated with differences in job satisfaction.

*Job feature 10: Supportive leadership (supervision).* Issues of leadership were often analyzed by surveys that were completed by the staff and recorded their perception of the behavior of executives in terms of their consideration (10a, supervisor behaves considerately). The questions concerned the support (10b, supervisor is supportive) and the respect shown to the employees, compliance with the welfare of employees and the tendency to express praise and appreciation for the work performed. Behavior that can be defined as considerate includes willingness to listen and to accept the suggestions of employees. Very high values of the feature supportive supervision will probably not

lead to dissatisfaction of subordinates, so a bell-shaped curve of the utility function is not expected.

*Job feature 11: Career prospects (career).* A career is often understood as upward movement in the work hierarchy. Careers can also develop positively for an individual in other ways, by career changes, taking on an alternative role or engaging in teaching activities. Two aspects of career prospects should be considered. First, jobs differ regarding their job and income security (11a, job security). The second aspect of career prospects is the possibility to take on another role (11b, good future prospects). For many people, this means having opportunities for promotion: do I collect experience and expertise on this job, which will be useful to be able to take a position with a higher status, and/or will such a position be available to me in the future? However, this outlook includes the opportunity for transition to other activities, which need not imply a hierarchical ascent. Diminishing marginal utility is assumed for this job feature.

*Job feature 12: Equality (fairness).* The last job feature with diminishing marginal utility in the vitamin model contains two aspects of equality: the fairness in the relationship of an employee and his employer (12a, fair treatment of employees) and the fairness of the company towards the society as a whole (12b, the organization's morality in society). Organizational justice of the first kind (within the organization) contains distribution-related and procedural issues. Distributive justice refers to the fairness or, in other words, the allocation of workload and benefits to the different members of a social system. Procedural justice refers to the fairness of the process that leads to this allocation (Cropanzano, Bowen, & Gilliland, 2007), particularly concerning direct unfair discrimination on the basis of age, gender, ethnic origin and so on. Above a moderate level, the utility function should flatten out (Warr, 2007, p. 140).

To evaluate the characteristics, a modified Kunin (1955) scale was used to make it easier for the respondents to grasp the nature of the characteristic values. This is particularly necessary, as linearity is often assumed by study participants. The symbols used are derived from a publication by Salcher and Hoffelt (1995, p. 95). In addition to this questionnaire, the individual preferences for certain characteristics should be recorded. Furthermore, it can be useful to capture some personal data.

## **7.2.2 Personal Characteristics and Their Influence on Subjective Satisfaction**

Environmental features are responsible for only part of satisfaction. Part of satisfaction comes from the person him- or herself or his or her characteristics or properties. Knowledge of the influence of personal characteristics is important to be able to interpret the results of measurement correctly.

*Different individual comparison processes and reference values.* If an employee is asked to evaluate a particular job feature, he turns to comparisons and looks for reference values with which to compare his individual situation. Depending on which reference values are used, the subjective evaluation and therefore the satisfaction change, regardless of the objective characteristic value. The individual evaluation processes, especially for moderate objective characteristic values, can be expected to contribute to the determination of subjective satisfaction, but their influence should be low for extreme objective characteristic values (Frese & Zapf, 1999).

*Demographic characteristics and their influence on subjective satisfaction.* Overall, women tend to have higher job satisfaction than men (Grandey, Cordeiro, & Crouter, 2005). However, whether a causal relationship between gender and satisfaction can be derived is questionable. Nevertheless, with regard to the job features, differences between the genders can be observed (Grandey et al., 2005). It has frequently been noted that older people are more satisfied than younger people (Diener & Suh, 1998). The reasons for the greater satisfaction of older people could lie in changed evaluation processes or in different characteristic values of the job features. In the first case, older people could, through their work and life experience, have lowered their expectations towards the job, while younger workers have positive expectations regarding their working life, which are then disappointed and lead to dissatisfaction. The second possible explanation could be that older employees tend to occupy jobs with a higher job quality (more positive levels of job features) or may, during their working lives, develop in a direction that is conducive to their needs.

*Different forms of employment and their influence on subjective satisfaction.* The third kind of group distribution could occur in relation to different forms of employment with different characteristics, for example part-time and full-time jobs or fixed and temporary employment (Thorsteinson, 2003). It is also useful to distinguish between core workers and seasonal workers, as seasonal workers occupy a special position in German horticulture.

*Influence of the individual personality on subjective satisfaction.* Other personal characteristics that have an impact on subjective satisfaction are personality and innate cognitive differences. Psychological research typically distinguishes between five personality characteristics: (Barrick & Mount, 1991) neuroticism, extraversion, openness to new experiences, agreeableness (cooperation, respecting the wishes of others, etc.) and conscientiousness (diligence). The personality characteristics will not be discussed in detail at this point; however, it is crucial to be aware that sometimes innate characteristics may influence perceived subjective satisfaction. They are not considered in this study. In addition, one's own abilities and level of education could affect one's subjective satisfaction (Ganzach, 1998). However, a higher level of education increases the probability of acquiring a job that has beneficial levels of different job characteristics.

### **7.3 Material and Methods**

For the study, more than 1,300 employees, vocational and master craftsman scholars as well as horticulture students in Germany were surveyed. The questionnaire was implemented in both paper-and-pencil form and web-based form. Individuals were invited to participate via presentations, trade fairs (IPM), lectures and social networks as well as two articles in the horticultural trade press (TASPO). The survey was conducted from August 2013 to February 2015. Over 200 completed questionnaires from employees of horticultural companies were analyzed. In this article, the groups of vocational and master craftsman scholars as well as horticulture students in Germany are considered, each of which accounted for over 200 completed questionnaires, so a total of 600 completed questionnaires were evaluable. Only questionnaires with more than ten completed questions were included in the analysis.

First, the sample is described for each group, and then the relationships between job aspects and job and life satisfaction are investigated. For this purpose, the rank correlation coefficient Spearman's rho ( $r_s$ ) is used, since normal distribution cannot be assumed

(Field 2009, pp. 179 ff.). For each correlation coefficient, the significance level ( $p$ ) and the number of records ( $n$ ) used in the calculation are indicated.

The model was tested in different ways. Covariance structure modeling (CSM) with full-information maximum likelihood (FIML) estimation was used to assess the fit of the proposed vitamin model and its operationalization in this study (Meyerding 2015a). Also variables were calculated for the aspects for which the utility function should have a bell-shaped curve. For each of these aspects, two variables were constructed. The first includes the records of low to moderate characteristic values and the second those of moderate to very high scores. In the case of a bell-shaped curve of the utility function (AD), the first variable should have a positive correlation with job satisfaction (see Figure 1, left side) and the second a negative correlation (see Figure 1, right side). In addition, the attributes for which a bell-shaped curve of the utility function is assumed are transformed into third variables so that characteristic values over the subjective optimum are assigned to the values on the left side of the optimum. The correlation between thus transformed variables and job satisfaction should be higher than those of the variable without the transformation, provided that this aspect has a bell-shaped profile of the utility function (AD). A further possibility, which is to be investigated, is the comparison of the results of a linear regression for each aspect and a nonlinear regression, wherein the nonlinear regression should present a higher  $R^2$  than the linear regression if the assumed utility functions can be supported by the data. In the case of the nonlinear regression, the following functions are used:

Concave with saturation limit (exponential model, CE characteristics (aspects)) (Eq.1):

$$(1) \text{ Job satisfaction} = M - a \cdot e^{(-b \cdot x)}$$

where  $x$  is the value of the job characteristic and the start values were chosen as follows:

$$a = 1; b = 0.5; M = 10$$

Concave with downturn (quadratic model, AD characteristics (aspects)) (Eq. 2):

$$(2) \text{ Job satisfaction} = a + b \cdot x - c \cdot x^2$$

where  $x$  is the value of the job characteristic and the start values were chosen as follows:

$$a = 5.6; b = 5.3; c = 10$$

As explained above, not only environmental characteristics, but also personal characteristics have an impact on subjective satisfaction (Warr, 2013). Therefore, they should be considered in the study. These are specifically gender, age and level of education. Furthermore, the type of employment, the size of the company and their influence on the subjective satisfaction of workers in German horticulture are considered.

## 7.4 Results and Discussion

### 7.4.1 Results of the Satisfaction and Preference Measurement of Vocational and Master Craftsman Scholars in German Horticulture

#### 7.4.1.1 Sample Description

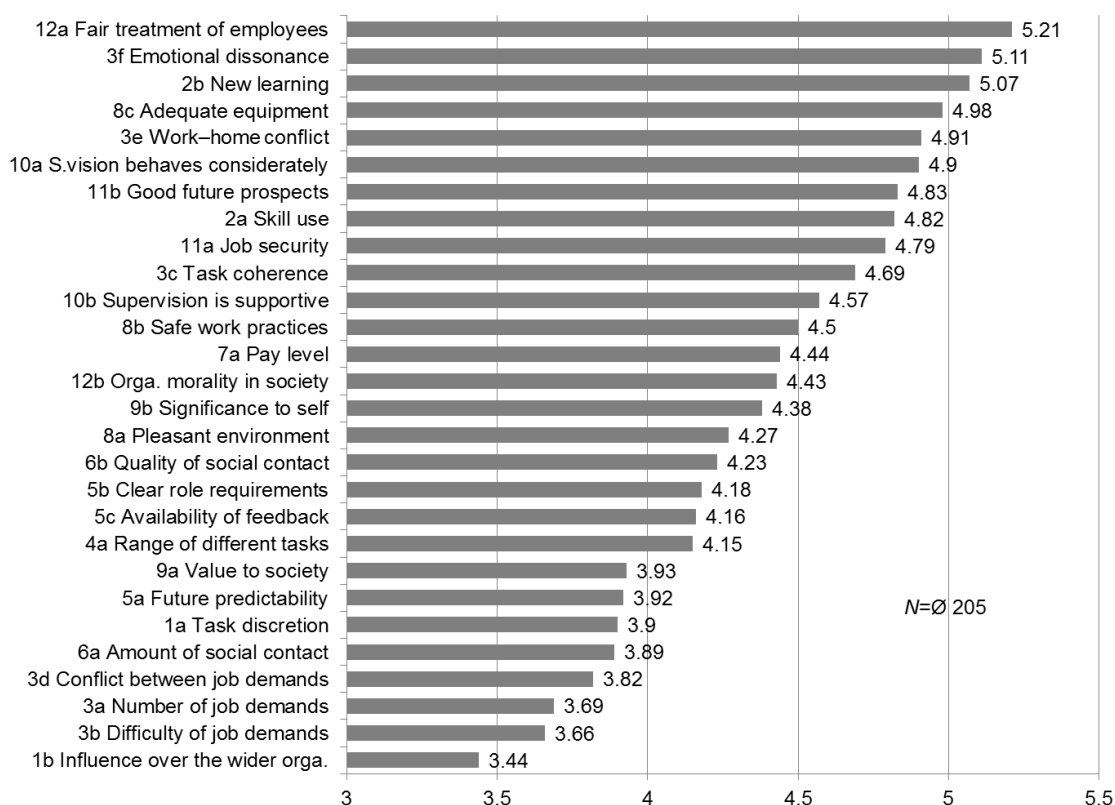
Over 200 people participated in the study between August 2014 and December 2014 in the group of vocational and master craftsman scholars. In contrast to the group of employees, the vocational and master craftsman scholars were surveyed exclusively with questionnaires in paper form. The questionnaires were distributed by teachers in their classes. The group of vocational and master craftsman scholars is evaluated separately

from the employees of horticultural companies, since the two groups differ particularly by age and life reality. The majority of the study participants in this group comes from the states of Bavaria and Baden Württemberg and work in service horticulture and floriculture, followed by multidivisional companies, tree nurseries and vegetable farms. Trade firms, pomiculture and retail horticulture are virtually absent. The divisions in the study are therefore not representative of the population (Gurrath, 2006). The average age of the vocational and master craftsman scholars who participated in the study is 24 years and shows an accumulation between 17 and 25 years.

As might be expected, the majority of the sample is undertaking an apprenticeship (39 %) or has already completed an apprenticeship (49 %). In individual cases, however, a specialist degree (9 %) or even a university of applied sciences (2 %) or university degree (2 %,  $N=174$ ) already exists. Most of the respondents work in horticultural companies that employ between six and ten employees (excluding seasonal workers, 33 %,  $N=196$ ) and up to five seasonal workers (80 %,  $N=196$ ). More than half of the vocational and master craftsman scholar respondents are male (67 %,  $N=200$ ) and are not self-employed (92 %,  $N=198$ ). A total of 97 % of the study participants are employed full-time; 98 % belong to the core workforce of the company ( $N=153$ ) and 54 % do not have any form of management responsibilities ( $N=188$ ).

#### **7.4.1.2 Preferences of Vocational and Master Craftsman Scholars Concerning the Job Characteristics Examined**

The vocational and master craftsman scholars were asked about their preferences regarding the job aspects investigated. For this purpose, they were required to imagine their dream job and specify the importance of each feature on a six-point Likert scale. Figure 2 shows the average values for the 28 aspects explored ( $N=205$ , standard deviation between 1.0 and 1.2).



**Figure 2.** Preferences regarding job characteristics (vocational and master craftsman scholars).

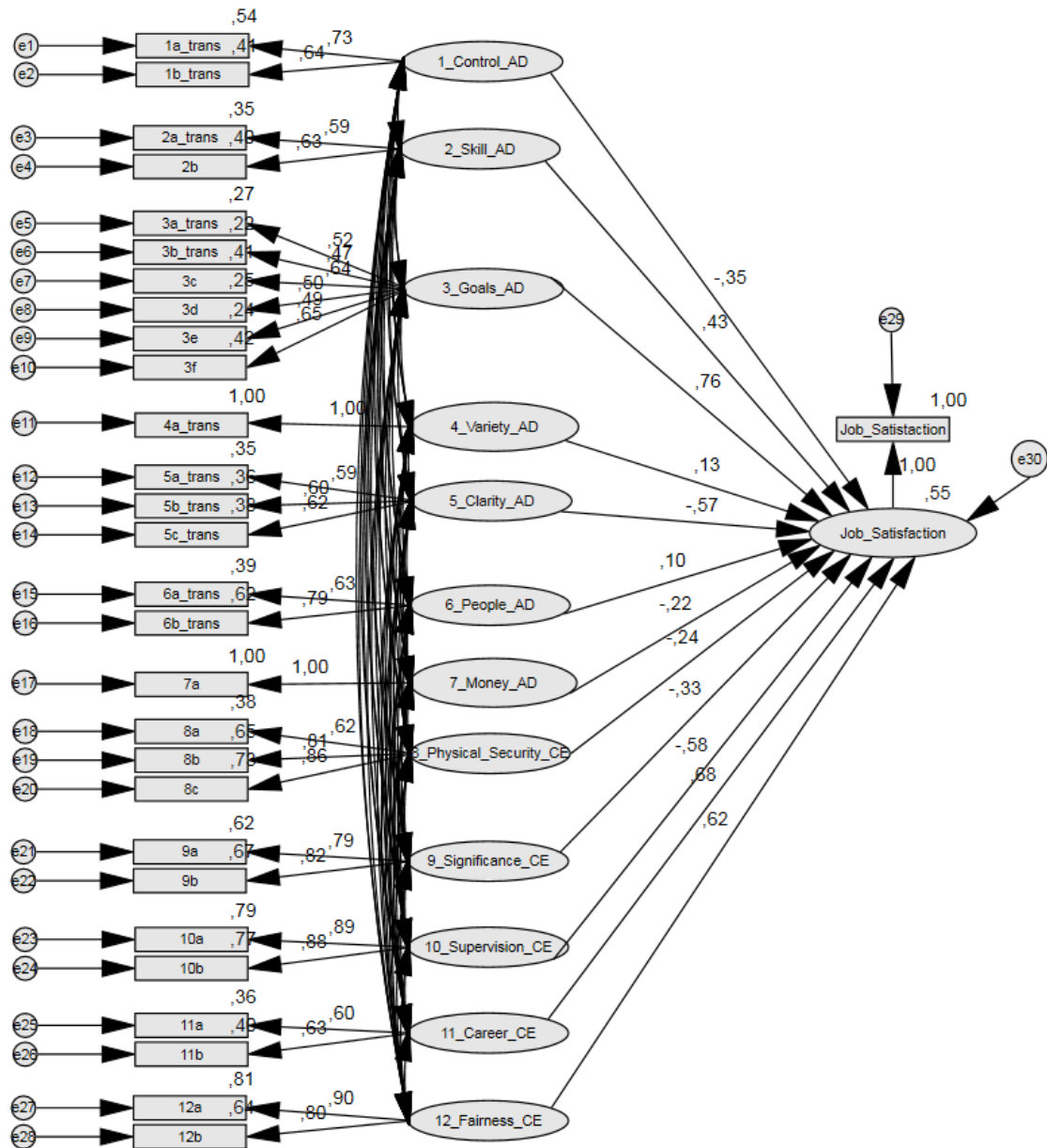
The fair treatment of employees (no discrimination) comes first (5.21, 12a), followed by the possibility of being oneself at work (emotional dissonance; 5.11, 3f). The possibility to expand one’s abilities and to learn (5.07, 2b) is also strongly preferred by the vocational and master craftsman scholars. In the fourth place, we find the work aspect suitable equipment (including machines, 4.98, 8c), and the balance between work and family life ranks fifth (4.91, 3e). Job aspects such as the level of salary (4.44, 7a) and the overall behavior of the company (towards suppliers, customers, the environment, etc., 4.43, 12b) find themselves in the middle, occupying the thirteenth and fourteenth ranks. Least important appears to be the level of task difficulty (3.66, 3b) and the possibility to have an impact on the organization as a whole (e.g. by trade unions or work councils, 3.44, 1b).

### 7.4.1.3 Covariance Structure Modeling

Covariance structure modeling (CSM) with full-information maximum likelihood estimation was used to assess the model fit of the vitamin model and the aspects in the present study. CSM is a multivariate instrument which combines methodological and statistical contributions from psychometric as well as econometric theory (Diamantopoulos, 1994; Meyerding, 2015a). CSM represents an integration of two models (Backhaus, Weiber & Erichson, 2013, pp. 63-118): (1.) the measurement or confirmatory factor analytic model, which examines the contributions of the performed measures (aspects) to the hypothetical latent vitamins, and (2.) the structural equation model, which defines (causal) relationships among these latent factors (the vitamins and job satisfaction). The corresponding analyses were performed using IBM SPSS AMOS (Meyerding, 2015a). Missing observations were handled by listwise deletion. Figure 3 shows the path diagram of the performed structural equation model. The intercorrelations between the vit-



amins are not shown in this diagram for reasons of readability; they can be seen in Table 2. The vitamins 1 through 12 (in the text also referred to as job feature 1-12) are latent variables which are operationalized by the 28 aspects in the present study (Meyerd- ing, 2015a).

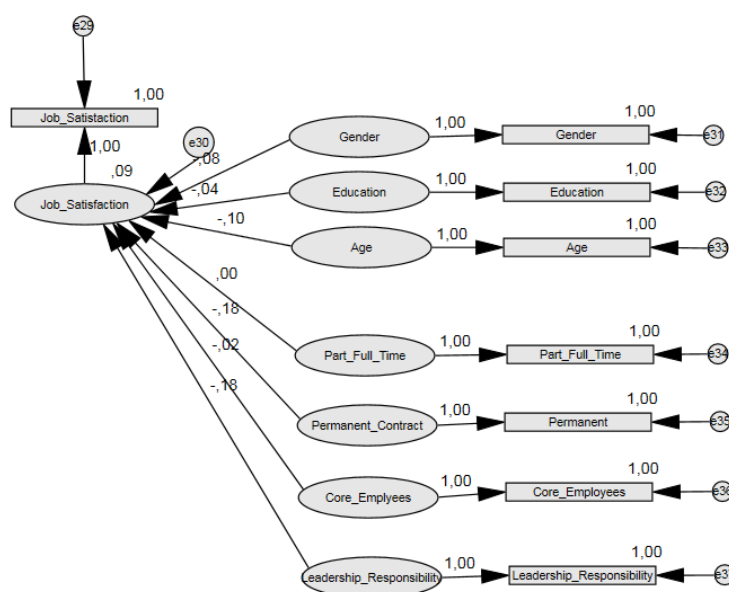


**Figure 3.** Path diagram of the covariance structure modeling (standardized estimates) for the vitamin model. The intercorrelations between the vitamins are not shown in this diagram for reasons of readability.

**Table 2.** Correlation Matrix for the 12 Estimated Vitamins

	1	2	3	4	5	6	7	8	9	10	11
1 Control (AD)											
2 Skill (AD)	.78										
3 Goals (AD)	.64	1.12									
4 Variety (AD)	.48	.48	.43								
5 Clarity (AD)	.61	.92	.74	.49							
6 People (AD)	.48	.58	.59	.44	.71						
7 Money (AD)	.16	.44	.45	.13	.22	.19					
8 Physical security (CE)	.14	.67	.61	.26	.51	.25	.51				
9 Significance (CE)	.15	.72	.60	.33	.53	.29	.43	.58			
10 Supervision (CE)	.32	.78	.75	.25	.61	.40	.31	.65	.57		
11 Career (CE)	.37	.88	.70	.25	.75	.44	.60	.70	.73	.79	
12 Fairness (CE)	.27	.69	.62	.23	.63	.31	.33	.62	.62	.81	.71

The factor loadings (printed on the arrows from the vitamins to the aspects in Figure 3) indicate the contribution of each aspect to the factor (vitamin). As the factor loadings are mostly above .63 they can be seen strong (Comrey & Lee, 2013, p. 243). The hypothetical vitamins are then associated with job satisfaction. In this model the transformed variables for the additional decrement (AD) features were used (Meyerding 2015a). In other words, nonlinearity is not tested. The model is recursive ( $N=205$ ), it is identifiable with degrees of freedom of 302. The assessment of normality reported acceptable values of kurtosis  $|\lt 2|$  and skewness  $|\lt 7|$  (Weiber & Mühlhaus, 2014) for the vitamin model (Figure 4). Normality distribution can not be reported in the case of a personal characteristics model (Figure 4 and Table 3,  $N=205$ ,  $df=0$ ) as core employee status (skew=6.95, kurtosis=46.27) and part time status (skew=-5.59, kurtosis=29.20) show no acceptable values. As this is essential to perform maximum likelihood estimation (Meyerding, 2015a), the vitamins and the personal characteristics are not analyzed in one CSM, because of this reason. Furthermore the personal characteristics model (Figure 4) should be considered with caution.



**Figure 4.** Path diagram of the covariance structure modeling (standardized estimates) for the personal characteristics model.

**Table 3.** Correlation Matrix for the Seven Estimated Personal Characteristics

	1	2	3	4	5	6
1 Gender (w=1, m=2)						
2 Education	.28					
3 Age	.19	.34				
4 Part-full-time (p=1, f=2)	.06	-.05	-.12			
5 Permanent contract (yes=1, no=2)	-.20	-.28	-.06	-.04		
6 Core employees (yes=1, no=2)	.03	.00	.09	.02	-.04	
7 Leadership responsibility (yes=1, no=2)	-.32	-.22	-.15	.01	.43	-.01

The factor loadings of all aspects of the vitamins are significant as the critical ratios (CR) are all above 1.96 (Backhaus et al., 2013, p. 141). Chi-square (CMIN) equals 716.41 for the default vitamin model (Figure 3) divided by the degrees of freedom ( $df=302$ ) equals 2.37 (CMIN/ $df$ ), which represents a appropriate model fit for the whole structural equation model (Backhaus et al., 2013, p. 147; Meyerding, 2015a). This is again not the case for the personal characteristics model (Figure 4, CMIN=0,  $df=0$ , CMIN/ $df$ =N.A.). Because chi-square is problematic especially for complex models (Reinecke, 2005, pp. 116 ff.), the root-mean-square-error of approximation (RMSEA) was calculated, which measures how well the model fits to the “reality” of the empirical data. A value of about .08 or less for the RMSEA would indicate a reasonable error of approximation, a value of .10 and above represents an insufficient model fit (Browne & Cudeck, 1992; Meyerding, 2015a). The RMSEA of the default vitamin model is .08 (personal characteristics model RMSEA=.15).

#### 7.4.1.4 Influence of the Investigated Aspects on Job and Life Satisfaction

Table 4 shows the Spearman correlation coefficient ( $\rho$ ) for all 28 job aspects and job and life satisfaction. For the AD aspects with an assumed bell-shaped curve of the utility function (see Figure 1), the transformed variables were used. In the first column (J), the correlation coefficients as a measure of the strength of the relationship between individual job aspects and job satisfaction are listed. In the second column (L), they are shown for life satisfaction.

**Table 4. Relationships Between Job Aspects and Work and Life Satisfaction (N=Ø200)**

	J	L	2b	3c	3f	7a	8a	8b	8c	9a	9b	10a	10b	11a	11b	12a	12b	3d	3e	1a	1b	2a	3a	3b	4a	5a	5b	5c	6a	
J Job satisfaction	1																													
L Life satisfaction	.65**	1																												
2b New learning	.40**	.25**	1																											
3c Task coherence	.37**	.25**	.62**	1																										
3f Emotional dissonance	.52**	.38**	.47**	.46**	1																									
7a Pay level	.33**	.17*	.38**	.27**	.34**	1																								
8a Pleasant environment	.21**	.20**	.28**	.19**	.27**	.37**	1																							
8b Safe work practices	.26**	.15*	.37**	.35**	.32**	.43**	.53**	1																						
8c Adequate equipment	.30**	.25**	.42**	.26**	.37**	.42**	.51**	.69**	1																					
9a Value to society	.31**	.37**	.34**	.21**	.28**	.41**	.37**	.41**	.46**	1																				
9b Significance to self	.44**	.44**	.43**	.38**	.46**	.29**	.26**	.31**	.41**	.62**	1																			
10a S.vision behaves considerably	.50**	.34**	.51**	.44**	.41**	.30**	.35**	.50**	.47**	.40**	.47**	1																		
10b Supervision is supportive	.49**	.30**	.52**	.40**	.40**	.35**	.31**	.45**	.43**	.36**	.50**	.76**	1																	
11a Job security	.25**	.25**	.37**	.25**	.20**	.35**	.22**	.44**	.49**	.35**	.37**	.45**	.43**	1																
11b Good future prospects	.41**	.31**	.43**	.34**	.40**	.40**	.11	.26**	.36**	.37**	.39**	.39**	.41**	.39**	1															
12a Fair treatment of employees	.48**	.33**	.43**	.30**	.42**	.32**	.34**	.37**	.46**	.43**	.46**	.66**	.65**	.38**	.44**	1														
12b Orga. morality in society	.45**	.39**	.37**	.29**	.39**	.28**	.46**	.39**	.49**	.44**	.44**	.53**	.52**	.37**	.36**	.70**	1													
3d Conflict between job demands	.30**	.18*	.39**	.38**	.42**	.28**	.29**	.40**	.41**	.27**	.35**	.41**	.37**	.37**	.25**	.39**	.41**	1												
3e Work-home conflict	.35**	.20**	.27**	.24**	.34**	.29**	.31**	.35**	.35**	.25**	.27**	.44**	.38**	.22**	.13	.35**	.32**	.46**	1											
1a Task discretion	.20**	.01	.27**	.29**	.21**	.06	.07	.11	.11	.00	.11	.17**	.27**	.10	.19**	.18*	.07	.16*	.10	1										
1b Influence over the wider orga.	.24**	.09	.29**	.26**	.24**	.25**	.04	.17*	.11	.13	.14*	.16*	.21**	.13	.27**	.22**	.18*	.24**	.10	.43**	1									
2a Skill use	.35**	.17*	.32**	.35**	.31**	.14	.09	.27**	.26**	.18**	.29**	.30**	.34**	.14*	.22**	.29**	.23**	.27**	.27**	.40**	.31**	1								
3a Number of job demands	.27**	.16*	.19**	.13	.18*	.16*	.11	.15*	.12	.10	.13	.19**	.28**	.03	.02	.17*	.12	.22**	.20**	.28**	.20**	.22**	1							
3b Difficulty of job demands	.18*	.02	.28**	.24**	.15*	.08	.04	.08	.12	.01	.15*	.18*	.22**	.10	.12	.09	.13	.11	.05	.35**	.20**	.31**	.43**	1						
4a Range of different tasks	.15*	.10	.08	.02	.15*	.07	.21**	0.1	.14*	.21**	.15*	.18*	.17*	-.05	.15*	.16*	.12	.11	.10	.26**	.27**	.32**	.40**	.38**	1					
5a Future predictability	.25**	.10	.25**	.15*	.15*	.13	.03	.14*	.24**	.20**	.18**	.23**	.31**	.14*	.40**	.28**	.19**	.20**	.17*	.26**	.30**	.30**	.14	.22**	.20**	1				
5b Clear role requirements	.31**	.13	.28**	.24**	.27**	.09	.22**	.22**	.26**	.17*	.27**	.22**	.24**	.20**	.26**	.26**	.29**	.25**	.24**	.32**	.28**	.36**	.24**	.29**	.26**	.37**	1			
5c Availability of feedback	.26**	.03	.30**	.21**	.29**	.11	.08	.27**	.24**	.21**	.32**	.38**	.42**	.21**	.21**	.36**	.34**	.36**	.25**	.22**	.18*	.34**	.24**	.17*	.23**	.32**	.34**	1		
6a Amount of social contact	.12	.07	.10	.07	.14	.12	.19**	.10	.08	.14*	.25**	.18*	.23**	-.00	.19**	.20**	.09	.08	.15*	.22**	.12	.21**	.17*	.10	.19**	.23**	.13	.30**	1	
6b Quality of social contact	.24**	.12	.19**	.23**	.15*	.09	.07	.06	.05	.08	.16*	.21**	.31**	.07	.21**	.20**	.19**	.23**	.17*	.22**	.16*	.26**	.32**	.22**	.21**	.27**	.29**	.32**	.35**	1

\*\* The correlation is significant at the 0.01 level (two-tailed)

\* The correlation is significant at the 0.05 level (two-tailed)

The job aspect 3f, emotional dissonance, shows the strongest relation with job satisfaction among the respondents. In the second and third places are the job aspects 10a, supervisor behaves considerately, and 10b, supportive supervision, followed by 12a, fair treatment of employees, and in fifth place is 12b, the organization's morality towards society. In addition, the job aspects 9b, the value of work for oneself, and 11b, good future prospects, are strongly related to job satisfaction. In the midfield, aspects such as 2b, learning, 3c, task integrity, 2a, skills use, 3e, conflict between work and family life, and 7a, salary level, come into place. The last places are occupied by 1a, job autonomy, 3b, difficulty level of the tasks, and 4a, variety. No significant correlation in the sample could be observed between the number of social contacts (6a) and job satisfaction.

As in other studies, the relationships between subjective characteristic values and context-free life satisfaction are less strong than with contextual job satisfaction (Rice, Frone, & McFarlin, 1992). The strongest connection with life satisfaction for vocational and master craftsman scholars is shown by the job characteristic 9b, value of work for oneself. In second place, 12b, fair treatment of the society as a whole (suppliers, customers, the environment, etc.) can be found, followed by 3f, emotional dissonance (to be completely oneself at work), 9a, the value of the work for society, and 10a, considerate leadership. Salary, for example, shows only a weak connection with life satisfaction. Of the 28 job aspects, nine show no significant relationship with context-free subjective life satisfaction.

#### **7.4.1.5 Nonlinearity of the Utility Functions of the Job Aspects**

For the group vocational and master craftsman scholars, the nonlinearity of the utility functions of the 28 job aspects were also examined. Here, three approaches were used to verify the functions; the results are compared in Table 5. The first column shows the Spearman correlation coefficient for a linear model (without transformation). The second column shows the transformed job aspect variables for which a bell-shaped curve of the utility function is assumed. Columns three and four provide the correlation coefficients for the variables of the second approach, in which the effective directions for the low and high characteristic values are compared. The last and second-last columns of Table 5 show the results of the linear and nonlinear regressions (coefficient of determination  $R^2$ ) for the third comparative approach. The regression equations, which are the bases for the nonlinear regressions, reflect the assumed curves of the utility functions (CE aspects=exponential function; AD aspects=quadratic function as shown in Figure 1 and the explanations given in the methods section).

**Table 5.** Comparison of Linear and Nonlinear Models (Vocational and Master Craftsman Scholars,  $N=200$ )

Job feature	$r_s$ with job satisfaction	$r_s$ transformed (AD)	$r_s$ low (AD)	$r_s$ high (AD)	Linear regression $R^2$	Nonlinear regression $R^2$
CE 2b New learning	.25**				.203	.212
3c Task coherence	.25**				.178	.188
3f Emotional dissonance	.38**				.296	.297
7a Pay level	.17*				.104	.104
8a Pleasant environment	.20**				.080	.101
8b Safe work practices	.15*				.094	.097
8c Adequate equipment	.25**				.126	.126
9a Value to society	.37**				.078	.079
9b Significance to self	.44**				.198	.199
10a S.vision behaves considerably	.34**				.255	.255
10b Supervision is supportive	.30**				.249	.249
11a Job security	.25**				.063	.064
11b Good future prospects	.31**				.172	.173
12a Fair treatment of employees	.33**				.261	.281
12b Orga. morality in society	.39**				.225	.244
3d Conflict between job demands	.18*				.104	.108
3e Work-home conflict	.20**				.136	.173
AD 1a Task discretion	.12	.20**	.27**	.06	.112	.113
1b Influence over the wider orga.	.17*	.24**	.29**	.13	.105	.108
2a Skill use	.23**	.35**	.38**	-.11	.128	.183
3a Number of job demands	.06	.27**	.24**	-.22**	.000	.128
3b Difficulty of job demands	-.02	.18*	.12	-.20*	.000	.040
4a Range of different tasks	.05	.15*	.12	-.14	.002	.067
5a Future predictability	.12	.25**	.27**	-.12	.049	.077
5b Clear role requirements	.01	.31**	.30**	-.24**	.015	.079
5c Availability of feedback	.03	.26**	.27**	-.07	.071	.093
6a Amount of social contact	.03	.12	.13	-.05	.050	.066
6b Quality of social contact	.02	.24**	.26**	-.11	.046	.064

\*\* The correlation is significant at the 0.01 level (two-tailed)

\* The correlation is significant at the 0.05 level (two-tailed)

As shown in columns one and two of Table 5, the observed relationships of the transformed dummy variables are in all cases far beyond those of the variables without transformation (column one). In addition, the second approach to testing the vitamin model (Warr, 2007) supports the idea of non-linear relationships. The dummy variables in column three of the low characteristic values of the AD aspects show positive correlations with job satisfaction. Furthermore, the dummy variables in column four show relationships that support Warr's assumptions (Warr, 1987, 1994), as these variables with the characteristic values above the subjective optimum (see Figure 1) are negatively correlated with job satisfaction. The AD aspects 1a, job autonomy, and 1b, influence over the organization, are exceptions. This can be explained by the fact that very high characteristic values of these job aspects rarely occur in the sample. In all cases, the nonlinear regression shows a higher  $R^2$  than the linear regression. The underlined regression equations for non-linear regressions explain job satisfaction better than a linear model. The entire model with 28 investigated job aspects, using the transformed dummy variables in the case of AD aspects, shows a high  $R^2$  of .51 in the linear regression for the group of vocational and master craftsman scholars. The examined aspects of work therefore explain 51 % of job satisfaction in the sample.

#### **7.4.1.6 Impact of Personal and Structural Features on Job and Life Satisfaction and Preferences Regarding Job Aspects**

Not only environmental characteristics are related to the individual satisfaction of people; personal characteristics, such as gender, age and level of education, also have an influence on the way in which the environment is perceived by an individual and which social standards he or she uses to assess his or her own situation (Warr, 2013). Furthermore, the size of the organization and other structural features can exert an impact on the characteristic values. Finally, the type of employment plays a not negligible role. Table 6 shows the relationships between personal and structural characteristics and job satisfaction.

**Table 6.** Relationships Between Personal and Structural Characteristics and Job Aspects (Vocational and Master Craftsman Scholars)

Personal characteristics	Job aspect	Effect size ( $r_s$ )	Sample size ( $n$ )	
Age	8a Pleasant environment	-.17*	196	
Managerial responsibility (no=1, yes=2)	2b New learning	.32**	187	
	3c Task coherence	.21**	187	
	3f Emotional dissonance	.23**	187	
	9b Significance to self	.26**	187	
	10a S.vision behave considerate	.22**	187	
	10b Supervision is supportive	.26**	187	
	11a Job security	.24**	187	
	11b Good future prospects	.36**	187	
	12a Fair treatment of employees	.23**	187	
	12b Orga. morality in society	.17*	200	
	3d Conflict between job demands	.15*	186	
	3e Work-home conflict	.17*	186	
	1b Influence over the wider orga.	.21**	186	
	2a Skill use	.18*	186	
Education level	5a Future predictability	.19**	186	
	11b Good future prospects	.27**	174	
Temporary employment(y=2)	11b Good future prospects	-.40**	157	
	3c Task coherence	-.35**	157	
	3f Emotional dissonance	-.32**	157	
	3d Conflict between job demands	-.32**	157	
	1a Task discretion	-.17*	157	
	1b Influence over the wider orga.	-.18*	157	
	5a Future predictability	-.20*	157	
	5b Clear role requirements	-.19*	157	
	Self-employed (no=1, yes=2)	2b New learning	.16*	197
		7a Pay level	.14*	197
9a Value to society		.21**	197	
11b Good future prospects		.17*	197	
3d Conflict between job demands		.16*	197	
1b Influence over the wider orga.		.21**	197	
3b Difficulty of job demands		.15*	197	
5a Future predictability		.16*	196	
5b Clear role requirements		.16*	196	
5c Availability of feedback		.19**	196	
Gender (w=1, m=2)	2b New learning	.15*	199	
	11a Job security	.15*	199	
	11b Good future prospects	.16*	199	

\*\* The correlation is significant at the 0.01 level (two-tailed)

\* The correlation is significant at the 0.05 level (two-tailed)

Vocational and master craftsman scholars carrying managerial responsibility often have the opportunity to expand their own abilities and to learn (2b), have the opportunity to complete a task from beginning to end with a visible result (3c) and recognize the importance of their work for themselves and the company (9b). Executives have more positive values for the aspects conflict between different tasks (3d) and conflict between work and family life (3). They have more influence on the organization as a whole (1b) and greater clarity with regard to the future (without career prospects, 5a). These observed correlations cannot exclusively be attributed to higher levels of job autonomy; thus, there is a significant correlation only when looking at the variables for low values



of job autonomy and managerial responsibility (1a,  $r_s = .17$ ,  $p < 0.05$ ,  $n = 174$ ). In the case of the transformed variables, no significant correlation between management responsibility and job autonomy can be observed. Vocational and master craftsman scholars with a higher education level assess their future prospects better than their peers with lower degrees (11b). For all extrinsic CE aspects except a pleasant work environment and safe work processes, people with a temporary employment contract show lower scores than employees with a permanent contract. A particularly strong relationship appears between the temporary nature of the employment contract and the assessment of the individual's own future prospects (11b). Self-employed people report more opportunities to develop their own skills and to learn (2b) and have a higher salary (7a). Men report more frequently the possibility to expand their own abilities and to learn (2b), higher job security (11a) and better future prospects operationalized by the following statement: "at present, I am developing in a good direction, towards my personal goals (11b)." The number of employees or the number of seasonal workers shows no significant relationship with the subjective values of the job aspects in this sample.

The personal and structural features examined also show correlations with the preference structure of vocational and master craftsman scholars with respect to the job aspects (Table 7).

**Table 7.** Relationships Between Personal and Structural Characteristics and Preferences for Job Aspects (Vocational and Master Craftsman Scholars)

Personal characteristics	Job aspect	Effect size ( $r_s$ )	Sample size ( $n$ )
Age	1a Task discretion	.27**	197
	1b Influence over the wider orga.	.19**	197
	3b Difficulty of job demands	.21**	197
	3c Task coherence	.16*	197
	5c Availability of feedback	.14*	197
	9b Significance to self	.15*	197
	8a Pleasant environment	-.16*	197
	Managerial responsibility (no=1, yes=2)	1a Task discretion	.25**
	1b Influence over the wider orga.	.15*	174
	3b Difficulty of job demands	.16*	174
	9b Significance to self	.17*	174
	8b Safe work practices	.16*	174
Temporary employment(y=2)	12a Fair treatment of employees	.18*	157
	8b Safe work practices	.18*	157
	3b Difficulty of job demands	-.24**	157
	3a Number of job demands	-.21*	157
	1b Influence over the wider orga.	-.17*	157
	1a Task discretion	-.29**	157
	Part-time employment (yes=1, no=2)	4a Range of different tasks	.20*
5b Clear role requirements		.25**	160
5c Availability of feedback		.16*	160
7a Pay level		.19*	160
Self-employed (no=1, yes=2)	1a Task discretion	.18**	198
	1b Influence over the wider orga.	.20**	198
	3a Number of job demands	.20**	198
	3b Difficulty of job demands	.19**	198
Gender (w=1, m=2)	1a Task discretion	.19**	200
	8a Pleasant environment	-.21**	200
	8b Safe work practices	-.17*	200

\*\* The correlation is significant at the 0.01 level (two-tailed)

\* The correlation is significant at the 0.05 level (two-tailed)

For the older respondents in the sample, job autonomy (3c) is more important than it is for their younger classmates. For vocational and master craftsman scholars who carry a form of management responsibility, job autonomy (1a), the impact on the organization (1b) and the importance of their own work for themselves and the company (9b) are more important than they are for their classmates without management responsibility. Instead, they put less value on safe work processes (8b), perhaps because they carry out more administrative activities. For people with a temporary contract, it is more important that the employer treats the staff fairly (12a) and that they have safe work processes (8b). Part-time workers put more emphasis on the variety (4a) and the amount of their salary (7a). For self-employed people, it is particularly the job autonomy (1a) and the impact on the organization (1b) that are important. Men place particular emphasis on job autonomy (1a), while women are more concerned about a pleasant work environment (8a) and safe working processes (8b). The number of employees of the company in which the participants work shows no effect on the preferences of the vocational and master craftsman scholars. For pupils from farms with many seasonal workers, the preference is less pronounced in terms of the job aspect appropriate equipment (8c,  $r_s = -.15$ ,  $p < 0.05$ ,  $n = 196$ ).

## **7.4.2 Results of the Measurement of Preferences for Selected Job Aspects of Students of Horticulture Science**

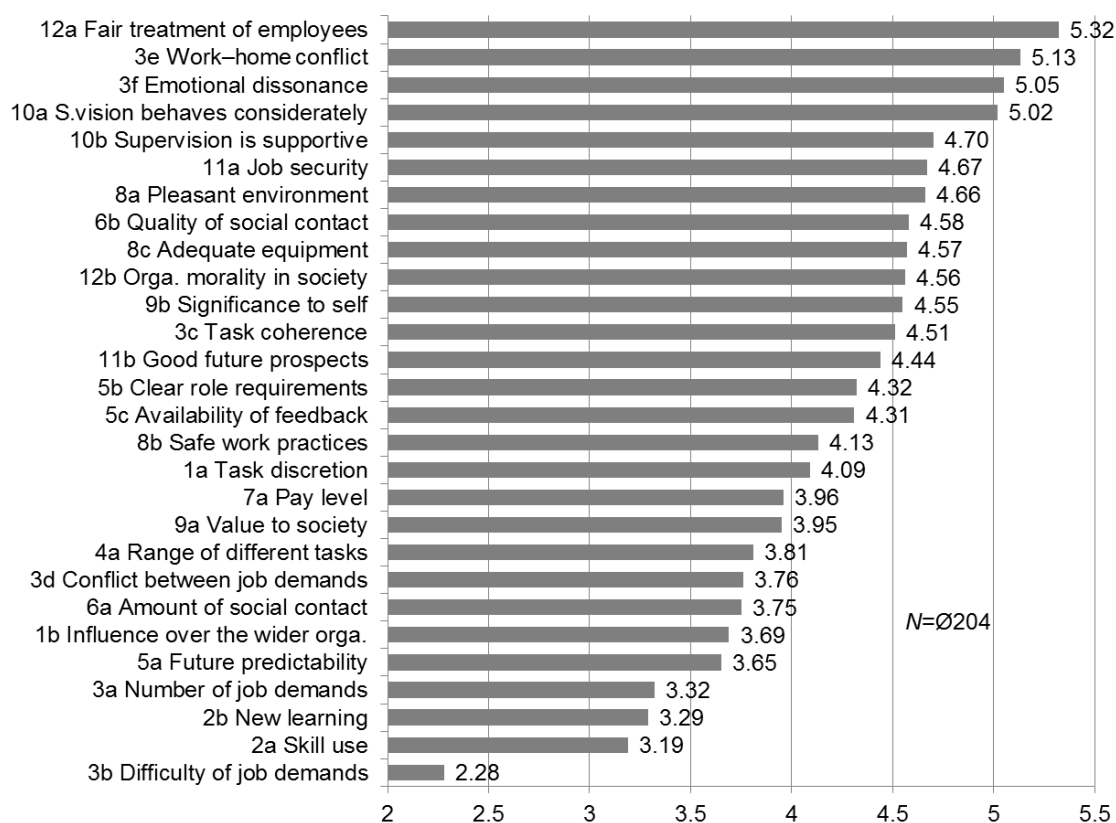
### **7.4.2.1 Sample Description**

In the study from August 2013 to August 2014, the group of students of horticulture science contained more than 200 people, especially from the Leibniz Universität Hannover and the Technical University of Munich. The respondents are on average 25 years old, with an accumulation between 19 and 29 years ( $N=212$ ).

Of the students participating in the study, 55 % have not previously worked in a horticultural company ( $N=224$ ). For the remaining 45 %, the employment duration is on average 19 months ( $N=98$ ). More than half (53 %,  $N=225$ ) of the surveyed horticulture students are female. The majority wants to be employed full-time (77 %,  $N=220$ ) with a permanent contract (93 %,  $N=220$ ) and to belong to the core workforce of the company (96 %,  $N=220$ ) in the future. In their future "dream job," 37 % of the horticulture students think about being self-employed ( $N=223$ ). A majority of the participants are following the bachelor's program (80 %) or the master's program (16 %) and 4 % are currently completing doctoral studies ( $N=224$ ). The first semester is clearly overrepresented in the sample.

### **7.4.2.2 Preferences of the Students Concerning the Examined Job Aspects**

The students were asked only about their preferences regarding the 28 job aspects. For this purpose, the study participants were required to imagine their dream job. The respondents were then asked to rate the importance of every job aspect of this dream job on a six-point Likert scale (from 1=unimportant to 6=essential). Figure 5 shows the mean values as a result of this task ( $N=204$ , standard deviation between 1.0 and 1.2).



**Figure 5.** Preferences regarding the job characteristics (students).

The most important point for the surveyed students is that the prospective employer treats its employees fairly. Secondly, the compatibility of work and family (free time) followed by the emotional dissonance operationalized by the statement "in my work I can be completely me, without having to shed my skin" can be found. In the fourth and fifth places we find considerate and supportive leadership. As high on the list as the sixth and seventh places there are two classic job characteristics, job security and a pleasant work environment (buildings, rooms, noise and temperature). The salary can be found only in the lower middle in the eighteenth place, even after job autonomy (17) and the employer's treatment of society as a whole (10). As the most insignificant aspect by far, students assess the difficulty of the tasks in their future job. Other job aspects are also rather insignificant: using one's own skills and experience, developing one's own abilities and the number of tasks.

### 7.4.2.3 Impact of Personal and Structural Characteristics on the Preferences Regarding the Job Aspects

Personal characteristics, such as age, gender or previous practical experience in horticultural companies, have an impact on the individual preferences of the students and are considered in the following section. In addition, other "structural features," such as a possible desire for self-employment, are included in the analysis (Table 8).

**Table 8.** Relationships Between Personal and Structural Characteristics and Preferences for Job Aspects (Students)

Personal characteristics	Job aspect	Effect size ( $r_s$ )	Sample size ( $n$ )
Age	3c Task coherence	-.15*	195
	9a Value to society	-.24**	194
	12b Orga. morality in society	-.16*	194
Gender (w=1, m=2)	1a Task discretion	.19**	204
	3b Difficulty of job demands	-.19**	225
	3d Conflict between job demands	-.18*	204
	3e Work-home conflict	-.17*	204
	3f Emotional dissonance	-.18*	204
	4a Range of different tasks	-.16**	204
	5b Clear role requirements	-.21**	204
	5c Availability of feedback	-.15**	203
	8b Safe work practices	-.22**	203
	8c Adequate equipment	-.14*	203
	10a S.vision behave considerate	-.16*	203
	10b Supervision is supportive	-.20*	203
	12a Fair treatment of employees	-.19**	203
	12b Orga. morality in society	-.17*	203
Wish to work full-time (no=1, yes=2)	7a Pay level	.22**	203
	8b Safe work practices	.18**	203
	8c Adequate equipment	.17*	203
	12b Orga. morality in society	-.16*	203
Progress in study	2a Skill use	.19**	224
	4a Range of different tasks	.17*	204
	3c Task coherence	-.16*	204
	12b Orga. morality in society	-.15*	203
Work experience (yes=1, no=2)	1a Task discretion	.22**	204
	2a Skill use	.21**	224
	2b New learning	.18**	224
	3b Difficulty of job demands	.17*	224
	8b Safe work practices	.14*	203
	8c Adequate equipment	.15*	203
Length of work experience (in month)	1b Influence over the wider orga.	-.22*	95
	8a Pleasant environment	-.24*	94
	8b Safe work practices	-.24*	94
	9a Value to society	-.30**	94
	10b Supervision is supportive	-.21*	94
	11a Job security	-.21*	94
	12a Fair treatment of employees	-.23*	94
	12b Orga. morality in society	-.29**	94
Prefer temporary contract (no=1, yes=2)	3b Difficulty of job demands	.15*	220
	7a Pay level	-.14*	203
	11b Good future prospects	-.15*	203
Imagine self-employment (no=1, yes=2)	1a Task discretion	.36**	204
	5a Future predictability	-.20**	204
	6b Quality of social contact	-.14*	203

\*\* The correlation is significant at the 0.01 level (two-tailed)

\* The correlation is significant at the 0.05 level (two-tailed)

Men prefer to have a high degree of job autonomy in their dream job (1a). In return, the difficulty of the tasks is less important for them (3b). Women prefer the absence of con-

flicts between different tasks (3d), the reconciliation of work and family (3e) and positive values of emotional dissonance (3f) more than their male counterparts. For students who wish to be employed full-time in their dream job, the amount of salary has a higher value than for students who wish to work part-time (7a). The company's morality in society as a whole, however, is more preferred by those who wish to work part-time (12b). Students who have already worked in a horticultural company pay particular attention to their impact on the organization as a whole (1b), the use of their own skills and experience (2a), safe work processes (8b) and appropriate equipment (8c). Unless the students imagine self-employment in their future dream job, they prefer the job aspect of autonomy, self-determination over job content and implementation (1a), whereas the predictability of the future (5a) and the quality of social contacts play a minor role (6b).

### **7.4.3 Comparison of the Different Groups**

In the study, 600 complete data sets were analyzed. Three heterogeneous groups were studied, each with about 200 full records. The model was tested by performing covariance structure modeling (CSM) with full-information maximum likelihood estimation. As the factor loadings of the 28 aspects are mostly above .63 they can be seen as strong (Comrey & Lee, 2013, p. 243), which supports the usage of the measures in the present study. The assumed latent variables and job satisfaction showed a reasonable model fit with further potential for improvement (Meyerding, 2015a). The groups of participants considered – employees, vocational and master craftsman scholars and students of horticultural sciences – are distinguished by their different life realities, but also by characteristics such as age, educational background and professional experience. For each group, the results of the preference measurement and the influence of different job aspects on job and life satisfaction were examined. To gain a complete picture of the situation in German horticulture, the results of the three groups need to be compared. For this purpose, Table 9 juxtaposes the results of the various satisfaction and preference measurements. In each case, the sample size, the top five job aspects for the preference measurement (mean values) and the top five aspects in terms of the strength of the relationship between the job aspect and the job satisfaction (Spearman's rho) are shown (Table 9).

**Table 9.** Comparison of the Results for the Three Different Groups

Group	Employees	Vocational and master craftsman scholars	Students
Average age	35 years	24 years	25 years
Sample size	337	205	204
preferences			
Preferences top five	12a Fair treatment of employees (5.13) 2b New learning (5.08)  10a Supervision behaves considerately (4.99) 2a Skill use (4.98)  3f Emotional dissonance (4.90)	12a Fair treatment of employees (5.21) 3f Emotional dissonance (5.11)  2b New learning (5.07)  8c Adequate equipment (4.98)  3e Work-home conflict (4.91)	12a Fair treatment of employees (5.32) 3e Work-home conflict (5.13)  3f Emotional dissonance (5.05) 10a Supervision behaves considerately (5.02) 10b Supervision is supportive (4.70)
Sample size effect	229	200	N / A.
Effect on job satisfaction top five	11b Good future prospects (.62**)  8c Adequate equipment (.51**), 12a Fair treatment of employees (.51**), 3e Work-home conflict (.51**) 10b Supervision is supportive (.50**) 9b Significance to self (.49**), 12b Organization's morality in society (.49**) 3f Emotional dissonance (.50**), 10a Supervision behaves considerately (.50**)	3f Emotional dissonance (.52**)  10a Supervision behaves considerately (.50**)  10b Supervision is supportive (.49**)  12a Fair treatment of employees (.48**)  12b Organization's morality in society (.45**)	N / A.  N / A.  N / A.  N / A.

\*\* The correlation is significant at the 0.01 level (two-tailed)

\* The correlation is significant at the 0.05 level (two-tailed)

For all three groups, the job feature related to the fair treatment of the employees shows the strongest preference values. The employees favor in the second place the opportunity to learn new skills, followed by considerate leadership, the use of their own abilities and low emotional dissonance.

For the vocational and master craftsman scholars, emotional dissonance and the possibility to learn new skills can be found in the second and third places. In the fourth place is suitable equipment and ranked fifth is the conflict between work and family. At this point, it is clear that work issues such as emotional dissonance and the conflict between work and family, which show changes in work attitudes and preference structure that require a cultural change within the company, gain importance. The younger generation with a formal higher education level shows a change in work attitude and favors job aspects that are accompanied by an increased work-life balance.

The trend described above is also reflected in the students' results. Here, the conflict between work and family is as high as the second place in the most important work characteristics, followed by emotional dissonance, that is, the ability to be completely oneself at work. Ranked fourth and fifth we find considerate executives and supportive executives. From the results, it can be deduced that for young well-trained junior staff, a work-life balance and transformational employee-oriented leadership are particularly important and that horticultural companies need to change their business and particularly their management culture to be attractive employers for the new generation (Y).

Overall, for all the groups studied, it is particularly important that the employer deals fairly with its employees, that they do not have to adjust too much at work (emotional dissonance), that they are able to develop their skills, that there is as little conflict between work and family as possible, that they can use their skills, that adequate equipment is available and that their leadership maintains supportive, considerate behavior. It is interesting that the availability of the appropriate equipment has such a high priority. This result is not commonly observed in other industries (Salvendy, 2012) and indicates the high level of physical stress in horticulture.

The strongest influence on job satisfaction for the group of employees is shown by the job aspect good future prospects. Ranked second, there are three aspects: suitable equipment, the fairness of the employer towards its employees and the conflict between work and family. In third place is supportive leadership and in fourth place the value of the work for oneself and the fairness of the employer towards society. Emotional dissonance and considerate leadership find themselves in fifth place. Particularly for this group good future prospects stand out, underlining the importance for employees to have the feeling of moving in a positive direction (towards their personal goals). The appropriate equipment plays a strong role in horticulture; this result seems to be a special characteristic of the industry.

For the group of vocational and master craftsman scholars, the strongest connection can be observed with the characteristic values of the work feature emotional dissonance. In the second and third places, considerate and supporting leadership can be found, followed by the fairness of the employer towards its employees and to society as a whole, that is, to customers, suppliers and the environment.

These results indicate that the sustainability of the horticultural company positively affects employee satisfaction (and/or vice versa). Furthermore, they provide an indication that soft job aspects, which include a special form of corporate and leadership culture, have the greatest effect on employee satisfaction, particularly among younger, well-trained employees. The results also show that the influence of "hard" job aspects, such as the salary, the difficulty of the tasks, the variety and the job security, is not especially great.

Furthermore, the characteristic values of the twelve job features could affect the satisfaction of the employee and at the same time his ability to achieve a high performance level. For example, supportive leadership (job feature 10) increases the satisfaction of employees and at the same time creates the conditions for a high working capacity. In this case, higher characteristic values of supportive leadership lead to increased job satisfaction and performance (Lyubomirsky, King, & Diener, 2005).

As the requirements for job satisfaction and work performance are mostly moderate characteristic values of job features, the employee satisfaction survey is a tool for both enhancing satisfaction and optimizing the use of human capital and thus serving the company's profitability. For horticultural companies, in which the personnel costs account for 40 % of the total costs, this optimization potential of human resource management is particularly interesting, especially since so far not enough importance has been attached to these issues.

There is a possibility that the utility functions of the job characteristics apply equally to the employees' performance and to satisfaction, so that the optimum for satisfaction is



close to the optimum for the long-term utilization of the performance potential of each employee. For example, stretched and excessive demand could lead to both dissatisfaction and long-term suboptimal performance. This possibility of using the vitamin model has not yet been investigated empirically.

## 7.5 Conclusion

The data support Warr's (2007) vitamin model and the assumption of nonlinear relationships between job characteristic values and job satisfaction. Furthermore, the personal characteristics of the study participants are included in the analysis. The study indicates a change in the preference structure of employees, who in the future would prefer a good work—life balance in particular as well as other “soft” factors.

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## 8 Change Management Study of Horticulture 2015 – Conditions and Success Factors

### 8.1 Abstract

The increasing organizational size, as a result of the industry's structural change, is leading to crises in German horticultural companies. Therefore, the present study examines the causes of fundamental change processes in horticultural companies, indicates the overriding trends and identifies the success factors of change initiatives. For this purpose, over 150 decision-makers with over 10 years' experience in their respective organization were surveyed from May to December 2014. The megatrends are *environmental issues, changed consumer behavior, resource shortages* and the *labor market*. Currently, the reasons for change lie in a *changing market strategy/sales approach, business succession and submission* and *external changes in the legal conditions*. Among the most difficult problems occurring in the implementation of change processes are *low willingness to take responsibility, interest and goal conflicts* of the involved organization's members and a *sacrifice of long-term actions for short-term profit improvements*. The most important success factors of change processes include *realistic, clear visions/goals and their communication, team spirit and motivation* and a *coordinated chronological procedure*. Six factors of the psychological level of the change success are presented. The results of the study can help to recommend a design for change processes in companies within horticultural manufacturing.

**Keywords:** business transformation, human resources management, project management, organizational change, economical sustainability

### 8.2 Introduction

Despite the relevance of change management to the corporate practice in horticultural companies, only a few comparative studies on horticulture can be found in the German-speaking world and beyond.<sup>8</sup> Change management is also important for small organizational units, which are common in horticulture. Even small organizations experience crises as triggers of change processes (Storck & Bokelmann, 1995). Thus, for example, company succession constitutes a significant crisis for small enterprises. Through the takeover of corporate governance, a change is triggered in the corporate culture in many cases. Behaviors that were considered desirable by a senior may not be desired by the new leadership. Therefore, the old and the new culture clash and cause friction processes.

With this study, the current situation was determined for change processes in German production horticulture. The study of the specific economic sector of horticulture was based on a series of extensive analyses undertaken by Capgemini Consulting in the years 2003 (Claßen, Alex, & Arnold, 2003), 2005 (Claßen, Arnold & Papritz, 2005) and 2008 (Claßen & von Kyaw, 2007; see: von Kyaw & Claßen, 2010; Keicher, Anke, Bohn, Crummenerl, & Mergenthal, 2012). Several aspects were deepened and extended in comparison with the listed studies (for example, the analysis of statistical relationships). Other topics – in which no meaningful results were expected – were not consid-

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<sup>8</sup> Considerations of the causes of developmental processes in horticulture can be found in Berndt (1984, pp. 54 ff.), Böckelmann (1992, pp. 106 ff.) and Bock (1994, pp. 49–57). Storck and Bokelmann (1995, pp. 303 ff.) establishes a relationship between plant growth and business development.

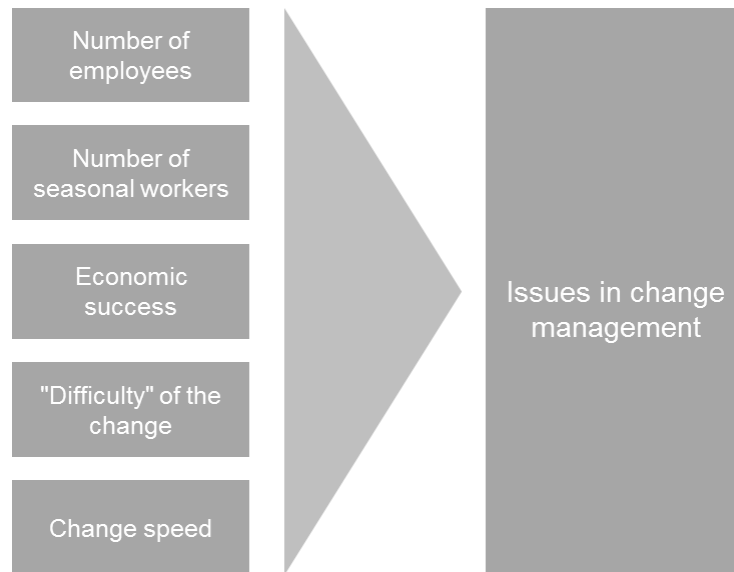
ered. Some questions and response categories of the key dimensions of change management (Meyerding, 2014a, 2014b) were adopted to carry out a comparison of horticulture with larger organizational units in Germany. The questions were rephrased to increase their intelligibility for horticultural entrepreneurs. In particular, technical business terms, which are also often in English, were transcribed and illustrated by examples.

The focus of the present study is on:

- ▶ The understanding and attitude of horticultural entrepreneurs towards change management
- ▶ The occasions for change initiatives in horticultural companies
- ▶ The organization and framework conditions of change management in horticulture
- ▶ The success factors of change management in horticulture

The main objective of the study is to develop an understanding of which success factors in change initiatives in German production horticulture companies are particularly relevant.

All the topics of the study were analyzed in relation to structural parameters, such as the *number of employees*, *number of seasonal workers*, *perceived economic success* compared with direct competitors, *perceived "difficulty"* encountered in the company changes and *perceived pace of change* (Figure 1; Kettinger & Grover, 1995; Walker, Armenakis, & Bernerth, 2007). But structures may be defined in various ways (Tran & Tian, 2013), the ones chosen in this study were selected because they can easily be evaluated subjectively by the decision-maker in a horticultural company. It is assumed that all of these structural parameters have an impact on the issues examined in the present study (for example, the success factors). Thus, a lack of personal, financial and time resources has an (assumed) influence on the change strategy, for example on the degree of participation of those affected by the decision-making process. The fewer the resources, the less participation is possible. On the other hand the number of employees can affect the level of hierarchy in the company, which would lead to different change strategies in smaller versus larger organizations. For the horticultural industry one should distinguish between seasonal and permanent workers, as seasonal workers often perform more standardized work and do probably not need to be involved in decision-making processes. As mentioned the factors change speed and economic success mainly refer to the availability of resources for the change project. The factor subjective difficulty of change might be an indicator of how much the change impacts the organization.



**Figure 1.** Investigated factors influencing thematic areas of change management. Cf. Kettinger and Grover (1995) and Walker et al. (2007).

The present article is structured as follows: After an introduction of the terminology change management and the conceptual approach the study is based on, the implementation of the study is presented, including the description of the sample. The results and discussion section is divided into three subsections. In the first the causes and background circumstances of change initiatives in the sample of German horticultural companies are presented and discussed. In this section the trends behind the change initiatives, the occasions of change projects in German horticulture and the main objectives of these initiatives are presented. The second subsection focusses on the attitudes of decision-makers towards change management to evaluate the standing of change management in German horticulture. The third subsection deals with the main objective of this study, i.e. to evaluate which challenges change projects in horticulture face, their success factors and the relationships between these factors and the structural variables from Figure 1. The article closes with a summary and conclusions.

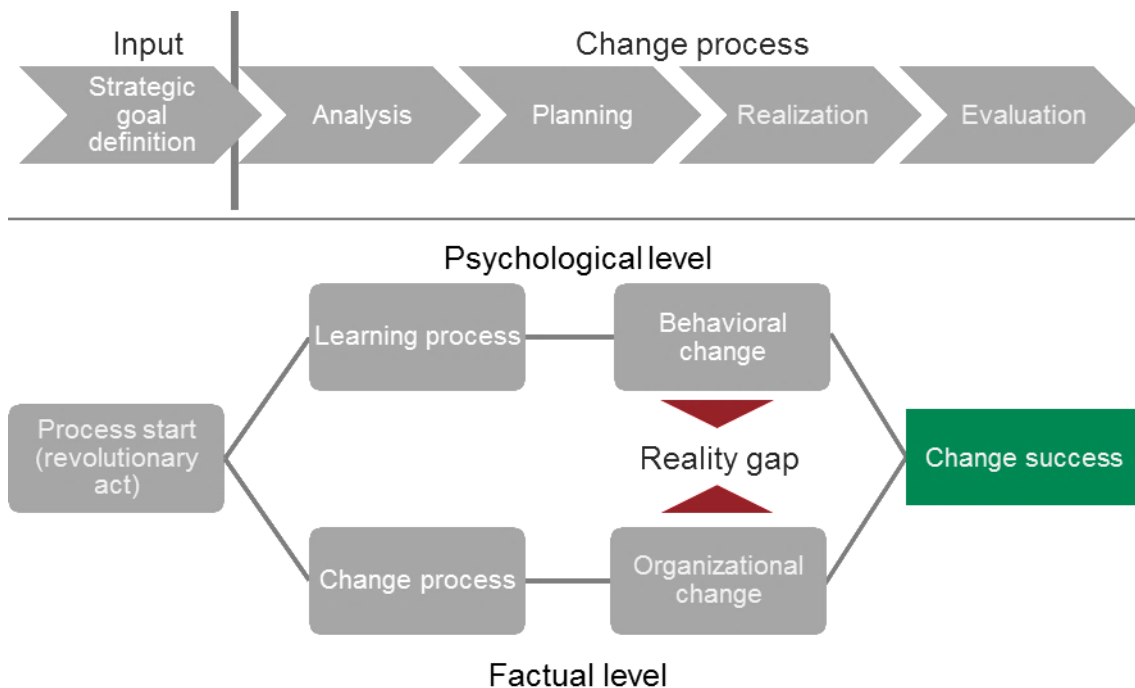
### **8.2.1 Terminology: Change Management**

To understand the concept of change management in this study, the definitions of Gattermeyer/Al-Ani and Vahs should be used. Gattermeyer and Al-Ani define change management as follows: "Under change management all measures are subsumed that are necessary for the initiation and implementation of new strategies, structures, systems and practices" (Gattermeyer, 2001, p. 14). Vahs refers to its holistic nature by defining change management as: "Change management is the purposeful analysis, planning, implementation, evaluation and ongoing development of holistic change measures in companies" (Vahs & Leiser, 2003, p. 32). The definition by Vahs can be linked with the objective of change management according to Klaffke: "The ultimate goal of change management is to achieve the stabilization of the everlasting change" (Klaffke, 2005).

### **8.2.2 Conceptual Approaches to the Design of the Change Management Process**

If change management is understood as an integrative approach, it considers both a factual level with the typical project phases of analysis, planning, implementation, moni-

toring and further development and a psychological level with the stages of unfreezing, changing and refreezing (Lewin, 1953). The two levels are different processes that have to be coordinated to avoid a "reality gap" arising (Figure 2). After the revolutionary act of the process's start, the learning process at the psychological level leads to a change in behavior of the employees and a process of change on the objective level to an organizational change. The change result depends on the behavior and the organizational change. In practice, the operational and organizational structure changes many times faster than the behavior of employees and the corporate culture, producing a "reality gap" and thus leading to a suboptimal change result. To ensure an optimal change result, change management needs to follow an integrated approach and coordinate the psychological and the factual level.



**Figure 2.** Methodology to avoid the reality gap. Cf. Vahs (2007, p. 392).

The two levels have to be planned and executed in parallel, in a synchronous process. The starting point for the change initiative is the strategic goal definition as the input variable. The target values arising from the options of strategic change in the form of the nature of the change initiative (e.g. the strategic realignment of the company, product innovation, merging of companies) and the target dimension of change success (e.g. ensuring competitiveness, increased market share, stronger market and customer orientation). Following the strategic goal definition is the actual change process, with its stages of analysis, planning, implementation and evaluation. The change process involves both the factual and the psychological level to avoid a "reality gap." The success factors on the psychological level are shown in Figure 3.

Based on the studies by Vahs (Vahs & Leiser, 2003) and Picot (Picot, Freudenberg, & Gaßner, 1999), universal factors of change success (unpublished script: Schnitzler, C.C.: Change Management, Fachhochschule Hannover, 2011) can be deduced for the psychological level (Meyerding, 2014a). Figure 3 shows the success factors with the associated issues in this study.





**Figure 3.** Assignment of questions to the success factors of change at the psychological level.

The organizational structure of the change initiative (S<sub>1</sub>) may consist of the steering committee, the core team, the individual project teams and the company as a whole, in which the former are often combined into one person in horticultural companies (Meyerding, 2014a).

In the context of leadership behavior (S<sub>2</sub>), two extremes of management orientation can be named: transactional leadership and transformational leadership. The object of transactional leadership is to offer incentives in exchange for the work that has to be performed. The motivation and commitment of employees are achieved by the design of the work environment and incentive systems. Transformational leadership is not based solely on an exchange relationship. The influence on the behavior of the employees is achieved by a goal and value change. Enthusiasm should be built through meaning and the charisma of the leader, which means an increase in output resulting from a specific "cultural" control (Krüger, 2012).

The success factor communication (S<sub>3</sub>) raises the question of the relationship between bottom-up and top-down communication and the way in which these communication streams should be organized. In terms of top-down communication, attention needs to be paid to the date of the communication, the communication channel, the contents of the communication, the communicator and the form of communication. Bottom-up communication is used for the disclosure of tacit knowledge and also deals with the organization of knowledge dissemination and transmission (Meyerding, 2014a).

Participation (S<sub>4</sub>) is particularly useful in dealing with knowledge holders. This is achieved through the integration of carriers of experiential knowledge into the change management process as well as the transfer of decision and action rights to knowledge

holders (especially to affected employees and external consultants) (Picot, et al. 1999, p. 135). Another possibility is the movement of change management knowledge to the person responsible for change management by knowledge disclosure in the form of bottom-up communication (Meyerding, 2014a).

The functions of the success factor training (S4) are the creation and expansion of employees' skills and the resulting increase in motivation and the credibility of strategic plans. Training can consist of three different components: professional knowledge, methodological knowledge and interpersonal knowledge (Meyerding, 2014a).

The success factor incentives (S5) is used to induce preference compatibility between employee and company goals. Four different types can be distinguished: material incentives, incentives from the task itself, social incentives and incentives for organizational framework conditions (Meyerding, 2014a).

Controlling (S6), as the last success factor, has the objective of "... coordination of information-, planning-, monitoring-, organizational- and personnel management systems to ensure a targeted steering of the change initiative" (Picot et al., 1999, p. 150), thus taking on a targeting function, a service function (communication of deviation between actual and desired values) and an adjustment innovation function (e.g. through benchmarking and the identification of best practices; Picot et al., 1999, p. 150; Meyerding, 2014a).

The limitations of the survey in the present study result from the subjective assessment by managers or horticultural entrepreneurs. Accordingly, the results of two companies are not necessarily comparable. Furthermore, the success factors could be judged differently by other groups, such as employees or external consultants. In individual cases, the specific situation of the company leads to other success factors. The most important limitation of the study is that it is the implementation of change management measures at the right time (S7) that leads to positive results. This timing can only be planned depending on the situation and therefore cannot be mapped in the study.

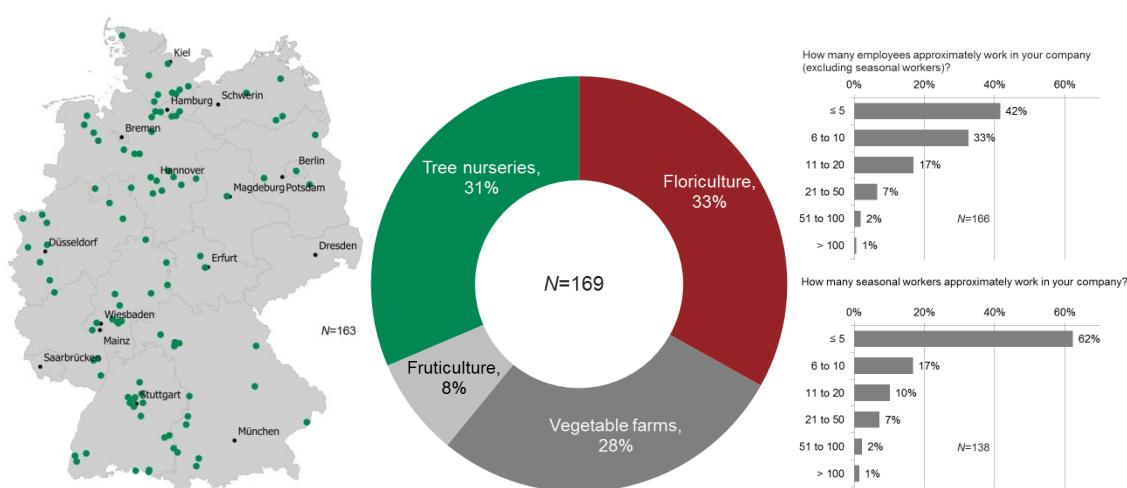
### **8.3 Materials and Methods**

The study is based on a survey of executives from German production horticulture companies conducted between May and December 2014. Horticultural entrepreneurs were contacted with a personalized letter by post or email. The addresses were taken from a commercially available horticulture business directory (Haymarket Media, 2009, 2010). For this purpose, a questionnaire was created with the online tool LimeSurvey and the appropriate link was sent via the letter or email. A total of 169 fully usable questionnaires were evaluated. Complete questionnaires were considered to be ones in which the respondent had progressed through the whole questionnaire, that is, he/she must not have answered all the questions. The survey questions are based on a series of analyses undertaken by Capgemini Consulting in the years 2003 (Claßen et al., 2003), 2005 (Claßen et al., 2005) and 2008 (Claßen & von Kyaw, 2007; see: von Kyaw & Claßen, 2010; Keicher et al., 2012). Change management and related topics are not easy to grasp for horticultural entrepreneurs, because of their education. For this reason, the questionnaire was optimized in several passes through pretests with executives and aspiring executives in horticulture. Many technical business terms had to be represented by tangible synonyms and explanations with examples. The result was a questionnaire with a total of five thematic areas, 34 issues and often diverse response categories.

Many questions were realized due to multiple responses; to avoid a possible primacy or recency effect,<sup>9</sup> the order of the answer choices was randomized for each participant. In addition, there was often an opportunity to give free answers. Despite all the efforts, the participation rate could not be prevented from falling in the last questions. In addition to the individual evaluations of the sets of questions, the relationships with certain structural variables (Figure 1) were investigated. Multiple responses produce dichotomous data; therefore, Kendall's tau-b ( $\tau_b$ ) was used to calculate most correlations (Field, 2009, pp. 181–182). For ordinal or parametric data, Spearman's correlation coefficient ( $r_s$ ) was used as normal distributions were not present (Field, 2009, pp. 179–181). The direction of relationships is not always clear in advance; therefore, two-sided analyses were performed throughout. In the text, the relationships (correlations) are presented as follows: (1. type of correlation coefficient; 2. level of significance; 3. number of considered records in the calculation), for example ( $\tau_b=.26$ ;  $p<0.01$ ;  $n=106$ ).

### 8.3.1 Structure of the Companies in the Sample

As Figure 4 (left) shows, the surveyed horticultural companies come from all over Germany.



**Figure 4.** Structure of the companies in the sample.

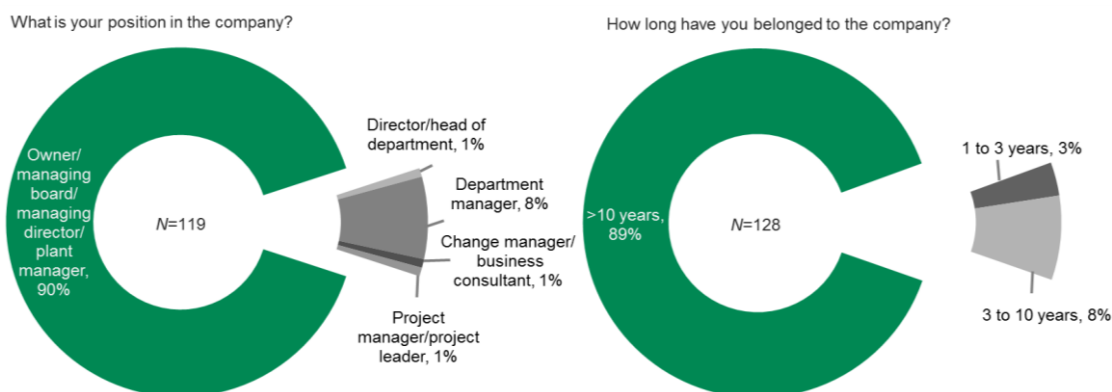
The companies analyzed represent the entire spectrum of German production horticulture (Figure 4, middle). One-third of the respondents classified themselves into the category floriculture (33 %); vegetable firms are represented by 28 %. Tree nurseries are overrepresented, with almost a third of the respondents (31 %), whereas fruit farms, accounting for 8 % of the respondents ( $N=169$ ), are under-represented compared with the population.<sup>10</sup> The focus is on small and medium enterprises. Thus, 75 % of the companies surveyed have fewer than 10 employees (excluding seasonal workers) and only 3 % have more than 50 employees (Figure 4, top right,  $N=166$ ). Of all the companies represented in the study, 62 % employ an annual average of fewer than 5 seasonal workers (Figure 4, bottom right,  $N=138$ ).

<sup>9</sup> Denotes that respondents assign greater importance either to the former or to the latter. By randomizing the order of the answers, these effects can be excluded. See, for example: Murphy, Hofacker, & Mizerski (2006).

<sup>10</sup> Population: fruticulture: 31.9 %; floriculture: 25.5 %; vegetable farms: 17.6 %; tree nurseries: 9.8 %; and other: 15.1 %. See: Gurrath (2006).

### 8.3.2 Structure of the Respondents in the Sample

Basically, any responsible manager of a horticultural company is both the initiator of and affected by change processes. Responses from experienced decision-makers within the company are important for the quality of the results. For a complete picture of the relevant parties of change processes, other hierarchical levels should be surveyed too. This point represents a weakness of the present study.



**Figure 5.** Structure of the respondents in the sample.

Nine out of ten respondents act as the owner, chairman, managing director or plant manager. The remaining 10 % consist of directors or senior department heads (1 %), project managers (1 %) and department heads (8 %,  $N=119$ , as shown in Figure 5, left). The length of service in the company, which was also collected, shows only a few participants (3 %) with short employment duration. Most of the answers are based on long-standing knowledge of their own organization. Almost 90 % of the respondents have corporate experience of ten years and more (Figure 5, right,  $N=128$ ). The participants in the study are therefore, with a score of almost 90 %, top decision-makers with many years of experience.

## 8.4 Results and Discussion

### 8.4.1 Causes and Backgrounds of Change Management

In comparative studies across all the industries in Germany, change management occupied a leading position among the personnel issues of the present and future (Claßen & von Kyaw, 2007). The importance of change management in horticulture also becomes apparent in this study. At present, change management is a very important issue in 35 % of horticultural companies ( $N=114$ ). Many participants in the study, while looking into the future (in 2020), increased their assessment by one level (e.g. from important to very important); barely a respondent anticipated an importance decrease. This result indicates that decision-makers in horticultural companies see a high need for change in the future. For the future, 87 % of the respondents expect a major role of change management and only 13 % a less important or insignificant value ( $N=106$ ).

#### 8.4.1.1 "Megatrends" Behind the Change Initiatives

Profound changes in society, economy and technology are becoming ever more hostile from the viewing angle. These "megatrends" are the driving force for future change programs and embedded change management measures. From the literature (Aronoff,

1998; Maas, 2015; Rump & Walter, 2013), comparative studies (Claßen et al., 2003; Claßen et al., 2005; Claßen & von Kyaw, 2007; von Kyaw & Claßen, 2010; Keicher et al., 2012) and the trade press, 22 "mega-trends" were identified. This list is not complete. However, allocated by the study participants to the category "others," the trends and developments will conform to just two aspects: *changed consumer behavior* and *progressive market liberalization*. Therefore, the selection represents the most important of the coming developments. Up to five aspects could be selected in answer to the question "Which five 'megatrends' will be the causes of fundamental change processes in your company in the next decade?" (Figure 6).



**Figure 6.** "Megatrends" in German production horticulture.

The main theme *environment* (64 %) is considered to be the most important megatrend by far. This includes both the effects of climate change and the topics of environmental regulations and costs, which are especially relevant to horticulture. The subject area *demographics*, with 32 %, is the fifth most important megatrend in German production horticulture. In the comparative study on all industries across the German-speaking world, *demographics*, with 48 % of the responses, was the most important megatrend. In second place, with 48 %, is the megatrend *changing consumer behavior* (such as rising health consciousness) in German production horticulture, followed by *shortage of resources/prices* (e.g. raw materials), with 40 %, and *changes in the labor market* ("war for talent" and shortage of skilled personnel).

Human resource issues can be found particularly frequently in the megatrends. They include megatrends such as the *labor market*, *demographics*, *working attitude*, *urbanization*, *diversity*, *division of labor*, *working methods* and *women*, for example their share in management positions.

Other typical sustainability issues are among the megatrends in German horticulture and clearly top the list: *environment*, *changing consumer behavior* and *resource shortages/prices*. Thus, sustainability issues will be the megatrends of the next decade and will, from the perspective of decision-makers, be the cause of fundamental change processes

in German production horticulture companies. The progressive *market liberalization and simultaneous concentration processes* account for 22 % of the 124 horticulture enterprises that count this issue as being among the most important change causes. The *acceleration* (e.g. "time to market," shorter product life cycles) is clearly noticeable for 16 % of the respondents.

The other megatrends with a certain degree of importance (>10 %) are hardly surprising. Each of these issues could be investigated in greater depth as a starting point for transformation processes: the *Internet*, for example Web 2.0 (facebook, etc.) and increasingly convergence media (smart TVs, phones), with 23 %, *urbanization* (e.g., metropolises, rural exodus), with 15 %, and *new technologies* (e.g., nano-, bio- and gene technology), with 11 %. Six of the megatrends play a negligible role for horticultural companies.

As shown in Figure 1, other structural factors were also examined. The results show a significant negative correlation with the *number of seasonal workers* and the importance of the megatrends *demographics* ( $\tau_b = -.25$ ;  $p < 0.01$ ;  $n = 138$ ) and a positive correlation with the *importance of financial markets* ( $\tau_b = .20$ ;  $p < 0.05$ ;  $n = 138$ ) as well as the *end of nation states* ( $\tau_b = .18$ ;  $p < 0.05$ ;  $n = 138$ ).

The assessment of the surveyed decision-makers with respect to the economic success of their own business compared with that of direct competitors is positively related to the importance of the topic *labor market* (e.g. "war for talent," shortage of skilled personnel;  $\tau_b = .20$ ;  $p < 0.05$ ;  $n = 114$ ). For successful growth-oriented companies, the skilled labor shortage is already a resource bottleneck. This assessment is also reflected in the result that companies that have *achieved their targets* with respect to quantifiable indicators on average over the past two years consider the development on the *labor market* ( $\tau_b = .28$ ;  $p < 0.01$ ;  $n = 72$ ) to be especially relevant.

For horticultural companies, for which dealing with change processes in the future is particularly important, the importance of the megatrends *resource shortages/prices* ( $\tau_b = .18$ ;  $p < 0.05$ ;  $n = 106$ ) and *progressive market liberalization and simultaneous concentration processes* ( $\tau_b = .25$ ;  $p < 0.01$ ;  $n = 106$ ) is particularly high. This shows that horticultural companies that are "forced" by external developments to adapt to changes are more dependent on assistance with the implementation of change projects or expect stronger opposition within the company than companies that adjust proactively to changing environmental conditions.

A significant negative correlation is shown in the subjective level of *difficulty* in terms of the change taking place within the company and the importance of the trend *IT flexibility* ( $\tau_b = -.21$ ;  $p < 0.05$ ;  $n = 97$ ) and a positive correlation with the importance of *shortage of resources/prices* ( $\tau_b = .21$ ;  $p < 0.05$ ;  $n = 97$ ). This result could indicate that more technologically advanced horticultural companies estimate the level of *difficulty* of the current changes to be lower, because they are generally more open to innovations and/or have gathered more experience with different (technology-related) processes of change. For horticultural companies that are affected by a shortage of resources and corresponding prices, the current processes of change seem to be perceived as particularly difficult.

### 8.4.1.2 Occasions of Change Projects in Horticultural Companies

Change management is not an end in itself but the response to a need for change within the company. To be able to design a suitable change management, the change's cause and requirements should be identified. These largely determine the appropriate transformation architecture. The participants in the study were asked to specify the most common causes of change projects in their companies in the next three years from a selection of 15 different examples.



**Figure 7.** Causes of change projects in the next three years.

As can be seen in Figure 7, five main reasons for change in horticultural companies can be identified.

- ▶ *Changed market strategy/sales approach* (42 %) – The customer as a dynamic creature requires the continuous attention of the company. Adjustments to changing demand structures and behaviors are the key to survival and the expected return on investment of the owners.
- ▶ *Corporate succession/business handover* (40 %) – Almost 90 % of the respondents have belonged to their company for more than ten years. For many horticultural companies, the succession is unclear. Furthermore, it is a fundamental process of change, which is connected to a large number of, mainly personal, challenges, especially in family-run businesses.
- ▶ *External changes, laws, etc.* (36 %) – Horticultural companies are subject to strict regulation and monitoring, particularly in the environmental field. The organizational structure and the production methods and technologies are therefore highly dependent on the legislation. Changes in political demands and currents can therefore quickly have a direct impact on corporate practices.
- ▶ *Changed HR concepts* (32 %) – Demographic change, urbanization and the changed working attitude of the staff require the reaction of the company to attract and retain staff in the future.

- ▶ *Cost reduction programs* (32 %) – As long as there are companies in market economies, the search for further efficiency gains will remain a significant driver of change initiatives, whether they are reactive "in difficult times" or, which is considered to be more purposeful, proactive "in better times."

In the comparative study (Claßen & von Kyaw, 2007, p. 15), the main reasons identified for change projects in Germany were *restructuring/reorganization* (49 %), *growth initiatives* (38 %), *changed corporate strategy* (33 %), *cost-cutting programs/"rightsizing"* (32 %), *changes in market strategy/sales approach* (32 %) and *mergers and acquisitions* (21 %,  $N=122$ ). Here, the larger organization size compared with German horticultural businesses becomes apparent. However, the *restructuring/reorganization* option must be considered critical at this point, since restructuring and reorganization can be understood as synonyms for a change process. In some cases, it can be argued that restructuring takes place for its own sake, carried out for example after a change of leadership, to break historically grown structures and fiefdoms.

### 8.4.1.3 Main Objective of the Change Initiatives in German Production Horticulture

In the occasions instigating change projects, a number of background causes often come to fruition. In every tenth company, this currently involves *increasing growth* (13 %,  $N=104$ ). In the comparative study of all the sectors in Germany, with 44 %, this was the main objective of change initiatives. *Cutting costs* was mentioned as the main target by 16 % of the respondents. In the comparative study, the equivalent figure was 29 %. *Quality improvement*, with 30 %, is located in the first place for German horticultural companies (14 % in the comparative study). Often, however, the project objectives *quality* and *cost reduction* are in contradiction. For German production horticulture, the issue of sustainability is essential, given that 24 % of the respondents named *practicing sustainability* as the main objective of their corporate changes. This item was not captured in the comparative study. That the list used, consisting of six main targets, is sufficient was demonstrated by the fact that only 14 % ticked *something quite different*.

### 8.4.2 Attitude of the Decision-makers towards Change Management

Leadership is a key organizational issue in horticultural enterprises (see chapter four). Nevertheless, it raises the question of how leadership should be designed. In the management literature, two oversubscribed leadership types are typically listed (transformational and transactional leadership; Krüger, 2012). Considering change initiatives, generally neither of these two extremes is right or wrong. Therefore, a situational leadership style should be chosen (Claßen & von Kyaw, 2007, p. 19). Transferred to management styles, this results in two types of managers. In the transactional type (rather "tough guy"), the employee dimension has subordinate, mostly secondary importance as long as success can be seen. This can be compared with the transformational employee-oriented manager, who reflects on all the decisions in the light of the impact on the stakeholder employee.



In addition to the normative, in the wake of the social dimension of sustainability's substantially fundamental question of what is "right," it is interesting that both types occur in corporate practice. For this reason, it was asked in the study how the following points of view are distributed among managers and entrepreneurs:

- ▶ "If the suffering of the employees is just large enough they will adapt to the necessary changes."
- ▶ "We need to make the persons concerned become participants and actively support the process of change."

As response categories, ten intervals (ten percentage levels) were predefined. The clusters in the distributions provide a tendency for the views.

In the results, it is clear that most horticultural entrepreneurs and managers disagree with the statement "increased distress." More than 30 % of the respondents agree with the statement at 0 % ( $N=100$ ). A different picture emerges for the statement "we must ensure that those affected become involved." Most of the respondents agree with this statement at a level of more than 50 %. However, only about 20 % of the respondents agree with the statement 100 % ( $N=108$ ). The result could indicate that the employee orientation is indeed strong, but the willingness of decision-makers to let the employees participate in the decision-making process does not exist to the same extent. A limiting factor is that the agreement on this issue is still no direct reference to the actual behavior of executives. At this point, a socially desirable response behavior (Stocke, 2004) could distort the result, in that the statement that the persons concerned should be made participants will indeed produce agreement, but the real leadership behavior shows a different picture.

### 8.4.3 Challenges and Success Factors in Change Processes

One of the major contributions of this study is the identification and analysis of the importance of success factors in change processes in German production horticulture. On the basis of Senge (1990) and Kotter (2011) but mainly grounded on the studies by Vahs and Leiser (2003) and Picot, et al. (1999), Schnitzler (unpublished) derived general factors of change success (Figure 3) on the psychological level. These general factors of change success and their implementation in a practical process model (Meyerding, 2014a) form the basis for the analysis of the success factors in the present study. In the aforementioned process model, the factors are applied accordingly at different stages of the change project (Figure 2, above). The application and intensity of the factors must be designed individually and in detail for each change situation. The deduced factors of change success are confirmed by the studies of inter alia Claßen (Claßen et al., 2005; Claßen & von Kyaw, 2007) and von Kyaw (von Kyaw & Claßen, 2010).

### 8.4.4 Challenges in the Implementation of Change Processes

The first clue may be the respondents' indication of the success factors when asked about the obstacles to the implementation of corporate strategies and change processes. Essentially strategic confusion, political conflicts and technical mistakes were mentioned as reasons for difficulties encountered in implementation (Figure 8). *Too little willingness to take responsibility* and *interest conflicts and conflicts of objectives of the parties involved* are each perceived by 34 % of the respondents as the most difficult problems in the implementation of change processes. As a strategic problem, the surveyed decision-makers in German horticultural production see that *long-term measures are sacrificed for short-term improvements in earnings* (29 %). In fourth place, with

25 % of mentions, is the *lack of skills/qualifications/expertise of those involved* in the change process. Here a self-critical view of the horticulture entrepreneurs can be observed. Challenges that can be assigned to the factual level of the change process are in the middle of the most difficult challenges in the implementation of change initiatives. These are: *no real sustainable monitoring/performance review of the activities* (23 %), *no clear objectives* (22 %), *too many activities without prioritizing* (18 %) and *weak project management* (10 %). Change fatigue is clear for 12 % of the respondents in the point *paralysis of the organization through ongoing reorganization*.



**Figure 8.** Problems in change processes.

Other challenges were noted, with 8 % of the respondents referring to the *lack of an international/global perspective* and the *missing link between "top-down" and "bottom-up" communication*. *Abandoning change management* is considered as problematic only by 7 % of the horticultural entrepreneurs. The *lack of commitment of the owner* has little relevance, with 5 % of mentions. This result is, however, hardly surprising, since most of the participants are also the owner of the horticultural company under investigation. The challenges that result from a *lack of concretization of the change by a business case* and *missing or lack of support from the line management*, each accounting for 3 % of mentions, are relatively insignificant ( $N=77$ ). Line management in the traditional sense, however, cannot be expected within the companies surveyed due to their size.

In horticultural companies, which employ *many seasonal workers*, the challenge of the *lack of clear objectives* is perceived as less problematic ( $\tau_b=-.16$ ;  $p<0.05$ ;  $n=138$ ). For companies that consider themselves to be *economically successful* in relation to their direct competition, *not enough change management* ( $\tau_b=-.20$ ;  $p<0.05$ ;  $n=114$ ) is less of a problem. Other statistically significant relationships can be observed between the *current importance of change management* and the *lack of support of line management* ( $\tau_b=-.18$ ;  $p<0.05$ ;  $n=114$ ), the *paralysis of the organization through ongoing reorganization* ( $\tau_b=.21$ ,  $p<0.05$ ;  $n=114$ ) and the *sacrifices of long-term measures for short-term improvements in earnings* ( $\tau_b=.19$ ;  $p<0.05$ ;  $n=114$ ). The results give the impression that the importance of change management is particularly recognized if deficits in strategic planning and implementation are visible. The same applies to the future importance of change management in the company and thus to the *paralysis of the organization through ongoing reorganization* ( $\tau_b=.20$ ;  $p<0.05$ ;  $n=106$ ), *no real sustainable monitoring/performance review of activities* ( $\tau_b=.19$ ;  $p<0.05$ ;  $n=106$ ) and the *sacrifice of long-*

term measures for short-term improvements in earnings ( $\tau_b=.27$ ;  $p<0.01$ ;  $n=106$ ). In addition, the perceived *difficulty* of the current change process within the company has a statistically significant relationship with some problem areas in the implementation of change processes (*too many activities without prioritizing* ( $\tau_b=.18$ ;  $p<0.05$ ;  $n=97$ ), the *paralysis of the organization through ongoing reorganization* ( $\tau_b=.20$ ;  $p<0.05$ ;  $n=97$ ), *waiver of change management* ( $\tau_b=-.25$ ;  $p<0.01$ ;  $n=97$ ) and *the lack of commitment of the board/owner* ( $\tau_b=-.20$ ;  $p<0.05$ ;  $n=97$ ). Companies that could have *achieved their goals* very well on average over the past two years could also define *clear objectives in the context of change projects* ( $\tau_b=-.22$ ;  $p<0.05$ ;  $n=72$ ). For companies with *many employees*, the problem of the *missing link between "top-down" and "bottom-up" communication* frequently appeared ( $\tau_b=.26$ ;  $p<0.01$ ;  $n=166$ ).

#### 8.4.5 Success Factors in Change Processes

In addition to the "negative" analysis – the question of the implementation barriers – the respondents were also asked about a "positive" view – the question of the success factors. The list of success factors demonstrates the high level of importance of soft factors in changes in German production horticulture, a conclusion that is slowly prevailing generally (Todnem By, 2005). The broad diversification of the success factors indicates that there are not one or two factors of change success, but that only a sensible combination of success factors positively affects the result of change initiatives (Figure 9; Mento, Jones, & Dirndorfer, 2002).



**Figure 9.** Success factors in known change processes.

At the top of the list of success factors that are known to the study participants from past change processes is a *realistic, clear vision/goals and their communication*, with 41 %. This shows that important foundations for the subsequent success of change are already set in the project phase of the strategic definition of goals. In addition, the *team spirit and motivation of the project team* or the change concerned were regarded as decisive for success (39 %). The *timing* factor (Figures 3 and 9) accounts for 31 % of the surveyed decision makers in German production horticulture concerning the three most important success factors. This is followed by the factors *information/communication* with the points *open, clear communication within the project and towards others* (26 %) and the *"right" information policy* (19 %). The *leadership* factor was mentioned fifth

with the success factor "*right*" leadership (21 %). With 17 % and 15 %, the success factors *participation of those affected in the decision process* and the *training of the person concerned* were named in places seven and nine. These two success factors are summarized in the factor *participation and training*. An *understanding of the urgency* of the need for change, therefore, is counted by 16 % of the respondents among the main three factors for success. Other success factors reported, with 9 %, are the *incentive system for those involved* (factor *incentives* in Figure 3) and *consistent monitoring and controlling of the change process* (factor *controlling*). The *commitment and the credibility of management* are considered only by 7 % of respondents to be among the three most important success factors. This result can be explained by the study participants themselves being the decision-makers in the horticultural business. In the comparative study, this success factor was in first place, with 75 %. In the results of this question, the importance of the factors of the psychological level of the change project becomes apparent. Subjects of the factual level end up with *projects/programs* (5 %) and *professional project management* (3 %) in the rear seats of the success factors ( $N=98$ ).

For companies with *many employees*, the *commitment and credibility of management* ( $\tau_b=.15$ ;  $p<0.05$ ;  $n=166$ ) is more frequently counted among the three most important success factors, but a *realistic, clear vision/goals and their communication* ( $\tau_b=-.15$ ;  $p<0.05$ ;  $n=166$ ) and a *tuned temporal approach* ( $\tau_b=-.17$ ;  $p<0.05$ ;  $n=166$ ) were rarely mentioned. Horticultural companies that see themselves as particularly *economically successful* compared with their direct competitors named the *professional project management* as having a significant impact on the success of change processes more often than less successful companies ( $\tau_b=.18$ ;  $p<0.05$ ;  $n=114$ ). Surprisingly, companies that perceive the current change as being particularly *difficult* see *professional project management* as a success factor of transformation projects ( $\tau_b=-.20$ ;  $p<0.05$ ;  $n=97$ ) less frequently, even though these companies particularly frequently mentioned *many activities without prioritizing* ( $\tau_b=.18$ ;  $p<0.05$ ;  $n=97$ ) and a *paralysis of the organization through ongoing reorganization* ( $\tau_b=.20$ ;  $p<0.05$ ;  $n=97$ ), which actually just points to a lack of *professional project management*. Perhaps *professional project management* is not even recognized as a way to simplify the process of change.

Unlike the question in Figure 9, the respondents were then asked to look into their own companies (Figure 10). Up to three success factors could be chosen. Again, the order for the respondents was randomized.



**Figure 10.** Success factors in change processes within the company.

The results support the importance of the factors of the psychological level of the change process, so the *involvement of employees in decision-making* (factor *participation/training*) is, with 53 % of the responses, in first place among the factors of successful change processes within the company. *Decent leadership and acting as a role model* (factor *leadership behavior*) can be found, with 47 %, in second place. In third place is the success factor *reducing and avoiding conflicts and resistance* (41 %). This success factor is not attributable to any of the general factors directly. Rather, the correct use of the factors (Figure 3) is responsible for reducing and avoiding conflicts and resistance. Only as the fourth of the success factors does a topic from the factual level of change processes appear. The result of 31 % of mentions of the point *analyze and understand the situation and environment* shows the importance of project phases one and two, *strategic goal definition* and *analysis*, to the success of change (Figure 2). The *development of the corporate culture* is to be found in fifth place, with 25 %. The *leadership* factor (operationalized by the success factor *correct leadership*) occupies sixth place, with nearly 25 %. The factor *information and communication* reached seventh place, with 24 %. Further points that can be assigned to *leadership behavior* are *identify and enshrine successes* (19 %), *promote leadership* (12 %), *force focus and alignment* (3 %) and *ensure mobilization and commitment* (2 %). The factor *incentives* can be found in midfield with 17 % of the mentions. The factors *controlling*, here operationalized as *project/process controlling*, with 10 %, and *develop and build structure and monitoring*, with 9 %, are located in the lower ranks. To carry out the *training and development of target groups*, the area of *participation and training* is of secondary importance (7 %) in German production horticulture. The same applies to the success factor of the factual level of the transformation process, *capture and design organization and processes* (19 %, N=93).

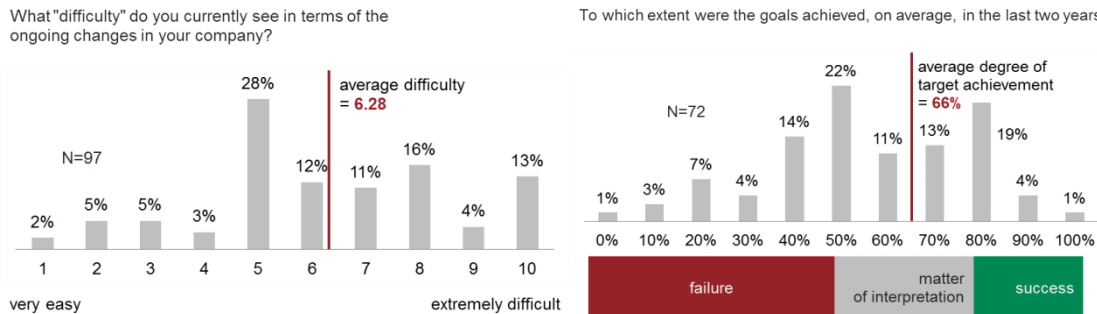
In companies with *many employees* (excluding seasonal workers), the *right leadership behavior* ( $\tau_b=.17$ ;  $p<0.05$ ;  $n=166$ ) and the *project/process controlling* ( $\tau_b=.16$ ;  $p<0.05$ ;  $n=166$ ) were statistically significantly more frequently named as a success factor in the own business than in companies with fewer employees. With the increase in seasonal workers, the importance of the success factors *reduce and prevent conflicts and resistance* ( $\tau_b=-.17$ ;  $p<0.05$ ;  $n=138$ ) and *information and communication* ( $\tau_b=-.23$ ;

$p < 0.05$ ;  $n = 138$ ) decreases. Horticultural companies that perceive themselves to be *economically successful* compared with their competitors named the success factor *training and development of target groups* particularly more frequently in relation to the success of change processes in their companies ( $\tau_b = .22$ ;  $p < 0.05$ ;  $n = 114$ ).

#### 8.4.6 Structural Variables: Economic Success, "Difficulty" of Change and Change Speed

As shown in Figure 1, in addition to the *number of employees* and the *number of seasonal workers*, more "structural variables" were collected, which can be assumed to have an influence on the various issues in the area of change management (for example, on the factors of success). One difficulty arises from the fact that these questions need to be answered especially subjectively. What is difficult? What is fast? The scale was also defined no further than the two extreme values of zero ("easy") and ten ("extremely difficult"). A limitation remains concerning the issue that no anchor was set. As already mentioned, the classifications represent the perceptions of the respondents and do not meet the criteria of reliability. However, they were a viable solution to analyze very different companies from different sectors of production horticulture and diverse change initiatives.

When asked about the *difficulty* of the changes currently taking place in the company on a scale from one (very easy) to ten (extremely difficult), an average degree of difficulty of 6.28 was observed ( $N = 97$ ). Figure 11 illustrates the results. They are particularly interesting with regard to the analysis of correlations with other issues.



**Figure 11.** Degree of difficulty (left) and degree of target achievement (right) of change initiatives over the past two years.

Concerning the question "if you characterize the *speed* of your business – analogous to road traffic – how fast is your business moving," most decision-makers in German production horticulture, considering the possible answers, described the speed of change as rather slow ( $N = 34$ ).

An average degree of *target achievement* of 66 % was calculated from the answers to the question "to which extent were the goals achieved, on average, in the last two years?" (Figure 11, right). It appears that more than half (51 %) of all the change initiatives in German production horticulture can be viewed as a failure ( $N = 72$ ). Here, the need for enhanced change management competency becomes apparent.

The relationships between the collected structural variables are shown below. Companies with *many employees* (excluding seasonal workers) also deal with *many seasonal workers* (or vice versa) ( $r_s = .27$ ;  $p < 0.01$ ;  $n = 136$ ) and perceive a greater *change speed*

( $r_s=.37$ ;  $p<0.05$ ;  $n=31$ ). Relationships between the *number of seasonal workers* and the *perceived economic success compared with direct competitors* ( $r_s=.30$ ;  $p<0.01$ ;  $n=93$ ), the *current importance of change management* ( $r_s=.23$ ;  $p<0.05$ ;  $n=92$ ), the *average achievement of quantitative indicators* ( $r_s=.30$ ;  $p<0.05$ ;  $n=60$ ) and the *perceived pace of change* ( $r_s=.43$ ;  $p<0.05$ ;  $n=28$ ) can be observed. A considerable, significant relationship is apparent for the structural variables of *economic success*, particularly for the *degree of target achievement, as measured by quantitative indicators* ( $r_s=.50$ ;  $p<0.01$ ;  $n=71$ ) and the *perceived pace of change* ( $r_s=.46$ ;  $p<0.01$ ;  $n=34$ ). Decision makers who believe that change management will be particularly important in the future assess the *difficulty* of the change process taking place in their company as being particularly high (or vice versa;  $r_s=.23$ ;  $p<0.05$ ;  $n=86$ ). Furthermore, there is a relationship between the *average achievement of objectives* based on quantifiable metrics in the past two years and the *perceived pace of change* ( $r_s=.58$ ;  $p<0.01$ ;  $n=27$ ). It could be concluded that successful companies are changing faster than less successful ones. However, the relationships shown illustrate mainly the consistency and traceability of the response behavior.

## 8.5 Conclusion

The German production horticulture sector has been experiencing a structural shift towards larger organizational units for decades. As shown in the development models of companies, for example those presented by Greiner (1983) and Bleicher (1991), this growth of organizations is already leading to potential crises, which have to be overcome in change initiatives. Furthermore, the corporate environment is changing increasingly. The study has identified the main megatrends, which will be the cause of the fundamental change processes in German production horticulture companies over the next decade. These are mainly trends regarding the *environment, modified consumer behavior, resource shortages* and the *labor market*. The horticultural entrepreneurs see the main objectives of change projects as the *improvement of product quality and sustainable agricultural practices*; only afterwards should the *costs* be reduced. In the next three years, *changing market strategies, customer approaches* and *corporate succession/business handover*, as well as *external changes*, for example the legal situation, will be the most common causes of changes in the horticultural companies studied. The study also points out that the importance of dealing with processes of change is detected by the horticultural entrepreneurs and will increase even further in the future.

Change management involves a factual level and a psychological level. The two levels need to be developed simultaneously to avoid a reality gap between the structural change and the behavioral change of those involved. The horticultural entrepreneurs surveyed recognize the need to involve those who are affected, for example in the decision-making process. Overall, the study demonstrates that dealing with change processes has little professional design in most horticultural companies. German production horticulture is faced with the challenge of improving its ability to transform significantly. Therefore, business consultancy services can make a valuable contribution.

The study indicates that the most difficult problems encountered in the implementation of change processes arise especially from *low willingness to take responsibility and interest and goal conflicts of those involved*. In addition, *long-term measures are often sacrificed for short-term improvements* in results. The study also provides important clues to which success factors are crucial to the success of change initiatives. Mentioned here are in particular a *realistic, clear vision and goals as well as their communication within the company*. In second place, the importance of the psychological level of

change management becomes apparent through the point *team spirit and motivation*. Furthermore, the relevance of a *coordinated temporal approach* to the change success is shown in the study.

From the comparative studies and the results of the present study, six factors of the psychological level of change management can be derived. These are *leadership behavior, controlling, incentives, participation and training, information and communication and timing*. The use and configuration of these factors in the various stages of a change project are, as the present study shows, dependent on the organizational structure, which includes the *number of employees* and the *number of seasonal workers*, as well as on the *economic success* of the company, the *difficulty* of the change and the *pace of change*. In the surveyed horticultural companies, the factors participation and training (with the aspect of *engaging employees in decision-making*) and *leadership behavior* (with the aspect of *adequate leadership, acting as a role model*) were particularly frequently identified as being crucial to the success of change.

Economically sustainable horticultural companies are able, as far as possible proactively, to adapt to changing environmental conditions. Not only the classical indicators of profitability, stability and liquidity help to reflect adequately the economic dimension of sustainability. The ability to change may therefore represent a key indicator of the economic sustainability of horticultural companies. The identified success factors in this study could be levied for this purpose in a questionnaire and compared with the average of the respective sector.

Due to the small number of cases, for example regarding the *loss of productivity* and *turnover rate*, the influences of the success factors could not be quantified. Therefore, further research is needed to determine the relative influence of different factors on the success of change. However, such measurements are complex, because not only the implementation of certain measures but also their timing and interdependencies are expected to affect the success of change. A sensible supplement to the present study would also be a survey of employees and external consultants concerning the success factors of change initiatives in German horticulture, as this would be likely to lead to different results.

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## 9 General Discussion

As outlined in the introduction, this thesis aims to contribute to the socially sustainable development of horticultural companies in Germany. Sustainability has developed from an ecocentric normative idea to a holistic approach based on three pillars – ecology, economy and social development (United Nations, 2002, p. 55). However, the social dimension of sustainability has not yet been addressed in research in as great a detail as the other two dimensions (Hauff & Kleine, 2009, p. 21).

As mentioned in the introduction the social dimension of sustainability is not sufficiently defined. This is depicted only rudimentarily in particular in sustainability assessment systems in agriculture. One reason for this could be that most enterprises in agriculture in Germany are family businesses with few employees, so that these systems are focused on the family rather than employees. Nevertheless the social dimension has clearly not given the weight of the other dimensions ecology and economy. Due to much higher labor intensity, employment of non-family labor is much more common in horticulture and more attention to the social dimension regarding the employees is needed. But also sustainability assessment systems for other industries (for example the Global Reporting Initiative (GRI), 2011, 2006a, 2006b, 2006c, 2006d) lack indicators for “soft” issues of social sustainability such as emotion and freedom.

In order to contribute to closing this gap, one first needs to define what social sustainability is for an enterprise. For this purpose, a modified extended capability approach (MECA) was presented for discussion as a guide and definition of social sustainability in organizations in chapter two. The MECA was then faced with three scientific sustainability evaluation systems in agriculture to identify gaps and potentials with respect to the social dimension of sustainability. As a result it became apparent that these sustainability evaluation systems failed to sufficiently address many aspects of a good life or aspects of social sustainability (MECA). The most important gap between the sustainability assessment systems and MECA was identified for factors of the satisfaction of the employees. For this reason job satisfaction was identified as an indicator of social sustainability of horticultural enterprises (see Table 1, p. 8 in the general introduction section).

Another question, that arises when dealing with social sustainability of horticultural enterprises, is what value these social sustainability issues have to the consumer of horticultural products. Especially it is of interest to compare the value of social issues with those of environmental ones, because the communication of social sustainability to the consumer is not that common compared to the communication of ecological sustainability. The sustainability performance of a horticultural enterprise can be communicated to the consumer using labels. The social dimension was represented by Fairtrade and “Ein Herz für den Erzeuger” (A heart for the producer) label (see chapter three). Consumer preferences for food labels were evaluated using the example of tomatoes in Germany and a comparison of a quasi-experiment with two stated preference approaches were made. Another objective of the study was to quantify the part-worth utilities of product characteristics such as origin, price and food labels. The real purchasing situation was simulated and evaluated in a quasi-experiment using the choice-based conjoint analyses.

Another question was how important social sustainability issues are for the organizational design of horticultural companies. For this reason chapter four was dedicated to

the importance of individual organizational topics (including the area employees) for organizational design from the perspective of horticultural entrepreneurs. The aim of the study in chapter four was to identify issues that will shape the organizational design in the future from the perspective of decision-makers in German horticultural companies. The study was also done to show overriding trends and to collect the perceived current competence of decision-makers in the different areas, as well as their previous experience. The study in particular had the goal to identify areas in which there is a gap between the future importance of the issues and the perceived competence of horticultural companies. This was especially the case for “soft” employee-related issues from the social dimension of sustainability.

The measurement of employee satisfaction can close many gaps identified in the other sustainability evaluation systems (see chapter two). Furthermore, the social dimension of sustainability has a higher value for the consumer (see chapter three), as it is the case for example, for certain aspects of the environmental dimension. Employee related organizational issues are also important (and will be even more so in the future) in the opinion of decision-makers in horticultural companies (see chapter four). To measure subjective job satisfaction, Warr’s (2007) vitamin model was used. The vitamin model and its operationalization were tested in German horticulture in the study in chapter five. Chapter six showed more descriptively the impact of the identified job characteristics on work and life satisfaction and the preferences regarding the job characteristics of employees in German horticulture. In addition, personal characteristics were examined. For the sustainable development of a horticultural company, not only the needs of the present generation (chapter six) are important, but also the needs of future generations. For this purpose, the vitamin model was also tested with the data of specialized vocational and master scholars in chapter seven. Furthermore, the preferences of students of horticulture science and of specialized vocational and master scholars were compared in chapter seven with those of today’s employees in horticulture (chapter six). As a result, differences between the groups become apparent.

To become more social sustainable, the horticultural company itself also has to change, including its strategy, organization, technology and culture. The experience of decision-makers in horticultural companies, when it comes to change processes was examined in chapter eight. To this end, the study identifies the causes of fundamental change processes in horticultural companies, shows overall trends and identifies the success factors of change initiatives in German horticulture production companies from the perspective of the decision-makers participating in the study. Again showing the importance of employee related issues.

## 9.1 Social Sustainability

The Brundtland report defines sustainability in terms of the needs of the present and future generations (Brundtland, 1987, p. 54). These needs are reflected not only by objective indicators such as the equal distribution of goods but also by other not so easy to measure “soft” factors, which influence human emotions and well-being (Nussbaum, Celikates, & Engels, 2010; Nussbaum, 2003). First, it was necessary to define what could be understood by social sustainability at the organizational level. For this reason, chapter two reviewed some approaches to social sustainability (Bentham, 2009, 1789, pp. 14–18; Haug & Gerlitz, 2007, pp. 189 ff.; Sen & Goldmann, 2002, p. 94; Kopfmüller, 2001, pp. 190–271; Peet & Bossel, 2000; Fischer-Kowalski, 1995, p. 5; Brown-Weiss, 1988, pp. 40 ff.; Rawls, 1971, pp. 93 ff.; Mill, 1871), showing that such ap-

proaches needed to be concretized, as they were too abstract for the application at company level. A renewed approach was introduced for discussion as a possible guideline for organizations – the modified extended capability approach (MECA). The MECA is based on Nussbaum's (2003) publication and includes 14 aspects of a good life such as life length; bodily health; bodily integrity; senses, imagination and thought; emotions; practical reason; affiliation; other species; play; control over one's environment; future generations; improvement; law and cultural diversity.

The social sustainability of the MECA also offered the opportunity to assess existing evaluation systems and uncover untapped potential. The results of the juxtaposition of the MECA framework with the KSL (Ehrmann & Kleinhanß, 2008, p. 2; Breitschuh, 2008; Breitschuh & Eckert, 2006, pp. 7–15) and RISE (Grenz, Studer, Stämpfli, & Thalmann, 2009, p. 7) rating systems and the indicators of the DLG (Schaffner & Hövelmann, 2009, p. 161; Hülsbergen, 2003) showed significant gaps in the assessment systems. To make a good life measurable one must return to the subjective area (Eid & Larsen, 2008). A good life's consequence is the satisfaction of humans (Warr, 2012; Eid & Larsen, 2008). Thus, with a view to closing off a substantial portion of the identified gaps, an additional indicator of social sustainability – employee satisfaction – may be applied. The areas of potential identified, such as autonomy of decision-making, non-discrimination, emotion and family friendliness, show that an improvement is achieved only by an effective change in management and corporate culture.

## 9.2 Consumer Preferences for Labels Communicating Social Sustainability

Changing consumer preferences is the second most frequently mentioned cause of fundamental changes in German horticultural companies expected for the next decade (see chapter eight, Figure 6, p. 149). Trends in consumer preferences for horticultural products, especially for fruits and vegetables, are convenience, functional and natural foods (Dirks, Kaiser, Klose, Pfeiffer, & Backhaus, 2010). Factors influencing consumer choice for natural food includes food safety, consumption with quiet conscience (sustainability) and organic production (Hempel & Hamm, 2016; Andorfer & Liebe, 2015; Schlich & Schlich, 2011). One way of communicating these characteristics to the customer is by labeling the product. In terms of social sustainability, the Fairtrade label as well as the “A Heart for the Producer” (ger. Ein Herz für den Erzeuger) label were considered in the study in chapter three.

There is a variety of studies that claim to show the market potential of certain labels such as, for example, the Fairtrade label (Andorfer & Liebe, 2015; Ladhari & Tchetgna, 2015; Rousseau, 2015). However, this assertion is not reflected in reported buying decisions (Bhardwaj, 2012). One possible reason for the gap between the results of certain consumer research and observed buying behavior could be the effect of social desirability (Crowne & Marlowe, 1960). The aim of the study was to both examine the possible effects of social desirability and to quantify the part-worth-utilities of product characteristics such as origin, price and food labels; the technique favored for this purpose was a comparison of consumer preferences as measured by a quasi-experiment with those preferences as quantified by direct questions.

The results of the quasi-experiment using a choice-based conjoint analysis (Green, Krieger, & Wind, 2001; Green & Srinivasan, 1990, 1978) showed that, with respect to food labels, the German organic label was ranked highest, followed by Fairtrade and

“Ein Herz für den Erzeuger”. Most remarkably, both carbon footprints (with and without a CO<sub>2</sub> emission indication) were attributed a negative part-worth utility as compared with a product without any label. The “grown locally” designation showed a greater than two times part-worth utility than the German organic label.

These results not only supported the conclusion that “local (regional) is the new organic,” but also indicated that the carbon footprint label in the current design was not a suitable marketing tool (Gadema & Oglethorpe, 2011; Schlich & Schlich, 2011). It may also be the case that consumers prefer first and foremost an affordable, safe and healthy product and only after that, they are willing to take into account social and climate considerations – with social issues playing a much more significant role than the climate aspect – only where these other conditions are fulfilled. The negative part-worth utilities for the carbon footprint label showed a clearly different picture with respect to its market potential than the majority of other studies in this field (Bhardwaj, 2012; Schlich & Schlich, 2011; Vanclay et al., 2011; Dirks, et al., 2010).

In the study in chapter three the results of all three approaches – quasi-experiment, ranking task, and Likert (1932) scales – were comparable in the case of the carbon footprint label (lowest ranking). However, when participants were asked about the importance they attach to a climate-friendly production, the average was much higher. This may have been due to multiple reasons, such as social desirability and/or a lack of knowledge and understanding of, or trust in, the carbon footprint label. It may be concluded that there are major differences between the results of direct questions such as those that are applied under the Likert scale or a ranking task and the quasi-experiment performing a choice-based conjoint analysis. One possible reason for the appearance of these differences in the same sample is the effect of social desirability, which fosters answers to direct questions that the respondent believes to be socially favorable (Almli, Øvrum, Hersleth, Almøy, & Næs, 2015; Kozak & Cliff, 2013; Lagerkvist, 2013; Villanueva, Petenate, & Da Silva, 2005; Crowne & Marlowe, 1960).

The results of studies investigating consumer preferences in terms of food labels based on direct questions are, therefore, questionable. The use of a combination of methods to gain an understanding of the true behavior of consumers is important, as demonstrated by this study. The biggest limitation of the study, as revealed in chapter three, is that the design of the label itself might have affected the observed utility (Beckley, Paredes, & Lopetcharat, 2012). Using other designs could therefore lead to different results. Future research should consider this possibility.

### **9.3 The Importance of Social Sustainability Issues in the Case of Employee Related Topics for Decision-makers in Horticultural Companies**

Besides the normative importance of the social dimension of sustainability (see chapter two) and its value for consumers when purchasing horticultural products (see chapter three and Lacy, Cooper, Hayward, & Neuberger, 2010, pp. 46 ff.), it is of interest how decision-makers in horticultural companies evaluate the importance of social issues for the organizational design of their companies (Schreiner et al., 2013, pp. 73–76). The aim of the study in chapter four was not only to identify issues which would characterize organizational design in the future (applying the perspective of German horticultural companies) but also to identify overarching trends and to capture the currently perceived competence and experience of decision-makers in different fields. The study

specifically aimed to highlight issues where a gap between future importance and perceived competence was present.

The spectrum of organizational issues analyzed in the study can be divided into hard and soft issues (Krüger & Bach, 2015; Gadenne & Sharma, 2009; Roghé et al., 2009; Cartwright & Cooper, 1995; Krüger, 1994, pp. 13 ff.; Dalton, Todor, Spendolini, Fielding, & Porter, 1980). The cost and benefits of appropriate measures for hard organizational issues can be more clearly quantified than those for soft issues (Krüger & Bach, 2015, p. 24; Krüger, 1994, pp. 13 ff.). The soft issues include all matters related to employees, cooperation and transformation which are inextricably linked to social sustainability goals especially when it comes to employee related issues (Roghé, et al., 2009).

The results showed one recognizable trend: with respect to the five most important organizational issues in 2020, soft issues were on average 50 % more often named than hard ones by the respondents in the study. The area of employees (consisting of four organizational issues) were rated as the most important for future organizational design. Apart from cost reduction/restructuring and individual responsibilities/accountability there was only a perceived small need for action on hard issues in the companies. The picture was different for the soft issues: with respect to such issues – process management, leadership, cross-divisional collaboration/cooperative behavior and design of the corporate culture – the situation was critical as perceived competence and the assessment of future importance were not pronounced to the same extent. This result was gaining importance, as implemented measures on cost reduction and restructuring in the previous three years in the field of hard organizational issues still had the highest distribution.

The mentioned need for action should lead to change processes in the structural and procedural organization of horticultural companies. These change processes are themselves major challenges for companies (Kettinger & Grover, 1995). This leads to the question of how these change projects can be successfully performed (chapter eight). The results of the study in chapter four underlined the particular relevance of the area of employees. The factors that have a significant impact on employee satisfaction in German horticulture were shown in the employee satisfaction study (chapters five to seven).

#### **9.4 Measuring Job Satisfaction as a Key Indicator of Social Sustainability Using the Vitamin Model**

As mentioned above, the measurement of employee satisfaction is a major part of closing the gaps between the normative definition of social sustainability and the indicator catalogs using objective indicators. The importance of people related issues is also significant for the key stakeholder groups of consumers (see chapter three and Lacy, et al., 2010, pp. 46 ff.) and decision-makers in horticultural companies (see chapter four and Schreiner, et al., 2013, pp. 73–76). In chapter five, Warr's (2007) vitamin model and its operationalization through 28 aspects was tested as a tool for measuring job satisfaction in German horticulture. Previous studies in horticulture (Reiche & Sparke, 2012; Bitsch, 2007; Bitsch & Hogberg, 2005) were based on Herzberg's model (Herzberg, 1966; Herzberg, Mausner, & Synderman, 1959) and assumed a linear relationship between job characteristics and job satisfaction. The main difference between Warr's (2007, p. 22, 1994, 1987) vitamin model and other models in this field (Karasek & Theorell, 1990; Johnson & Hall, 1988; Hackman & Oldham, 1980; Weiss, Dawis, England, & Lofquist, 1967; Herzberg, 1966; Brayfield & Rothe, 1951) is the assumed nonlinear utility func-

tions. Even though Herzberg's model (Herzberg, 1966; Herzberg, et al., 1959) is common in business management research (Eid & Larsen, 2008; Rosenstiel, Kehr, & Maier, 2000), it is not state of the art in psychology and has almost no empirical backing (Gebert & Rosenstiel, 2002; Rosenstiel, et al., 2000; Locke & Henne, 1986; Vroom, 1967). A comprehensive empirical test of the current vitamin model was needed (Rydstedt, Ferrie, & Head, 2006; Jonge, Reuvers, Houtman, Bongers, & Kompier, 2000; Jong & Schaufeli, 1998; Jong, Schaufeli, & Furda, 1995; Xie & Johns, 1995; Fletcher & Jones, 1993; Parkes, 1991; Warr, 1990).

The data collected for the study were analyzed in chapter five using descriptive statistics, revealing correlations between job aspects and job and life satisfaction. Covariance structure modeling (Backhaus, Erichson, & Weiber, 2013, pp. 63–118; Diamantopoulos, 1994) was used to assess the fit of the proposed vitamin model and its operationalization in the questionnaire. To evaluate the nature of the assumed utility functions, different parts of the features' characteristics were analyzed, and linear and nonlinear regressions were calculated.

The data supported Warr's (2007) vitamin model, as nonlinear regressions with the assumed utility functions led to a greater coefficient of determination than (or coefficient of determination equal to) linear regressions (Backhaus, et al., 2013, pp. 35 and 38). Further, the covariance structure modeling reported a reasonable model fit (Browne & Cudeck, 1992).

The factor loadings in the covariance structure model indicated the contribution of each aspect to the factor (vitamin). The factor loadings in the present study can be seen strong (Comrey & Lee, 2013, p. 243), which also exemplifies the good quality of the operationalization in the questionnaire. A further question that was investigated was whether the shapes of the utility functions assumed by Warr (2012, 2007, 1994, 1987) could be supported. It was evident from the results in chapter five that the assumed curves describing the relation of the job features with job satisfaction provided a better description of its true nature than a linear relationship. In all cases, using nonlinear regression resulted in a greater coefficient of determination than (or coefficient of determination equal to) linear regressions. The transformed variables for the additional decrement vitamins provided much higher and more significant Spearman correlations than their nontransformed counterparts. If the additional decrement features were split into two variables each – one for the left and one for the right side of the utility function – they showed the expected directional effect on job satisfaction. Increasing a specific feature to a moderate level was related to higher job satisfaction, but after a subjective optimum, the reported correlations became negative. This indicated that, at high values, the vitamin became toxic and related to a decrease in job satisfaction. In linear regressions with job satisfaction, squared variables showed the expected negative sign of the  $\beta$  estimate, which also supported the hypothesized concave functional form (Thornhill & Gangestad, 1994).

De Jonge and Schaufeli (1998; Jong, et al., 1995) also showed that the fit of the nonlinear model was superior to that of the linear model for the aspects of three vitamins. The results presented in chapter five supported this approach for aspects of all 12 vitamins.

One of the major limitations of the study, as revealed in chapter five, is the cross-sectional design. A construct such as job satisfaction or employee well-being cannot be fully captured at one point in time (Mulinge, 2000). The variables impacting on such



constructs might change over time and should ideally be collected repeatedly. A future area for research would be collecting longitudinal data. Additionally, it is clear that job satisfaction depends on both jobs and job-holders (Warr, 2013); therefore, chapter six also analyzed the impact of personal characteristics on job satisfaction in German horticulture. It was also evident that the importance of job features differs between individuals (Warr, 2013). Chapter six and seven therefore compared the relationship with job satisfaction and the varying preferences of different groups. It is essential to know what is important for the next generation of employees in German horticulture (chapter seven and Schreiner, et al., 2013, pp. 73–76).

### **9.4.1 Job Satisfaction and Preferences of Employees in German Horticulture**

Chapter six described the preferences of employees of horticultural companies with respect to job characteristics as well as the relations between characteristic values and job satisfaction. To investigate why some people were happier than others, chapter six considered perspectives that were either eco-centric or person-centered (Warr, 2013, 2012). In the first case, the influence of the environment on the satisfaction of an individual was analyzed. In the second case, the influence of a person's own characteristics on individually experienced satisfaction was investigated.

In relation to employees' preferences regarding job characteristics, the most important consideration was the employer's fair treatment of its employees, followed by opportunities for the employees to expand their abilities and learn, the considerate behavior of the supervisor toward staff, and the use of the employees' own skills and experience. In addition, emotional dissonance and task identity were very important for the participants. The work in horticulture is often of a physical nature; so appropriate equipment was strongly preferred by the employees (Salvendy, 2012, p. 708). Also the perceived sustainability of the employer was of great importance to the employees. The level of salary was in the middle of the order of concerns and, therefore, of moderately minor importance. This is remarkable, as one would have expected that in a low wage industry, such as horticulture, the issue of income would have a higher priority (Srivastava, Locke, & Bartol, 2001; Adams, 1963; Kornhauser, 1962).

The main objective of the study in chapter six was to investigate which job characteristics or aspects showed the strongest relationship with employee satisfaction in German horticulture. The strongest connection with job satisfaction was observed in relation to future prospects, i.e., feeling that one was moving in a positive direction. This aspect is more strongly affected by the subjective perceptions of the employee than other aspects (Warr, 2007, pp. 133–135). The employer can influence this aspect positively through affirmative communication, the demonstration of prospects, and active staff development. In second place, came the conflict between work and family life, followed by the employer's fair treatment of employees and appropriate equipment (which shared the same correlation coefficient). Having adequate equipment available in horticulture – having regard to the primary physical nature of work – is more important than in other industries (Salvendy, 2012, p. 708; Carlopio, 1996; Taber, Beehr, & Walsh, 1985), where the influence of this aspect on job satisfaction is less significant.

Also, as already mentioned, the influence of personal and structural characteristics on both job satisfaction and job preferences were analyzed. Older employees in German horticulture were more frequently dissatisfied with their working lives and their lives in

general than younger employees. In this regard, horticulture is different from other industries; on average, satisfaction increases with age (Mroczek & Spiro, 2005). The different values in horticulture could be due to physical stress, which leads to difficulties with advancing age. Thus, a negative correlation between age and working environment can be observed. The same applies for age and considerate leadership, working safety, and own future prospects. It was also possible to observe relationships between personal and structural characteristics and preferences with regard to job characteristics. Employees with a higher level of education put astonishingly less emphasis on the compatibility between work and family life, adequate equipment, and own job security – probably because their chances in the labor market could be assessed more positively (Häublein, 2014; Piopiunik & Wößmann, 2011). For women – compared to their male counterparts – the development of their own skills, the compatibility of work and family life, and the ability to be completely themselves at work were more important than other elements.

#### **9.4.2 Job Satisfaction and Preferences of Vocational and Master Craftsman Scholars and Horticulture Students**

As sustainability is defined as the satisfaction of the needs of the present and future generations (Brundtland, 1987, p. 54), chapter seven focused on job satisfaction and preferences regarding job characteristics of vocational and master craftsman scholars and horticultural students. In addition, Warr's (2007) vitamin model was also tested with this dataset. Furthermore, the different preference structures between generations regarding the job aspects investigated became visible.

The fair treatment of employees came first, followed by the possibility of being oneself at work. The possibility to expand one's abilities and to learn was also strongly preferred by the vocational and master craftsman scholars.

Covariance structure modeling (Meyerding, 2015; Backhaus, et al., 2013, pp. 63–118; Diamantopoulos, 1994) was again used to assess both the model fit of the vitamin model and the job aspects on vocational and master craftsman scholars. Additional covariance structure modeling was also used for a personal characteristics model. The factor loadings indicated the contribution of each aspect to the factor (vitamins). The factor loadings could be seen as strong (Comrey & Lee, 2013, p. 243) for the vitamin model. The assessment of normality reported acceptable values of kurtosis and skewness (Weiber & Mühlhaus, 2014) for the vitamin model. Normality distribution could not be reported in the case of a personal characteristics model as core employment status and part time status showed no acceptable values. As this was essential to perform maximum likelihood estimation (Backhaus, et al., 2013, pp. 63–118), the vitamins and personal characteristics were not analyzed in one covariance structure model. Furthermore, the personal characteristics model should be considered with caution. The factor loadings of all aspects of the vitamin model were significant and an appropriate model fit (Browne & Cudeck, 1992) for the whole structural equation model was reported. Again, this was not the case for the personal characteristics model.

For the group of vocational and master craftsman scholars emotional dissonance showed the strongest relation with job satisfaction. In the second and third places were considerate behavior by supervisor and supportive supervision, respectively, followed by fair treatment of employees, and, in fifth place, the organization's morality towards society.

As for the group of employees (chapter five), the nonlinearity of the utility functions of the job aspects could also be supported by the data for vocational and master craftsman scholars.

The impact of personal and structural features on job and life satisfaction and preferences regarding job aspects were also presented for the subgroups in chapter seven. For example, for all extrinsic aspects – except with respect to a pleasant work environment and safe work processes – people with a temporary employment contract showed lower scores than employees with a permanent contract. A particularly strong relationship appeared between the temporary nature of the employment contract and the assessment of the individual's own future prospects.

The results of the measurement of preferences for the job aspects of horticultural science students showed that the most important point for the surveyed students was fair treatment by the prospective employer of its employees. Secondly, the compatibility of work and family (free time) followed by emotional dissonance could be found. Salary could be found only in eighteenth place, having even less perceived importance than job autonomy and the employer's treatment of society as a whole.

Whereas men preferred to have a high degree of job autonomy in their dream jobs, woman preferred the absence of conflicts between different tasks, the reconciliation of work with family and positive values of emotional dissonance (that is, the ability to be completely oneself at work; Glomb, Kammeyer-Mueller, & Rotundo, 2004).

The groups of participants – employees, vocational and master craftsman scholars and students of horticultural science – were distinguished by their different life realities, but also by characteristics such as age, educational background and professional experience. To gain a complete picture of the situation in German horticulture, the results of the three groups were compared. From the results, it was clear that work issues such as emotional dissonance and conflict between work and family had gained importance – showing changes in work attitudes and preference structure that require a cultural change within the company (Greenhaus & Beutell, 1985). The younger generation with a formal higher education level showed a change in work attitude and favored job aspects that are accompanied by an increased work-life balance. This trend was also reflected in the students' results.

In this regard, the conflict between work and family featured in second place as the most important work characteristics, followed by emotional dissonance. From the results, it can be deduced that for young well-trained junior staff, a work-life balance and transformational employee-orientated leadership are particularly important and that horticultural companies need to change their business and particularly their management culture to be attractive employers for a new generation.

The strongest influence on job satisfaction for the group of employees was shown by good future prospects, underlining the importance for employees of having the feeling of moving in a positive direction (towards their personal goals). Having appropriate equipment played a strong role in horticulture; this result seems to be a special characteristic of the industry (Salvendy, 2012, p. 708; Carlopio, 1996; Taber, et al., 1985). The results in chapter seven also indicated that the sustainability of horticultural companies positively affected employee satisfaction (and/or vice versa). Furthermore, they provid-

ed an indication that soft job aspects, which include a special form of corporate and leadership culture, had the greatest effect on employee satisfaction, particularly among younger, well-trained employees. The results also showed that the influence of hard job aspects, such as salary, the difficulty of the work, the variety of tasks, and job security, was not especially pronounced.

As the requirements for job satisfaction and work performance are probably mostly moderate characteristic values of the job features (Lyubomirsky, King, & Diener, 2005), the employee satisfaction survey could be a suitable tool for enhancing satisfaction and social sustainability as well as optimizing the use of human capital and thus serving the company's profitability and economic sustainability (Lyubomirsky, et al., 2005). For horticultural companies, in which the personnel costs account for 40 % (own calculation based on the farm comparison statistic in October 2012 of the Centre for Business Management in Horticulture and Applied Research) of the total cost, this optimization potential for human resource management is particularly interesting, especially since, thus far, not enough importance has been attached to this issue, as indicated in the results of chapter four and eight.

There is a possibility that the utility functions of the job characteristics apply equally to the employees' performance and to satisfaction (Lyubomirsky, et al., 2005), so that the optimum for satisfaction is close to the optimum for the long-term utilization of the performance potential of each employee. This possibility of using the vitamin model has not yet been investigated empirically and should be considered in future research.

Overall, the results show the importance of measuring subjective indicators in the evaluation of social sustainability as objective measures such as income, working hours and leave entitlement are not capable of satisfactorily reflecting the social dimension of sustainability (see chapter two and Sen, 2003). The goal of a sustainable corporate development necessarily includes a change process in the organization of horticultural companies. To support this change process, it is important to gain an understanding of the catalysts, challenges and factors essential to these processes of change (Storck & Bokelmann, 1995).

## **9.5 Change Management for Supporting a Socially Sustainable Corporate Development**

Therefore, the study in chapter eight examined the cause of fundamental change processes in horticultural companies, revealing the overriding trends and identifying the pivotal factors in change initiatives. The change process involves activity at both the factual and the psychological level to avoid a "reality gap" (Vahs, 2007, p. 372; Lewin, 1953). Based on the studies by Vahs and Leiser (2003) and Picot, Freudenberg, and Gaßner (1999), universal factors of change success (Schnitzler, 2011) can be deduced for the psychological level. The universal success factors are organizational structure, leadership behavior, communication, participation, training, incentives, controlling and timing.

The study in chapter eight indicated the megatrends (Maas, 2015; Rump & Walter, 2013; Keicher, Anke, Bohn, Crummenerl, & Mergenthal, 2012; Kyaw & Claßen, 2010; Claßen & Kyaw, 2007; Claßen, Arnold, & Papritz, 2005; Claßen, Alex, & Arnold, 2003; Aronoff, 1998), which will be the cause of fundamental change processes in horticultural companies in the next decade. The main theme – the ecological environment –

is considered to be the most important megatrend by far, followed by changing consumer behavior. Human resource issues can be found with particular frequency in the megatrends. Among the dominant megatrends are the labor market, demographics, working attitude, urbanization, diversity, division of labor, working methods and the position of women in organizations. This result again underlies the importance of the social sustainability of horticultural companies, especially with regard to a key group of stakeholders – its employees (see chapter three and four and Schreiner, et al., 2013, pp. 73–76). For successful growth-oriented companies, the skilled labor shortage is already a resource bottleneck.

The most common causes of change projects in horticultural companies over the next three years will be changed market strategy/sales approach, corporate succession/business handover, external changes (laws), changed human resource concepts and cost reduction programs. Absence of willingness to take responsibility, conflicts of interest and divergence of objectives of the different groups involved are perceived as the most difficult problems in the implementation of change processes.

The results of the study also gave the impression that the importance of change management is particularly recognized where deficits in strategic planning and implementation are visible. Companies that could very well have achieved their goals during the previous two years could also define clear objectives in the context of change projects. For companies with many employees, the problem of the missing link between top-down and bottom-up communication frequently appeared.

The list of identified success factors demonstrated the high level of importance of soft factors in changes in German production horticulture. The broad diversification of success factors indicates that there are not only one or two factors affecting change success (Kotter, 2011), but, in fact, a diversity of factors, the judicious combination of which will likely positively affect the outcome of change initiatives (Todnem By, 2005; Mentto, Jones, & Dirndorfer, 2002; Kettinger & Grover, 1995). At the top of the list of success factors that are known to the study participants from past change processes are realistic, clear vision/goals, their communication to the employees and the spirit and motivation of the project team.

The results of the question on success factors in change processes in the company support the importance of the psychological factors at work in this process; therefore, the involvement of employees in decision-making is of paramount importance. Inspired leadership and providing role models are also pivotal factors. Change management involves manipulating dynamics at both factual and psychological levels (Krüger, 2012). Adjustments at both levels need to be developed simultaneously in order to avoid a reality gap between structural change and the shifts in behavioral patterns of those involved (Vahs, 2007, p. 392). The horticultural entrepreneurs surveyed recognized the need to involve those who are affected by change in the various processes aimed at producing such change such as, for example, in the decision-making process.

Overall, the study demonstrated that, in the majority of horticultural companies, change processes were not the product of professional design. German production horticulture is faced with the challenge of improving its capacity to significantly self-transform (Schreiner, et al., 2013; Dirksmeyer, 2009; Storck & Bokelmann, 1995; Bock, 1994; Böckelmann, 1992; Berndt, 1984). Therefore, tapping the creativity of business consultancy services could make a valuable contribution.

Economically sustainable horticulture companies have the flexibility to proactively adapt to changing environmental conditions. Such factor, along with the classical indicators of profitability, stability and liquidity (Wöhe, 1997, pp. 74 ff.) converge to reflect the economic dimension of sustainability (Rabbe & Schulz, 2011). The ability to change may therefore represent a key indicator of the economic sustainability of horticultural companies. The identified success factors in this study could be incorporated into a questionnaire and compared with the norms for a particular industry sector.

Giving that the results of the study as set forth in chapter eight indicated that soft factors play a central role in change success, a link between social and economic sustainability may be assumed. Due to the small number of cases surveyed, the influence of the success factors could not be quantified for all possible effects such as, for example, regarding the loss of productivity and turnover rate. Therefore, further research is needed to determine the relative influence of different factors of change success.

## **9.6 Contribution of the Doctoral Thesis to the Socially Sustainable Development of Horticultural Enterprises**

The results of the research of the present thesis contribute to the socially sustainable development of enterprises in German horticulture. A proposal for a list of indicators to assess the sustainability of horticultural companies can be found in the introduction (Table 1 to 3). Table 3 includes indicators for social sustainability. The indicators listed there cover the 14 aspects of MECA framework which concretizes social sustainability of organizations developed in chapter two.

The list of criteria of social sustainability for companies has been developed in chapter two based on the literature. MECA can serve as a guide to develop indicators in catalogs and thus makes social sustainability for organizations, also outside of horticulture, tangible. Simultaneously MECA offers the opportunity for evaluating other indicator catalogs for completeness. A review of sustainability indicator catalogs in chapter two has made apparent that in particular with respect to the soft categories on the company's employees such as work autonomy, future prospects and reconciliation of work and family action is still needed. These aspects of social sustainability are difficult to measure objectively, so that a subjective survey of employees appears to be more purposeful. The proposed list of indicators still needs to be verified, at the same time it would have been possible to implement the concretization of social sustainability of horticultural companies differently. For example, a stakeholder survey would probably come to different criteria of social sustainability.

The results of the survey in chapter three demonstrate the potentials of aspects of social sustainability for the marketing of food products. The benefit of the label Fairtrade and "Ein Herz für den Erzeuger" (A heart for the producer), is significantly higher than that of some environmental aspects such as the carbon footprint. When measuring consumer preferences the effect of social desirability is often problematic, especially when ethical aspects are involved. The study in chapter three highlights the importance of using different methods to determine the utility of product characteristics adequately. In the study, a quasi-experiment was carried out. Although the quasi-experiment is expected to produce more realistic results than, for example, direct question methods, it is still no real purchasing situation. An observation of real purchasing situations could enhance

the method comparison in chapter three. Additionally further studies should quantify the utility of other labels and label designs.

The results of the study organization 2020 in chapter four shows the significance of employee-related topics for the organizational development of horticultural companies. The results are particularly interesting for advisory services, as they identify areas in which the consulting service can add value for horticultural companies and where action is needed. An extension of the survey to other stakeholder groups and industry experts could supplement the results, also the list of studied organizational subjects could be narrowed down and/or supplemented if necessary through interviews with industry experts.

As already mentioned, the measurement of employee satisfaction can make a significant contribution to the assessment and management of social sustainability in horticultural companies. A method for measuring job satisfaction based on the vitamin model by Warr (2007) has been successfully tested in chapter five. German horticultural companies now have the opportunity to let their employees fill out an online questionnaire and can get an automated individual report created by the Centre for Business Management in Horticulture and Applied Research. Based on this report, companies can identify areas of risk and improve their employee's satisfaction and social sustainability through targeted measures.

The employee satisfaction survey, which covers the chapters five, six and seven, is the first of its kind in German horticulture and forms a highly detailed picture of the preferences of the surveyed groups and the relations of the job features and work and life satisfaction in horticulture. The sample covered three distinct groups: employees and vocational and master craftsman scholars and finally students of horticultural sciences. The results show that especially the job aspects "good future prospects" and the reconciliation of work and family in horticulture are crucial for a high level of employee satisfaction and that this importance continues to increase for the younger generation. Horticultural companies must pay attention to work-life balance to be an attractive employer in the future. The lack of comparable studies in horticulture, however, ensures that it is unclear whether a different method of measurement based on different theoretical foundations, might be more suitable to measure employee satisfaction in horticulture. Further studies can help to refine the measuring instrument.

If the risk areas are identified with the help of the employee satisfaction measurement, the corporate management can begin a process of change within the company to improve its social sustainability. The results of the change management study in chapter eight point to the importance of a clear strategic goal definition and the inclusion of employees in decision-making processes for change success. The results are mainly of importance for the consulting services and help to clarify and communicate the need for change management to the entrepreneur. Furthermore, the results on the causes of fundamental change processes in German horticulture reaffirms the importance of employee-related topics and thus underlines once again the benefits of a measurement of employee satisfaction and greater consideration of the social sustainability dimension in horticulture. A complementary study, involving other stakeholder groups in addition to the decision-makers, such as employees, consultants and industry experts could identify the success factors of change management in horticultural companies more completely.

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# Appendix

## Questionnaire Chapter Three

### Eingangsfragen

**Haben Sie in den letzten 2 Wochen Rispentomaten (auch Strauchtomaten genannt) gekauft?**

**Bitte wählen Sie eine der folgenden Antworten:**

- Ja
- Nein
- Nein, ich kaufe generell keine Rispentomaten
- keine Antwort

**Wie viele Rispentomaten haben Sie in den letzten 2 Wochen gekauft?**

**Bitte wählen Sie eine der folgenden Antworten:**

- < 500g
- 500g-1.000g
- 1.001g-1.500g
- > 1.500g
- keine Antwort

**Wo kaufen Sie gewöhnlich Ihre Rispentomaten ein? (Mehrfachnennung möglich)**

**Bitte wählen Sie einen oder mehrere Punkte aus der Liste aus.**

- Discounter (z.B. Aldi)
- Supermarkt (z.B. Edeka, Marktkauf)
- Wochenmarkt
- Bio-Laden, Reformhaus (z.B. Alnatura, Denn's)
- Sonstiges:

#### Conjoint Analyse

Stellen Sie ich vor, Sie befinden sich gerade in einem Supermarkt und möchten eine Packung Rispentomaten kaufen. Dabei stehen Ihnen lediglich die Produkte in der jeweiligen Zeile zur Verfügung. Welches dieser Produkte würden Sie wählen?

					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>



					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>






					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
					Kein Kauf	keine Antwort
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

					Kein Kauf	keine Antwort
					Kein Kauf	keine Antwort
					Kein Kauf	keine Antwort
					Kein Kauf	keine Antwort
					Kein Kauf	keine Antwort
					Kein Kauf	keine Antwort
					Kein Kauf	keine Antwort

Bitte bringen Sie die folgenden Label in eine Reihenfolge (Das was Ihnen am wichtigsten ist zuerst). Ordnen Sie die Elemente in die rechte Liste ein (höchste Bewertung oben). Die Elemente können mit der Maus verschoben werden. Doppelklick verschiebt ein Element in die andere Liste.

Ihre Auswahl

Ihre Rangfolge

Bitte geben Sie an wie wichtig Ihnen die folgenden Merkmale beim Einkauf von Rispen Tomaten sind.

	unwichtig	ein wenig wichtig	wichtig	sehr wichtig	extrem wichtig	unentbehrlich	keine Antwort
Tomaten kommen aus der <b>Region</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Tomaten kommen aus <b>Deutschland</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Tomaten kommen aus <b>Europa</b> (der EU)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Tomaten sind <b>preiswert</b> , günstig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Tomaten wurden <b>klimafreundlich</b> produziert	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Tomaten wurden <b>umweltfreundlich</b> produziert	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Der Tomatenproduzent ( <b>Bauer</b> ) bekommt einen " <b>anständigen</b> " <b>Preis</b> für sein Produkt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Tomaten haben ein <b>Bio-Label</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Tomaten haben einen <b>Carbon-Footprint-Label</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Tomaten haben einen <b>Carbon-Footprint</b> -Label, welcher angibt wieviel CO2 bei der Produktion ausgestossen wird <b>(mit Zahl)</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Wenn die Tomaten nicht aus Deutschland sind tragen sie ein <b>FairTrade</b> -Label	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Tomaten sind <b>nicht zu groß</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Tomaten sind <b>nicht zu klein</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Tomaten <b>riechen gut</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Tomaten sind <b>nicht zu hart</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Tomaten sind <b>nicht zu weich</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Tomaten haben eine tiefe <b>rote Farbe</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Die <b>Verpackungsgröße</b> ist <b>nicht zu groß</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Die <b>Handelsklasse</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

### soziodemografische Merkmale

#### Sie sind zur Zeit?

Bitte wählen Sie eine der folgenden Antworten:

- Vollerwerbstätig
- Teilzeiterwerbstätig
- In Ausbildung/Studium
- Rentner/Pensionär
- Hausfrau/Hausmann
- Erwerbslos
- Sonstiges:
- keine Antwort

Wie viele Personen gehören insgesamt zu Ihrem Haushalt?  
In dieses Feld dürfen nur Zahlen eingegeben werden.

**?** Anzahl Personen

davon Kinder unter 12 Jahren?  
In dieses Feld dürfen nur Zahlen eingegeben werden.

**?** Anzahl der Kinder

Können Sie uns bitte Ihre Postleitzahl nennen?  
In dieses Feld dürfen nur Zahlen eingegeben werden.

**Wie hoch ist Ihr Netto-Haushaltseinkommen**  
**Bitte wählen Sie einen oder mehrere Punkte aus der Liste aus.**

- keine Angabe
- < 500 €
- 500 - 900 €
- 900 - 1.300 €
- 1.300 - 1.700 €
- 1.700 - 2.000 €
- 2.000 - 2.600 €
- 2.600 - 4.500 €
- > 4.500 €

**Ich bin ...?**

- weiblich
- männlich
- keine Antwort

**In welchem Jahr sind Sie geboren?**  
**In dieses Feld dürfen nur Zahlen eingegeben werden.**

**?** Jahr

**Welchen höchsten Bildungsabschluss haben Sie?**  
**Bitte wählen Sie einen oder mehrere Punkte aus der Liste aus.**

- Noch Schüler
- Volks-/ Hauptschulabschluss
- Mittlere Reife / Realschulabschluss
- Abitur oder vergleichbares
- Meister/ Techniker/ Fachschulabschluss
- Fachhochschul- / Hochschulabschluss
- Ohne Abschluss
- Sonstiges:

**Welcher Nationalität würden Sie sich am ehesten zuordnen? (polnisch, deutsch etc.)**

**?** Die Frage hat folgenden Hintergrund: Es wäre interessant zu erfahren, ob Menschen aus unterschiedlichen Kulturkreisen unterschiedliche Dinge beim Einkauf von Rispen Tomaten wichtiger sind.

**Wohnen Sie eher in einer ländlichen oder städtischen Gegend?**  
**Bitte wählen Sie eine der folgenden Antworten:**

- ländliche Gegend
- städtische Gegend
- keine Antwort

## Questionnaire Chapter Four

### Betriebsmerkmale

**In welchem Postleitzahlen Gebiet liegt der Betrieb in dem Sie arbeiten?  
In diesem Feld kann nur ein ganzzahliger Wert eingetragen werden.**

**?** Die Frage dient nicht dazu den Betrieb zu identifizieren, sondern um bei der Auswertung der Ergebnisse angeben zu können, wieviele unterschiedliche Betriebe an der Auswertung teilgenommen haben.

**In welche Sparte des Gartenbaus kann der Betrieb in dem Sie arbeiten eingeordnet werden? Bei Mehrfachauswahl geben Sie bitte die ungefähre prozentuale Verteilung an.**

**Bitte wählen Sie einen oder mehrere Punkte aus der Liste aus.  
Kommentieren wenn eine Antwort gewählt wird**

Zierpflanzen

Gemüse

Obst

Baumschule

Sonstiges:

**Wieviele Mitarbeiter sind ungefähr in dem Betrieb beschäftigt (ohne Saisonmitarbeiter)?  
Bitte wählen Sie eine der folgenden Antworten:**

- bis 5
- 6 bis 10
- 11 bis 20
- 21 bis 50
- 51 bis 100
- über 100
- keine Antwort

**Wieviele Saisonmitarbeiter sind ungefähr in dem Betrieb beschäftigt?  
Bitte wählen Sie eine der folgenden Antworten:**

- bis 5
- 6 bis 10
- 11 bis 20
- 21 bis 50
- 51 bis 100
- über 100
- keine Antwort

**Wieviele Hektar (ha) werden ca. im Freiland angebaut?  
In dieses Feld dürfen nur Zahlen eingegeben werden.**

**?** wenn nichts im Freiland angebaut wird geben Sie bitte eine 0 ein.

**Wieviele Quadratmeter (m<sup>2</sup>) werden ca. Unterglas angebaut?**

**In dieses Feld dürfen nur Zahlen eingegeben werden.**

**?** wenn nichts im Gewächshaus angebaut wird geben Sie bitte eine 0 ein.

**Wieviele Quadratmeter (m<sup>2</sup>) ca. sind Verkaufsfläche?**

**In dieses Feld dürfen nur Zahlen eingegeben werden.**

**?** wenn es keine Verkaufsfläche gibt, geben Sie bitte eine 0 ein.

**Wie hoch ist ungefähr der Betriebsertrag ihres Unternehmens? (Angabe bitte auf Tausenderstellen gerundet)**

**In dieses Feld dürfen nur Zahlen eingegeben werden.**

**?** Der Betriebsertrag enthält alle monetären Erträge aus Produktion, Handel und Dienstleistungen.

**Wie hoch ist ungefähr der Betriebsaufwand Ihres Unternehmens? (Angabe bitte auf Tausenderstellen gerundet)**

**In dieses Feld dürfen nur Zahlen eingegeben werden.**

**?** Der Betriebsaufwand enthält alle Aufwendungen (abzüglich Fremdkapital, Mieten und Pachten), die im Zusammenhang mit gärtnerischer Produktion, Dienstleistungen und Handelstätigkeit in einem Wirtschaftsjahr anfallen, einschließlich der Abschreibungen.

Abschreibungen erfassen die planmäßige oder außerplanmäßige Wertminderung von Vermögensgegenständen.

**Welche Funktion haben Sie im Unternehmen?**

**Bitte wählen Sie eine der folgenden Antworten:**

**Wie lange gehören Sie dem Unternehmen schon an?**

**Bitte wählen Sie eine der folgenden Antworten:**



**Welche der folgenden Themen zählen heute zu den 5 wichtigsten Themen im Bereich Organisation für Ihr Unternehmen?**

**Bitte wählen Sie maximal 5 Antworten.**

- Informations- und Wissensmanagement
- Out- / Co- Sourcing, Offshoring
- Effektive Organisationskriterien für die Organisationsstruktur
- Projektmanagement
- Geschäftstransparenz und -analyse
- Netzwerk / virtuelle Organisation
- Rolle der Zentrale / Corporate Governance
- Führung / Leadership
- Change Management / Umsetzung
- Effektive Matrixorganisation / multidimensionale Organisation
- Innovationsmanagement
- Shared Service
- Bereichsübergreifende Zusammenarbeit / Kooperationsverhalten
- Individuelle Verantwortlichkeiten / Accountability
- Gestaltung der Unternehmenskultur
- Prozessmanagement
- Mitarbeitermotivation/ Mitarbeiterengagement/ Empowerment
- Optimierung von Entscheidungsprozessen
- Performance- Management
- Kostenreduktion / Restrukturierung
- Optimierung Führungsebenen und -spannen
- Organisatorische Flexibilität / Fähigkeit zur Integration von Akquisitoren (Unternehmenszukäufen)
- Globale Organisation / Grad der Zentralisierung
- Sonstiges:

**Welche der folgenden Themen werden 2020 zu den 5 wichtigsten im Bereich Organisation für Ihr Unternehmen zählen?**

**Bitte wählen Sie maximal 5 Antworten.**

- Optimierung von Entscheidungsprozessen
- Informations- und Wissensmanagement
- Kostenreduktion / Restrukturierung
- Gestaltung der Unternehmenskultur
- Projektmanagement
- Globale Organisation / Grad der Zentralisierung
- Führung / Leadership
- Shared Service
- Organisatorische Flexibilität / Fähigkeit zur Integration von Akquisitoren (Unternehmenszukäufen)
- Individuelle Verantwortlichkeiten / Accountability
- Prozessmanagement
- Effektive Organisationskriterien für die Organisationsstruktur
- Rolle der Zentrale / Corporate Governance
- Netzwerk / virtuelle Organisation
- Performance- Management
- Mitarbeitermotivation/ Mitarbeiterengagement/ Empowerment
- Effektive Matrixorganisation / multidimensionale Organisation

- Rolle der Zentrale / Corporate Governance
- Netzwerk / virtuelle Organisation
- Performance- Management
- Mitarbeitermotivation/ Mitarbeiterengagement/ Empowerment
- Effektive Matrixorganisation / multidimensionale Organisation
- Bereichsübergreifende Zusammenarbeit / Kooperationsverhalten
- Out- / Co- Sourcing, Offshoring
- Geschäftstransparenz und -analyse
- Optimierung Führungsebenen und -spannen
- Innovationsmanagement
- Change Management / Umsetzung
- Sonstiges:

**Bei welchen 5 der folgenden Themen würden Sie Ihr Unternehmen als besonders kompetent wahrnehmen?**

**Bitte wählen Sie maximal 5 Antworten.**

- Projektmanagement
- Netzwerk / virtuelle Organisation
- Prozessmanagement
- Optimierung Führungsebenen und -spannen
- Change Management / Umsetzung
- Innovationsmanagement
- Mitarbeitermotivation/ Mitarbeiterengagement/ Empowerment
- Gestaltung der Unternehmenskultur
- Globale Organisation / Grad der Zentralisierung
- Geschäftstransparenz und -analyse
- Informations- und Wissensmanagement
- Out- / Co- Sourcing, Offshoring
- Führung / Leadership
- Bereichsübergreifende Zusammenarbeit / Kooperationsverhalten
- Individuelle Verantwortlichkeiten / Accountability
- Kostenreduktion / Restrukturierung
- Shared Service
- Organisatorische Flexibilität / Fähigkeit zur Integration von Akquisitoren (Unternehmenszukaufen)
- Effektive Matrixorganisation / multidimensionale Organisation
- Optimierung von Entscheidungsprozessen
- Performance- Management
- Rolle der Zentrale / Corporate Governance
- Effektive Organisationskriterien für die Organisationsstruktur
- Sonstiges:

**Für wie wirtschaftlich erfolgreich würden Sie Ihr Unternehmen im Vergleich zur direkten Konkurrenz beurteilen?**

**(1 = Überhaupt nicht erfolgreich; 5 = sehr erfolgreich)**

- 1  
  2  
  3  
  4  
  5  
  keine Antwort

**Wie wurden im Durchschnitt der beiden vergangenen Jahre die Ziele am besten bezogen auf quantifizierbare Kennzahlen erreicht?**

**Bitte wählen Sie eine der folgenden Antworten:**

- 0%
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100%
- keine Antwort

**Bei welchen der folgenden Themen wurden in den letzten 3 Jahren Maßnahmen durchgeführt?**

**Bitte wählen Sie einen oder mehrere Punkte aus der Liste aus.**

- Mitarbeitermotivation/ Mitarbeiterengagement/ Empowerment
- Gestaltung der Unternehmenskultur
- Informations- und Wissensmanagement
- Führung / Leadership
- Performance- Management
- Individuelle Verantwortlichkeiten / Accountability
- Bereichsübergreifende Zusammenarbeit / Kooperationsverhalten
- Projektmanagement
- Optimierung von Entscheidungsprozessen
- Out- / Co- Sourcing, Offshoring
- Kostenreduktion / Restrukturierung
- Geschäftstransparenz und -analyse
- Optimierung Führungsebenen und -spannen
- Globale Organisation / Grad der Zentralisierung
- Prozessmanagement
- Innovationsmanagement
- Organisatorische Flexibilität / Fähigkeit zur Integration von Akquisitoren (Unternehmenszukäufen)
- Effektive Matrixorganisation / multidimensionale Organisation
- Netzwerk / virtuelle Organisation
- Effektive Organisationskriterien für die Organisationsstruktur
- Rolle der Zentrale / Corporate Governance
- Change Management / Umsetzung
- Shared Service
- Sonstiges:

**Wie positiv waren Ihre Erfahrungen mit diesen Maßnahmen?**

**(1 = Überhaupt nicht positiv; 5 = sehr positiv)**

- 1
- 2
- 3
- 4
- 5
- keine Antwort

## Questionnaire Chapter Five and Six (Employees)

### Ihre individuellen Präferenzen bezüglich Ihres Traumjobs

Denken Sie an Ihren Traumjob, einen den Sie wirklich lieben könnten. Wie wichtig wäre Ihnen das Vorhandensein der folgenden Merkmale? Kreuzen Sie das entsprechende Feld an.

\* In meinem Traumjob ist das Vorhandensein des Merkmals:








	unwichtig	ein wenig wichtig	wichtig	sehr wichtig	extrem wichtig	unentbehrlich
Entscheidung, Autonomie, Selbstbestimmung über Arbeitsinhalt und Durchführung	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Einfluss auf die Organisation als Ganzes zu haben (auch durch Gewerkschaften und Betriebsrat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meine eigenen Fähigkeiten und Erfahrungen einzusetzen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meine eigenen Fähigkeiten auszubauen und zu lernen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Anzahl meiner Aufgaben	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Der Schwierigkeitsgrad meiner Aufgaben	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aufgaben von Anfang bis Ende mit einem sichtbaren Ergebnis abzuschließen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Konfliktfreiheit zwischen unterschiedlichen Aufgaben	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vereinbarkeit von Beruf und Familie (Freizeit)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bei meiner Arbeit ganz ich selbst sein zu können und mich nicht verstellen zu müssen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Palette von unterschiedlichen Aufgaben und Arbeitssituationen oder Arbeitsort	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Vorhersagbarkeit der Zukunft bezogen auf die Arbeit (ohne Karriereperspektiven)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Der Grad mit dem ich weiss, was von mir in meiner Rolle erwartet wird und welche Anforderungen ich erfüllen muss	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Verfügbarkeit von Feedback. Das ich Informationen über meinen Leistungsstand bekomme	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Anzahl sozialer Kontakte	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Qualität der sozialen Kontakte	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Höhe meines Gehaltes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Angenehme Arbeitsumgebung (Gebäude, Räume, Lärm, Temperatur)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sichere Arbeitsprozesse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Angemessene Ausrüstung und Werkzeuge (inkl. Maschinen)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Der Wert meiner eigenen Arbeit für die Gesellschaft oder Gemeinde	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Bedeutung der eigenen Arbeit für mich selbst und das Unternehmen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Führungskraft pflegt einen rücksichtsvollen Umgang mit den Mitarbeitern	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Führungskraft unterstützt die Mitarbeiter bei ihrer Arbeit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
eigene Arbeitsplatzsicherheit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<b>unwichtig</b>	<b>ein wenig wichtig</b>	<b>wichtig</b>	<b>sehr wichtig</b>	<b>extrem wichtig</b>	<b>unentbehrlich</b>
eigene Zukunftsaussichten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Arbeitgeber geht fair mit seinen Mitarbeitern um (keine Diskriminierung)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Umgang des Unternehmens mit der Gesellschaft insgesamt (Lieferanten, Kunden, Umwelt etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Merkmale Ihrer Arbeit im Gartenbau

Wenn Sie alle Aspekte Ihrer Arbeit berücksichtigen und an die letzten vier Wochen denken, wie würden Sie diese beurteilen? Bitte kreuzen Sie das entsprechende Symbol für jeden Aspekt an.

\* Die Höhe oder Menge, welche mir von dem Merkmal zur Verfügung steht ist (1):

	<b>extrem zu niedrig</b>	<b>sehr zu niedrig</b>	<b>etwas zu niedrig</b>	<b>etwa richtig</b>	<b>durchaus akzeptabel</b>	<b>sehr akzeptabel</b>	<b>extrem akzeptabel</b>
							
Die Möglichkeit meine eigenen Fähigkeiten auszubauen und zu lernen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Möglichkeit meine Aufgaben von Anfang bis Ende mit einem sichtbaren Ergebnis abzuschließen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bei meiner Arbeit kann ich ganz ich selbst sein und muss mich nicht verstellen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Höhe meines Gehaltes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Angenehme Arbeitsumgebung (Gebäude, Räume, Lärm, Temperatur etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sichere Arbeitsprozesse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Angemessene Ausrüstung und Werkzeuge (inkl. Maschinen)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Der Wert meiner eigenen Arbeit für die Gesellschaft oder Gemeinde	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Bedeutung der eigenen Arbeit für mich selbst und das Unternehmen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Die Führungskraft pflegt einen rücksichtsvollen Umgang mit den Mitarbeitern	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Führungskraft unterstützt die Mitarbeiter bei ihrer Arbeit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wie beurteile ich meine Arbeitsplatzsicherheit (ich kann meinen Arbeitsplatz noch lange behalten)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wie beurteilen Sie ihre Zukunftsaussichten (derzeit entwickle ich mich in eine gute Richtung (in Richtung meiner persönlichen Ziele))	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mein Arbeitgeber geht fair mit seinen Mitarbeitern um (keine Diskriminierung)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Der Umgang des Unternehmens mit der Gesellschaft insgesamt (Lieferanten, Kunden, Umwelt etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\*

Die Höhe oder Menge, welche mir von dem Merkmal zur Verfügung steht ist (2):



**Achtung: Die Antworten haben sich verändert! Jetzt ist links besser und rechts schlechter.**

	extrem akzeptabel	sehr akzeptabel	durchaus akzeptabel	etwa richtig	etwas zu hoch	sehr zu hoch	extrem zu hoch
Der Konflikt zwischen unterschiedlichen Aufgaben	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Der Konflikt zwischen Arbeit und Familie (Freizeit)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Da es sich um Konflikte handelt, ist es besser sehr wenig Konflikte dieser Art zu haben (links)(extrem akzeptabel) als sehr viele (rechts)(extrem zu hoch).

Die Höhe oder Menge, welche mir von dem Merkmal zur Verfügung steht ist (3):

## Grafik entfernt

Achtung Achtung: Die Antwortmöglichkeiten ändern sich! Jetzt kann es zu wenig oder zu viel von Etwas sein!

	extrem zu niedrig	sehr zu niedrig	etwas zu niedrig	etwa richtig	etwas zu hoch	sehr zu hoch	extrem zu hoch
Mein Einfluss auf meinen Arbeitsinhalt und dessen Durchführung (Entscheidungsfreiheit)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mein Einfluss auf das Unternehmen insgesamt (auch durch Gewerkschaften und Betriebsrat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Möglichkeit meine eigenen Fähigkeiten und Erfahrungen einzusetzen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Anzahl meiner Aufgaben	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Der Schwierigkeitsgrad meiner Aufgaben	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Palette von unterschiedlichen Aufgaben und Arbeitssituationen oder Arbeitsort	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Vorhersagbarkeit der Zukunft bezogen auf die Arbeit (ohne Karriereperspektiven; Ich weiß was in nächster Zeit passieren wird)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Der Grad mit dem ich weiß, was von mir in meiner Rolle erwartet wird und welche Anforderungen ich erfüllen muss	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Verfügbarkeit von Feedback. Ich bekomme Informationen über meinen Leistungsstand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Anzahl sozialer Kontakte (beinhaltet auch die Pri-vatsphäre am Arbeitsplatz)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Qualität der sozialen Kontakte (extrem zu hoch: z. B. mir wird Hilfe aufgezwungen)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**?** Bei diesen Merkmalen ist zu wenig negativ aber zu viel auch. Haben Sie beispielsweise sehr wenig Entscheidungsfreiheit ist das negativ, haben Sie aber zuviel, dann können Sie überfordert sein und sich etwas Anleitung wünschen. Zu wenig Vorhersagbarkeit der Zukunft schafft Unsicherheit, zuviel bringt Langeweile mit sich. Nicht zu wissen was in seiner Rolle verlangt wird schafft Unzufriedenheit, aber es bis ins letzte Detail zu wissen ist wiederum langweilig. Kein Feedback zu bekommen ist frustrierend, da Sie dann nicht beurteilen können ob Sie eine Aufgabe gut oder schlecht gemeistert haben. Zu detailliertes und laufendes Feedback ist hingegen frustrierend. Selbst bei der Qualität der sozialen Kontakte kann es ein zu viel geben, wenn Sie mit Gutherzigkeit und Hilfestellungen überhäuft werden, dann möchten Sie vielleicht einmal keine Hilfe bekommen, sondern das Problem alleine lösen.

Alles zusammengenommen, wie zufrieden sind Sie mit Ihrem Leben und Ihrer Arbeit insgesamt? Bitte kreuzen Sie das Symbol an, welches Ihrer Zufriedenheit am ehesten entspricht.

								keine Antwort
Alles zusammengenommen, wie zufrieden sind Sie mit Ihrem Leben insgesamt?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Alles zusammengenommen, wie zufrieden sind Sie mit Ihrem Arbeitsleben insgesamt?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

### Betriebsmerkmale

Die Abfrage dieser einiger Merkmale des Betriebes in dem Sie arbeiten dient lediglich der statistischen Auswertung. Eine Rückverfolgbarkeit wird ausgeschlossen. Beispielsweise wäre es interessant zu erfahren, ob bestimmte Arbeitsmerkmale in einer Sparte in bestimmter Weise auftreten.

In welchem Postleitzahlen Gebiet liegt der Betrieb in dem Sie arbeiten?  
in diesem Feld kann nur ein ganzzahliger Wert eingetragen werden.

**?** Die Frage dient nicht dazu den Betrieb zu identifizieren, sondern um bei der Auswertung der Ergebnisse angeben zu können, wieviele unterschiedliche Betriebe an der Auswertung teilgenommen haben.

\* In welche Sparte des Gartenbau kann der Betrieb in dem Sie arbeiten eingeordnet werden?  
Bitte wählen Sie eine der folgenden Antworten:

\* Wieviele Mitarbeiter sind ungefähr in dem Betrieb beschäftigt (ohne Saisonmitarbeiter)?  
Bitte wählen Sie eine der folgenden Antworten:

- bis 5
- 6 bis 10
- 11 bis 20
- 21 bis 50
- 51 bis 100
- über 100

\* Wieviele Saisonmitarbeiter sind ungefähr in dem Betrieb beschäftigt?  
Bitte wählen Sie eine der folgenden Antworten:

- bis 5
- 6 bis 10
- 11 bis 20
- 21 bis 50
- 51 bis 100
- über 100

\* Wieviele Hektar (ha) werden ca. im Freiland angebaut?  
In dieses Feld dürfen nur Zahlen eingegeben werden.

Grafik entfernt

**?** wenn nichts im Freiland angebaut wird geben Sie bitte eine 0 ein.

\* Wieviele Quadratmeter (m<sup>2</sup>) werden ca. Unterglas angebaut?  
In dieses Feld dürfen nur Zahlen eingegeben werden.

Grafik entfernt

**?** wenn nichts im Gewächshaus angebaut wird geben Sie bitte eine 0 ein.



**\* Wieviele Quadratmeter (m<sup>2</sup>) ca. sind Verkaufsfläche?** Grafik entfernt  
**In dieses Feld dürfen nur Zahlen eingegeben werden.**

**?** wenn es keine Verkaufsfläche gibt, geben Sie bitte eine 0 ein.

**Personenbezogene Angaben**

Die Angaben dienen lediglich der statistischen Auswertung. Es ist beispielsweise interessant ob Frauen und Männer unterschiedliche Arbeitsmerkmale aufweisen.

**Welcher Nationalität würden Sie sich am ehesten zuordnen? (polnisch, deutsch etc.)**

**?** Die Frage hat folgenden Hintergrund: Es wäre interessant zu erfahren, ob Menschen aus kollektivistischen Kulturen (z.B. Chinesen) oder aus individualistischen Kulturen (US-Amerikaner, Deutsche) andere Dinge im Beruf wichtiger sind.

**Ihr Geschlecht (bitte ankreuzen)**

weiblich    männlich    keine Antwort

**In welchem Jahr wurden Sie geboren? (JJJJ)**  
**in diesem Feld kann nur ein ganzzahliger Wert eingetragen werden.**

**?** Beispielsweise 1983.

**Sind Sie selbstständig?**

Ja    Nein    keine Antwort

**Welches ist Ihr höchster beruflicher Bildungsabschluss?**  
**Bitte wählen Sie eine der folgenden Antworten:**

Bitte auswählen..

**Tragen Sie Führungsverantwortung?**

Ja    Nein    keine Antwort

## Questionnaire Chapter Seven (Vocational and Master Craftsman Scholars)

The questionnaire for the sample of vocational and master craftsman scholars is the same as for the employees plus the following question.

**\* Besuchen Sie derzeit eine Schule (Berufsschule, Meisterschule usw.)?**

Ja    Nein

## Questionnaire Chapter Seven (Horticulture Students)

Personenbezogene Daten	
<p>* <b>Welcher Nationalität würden Sie sich am ehesten zuordnen? (polnisch, deutsch etc.)</b></p>	
<input type="text"/>	
<p><b>?</b> Es ist hierbei nicht wichtig, welche Staatsangehörigkeit Sie besitzen. Hintergrund der Frage ist die Hypothese, dass es kulturelle Unterschiede in den Präferenzen gibt. D.h. eine Person mit einem individualistischen kulturellen Hintergrund beispielsweise dem Aspekt Autonomie mehr Bedeutung beimisst, als es eine Person aus einem kollektivistischen Hintergrund tut.</p>	
<p>* <b>Ihr Geschlecht? (Bitte ankreuzen)</b></p>	
<p><input type="radio"/> weiblich    <input type="radio"/> männlich</p>	
<p><b>Wann wurden Sie geboren?</b></p>	
<input type="text"/> <input type="button" value="..."/>	
<p><b>?</b> Ihr Geburtsdatum. Wenn Sie vor 1980 geboren sind, geben Sie bitte Ihr Geburtsdatum direkt in das Feld ein. z.B. 21.01.1976 für den 21. Januar 1976. Wenn Sie nach 1980 geboren sind können Sie auch den Assistenten verwenden.</p>	
<p>* <b>Sind Sie In Ihrem Traumjob teilzeit oder vollzeit beschäftigt?</b> <b>Bitte wählen Sie eine der folgenden Antworten:</b></p>	
<input type="text" value="Bitte auswählen.."/>	
<p>* <b>Haben Sie in Ihrem Traumjob einen festen oder befristeten Arbeitsvertrag?</b> <b>Bitte wählen Sie eine der folgenden Antworten:</b></p>	
<p><input type="radio"/> fester Arbeitsvertrag <input type="radio"/> befristeter Arbeitsvertrag</p>	
<p>* <b>In Ihrem Traumjob, gehören Sie zur Kernbelegschaft des Unternehmens oder gehen Sie einer Leih- oder Saisonarbeit nach?</b> <b>Bitte wählen Sie eine der folgenden Antworten:</b></p>	
<p><input type="radio"/> Kernbelegschaft <input type="radio"/> Leih- oder Saisonarbeitskraft</p>	
<p>* <b>Sind Sie in Ihrem Traumjob selbstständig?</b></p>	
<p><input type="radio"/> Ja    <input type="radio"/> Nein</p>	
<p>* <b>In welchem Semester befinden Sie sich derzeit?</b> <b>in diesem Feld kann nur ein ganzzahliger Wert eingetragen werden.</b></p>	
<input type="text"/>	
<p>* <b>Studieren Sie im Bachelor- oder Masterstudiengang?</b> <b>Bitte wählen Sie eine der folgenden Antworten:</b></p>	
<p><input type="radio"/> Bachelorstudiengang <input type="radio"/> Masterstudiengang <input type="radio"/> Promotion</p>	
<p>* <b>Haben Sie schon in einem Gartenbauunternehmen gearbeitet?</b></p>	
<p><input type="radio"/> Ja    <input type="radio"/> Nein</p>	
<p><b>Wieviele Monate waren Sie in einem Gartenbauunternehmen bis jetzt beschäftigt?</b> <b>In dieses Feld dürfen nur Zahlen eingegeben werden.</b></p>	
<input type="text"/>	

**Ihre individuellen Präferenzen bezüglich Ihres Traumjobs (letzte Seite der Umfrage!)**

Denken Sie an Ihren Traumjob, einen den Sie wirklich lieben könnten. Wie wichtig wäre Ihnen das Vorhandensein der folgenden Merkmale? Kreuzen Sie das entsprechende Feld an.

**\* In meinem Traumjob ist das Vorhandensein des Merkmals:**

	unwichtig	ein wenig wichtig	wichtig	sehr wichtig	extrem wichtig	unentbehrlich
Entscheidung, Autonomie, Selbstbestimmung über Arbeitsinhalt und Durchführung	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Einfluss auf die Organisation als Ganzes zu haben (auch durch Gewerkschaften und Betriebsrat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meine eigenen Fähigkeiten und Erfahrungen einzusetzen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meine eigenen Fähigkeiten auszubauen und zu lernen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Anzahl meiner Aufgaben	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Der Schwierigkeitsgrad meiner Aufgaben	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aufgaben von Anfang bis Ende mit einem sichtbaren Ergebnis abzuschließen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Konfliktfreiheit zwischen unterschiedlichen Aufgaben	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vereinbarkeit von Beruf und Familie (Freizeit)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bei meiner Arbeit ganz ich selbst sein zu können und mich nicht verstellen zu müssen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Palette von unterschiedlichen Aufgaben und Arbeitssituationen oder Arbeitsort	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Vorhersagbarkeit der Zukunft bezogen auf die Arbeit (ohne Karriereperspektiven)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Der Grad mit der ich weiss, was von mir in meiner Rolle erwartet wird und welche Anforderungen ich erfüllen muss	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Verfügbarkeit von Feedback. Das ich Informationen über meinen Leistungsstand bekomme	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Die Anzahl sozialer Kontakte	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Qualität der sozialen Kontakte	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Höhe meines Gehaltes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Angenehme Arbeitsumgebung (Gebäude, Räume, Lärm, Temperatur)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sichere Arbeitsprozesse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Angemessene Ausrüstung und Werkzeuge (inkl. Maschinen)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Der Wert meiner eigenen Arbeit für die Gesellschaft oder Gemeinde	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Bedeutung der eigenen Arbeit für mich selbst und des Unternehmens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Führungskraft pflegt einen rücksichtsvollen Umgang mit den Mitarbeitern	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Führungskraft unterstützt die Mitarbeiter bei ihrer Arbeit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
eigene Arbeitsplatzsicherheit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<b>unwichtig</b>	<b>ein wenig wichtig</b>	<b>wichtig</b>	<b>sehr wichtig</b>	<b>extrem wichtig</b>	<b>unentbehrlich</b>
eigene Zukunftsaussichten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Arbeitgeber geht fair mit seinen Mitarbeitern um (keine Diskriminierung)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Umgang des Unternehmens mit der Gesellschaft insgesamt (Lieferanten, Kunden, Umwelt etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Questionnaire Chapter Eight

### Betriebsmerkmale

**In welchem Postleitzahlen Gebiet liegt der Betrieb in dem Sie arbeiten?  
In diesem Feld kann nur ein ganzzahliger Wert eingetragen werden.**

**?** Die Frage dient nicht dazu den Betrieb zu identifizieren, sondern um bei der Auswertung der Ergebnisse angeben zu können, wieviele unterschiedliche Betriebe an der Auswertung teilgenommen haben.

**In welche Sparte des Gartenbaus kann der Betrieb in dem Sie arbeiten eingeordnet werden? Bei Mehrfachauswahl geben Sie bitte die ungefähre prozentuale Verteilung an.**

**Bitte wählen Sie einen oder mehrere Punkte aus der Liste aus.  
Kommentieren wenn eine Antwort gewählt wird**

Zierpflanzen

Gemüse

Obst

Baumschule

Sonstiges:

**Wieviele Mitarbeiter sind ungefähr in dem Betrieb beschäftigt (ohne Saisonmitarbeiter)?  
Bitte wählen Sie eine der folgenden Antworten:**

- bis 5
- 6 bis 10
- 11 bis 20
- 21 bis 50
- 51 bis 100
- über 100
- keine Antwort

**Wieviele Saisonmitarbeiter sind ungefähr in dem Betrieb beschäftigt?  
Bitte wählen Sie eine der folgenden Antworten:**

- bis 5
- 6 bis 10
- 11 bis 20
- 21 bis 50
- 51 bis 100
- über 100
- keine Antwort

**Wieviele Hektar (ha) werden ca. im Freiland angebaut?  
In dieses Feld dürfen nur Zahlen eingegeben werden.**

**?** wenn nichts im Freiland angebaut wird geben Sie bitte eine 0 ein.

**Wieviele Quadratmeter (m<sup>2</sup>) werden ca. Unterglas angebaut?**

**In dieses Feld dürfen nur Zahlen eingegeben werden.**

**?** wenn nichts im Gewächshaus angebaut wird geben Sie bitte eine 0 ein.

**Wieviele Quadratmeter (m<sup>2</sup>) ca. sind Verkaufsfläche?**

**In dieses Feld dürfen nur Zahlen eingegeben werden.**

**?** wenn es keine Verkaufsfläche gibt, geben Sie bitte eine 0 ein.

**Wie hoch ist ungefähr der Betriebsertrag ihres Unternehmens? (Angabe bitte auf Tausenderstellen gerundet)**

**In dieses Feld dürfen nur Zahlen eingegeben werden.**

**?** Der Betriebsertrag enthält alle monetären Erträge aus Produktion, Handel und Dienstleistungen.

**Wie hoch ist ungefähr der Betriebsaufwand Ihres Unternehmens? (Angabe bitte auf Tausenderstellen gerundet)**

**In dieses Feld dürfen nur Zahlen eingegeben werden.**

**?** Der Betriebsaufwand enthält alle Aufwendungen (abzüglich Fremdkapital, Mieten und Pachten), die im Zusammenhang mit gärtnerischer Produktion, Dienstleistungen und Handelstätigkeit in einem Wirtschaftsjahr anfallen, einschließlich der Abschreibungen.

Abschreibungen erfassen die planmäßige oder außerplanmäßige Wertminderung von Vermögensgegenständen.

### **Veränderungsmanagement (Change Management)**

**Welche 5 „Megatrends“ werden im kommenden Jahrzehnt die Ursache für fundamentale Veränderungsprozesse in Ihrem Unternehmen sein?**

**Bitte wählen Sie maximal 5 Antworten.**

- Global Sourcing, z.B. weltweite Beschaffung
- Arbeitseinstellung z.B. „Work-Life-Balance“
- Frauen z.B. Anteile in Führungspositionen
- Urbanisierung z.B. Metropolen, Landflucht

- Beschleunigung z.B. „Time to Market“, immer kürzere Produktlebenszyklen
- Diversität z.B. Anteil Menschen mit Migrationshintergrund
- Arbeitsformen z.B. Home-Office, virtuelle Organisationen
- Ende der Nationalstaaten z.B. regionale Allianzen
- Corporate Governance z.B. Shareholder-Focus
- Ressourcenengpässe /-preise, z.B. Rohstoffe
- Komplexität z.B. Ende der Eindeutigkeit
- Demografie z.B. Alterspyramide
- Internet z.B. Web 2.0 (Facebook und Co), Konvergenz Medien (Smart-TV, -Phone)
- Finanzmärkte z.B. regionale Allianzen
- Fortschreitende Marktliberalisierung bei gleichzeitigen Konzentrationsprozessen
- Arbeitsteilung z.B. fokussierte Wertschöpfung
- Verändertes Konsumentenverhalten z.B. steigendes Gesundheitsbewusstsein
- Umwelt z.B. Klimawandel, Auflagen, Kosten
- Neue Technologien z.B. Nano-, Bio-, Gentechnik
- IT- Flexibilisierung z.B. Serviceorientierte Architektur (SOA)
- Asien z.B. China, Indien
- Arbeitsmarkt z.B. „War for Talents“, Fachkräftemangel
- Sonstiges:

**Welche Funktion haben Sie im Unternehmen?**

Bitte wählen Sie eine der folgenden Antworten:

Bitte auswählen..

**Wie lange gehören Sie dem Unternehmen schon an?**

Bitte wählen Sie eine der folgenden Antworten:

Bitte auswählen..

**Zustimmung zur Aussage:**

**„Wenn der Leidensdruck für die Mitarbeiter nur groß genug ist, werden sie sich schon an die erforderlichen Veränderungen anpassen“**

Bitte wählen Sie eine der folgenden Antworten:

- 0%
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100%
- keine Antwort

**Zustimmung zur Aussage:**

**„Wir müssen die Betroffenen zu Beteiligten machen und den Veränderungsprozess aktiv unterstützen“**

**Bitte wählen Sie eine der folgenden Antworten:**

- 0%
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100%
- keine Antwort

**Für wie wirtschaftlich erfolgreich würden Sie Ihr Unternehmen im Vergleich zur direkten Konkurrenz beurteilen?**

**(1 = Überhaupt nicht erfolgreich; 5 = sehr erfolgreich)**

- 1
- 2
- 3
- 4
- 5
- keine Antwort

**Wie wichtig ist der Umgang (das Managen) von Veränderungsprozessen in Ihrem Unternehmen derzeit?**

**(1 = unbedeutend; 5 = überaus wichtig)**

- 1
- 2
- 3
- 4
- 5
- keine Antwort

**Wie wichtig wird der Umgang (das Managen von Veränderungsprozessen in Ihrem Unternehmen im Jahr 2020 sein?**

**(1 = unbedeutend; 5 = überaus wichtig)**

- 1
- 2
- 3
- 4
- 5
- keine Antwort

**Welche werden in den kommenden 3 Jahren die häufigsten Ursachen für Veränderungen in Ihrem Unternehmen sein? (Mehrfachnennung möglich)**

**Bitte wählen Sie einen oder mehrere Punkte aus der Liste aus.**

- KVP (Kontinuierlicher Verbesserungsprozess)/ sonstige Verbesserungsinitiativen
- Kostensenkungsprogramme
- Veränderte Personalkonzepte
- Internationalisierung
- Merger & Acquisition (Fusion, Unternehmenskäufe usw.)
- Externe Veränderungen, Gesetze etc.
- Umweltinnovationen
- IT-Innovationen
- Veränderte Marktstrategie / Kundenansprache
- Veränderte Unternehmensstrategie



- Wachstumsinitiativen
- Nachhaltigkeitsinitiativen inkl. Labeling, Umstellung auf Bioproduktion usw.
- Restrukturierung / Reorganisation
- Technikinnovationen
- Unternehmensnachfolge / Unternehmensübergabe
- Sonstiges:

**Wenn Sie die Ursachen auf ein einziges Hauptziel der Unternehmensveränderung (Business Transformation) reduzieren würden, welches wäre dies für Ihr Unternehmen (Einfachnennung)?**

**Bitte wählen Sie eine der folgenden Antworten:**

- Wachstum erhöhen
- Kosten senken
- Qualität verbessern
- Integration stärken
- Internationalität erreichen
- Nachhaltigkeit leben
- etwas ganz anderes
- keine Antwort

**Welches waren die Schwierigsten Probleme bei der Umsetzung und Implementierung von Veränderungsprozessen? (Mehrfachnennung möglich)**

**Bitte wählen Sie einen oder mehrere Punkte aus der Liste aus.**

- Langfristige Maßnahmen werden für kurzfristige Ergebnisverbesserung geopfert
- Schwaches Projektmanagement
- Verzicht auf Change Management (Veränderungsmanagement)
- Mangelnde Fähigkeiten / Qualifikationen / Know-How
- Zu geringe Verantwortungsbereitschaft
- Kein Commitment (dt. Einstandspflicht, Bekenntnis, Hingabe) des Vorstandes / des Eigentümers
- Fehlende Verknüpfung „top down“ (die da oben) und „bottom-up“ (die da unten)
- Kein echtes und nachhaltiges Monitoring / Erfolgskontrolle der Aktivitäten
- Keine Konkretisierung durch Business Case (Szenario zur betriebswirtschaftlichen Beurteilung einer Investition)
- Fehlende oder mangelnde Unterstützung aus dem Linienmanagement
- Zu viele Aktivitäten ohne Priorisierung
- Interessen- / Zielkonflikte der Beteiligten
- Keine klare Zielsetzung
- Fehlende internationale / globale Perspektive
- Lähmung der Organisation durch andauernde Reorganisationen
- Sonstiges:

**Wenn Sie auf die Ihnen bekannten Veränderungsprozesse zurückblicken ... welche 3 Erfolgsfaktoren waren für das Gelingen ausschlaggebend? (3 Nennungen)**

**Bitte wählen Sie maximal 3 Antworten.**

- Dringlichkeit („sense of urgency“)
- Partizipation der Betroffenen am Entscheidungsprozess
- Projekten / Programmen
- Professionelles Projektmanagement
- Anreizsystem für die Beteiligten
- Training der Betroffenen
- Effektives Stakeholder Management
- Ein abgestimmtes zeitliches Vorgehen (alles zu seiner Zeit), Timing
- Offene, klare Kommunikation innerhalb des Projektes und gegenüber anderen
- „Richtige“ Informationspolitik
- „Richtiges“ Führungsverhalten
- Commitment und Glaubwürdigkeit des Managements
- Konsequentes Monitoring und Controlling des Prozesses
- Teamgeist und Motivation („winning spirit“)
- Realistische, klare Vision / Zielsetzung und ihre Kommunikation
- Sonstiges:

**Welche Erfolgsfaktoren waren bei erfolgreichen Veränderungsprozessen in Ihrem Unternehmen ausschlaggebend? (Mehrfachnennung)**

**Bitte wählen Sie einen oder mehrere Punkte aus der Liste aus.**

- Angemessenen Führungsstil leben, als Vorbild agieren
- Qualifizierung und Entwicklung zielgruppenorientiert durchführen
- Strukturen und Monitoring entwickeln und aufbauen
- Mobilisierung und Commitment sicherstellen
- Richtiges Führungsverhalten
- Konflikte und Widerstände reduzieren und vermeiden
- Ausrichtung und Alignment forcieren
- Information und Kommunikation (top-down und bottom-up)
- Projekt-/ Prozesscontrolling
- Organisation und Prozesse erfassen und designen
- Führung fördern
- Unternehmens- Kultur weiterentwickeln
- Erfolge identifizieren und verankern
- Anreize (vielleicht auch materieller Art) geben
- Einbindung der Mitarbeiter bei Entscheidungsprozessen
- Situation und Umfeld analysieren und verstehen
- Sonstiges:

**Was ist wichtiger: Inhalt oder Prozess (Ablauf)? (Vergabe von maximal 10 Prioritätspunkten (von 1 bis 10))**

**Nur Zahlen dürfen in dieses Feld eingegeben werden.**

**Jede Antwort muss zwischen 1 und 10 sein**

Prozess

Inhalt

**Welchen „Schwierigkeitsgrad“ sehen Sie derzeit hinsichtlich der in Ihrem Unternehmen stattfindenden Veränderungen?**

**(1 = sehr einfach; 10 = extrem schwer)**

**Jede Antwort muss zwischen 1 und 10 sein  
in diesem Feld kann nur ein ganzzahliger Wert eingetragen werden.**

**Wie wurden im Durchschnitt der beiden vergangenen Jahre die Ziele am besten bezogen auf quantifizierbare Kennzahlen erreicht?**

**Bitte wählen Sie eine der folgenden Antworten:**

- 0%
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100%
- keine Antwort

**VIELEN DANK, dass Sie so lange durchgehalten haben!!!**

**Sind Sie bereit noch ein Paar Fragen zum Thema Veränderungen und Veränderungsmanagement im Gartenbau zu beantworten?**

- Ja
- Nein
- keine Antwort

**Welches Kompetenzprofil sollte für Sie der „ideale“ Veränderungs(manager)- Unterstützer (Change Manager) haben? (bis zu 5 Nennungen)**

**Bitte wählen Sie maximal 5 Antworten.**

- Vertrauenswürdigkeit
- Kommunikationsfähigkeit
- Moderation
- Durchsetzungsfähigkeit
- Lernfähigkeit / Flexibilität
- Motivationsfähigkeit (sich und andere)
- Delegationsfähigkeit
- Zielorientierung
- Organisationsvermögen
- Teamfähigkeit
- Authentisches Auftreten / Selbstvertrauen
- Stressresistenz
- Konfliktfähigkeit
- Extrovertiertheit
- Belastbarkeit
- Ambiguitätstoleranz (Ungewissheitstoleranz)
- Einfühlungsvermögen
- Kenntnisse im Projektmanagement
- Branchen- / Marktkenntnisse

**Die Eigenschaften eines „idealen“ Veränderungsmanagers...**

**Bitte wählen Sie eine der folgenden Antworten:**

- ... lassen sich erlernen und trainieren
- ... sind ganz wesentlich in der Persönlichkeit verankert
- keine Antwort

**Veränderungsmanagement (Change Management) ist ein fester Bestandteil im internen Fortbildungsprogramm Ihres Unternehmens**

- Ja
- Nein
- keine Antwort

**Ist Ihnen dieses Instrument unbekannt?**

**Bitte wählen Sie einen oder mehrere Punkte aus der Liste aus.**

- Resistance Radar
- Analoge Intervention
- Lernlandkarten
- Change Readiness Assessment
- Change Impact Analyse
- World Café
- Kulturforen
- Stroytelling
- Kräftefeldanalyse
- Systematische Aufstellung
- Unternehmenstheater
- Kulturmanagement
- Zukunftskonferenzen
- Konsequenzen Management / Sanktionen
- Retention Management
- Change Story
- Open Space
- Kulturanalyse
- Kreativitätstechniken
- Stakeholder Management
- Change Controlling
- Projektmarketing
- Transformationsfahrplan
- Change Agents
- Lernende Organisation
- Kompetenzmanagement
- Umfeld-/Statusanalyse
- Qualitätszirkel
- Projektbeurteilung
- Information Faire / Roadshow
- Wissensmanagement
- Rollen- / Auftragsklärung
- Balanced Scorecard
- Mitarbeiter-Mobilisierung
- Tain-the-Trainer für Führungskräfte
- Interviews
- Kommunikation Printmedien
- Assessment Center / Audits
- Visionsentwicklung
- Team Building- Aktivitäten
- Organisationsentwicklung
- Coaching
- Anreizsysteme / Motivation

- Veranstaltungen / Events
- Konfliktmanagement
- Führungsgrundsätze
- Befragung / Surveys
- Projektmanagement
- Kommunikation Intranet
- Kommunikation persönlich
- Workshops
- Personalentwicklung
- Training / Schulung

**Wann werden die Change Management- Aktivitäten üblicherweise in Ihrem Unternehmen begonnen?**

**Bitte wählen Sie eine der folgenden Antworten:**

- Vor Beginn des Veränderungsprozesses (der Business Transformation) mit ausreichendem Vorlauf
- Unmittelbar mit Beginn des Veränderungsprozesses (der Business Transformation)
- Mit deutlicher Verzögerung zum Beginn des Veränderungsprozesses (Business Transformation)
- Erst, wenn bei dem Veränderungsprozess (der Business Transformation) der „Karren im Dreck steckt“
- gar nicht
- keine Antwort

**Wie werden die Change- Management (Veränderungsmanagement) Aktivitäten üblicherweise in Ihrem Unternehmen mit personellen und materiellen Ressourcen ausgestattet?**

**Bitte wählen Sie eine der folgenden Antworten:**

- Üppiger als erforderlich
- Gerade richtig
- Etwas zu knapp
- Viel zu knapp
- Gar nicht
- keine Antwort

**Wenn Sie das Tempo Ihres Unternehmens – analog zu Straßenverkehr – charakterisieren, mit welcher Geschwindigkeit geht es bei Ihnen voran?**

**Bitte wählen Sie eine der folgenden Antworten:**

Bitte auswählen.. ▾

**Gibt es in Ihrem Unternehmen ein eigenes Budget oder eine eigene Budgetposition für Veränderungsmanagement (Change Management) Maßnahmen / Projekte?**

- Ja
- Nein
- keine Antwort

**Wie wird sich das Change Management Budget / Budgetposition in Ihrem Unternehmen (falls vorhanden) in den nächsten 3 Jahren ungefähr entwickeln?**

**Bitte wählen Sie eine der folgenden Antworten:**

Bitte auswählen.. ▾

**Welche der folgenden Aussagen zur Organisation von Veränderungsmanagement (Change- Management) in Ihrem Unternehmen treffen zu? (Mehrfachnennung)**

**Bitte wählen Sie einen oder mehrere Punkte aus der Liste aus.**

- Eine genaue Nutzenmessung ist bei Change Management nur bedingt möglich. Dennoch ist die Bestimmung von Nutzen und Kosten ein wichtiger Aspekt bei der Begründung von Change Management Maßnahmen.
- In unserem Unternehmen sind die Entscheider aufgrund ihrer Erfahrungen und Überzeugungen vom Nutzen des Change Managements überzeugt. Eine quantitative Bestimmung ist deshalb als Begründung nicht erforderlich.
- Auch Change Management muss sich an ökonomischen Kriterien messen lassen, selbst wenn die Nutzenseite nur teilweise quantifizierbar ist. Sämtliche Maßnahmen sind ein Investment, das sich am Ende des Tages rechnen muss.
- Weiche Themen wie Change Management sind einer validen Nutzenmessung nicht zugänglich, da zu viele Aspekte dabei vage bleiben. Ein Benefit Case für Change Management macht deshalb wenig Sinn.

**Welche negativen Effekte treten Ihrer Meinung nach besonders häufig auf, wenn das Thema Change Management in Unternehmen vernachlässigt wird? (Mehrfachnennung)**

**Bitte wählen Sie einen oder mehrere Punkte aus der Liste aus.**

- In effizientes Arbeiten durch fehlende / unzureichende Informationen über den Veränderungsprozess
- Höherer Krankenstand z.B. Krankschreibung, blauer Montag Nichts von alledem
- Häufigere Unterbrechungen der Arbeit z.B. Diskussionen mit Kollegen, privates Internetsurfen, längere Pausen
- Bewusstes Agieren gegen die Veränderung z.B. blockieren, verzögern, vermeiden
- Höhere Fluktuation

**Um wieviel Prozent sinkt laut Ihrer Erfahrung /Schätzung die Produktivität der betroffenen Mitarbeiter bei einem unzureichend ausgeführtem Change Management**

**Bitte wählen Sie eine der folgenden Antworten:**

- 0%
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100%
- keine Antwort

**Um wieviel Prozent steigt laut Ihrer Erfahrung / Schätzung die Fluktuation der Mitarbeiter bei einem unzureichenden Change Management?**

**Bitte wählen Sie eine der folgenden Antworten:**

- 0%
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100%
- keine Antwort



# Curriculum Vitae

## Persönliche Daten

Vor- und Zuname      Stephan Gerhard Heinz Meyerding  
Geburtstag            21.01.1983

## Studium

10/09 – 02/11      Fachhochschule Hannover  
Master of Science – Unternehmensentwicklung

08/05 – 10/09      Fachhochschule Hannover  
Bachelor of Science – Betriebswirtschaftslehre

01/08 – 06/08      Auslandssemester  
Southern Illinois University Edwardsville, USA

## Praktische Tätigkeiten

08/16 – dato      Wissenschaftlicher Mitarbeiter  
Georg-August-Universität Göttingen, Göttingen

03/12 – 07/16      Wissenschaftlicher Mitarbeiter  
Zentrum für Betriebswirtschaft im Gartenbau,  
Hannover

08/11 – 03/12      Controller  
LBS Norddeutsche Landesbausparkasse  
Berlin - Hannover, Hannover

09/07 – 11/09      Werkstudent  
Edicos Group, Hannover

## Schulbildung

08/03 – 07/04      Eugen- Reintjes- Schule, Hameln  
Fachoberschule Elektrotechnik

08/99 – 07/01      Elisabeth- Selbert- Schule, Hameln

## Berufsausbildung und Zivildienst:

08/01 – 06/03      Staatlich geprüfter technischer Assistent  
für Informatik  
Eugen- Reintjes- Schule, Hameln

08/04 – 07/05      Zivildienst - Deutsches Taubblindenwerk Fischbeck  
im technischen Dienst und anschließendes Praktikum in der  
Verwaltung

