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Values as Performance Indicators: A Path to Climate Protection

Werte als Leistungsindikatoren: ein Weg zu tätigem Klimaschutz

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Kurzfassung / Abstract

Climate mitigation and climate change adaptation are directly related to socio-cultural norms and values. Knowledge in itself, e.g. on the threat posed by climate change, is not *per si* sufficient to activate climate-friendly behaviour. Individual and collective sets of values (often held unconsciously) rather have an essential influence on behaviour. Some values appear to be a better source of motivation for an environmentally and climate-friendly behaviour than others. Thus it is imperative to make values visible. To understand the evolution or change of values in the society it is required to have indicators for these sets of values.

In this research it is proposed and tested a process to identify and measure the set of shared values held by university staff and students. Interviews, surveys and working groups were used to identify eight values which are climate-relevant and meaningful for university members. These eight value statements can be assessed by means of 76 validated indicators. For instance, the value statement „Taking over responsibility for the environment and protect, maintain and respect the environment for future generations" can be assessed by identifying "the extent "*Generationenfähigkeit* is being considered in BOKU member´s work" or "the extent people at BOKU attempt to have an up-to-date information about the environment and strive to spread it throughout research and development" or "the extent people at BOKU give preference to environmentally friendly and eco-friendly activities/procedures/resources".

The positive link between these eight values and the reduction of the carbon footprint, increased adaptability to climate chance and willingness to adapt to climate change is discussed.

The recommendation is to discuss these values and indicators (after adapting them to the different organisational contexts) checking possibilities to incorporate them into the BOKU sustainability report and the sustainability strategy, the work of the BOKU Ethics Platform and the Working Group on Social Responsibility.

Abstract

Klimaschutz und Klimawandelanpassung hängen unmittelbar mit soziokulturellen Normen und Werten, den gesellschaftlich verwurzelten Anschauungen und individuellen (Risiko-) Wahrnehmungen und Präferenzen zusammen. Wissen allein – z.B. über die Bedrohung durch den Klimawandel – führt nicht zwangsläufig zu entsprechend klimafreundlichem Verhalten. Vielmehr bestimmen individuelle wie kollektive Werthaltungen (häufig unbewusst) oft das Handeln. Man geht davon aus, dass manche Werte ein umwelt- und klimafreundliches Verhalten stärker motivieren als andere. Will man untersuchen, wohin sich eine Gesellschaft diesbezüglich entwickelt, braucht man erheb- und überprüfbare Indikatoren für diese Werthaltungen.

Am Fallbeispiel der Universität für Bodenkultur wurden mithilfe eines qualitativen, partizipativen und pionierhaft-explorativen Forschungsansatzes für wichtige und klimarelevante Werte solche Indikatoren entwickelt. Zunächst wurden durch Umfragen und in Arbeitstreffen acht Werte identifiziert, zu denen jeweils ein gemeinsames, intersubjektives Verständnis über deren Bedeutung seitens der mitwirkenden BOKU Angehörigen vorliegt. Diese 8 Werte werden durch 76 validierte Indikatoren beschrieben. So kann z.B. der Wert „*Verantwortung für die Umwelt übernehmen und Natur für kommende Generationen schützen, erhalten und respektieren"* durch das *„Denken an Generationenfähigkeit*", das „*Bemühen um aktuelles Umweltwissen und dessen Verbreitung durch Forschung und Lehre*" oder durch das „*Bevorzugen umweltschonender und umweltfreundlicher Maßnahmen/Verfahren/Mittel*" beschrieben werden. Die Werte konnten auch in Verbindung gebracht werden mit der Reduktion des CO2 Fußabdruckes sowie einer verbesserten Anpassungsbereitschaft und -fähigkeit an den Klimawandel.

Ziel wäre es, diese, oder in einem erweiterten Prozess noch besser abgesicherte Werte und Indikatoren u.a. in den BOKU Nachhaltigkeitsbericht und die Nachhaltigkeitsstrategie, die BOKU Ethikplattform und AG Soziale Verantwortung einzubringen.

F-1 Introduction and theoretical framing

F-1.1 Meaning and relevance for use of values in the context of climate change and sustainability

The Intergovernmental Panel on Climate Change (IPCC) met for the first time in 1988 to advocate for global cooperation to contain and cope with the effects of human activity on the environment (WCPSS, 1988). Since then the IPCC has issued numerous publications and held international conferences to raise awareness and look for common and synchronous ways of addressing climate change. A survey about climate change awareness conducted between 2007 and 2008 assessed a total of 206,193 residents in 128 countries. This survey shows that a majority of the world's adult population is aware of climate change. The survey also revealed that those who are aware are more likely to say climate change poses a serious threat to themselves and their families. According to the polls, 88% of adult Europeans, 95% of adult Austrians, 97% of Adults in the United States and 99% of adult Japanese are aware of climate change. In addition, 54% of Austrians, 63% of US Americans, 80% of Japanese perceive it as a serious threat to themselves and their families (PUGLIESE and RAY, 2009). Hence citizens' lack of awareness about climate change does not seem to be the reason for lack of political willingness to act, i.e. agreeing on an international legislative framework to reduce greenhouse gas emissions. Such political action would not only support actions to reduce the carbon footprint of economies, but it would also create synergies towards long-term planning and sustainability-based policies.

A central question here is: Why did awareness not result in concrete actions by individuals, especially decision-makers?

The rational approach in decision-making claims that if people are informed they will act in more sustainable ways. The belief that awareness about climate change results in actions is often not supported by empirical data. Instead what is often experienced is that humans are bounded rational, i.e. people making choices are intentionally rational in the sense that they are goal oriented and adaptive, but there are limits on rational behaviour: a) given the degree of complexity of systems, humans, more often than not, plan and decide on the basis of limited information; b) humans set aspiration levels for each of the multiple goals that they face while looking for satisfying solutions to their problems rather than the "optimal solution". The implications are that social and environmental concern and action on climate issues are based on more than simply access to the facts. A recent study about the reasons U.S. public give for supporting domestic climate change policies indicates that the reasons identified by individuals were generally weaker predictors of their policy support than values and beliefs (SHWOM et al. 2010). In the same way people's engagement in solving `bigger-than-self' problems, such as taking actions to avoid human induced climate change, is based on a particular set of underlying values. **Our approach to raise awareness about climate change and sustainability within the BOKU University setting is based on the assumption that people´s decisions (i.e. acting pro-sustainability, and therefore, pro-climate) is driven by the values they held.**

Numerous studies confirm a correlation between individual value systems and behaviour. People strive for consistency between their individual value system and their actions and feel good or rewarded if they act in accordance with values considered important by them (ROKEACH, 1973; BARDI and SCHWARTZ, 2003, quoted in: CROMPTON et al., 2010). The value pyramid according to ROKEACH (1968) as well as URBAN's model of ecological actions (1986, quoted in: HOMBURG and MATTHIES, 1998) show that values influence the individual behaviour in a certain hierarchical order. Value constructs (e.g. environmental-relevant value systems and attitudes) form the identity of a person and, as a consequence, guide their intended actions ultimately resulting in a specific (e.g.

environmental) behaviour. However, this does not mean that any individual action can be ascribed exclusively to a specific value nor can it be excluded that people may act contrary to their own values. It also does not mean that values are the only variables explaining behaviour. There is a multitude of empirically and theoretically founded behavioural models which consider various other factors equally relevant for action (cf. inter alia HOMBURG and MATTHIES, 1998; FIETKAU and KESSEL, 1981).

Nonetheless, values play a decisive role in particular if there is a choice between several alternative options or if in specific decision-making situations a conflict of values occurs (SCHWARTZ, 1996). An individual is thus forced to reflect about their own value standards in order to be able to decide for one or the other option. Values also play an important role in conflict ridden, complex decision-making situations, in which information and logic are often insufficient to make a decision (SCHWARTZ, 1996). Environmental and climate questions are complex decision-making situations often involving a myriad of different stakeholders, interests and value conflicts.

KASSER et al. (2007) were also able to show that value systems have considerable influence on the carbon footprint. The individual's commitment with regard to solving so-called 'bigger-than-self' problems (i.e. global environmental and social problems) – such as measures for combating anthropogenic climate change – depends of a specific set of basic values.

The people's attitude towards climate change and the way and extent to which they are willing to actually put corresponding strategies into practice or make resources for adaptation available strongly depends on the socio-cultural environment and the existing individual or collective value systems (BMLUFW, 2012). Thus adaptation measures to climate change are influenced by deeply rooted (though changeable) cultural and social norms and values as well as individual perceptions.

Values can be intrinsic or extrinsic. While extrinsic values are centred on external approval or rewards, intrinsic values are focused on more inherently rewarding pursuits. Individuals who prioritise intrinsic values such as freedom, creativity and self-respect (self-direction values), or equality and unity with nature (universalism values) tend to be more politically engaged, have higher levels of concern about social justice, engage in environmentally-friendly behaviours, and present lower levels of prejudice (CROMPTON et al., 2010). In contrast, individuals placing more importance on extrinsic values such as wealth, or preservation of public image tend to present higher levels of prejudice; less concern about the environment and corresponding behaviours; and weak (or absent) concern about human rights (CROMPTON et al., 2010).

Therefore systemic and durable responses to the challenges such as action to mitigate climate change or willingness to accept adaptation measures cannot be envisaged unless these come to be built upon an appeal to intrinsic values. The values located in the right top quadrant of the axis (see Fig. F- 1) are most supportive of addressing the 'bigger-than-self' problems such as climate change, global environmental and social problems.

Fig. F-2: Circumplex model of personal goals, based on a study of how 1800 students from 15 nations – both developed and developing – rated the importance of a variety of life goals (GROUZET et al., 2005).

Empirical studies reveal that values are related to one another in particular ways, with a degree of cross-cultural consistency. SCHWARTZ´S (1992) model of social values (see figure 2) shows that self-transcendence (universalism and benevolence) and openness to change (self-direction and stimulation) are held in opposite to power and achievement. Despite their slightly different objective, both models propose that there are "four occasionally overlapping but sometimes conflictual motivational systems that people must negotiate as they make their way through life" (GROUZET et al., 2005).

Exposing or priming a person to a particular value has predictable effects on different values and on behaviors that express different values. This is it seems to activate particular values which tend to promote behaviour associated with these and other compatible values, and to suppress behaviour associated with opposing values (MAIO et al., 2009).

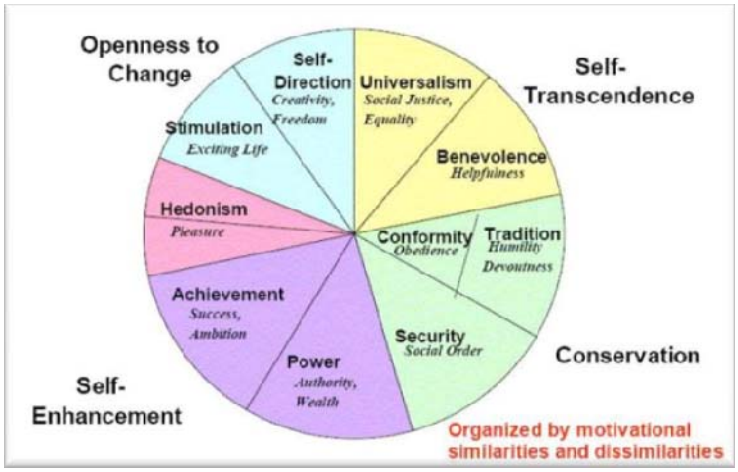

Fig. F-3: Theoretical model of relations among 10 types of values, organised by motivational similarities and dissimilarities (SCHWARTZ, 1992)

CROMPTON et al. (2010) suggest that individuals with a strong orientation to self-transcending and open-to-change values, including in particular universalism (defined as understanding, appreciation, tolerance and protection for the good of all human beings and nature) and self-determination (defined as independence of thought and action, freedom of choice) are more sensitive to global problems and more willing to actively tackle them – whether by changing their individual behaviour or by becoming politically active.

Individuals with a strong orientation to self-enhanced and conservative values, including in particular power (defined as social status and prestige, control and dominance of other human beings and resources) and security / protection (defined as safety, harmony and stability in society, relationships or the individual itself) care less about global conflicts or violations of human rights, are more prejudiced towards "outsiders" (with regard to origin, religion, sex), are less concerned about the environment and less motivated to behave eco-friendly or be politically active (CROMPTON et al., 2010).

In a cross-disciplinary analysis of numerous research sources on the topic of sustainable development BUCHEBNER (2011) identified 15 supporting and 6 hindering set of values which respectively support and hinder sustainable development processes. The study shows that empathy, solidarity, cooperation and respect for nature support pioneer processes towards sustainable development. BUCHEBNER (2011) found values inhibiting sustainable development, including among others self-centered values (e.g. image, power, competition), monetary-material values (e.g. greed, wealth, increase of profits) as well as an anthropocentric vision of the world (i.e. seeing humans as being the measure of all things). BUCHEBNER (2011) distinguishes between values with a weak and a strong link to sustainability. **Values with a weak link to sustainability** are referred as "sustainability values in the broadest sense" and are not necessarily and directly included in the general discourses on or definitions of sustainability as they are included in many other areas and contexts (of life). However they seem to have an indirect positive relation to sustainable development. Examples are: courage, creativity, cooperation, sympathy and compassion. **Values with a strong link to sustainability** are referred as "sustainability values in a narrower sense" and are values strongly linked to conservation and sustainability, both with regard to human societies and natural environment. For example respect for inner value of nature, inter- and intragenerational justice with regard to the distribution of both resources and immaterial factors. Values with a close link to sustainability can be derived from established definitions and concepts of sustainability or from previous research on the subject (BOSSEL, 1998; ÖMER, 2000; ERD CHARTA 2003, STEPHARD et al., 2009; CROMPTON et al., 2010).

F-1.2 Meaning and development of value-based indicators

Most of the above mentioned socially relevant values for sustainability oppose the dominating, materialistic and egocentric values of the economic system and consumer society. In a world faced with accelerating climate change and resource limits, there is an urgent need to identify better indicators of progress towards sustainability. Indicators are used by every organization to evaluate its success or the success of a particular activity; therefore they contribute to defining the goals and the values of organisations. The indicators in current use generally succeed in highlighting unsustainable trends that can be targeted by management action, but fall short of defining or ensuring sustainability (DAHL, 2012). **Achieving sustainability is an ethical challenge, thus a new set of values-based indicators is required to measure and motivate the implementation of ethical principles necessary to guide the transition.**

On the basis of this new understanding of the necessity of addressing cultural-collective values it is no longer a marginal view to recognize the ethical (and spiritual) dimension

as fourth (or rather fifth) additional "pillar" of sustainable development – or rather as the most fundamental and crucial dimension (CLUGSTON, 2011; BURFORD et al., 2012a).

Performance indicators are used by organizations in order to measure success or progress. They are also used as a conception tool influencing and reflecting upon everything which is important in a society. Thus performance indicators make a subtle but relevant contribution to the definition of aims and values of an organization. It is also staggering how little values and ethical aspects are for instance are taken into account in the performance of universities. Despite the fact that many universities describe their values and principles in mission statements, guidelines or even explicitly phrase them in their codes of ethics. Few universities consider them relevant in their annual performance evaluation. Conventional evaluation methods of university performance are focused on a concrete output (e.g. turnover figures, number of research projects acquired, number of students, number of publications) and neglect values and "value-based work". **An important step to achieve universal sustainable development is to move away from income as the key constituent of well-being, and to develop new indicators that measure actual improvements in well-being at all scales, we believe including values in these assessments would contribute to increase well-being as we would be measuring what make us flourish**, rather than measuring what makes economies flourish. Challenges to overcome before having value-based indicators:

(i) **Little research: Up to now there are hardly any useful indicators for sustainability tying in with this dimension of values.** Developing value-based indicators is critical if those ethical principles are to be measured and promoted which are essential for a sustainable development (DAHL, 2012).

(ii) **Lack of awareness and sensitisation to values.** Only rarely universities and other education institutions make an effort to assess and review if the values laid down in written on the mission statement and ethical code are actually adhered to, shared by everybody and acted upon within the university or organisation.

(iii) **Dealing with differing paradigms:** Values are seen as generally subjective, immaterial and hard to define or assess. On the other hand indicators are seen as objective and measurable. The challenge is to overcome this mismatch between a subjectivistic understanding of values and the objectivistic understanding of indicators by means of an intersubjective conceptual approach which acknowledges the existence of both sides, considers both valid and tries to establish a common basis of understanding. BURFORD et al. (2012a) were successful in developing value-based indicators for civil society organizations.

The **semiotic triangle** (OGDEN and RICHARDS, 1946) illustrates the relationship between three elements: (i) the **„symbol"** as a written or oral denomination (writing, words) containing some kind of meaning, (ii) the "**thought**" or "reference" as a set of meanings an individual, shaped by his/her experiences, links with this symbol and (iii) the "**referents**" as objects, perception or behaviour patterns that may constitute indicators for "thought". This triangle (Fig. F-3) shows that misunderstandings will easily occur if several persons use the same symbol (the same denomination) but associate different mental images due to the different subjective experiences they have made.

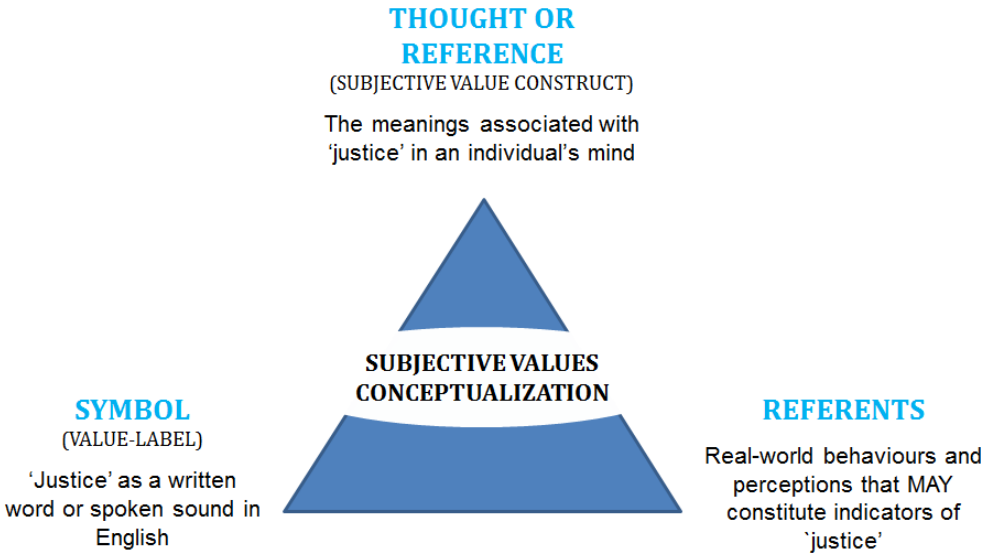

Fig. F-4 The Semiotic triangle (OGDEN and RICHARDS, 1946)

If these differences are acknowledged and a purposeful dialogue and exchange is initiated a series of referents can be effective for an entire group of people creating a common understanding on a specific denomination or an "intersubjective value construct" (BURFORD et al., 2012a). **The values originally conceived subjectively thus turn to a shared, "quasi-objective" truth for a group of people in a specific context. This intersubjective conceptualization of values, their meaning and implementation are a prerequisite to derive measurable value-based indicators.** For an intersubjective conceptualization of values the following criteria must be taken into consideration:

(i) **a group of individuals must be willing and ready to embark on a dialogue** with the aim of working together in order to create a common definition of values, being aware that this dialogue will create an added value for everybody (BURFORD et al., 2012a)

(ii) **the existence of a practical context** in which values are manifested through the interdependency of individuals with each other and with their environment. Context must be shared and understood by all participants (TALAMO and POZZI, 2011)

(iii) **a real dialogue or „*genuine dialogue*"** (BAKHTIN, 1981) on the meaning(s) of the values within the given context must be successfully realized.

F-1.3 Research needs

Ethics and values have, in part, been ignored by many scientific curriculums, employing the argument that they have no place within rational and "value-neutral" science (see for example UNESCO, 2005). Today this argument is discarded by philosophers (HARRIS 2010), policy makers (UNESCO-CEPES, 2004; UNESCO, 1998 and 2009) and scientists who see humans as having a bounded rationality and often driven by emotions (KASSER et al. 2004). Science has still a lot of work to do making values or value-based decisions visible and measureable. With this project we hope to increase the understanding on how develop value-based indicators to help organisations deal with up-to-now not tangible and too vague areas and value dimensions of sustainability.

Tab. F-1: Benefit of value-based indicators in addressing current organizational problems in the shift towards sustainable development

PROBLEM	BENEFIT/SOLUTION
Ethical dimension of sustainability important, but too vague and too little knowledge about what should be included in this dimension.	Ethical dimension of sustainability is purposefully addressed with the development of sustainability values. These values make this dimension visible.
Different, subjective understanding of values through respectively different individual histories and associations.	This method creates increased awareness of values as well a common understanding on their meaning.
Organisational performance indicators were developed to measure economic development and thus are insufficient for assessing the multiple pillars of sustainability.	Value-based indicators departure from the aims and values of an organization as cited in its mission statement to measure positive target states.
Incongruence between goals and objectives cited in organisation´s mission statement and value models and concepts laid down in organizations.	This method support a review to what extent communicated ethical values (e.g. code of ethics, role models) are actually shared and practised and addresses the issue of cognitive dissonance (i.e. discomfort experienced due to simultaneously holding two or more conflicting beliefs or values) managers are often driven into.

On the basis of a common value basis in particular those values are of great interest for this project which promote climate-friendly and sustainable actions. This means that there is also a research necessity with regard to the connection of specific values and their relevance for pro-climate action.

F-1.4 Research objectives

The following objectives are placed at the heart of this project:

a) Identification of values essential for BOKU staff and students,

b) Identification of values motivating a reduction of the carbon footprint and other eco-friendly activities,

c) Development of indicators for measuring values promoting sustainability from step b) and

d) Initiating a discussion on usability/relevance of a value-based (performance) evaluation of the university.

Implied in these objectives are two different, parallel yet intertwined research contributions:

- Creation and development of values and value-based indicators for BOKU and the related potential use of these indicators for diverse performance descriptions of the university (e.g. for instance sustainability reporting, performance agreements).
- Scientific review/enhancement of knowledge in the area of research on values, in particular with regard to the relevance for action of values in connection with climate change and protection.

F-2 Methodological Framework

F-2.1 Overview of the research design

The type and nature of the data collected in the course of this research project include both the "objective world" of sustainability indicators and the "subjective world" of individuals' sets of values. According to JOHNSON and ONWUEGBUZIE (2004) a mixture of various methods is required in research if „reality is constructed both objectively and socially" then both dimensions must be understood equally in the context of specific research questions. Figure F-5 illustrates the methodological process, goals and outputs of the research process. The research uses an exploratory qualitative design using semi-structured interviews (see Appendix A), followed by content analyses, clustering into proto-values and proto-indicators (qualitative data). The proto-values and proto-indicators were prioritized using an online survey and were validated in the course of a workshop with BOKU members (staff and students). In this workshop an intersubjective, common understanding of values was created which is the prerequisite for deriving specific, value-based indicators. Figure 4 shows that one value can be described by several indicators as well as that one indicator can be characteristic for two or more values. Shared understanding thus is essential. The results and their relevance were presented and discussed in different management groups of the University. Values, indicators and assessment tools can be developed through interviews and workshops with specific stakeholders of an organization (e.g. university staff) (BURFORD et al., 2012a).

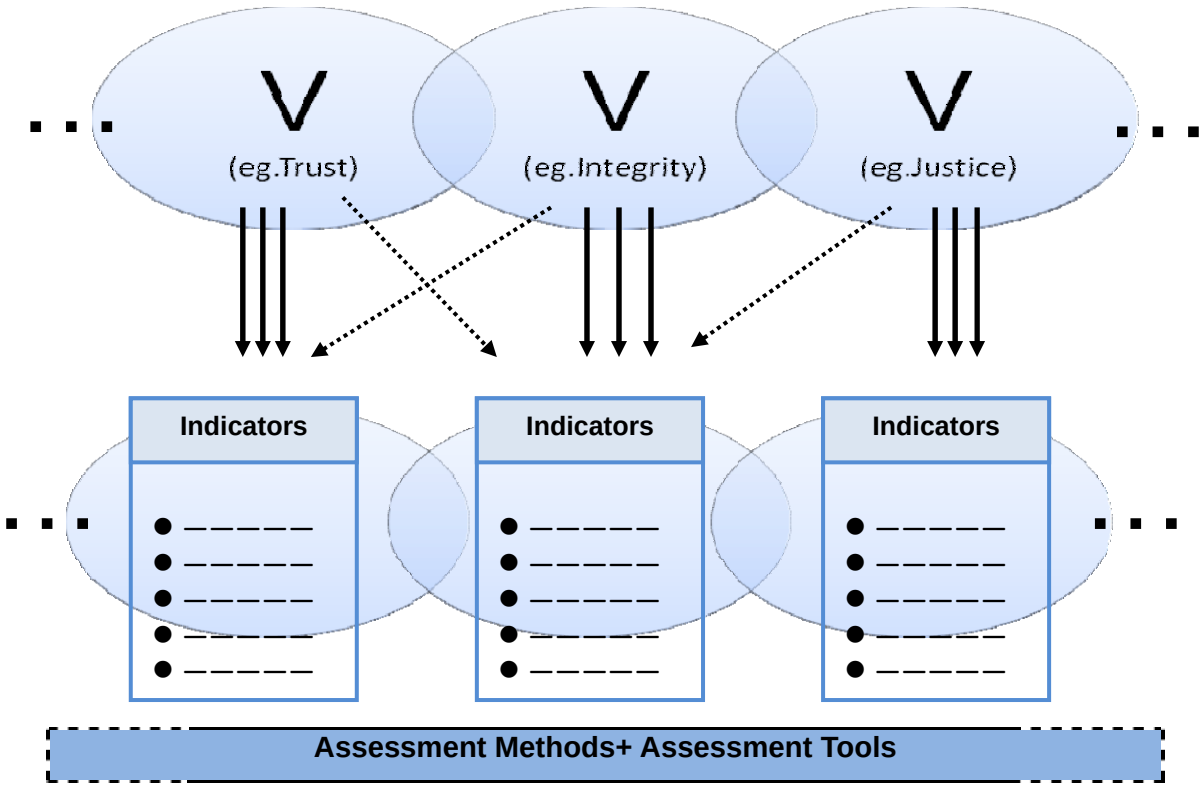

Fig. F-5: The Logic Model (BURFORD et al., 2012a)

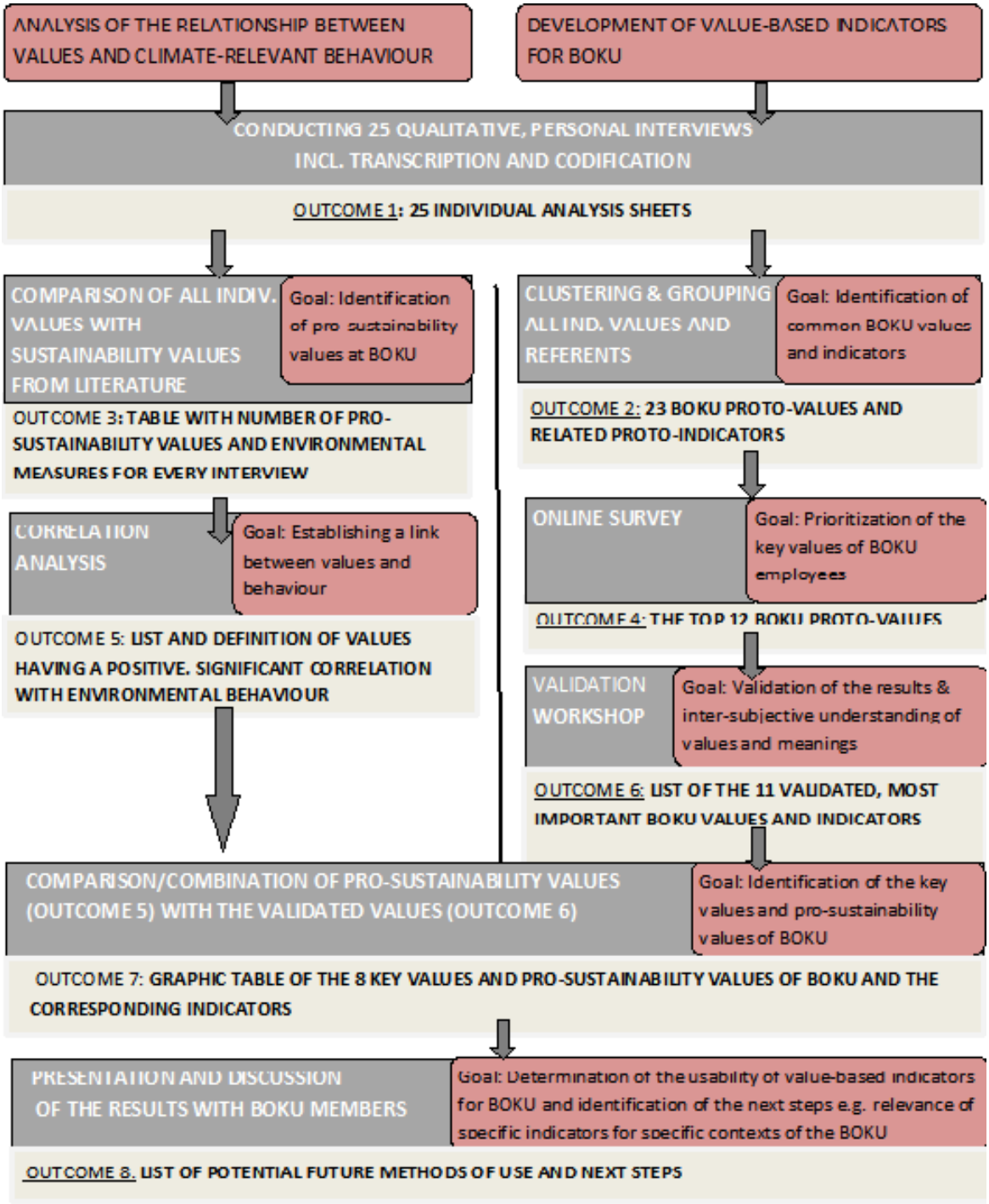

Fig. F-6: The research process

F-2.2 Development of value-based indicators for BOKU

F-2.2.1 Qualitative interviews and analysis

Conducting interviews and guideline characteristics

A qualitative interview allows to study value concepts of social groups or to explore a (new) topic (SCHIRMER, 2009). The method of an open, guided interview was chosen, so that the interviewee would be able to freely state what is important to them (SCHIRMER, 2009). A total of 20 qualitative, **semi-structured interviews** were carried out. Of these 20 interviews 15 were conducted with BOKU employees (12 scientific staff, 4 administrative staff) and 5 interviews carried out with 10 BOKU students (each interview included two students). Referring to the BOKU data with regard to the number of employees and following the formula for determining the sample size per group of people the interviews were divided as follows:

- Group A: Scientific staff: [15* (2000/2500)] = 12 interview partners
- Group B: Non-scientific staff: [15 * (500/2500)] = 3 interview partners
- Group C: Students: 5 interviews with 2 individuals = 10 interview partners[1]

Conducting group interviews with the students allowed for an increase of the data volume without significantly increasing the time required. Thus it was possible to interview a total of 25 people in 20 interviews on their general and environmental sets of values and their behaviour with regard to environmental protection.

The BOKU employees were selected by means of an online random generator in combination with the BOKU telephone directory. Students (10) were purposeful selected to achieve a maximum diversity of perspectives and values by including one representative of every field of study (of a total of 8) active in the ÖH (Österreichische HochschülerInnenschaft - Federal Representation of the Austrian National Union of Students) and additionally 2 students of the ÖH (Österreichische HochschülerInnenschaft - Federal Representation of the Austrian National Union of Students) chairmanship (representatives of the university). The reason for limiting the interview partners exclusively to students who actively study in the ÖH consists in the necessity of them being familiar with what is going on at the university, i.e. the procedures and structures. For these students are able to contribute more precisely to the sets of values of BOKU than those students who are only loosely affiliated with the university or who only spend sporadically or little time at BOKU – as for instance in case of some students who only spend time at university during their lectures.

At the beginning of the interviews information on the research project and on the course and structure of the interview was given and the interviewees were asked to sign a letter of agreement concerning data protection and utilization. During the entire duration of the interview (60 minutes on average) a tape recorder recorded what was said and the essential statements of the interviewees were taken down in order to correctly summarize them for the interviewees and to be able to go more into detail regarding specific issues. The interviews were semi-structured with support of a guideline.

Values and world views are present in the individual often latently, without individuals being aware of them and without further reflection. The direct request of causal connections between values and behaviour does often not lead to the desired result, rather the

[1] A criterion to select students was their work and involvement with political structures at BOKU, e.g. being chair of students union or active member in the student´s union working groups.

things unsaid and which the interviewees are not aware of have to be taken into account (SCHIRMER, 2009).

Therefore the questionnaire was designed in a way in which values and sets of values of an individual are indirectly asked for and the desired information is gathered afterwards by means of a categorization and a "*profoundly hermeneutic understanding*" (HEINZE, 2001, quoted in: SCHIRMER, 2009). Questions such as *"What is important for you in the context of your daily work at BOKU?"* or *"Which aspects of the environment/nature do you especially appreciate?"* allowed for this indirect collection of values. If values (e.g. *"respect"*, *"quality of life")* were mentioned the interviewees were asked to describe and define the respective value in their own words by means of sub-questions (for instance, *"What exactly do you mean by respect?"*). Doing this allowed for the identification of referents (i.e. the basis to develop proto-indicators) and gave the interviewees the opportunity to reflect on and become aware of their own values and sets of values (Appendix A).

Analysis and codification of the data set

After each interview the recorded interviews (mp3 files) were completely transcribed with a particular focus on the content-bearing parts especially relevant for the research. This means that several less essential and meaningful passages sometimes were abridged and not everything was transcribed literally including specific phonemes (for instance, *"eh"*). However, these abridgements or summaries were carried out in a way in which *"the essential content was maintained"* and clear statements were generated which *"still are an account of the basic material"* (MAYRING, 1994). **Data analysis follows the structure given by the objectives of this research i.e. into four categories of information, in which the text content is examined:**

- Values: Those statements and terms ("value label") are considered and coded as „individual values" which describe a concept of a desired or considered as desirable state.
- Referents: Those statements are coded as „referents" which describe meanings, characteristics, qualities or real manifestations of the "individual value" in a practical/experienced context (e.g. concrete behaviour) according to the subjective perception of the interviewee (see Fig. F-3). They serve as a basis/preliminary stage for the development of proto-indicators (Tab. F-2).
- Environmentally relevant attitudes or key statements: This group comprises all key statements which obviously are given particular significance (e.g. by repetition or intonation), which, however, do not contain an explicit value label. The loss of implicitly contained information is thus avoided. Subsequently the attempt is made to extract values with a higher degree of uncertainty, since the subjective influence of the scientist has the highest effect due to the broad margin of interpretation (Tab. F-3).
- Environmentally relevant activities: This group contains all activities the corresponding interviewee mentioned as environmental behaviour (e.g. turn off the light, recycling), always categorised according to specific areas (e.g. energy, mobility) (Tab. F-4).

This categorization constitutes the key instrument of the content analysis (MAYRING, 2008) and was carried out inductively. An inductive categorization derives the categories directly from the material, which means that there are no pre-defined, theory-based categories in the beginning allowing the development of new ideas/concepts – in this case the development of values and indicators considered essential by BOKU staff and students. This is in this case a more useful approach than a theory-based categorization as the research project focuses on the key values of BOKU and its employees; as such the values need to be derived from the subject. By means of several interactions with the

data sets, the categories are systematically edited and reviewed. The codification of values and referents was carried out with reference to the original (in part also colloquial) concepts of the interviewees.

At the end of the codification so-called "analysis sheets" were created for every single interview. Therefore, each individual analysis sheet contains:

- **a table with values and the corresponding referents (Tab. F-2)**
- **a table with environmentally relevant attitudes or key statements including the probably implicitly contained sets of values (Tab. F-3)**
- **and a table with the environmental-related activities classified according to specific areas (Tab. F-4)**

Tab. F-2 Example illustration of the codification of individual values and referents

Individual values	***Set of Referents***
Freedom	nobody dictates what topics one has to focus on;
	freedom in the choice of topic priorities as well as the way of working;
Nice working atmosphere	being like a family;
	in case of controversies people are not angry with each other;
	spending time together at the terrace while discussing something;
	having a cool boss;
	being able to talk about everything;
	being on a first-name basis;

Tab. F-3: Example illustration of the codification of „environmentally relevant attitudes or key statements and the extraction of possible underlying values of the interviewee X"

Environmentally relevant attitude or key statement with regard to the environment	***Possible underlying value***
„*If you compare our situation to that of other regions in the world, this is what scares me most*"	Justice
„*For me, nature is a relaxed sheltered area in which I like spending time but I do so too infrequently. Being in nature is very relaxing and calming*"	Relaxation/peace/calm

Tab. F-4: Example illustration of the codification of environmental measures for interviewee X

Area	***Activity***
Mobility	Rarely using a car
	Annual ticket for the public transport service of Vienna
	Taking a train for long-distance trips outside of Vienna
Energy	Saving electricity
	Cutting the heating (dress warmer)
	Turning off the light
	No radio and television

Aggregating

All values and indicators were eventually compiled in an Excel sheet with a traceable labelling to the original interview. Aggregation allows "grouping" similar statements or statements with a close coherence of content in a bundled form (MAYRING, 1994).

This means that all statements with a meaning corresponding to a specific value can be jointly displayed in a specific value category. For instance, the value categories "teamwork" and "cooperation" were combined eliminating multiple entries of values as far as

possible and allowing for a massive numerical reduction (from 200 individual values to about 55 proto-values). Then the aggregated data were examined and grouped, in a third interaction with the data we included the proto-indicators, i.e. combining values with identical or (very) similar indicators (see Tab. F-5). In this step the original referents (individual indicators) were developed further into proto-indicators, i.e. an aggregated version of indicators found in the interviews.

Tab. F- 5: Example illustration of the aggregation on the referents' level

Referents (Individual Indicators)	***Interview***	***Proto-Indicator***
"having a contact person in case of need"	A1	**Staff and students at BOKU help each other mutually and can ask each other any time they need something or have a question**
„providing mutual help"	A7	
"being able to ask other people anything"	A7	
„helpfulness"	B3	
"being helpful if somebody has a question"	A9	
„helping each other"	A6	

F-2.2.2 Validation and inter-subjective understanding of values

After identifying 23 proto-values we had to reduce them to a manageable number of values which could be discussed and validated in the workshop. To do so, a quantitative ranking procedure was chosen as a suitable instrument. The proto-values were prioritized according to their importance by means of an online survey to which all interviewees as well as the members of the ethics platform were invited. The task consisted in choosing those 10 values from the list with 23 proto-values identified as relevant in interviewee work and life at BOKU. We selected the top 12 values of this ranking to take to the validation workshop (March 27, 2013). The workshop had the following aims:

- **Validation of the previously developed proto-values and proto-indicators with regard to their relevance for BOKU:** Reviewing and, if necessary, adjustment of the proto-values and proto-indicators identified.
- **Feedback from the group and creation of a common understanding among participants about the relevant values at BOKU:** The proto-values and their subjective understanding are to be combined in a commonly shared picture with an inter-subjective validity for the context of BOKU.
- **Participation and inclusion of BOKU employees in a research project:** as prerequisite both for the research and for socially and subjectively constructed realities.

Values are in the context of this study desired principles or qualities that were collective understood and defined for the context of the BOKU. Therefore the values presented are "constructed" for and by a group of people in a participatory process. This procedural approach allows to integrate formerly subjectively defined sets of values into a common, specified context so that a form of inter-subjectivity (or quasi-objectivity) between several individuals is created. This inter-subjective conceptualization of value denominations is the prerequisite for the possibility of deriving all value-based indicators as measurable sizes (BURFORD et al., 2012a).

For the workshop were invited the interviewees, the members of the ethics platform and other interested BOKU employees. At the workshop the background, goals and methods of the research project and the results of the online survey were presented and there

was space for questions. The genuine dialogue took place in the second part of the workshop, in which with the help of professionally moderated teamwork in small groups and plenary assemblies. Every small group (in total 4 small groups with each about 4-5 individuals and 1 moderator) was assigned 3 values and the corresponding proto-indicators. The group was asked to answer the following questions for every value and every proto-indicator:

- *Relevance:* Is this indicator useful, practical and important for the context of BOKU?
- *Comprehensibility:* Can this indicator be easily understood and does it express the value in a suitable/matching way (i.e. or: does it have to be rephrased?)
- *Completeness:* Is the value sufficiently covered by the present indicators or are further indicators missing which should be added?
- *Definition:* How could the value be defined and described for the BOKU context with the validated indicators?

All changes were executed consensually. After the discussion in the groups the results were presented in the plenum. The groups presented their established understanding of values and indicators. Finally all participants gave feedback in a final round, where they were asked to provide us feedback regarding the relevance of the list of values and value-based indicators they had been working.

All results (flip charts, feedback, etc.) were documented in written form and/or photographed. On this basis a list was created with the new, validated values and indicators which were sent to all participants for a final review, giving them the opportunity to amend, change or even correct some aspects. Directly after the workshop a meeting of the moderators and the project leaders and the cooperation partners of the University of Brighton took place, with the aim of cross-check opinions, reflect upon the workshop procedure, its successful and challenging elements and to determine the further course of the project.

F-2.3 Relation-Analysis between values and behaviour

In order to identify pro-sustainable values present at BOKU all individual values were contrasted and compared with the pro-sustainable values defined in the literature. In doing so, we distinguish between values with a strong and a weak relation to sustainability. Every value of the 25 analysis sheets was marked accordingly with “A” (i.e. strongly related to sustainability), “B” (i.e. weak related to sustainability) or left in blank which means no positive relationship with sustainability (i.e. neutrality or negative relationship to sustainability). The basis of this classification is a table with pro-sustainability values based on BUCHEBNER´S (2011).

In order to classify the values it is not only important to look at the denomination of the value per se, but also the corresponding personal definitions (i.e. referents) associated with them. This explains why the same value label was for instance classified sometimes as a “neutral” value, sometimes as a “A” value and other times as a “B” value. For instance, a *“good working atmosphere”* may be defined by a person through *“saying hello to each other”*, which in this case does not have any relevance for sustainability (neutral). Another person will define this value as *“respectful cooperation with colleagues*”, which is to be classified as a value with a weak relation to sustainability.

Values with a strong and a weak relation to sustainability were eventually identified in the analysis of every individual interview and compared with the number of the environmental actions that the corresponding interviewee takes in their everyday life. The data set in table 6 allowed for a statistic correlation analysis - Pearson’s correlation analysis.

Tab. F-6 Excerpt of the quantitative database for the correlation analysis

Interview #	# of values strongly related to sustainability	# of values weakly related to sustainability	All values related to sustainability	# of environmental actions
A1	4	4	8	6
A2	10	1	11	13
A3	3	3	6	5
A4	15	3	18	6
A5	7	3	10	4

Pearson's correlation analysis requires that the relationship between both variables under study exhibit equal variances (homoscedasticity) and are normally distributed. Therefore, both of these assumptions are checked for in each analysis. Normally distributed data can be confirmed where skewness and kurtosis values are >=-2 or <=+2. One-tailed tests are used in each case because we would expect, a priori, positive relationships to occur in each analysis.

F-2.4 Integration of value-based indicators in the strategic and operative context of BOKU

The fourth research objective is to initiate a discussion on the usability/relevance of value-based indicators for the performance evaluation of the university, i.e., to check the relevance of including values as performance indicators for university-specific evaluations, strategic or operative control (e.g. development plan, performance agreements, target agreements, sustainability strategy, etc.). We met and presented the results in several BOKU operative units:

- BOKU Centre for Global Change and Sustainability (April 18th, 2013)
- BOKU Ethics Platform meeting (April 24th, 2013)
- BOKU Sustainability Report working group (in a two-hour meeting on May 28th, 2013);
- BOKU Working group on social responsibility (June 10th, 2013)

F2.5 Opportunities and limitations of the project

Universities are great places to carry out this pilot study, not only because they are the forerunners in innovation and exemplarity, but also due to their role as politically-neutral advisory expertise to decision-makers and civil society. Universities often have codes of ethics stating their values and principles, but in the performance evaluation of those universities, the importance of their values-based work is forgotten and usually seen as a non-measurable intangible asset. Information produced with and during this research is applied to the needs of an organization and can be used by University management in their efforts to develop sustainable programs and support new administrative models which support climate-protection measures.

The BOKU University neither represent an average sample for the general public nor a large segment of the population. However, this does not affect the relevance of this research, since our objective is to check the relevance/usefulness/limitedness of this this concept and method in the high school sector in Austria. We choose an explorative re-

search design as no data on BOKU values was available. The explorative method was adequate to the budget and timeframe for the research.

Research project challenges:

(i) A gap between the relevant values for BOKU (goal 1) and the pro-sustainability values (goal 2)

Pro-sustainability values can only be identified on an individual level (as they depend on the context of the statement during the interview), while the relevant values for the BOKU context are established on the basis of an aggregation of individual values (and inter-subjective validation) and therefore exist only at a collective level. For this reason, the aim is an integrative synthesis of both results in a way in which it is expressed as clearly as possible.

(ii) Methodical uncertainties and higher likelihood of inaccuracies due to the character of a pioneer research

Very little previous work was done in this field before**.** The only project we know about which provided a rough methodical guideline and orientation for this project was the two-year EU research project ESDinds (BURFORD et al., 2012b). ESDinds identified value-based indicators for civil society organisations in the area of sustainability (e.g. environmental NGOs, associations, etc.). We adapted ESDinds methodology to identify the values at BOKU enquiring the important values and also about the sustainability and action relevant values to derive concrete recommendations for climate protection and adaptation. To address these issues we held several online meetings with partners and draw on our list of experts to help us in a continuous reflection about the research methodology.

(iii) Subjective interpretation

Though codifications, categorizations and data aggregation are carried out systematically, judgements and interpretations of researchers are not value free. To address this issue we included additional data validation steps (workshop, facilitator´s meeting) and feedback options for the interviewees (e.g. sending workshop results to participants).

Bearing in mind these challenges we still believe on the relevance of this work as values have been largely overlooked in conventional evaluation activities.

F-3 Results

The results comprise:

(i) a list with the 11 most important/relevant and validated values and their indicators for BOKU (objectives 1 and 3) (see chapter 3.1.),

(ii) identification of pro-sustainability values and a correlation analysis between environmentally relevant values and environmental behaviour (objectives 2 and 3) (see chapter 3.2.), and

(iii) Results from the discussions on the use of these value-based indicators for the performance evaluation of the university (objective 4) (see chapter 3.3.).

F-3.1 The most important BOKU values and indicators

In the course of the categorization and aggregation of individual data sets a list of 23 BOKU set of values were identified (see Table F-7). The results of the online ranking in which a total of 33 people participated can also be found in table F-7 in the third and fourth columns. The 12 first ranked values were taken into the workshop (Table F-7 coloured in green).

Tab. F-7: Results of the online survey regarding the prioritization of values (own illustration)

Rank	Set of values	Answers	
		%	#
1	**Appreciation and mutual respect** *Original: Wertschätzung und Respekt füreinander*	75,8	25
2	**Friendly, cooperative working atmosphere and social interaction** *Original: Freundliche, kollegiale Stimmung und soziales Miteinander*	69,7	23
3	**Openness, trust and honesty** *Original*: *Offenheit, Vertrauen und Ehrlichkeit*	63,6	21
4	**Spirit of research, science and developing solutions for existing problems** *Original*: *Forschergeist, Wissenschaft und die Entwicklung von Lösungen zu bestehenden Problemen*	54,6	18
5	**Networking and exchange of know-how and experience** *Original*: *Vernetzung und Austausch von Wissen und Erfahrungen*	54,6	18
6	**Critical thinking** *Original*: *Kritisches Denken*	54,6	18
7	**Cooperation and teamwork** *Original*: *Zusammenarbeit und Teamwork*	51,5	17
8	**Integral and systemic reflection** *Original*: *Ganzheitliche und systemische Betrachtungen*	51,5	17
9	**Change and diversity in the job** *Original*: *Abwechslung & Vielfalt im Tätigkeitsbereich*	51,5	17
10	**Personal development and following one´s own path** *Original*: *Sich persönlich weiterentwickeln und seinen eigenen Weg gehen*	48,5	16
11	**Take over responsibility and taking pro-environment action** *Original*: *Verantwortung wahrnehmen und etwas für die Umwelt tun*	48,5	16

12	**Protect, maintain and respect the environment/nature for future generations** *Original*: *Umwelt/Natur für kommende Generationen schützen, erhalten und respektieren*	45,5	15
13	**Quality Teaching and Transfer of Knowledge** *Original: Qualitätsvolle Lehre und Wissensvermittlung*	45,5	15
14	**Being Involved and participating in Decisions** *Original*: *Eingebunden sein und Mitbestimmung in Entscheidungen*	39,4	13
15	**Being motivated and committed at work and society** *Original*: *Motiviertheit und Engagement im Beruf und in der Gesellschaft*	39,4	13
16	**Equality of Human Beings** *Original*: *Gleichwertigkeit von Menschen*	36,4	12
17	**Support and Encouragement from the boss** *Original*: *Unterstützung und Förderung durch den Chef*	33,3	11
18	**Freedom and Independence** *Original*: *Freiheit und Selbstständigkeit*	30,3	10
19	**Helpfulness** *Original*: *Hilfsbereitschaft*	30,3	10
20	**Nice Workplace** *Original*: *Guter/Schöner Arbeitsplatz*	24,2	8
21	**A good and just world for everyone** *Original*: *Eine gute und gerechte Welt für Alle*	24,2	8
22	**Financial Success** *Original*: *Finanzieller Erfolg*	21,2	7
23	**Experience and enjoy nature, "reloading one´s batteries"** *Original*: *Naturerfahrung, Naturgenuss und Krafttanken in der Natur*	6,1	2

In the framework of the participatory workshop these top 12 values and their proto-indicators were discussed and validated by the participants in small groups (see chapter F-2.2.). In doing so, proto-indicators were rephrased, removed or new ones added. In part, values as a whole were realigned and more precisely defined (e.g. value 10 changed to: F*inding and following one´s own path in and "with" BOKU*). Values 11 and 12 were combined due to similarities in content.

F-3.2 List of values after workshop validation

- Appreciation and mutual respect (*Wertschätzung und Respekt füreinander*)
- Friendly, cooperative working atmosphere and social interaction (*Freundliche, kollegiale Stimmung und soziales Miteinander*)
- Openness, trust and honesty (*Offenheit, Vertrauen und Ehrlichkeit*)
- New/Modified: Take over responsibility for the environment and protect, preserve and respect nature for future generations (*Verantwortung für die Umwelt übernehmen und Natur für kommende Generationen schützen, erhalten und respektieren*)
- Cooperation and teamwork (*Zusammenarbeit und Teamwork*)
- New/Modified: Spirit of research, science and developing solutions for existing problems in society and in practice (*Forschergeist, Wissenschaft und die Entwicklung von Lösungen zu bestehenden Problemen aus Gesellschaft und Praxis*)
- Integral and systemic reflection (*Ganzheitliche und systemische Betrachtungen*)

- New/Modified: Networking and (interdisciplinary) exchange of know-how and experience (*Vernetzung und (fächerübergreifender) Austausch von Wissen und Erfahrungen*)
- Critical thinking (*Kritisches Denken)*
- New/Modified: Rich diversity (*Abwechslungsreichtum*)
- New/Modified: Find and follow within and „with" the BOKU one´s own path (*Innerhalb und „mit" der BOKU seinen eigenen Weg finden und gehen*)

The results displayed in the following lists show the indicators validated for during the workshops only for the top 12 ranked values[2].

Value 1: Indicators for „Appreciation and mutual respect" *(Wertschätzung und Respekt füreinander)*

- People at BOKU take each other and their opinions seriously (*Menschen an der BOKU nehmen sich gegenseitig und das was der andere sagt, ernst*)
- People at BOKU listen, respond to each other and let the other finish speaking (*Menschen an der BOKU gehen aufeinander ein, lassen andere ausreden und hören einander zu*)
- People at BOKU show mutual respect, politeness and appreciation and acknowledge the work and performance of each other (*Menschen an der BOKU zeigen sich gegenseitig Akzeptanz, Höflichkeit und Wertschätzung und anerkennen die Arbeit und Leistungen der anderen*)
- Superiors at BOKU show appreciation and are proud of their employees (*Vorgesetzte an der BOKU können die Wertschätzung und den Stolz für ihre MitarbeiterInnen zeigen*)
- People at BOKU give constructive feedback and if a good job was done, they thank each other (*Menschen an der BOKU geben sich gegenseitig konstruktives Feedback und bedanken sich, wenn etwas gut gemacht wurde*)
- People at BOKU respect other people and their opinions (*Menschen an der BOKU haben Respekt gegenüber anderen Personen und anderen Meinungen*)
- People at BOKU have good relationships and a feeling/awareness/sensitivity for their colleagues (*Kollegen haben gute menschliche Beziehungen zueinander und ein Gespür/Bewusstsein/Sensbilität füreinander*).

Value 2: Indicators for „Friendly, cooperative working atmosphere and social interaction" (*Freundliche, kollegiale Stimmung und soziales Miteinander*)

- Colleagues get along well and have jovial relationships (*KollegInnen verstehen sich gut miteinander und haben einen humorvollen Umgang miteinander*)
- In the university/institute prevails a good mood and a nice and friendly atmosphere (*An der Universität / Am Institut herrscht eine gute Grundstimmung und eine gute, freundliche Atmosphäre*)
- People at BOKU have good manners, i.e. they greet and say goodbye (*Menschen an der BOKU haben gute Manieren, d.h. grüßen und verabschieden sich*)

[2] Value 11 and 12 were merged.

- People at BOKU feel well and satisfied at university and in their relations with colleagues (*Menschen an der BOKU fühlen sich an der Universität und mit ihren KollegInnen wohl und zufrieden*)
- Colleagues have an appreciative, collegial way of treating each other (*Man hat ein gutes Kollegium und pflegt einen kollegialen, wertschätzenden Umgangston miteinander*)
- Colleagues cook and eat or drink coffee together (*KollegInnen kochen und essen gemeinsam oder trinken gemeinsam Kaffee*)
- Colleagues organize common excursions or events and projects (*KollegInnen unternehmen gemeinsame Ausflüge oder machen gemeinsam Events und Projekte*)
- At BOKU there is an atmosphere of constructive debate and criticism (*An der BOKU gibt es eine gesunde Konfliktkultur und Platz für konstruktive Kritik*)
- People at BOKU strive for a balance between a healthy degree of competitiveness and an integrative cooperation (*Menschen an der BOKU bemühen sich um eine Balance zwischen gesunder Konkurrenz und integrativer Kooperation*)
- At BOKU pervades a supportive, appreciative working culture, even if at times conflicts of opinion take place (*An der BOKU herrscht eine unterstützende, wertschätzende Arbeitskultur, auch wenn es einmal Meinungsverschiedenheiten gibt*)

Value 3: Indicators for „Openness, trust and honesty“ (*Offenheit, Vertrauen und Ehrlichkeit*)

- People at BOKU express important concerns and discuss them with others (*Die Menschen an der BOKU können wichtige Anliegen vorbringen und mit anderen besprechen*)
- People at BOKU treat each other openly, personally and politely (*Die Menschen an der BOKU pflegen einen guten, offenen, persönlichen und höflichen Umgang miteinander*)
- At BOKU there is a personal and familiar atmosphere (*Auf der BOKU herrscht eine persönliche und vertraute Atmosphäre*)
- People at BOKU talk to each other as well as criticise superiors openly and without fear (*Menschen an der BOKU können offen und ohne Angst miteinander reden und auch gegenüber höhergestellten Menschen Kritik aussprechen*)
- People at BOKU give attention to a good flow of information and have a good communication structure (*Menschen an der BOKU achten auf einen guten Informationsfluss und haben eine gute Kommunikationsstruktur*)

Value 4: Indicators for „Take over responsibility for the environment and protect, preserve and respect nature for future generations“ (*Verantwortung für die Umwelt übernehmen und Natur für kommende Generationen schützen, erhalten und respektieren*)

- People at BOKU consider *Generationenfähigkeit* (equity/fairness of the generations) in their decisions (*Menschen an der BOKU denken an Generationenfähigkeit*)
- People at BOKU take care of a co-existence and common features of humanity and nature (*Menschen an der BOKU achten auf die Koexistenz und das Gemeinsame von Mensch und Natur)*

- People at BOKU would like to "*alles in einem Kreislauf gehalten wird*" *(*maintain a circular flow of everything) (*Menschen an der BOKU möchten, dass alles in einem Kreislauf gehalten wird*)
- People at BOKU take long-term nature and sustainability into account when planning and solving problems (*Menschen an der BOKU und orientieren sich in der Planung und Problemlösung an Langfristigkeit und Nachhaltigkeit*)
- People at BOKU do not perceive nature as an exploitable resource to be taken for granted but appreciate and accept its intrinsic value (*Menschen an der BOKU nehmen Umwelt/Natur nicht als selbstverständliche, ausbeutbare Ressource wahr sondern anerkennen und achten ihren intrinsischen Wert*)
- People at BOKU make a careful, conscious use of natural resources (*Menschen an der BOKU pflegen einen bedachten, bewussten Umgang mit den natürlichen Ressourcen*)
- People at BOKU would like to have more commitment regarding the environment and BOKU actually putting environmentally relevant activities into practice (*Menschen an der BOKU wünschen sich mehr Verbindlichkeit im Umweltbereich und dass umweltbezogene Maßnahmen an der BOKU wirklich umgesetzt werden*)
- People at BOKU avoid environmental burdens, exploitation and ecological damage as well as to treat the environment/nature carelessly (*Menschen an der BOKU vermeiden Umweltbelastungen, Ausbeutung, Raub an der Natur sowie einen achtlosen Umgang mit Umwelt/Natur)*
- People at BOKU prefer environmentally friendly and eco-friendly activities/procedures/resources (Menschen an der BOKU ziehen umweltschonende und umweltfreundliche Maßnahmen/Verfahren/Mittel vor)
- People at BOKU are aware of the environmental behaviour of others as well as of themselves and give each other positive tips (*Menschen an der BOKU sind aufmerksam bzgl. des Umweltverhaltens von sich und anderen und geben einander positive Hinweise*)
- People at BOKU promote the protection of the environment through their own pro-environmental behaviour (*Menschen an der BOKU treiben den Umweltschutz voran, indem sie in der Praxis durch ihr eigenes Verhalten Maßnahmen setzen*)
- People at BOKU treat nature/environment with consideration and respect (*Menschen an der BOKU nehmen Rücksicht auf Natur/Umwelt und verhalten sich ihr gegenüber respektvoll*)
- People at BOKU are sympathetic with other creatures and treat animals ethically (*Menschen an der BOKU sind mitfühlend mit anderen Lebewesenund pflegen einen ethischen Umgang mit Tieren*)
- People at BOKU strive for a balance with nature (*Menschen an der BOKU streben nach Gleichgewicht mit der Natur*)
- People at BOKU attempt to have up-to-date knowledge about the environment as well as spreading it through research and teaching (*Menschen an der BOKU bemühen sich um aktuelles Umweltwissen und verbreiten es durch Forschung und Lehre*)
- People at BOKU want to make a contribution, take action against environmental problems and achieve a system improvement (*Menschen an der BOKU möchten ei-*

nen Beitrag leisten, etwas Gutes gegen Umweltprobleme tun und Veränderungen zur Systemverbesserung bewirken)

Value 5: Indicators for „Cooperation and teamwork" (*Zusammenarbeit und Teamwork*)

- People at BOKU are working together on a goal/a task, are acting in concert and follow a common path (*Menschen an der BOKU arbeiten gemeinsam an einem Ziel/einer Aufgabe, ziehen dabei am selben Strang und gehen einen gemeinsamen Weg*)
- People at BOKU discuss with each other (*Menschen an der BOKU diskutieren miteinander*)
- People at BOKU help and respect each other (*Menschen an der BOKU helfen und achten einander*)
- People at BOKU have a reliable cooperation (*Menschen an der BOKU pflegen eine verlässliche Zusammenarbeit*)
- Colleagues are working together well, constructively and considerately (*KollegInnen arbeiten gut, konstruktiv und rücksichtsvoll zusammen*)
- Colleagues from science and other areas are working together trying to achieve a common goal (*KollegInnen aus Wissenschaft und Nicht-Wissenschaft arbeiten auf einer Ebene im Interesse des Ziels zusammen*)
- Colleagues can trust each other (*KollegInnen können einander vertrauen*)

Value 6: Indicators for „Spirit of research, science and developing solutions for existing problems" (*Forschergeist, Wissenschaft und die Entwicklung von Lösungen zu bestehenden Problemen aus Gesellschaft und Praxis*)

- People at BOKU understand how political and social changes and processes take place and how to solve social issues (*Menschen an der BOKU verstehen wie politische und gesellschaftliche Veränderungen und Prozesse passieren und wie man gesellschaftliche Fragen lösen kann*)
- People at BOKU are very curious and are interested in discovering and finding out new things (*Menschen an der BOKU haben eine große Neugierde und möchten etwas Neues entdecken/herausfinden*)
- People at BOKU are interested in finding new methods and results in order to publish and implement new ideas (*Menschen an der BOKU möchten neue Methoden und Ergebnisse finden, um neue Ideen zu publizieren und umzusetzen*)
- People at BOKU continuously improve their professional competence and study further (*Menschen an der BOKU lernen fachlich stets etwas Neues dazu und bilden sich weiter*)
- People at BOKU learn from each other and work in a team (*Menschen an der BOKU lernen voneinander und arbeiten im Team*)
- People at BOKU constantly communicate with other internal and external experts from research, practice and society (*Menschen an der BOKU stehen in ständigem Austausch mit anderen internen und externen Experten aus Forschung, Praxis und Gesellschaft*)
- People at BOKU observe, analyze and integrate individual results and draw conclusions for sustainable responses (*Menschen an der BOKU beobachten, analysieren*

und integrieren Einzelergebnisse und ziehen Schlussfolgerungen für nachhaltige Antworten)

- People at BOKU have varied work and tasks and work with different methods (*Menschen an der BOKU verrichten abwechslungsreiche Arbeit, arbeiten mit verschiedenen Methoden und haben verschiedene Tätigkeiten*)
- People at BOKU work jointly and constructively on solutions for pending problems and implement them (*Menschen an der BOKU arbeiten gemeinsam und konstruktiv an der Lösung für anstehende Probleme und setzen diese um*)
- People at BOKU are not afraid of making mistakes or discussing them but are tolerant towards each other as well as themselves (*Menschen an der BOKU haben keine Angst davor, Fehler zu machen oder über Fehler zu reden sondern sind sich selbst und anderen gegenüber fehlertolerant*)
- People at BOKU use a creative approach to problems, challenges and solutions and develop new approaches (*Menschen an der BOKU gehen mit kreativen Ideen an Probleme, Herausforderungen und Lösungen heran und entwickeln daraus Neues*)
- People at BOKU are committed researches who are persistent in and focused at their projects (*Menschen an der BOKU sind engagierte ForscherInnen, die ausdauernd sind und bei ihren Sachen bleiben*)
- The BOKU overall concept is implemented at work (*Das Leitbild der BOKU wird in der Arbeit gelebt*)
- People at BOKU are able to cooperate across disciplines and beyond the institutes and strive for an interdisciplinary research in projects (*Menschen an der BOKU können fächerübergreifend und über Institutsgrenzen hinweg zusammenarbeiten und bemühen sich um interdisziplinäre Forschung in Projekten*)
- People at BOKU do not always reinvent the wheel but rely on established knowledge (*Menschen an der BOKU erfinden das Rad nicht immer neu sondern greifen auf altes Wissen zurück*)

Value 7: Indicators for „Integral and systemic reflection“ (*Ganzheitliche und systemische Betrachtungen*)

- People at BOKU think and act systematically, integrally, with integrity and authentically (*Menschen an der BOKU denken und handeln systemisch, ganzheitlich, integer und authentisch*)
- People at BOKU take partial aspects into consideration and learn to keep in mind and implement many factors (*Menschen an der BOKU ziehen alle Teilaspekte in Betracht und lernen, viele Faktoren mitzubedenken und umzusetzen*)
- People at BOKU understand systemic connections of nature and integrate this awareness into their work and lives (*Menschen an der BOKU verstehen die Systemzusammenhänge in der Natur und integrieren dieses Bewusstsein in ihre Arbeit und ihr Leben*)
- People at BOKU pass on and spread their systematic knowledge (*Menschen an der BOKU bringen systemisches Wissen nach außen, geben es weiter und verbreiten es*)
- People at BOKU do not stick only to their own subject but embrace the entire context (*Menschen an der BOKU verharren nicht nur im eigenen Fach sondern beziehen den gesamten Kontext mit ein*)

- People at BOKU do not regard other individuals just being experts in their area but holistically as human beings (*Menschen an der BOKU sehen andere Menschen nicht nur als Fachpersonen sondern in deren Gesamtheit*)

Value 8: Indicators for „Networking and exchange of know-how and experience“ (*Vernetzung und (fächerübergreifender) Austausch von Wissen und Erfahrungen*)

- People at BOKU are open for other people and different ways of thinking (*Menschen an der BOKU sind offen für neue Leute und verschiedene Denkweisen*)
- People at BOKU are open towards each other and strike up conversations easily (*Menschen an der BOKU gehen aufeinander zu und kommen leicht miteinander ins Gespräch*)
- People at BOKU exchange experiences and are interested in the work of other people (*Menschen an der BOKU tauschen ihre Erfahrungen aus und haben Interesse, wie und was andere Menschen arbeiten*)
- People at BOKU maintain social contacts (*Menschen an der BOKU pflegen ihre sozialen Kontakte*)
- People at BOKU are interconnected locally, internationally and globally and have a scientific exchange through networks (*Menschen an der BOKU sind lokal, international und global durch Kontakte vernetzt und pflegen den wissenschaftlichen Austausch in Netzwerken*)
- People at BOKU are thinking and acting in global networks and jointly look for solutions to problems (*Menschen an der BOKU denken und handeln weltweit vernetzt und suchen gemeinsam nach der Lösung von Problemen*)
- People at BOKU create good connections, cross-linkings and friendships with each other (*Menschen an der BOKU schaffen gute Verbindungen, Vernetzungen und auch Freundschaften untereinander*)
- People at BOKU are able to discuss topics and other issues on a collegial level on a par (*Menschen an der BOKU können auf kollegialer Ebene und auf Augenhöhe Themen und andere Fragen besprechen*)
- People at BOKU have interdisciplinary and transdisciplinary contacts and cooperate with different people (*Menschen an der BOKU pflegen interdisziplinäre und transdisziplinäre Kontakte und arbeiten mit unterschiedlichen Leuten zusammen*)
- People at BOKU communicate and cooperate with other BOKU institutes (*Menschen an der BOKU kommunizieren und kooperieren mit anderen Instituten an der BOKU*)

Value 9: Indicators for „Critical thinking“ (*Kritisches Denken)*

- People at BOKU think and critically reflect and have constructive discussions with others (*Menschen an der BOKU denken und reflektieren kritisch und führen konstruktive Diskurse mit anderen*)
- People at BOKU have the courage and opportunity to take a critical look at themselves and others regardless of hierarchies and openly ask questions (*Menschen an der BOKU haben den Mut und bekommen den Raum, sich und andere unabhängig von Hierarchien kritisch zu hinterfragen und offen Fragen zu stellen*)

- People at BOKU take a critical and profound look at socio-political topics (*Menschen an der BOKU setzen sich mit gesellschaftspolitischen Themen kritisch und tiefgehend auseinander*)

Value 10: Indicators for "Rich diversity" (*Abwechslungsreichtum*)

- People at BOKU have a diverse, varied, broad and interesting field of activity (*Menschen an der BOKU haben die Möglichkeit zu einem vielfältigen, abwechslungsreichen, breiten und bunten Tätigkeitsfeld*)

Value 11: Indicators for "Finding and following one´s own path in and "with" BOKU" (*Innerhalb und „mit" der BOKU seinen eigenen Weg finden und gehen*)

- People at BOKU carefully consider what they are interested in and in which job they would like to work (*Menschen an der BOKU überlegen sich gut, wofür sie sich interessieren und in welchem Beruf sie sich engagieren möchten*)
- People at BOKU are aware of the fact that there are other priorities in life than work and material values (*Menschen an der BOKU sind sich bewusst, dass es auch andere Wertigkeiten im Leben gibt als Arbeit und materielle Werte*)
- People at BOKU responsibly manage our fast-paced world and modern means of communication (*Menschen an der BOKU gehen mit der schnelllebigen Zeit und den modernen Telekommunikationsmitteln verantwortungsvoll um*)
- People at BOKU spend enough time with family, friends, colleagues and the important things in life (*Menschen an der BOKU nehmend sich ausreichend Zeit für Familie, Freunde, Kollegen und wichtige Dinge des Lebens*)
- People at BOKU expand their own experiences by rising to new challenges and limits and trying out new tasks (*Menschen an der BOKU bereichern ihren eigenen Erfahrungsschatz, indem sie an neue Grenzen & Herausforderungen stoßen und sich in neuen Aufgaben ausprobieren*)
- People at BOKU continually learn something new and deal with new situations and people (*Menschen an der BOKU lernen stets Neues dazu und setzten sich mit neuen Situationen und Menschen auseinander*)
- People at BOKU are able to work both independently and cooperatively (*Menschen an der BOKU können sowohl selbstständig als auch kooperativ arbeiten*)
- People at BOKU try to follow their own path in a joint exchange with BOKU (*Menschen an der BOKU versuchen, im gemeinsamen Diskurs an der BOKU ihren eigenen Weg auszuloten*)
- People at BOKU find a balance and a good way for themselves and society as well as their environment (*Menschen an der BOKU finden die Balance und einen guten Weg für sich selbst und die Gesellschaft und ihr Umfeld*)

F-3.3 BOKU values promoting a positive environmental and climate-friendly behaviour

In this chapter the environmental and climate behaviour of BOKU members is discussed in the framework of the specific set of values drawn from individual interviews.

F-3.3.1 Environmental and climate-friendly behaviour of BOKU staff and students

To every field of environmental behaviour we identified a number of pro-sustainability activities carried out by interviewees (Table F-8). Climate and sustainability relevant behaviour occurs primarily in the areas of mobility, energy, food, waste and consumption of resources. Some activities are also taken in the areas water, biodiversity and creation of awareness. Example activities are listed below table F-8.

Tab. F-8: Comparison of the number of interviewees and of pro-sustainability actions mentioned for every area (own illustration)

Fields of environmental behaviour	*Number of interviewees mentioning activities in the field (N=25)*	*Number of pro-sustainability activities mentioned by interviewees*
Mobility	19	40
Waste	16	30
Energy	15	39
Food	13	31
Resources and consumption	11	23
Water	6	6
Creation of awareness	4	4
Career focus on the protection of the environment	3	3
Biodiversity	2	4

The majority of this pro-sustainability behaviour is climate-relevant, i.e. directly or indirectly connected with a reduction of the CO_2 emissions. For example in the fields of Mobility and Energy, in which 19 and 15 individuals (of 25) respectively mention CO_2 - reducing measures.

The most frequent environmental activities for the individual fields mentioned by the interviewees are the following:

- Mobility: Using public transportation; no possession of a car or only very rarely using a car; having a fuel-efficient car; driving to work by bike.
- Energy: Switching off the light; no over-heating; avoiding stand-by-mode; purchasing eco-friendly devices.
- Food: Preferring organic, seasonal and Austrian products.
- Waste: Waste separation; waste prevention; recycling and long-term use; not using plastic bags.
- Resources and consumption: No waste of products; consciously buying and thinking about what one really needs; careful use of resources; quality regarding clothing and cosmetics.
- Water: Do not let water running; careful use of water.
- Creation of awareness: Inspire the own family friends and children to protect the environment; create awareness for the environment in others.

Figure F-6 shows the distribution of pro-sustainability activities through the different action fields. Most sustainability activities are mentioned in the areas of “mobility” and “energy” (both about 23%), followed by “waste” and “food” (both about 17 % of all answers).

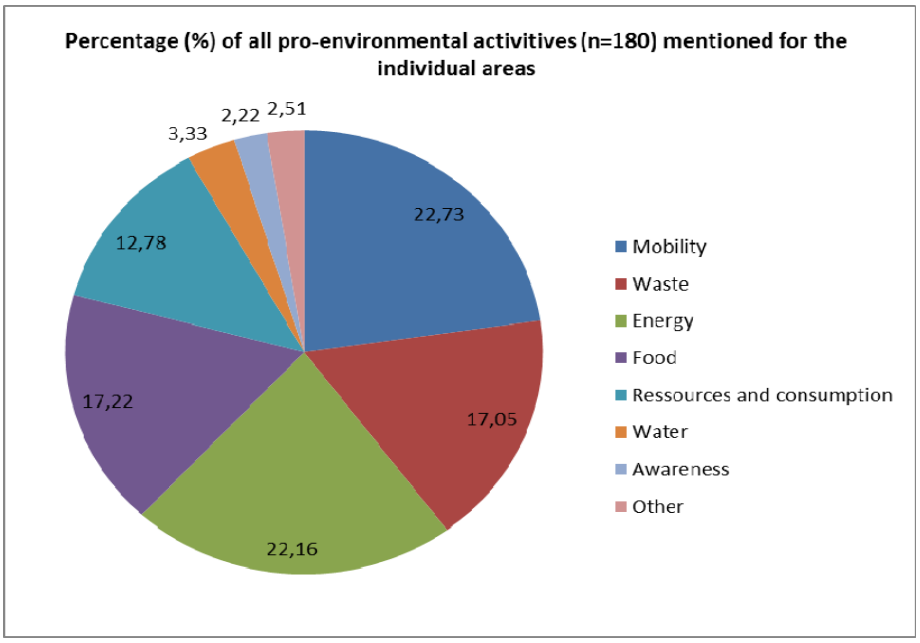

Fig. F-7: Distribution of pro-sustainability activities (n=180) through the different action fields (own illustration)

About 60% of the interviewees consider climate change an environmental problem, with the scientific staff at BOKU mentioning this problem most. The consequences climate change has on natural eco-systems and society are referred to in particular (cf. e.g. shortage of water, extreme weather events). Apart from that, pollution, global injustice, natural disasters, nuclear energy and a wasteful behaviour (keyword "throw-away society") in the global North are perceived as severe environmental problems.

F-3.3.2 Sustainability relevant BOKU values

In order to identify a connection between pro-sustainability behaviour and presence of pro-sustainability values a comparison of all individual BOKU values with sustainability-relevant values from literature was made. The result of this comparison can be seen in table F-9.

Tab. F-9: Pro-sustainability values (BUCHEBNER, 2011) and examples of pro-sustainability values found in the BOKU data. Left column: an attempt to categorise pro-sustainability values into different groups. Right column: those individual values classified as *"A: strong relation to sustainability"*.

VALUE CLUSTERS	EXAMPLES OF "A" VALUES FOUND AT BOKU
Values related to ecocentric world view and environmental ethics	Appreciation and respect of nature, being close to nature, harmony with nature, holistic thinking, enjoying nature
Values related to solidarity and egalitarianism	Peace, fair distribution, equality of all human beings, a good world, altruism, justice
Values related to cooperation & co-determinarion	Cooperation; Social interaction; Co-determination;participation in decision; to lern from each other: global networking

Values related to Life quality	Quality of life, Deceleration, sufficiency, Peace and inner satisfaction
Values related to long-term thinking and minimization of risks	Conservation of nature, *Generationenfähigkeit*, protecting the environment, eco-friendliness, co-existence
Values related to reflexivity	Critical thinking, education; Reflective skills
Values related to action	Commitment, take responsibility, making a difference, springing into action, participation in decision-making, contributing something
Values related to liberty and Self-determination	Freedom, following one's own path, being oneself, independence

Correlation Analysis

Pearson's correlation analysis requires that the relationship between both variables under study exhibit equal variances (homoscedasticity) and are normally distributed. Therefore, both of these assumptions are checked for in each analysis below. Normally distributed data can be confirmed where skewness and kurtosis values are >=-2 or <=+2. In this data set values are below this range. Skewed distributions can occur for many reasons, and also be associated with restriction of measurement range, outliers, small biased samples, and other sample irregularities. One-tailed tests are used in each case because we would expect, a priori, positive relationships to occur in each analysis.

The data presented here is derived from semi-structured interviews, thus the number of values and pro-sustainability actions identified per interview were dependent on the values and actions elicited by interviewees and not based on a pre-defined list as is usual in quantitative methods. Still we find these results informative.

Figure F-7 and table F-10 show a positive modest and significant correlation (r=0.461; one tailed P = 0.010<0.05)[3] between values with a strong relation to sustainability and the number of pro-sustainability activities. Thus people who exhibit more values strongly related to sustainability also carry out more environmental actions.

[3] The following should be used as a guide to interpret the strength of relationship implied by the size of a correlation coefficient: 0 none; 0.01-0.19 very weak; 0.20-0.39 weak; 0.40-0.69 modest; 0.70-0.89 strong; 0.90-0.99 very strong; 1 perfect. Whether that relationship is likely to be real then needs to be confirmed by a significance value <=0.05.

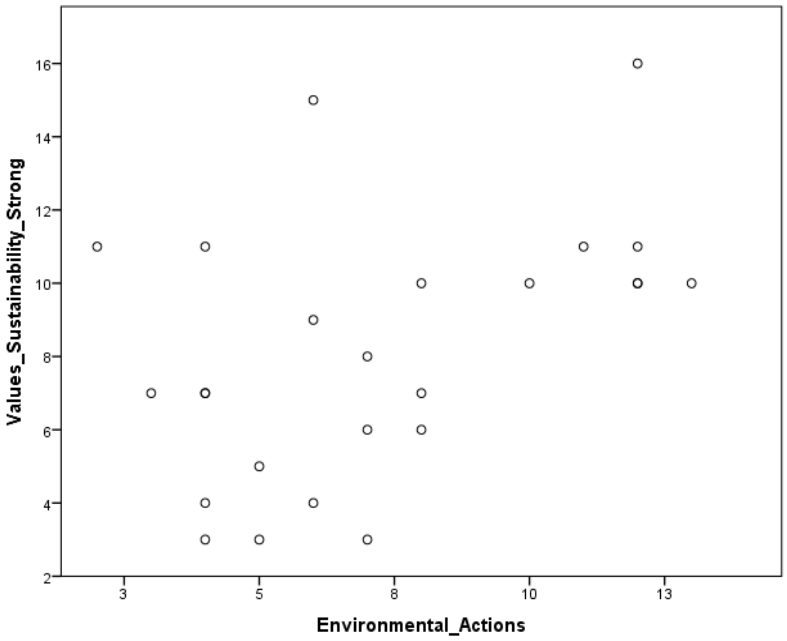

Fig. F-8: Graph showing relationship between values strongly ("A values") related to sustainability and environmental actions (own illustration)

The graph suggests homoscedasticity and both variables are normally distributed (see Tab. F-10).

Tab. F-10: "A" Values (strongly related to sustainability) versus environmental actions (own illustration)

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Values_Sustainability_Strong	25	.323	.464	-.221	.902
Environmental_Actions	25	.395	.464	-1.068	.902
Valid N (listwise)	25				

A correlation analysis comparing both value categories – values with a strong and a weak relation to sustainability ("A and B values") with the pro-sustainability activities yields a less explicit, however significant (figure F-8 and Table F-11).

Values with a weak relation to sustainability ("B values") are for instance appreciation, helpfulness, creativity, honesty, trust, enthusiasm.

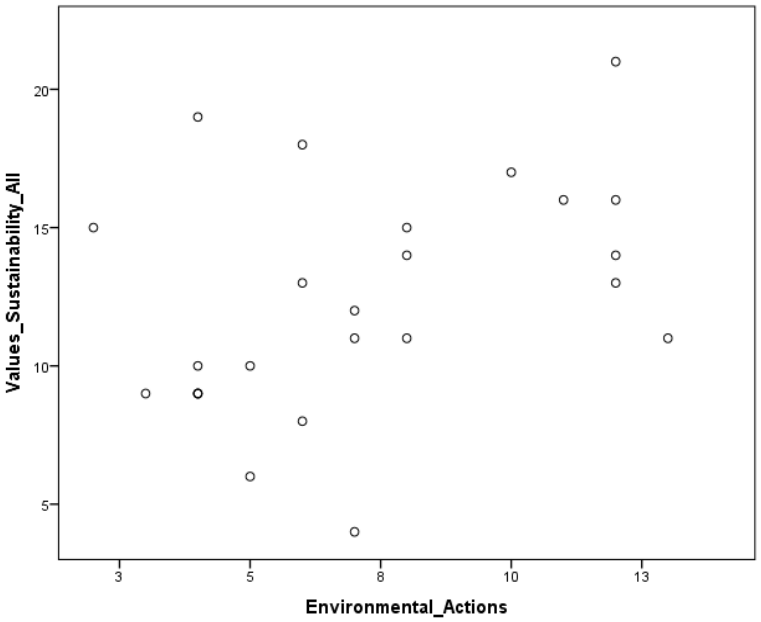

Fig. F-9: Graph showing relationship between all ("A + B") values related to sustainability and environmental actions (own illustration)

The graph above suggests a positive weak and and significant correlation (r=0.395, one tailed P = 0.025<0.05)[4] between these two variables so that people who exhibit more values related to sustainability (A+B) also carry out more environmental actions. The graph suggests homoscedasticity and both variables are normally distributed.

Tab. F-11: Statistic table for all values ("A+B") related to sustainability versus environmental actions (own illustration)

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Values_Sustainability_All	25	.129	.464	-.319	.902
Environmental_Actions	25	.395	.464	-1.068	.902
Valid N (listwise)	25				

F-3.3.3 Synthesis of the most important and pro-sustainability values

Out of the list of 23 values which were withdrawn from individual interviews and aggregated, 16 values belong to the pro-sutainability values´ sets (A values) described by BUCHEBNER (2011). However, not all sustainability relevant values were considered relevant for the work and time spent at BOKU of the 33 BOKU staff and students who participated in the online ranking. Only eight values were considered relevant in the context of participant´s work and time at BOKU and have therefore been included in the validation workshop. Fig. F-9 illustrates this objective.

[4] The following should be used as a guide to interpret the strength of relationship implied by the size of a correlation coefficient: 0 none; 0.01-0.19 very weak; 0.20-0.39 weak; 0.40-0.69 modest; 0.70-0.89 strong; 0.90-0.99 very strong; 1 perfect. Whether that relationship is likely to be real then needs to be confirmed by a significance value <=0.05.

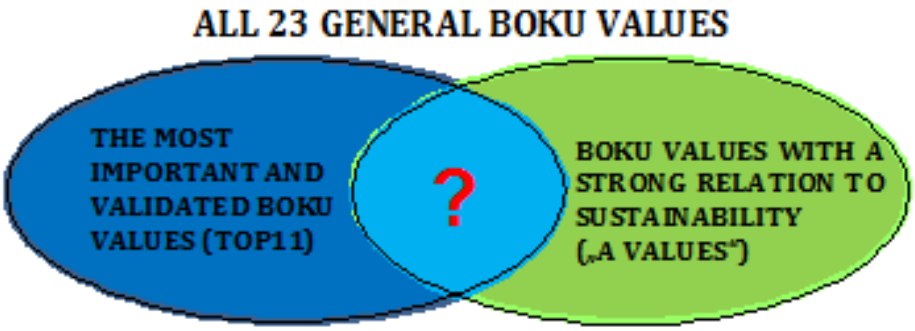

Fig. F-10: Union of two sets of data: a) most relevant and validated BOKU values (objective 1) and b) the pro-sustainability values (objective 2).

Table F-12 combines both results from chapters 3.1. and 3.2. by comparing the identified BOKU values with those values found in the literature to be positively influencing environmental behaviour.

Tab. F-12: Values found in interviews which have a strong relation to sustainability which were also validated at the workshop (Green cells). We also added to this list values found in interviews which have a strong relation to sustainability but due to time limitations were not validated at workshop (orange cells).

CLUSTERS OF VALUES	INDIVIDUAL VALUES WITH A STRONG RELATION TO SUSTAINABILITY[5] (SOURCE: INTERVIEWS)	DEFINITION OF THE VALUE IN BOKU CONTEXT (SOURCE: INTERVIEWS)	VALIDATED AND UN-VALIDATED BOKU VALUES (GREEN CELLS: VALIDATED IN WORKSHOP (WS); ORGANGE CELLS: NOT VALIDATED IN WS)
Values related to ecocentric world view and environmental ethics	Appreciation and respect for nature; Being close to nature; Harmony with nature; Holistic thinking; enjoying nature (*Wertschätzung und Achtung der Natur; Respekt vor der Natur, Naturverbundenheit, Einklang mit der Natur, ganzheitliches Denken, Naturgenuss)*	Respect, esteem and appreciation for nature and all beings by recognizing the intrinsic value of life and through a holistic view of the world	**Take over responsibility for the environment and protect, preserve and respect nature for future generations** (*Verantwortung für die Umwelt übernehmen und Natur für kommende Generationen schützen, erhalten und respektieren*)
Values related to life quality	Quality of life; Deceleration; Sufficiency; Peace and inner satisfaction *(Lebensqualität, Entschleunigung, Suffizienz, Ruhe und innere Befriedigung)*	Leading a slowed-down and sufficient life in a healthy society worth living in by finding a quality of life, balance and inner fulfilment away from consumerism	**Experiencing and enjoying nature "reloading one´s batteries"** (*Naturerfahrung, Naturgenuss und Kraft-tanken und der Natur)*
Values related to long-term thinking and minimization of risks	Conservation of nature; *Generationenfähigkeit*; Protecting the environment, Eco-friendliness; Co-existence *(Erhaltung der Natur, Generationenfähigkeit, Umweltschutz, Umweltfreundlichkeit, Naturbewahrung, Koexistenz)*	A long-term conservation and preservation of the natural resources for all human beings by means of an active and considerate protection of the environment, nature and climate	**Take over responsibility for the environment and protect, preserve and respect nature for future generations** (*Verantwortung für die Umwelt übernehmen und Natur für kommende Generationen schützen, erhalten und respektieren*)

[5] This list present examples for each category, thus is not an exhaustive account.

Values related to action	Commitment, take responsibility, making a difference, springing into action, participation in decision-making, contributing something (Engagement, etwas bewegen, aktiv werden, seinen eigenen Beitrag (zum Umweltschutz) leisten, Neue Wege aufzeigen, Neues ausprobieren)	With motivation and commitment help to solve existing problems by taking one's own responsibility, making one's own contribution and actively changing something for the better	**Spirit of research, science and developing solutions for existing problems** (*Forschergeist, Wissenschaft und die Entwicklung von Lösungen zu bestehenden Problemen aus Gesellschaft und Praxis*) **Being motivated and committed at work and society** *(Motiviertheit und Engagement im Beruf und in der Gesellschaft)*
Values related to liberty and Self-determination	Freedom; Following one's own path; Being oneself, Independence *(Freiheit, den eigenen Weg gehen, sich selbst sein, Selbstständigkeit)*	Being one-self and following one's own path independently and freely	**Finding and following one´s own path in and "with" BOKU"** (*Innerhalb und „mit" der BOKU seinen eigenen Weg finden und gehen*) **Freedom and independence**
Values related to reflexivity	Critical thinking, education; Reflective skills (*Kritisches Denken; Bildung)*	Education, creativity and taking a critical look as well as being open for critical discussions	**Critical thinking** (*Kritisches Denken)* **Integral and systemic reflection** (*Ganzheitliche und systemische Betrachtungen*) **Quality teaching and transfer of knowledge** *(Qualitätsvolle Lehre und Wissensvermittlung)*
Values related to cooperation & co-determination	Cooperation; Social interaction; Co-determination; participation in decision; to learn from each other: global networking (*Zusammenarbeit; soziales Miteinander; Mitbestimmung; Vernetzung)*	An attitude of a well-connected social interaction in which cooperation and teamwork are cultivated and which allows for a participation in making decisions for the future	**Cooperation and teamwork** (*Zusammenarbeit und Teamwork)* **Being involved and participating in decisions** *(Eingebunden sein und Mitbestimmung in Entscheidungen)*

			Networking and (interdisciplinary) exchange of know-how and experience *Vernetzung und (fächerübergreifender) Austausch von Wissen und Erfahrungen*
			Friendly, cooperative working atmosphere and social interaction *(Freundliche, kollegiale Stimmung und soziales Miteinander)*
Values related to solidarity and egalitarianism	Peace, fair distribution, equality of all human beings, a good world, altruism, justice DE: *Friede; Gerechte Verteilung; Gleichheit aller Menschen; Eine gute Welt; Altruismus*	A good world in which resources and opportunities are fairly distributed and human beings live together in peace and mutual helpfulness	**Equality of human beings** *(Gleichwertigkeit von Menschen)*
			Helpfulness (*Hilfsbereitschaft*)
			A good and just world for everyone *(Eine gute und gerechte Welt für Alle)*

The following list enumerates the results of the union of 2 data sets (Fig. F-9), i.e. the eight values also illustrated in the green cells of table F-12:

- Take over responsibility for the environment and protect, preserve and respect nature for future generations (*Verantwortung für die Umwelt übernehmen und Natur für kommende Generationen schützen, erhalten und respektieren*)
- Critical thinking (*Kritisches Denken)*
- Find and follow within and „with" the BOKU one´s own path (*Innerhalb und „mit" der BOKU seinen eigenen Weg finden und gehen*)
- Integral and systemic reflection (*Ganzheitliche und systemische Betrachtungen*)
- Cooperation and teamwork (*Zusammenarbeit und Teamwork*)
- Networking and (interdisciplinary) exchange of know-how and experience (*Vernetzung und (fächerübergreifender) Austausch von Wissen und Erfahrungen*)
- Friendly, cooperative working atmosphere and social interaction (*Freundliche, kollegiale Stimmung und soziales Miteinander*)
- Spirit of research, science and developing solutions for existing problems in society and in practice (*Forschergeist, Wissenschaft und die Entwicklung von Lösungen zu bestehenden Problemen aus Gesellschaft und Praxis*)

F-3.4 Potential for using value-based indicators in the BOKU context

In this chapter the environmental and climate behaviour of BOKU employees is discussed in the framework of the specific set of values drawn from individual interviews.

We met and presented the results in several BOKU operative units:

- BOKU Centre for Global Change and Sustainability (April 18th, 2013)
- BOKU Ethics Platform meeting (April 24th, 2013)
- BOKU Sustainability report working group (in a two-hour meeting on May 28th, 2013);
- BOKU Working group (AG) Social responsibility (June 10th, 2013)

Below are the summarised results of the different discussion rounds. This summary gives emphasis to the main opportunities and challenges regarding the usability/relevance of the developed value-based indicators as performance indicators for BOKU.

F-3.4.1 Utilization in the BOKU sustainability report

Amending Global Reporting Initiative (GRI): One way to evaluate sustainability performance at Universities is using the Global Reporting Initiative (GRI) as blueprint for sustainability reporting**.** The BOKU uses this blueprint for its sustainability reporting. The feedback from the Working group Sustainability report was positive. All members considered value-based indicators essential in the BOKU sustainability report. An interesting idea was to include value-based indicators into the currently used GRI indicators. Members of the sustainability reporting group also suggested giving visibility to this research project by publishing in the BOKU Magazine or a top story in the BOKU Homepage.

However, one concern regards to including value areas at BOKU which are not covered by GRI is that GRI reports on the topics which are selected by nominated groups of stakeholders (e.g. professors, alumni, students). The topics and indicators for the next Sustainability Report of the BOKU are selected and directed to the Alumni. It can happen that the Alumni do not find the information given by value-based indicators of BOKU employees and students essential or of particular interest to be presented in the sustainability report. **Although members of this working group genuinely find the value and indicator´s list relevant they have difficulties to include it within the current sustainability reporting system which is done with an internationally recognised blueprint – the GRI.**

F-3.4.2 Applications of value-based indicators in the framework of the BOKU Ethics Platform

The members of the Ethics Platform showed great interest in the idea of reviewing the status of values and ethical principles at BOKU mentioned in the draft of BOKU Ethical Charter by means of value-based indicators. This project´s results are interesting for the group as they support many of the values and ethical principles detailed in the draft of the BOKU Ethical Charter. However, there is no consensus in the group on a concrete "how" to move forward and "what" can be done with it. **Therefore, the conversations with the BOKU Ethics Platform are to be continued after the conclusion of the project. One particular idea which will be presented to the Ethics Platform refers to application of the value-based indicators identified to create a check list for ethical approval of research projects carried out at BOKU.** This check list could contain several indicators as a kind of ethical checklist instead of just one clearing sentence to be ticked off[6]. This could make the assessment of an ethical approval clearer and more transparent since the applicant might not be aware of these ethical issues (see example Tab. F-13).

Tab. F-13: Example how a value-based indicators check list for ethical approval of research projects at BOKU could look like.

	(X)
• People at BOKU have the courage and opportunity to take a critical look at themselves and others regardless of hierarchies and openly ask questions	
• Project engaged people give attention to a good flow of information and have a good communication structure	
• Project engaged people can trust each other	
• Project engaged people help and respect each other	
• Project engaged people are working together well, constructively and considerately	
• Project engaged people are open for other people and different ways of thinking	
• Project engaged people consider *Generationenfähigkeit* in their judgments regarding this research.	
• This research project contributes to maintain a circular flow of everything *(Menschen an der BOKU möchten, dass alles in einem Kreislauf gehalten wird)*	

[6] Curerntly research projects managers just need to tick in a form that their projects do not have any ethical implications. Some members of the Ethics Platform wish a check list of ethical issues.

- This research project considers the long-term sustainability of society, nature and economy
- Project engaged people make a careful, conscious use of resources

F-3.4.3 Application in the BOKU sustainability strategy

The BOKU sustainability process is structured according to the AISHE Tool 2.0 (RAMMEL et al., 2012). In it, 5 working groups are established regarding certain topic areas (Education, Research, Operations, Society and Identity, see Fig. F-10). The university management makes part of these working groups which will moderate topic specific workshops. These groups develop concrete goals and measures to be achieved for the respective topic area.

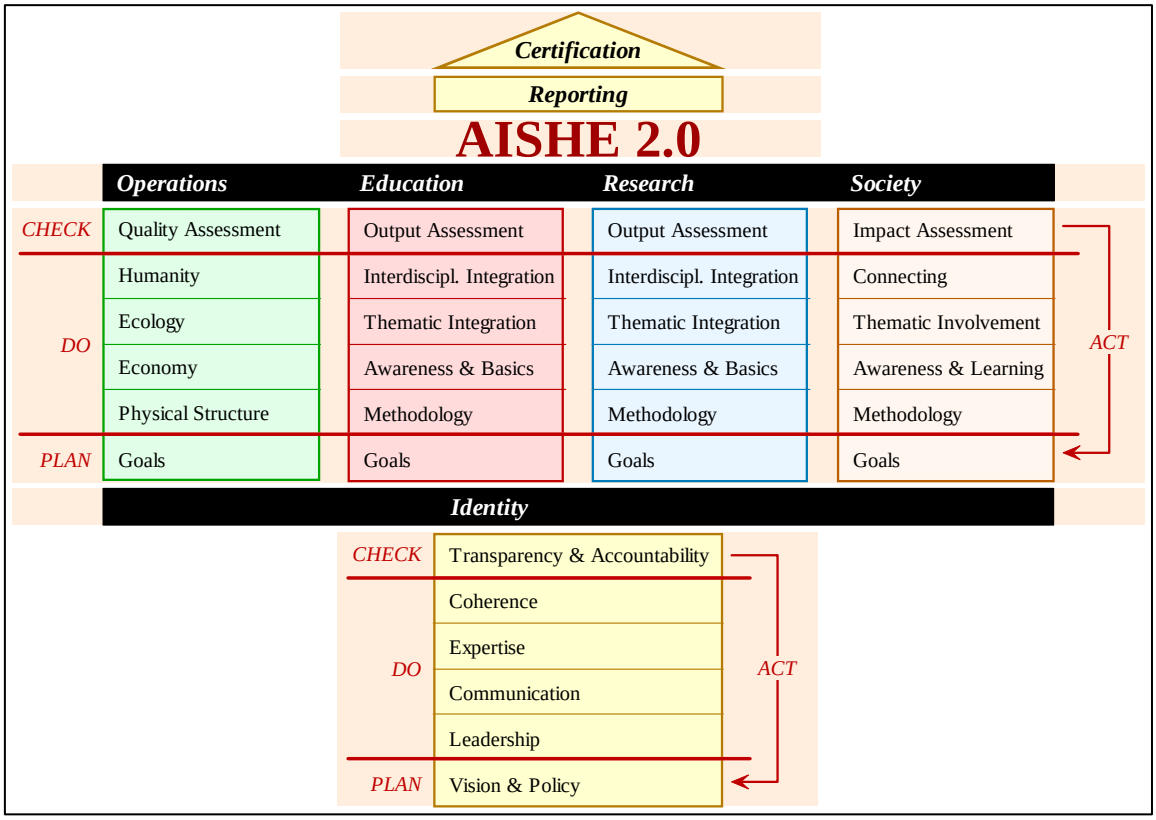

Fig. F-10: The AISHE 2.0 tool containing 5 modules with 6 criteria each (RAMMEL et. al, 2012)

Two approaches are possible in order to include value-based indicators into the BOKU sustainability strategy:

- **the value-based indicators are assigned according to the sectoral AISHE modules** (e.g. the indicators corresponding to the value *"spirit of research, science and developing solutions for existing problems in society and practice"* are assigned to the working group *"research"*)
- **Value-based indicators are included in the basic module „identity".** The Identity Module describes a number of fundamental characteristics of the organization, which together describe the essence or the nature of the organization. The different criteria examine if the vision is expressed in the policy and if this policy translates the vision into concrete plans for action (RAMMEL et al., 2012). The Identity Module also describes how far management also takes leadership for the integration of sustainable development in the organization vision and activities.

The recommendations from the discussions with relevant BOKU Sustainability strategy working group rather tend towards the second approach, i.e. to an integration of value-based indicators into the management and organizational philosophy and culture of the university.

F-3.4.4 AG Social Responsibility & AG Betriebsökologie

The two working groups at BOKU „AG[7] Social Responsibility“ and „AG *Betriebsökologie* (Business Ecology)“ are relevant for the integration of value-based indicators in many aspects. Both working groups essentially contribute to the writing of the BOKU sustainability report and both topics (social and ecological responsibility) are essential in the BOKU sustainability strategy and are also represented in the AISHE workshops inter alia by those individuals participating in these working groups.

We presented the results to these groups during the discussions with them we were informed that the AG Social Responsibility has a three-year project “Healthy BOKU”. This project aims to build up a regular assessment (survey) of the “spiritual/emotional health” of BOKU employees. The **value-based indicators identified in this study (e.g. regarding the values *„appreciation and respect“* or *„friendly, cooperative working atmosphere and social interaction”*) could be further developed and included in “healthy BOKU” survey**. **In addition, there is interest to use the results of this study as basis to develop “BOKU happiness index”.**

F-3.4.5 BOKU development plan: University performance and target agreements

The development plan is the basis for the performance agreements between the University and the Austrian Federal Ministry of Science and Research. The process for creating a new development plan of BOKU starts in autumn 2013 and is basically open for opinions and creative ideas from the outside. Therefore, the attempt shall be made **at a later point of time to identify together with the AG Development Plan relevant indicators which would be further developed into more measurable forms and included in assessment tools.**

[7] Working group

F-4 Discussion of results

F-4.1 List of values and indicators (Objective 1, 3)

There is still a lot to be done to make values or value-based decisions visible and measureable. With this project we hope to increase the understanding on how organisations similar to the BOKU could develop value-based indicators to help making visible not tangible and too vague areas related to human well-being and sustainability. We were successful identifying the relevant values of the BOKU which are also pro-sustainability values. Although the number of interviews was small, different groups of BOKU stakeholders have read and approved he list of values and indicators.

Values found in interviews which have a strong relation to sustainability and are relevant for BOKU members:

- Take over responsibility for the environment and protect, preserve and respect nature for future generations (*Verantwortung für die Umwelt übernehmen und Natur für kommende Generationen schützen, erhalten und respektieren*)
- Critical thinking (*Kritisches Denken)*
- Find and follow within and „with" the BOKU one´s own path (*Innerhalb und „mit" der BOKU seinen eigenen Weg finden und gehen*)
- Integral and systemic reflection (*Ganzheitliche und systemische Betrachtungen*)
- Cooperation and teamwork (*Zusammenarbeit und Teamwork*)
- Networking and (interdisciplinary) exchange of know-how and experience (*Vernetzung und (fächerübergreifender) Austausch von Wissen und Erfahrungen*)
- Friendly, cooperative working atmosphere and social interaction (*Freundliche, kollegiale Stimmung und soziales Miteinander*)
- Spirit of research, science and developing solutions for existing problems in society and in practice (*Forschergeist, Wissenschaft und die Entwicklung von Lösungen zu bestehenden Problemen aus Gesellschaft und Praxis*)

F-4.2 Relevance of these results in the context of climate protection and adaptation (objective 2)

This study shows that **people who hold pro-sustainability values tend to take actions which are climate-friendly** (e.g. drive the bicycle to work, save energy in household). Including these values and indicators in the assessment of the University would make these values visible and important to apprehend by the university management, staff and students. A major part of pro-sustainability measures cited by interviewees (chapter 3.2.) contribute to **climate change mitigation**. It is also possible to link some of these pro-sustainability measures to **climate change adaptation** – for instance the tendency to moderate use of water or reduce energy consumption. Actually this shows that top-down politics of artificially shortening assess to natural resources such as water privatisation, would not be necessary if people´s inner value would be: *Deceleration; sufficiency; Peace and inner satisfaction; Making a difference; Springing into action; Contributing something to environment.*

Climate change forecasts for Vienna predict an increase in average temperatures and increased occurrence of extreme events (e.g. heat waves, frost days, floods) which can cause loss of comfort, higher consumption of energy for cooling during the summer months and increased number of disruptions of public and private transport. This change in climate patterns is likely to cause increased costs in building maintenance and energy consumption. **Even those relevant stakeholders who are aware and informed about their vulnerability and the measures they can take to pro-actively adapt or mitigate climate change may not take them due to low willingness to ac-**

cept higher financial costs on the short-run for benefits on the long-run for housing climate adapted infrastructures, energy independency and community level resilience. Indeed according to the polls the great majority of Austrians is informed about climate change; still Austrian per capita GHG emissions trend does not show significant signals of reduction (UMWELTBUNDESAMT, 2011). This shows that there is no problem in information assess, the question seems are we honestly willing to change our life and work patterns? To answer this question we need to move beyond the climate change discourse and embrace the idea that climate change, just like many other environmental, socio and economic problems of our time, is just a symptom from deep held cultural and moral assumptions about how humans ought to live and achieve in their lives (CROMPTON et al, 2010). The implication is that actions/politics which apparently have little to do with climate change may have important consequences in the capacity to adapt and mitigate climate change.

Based on this research we expect that people holding pro-sustainability values which are also pro-climate, BOKU stakeholders and management would be more willing to accept and adopt measures which do not directly result in benefits for the individual (e.g. measures to reduce energy consumption) and there would be more solidarity to help and manage disruptions in public and private transport.

It is not sufficient to work just on changing mainstream societal values, because indicators are used by every organization to evaluate its success or the success of a particular activity in which organization is engaged. Therefore they contribute to defining the long term goals and, indirectly, the values of organizations. The indicators in current use generally succeed in highlighting unsustainable trends that can be targeted by management action, but fall short of defining or ensuring sustainability (DAHL, 2012). An important step to achieve universal sustainable development is to move away from income as the single, key constituent of well-being, and to include new indicators that measure actual improvements in well-being at all scales (PLANET UNDER PRESSURE, 2012). Thus a new set of value-based indicators is required to measure and motivate the implementation of ethical principles, which are necessary to guide the transition towards sustainability and thus towards a pro-climate action.

Yet, when interpreting the results we observed that some interviewees for instance opt for the more pro-sustainability behaviour due to individual benefits such as cost savings (e.g. high fossil fuel price; saving energy at home) and a certain social self-image (e.g. waste separation). Thus values are alone cannot explain action.

The climate relevance of this research in 4 points:

(i) <u>Inner value of nature and is *per se* worthy of protection</u>

One of the most relevant values for BOKU members is: ***Take over responsibility for the environment and protect, preserve and respect nature for future generations.*** There are two of the clusters of values in Table 12 which are both related to are:

- "***Values related to ecocentric world view and environmental ethics***" i.e. Respect, esteem and appreciation for nature and all beings by recognizing the intrinsic value of life and through a holistic view of the world
- "***Values related to long-term thinking and minimization of risks***" i.e. long-term conservation and preservation of the natural resources for all human beings by means of an active and considerate protection of the environment, nature and climate

These are both related to ecocentric ethics. Ecocentrism include the affirmation of a philosophy granting every being the same right to a (fulfilling) life, this in principle would lead to the biggest and most long-ranging positive changes in human development and in our relation with the planet (e.g. SCHMUCK, 2005; VON LÜPKE, 2003; MACY and BROWN, 2007; HAASE and BOGNER, 2002). This shows an appreciative, careful, respectful attitude towards nature and all its lifeforms – in a way the so called **„spiritual" com-**

ponent of the ethical dimension of sustainability measured in indicators such as „*People at BOKU do not perceive nature as an exploitable resource to be taken for granted but appreciate and accept its intrinsic value*".

Thus, this value supports the attitude that nature and environment are valuable and should be protected and the willingness to take over concrete responsibility and make a contribution in the field of climate change.

(ii) Fulfilling social interaction

Results show a high prioritization of values belonging to the area of social sustainability. Values such as: ***appreciation, respect for each other, cooperation and collegiality*** **are values positively influencing the social cohesion as well as are considered to have a relation to a sustainable development** (e.g. GROUZET et al., 2005; CROMPTON et al., 2010; FELBER, 2008; GOLLAN, 2008; ANDREWS and URBANSKA, 2010).

All of the 25 interviewees related to the importance and relevance of good relationships with colleagues in the daily work routine. Pro-social values are expressed in a concrete behaviour and become visible in the form of „little things" at the interpersonal level – thus becoming tangible: *drinking a cup of coffee together or joint activities, giving praise for a well done job, have open doors at the institute, mutual help in case of not knowing how to proceed*. The „social bond" is an essential part of the factors making interviewees working life valuable. In the ranking of 11 most relevant values for interviewees work and life at BOKU, 5 out of 11 values are pro-social values or have many pro-social indicators.

Successful social relationships not only are an essential factor of happiness (e.g. BMLFUW, 2004; CROMPTON et al, 2010 ; ANDREWS and URBANSKA, 2010) **but also this social cohesion might have implications for an ecologically sustainable development, in particular climate protection – for the following two reasons:**

First, fulfilling relationships can inspire people to voluntarily lead an *easier and simple living lifestyle* (ANDREWS and URBANSKA, 2010) since excessive consumption works as a compensation for inner dissatisfaction. If people feel accepted and respected in a community it is not necessary for them to seek happiness in status and consumer goods any longer (ANDREWS and URBANSKA, 2010; ASSADOURIAN, 2010).

Second, denser social networks and high social and institutional trust promote collective action for the achievement of the common good and contribute to individual well-being (Coleman, 1990; Bourdieu, 1986; Zhao, 2002; EVANGELINOS and JONES, 2009). There is some evidence that in communities with denser social networks, high institutional and social trust and a tendency to comply with regulations[8] are characteristics facilitating the application of environmental initiatives in higher education institutions (EVANGELINOS and JONES, 2009).. Therefore the importance of exploring the potential influence of social factors while planning environmental initiatives is also emphasized.

(iii) Self- and co-determination as a prerequisite for adaptability

Measures to adapt to climate change require by definition willingness for change and the readiness to try new approaches. CROMPTON et al. (2010) argument that people with a strong orientation to values open to change have a higher sensitivity for global problems as well as a higher willingness to constructively tackle them – either by changing their personal behaviour or by taking political action. Open to change cluster of values according to SCHWARTZ (1992) in particular self-direction – are defined as creativity, freedom, independence, ability, wisdom, world of beauty. This openness for change can also be found in these research results. Three of the most relevant and pro-

[8] Which have the objective of bringing sustainability to the University.

sustainability values at BOKU are directly linked to this set of value: *„**Critical thinking**“, „**Finding and following one's own path in and „with“ BOKU**“ and „**Spirit of research, science and developing solutions for existing problems in society and practice**“.* We also identified another three related values which were not validated in the workshop: „***Freedom and independence**“, „**Being involved and participating in decisions**“, „**Being motivated and involved in job and society**“.*

A strong emphasis on the desire for freedom, self- and co-determination was shown in the interviews. BOKU member frequently emphasized the freedom of science, of the choice of the contents of teaching as well as the possibility to flexibly and self-determinedly organize the areas of activity and the working times as far as possible. For BOKU students the possibility to actively contribute to the future (also politically) and to be able to participate is essential. Both groups considered variety in job very important (e.g. a diverse area of activity, working with different people, trying out new methods to developing new ideas).

Increased diversity is the foundation of a healthy development potential since it increases the number of possible system states (ÖMER, 2000). A higher degree of openness for change would increase public acceptance to climate adaptation measures than for instance individuals which show stronger value orientation towards traditional, conservative and safety-related values.

(iv) Networking, interdisciplinarity and Integral thinking

Integrative perspectives, cohesive thinking, changing one's point of view from a partial to the broader perspective are useful to address the complex problems such as climate protection and adaptation at all levels (LINDENTHAL, 2010). Cooperation and communication between different countries or organizations is essential and must be maintained in order to minimize potential disputes from arising. Researchers need to work in interdisciplinary and transdiciplinary teams. Decision makers include intergenerational communication and cooperation, in order to develop the right tools to manage and prevent risk and implement adaptation strategies which are useful to all communities or organizations (RIBEIRO et al., 2009). We have found networking, interdiciplinarity and holistic thinking to be values BOKU staff and students held as relevant in their work and life at BOKU. The readiness to „***Networking and (interdisciplinary) exchange of know-how and experience**“* and „***Integral and systemic reflection***“ are validated BOKU values with a particular relevance for climate protection and the adaptation to climate change. The corresponding indicators frequently imply the desire for interdisciplinary and transdisciplinary for instance in international, scientific networks or in keeping an ongoing exchange with other BOKU institutes. **It is important for both BOKU members and for climate protection and adaptation to look at all partial aspects of a problem in their interdependency and to take into account their context as a whole instead of their sectoral or disciplinary context.**

F-4.3 Initiating a discussion on usability/relevance of a value-based (performance) evaluation of the university (Objective 4)

Part of this project was to test if the usability and relevance of the list of values and indicators which are important for BOKU members and pro-sustainability. The results of several meetings in which results were presented and debated are encouraging but also highlight some challenges in the system. Encouraging because in all meeting everyone thought the idea very innovative and as a necessity. On the other hand it is not a straight forward process, the different BOKU actors need another 1-2 years to "digest" this information and explore ways of using it. There are some interesting ideas and some lose commitments which are presented in chapter 1.

F-5 Recommendation and further work

This study shows that people who hold pro-sustainability values tend to take actions which are climate-friendly (e.g. drive the bicycle to work, save energy in household, etc.).

F-5.1 Recommendations for the BOKU and similar Austrian universities…

- To carry out a similar methodology to identify (for other Austrian Universities) and include pro-sustainability values and indicators in the assessment of the University,
- To make these values visible and through that capture the attention of university management, staff and students. Visibility can be reached by including value-based indicators in university assessment and by checking if there is a dissonance between values of BOKU (reported as being important in the code of ethics or mission statement) and the values which are regularly communicated and practised (e.g. in the university development plan). In this way closing the gap between what is "public relations talk" (i.e. organisation´s mission statement) and what is being assessed to measure performance of an organisation[9].
- To raise awareness of this debate within the organization.

F-5.2 Recommendations for the BOKU Ethics platform…

- To cross-check the current discussion paper of the BOKU code of ethics with the 11 most relevant values at BOKU (online ranking)
- To discuss the relevance of a value-based indicator´s check list for ethical approval of research projects at BOKU (see table 13, chapter 3)

[9] We can shape communications within the university so that we strengthen values which are relevant for University members as they are also supportive of pro-sustainability actions. For example through including these values not only in the mission statement and the code of ethics of the University, but make them more transparent and visible in all internal and external communication of the university. This will not only reinforce the pro-sustainability deep frames necessary for deep organisational change in order to address "bigger-than-self" problems such as climate change. **The implicit and explicit communication of pro-climate and pro-sustainability values can take place on different levels:**

(i) by means of a punctual communication such as press releases and other simple instruments of public relations

(ii) by means of an integration and continuous evaluation of value-based indicators in relevant surveys (see recommendation 1)

(iii) by means of a strategic approach for instance on the level of personnel development and the corresponding (further training or development) opportunities for individuals and institutes or

(iv) from a holistic view on the level of the organizational culture, by means of actively practising values through a conscious levelling of strong hierarchies, creation of participatory decision-making structures, promotion of interdisciplinary networks or communication platforms or opening up space for diversity and co-determination.

F-5.3 Recommendations for the "AG Social responsibility" and AG "BOKU sustainability report"…

- To include value-based indicators found in this study in the GRI (Global Reporting Initiative) standard. The GRI does not cover values of social interaction found to be relevant for BOKU stakeholders (e.g. appreciation, respect and acknowledgement).

F-5.4 Recommendations for "AG Sustainability strategy", teaching and personal development units at BOKU…

- Values and indicators related to interdisciplinary, inclusiveness, openness for change, diversity and self-determination which are already endorsed at BOKU in its mission statement and by different working groups working on the topic. To strengthen openness for change at BOKU through moderated positive visionary circles, deep ecology seminars for training holistic thinking. Also by increasing the number and strengthening interdisciplinary in courses for students, i.e. courses in which lecturers from very different research fields would present their perspective of a societal problem and debate it with students.

- Participatory decision-making, critical thinking and independent ways of working may trigger openness to change. The BOKU could also support this by creating space for co-determination, participatory decision making and implementation of ideas.

- To include the creation of a "BOKU happiness index"[10] containing value-based indicators found out in this report in the sustainability strategy of the university. This could be carried out in cooperation and through integration in the regular surveys of the "Healthy BOKU" project. "Healthy BOKU" project will assess the physical, emotional, mental and spiritual health of its employees.

F-5.5 Recommendations for further research

- To develop concrete assessment tools for these pro-sustainability and pro-climate indicators

- To identify values and indicators in other universities and see if there are similarities and whether we can build a common value-based indicators for the high school sector in Austria. Which could be regularly assessed by the for runners of High school sustainability in Austria for example by the Austrian network of "Allianz nachhaltiger Unis[11]"

- To assess the type of values which are being communicated by the BOKU and check whether there is a gap between values that are communicated and desired pro-sustainability and pro-climate values.

[10] Inspired by the Gross national happiness in Bhutan.

[11] Alliance of Sustainable Universities.

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Figures and Tables

Figures

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