

Constructing “Climate Change Knowledge”
The example of small-scale farmers in the Swartland region,
South Africa

by
Susann de Ruijter

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Supervisors:

Prof Johan P Hattingh (Stellenbosch University)

Prof Ulf Engel (Leipzig University)

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Dedicated to Roland Heinze (1938 - 2009)
and Levi Jeroen de Ruijter

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Abstract

During the last decades “Climate Change” has become a vital topic on national and international political agendas. There it is presented as an irrevocable fact of global impact and thus of universal relevance. What has often been neglected are local discourses of marginalized groups and their specific contextualization of “Climate Change” phenomena. The aim of this project, to develop another perspective along these dominant narratives, has resulted in the research question *How is social reality reconstructed on the phenomenon of “Climate Change” among the “Emerging Black Farmers” in the Swartland region in Western Cape, South Africa?*

Taken as an example, “Climate Change Knowledge” is reconstructed through a case study on the information exchange between the NGO Goedgedacht Trust and local small-scale farmers in the post-Apartheid context of on-going political, social, economic and educational transition in South Africa.

Using a constructivist approach, “Climate Change Knowledge” is not understood as an objectively given, but a socially constructed “reality” that is based on the interdependency of socio-economic conditions and individual assets, including language skills and language practice, sets of social norms and values, as well as strategies of knowledge transfer.

The data set consists of qualitative data sources, such as application forms and interview material, which are triangulated. The rationale of a multi-layered data analysis includes a discursive perspective as well as linguistic and ethical “side perspectives”. Epistemologically, the thesis is guided by assumptions of complexity theory, framing knowledge around “Climate Change” as a fluid, constantly changing system that is shaped by constant intra- and inter-systemic exchange processes, and characterized by non-linearity, self-organization and representation of its constituents. From this point of departure, a theoretical terminology has been developed, which differentiates between symbols, interrelations, contents and content clusters. These elements are located in a system of spatio-temporal orientation and embedded into a broader (socio-economic) context of “historicity”. Content clusters are remodelled with the help of concept maps. Starting from that, a local perspective on “Climate Change” is developed, adding an experiential notion to the global narratives.

The thesis concludes that there is no single reality about “Climate Change” and that the farmers’ “Climate Change Knowledge” highly depends on experiential relativity and spatio-temporal immediacy. Furthermore, analysis has shown that the system’s historicity and social manifestations can be traced in the scope and emphasis of the content clusters discussed. Finally the thesis demonstrates that characteristics

of symbols, interconnections and contents range between dichotomies of direct and indirect, predictable versus unpredictable, awareness and negligence or threat and danger, all coexisting and creating a continuum of knowledge production.

All names of participants in this study are mentioned on the basis of explicit informed consent.

Opsomming

Tydens die laaste dekades het “Klimaatsverandering” ‘n belangrike onderwerp op nasionale en internasionale politieke agendas geword. Volgens die dominante narratiewe word “Klimaatsverandering” voorgestel as ‘n onherroeplike universele feit met globale impak en relevansie. Wat egter dikwels agterweë gelaat word is plaaslike diskoerse van gemarginaliseerde groepe en hul konteks-spesifieke perspektiewe van “Klimaatsverandering”. Die doel van hierdie projek is dus om ‘n ander perspektief naas hierdie dominante verhale te ontwikkel deur die volgende navorsingsvraag te beantwoord: “Hoe word die sosiale werklikheid gekonstrueer rondom die verskynsel van “Klimaatsverandering” onder die “ontluikende swart boere” in die Suid-Afrikaanse provinsie van die Wes-Kaap?

As ‘n voorbeeld van so ‘n kontekstuele ervaring van dié universele fenomeen is “Kennis van Klimaatsverandering” gerekonstrueer deur ‘n gevallestudie oor die uitruil van inligting tussen die NGO Goedgeacht Trust en plaaslike kleinskaalse boere in die post-Apartheid konteks van die deurlopende politieke, sosiale, ekonomiese en opvoedkundige oorgang in Suid-Afrika.

Die studie is gegrond op ‘n konstruktivistiese benadering waarvolgens “Kennis van Klimaatsverandering” nie verstaan word as ‘n objektiewe gegewe nie, maar as ‘n sosiaal gekonstrueerde “werklikheid” wat gebaseer is op die interafhanklikheid van sosio-ekonomiese toestande en individuele bates, insluitend taalvaardighede en -praktyke, stelle van sosiale norme en waardes, sowel as strategieë van kennisoordrag.

Die datastel bestaan uit kwalitatiewe databronne, soos aansoekvorms en onderhoudmateriaal, wat getrianguleer is. Die rasionaal van ‘n meerlagige data-analise sluit ‘n diskursiewe perspektief sowel as taalkundige en etiese “randperspektiewe” in. Epistemologies word die proefskrif gelei deur aannames van kompleksiteitsteorie wat kennis omtrent “Klimaatsverandering” beskryf as ‘n vloeiende, voortdurend veranderende stelsel wat gevorm word deur konstante intra- en inter-sistemiese ruilprosesse, en wat gekenmerk word deur nie-lineariteit, self-organisasie en verteenwoordiging van die onderskeie bestanddele. Vanuit hierdie uitgangspunt is ‘n teoretiese terminologie ontwikkel wat ‘n onderskeid tussen simbole, verbindings, inhoud en inhoudklusters tref. Hierdie elemente is geleë in ‘n stelsel van tydruimtelike oriëntasie en ingebed in ‘n breër (sosio-ekonomiese) konteks van “historisiteit”. Inhoudklusters is gehermodeleer deur die gebruik van konsepkaarte. Hieruit is ‘n plaaslike perspektief op “Klimaatsverandering” ontwikkel wat ‘n ervaringsbegrip by die globale verhale voeg.

Die tesis kom tot die gevolgtrekking dat daar geen enkele werklikheid ten opsigte van “Klimaatsverandering” bestaan nie en dat die betrokke boere se “Kennis van Kli-

maatsverandering” hoogs afhanklik is van relatiwiteit van ervaring en tydruimtelike onmiddellikheid. Verder het ontleding getoon dat die historisiteit en sosiale manifestasies van die stelsel opgespoor kan word in die omvang en nadruk van die behandelde inhoudklusters. Uiteindelik bewys die tesis dat eienskappe van simbole, verbindings en inhoud wissel tussen digotomieë van direk en indirek, voorspelbaar versus onvoorspelbaar, bewustheid en nalatigheid of bedreiging en gevaar, wat almal saambestaan en ‘n kontinuum van kennisproduksie skep.

Alle name van deelnemers aan hierdie studie word genoem op die basis van eksplisiete ingeligte toestemming.

Table of contents

List of abbreviations	xi
List of tables	xiii
List of figures	xiv
List of concept maps	xiv
List of maps	xv
List of appendices	xv
1. Introduction: “The art of muddling through”	1
1.1 The research object	1
1.2 Group designations: The case of <i>Emerging Black Farmers</i>	5
1.2.1 Occupation: Two perspectives	7
1.2.2 Ethnic ascriptions: Two perspectives	10
1.3 Project partners	15
1.4 Structure of the thesis	15
2. Theoretical considerations	17
2.1 The study of complex systems	18
2.1.1 Emergence (of knowledge)	19
2.1.2 Non-linearity	20
2.1.3 Representation	21
2.1.4 Self-organization	21
2.1.5 Characteristics of complex systems	22
2.1.6 How to model a complex system?	25
2.2 The social character of knowledge	27
2.3 Knowledge constituents	34
2.3.1 Data and information	34
2.3.2 Signs and symbols	35
2.3.3 Natural kind terms	36
2.3.4 Meaning	38
2.3.5 Contents and content clusters	39
2.3.6 Context	40
2.4 The role of language	41
2.4.1 Multilingual language practice	44
2.4.2 Connections between Afrikaans and English in South Africa	54
2.5 Summary	59

3. Methodology and the research process	61
3.1 The research design: An outline	61
3.2 Limitations of the research design: About generalizability	66
3.3 Data collection	68
3.4 Data sources	68
3.5 Ethical clearance and informed consent	74
3.6 Data analysis	75
3.6.1 A linguistic perspective	75
3.6.2 A discursive perspective	76
3.6.3 An ethical perspective	78
4. Framing the case	79
4.1 The Swartland region	81
4.1.1 Climatic features	81
4.1.2 Political administration	83
4.2 A historical outline	85
4.2.1 School education	86
4.2.2 Occupational qualification	93
4.2.3 Land reform and tenure status	96
4.3 The <i>BFFAW farmers</i> : Socio-economic conditions	99
4.3.1 Educational and occupational qualifications	101
4.3.2 Available means of telecommunication	106
4.3.3 Land size and tenure status	107
4.3.4 Farming in practice	112
4.3.5 Conclusion: The vulnerable character of the <i>BFFAW farmers</i>	117
4.4 The interview partners	120
4.4.1 Linguistic preconditions	120
4.4.2 Linguistic preferences	124
4.4.3 Intermediate result	128
4.4.4 Information sources	129
4.5 The <i>Cool World Climate Path</i>	136
4.5.1 The genesis of the <i>Cool World Climate Path</i>	136
4.5.2 The structure of the <i>Cool World Climate Path</i>	143
4.5.3 The questionnaire	146
4.5.4 Practical installations on the path	148
4.5.5 Information sources	154
4.6 Summary	160

5. The contents of “Climate Change”: different perspectives	161
5.1 Contextualizing “Climate Change”	165
5.2 Framing “Climate Change”: the problem character	168
5.2.1 Identifying “Climate Change”: basic observations	170
5.2.2 Tracing “Climate Change”: root causes	176
5.2.3 Perceiving “Climate Change”: impacts	183
5.2.4 Concerning “Climate Change”: responsibilities (expectations)	192
5.2.5 Encountering “Climate Change”: chances	202
5.2.6 Evaluating “Climate Change”: risk awareness and threat potential	210
5.3 Summary	223
6. Reconstructing content clusters	226
6.1 “Weather”	226
6.1.1 “Weather” contents of <i>BFFAW farmers</i>	227
6.1.2 “Weather” contents of <i>Cool World Climate Path</i>	233
6.1.3 Summary	246
6.2 “Greenhouse Gas Emissions” (GGE)	246
6.2.1 GGE on the <i>Cool World Climate Path</i>	247
6.2.2 GGE and the <i>BFFAW farmers</i>	248
6.2.3 Summary	252
6.3 Restructuring content clusters: a system of orientation	253
6.3.1 Spatiality	254
6.3.2 Temporality	256
6.3.3 Personality	262
6.4 Summary	263
7. Conclusion: After having muddled through	268
7.1 Framing the knowledge continuum	268
7.2 Framing “Climate Change Knowledge”	270
7.3 “Climate Change Knowledge” and the study of complex systems	274
7.4 Outlook	275
8. References and source material	276
Appendices	294

List of abbreviations

Afr.	in Afrikaans language
AIDS	Acquired immunodeficiency syndrome
ANC	African National Congress
APRM	African Peer Review Mechanism
BFFAW	Black Farmers Funding Application Workshop
BBC	British Broadcasting Corporation
bot.	Botanical expression
CCV	Contemporary Community Values
CCV-TV	Contemporary Community Values television
CEPD	Centre for Education Policy Development
CHE	Council on Higher Education
COP	Conference of the Parties
COSATU	Congress of South African Trade Unions
CPA	Community Property Association
CWCP	Cool World Climate Path
DA	Democratic Alliance
DESC	Departmental Ethics Screening Committee
DNE	Department of National Education
DWD	Deutscher Wetterdienst
ERS	Education Renewal Strategy
Engl.	in English language
FAO	Food and Agriculture Organization of the United Nations
FET	Further Education and Training
FSCC	Financial Sector Coalition Campaign
GET	General Education and Training
GFETQSF	General and Further Education and Training Qualifications Sub-Framework
GGE	Greenhouse Gas Emission
GIGA	German Institute of Global and Area Studies
GTZ	Gesellschaft für Technische Zusammenarbeit
GIZ	Gesellschaft für Internationale Zusammenarbeit
HEQSF	Higher Education Qualifications Sub-Framework
HET	Higher Education and Training
ICT	Information and Communication Technology

IFAD	International Fund for Agricultural Development
IPCC	Intergovernmental Panel on Climate Change
LRAD	Land Redistribution for Agricultural Development
MAFISA	Micro-Agricultural Finance Initiative of South Africa
MTE	mother-tongue education
NECC	National Education Co-operating Committee
NEPI	National Education Policy Initiative
NGO	non-governmental organization
NQF	National Qualifications Framework
NUMSA	National Union of Metalworkers of South Africa
NWC	National Working Committee
OQSF	Occupational Qualifications Sub-Framework
PLAS	Proactive Land Acquisition Strategy
POP	Path out of Poverty
PTO	permission to occupy
QC	Quality Council
QCTO	Quality Council for Trades and Occupations
ZAR	South African Rand
R p/m	Rand per month/ Rand per maand
REC	Research Ethics Committee
REDD	Reducing Emissions from Deforestation in Developing Countries
RSA	Republic of South Africa
SAE	South African English
SA	South Africa
SABC	South African Broadcasting Corporation
SACP	South African Communist Party
SAQA	South African Qualifications Authority
SOP	Standard Operation Procedure
SKAD	Sociology of Knowledge Approach to Discourse
Stats SA	Statistics South Africa
SU	Stellenbosch University
UN	United Nations
UNFCCC	UN Framework Convention on Climate Change
UNISA	University of South Africa
WMO	World Meteorological Organization
WWF	World Wide Fund for Nature

List of tables

Table 1: Deconstructing the term “Emerging Black Farmers”: two perspectives on the role of ethnic ascription and occupation	6
Table 2: Horizontal system-context interrelations in knowledge production	43
Table 3: Typology of code-switching	48
Table 4: Comparison of lexical reference in code-switching, lexical borrowing and translation	51
Table 5: Summary of Level Descriptor Category contents in relation to NQF levels 1-4	91
Table 6: Distribution of male and female participants	100
Table 7: Applicants’ choice between English and Afrikaans application form	101
Table 8: Overview of school education of BFFAW attendants	102
Table 9: Overview of occupational qualifications of BFFAW attendants	105
Table 10: Number of people living on the farms of the BFFAW participants	107
Table 11: Number of people working on the farms of the BFFAW participants	107
Table 12: Size of farmland accessed by BFFAW participants	108
Table 13: Land tenure status of the total of 117 BFFAW participants	109
Table 14: Tenure status in the Swartland district, South Africa 2013	110
Table 15: Duration of access to current farmland of BFFAW participants	111
Table 16: Agricultural and livestock farming products of the BFFAW farmers	112
Table 17: Water sources used by BFFAW farmers	114
Table 18: Equipment used by BFFAW farmers	115
Table 19: Spatial localization of “Climate Change” within the system of orientation .	254
Table 20: Temporal localization of “Climate Change” within the system of orientation	256
Table 21: Combinatory types of temporal referencing	261
Table 22: Personal localization of “Climate Change” within the system of orientation	263
Table 23: Cool World Climate Path: Appearance of the term “Climate Change” ...	294
Table 24: Cool World Climate Path: Appearance of the term “Greenhouse”	297

List of figures

Figure 1: Köppen-Geiger climate type map of South Africa	82
Figure 2: Overview of Basic Education System in South Africa: FET and GET band88
Figure 3: Basic Education System in South Africa – Comparison of Grades and Standards in relation to the NQF level	93
Figure 4: Word cloud of “The new climate deal: A pocket guide”	156
Figure 5: System of orientation (side view)	264
Figure 6: Content cluster: Greenhouse Gas Emissions (side view)	265
Figure 7: Content cluster: Greenhouse Gas Emissions (top view)	266
Figure 8: Content cluster: Greenhouse Gas Emissions (front view)	266
Figure 9: Constitution process of “Climate Change Knowledge”	271

List of concept maps

Concept map 1: Interrelation of “Climate Change Knowledges”	162
Concept map 2: Identifying “Climate Change”: basic observations	175
Concept map 3: Tracing “Climate Change”: root causes	183
Concept map 4: Perceiving “Climate Change”: impacts	191
Concept map 5: Concerning “Climate Change”: responsibilities	201
Concept map 6: Encountering “Climate Change”: chances	209
Concept map 7: Evaluating “Climate Change”: risk awareness and threat potential	223
Concept map 8: Weather concept of BFFAW farmers	234
Concept map 9: CWCP symbol “rain”	237
Concept map 10: CWCP symbol “temperature”	241
Concept map 11: CWCP symbol “wind”	243
Concept map 12: CWCP symbol “Greenhouse Gas Emissions”	248
Concept map 13: The conception of “Greenhouse Gas Emissions”	253

List of maps

Map 1: Location of BFFAW farmers' residences: terrain map of the Swartland area	81
Map 2: Location of the Cape Town Metropolitan Municipality	84
Map 3: Location of the Swartland Municipality	85
Map 4: Cool World Climate Path route	146

List of appendices

Appendix A: Cool World Climate Path: Appearance of the term "Climate Change" .	294
Appendix B: Cool World Climate Path: Appearance of the term "Greenhouse"	297
Appendix C: BFFAW application forms (English)	301
Appendix D: BFFAW application forms (Afrikaans)	303
Appendix E: Interview guideline (Goedgedacht Trust)	305
Appendix F: Riglyn vir onderhoud (BFFAW farmers)	311
Appendix G: Informed consent form (English)	316
Appendix H: Informed consent form (Afrikaans)	320
Appendix I: The "Climate Change Knowledge" continuum (Animation)	324

1. Introduction: “The art of muddling through”

“You know, we’ve called it, and this might be ridiculous of calling it like this, we [at Goedgedacht] call it ‘the art of muddling through’. We just muddle through. You just make it work. You know, you just shift it and change it and let it happen.”
(Interview with Peter Templeton)

In this sense, this project is an attempt to describe “Climate Change Knowledge” in all its fuzziness, open as it always is to serendipity.

1.1 The research object

During the last two decades, “Climate Change” has become a vital topic on national and international political agendas. The powerful discourse on “Climate Change” has established a number of “truths” that, after a period of initial scientific and political contestation, have become common sense: “Climate Change” is happening, it is man-made, its effects are global and its consequences need to be mitigated. In contrast to this global knowledge, very little is known about how local knowledge about “Climate Change” is produced, and how it interacts with this global knowledge. Therefore this project will shed light on one specific local context of small-scale farmers that frames the construction of their climate-related knowledge.

Some basic assumptions underlie this project.

There is more than one reality of “Climate Change”, based for instance on pre-scientific perceptions of a changing environment that shape local discourses. The approach is further determined by the fundamental idea that this particular climate-related knowledge is, on the one hand, experience-based, and on the other it results from access to information. As the topic of “Climate Change” gains importance in local discourses, a new set of terminological and conceptual tools also enters a system of local knowledge. Here the fundamental understanding of knowledge as a complex system, which emerges through processes of interaction that connect systemic elements, invites us to get involved with the theory of complex systems.

This project is based on the idea that a transdisciplinary, “metaparadigmatic” research design to examine the transfer of “Climate Change Knowledge” might offer an extended scope for scientific disciplines and their practices. By focusing on the complexity of knowledge, its emergence and transfer under the specific conditions of multilingualism in an environment-emphasizing context, a discussion between the scientific disciplines

Sociology of Knowledge, Human Ecology, Translation Studies and Cognitive Linguistics arises in order to create a new transdisciplinary lens on the space between knowledge texture and reality construction of natural space. Despite being based on disciplinary approaches and methods, my paper does not claim to be disciplinary.

From an empirical perspective, this project has been developed with support of the Goedgedacht Roman Catholic Trust, Riebeeksrivier, South Africa, a non-governmental institution that has dedicated itself to the topics of poverty and “Climate Change”. This organization has been the “gate” to the group of local “Emerging Black Farmers”, who struggle with small-scale farming production at subsistence level. The Goedgedacht Trust is embedded in a dynamic political, social and economic environment that is shaped by post-Apartheid reform politics.

The fieldwork context is located in South Africa’s Western Cape Province, which has a population of approximately 5.8 million people (or 10.6% of the total population of the country). The main social divide in the Western Cape is between South Africans of European origin (or, in the old discourse, “Whites”, 15.7%) and the so-called “coloured” population (48.8%) of mixed origin. Africans (“Blacks”, 32.8%) represent a substantial and growing section of the population. Among the people in the Western Cape, Afrikaans is the most widely spoken language (49.7%), followed by Xhosa (24.7%) and English (20.2%) – obviously cutting across some of the lines of identity groups (see Statistics South Africa 2011).

While the country is governed by the African National Congress (ANC) under President Jacob Zuma, the Western Cape Province is governed by the Democratic Alliance (DA) under Premier Helen Zille. While the injustices of the past are slowly being overcome and major improvements have been made in the areas of democracy and political governance, substantial challenges remain with regard to inequality, service delivery and reconciliation. Income inequality has actually risen in the post-Apartheid society (Terreblanche 2002) and correlates highly with what is still being described as “race” (MacDonald 2006; Seekings and Natrass 2005). Land reform, affirmative action, violence against women and children, crime, xenophobia, and racism have all been singled out as particular challenges (see RSA Presidency 2010).

Taking the Intergovernmental Panel on Climate Change (IPCC) report of 2007 as discursive example, a lack of consideration of local or indigenous knowledge can be observed for the comprehension of the way regional resource systems operate and are affected by biophysical and socioeconomic forces (IPCC 2007: 833). The goal set out is social learning of complex issues like “Climate Change” and its cultural significance in order to reduce (social and biophysical) vulnerability and the disempowerment of communities resulting from a deficiency of modern technology

competence (cf. Brooks 2003: 2f; Müller-Mahn 2010; Vincent 2004). The authors argue that “dialogue processes in assessment and appraisal are becoming important tools in the support of participatory processes” (IPCC 2007: 834; see also IPCC 2007: chap. 20).

Therefore the basis for a successful and sustainable integration of all actors is

“a comprehensive understanding of the implications of extreme climate change [which] requires an in-depth exploration of the perceptions and reactions of the affected stakeholder groups and the lay public” (IPCC 2007: 834).

The methods which are mentioned include a policy exercise approach as well as directed focus-group conversations (IPCC 2007: 834).

In all cases, the responsibility for the protection of local knowledge lies with national legislation and depends on the latter’s evaluation of its necessity. The most recent long-term strategy papers published by the South African Government is the National Climate Change Response Green Paper of 2010, which was the draft of the final National Climate Change Response White Paper of 2011. Because South Africa is particularly vulnerable to the impacts of “Climate Change”, the main objectives are interventions to strengthen social, economic and environmental resilience and to contribute to the global effort to stabilize greenhouse gas concentrations in a sustainable manner (Government of the Republic of South Africa 2011). The South African Government commissioned four different institutions¹ to provide research papers concerning financing “Climate Change”, governance of “Climate Change” in SA, adaption, research and technologies and mitigation as a basis for its white paper of 2011.² The South African debate on “Climate Change”, particularly following the country’s hosting of the 17th Conference

1 The contributing research institutions are the Development Bank of Southern Africa, the Energy Research Centre of the University of Cape Town, the South African Biodiversity Institute and Business Enterprises of the University of Pretoria.

2 Chrisna du Plessis, an international expert on the development and evaluation of policy and research strategy for sustainable human settlement, building and construction within developing countries, appraises the current status and scope of South Africa’s national policy and strategy initiatives to aim at mitigating the role of the built environment in climate change and at adapting current settlement and construction practices to proposed climate change in the country. She summarizes “that climate change is not a major item on the country’s research and policy development agendas, and the country is reserved to take responsibility for its own role in the crisis. Both adaptation and mitigation is happening in an ad hoc manner, often driven by pressures other than climate change, and the task of interweaving the demands of climate change into South Africa’s settlement development policies is yet to be attempted in a focussed manner” (Du Plessis 2003: 1)

of the Parties (COP) of the UN Framework Convention on Climate Change (UNFCCC) in 2011 in Durban, has really only just started (see, for instance, Bond 2011; Masters and Duff 2011; Raubenheimer 2011). However, the importance of “Climate Change Knowledge” systems has already been acknowledged (Never 2010, 2012). Yet so far the academic debate has not picked up on how knowledge on “Climate Change” is constituted in South Africa and how this relates to the global discourse, or how the talk about “Climate Change” reflects various imbalances of power – between South Africa and the international systems, but also within the country.

As the topic of “Climate Change” is vital to the groups which interact closely with the natural environment, such as small-scale farmers, the power imbalances are also reflected in their discourse. The rationale of this project thus assumes that a discrepancy exists between those scientific discourses which frame “Climate Change” from a global perspective on the one hand, and everyday experiences or local needs on the other. Here the global narratives are driven by “facts and figures” which contextualize environmental changes in large temporal and spatial-scales, whereas experience-based perception on the grass-roots level is often unconscious and mainly deduced from transformations in a person’s direct surroundings. The result is a disparity in the conceptualization of “Climate Change” phenomena and a hierarchy of orders of “Climate Change Knowledge”. The basic assumption that there exists more than one reality of “Climate Change” has resulted in the decision for an orthographic convention that refers to “Climate Change” capitalised and in inverted commas. This also refers to the Goedgedacht Trust’s language practice of this term in capitalisation. In the case of the climate policy of the Goedgedacht Trust, a hierarchical situation results from the position of the Western organization, which aims to inform and educate local people in order to raise awareness of their own responsibility towards the climate. The alleged objectivity of “scientific evidence” seemingly allows a certain moral superiority.

Referring to BBC (2010a and 2010b) research on Africa’s public understanding of “Climate Change”, my research objectives address similar fundamental questions about the people’s experiences with local “Climate Change” in the context of their knowledge about global climate and how it is changing. One of the major challenges that the BBC survey describes is the adequate translation and contextual framing of central terminology, including basics like “Climate”, “Climate Change” and “Global Warming”.³ The “gap” they describe raises questions about the constitutive processes

3 “People note the lack of climate change terminology in local languages. Although English terms are widely recognised, there are no standard translations in Zulu or Sepedi. These terminologies are thus not accessible to many South Africans. Opinion leaders agree that the lack of appropriate words prevents engagement among certain publics and increases the

of knowledge orders under these specific conditions.⁴

The following research questions can be derived from this assumption:

How is social reality reconstructed in the phenomenon of “Climate Change” among the “Emerging Black Farmers”?

Further, how do “Emerging Black Farmers” adopt the concept of “Climate Change” against the backdrop of the Goedgedacht information campaign “Cool World Climate Path”?

This research begins from this point. To unpack these research questions in more detail, I will first focus on certain conceptual issues, and then to theoretical considerations in chapter 2.

1.2 Group designations: The case of *Emerging Black Farmers*

At the very beginning of this project I was confronted with a group designation that I was unable to classify properly. By ‘classify’ I mean evaluating the underlying connotation and the impact on the persons designated. The phrase “Emerging Black Farmers”⁵ appeared in official terminology in Goedgedacht documents and publications referring to a specific group. Jafta Hendricks⁶ described it as follows:

“Not really, like I say, we keep it simple and the farmers, the Emerging Black Farmers, these guys who grows up in nature, they know nature, long before maybe those professors. No, they know nature, they can just, maybe they know what we talk about, but they don’t use that fancy big words, but they knows the same stuff. But in the moment that somebody start talking then you will be surprised how much they know, because they are on site every day and they know exactly what’s going on.” (Interview with Jafta Hendricks)

perception that climate change is not immediately relevant to people’s lives.” (BBC 2010: 5)

4 The BBC report states that “[m]ost South Africans are aware of the phenomenon of global climate change, but their understanding of the science is patchy. Although they associate the terms ‘climate change’ and ‘global warming’ with carbon emissions, many also conflate them with ozone depletion. They tend to use ‘climate change’, ‘global warming’, and ‘ozone depletion’ interchangeably.” (BBC 2010: 5)

5 In the oral language practice of the Goedgedacht Trust, the designation alternates synonymously with “Black Emerging Farmers” and “small-scale farmers”.

6 Mr Hendricks is the manager of the “Climate Change” projects at the Goedgedacht Trust.

The specific group the Goedgeacht Trust refers to here does not exclusively form a part of the population group of “Black Africans”. In fact this group comprises the whole community of small-scale farmers, including mostly Afrikaans-speaking “Coloureds” and isiXhosa-speaking “Black Africans”. During my fieldwork I began to understand that the term is configured in a space between two horizontal and two vertical levels, as table 1 shows.

Table 1: Deconstructing the term “Emerging Black Farmers”: two perspectives on the role of ethnic ascription and occupation

Group \ Perspective	External: social and/or political ascription	Internal: self-reference
Ethnic ascription	Black	
Occupation	Emerging Farmers	

Source: Own interpretation.

On the horizontal level, two perspectives are determined by an external “outsider” ascription and an internal “self-reference” of the group members themselves, both contributing to the group-specific identity formation.

Not intended in a hierarchical sense, on a further vertical level the term “Black Emerging Farmers” contains a relation to two groups. The first one is characterized by “ethnic” features, pointing to visual differences of skin colour, which is closely related to the question of language practice. The term “ethnic” is used in reference to People and Garrick (2011: 389), which define an ethnic group as a named social category of people based on perceptions of shared social experience or ancestry. Members of the ethnic group see themselves as sharing cultural traditions and history that distinguish them from other groups. Ethnic group identity has a strong psychological or emotional component that divides the people of the world into opposing categories of “us” and “them.” This definition highlights the important role of the farmers' self-ascription to the group of “Coloureds”.

The second group describes the occupational conformance of the members as “Farmers”. The attribution “Emerging” specifies this group further and suggests this subgroup developed only recently. The etymology of these group descriptions will also give some hints as to their social status.

1.2.1 Occupation: Two perspectives

As the term “Emerging Black Farmers” suggests, most members of this group work in agricultural production. The constituent factors which determine this group are briefly explained in the following, which again offers an external and an internal perspective.

An external perspective

The term “emerging farmers” or “smallholder farmers” can be traced back to literature of NGOs and international agencies, such as the Food and Agriculture Organization of the United Nations (FAO) and the International Fund for Agricultural Development (IFAD). The terms describe groups of pastoralists, forest keepers or fishers, who are involved in agricultural activity, whose household income and consumption are dependent on family-based agricultural production (cf. FAO 2012). In South Africa, this group consists mostly of primary farm workers. According to van Zyl (1998: 561), in the South African context the term “small-scale farmers” conveys the connotation of “a backward, non-productive, non-commercial, subsistence agricultural sector” with “blacks who do not have the ability to become large-scale commercial farmers” (Tshuma 2014: 2410). The IFAD sees the reason for this in a lack of access to assets and financial resources and comparably higher transaction costs (e.g. transportation), reducing their capacities to adapt to market changes. A further element is land size and the size of cultivated land. The FAO (2012: 1) defines the farming areas of small-scale production as “varying from less than one hectare to 10 hectares”. This dimension aligns with the living conditions of the farmers, who assisted in this project (cf. chapter 4.3).

The current farming conditions can be traced back to the beginning of the post-Apartheid era in 1994, when South Africa faced a situation where 13 million “black” people lived crowded together in homelands while 86 per cent of farmland was owned by “Whites” (cf. FAO 2009). In response, the South African Government pursued a redistribution reform programme which aimed at transferring 30 per cent of South Africa’s agricultural land to the “black” community within five years. The timeframe was extended to 2014 after it became clear that a period of five years was insufficient for such a fundamental transition. The reconditioning of land possession and tenure did not answer the questions of sustainable agricultural activities on that land. Therefore one current focus of South Africa’s agrarian sector is the development of efficient “black” commercial farmers, who are referred to as “emerging farmers”,

and an enlargement of land holdings. The IFAD (2014) evaluates the potential of smallholder farmers as “very efficient in terms of production per hectare, and they have tremendous potential for growth.” In his study on the performance of the agricultural sector in the Western Cape region, de Lange (2004: 35ff) concludes that successful farming production depends on the availability of the following resources: knowledge of production methods and capacity building; personal capacities for production; production means (land and equipment); cultivation input (fertilizer, compost, pesticides) and last but not least commercial markets. Furthermore the producers need to be institutionally organized, to enable them to influence political decisions. The political version of an “emerging farmer” is thus shaped as a combination of farming expert and business-man with management skills.

An internal perspective

The self-perception of the farmers who assisted in this project is slightly different. The following quotations exemplify the continuum of the interviewees’ terminological self-referencing.

The assessment of Tshuma (2014) in particular proves to be in line with the farmers’ self-perception, when “kleinboere” is referred to as a group of underdeveloped and backward small-scale farmers.

‘Kan jy vir my die Goedgedacht organisasie beskryf?’ ‘Die Goedgedacht Trust is ‘n baie goeie beskikbare organisasie wat veral omkyk na die ontwikkeling van kleinboere. So hulle kyk na die agtergestaan van **ons kleinboere** en hulle help ook kleinboere op.’ (Onderhoud met CA)

*‘Can you describe the Goedgedacht organization for me?’ ‘The Goedgedacht Trust is a very good available organization which is primarily looking after the development of small-scale farmers. So they take care of the backwardness of **us small-scale farmers** and they also help small-scale farmers.’ (Interview with CA)*

A lack of financial resources is also directly connected to the small-scale farmers, in this case with a reproduction of the ethnic aspect “swart” – which often connotes small-scale business, by naming them “swartkleinboere” or “swart boere”.

Die grootste uitdaging wat die meeste boere, of sal ek sê die swart kleinboere, is finansiële en hoe om by die finansies uit te kom. (Onderhoud met LK)

The biggest challenge that most farmers, or should I say the black small-scale farmers, face is financial and to access finances. (Interview with LK)

The term “swart(klein)boere” specifies the group of farmers and limits the scope of personal referencing to the immediate local community of interaction, as the following evaluation shows by being further connected to a spatial reference of the Swartland region.

Ja, as 'n mens moet kyk na die uitdagings in **die Swartland**, dan praat ons van ons. **Swartboere** is maar mense wat maar nie die kapitaal het nie om die boerdery suksesvol te laat ontwikkel nie. (Onderhoud met JV)

Yes, if one looks for the challenges in the Swartland, then we speak about us. Black farmers are people who have no capital to develop farming successfully. (Interview with JV)

More generally, the aspect of financial deficiency is pointed out again – in this case under the specific conditions of the recent land reforms, defining the reference group in the sense of “emerging farmers” as “nuwe boere” (Engl. new farmers).

[...] Ek was nou eintlik lanklaas op Goedgedacht-plaas, alhoewel daar was opleiding gewees, en 'n man is nou al so gefrustreerd, dit bly net by opleiding, opleiding, opleiding. Maar verder die opleiding, orraait, dis goed vir jou, maar nou kom jy terug van die opleiding af, dan sit jy maar weer net hierso. Nou dit is wat ek eintlik 'n probleem mee het, want daar is nooit, uhm ... jy weet, **ons boere, ons kleinboere, ons nuwe boere**, ons het kapitaal nodig om te boer. Die mense kry geld vir opleiding, ek dink hulle moet geld kry vir opleiding, vat 'n projek aan en kry geld ook vir daai mense en sê: hier begin ons dan nou 'n projek, saam met geld wat ons gekry het. En daar is miljoene, ek weet daar's miljoene waarvoor kan aansoek gedoen word overseas. (Onderhoud met RS)

*[...] I haven't actually been to Goedgedacht farm in a long time, although there was training, and a man [one] is just so frustrated by now because it just stays at training, training, training. But further than the training, okay, it's good for you, but then you return from the training and once again you are just sitting here. Now that is what I actually have a problem with, because there is never, uhm ... you know, **we farmers, we small farmers, we new [emerging] farmers**, we need capital to farm. The people get money for training, I think they should get money for training, embark on a project and also get money for those people and say: here we are now starting a project, with the money we have obtained. And there are*

millions, I know there are millions that can be applied for overseas. (Interview with RS)

Small-scale farming under the condition of limited educational and practical capacities is seen as something inherited from the Apartheid era, when the “coloured” and “black” community were employed as farm workers, not being in the position to gain experience in agricultural management or to establish their own farming businesses. The final quotation describes a system that systematically excluded “coloured” and “black” small-scale farmers from occupational improvement.

My persoonlike opinie is dat die oorsake is dat ons mense was altyd agtergebly aan die kant ek sê ontwikkeling van ons land en veral op die vlak van boerdery. Hulle was altyd net gebruik om die werk te doen, maar hulle was nooit gebruik om die werk te bestier nie en dit is een van ons groot nadele as kleinboere en kan ek sê kinnners van kleinboere, ons mense wat op die plaas gewerk het. Daar was nooit die voordeel om enigiets te bestier. (Onderhoud met LK)

My personal opinion is that cause is that our people have always been backward to can I say the development of our country and most of all in the field of agriculture. They have always been only needed to do the work, but they weren't needed to manage the work and this is one of our big disadvantages as small-scale farmers and can I say children of small-scale farmers, us people who worked at this place. There was never the interest to manage something. (Interview with LK)

This retrospective attempts to explain the current backward situation of the small-scale farmers by identifying a structural lack of educational and management skills as its root cause.

1.2.2 Ethnic ascriptions: Two perspectives

There is considerable disagreement about the appropriateness of labels describing specific communities that agree on gender, class or ethnicity (cf. Mesthrie 2002: 4). Especially in the South African context, terminological references “can be a minefield” (Mesthrie 2002: 5).

Before presenting the convention for this thesis, I will briefly outline the external and internal perspectives that influenced the final decision.

An external perspective

The designation “Coloured” is highly contentious (Kwangamalu 2004: 115). Its history starts in the Apartheid era. At that time, the group of “Coloureds” was created and established first in the *Group Areas Act* and the *Population Registration Act* both of 1950 (Union of South Africa 1950a and 1950b). There the term “coloured person” was defined by exclusion as “a person who is not a white person or a native” (Union of South Africa 1950b: iii). Finally the Apartheid regime distinguished between four main racial groups, which included “Coloureds” as well as “Blacks”, “Whites” and “Indians” by law (cf. Branford 1996: 4). It is needless to say that these definitions paved the way for a systematic separation and oppression policy. To describe the role of the “Coloureds” with the words of Zegeye (2001: 188), they are “the country’s “living conscience”; that is, they are an ongoing example, warts and all, of what South Africa could have been without apartheid”.

Conditioned by the “abuse” of designations serving the interests of Apartheid, the necessity arose for a deliberate differentiation in post-Apartheid times. Nelson Mandela for example attempted to differentiate the South African population according to just two features: “Black” and “White”. Kamwangamalu (2004: 117) pointed out that Mandela usually added the qualification “by Black I mean Africans, Indians and Coloureds.” With this distinction, Mandela was attempting to overcome the Apartheid legacy of the skin colour-related classification of the population. Despite attempts to decrease the impact of population group as a factor, some post-Apartheid political decisions seem to preserve this consciousness. In the two recent census surveys, for example, Statistics South Africa asks the population to describe themselves as belonging to one of five racial groups: African, White, Coloured, Indian/Asian and Other. According to Statistics South Africa (2011),

[t]his information is used to track population group dynamics. E.g. different population groups have different fertility and mortality rates. This information needs to be taken into account when demographers do population projections, to ensure that they are as accurate as possible. Stats SA asks this question for statistical purposes only.

Furthermore, the *Employment Equity Act* of 1998 states that “‘black people’ is a generic term which means Africans, Coloureds and Indians” (Republic of South Africa 1998). It further states that “‘designated groups’ means black people, women and people with disabilities” (Republic of South Africa 1998). These race-relational inclusions, which

have been intended to monitor the development of convergence, still represent a race-based access to resources and power. So the objective of overcoming these designations has not lead to their exclusion, but to the decision of self-identification regarding group affiliation. What started as an externally ascribed “etic” category became an internalized “emic” feature of identification and self-reference (cf. Kwangamalu 2004: 117). The patterns of identification with the population groups will remain stable as long as the group properties are transparent and relevant for people, enabling them to identify themselves with it, and staying available to the members (Le Page and Tabouret-Keller 1985: 181 and Kamwangamalu 2004: 117).

In the Goedgedacht context, the attribution “Black” is used in the sense that Nelson Mandela used the terms in the dichotomy “Black” and “White” to describe the South African population. In that sense, the designation “Emerging Black Farmers” includes mostly “Black Africans”, qualified as isiXhosa speakers, and “Coloureds”, as the Afrikaans-speaking community.⁷ The group that assisted with the realization of this study is covered best by the term “Coloureds”. The internal perspective will give some insights into the interviewees’ self-referencing.

An internal perspective

Defining the group of “Coloureds” from a genealogical perspective, according to a genetic study by De Wit et al. (2010) the “coloured” community of the Western Cape has a mixed ancestry, including indigenous Khoisan, Southern African Bantu people, Western Europeans and South and Southeast Asians. Kamwangamalu (2004: 116) mentions that the “Coloureds” of the Western Cape are identified as Afrikaans-speaking. In Afrikaans, the designation “Coloureds” is also commonly referred to as “Bruinmense”, “Kleurlinge” or “Afrikaners”. In the first quotation, the interviewee refers to himself using the term “Bruinmense”. The description explains the unequal situation during the Apartheid era, when his ethnic ascription meant that he was unable to access the same educational opportunities as others.

Toe het ek maar so beginne aandskool gaan, daardie aandskool by die tegniese kollege in die aand daar in Athlone, en daai tyd toe mag **ons “bruinmense”** net leer as ’n wireman, jy kannie kwalifikasie kry in machines, regmaak, en al daai goeters. Maar in Athlone het hulle daai vir ons geleer, dit was eintlik onwettig gewees, want ek het gesê, daai wireman kan ek in drie dae master, maar die controls wat ’n masjien het, daai is die rigting wat ek wil gaan. (Onderhoud met WS)

7 The group of “Indians” is not a relevant addressee here in the context of small-scale farming support.

Then I started going to night school, that night school at the technical college in the evening there in Athlone, at the time we “brown [coloured] people” were only allowed to learn to be a wireman, you couldn’t get a qualification in machines, repair, and all those things. But in Athlone they taught us those things, it was actually illegal, because I said, that I could master the wireman profession in three days, but the controls that a machine has, that is the direction that I wanted to take. (Interview with WS)

More specifically, unlike “swart” “bruin” (Engl. brown) refers not to the community of “Blacks” in the sense Mandela used it, but it includes “Blacks”, “Indians” and “Coloureds”, as it rather demarcates people of “mixed race” or “Coloureds”. It becomes clear that this person associates the exclusion clearly with his external appearance, which was politicized during that time, but still leads to effects of self-inclusion in this marginalized group.

Language is often connected with the individual or a group’s identity, revealing membership through language practice (Tabouret-Keller 1997; 317, Gumperz 182: 239). According to Kamwangamalu (2004: 114) and Le Page and Tabouret-Keller (1985: 10), language use is an “act of identity projection”, which means that the individuals adapt their (linguistic) behaviour to the group they intend to belong to. Thus another way of describing ethnic affiliation is by relating it to language practice. In the next citation, the group “Kleurige” is directly linked to the feature of Afrikaans.

Ons “kleurlinge”, ons sal sê ons praat Afrikaans. Kom andere mense wat buitelandse praat, regte Afrikaans, so onse Afrikaans pas nou nie by hulle Afrikaans nie, ons dink miskien ons praat Afrikaans, maar dan praat ons nog geen regte Afrikaans. (Onderhoud met CA)

We “Coloureds”, we would say we speak Afrikaans. If other people come that speak foreign languages, real [correct] Afrikaans, if our Afrikaans doesn’t match with their Afrikaans, we might think we speak Afrikaans, but then we don’t yet speak real Afrikaans. (Interview with CA)

Although Afrikaans serves as a major identity constituent, the interviewee is unsure when evaluating its appropriateness. This suggests that self-esteem has also been affected by the historical Apartheid misuse.

In another case, the interviewee answers the question about their mother tongue with a reference to a group. As the context reveals, they are obviously referring to the group of Afrikaans speakers.

‘Watter taal, sou jy sê, is jou hooftaal?’ ‘Ja, ek is Afrikaner.’ (Onderhoud met SD)

‘Which language would you identify as your main language?’ ‘Yes, I am an Afrikaans speaker.’ (Interview with SD)

A second interpretation of the answer could be that the person sees himself as part of a broader community of “Africans”. According to Mesthrie (2002: 5), the term “African” or “Afrikaner” is generally more favourable than the term “Black”, although it is unclear in its scope. In the South African context it refers to the “native” or “Black” population group, while in a broader sense it comprises all people on the African continent, thus “belonging to Africa” (Mesthrie 2002: 6).

The last two citations showed that self-identification with the (ethnic) group of “Coloureds”, “Kleurlinge”, “Afrikaners” or “Bruinmense” is closely linked to Afrikaans as uniting medium and main group feature. But Afrikaans simultaneously dissociates these speakers from other population groups. This dissociation is framed by the fact that the members of this group share a common history of discrimination based on ethnic and linguistic affiliation.

Orthographic convention

The University of Stellenbosch has only recently (26.04.2015) positioned itself in an official statement regarding staff composition by population group.⁸ The terminology with attributive adjectives refers to black in the following sense: “Black includes coloured, Indian and black (African).” In the context of the University’s student profile, language relates to the group designations in small letters, except in the case of the population group with Indian roots: “At the time of former President Nelson Mandela’s release from prison in 1990, 762 black students (as a generic term for blacks, coloureds and Indians) were enrolled at SU, [...]”⁹

Regarding this terminological inclusion, I will follow the language policy of the University of Stellenbosch. I will further capitalize the group terms. This decision is based on the following rationale: A group can be qualified as a group if it shares at least one characteristic. In the case of the inclusion of the designation *black*, the designation of a group that is characterized by the roots of the same continent – “Indian” – stands as a sub-category on the same level as groups that are determined by

8 The full text is available under: <<http://www.sun.ac.za/english/Lists/news/DispForm.aspx?ID=2488>>. [26.04.2015].

9 The full text is available under: <<http://www.sun.ac.za/english/Pages/Student-Profile.aspx>>. [27.04.2015].

external appearance and a common historical formation process, such as “Blacks” or “Coloureds”. Consequently it should follow the same orthographical principles. I am fully aware that this decision seemingly aligns with the word style of the Apartheid regime. Thus I will further indicate my ideological disagreement and distance myself from said style by the using inverted commas. Therefore in this thesis the population groups are marked as “Blacks”, including “Coloureds”, “Indians” and “Black Africans”; “Coloureds”; “Whites” in reference to a group and as “black”, “coloured” and “white” when used as attributive adjectives.

1.3 Project partners

The contributing project partners are, first and foremost, the Goedgedacht Roman Catholic Trust, represented by its founder and Co-Director Peter Templeton. When we first communicated Mr Templeton already signalled his openness and interest in my project idea. As a result I was introduced to the manager of Goedgedacht’s “Climate Change” projects, Mr Jafta Hendricks, the author of the “Cool World Climate Path”, Mrs Shannon Paul and to Mr Johnny Philander, the presenter and lecturer of the “Goedgedacht Workshops on Governmental Funding”. All of these people worked together on different “fronts” with the group that the Goedgedacht Trust labels the “Emerging Black Farmers”, being mostly engaged with practical farming assistance and information provision. This thesis project would have not been possible without their constant support and openness.

Secondly, being vital to this project, the interview partners from the group of small-scale farmers allowed me to share in their world of thought, welcoming me without prejudice and reservation. With patience and sincerity they answered my questions, placing their trust in me and my work. I am very grateful for this experience.

Thirdly, the universities of Leipzig and Stellenbosch contributed to this project by way of cooperative supervision, which enabled me to profit from both academic systems. The chance to participate in the ethical screening process, directed my attention to the importance of the topic against the backdrop of the Apartheid legacy, sensitizing my research perspective.

1.4 Structure of the thesis

This thesis is divided into three main parts. Chapter 2 explains my theoretical

considerations and introduces the theoretical terminology that underpins the analysis of the data. It further elaborates the role of complexity when reflecting on climate-related knowledge emergence. The research process is at the centre of chapter 3, illuminating the rationale behind data collection and analysis.

The most comprehensive part is the combination of chapters 4 to 6, all three contributing to reconstruction of “Climate Change Knowledge” by discussing different elements and their role for system configuration. While chapter 4 introduces the interview partners and their living contexts accompanied by a historical perspective, chapters 5 and 6 focus on dominant symbols and contents in their specific manifestations. The contextualization of the interview data shifts from a broader framing and aspectual deconstruction of “Climate Change” in chapter 5 to a concrete description of two content clusters in chapter 6, contrasting conceptual subsumptions of the local small-scale farmers with those of the Goedgedacht Trust by using the examples of “weather” and “Greenhouse Gas Emissions”. Both approaches result in a broad embedding of the elements in the spatio-temporal system of orientation.

A final discussion in chapter 7 summarizes the results and concludes on the contribution of complexity theory to the modelling and understanding of “Climate Change Knowledge”.

2. Theoretical considerations

The project is grounded in the fundamental idea of a three-dimensional system of complex interrelations (between elements and their context) that shapes the basic understanding of knowledge emergence and influences the line of thought that guided the data collection and analysis.

The first dimension concerns the “real-world” interaction between the individual and their natural environment (context). Humans exist within the natural system. Their constant relationship of exchange is most obvious in agriculture or fishery. It is also related in a broader sense to the exchange between the individual (interpreter) and his historical and socio-economic (vulnerable) environment. Secondly, the interconnections between symbols (linguistic signs) and the context (utterance), on both a linguistic and a semantic level, represent the exchange between elements of the system and the external conditions. The specific challenge of this case consists in the addition of a third dimension of complex systems that concerns the exchange processes in reference to the transfer of information (translation and multilingual communication) between two linguistic systems (languages: Afrikaans and English). The attribution of meaning is characterized here by the specific conditions of unequal power relations between these systems of an experiential and the abstract scientific discourse on “Climate Change”, in which information imprinting takes place. The variety of outcomes in each dimension (through power imbalances) can be explained with regard to the historicity of the systems, in this case of the interviewees. With these assumptions, the complexity of the topic has already started to evolve.

In this sense, the theoretical basis is developed with reference to a social constructionist approach, where “Climate Change Knowledge” is not framed as an objectively given, but rather a socially constructed “reality”. It is based on the interdependency of socio-economic conditions and individual assets, which include language skills and language practice, sets of social norms and values, as well as strategies of knowledge transfer. Thus knowledge is defined as a construction – which I imagine as a system in a network structure that comprises interdependent elements. The key to the organization of the elements is the process of meaning attribution.

Therefore in chapters 2.1 to 2.3, a closer look is taken at the conditions of the meaning attribution processes, by discussing the character and inherent logic of its components. The aim was to emphasize and exemplify the relativity of meaning ascription that provides the basis for an individual construction of reality. Special attention is given to the role of the natural environment as well as processes that transfer experiential perception into a semantic system.

The specific focus on the social character of knowledge in chapter 2.2 combines aspects from different theoretical discourses of philosophy, sociology of knowledge and linguistics, with the aim to demonstrate also the complexity of the meaning creation process in itself and to derive for instance assumptions about the consistency and limitations of reality production from that.

To materialize these very theoretical assumptions into an operational model and to enable assertions about the concrete shape and consistency of this specific network of “Climate Change Knowledge”, the study is guided epistemologically by complexity theory.

As language fulfils multiple functions in the approach of this project, it is addressed in a linguistic and a discursive way. Special attention is given to multilingual language practice.

2.1 The study of complex systems

In general, *knowledge* can be considered as a dynamic system, whose elements are connected to individual patterns that are influenced by social conventions. It emerges in a process of meaning creation, one of learning and internalizing of information. Knowledge is shaped by its historical, linguistic and socio-economic context and thus represents a social phenomenon. By adopting this general understanding, it quickly becomes clear that knowledge is a multi-layered construct with a high degree of complexity. Therefore its analysis and reconstruction require an approach which provides appropriate analytical concepts and a methodological set of tools that assists in “attempting the impossible”.

The *study of complexity* offers an interesting access here; it concentrates on the elements or components of a system and their interconnections from which complexity results. Here the elements are complex systems themselves and therefore part of this basic category. They are self-organized rather than sorted by a constituting law. The shape of the system emerges as a result of the interactions between its elements. Practical examples are the human brain and natural language.

In the last two decades, since the 1990s, various scientific disciplines, such as mathematics, economics, physics and computer science, have shifted their analysis from a reductionist perspective to an approach of complex adaptive systems, which are in line with approaches of non-linearity, chaos and dynamical system analysis in search of structural order (Urry 2005: 1; further e.g. Waldrop 1992; Holland 1998; Bryne 1998; Mitchell 2011; Spier 2011). “Complexity” has become a means to define

new theoretical and empirical perspectives within discourses of, for instance, architecture, geography, historical ecology, management, politics and sociology, one that combines ideas of system and process not only on the “edge of chaos”, but in this regard also on the edge of “predictability” (Urry 2005: 2f; further e.g. Thrift 1999; Venturi 2002; Richards 2002; O’Sullivan 2004; Balée and Erickson 2006). Chaos theory differs here from complexity theories in that it is based on the idea of a constant iteration of mathematical algorithms describing traceable patterns (Urry 2005: 4).

In the late 1990s, social sciences extended its discussion about “complexity” in various conferences, workshops and books. This is the point that Urry (2005: 2f) identifies as the “complexity turn” in the social and cultural sciences. These approaches emphasize a holistic idea of emergence by differentiating complicated systems from complex ones. Complex systems are thus not only a collection of interrelated elements in a system (complicated), as they have on the contrary developed through micro-dynamic interactions that constitute the system leading to an irreducibility of elements and the ability to evolve over time (Urry 2005: 3; Jervis 1997).

One prominent advocate of the debate around complex systems is Paul Cilliers, who bases his idea on postmodern approaches (e.g. Jaques Derrida). He emphasizes the historicity of the system as a precondition for its evolution. In Cilliers’ understanding, complexity concerns the system itself, not the source or meta-descriptive levels, and that complexity results from internal interactions as well as an exchange with the external system context (Cilliers 1998).

Complex systems are not determined by the observer’s perspective as they contain a certain degree of objectivity, or *relationality*, in themselves. Predictions about the system’s behaviour are restricted when compared with the performance of non-complex systems.

Paul Cilliers (1998) assumes the system to be capable of two features, which result from the need for adaptation to a changing environment. He identifies *representation* and *self-organization*. But a brief introduction to these capabilities is preceded here by a short excursion into the role of emergence and non-linearity.

2.1.1 Emergence (of knowledge)

Complexity science researchers, such as Holland (1992, 1998) and Waldrop (1992), established an idea of emergent phenomena that appear in complex systems. These phenomena are characterized by unpredictability and arranged hierarchically, thus consisting of a minimum of two levels. These levels can be either causally connected from the low level to the higher level, *microdeterministic* with an upward connection,

or the higher-level emergent entity influences the lower one in a *macrodeterministic* notion with a downward connection. Although this assertion of *hierarchical realism* can in principle be questioned, Herbert Simon (1962) for example argues that this hierarchical structure results from an error-resistant construction principle geared towards the system's ruggedness.

The literature differentiates between two major types of emergence: *weak and strong* emergence. *Strong emergence* includes a downward causation (Bedau 1997: 377) of the system's higher level to the lower ones, resulting in irreducibility of the system into its elements. This incompressibility leads to the impossibility of simulating a system. *Weak emergence* on the other hand describes the emergence of a system through the interconnection of elements.

Bedau (1997: 376) identifies two further basic characteristics of emergent phenomena, firstly that they are constituted by, and generated from, underlying processes and secondly that they are autonomous from underlying processes and interactions like generative laws (Bedau 1997: 377f). Cilliers' concept of emergence differs from that interpretation as it emphasizes the interconnections within the systems on the one hand, but on the other hand also of those with their external context (Cilliers 1998: 5), advocating a concept of weak emergence. By accentuating this dual relationality, he also emphasizes the absence of external causes, those being "outside" of the system (Bedau 1997: 380), that determine or structure the complex system. Transferring this position to the context of knowledge, the disposal of the contents, as complex systems in themselves, in continuous interaction with external conditions or contexts, constitutes and shapes the state of knowledge in a specific moment.

2.1.2 Non-linearity

Non-linearity of interconnections is identified as one major feature of complex systems. It leads to the challenge, almost the impossibility, of describing *causal relations*. Paul Cilliers (1998: 10) emphasizes a feature resulting from non-linearity that he calls *incompressibility*. He further states that in

a non-linear world where we cannot track a clear causal chain, something that may appear to be unimportant now, may turn out to be vitally important later. Or vice versa, of course. Our models have to "frame" the problem in a certain way, and this framing will inevitably introduce distortions. (Cilliers 2001: 3)

Thus small changes to system input or interactions may provoke significant effects in output. Non-linearity induces a distinction between complicated and complex systems, since multiple elements of the system are either connected directly or linearly (complicated) or non-linearly (complex). Here the idea of non-linearity is connected to the discourses of *chaos theory*, which addresses spontaneous unpredictable strategies and patterns of intra-systemic organization.

2.1.3 Representation

Cilliers rejects traditional conceptions of representation. He bases his idea on connectionism, so the interconnections of elements which belong to the class of complex systems themselves (Cilliers 1998: 11f, 58ff). As such, the structure of the network (of interconnections) also represents the complex system. In this notion, knowledge can also be conceptualized as a dynamic system, which gathers and stores information about its environment. This understanding is built on the idea of a certain systematization that avoids a random integration of elements. The symbols are connected to their meaning by representation. Cilliers (1998: 11) concludes that the elements “must have some meaning” and a certain degree of importance or *relevance* to the system. Misunderstandings of a system result from the separation of structure and meaning, for example multilingual equivalence of concepts assuming that a concept remains stable independently from the language of communication. Cilliers (1998: 11) disagrees with this one-to-one assignment of element to (external) object, and instead proposes explaining the emergence of a system as a result of inner-systemic interactions. The specific form of *distributed representation* that he suggests conveys the idea that elements of the complex system (symbols or contents) themselves have no representational meaning, and only their patterns of interconnection determine the meaning of the whole. Lloyd (1989) formulates a number of characteristics that representations need to fulfil. According to him representations need inter alia to be accurate (clearly assignable) and focused (adequate degree of specialization). Representations are asymmetric and thus valid only one way, as the symbol represents the object, but the object does not represent the symbol.

2.1.4 Self-organization

Cilliers (1998: 11, 107) denominates the principle of *self-organization* (of informa-

tion) a fundamental mechanism of system configuration and adaptation. Neither external factors nor a central control determine the behaviour of the system. It rather adapts to changes in its environment autopoietically. This position accentuates the openness and activity of a complex system and conveys the idea of a system in transformation between different states within a global pattern of interpretation.

2.1.5 Characteristics of complex systems

Moving away from the human brain and language as objects of analysis, the description of a social phenomenon like “Climate Change Knowledge” brings up some further challenges for transferring the theoretical approach into an analytical scheme. Paul Cilliers (2000: 3-7) offers a description of ten characteristics of complex systems which facilitate the framing of an empirical case. These features give a detailed description about his conception of a complex system. By adapting them to the specific field of knowledge production, the role of relevant features will become clearer.

1) The amount of elements in a complex system is adequately large to exceed the explanatory capacities of formal descriptions in conventional terms.

The interconnected elements of “emerging knowledge” are the symbols and contents mentioned, as sub-systems, which rely on social conventions in their form and appearance.

The following five characteristics refer to the specific nature of the interconnections and thus emphasize the approach of *weak emergence*, as it applies to Cilliers’ idea of complex systems.

*2) The elements interact **dynamically** and the state of the system changes over the course of time. Interactions are either physical or refer to information exchange.*

The dynamic character can also be interpreted as a single symbol or (piece of) content being connected to multiple larger contexts in different ways and on different levels.

*3) The interactions are **rich** when each element is affected by and affects other units or subsystems.*

4) Interactions are **non-linear**. Small changes in input may cause large changes in output.

5) An element interacts with its immediate neighbours. **Influence** of wide range is possible in cases of “rich” interactions, but underlies modulations or distortions.

6) Every interaction may feed back onto itself, either with positive or with negative effects. This principle of the feedback loop is called **recurrency**.

Following Cilliers explanations, the interactions can be characterized as dynamic, rich, nonlinear, with short-range influence and recurrent effects. This implies that symbols or contents are not linked in a mono-causal line (hierarchically), but rather that they are also connected horizontally on the same level to neighbouring symbols and concepts. The sphere of influence exceeds the directly connected elements and affects the shape of the system as a whole. These constraints and (external) conditions of the complex system as a whole are referred to especially by the tokens that are mentioned as the last four subitems of Cilliers’ list.

7) A complex system is an **open system** with fuzzy boundaries. Its scope (purpose of description) is determined by the observer’s perspective, which frames the system.

This point emphasizes the constitutive role of the observer (or individual) in the process of “knowledge emergence”. The consciousness, which might be defined as a decision-making mechanism or a tool for qualitative information selection, plays a major role in evaluating input information regarding its relevance and integrating it conclusively into the knowledge system. Consciousness as a determinator is a subjective feature and therefore depends on individual preconditions and interpretative and evaluative contexts, such as personal living conditions.

8) The system acts far from equilibrium. A constant energy stream and input secures its survival.

Thus “knowledge” is also far away from being complete. It is constantly changing and adapting to the contribution of new information, reconfiguring its shape and its content.

9) Complex systems have a **history** which influences their evolution and present behaviour and constitution.

Referring to the role of history on the system's constitution, Cilliers (2000: 108) draws the conclusion that global behaviour of a system is the result of "patterns of [specific] traces", which have no meaning themselves. The patterns are created by a set of multiple traces, which again can belong to different patterns. Thus an identical reproduction of a pattern is improbable. By understanding "Climate Change Knowledge" as a self-organizing phenomenon with inanimate matter that functions in this sense, it quickly becomes clear that articulated knowledge (here a reactive explanation to a rhetoric impulse) is unique in its situational appearance. One reaches the limits of representability with the attempt to capture more than such an "excerpt of knowledge". The historical dimension is an aspect which poses a certain challenge for modelling, as this subitem points to the temporal variability of the system. As regards "knowledge", these changes include shifts of definitions, produced by new scientific findings, or variances of connotations through e.g. the politically motivated and biased distribution of information. Nevertheless this item raises the question of the validity of information as it may be transformed, substituted or deleted dependent on its relevance and application. Substantial events on the individual or social level mark turning points in the evaluation of information. The "history" of a "system of knowledge" is highly determined by individual (educational, experience-based) and social (status, milieu) preconditions in which it is formulated or created. Experience-based perceptions will lead to other explanation patterns than those being derived from theoretical analysis. The history of a system includes constant interaction of knowledge orders and opens a space in which the knowledge referred to colloquially as "traditional" or "indigenous" encounters the "technical" and "scientific" sphere within the knowledge continuum.

10) The elements are ignorant of the system's behaviour in its entirety. Elements react to immediate and locally available information.

It directs away from a game theory-based idea of a system with complete and perfect information. Such an assumption would also assign consciousness or awareness to the elements themselves. Here Cilliers asserts the local validity of elements and subsystems rather than their universal validity. In the context of "knowledge emergence" it conforms to the idea that symbols access their meaning by signification in a specific utterance, although they convey a certain semantic limitation in their usability (e.g. word class).

2.1.6 How to model a complex system?

The study of dynamic complex systems has essentially influenced the methodological approach not only in natural sciences, but also in social science. The theory of complexity results from the endeavour to overcome the simplicity of rule-based models. Following this, Paul Cilliers identifies the connectionist model as a starting point for modelling complex systems. Connectionism, as a field of cognitive science, attends to behaviour as a product of interacting elements which influence each other. The most prominent form of connectionist models are neural network models (Cilliers 1998: 16).

Agreeing on the assumption that models of complex systems need to be complex themselves (Cilliers 1998: 70 and 2001: 3), the challenge of untangling the structure in order to re-construct it promptly becomes clear. Paul Cilliers (2001: 2) states that “We cannot deal with reality in all its complexity. Our models have to reduce this complexity in order to generate some understanding”. He concludes that a perfect model of a complex system is impossible, as there will always be a gap between the “model” of the system and the “system” itself (Cilliers 2001: 3). Thus a preliminary assumption on the restrictions of the model is the impossibility of describing the system completely; only “snapshots of a system as it exists at a given moment” can be extracted (Cilliers 1998: 109). The moment to which this project refers, is the point at which the interviews took place. Before, after, and even during this moment the knowledge has continuously changed. But despite being fluid and permeable and exposed to innumerable interactions of internal elements and the external context, exceeding the explanatory adequacy of deterministic models, a framework of the system’s internal structure is possible. The description of meaningful patterns is based on the level of detail that the focus or segment allows for (Cilliers 1998: 5). Cilliers emphasizes that even the model of a complex system needs to represent the features of self-organization and representation (1998: 10).

The process of modelling, or re-constructing, needs to be preceded by a deconstruction of the text material in the first step. The strategy behind the deconstruction which this project applies to combines three perspectives on the data: one linguistic, one discursive and one ethical. They will be further elaborated in chapter 3. The strategy of modelling that appears to be feasible for emerging knowledge will be explained by using a metaphor of the children’s toy Geomag™ in the following section.

The Geomag™ metaphor

It is quite challenging to visualize or even to describe systematically in a continuous text the multi-dimensionality of a complex system, such as the “Problem of Climate Change”. The suggestion now is to model a complex system by dividing the analysis into levels and thematic fields, which first need to be analysed separately, and to connect these in the second step to create a whole 3D image. One might compare this to modelling with the children’s toy *Geomag™*¹⁰, 2.7 mm magnetic rods which can be connected at either end through non-magnetic steel spheres. This kit can be used to create three-dimensional objects, which can be turned in any direction around their own axis. Transferred to the modelling of a complex system, each sphere represents single information denoted by a linguistic symbol. It varies in size according to the frequency of appearance, which represents the prominence of this term. Keeping to the metaphor of the children’s construction tool, the spheres are linked by the rods to a *content*. The interconnections express the manner in which symbols refer to each other. They can be analytically described by using active or passive verbs. Different rod colours help to represent the variety of possible manners of interconnection. The rods now frame a space between the entangled symbols, which represents the *content*. Speaking in our *Geomag™* metaphor, this space is embodied by a panel. This is the first level of this 3D modelling exercise.

Returning now to the *context* the spatio-temporal integration of symbol and content into a broader *system of orientation* also determines the shape of the figure. Now imagine the three dimensions, spatial, temporal and agency, as a coordinate system with an x (spatial), y (temporal) and z-axis (agency) with the dimensional characteristics arranged on each axis.

Depending on the exact location within this system the field, to speak in the parlance of algebra, is turned and located according to the collocation of associated dimensional features. At this point the distribution of elements of the field causes distortions and rotations. Their distance from each other influences the length of the linear connections, and thus of the rods.

Now we have the spheres, the rods and the panels, all connected to a construction which is located in a broader system of orientation. The combination and intersection of different contents that are related to a single term (linguistic sign), constitute the space in which knowledge circulates, or, in the context of this project, the “Problem Character of Climate Change” emerges. That means for example that a content in-

10 *Geomag™* is a registered trademark. All rights are reserved.

cluding the symbol “water” can be attached to another content, which contains the same symbol, exactly at the sphere representing the symbol “water”. The system is open to being connected at any point to new contents and symbols, and is constantly adjusting itself within the larger context. The picture that we get is very similar to the image of neural networks, which have often been prime examples of complex systems in the reflections of complexity theorists.

But even so, the application of the Geomag™ image to a written text format simply poses a practical challenge in terms of cutting the dimension systematically into meaningful pieces, and therefore involves the danger of losing important constituents of a complex system.

Concept maps

In searching for a way to illustrate these fragments I encountered *concept maps*, as developed by Joseph C. Novak in the 1970s (cf. Novak 1977). He approached students’ understanding of scientific topics in a longitudinal study by providing audio-tutorial lessons and interviewing them periodically afterwards (Novak and Musonda 1991). Novak followed the theoretical presumptions of cognitive psychology (e.g. Ausubel 1963, 1968), stating that learning is a process of assimilating and integrating new concepts (or contents) into an existing individual propositional framework and thus a creative constructive process. Learning is presumably limited by individual cognitive structure. Novak finally overcame the challenge of visualizing the emergent knowledge, finding an appropriate solution in the form of *concept maps*. With this tool, which arranges terms hierarchically, the represented contents are connected by linking words and constructed into a complex system of interconnections that form a meaningful statement. Concept maps illustrate particular areas of knowledge related to a specific topic (Novak 1990, 1993). They illustrate the isolated contents and reveal where and how the symbols are intertwined to form a larger unit, namely contents, finally constituting knowledge.

2.2 The social character of knowledge

Concepts of “knowledge” are theorized in various disciplines, such as sociology, psychology and neurobiology. The social character of *knowledge* is discussed in theoretical agendas such as Sociology of Knowledge and Social Constructionism, assuming that knowledge is produced in contexts which are determined by a syn-

chronic and diachronic dimension of the interdependency of the individual and the structure of society. In general *Constructionism* is based on three fundamental assumptions. Firstly reality is knowledge. It is objective, and thus true, reliable and real, as an object (i.e. natural environment) existing independently of the subject's perception or willing, being still there even if it is not perceived by any subject. Thus "objective knowledge" refers to the certainty of the existence of phenomena, comprising determinable properties (cf. Berger and Luckmann 2010: 1). Secondly knowledge is derived from the individual's experience and represents a social construction. Without the individual's interpretation no meaning exists, and therefore nor does reality. And thirdly, constructionist considerations describe the structure of the memory as conscious or unconscious representations of knowledge.

This contextual interpretation, that knowledge and reality are actively created by social relationships and interactions, also changes the way in which scientific episteme and modelling can be understood. This way of understanding social reality became popular with Peter Berger and Thomas Luckmann's (1967) book about *The social construction of reality* and Alfred Schütz's (1971) paper about *The problem of social reality*. Schütz's approach asks about the social conventions which influence the reception of knowledge in everyday life. Knowledge about the world doesn't emerge as the reproduction of facts, rather their content is actively produced. Language, which plays a major role in this approach, derives its status and relevance from its functionality in social relationships (Flick et al. 2012: 151, 154).

The social character of knowledge is also subject to Mead (1934) and Blumer's (1969) *phenomenology*. They emphasize the character of shared symbols as "knowledge", emphasizing the biographic component in the construction of the lifeworld. *Phenomenology* and *symbolic interactionism* are both based on the assumption that the meaning of social objects, situations and relationships is created (constructed) in a process of symbolic mediation by interaction and communication. Blumer (1969) specifies the emergence of social norms and rules as a result of meaning significance in the process of communication.

This work is guided by the assumption that the reality of everyday life is based on the construction of knowledge, conditioned by individual perception and interpretation. *The radical constructivism* of Ernest von Glaserfeld (1992) argues that knowledge organizes experiences, which are individually constructed and interpreted through the attribution of terms, in order to cognize the *world* or *reality*. It emerges from a combination of individual sensations and memory decline and is therefore totally subjective. Knowledge is qualified by its *viability* to enable an individual to orient themselves in the world (Glaserfeld 1992: 30; Flick 2012: 154).

In this context Kenneth J. Gergen (1994: 49ff) argues that terms which express the understanding of the world or the self are social artefacts, which means products of historically and culturally situated exchange processes, whose long-term constancy depends on coincidences of social processes rather than on objective validity of (linguistic) symbols. According to Paul Watzlawick (2004) *objectivity* can only occur culturally specifically. Terms and information are therefore subjective, arbitrary and only culturally objective. Their meanings result from a social consensus which becomes part of the individual body of knowledge and is permanently reproduced. Watzlawick's concept of two orders of reality differentiates between objectively detectable attributes and the quality of things (reality of first order) in contrast to the attribution of meaning and value to observable and non-observable phenomena (reality of second order) through speaking and communication. The human assignment is to connect these meanings and values, which refer to the consensus of cognition (experimental, repeatable), to a reality of first order.

It is necessary, however, to remark that the reality of second order is not automatically connected to the reality of first order. The physical character of things seems to be apparently objective, scientifically describable and verifiable, whereas the status of, for example, resources differs within and between social unities, depending on its functions and influence on aspects of everyday life. Therefore Watzlawick argues that there is no division between subject and object. Every attribution of meaning and status and every naming creates a specific reality (Watzlawick 2004: 142ff).

From a linguistic perspective Benjamin Lee Whorf, in his Sapir-Whorf Hypothesis, contends that language creates thinking and knowledge, based on a linguistic relativity. He gives the example of the Hopi language and argues that grammatically different languages do not share an extra-linguistic reality which leads to different observation patterns and evaluations of, for instance, bio-geographic entities (Whorf 1956: 20)¹¹. In combination, the social constructionist and this linguistic point of argumentation reveal a new perspective on the emergence of knowledge beyond a monolingual focus.

If multilingual contexts produce different versions of knowledge, the question of their interrelation emerges. Thus tracing the contents of knowledge in their hierarchical interrelation, the discourse-theoretical perspective in reference to Michel Foucault (1974) defines the "episteme" as the historical *a priori* which constitutes knowledge

11 Whorf's hypothesis is based on secondary literature about the Hopi language and describes the absence of utterances and grammatical construction of time (present, past and future). Although Ekkehart Malotki proved in 1983 that the Hopi language commands such expressions, Whorf's point of linguistic relativity and determinism remains important.

and its discourse. Here the elementary codes of a culture determine and limit the language, reality perception, the moral system and the hierarchy of social practice to which an individual relates. He states that several episteme belonging to different orders of knowledge can interact synchronically (Foucault 1978: 124). This happens observably in multilingual exchange processes in which knowledge emerges as a result of the information transfer and interpretation mechanisms in communication. In Foucault's understanding, discourses systematically create "things", which they describe or perform (1981: 74).

Depending on the authority of the discourse, specific patterns and contents are reproduced and transferred to the present. Reality therefore can only be experienced within the limits of the discourse. This argumentation offers a feasible starting point for the analysis of knowledge emergence in the climate change debate of this specific multilingual working context of the Goedgedacht Trust.

Some basic assumptions about knowledge guide the methodological and analytical approach of this project. Firstly, knowledge does not need to follow the rule of being true or false in logical terms. This project is driven by the idea of knowledge emergence as a result of a constructive dynamic process. Knowledge is characterized by its variability, a wobbling system with blurred and fuzzy limits. The goals of this work are to extract the hybrid form of knowledge, which emerges through the process of information transfer in a situational communication context, and to gain a deeper understanding of the process of normative knowledge configuration.

As I am trying to divide the "objective" bio-geographic entities from their social relevance, the Goedgedacht Trust offers a convenient platform for my study due to their explicit and consistent attitude of a radical value position¹², as discussed in *Environmental Ethics* discourses. Their leading idea is that climate change is caused by humans and can therefore be reversed by appropriate human behaviour (interview with Peter Templeton, 17.12.2013). In contrast to other Environmental Ethics discourses, in its pattern of argument the Goedgedacht Trust clearly links responsibility and agency to the individual.¹³ From this basic attitude, a common thread to the specific cognitive and "objective" reality of the local farmers may be traced and opposed.

12 "The many variations of radical value theories focus on the root causes of our environmental problems, and make proposals to overcome these causes through a radical transformation of our behavior, mindsets, notions of self and self-realisation, social structures, institutions or decisionmaking procedures" (cf. Hattingh 2007).

13 Gardiner (2011), for example, identifies national and international institutions like governments or international organizations such as the United Nations as the responsible agents that should act on the global challenges of climate change.

The role of 'experience' and 'contents of perception'

Understanding knowledge emergence through the perspective of knowledge-sociological hermeneutics, as it is for instance presented by Luckmann and Berger (1967), the challenge of an acting subject is the interpretation and invention of objects through signification in the frame of internalized historical and socially embedded interpretation routines. The aim of Sociology of Knowledge here is to identify and reconstruct especially the hybrid forms of “invented” knowledge in the frame of their “intersubjectivity”, thus as the applied signification within one community of (i. a. communicative) interaction. The question about its truth is subordinate here. By signification “sensory experience” is translated into reflected “meaningful experience” (Keller 2007).

As this thesis follows these basic assumptions of Sociology of Knowledge emphasizing the role of experiences for knowledge emergence, some preliminary assumptions about “experiences” are required. In a general understanding experience results from exteroceptive stimuli that are received with one of our five senses. The sensual modalities thus enable olfactory, gustatory, kinaesthetic, haptic-tactile and visual experiences. Simultaneously the experiences are restricted by the senses and their capabilities. Any sensitive or hypothetical experience may provoke individual intuitions about its *accuracy*, being either accurate (veridical) or inaccurate (falsidical) (Siegel 2015). Therefore the evaluation of accuracy is at the same time a consideration of “the world”, thus a reality constituent. Siewert (1998) adds that an individual possesses at least intuitions about the conditions for accuracy. Taking visual perception as an example the picture of the following dress, posted by a Tumblr blogger¹⁴, divided the internet community into those experiencing this dress (picture 1) as white with gold stripes and those perceiving it as a black-and-blue dress.

14 To access the original blog post, please go to: <<http://swiked.tumblr.com/post/112073818575/guysplease-help-me-is-this-dress-white-and>>. [20.04.2015].

Picture 1: What is actually the colour of this dress?¹⁵



Source: Tumblr blog of swiked <<http://swiked.tumblr.com/post/112073818575/guys-please-help-me-is-this-dress-white-and->>. [20.04.2015].

This picture illustrates that there might exist two versions of “accurate” intuition about the visual experience, by seeing the colour of this dress. Either both experiences are true or accurate in an intuitive sense or at least one of them is inaccurate. The example demonstrates that the question about the extent and scope of these intuitions of accuracy remains uncertain and fuzzy.

Another aspect of experience is the role of content. Siegel (2010) states that the

15 The picture is subtitled: “guys please help me – is this dress white and gold, or blue and black? Me and my friends can’t agree and we are freaking the fuck out.”

possible contents of experiences are structured by attitude, thus the content has an “experiential” notion and according to Tye (1995, 2000) a functional role in the cognitive system. Contents of for instance visual experience are, according to Siegel (2007: 127), *propositions* (or abstract entities) that characterize how things look. By assuming that, they are distinct from the actual world (real object). They are determined by their accuracy or fulfilment of correctness (Siegel 2010). Experiential contents are either true (accurate) or false (inaccurate). Referring to the example of the dress, the question of sufficient sorts of truth conditions arises. The answer of having two different colour experiences lay in the *externalism* (intrinsic properties lay outside of the subject) about the colour contents leading to the assumption of different contents. This interpretation presumes that a single colour property can present itself to a perceiver in phenomenally different ways (Siegel 2015).

Looking for the representations of the objects, different types are discussed. One example is object-involving contents that reflect intuitions about the accuracy conditions of adequately environment-connected experiences (Siegel 2010). Contents represent objects of experience. The semantic form that expresses the property of perceived objects of experience characterizes the appearance of the perceived objects at the same time (Siegel 2015).

A second type is *indexical contents* that are represented in spatial relation to the subject. They involve a certain degree of self-awareness and self-positioning (Peacocke 1992). The theoretical assumptions support the argument of *experiential relativity* of contents in its role as a knowledge constituent.

Limitations of knowledge

Before focusing on the constituents that play a role in the construction of knowledge, the following includes some brief remarks on the limitations of knowledge. According to the philosopher Immanuel Kant (1781), knowledge and perception are firstly limited by *metaphysical* boundaries of perception, describing the impossibility to perceive (or to know) God or the character of consciousness. These objects cannot be empirically or rationally verified and validated, and are thus predicated on belief.

Secondly *empirical* limitations are determined by cognitive and technical restrictions of human capacities. These margins result from the complexity of phenomena or dynamics like “Climate Change” that humans fail to model and predict (Betz 2007; Risbey 2007). Looking to the context of scientific knowledge production, limitations result mostly either from the unavailability or a surplus of data.

Now exactly these margins are also touched in the context of the climate-related

knowledge production of small-scale farmers. The (technical) concept of “Climate Change” seems to bear a certain metaphysical component, as its explanatory contents are fairly inaccessible to the farmers by experience and thus not verifiable by their own means. This divergence is based mainly on different scales of reference in the scientific vs. individual experience-based constructions. If causal relations are not immediately tangible (observable) by the farmers themselves, their validity depends on the belief in their truth. Knowledge about the “Topic (sphere) of Climate Change” is cut down into manageable pieces, to which meaning and content can be attributed. Thus the complexity (cf. chapter 2.2) of “Climate Change” in combination with the farmers’ restricted educational preconditions leads to a fragmentation of the knowledge corpus mainly with an experiential scope of short range.

Following the traces of “Climate Change Knowledge” within these limitations, I endeavour to perform a systematic restructuring of the collected data.

2.3 Knowledge constituents

It is assumed that knowledge emergence is a product of a construction process and not a static fact. It results from the interweaving of social conventions and the act of individual meaning assignment. To build up a structure of knowledge, we have to differentiate between the constituents and processes. The concrete arrangement of constituents is produced in a configuration process of individual (intentional and unintentional or conscious and unconscious) practice. Although the focus of this project is not to explain the concrete attribution process as such rather than examining the result, the components constituting “knowledge” need to be clearly framed in order to describe their relation to each other.

2.3.1 Data and information

One way of conceptualizing the smallest elements of cognitive processes is the distinction between *data* and *information*. It is relevant to this project as the research process is based on the connection between these terms. Data refer to the existence of something and are generally defined as statements or evidence, which can be articulated. They are gathered through collection processes like measuring and observation. By detecting patterns in the data, information is created. Beynon-Davies (2002) differentiates between data as a series of symbols and information as the reference of these

symbols to an object. *Information* is defined in a semiotic understanding as purposive data resulting from the subjectivization of a term, referring to an idea and not to an extra-linguistic entity.

Thus data are, in a general understanding, referred to as simple facts or potential information, like the indicated mother tongue of an interviewee, whereas information relates or combines these facts to create a context or derive a conclusion, such as the distribution of English and Afrikaans as native languages in the group of interviewees. According to this distinction, the term data is used in this thesis to refer to raw material of interviews or texts, including words, statements and text fragments. *Information*, on the other hand, refers to the content of statements as it could be organized into larger units.

2.3.2 Signs and symbols

The smallest element that I will refer to is a *sign*. In colloquial language, *sign* is often equated with the term *symbol*. The linguistic field of *Semiotics* offers two main understandings of the term *sign*. The first one is associated with Ferdinand de Saussure, who differentiates in his approach between the *signifié*, the image or object, and the *signifiant*, which is the linguistic appearance of the image. The connection between the signifiant and the signifié is arbitrary, but the productive use of a signifiant depends on social conventions. It is stable as long as these conventions do not change.

Secondly, in contrast to Saussure's dyadic approach, Charles S. Peirce (1974: 142) distinguishes between three semiotic elements which constitute the meaning of a sign: the *sign*, the *object* and the *interpretant*¹⁶, characterizing the sign as a tool to access understanding. The meaning results not from a static relation (cf. Saussure 2003), but is produced in an infinite signification process, that he named *semiosis*. Signs serve in this process as mediators between the object, and the interpretant, satisfying a representational and a recognitional function. He further subdivides signs according to their relation to the object into *icon*, *index* and *symbol*. While icons possess a certain similarity with the object and reflect qualitative features, indices are dyadic signs, pointing to an object without designating it. Symbols are qualified to be law-ruled and based on arbitrary social conventions about their meaning.

16 The interpretant of a sign in this regard describes another sign, which is created in the interpreter, determining the sense made of the first sign (cf. Chandler 2007: 29).

Kenneth J. Gergen (2001) argues in this context that terms, which express the understanding of the world or *the self*, are social artefacts, which means products of historically and culturally situated exchange processes, whose long-term constancy depends on eventualities of social processes rather than on objective validity of (linguistic) symbols (Gergen, 1994: 49ff).¹⁷ According to Paul Watzlawick, *objectivity* can only occur culturally specifically. Terms and information are therefore subjective, arbitrary and only culturally objective. Their meanings result from a social consensus which becomes part of the individual body of knowledge and is permanently reproduced (Watzlawick 2004). Watzlawick's concept of two orders of reality differentiates between objectively detectable attributes and the quality of things (reality of first order) in contrast to the attribution of meaning and value to observable and non-observable phenomena (reality of second order) through speaking and communication. The human strategy is to connect these values and meanings, which are referring to the consensus of cognition (experimental, repeatable), to a reality of first order. It is necessary to remark that the reality of second order is not automatically connectable to the reality of first order. The physical character of things seems to be apparently objective, scientifically describable and verifiable, whereas the status of resources, for instance, differs within and between social unities, depending on their functions and influence on aspects of everyday life. Therefore Watzlawick argues that there is no division between subject and object. Every attribution of meaning and status and every naming creates a specific reality (Watzlawick 2004: 142 ff).

Identical objects can be represented differently, and signs are interpreted depending on the situation and the social consensus about them. The relations between the signs are therefore perspective-related and situationally configured, representing a social agreement on their relevance. However the signs are constituted, they convey *meaning*. A symbol can be defined as a *conventional sign*, such as a linguistic expression. It fulfils a representational function. In the context of this project, *symbol* and *term* are used synonymously in reference to a linguistic sign.

2.3.3 Natural kind terms

A specific category of linguistic signs are *natural kind terms*. A spontaneous general mode of reference-fixing implies that these terms have a relation to nature or the

¹⁷ Fundamental questions about an adequate concept of knowledge and criteria for the evaluation of knowledge are tied in with this approach.

natural environment and their referential objects are directly perceivable with (at least one of) our five senses. Academic disciplines generally used to define *natural kinds* as objects of the natural world which are perceivable with our five senses and bound by natural laws. A *naturalist* perspective, as represented e.g. by John Stuart Mill (1884), states that the classification of natural kind terms relies on a natural distinction between objects, and their classification is therefore truly natural. Contesting this fundamental perspective, discourses on *realism* (Quine 1969), *conventionalism* (Hacking 1999) and *essentialism* (Kripke 1972; Putnam 1975) agree on the relativity of assignment and the role of natural kind properties for definition, although explaining their distinction, their classification and the attribution of names to natural kinds differently. Bird (2008) extracts the following principles of *natural kinds*:

- 1) *Members of a natural kind should have some (natural) properties in common.*
- 2) *Natural kinds should permit inductive inferences.*
- 3) *Natural kinds should participate in laws of nature.*
- 4) *Members of a natural kind should form a kind.*
- 5) *Natural kinds should form a hierarchy.*

This criterion refers to the case of an overlap of two or more kinds, which then need to be defined either as kind and sub-kind or as identical kinds (Kuhn 2000; Ellis 2001).

- 6) *Natural kinds should be categorically distinct.*

This last criterion in particular emphasized the constitutive role of the “interpreter”, as the distinction between two kinds results from an active decision. This choice always involves the evaluation of tokens in their function as constituents.

To explain the relation between linguistic signs and *natural kind terms* now, in his *Causal theory of reference* Putnam (1975) assumes that terms always refer to kinds of things dependant on their imprinting, which again is based on experiences and possesses a certain historicity. The exact form of the term is arbitrary here and does not result from a formal naming process. Relating this supposition to *natural kind terms*, he states that their meaning and sense are determined by external factors, such as social conventions and their regular use creating a causal relation between them. Putnam calls this causal relation *semantic externalism*. Thus a change of the interpreter’s environment also shifts the referential status of the term and thus its subjective *concept*, which is the mental representation.

Coming back to the function of *meaning*, Putnam sees the key to the understanding of natural kind terms in its *indexicality* (Putnam 1988: 33f). Kripke (1972) and Putnam (1975) state that *indexicals* possess two dimensions of meaning, firstly a *linguistic meaning* and secondly a *content*. Indexicality now describes the relation of an expression to an object, whose reference shifts depending on the context of utterance. This means that a change in the context also results in the shift of the meaning of an indexical. This principle does not only apply to the preferred grammatical categories, like pronouns, adverbs or adjectives, but can also be applied to natural kind terms. The indexical nature of natural kind terms also determines a variation of contents.

Similarly, at first sight the topic of “Climate Change” now suggests that *natural kind terms* are major constituents involved in the process and therefore relevant for the discourse. And this is absolutely correct, but the way that these terms need to be approached has to shift from the idea that words of this category are stable in meaning and connotation in relation to the recognition of their constructive or relative character.

2.3.4 Meaning

While “signs” and “symbols” convey an idea about the function of words, these can also be discussed regarding their “quality” and “content”. Hilary Putnam (1988) relates in his paper *The Meaning of ‘Meaning’* to a dimension of language, or in particular words, namely the role of *meaning*, as “sense” or “significance”. Putnam remarks three main aspects that characterize “meaning” in his idea. Firstly, he criticizes the idea of a direct interconnection between a symbol and its meaning, advocating an understanding of meaning that emerges in a network of interrelations with shifting validity. Secondly, Putnam emphasizes the role of the interpreter as meaning attributor, who is involved in a social net of power relations. According to the explanatory origin and position (theoretical, experienced), different patterns of meaning attribution are produced. Thirdly, meaning changes dependent on the environment. On the one hand its immediate contentual environment and on the other hand the natural environment. Paul Cilliers (1998: 66) adds a further aspect by pointing out the role of the system’s history as well as the external conditions influencing meaning constitution and attribution.

Putnam takes up the dichotomy between *extension*, the “set of things the term is true of” (Putnam 1988: 132), and *intension*, the “sense” or “occasion of use” (Putnam 1988: 133). While *extension* describes the scope of application of terms and

the universe of things that it comprises, *intension* includes the entirety of tokens or characteristics that belong to a term. Further, it marks the character of a term as being “public property”, to which different people at different times have access to (Putnam 1988: 134), which he equates with “concepts”. Intension can also be understood as (internal) *content*. Thus while the intension of the word “book” defines (in very general terms) “a bound set of papers with texts”, its extension encompasses hardcover books, softcover books (quality) and novels, schoolbooks and handbooks equally. Without engaging with his deliberations in depth, the fundamental distinction between these two levels of meaning attribution leads to a two-part access to analysis. The *content* of a specific term reveals initial insights about its intension, whereas the broader scope as well as its combination with other terms indicates the extensional meaning. Thus exactly these two complementary aspects of meaning attribution offer a perspective on the constitution of abstract terms beyond the attempt of a simple literal translation. Taking “Climate Change” as an example, this multilateral term is more a constructed relational concept than representing a physical entity as such. Its *intention* becomes visible in the arrangement and inter-connection of information, thus the explanation patterns. The range of topics or contents which are involved in the description of “Climate Change” again expresses its *extension*. Both aspects finally shape the “knowledge” about this term. By summarizing conceptualizations of an exclusive group like rural small-scale farmers of the Western Cape, the prominent intra-group-specific patterns of meaning can be extracted. Such systematization reveals a meta-level that ranges between cognition and emotion, experience and education and in the end their language practice.

2.3.5 Contents and content clusters

In reference to Putnam (1988), *contents* refer to the intention of an object. Contents are sets of information that are associated with each other in a specific way. They indicate a specific semantic field or fields, as a social consensus of the directly connected speaker community, that the particular subject is connected to. In reference to experiences, contents (Siegel 2007: 127) are *propositions* (or abstract entities) that characterize objects. *Content clusters* are the systems in which the *contents* are again related to each other, creating a field/space in which knowledge emerges. Variations of contents and content clusters are based on altering contexts.

2.3.6 Context

The *position of a speaker* towards the object that a term refers to, determines the way he linguistically connects to it, but also how he interprets and perceives it. To convey an abstract idea, the *context* in which a symbol is used and content is framed gains in importance. The specific character of knowledge is shaped by the set of referred orientation principles in a specific communication context. The idea of *context* is connected to a network of spatio-temporal designations which locate the concept within the imaginary space. In this project, this *system of orientation* consists of a *spatial*, a *temporal* and a *personal dimension* of reference formation.

The *spatial* dimension is divided into four main reference levels which all relate to physical space: *local*, *regional*, *national* and *global*. They are ordered hierarchically with an ascending scope of spatial reference. Attributes which refer to these spaces are the hometowns and farms (local), the Swartland region as extensive area of socio-economic interaction (regional), the Republic of South Africa (national) and every space super-ordinate to all others (global). Furthermore, other countries and world regions mentioned are associated with the global level. I am aware that especially the regional and national spaces entail further political implications. The national space in particular is a product of historical configuration processes of exclusion and inclusion and power negotiation, provoking a specific quality of integration and self-assignment. Of course, the spaces overlap in the sense that a local reference belongs to a regional one and both of them to national and so on, but the lowest level of articulated reference is always relevant for analysis.

A second dimension concerns *temporal* integration. The initial point of reference is always the moment of text production, thus of the interview session. It possesses two levels of reference-fixing. The first one is linked to *duration* and comprises the timeframe between the initial point of reference and the articulated point of time, being assigned a *short-term*, *mid-term* or *long-term* period. Short- and long-term references have in common that they both align with an individual lifetime. While a short-term indication alludes to a time within the most recent past – such as the last harvest season or the heavy rain last week – which often had direct effects on the current living situation, the mid-term references comprise intergenerational or individual farming experiences in the scope of a lifetime. Long-term references indicate a period beyond a single human lifetime, referring to other sources than experience or personal communication. A common example of long-term references are found in biblical projections. The second level of temporal orientation concerns the *directions* of temporal attributions, namely retrospective, present or prospective. All individual

experiences mentioned possess a retrospective relation, whereas a perceived responsibility towards future generations for example has a prospective connotation.

The third point of reference within the broader system of orientation relates to *agency* and concerns *persons* and *authorities*. The type “persons” is differentiated from “authorities”, because expressions identifying persons describe consciously acting individuals, while authorities include incumbents and larger entities, such as institutions or parties, which act on an explicitly constitutive basis rather than depending on individual choices. Furthermore, their participants can be substituted without changing the position or institution itself. But there is also a third relevant instance of personal reference, a *metaphysical entity* communicating to the interviewees via the Bible or church services.

But the content cluster itself also appears in a broader contextual embedding, such as its historical setting: each element of the system refers to a larger *background context*. It comprises information about the personal and group-specific history considering the educational, socio-economic background, as well as individual capacities of multilingual practice. Chapter 4 will elaborate on the specific background information of the group of interviewees, the BFFAW farmers. Paul Cilliers (1998: 72) complements this approach by emphasizing the constitutive role of the context for interpretation and meaning attribution. The context merges with the representation and must not be differentiated from the content. As the complex system is open, the amount of referred contextual features is also indefinable.

2.4 The role of language

Natural language can also be described in the realm of complex systems. To fulfil its purpose, which is communication, language has to embody an identifiable and adaptive structure. Understanding language on the basis of social conventions, any change in natural language cannot be motivated merely individually, but must rather be consented to socially to retain its validity. Language normally consists of a lexicon, thus an accumulation of terms that convey meanings according to the relation they have to each other. These words are connected *asymmetrically* and *non-linearly* to each other (Cilliers 1998: 124ff), not in the sense of a grammatical structure and syntactic function, but rather with regard to meaning production. Restrictions are for example associative connotations which connect word pairs and exclude other words. Here Cilliers exemplifies the connection between a colour “red” and “blood”. The adjective “red”, being a visual attribute of “blood”,

could not be substituted by any other colour without changing the meaning of this content, creating an irregular image, or distorting the relationship between these elements. This example mentions a union of object and (visual) attribute, with an associative character. These “natural” associative connections, following syntactic patterns, are relatively stable.

The frequency and context in which terms are used limit or expand the scope of linguistic symbols. Words may receive new connotations by being related to new contexts. Language thus functions as a tool for communication. As such the lexicon of a single language is stable within a certain continuum that delimitates it from other languages, but as an open system constantly adapting and updating its applicability for successful communication. The process is driven by the individual’s attempt at meaning creation within the given conditions. Cilliers (1998: 124) describes the attribution of meaning as a *local* phenomenon, with restricted spatiotemporal validity. I will briefly specify the exchange process and its context regarding this transformative character of a single language, as it also applies to the research context of this project. In the case of South Africa, language contact phenomena play a major role in the transformation of language practice. Compared to Germany, where only one super-ordinate language fulfils the roles of vernacular language, official language and medium of instruction at once, the exposure of the German language to external linguistic influences is relatively low. Even the media conform to this dominance, for example by constantly translating and dubbing of foreign films. Of course there are multilingual influences on each linguistic domain, but the whole system of social interaction is based on German, which reduces the necessity of switching between different languages. Comparing this to South Africa, with its eleven official languages and even more vernacular languages, the structure of language contact differs. Considering English and Afrikaans as the most prominent languages, their exposure to external linguistic input especially results from individual contact with more than one language in different social domains. These contacts are again determined by historical socio-economic conditions of and their relevance for each “knowledge producer”. Therefore a closer look at the linguistic preconditions and socio-economic living circumstances of the group of interviewees in chapters 4.3 and 4.4 will elaborate their background in more detail.

In the process of self-organization the (complex) linguistic system is adapted to external input and transformed by a competition of external and stored information for predominance. In his approach Cilliers (1998: 125) emphasizes that these influences cause changes, but do not determine their scope. Thus the interrelation between language and its context keeps the system in motion and is essential for the system’s

survival. Transferring this basic understanding to the process of knowledge production, a *horizontal system-context interrelation* can be identified on three basic levels, as table 2 summarizes. Of course the interactions are not restricted to a level, but rather they mutually influence each other vertically as well as transversely. Even more layers may be discerned between these levels, increasing not only the number of features, but also that of possible interconnections, thus illustrating the system of “knowledge” in its marvellous complexity.

Table 2 : Horizontal system-context interrelations in knowledge production

	Element	Context/ super-ordinate system	Interactive setting	Restrictions
Level: symbol	symbol	content, language	content, meaning imaging	syntactic preconditions
Level: language	language	culture ¹⁸	communication, meaning transfer	applicability, communicative validity
Level: actor	individual	society, living conditions	social interaction, meaning validation	socio-economic and educational preconditions, personal cognitive capacities

Source: Own interpretation.

The context in this abstracted summary denotes the super-ordinate system in which the elements are positioned. The *interactive setting* marks the space in which the interactions occur on the same (horizontal) level within the larger system of knowledge. Certain restrictions underlie each connection, and in turn the former condition the shape of knowledge. All *restrictions* result from historical formation processes. Firstly,

18 *Culture* describes a “set of norms and behaviours that are constructed and deconstructed in interaction with relevant others” (Lüdi 2000: 13).

the level of the linguistic symbol contextualized in its linguistic and terminological utterance is restricted by conformance with syntactic features. Secondly the language itself, presented here as an element and not as a complex system, is stable within the margins of communicative validity. Language as an item belongs to the culture of the social group of speakers. And thirdly the level of the individual, the actor, with conscious or unconscious social practice, such as communication, is shaped by personal (educational, socio-economic) history and living conditions. As already mentioned, the levels are not limited to a horizontal connection. They are instead intertwined, and by interacting they contribute to the production and attribution of meaning.

This interdependence leads to a closer look at individual language competence and the cognitive dimension of knowledge production, as e.g. discussed by the cognitive linguist Alexander Kravchenko (2003). He dismantles the essential properties of language by constructing the interdependency of sign, meaning and knowledge from a semiotic perspective to extract the knowledge-representational function of language and its adaptive interplay with the environment. His approach can be extended by a further analysis of the influence of multilingual practice on knowledge production. The focus on the role of language and emergence of knowledge is connected to concepts of the individual repertoire and access to different languages and thus systems of values and norms. *Multilingualism*, as the most common social linguistic practice in my understanding, is presumed as a state of nature appearing only in different shapes and constellations. The common sense and the relevance of the bio-geographic environment and the perception of its change are pictured in linguistic symbols and concepts, which are expected to be “hybrids” in a linguistic and contentual sense. Alain Berrendonner (1983) argues that variation is constitutive for all languages. The differences lie in the grammaticality of a variant and its meaning.

2.4.1 Multilingual language practice

The recent times of “globalization”, a phenomenon that is shaped by an increase of spatial mobility with a simultaneous reduction in time exposure, is leading to an intensification and acceleration of a worldwide intercultural exchange. This trend also induces an increased exposure of humans to multiple sets of e.g. groups, behaviours and languages that they access actively or passively. The bigger the cultural difference of the sets is, the more visible these exchange processes become. *Multilingual competences* (or repertoires) are considered linguistic resources that are “avail-

able to members of a community for socially significant interactions” (Lüdi 2000: 14), based on an integrated “holistic” idea (cf. Lüdi and Py 1984; Grosjean 1985; Siguan 1987). Besides linguistic competence, multilingualism enables outreach to a single culture, builds bridges between cultures and leads to the emergence of a meta-system of individual intercultural communicative competence. This is what Lüdi (2000: 15f) calls *pluriculturalism*.

Different manifestations of multilingualism can be observed in the transfer of information, in communication and language practice. Translation as a key to inter-language transfer of meanings presumes appropriate (valid) information regarding the norms and values, meaning social or cultural consensuses, of the target language (Wolmarans 2006: 142; McCawley 1971: 219; Botha 1995: 5f). This includes grammatical insights as well as a grasp of symbol-object relations. Starting from this understanding of complex interrelations, the multilingual dimension of individual perception, is addressed in particular, as it applies to most of the worldwide contexts of information exchange processes (through communication). The idea that evidence for certain hierarchies and statuses of knowledge (concepts) can be extracted from the linguistic utterance is already discussed in *Linguistic Theory*. The Swiss linguist Georges Lüdi (2000: 14) argues that multilingual repertoires

[...] are configured in the course of practical activities that are linked with specific sociocultural contexts and with particular forms of action, interaction and intersubjectivity. This leads to various forms of multilingual speech as a response of precise, locally situated communicative needs. (Lüdi 2000: 16f)

and therefore he proposes *translinguistic markers*¹⁹ as objects of analysis which he defines as forms at the surface of discourse like lexical borrowing, interferences and code-switching. Exactly these language contact phenomena lead to a *hybridisation*, i.e. a mix of different varieties and lects (Lüdi 2000: 15f). Translinguistic markers help to determine membership of a social, linguistic or cultural group. In the context of the South African Western Cape region, a closer look at the specific code-switching processes and strategies of lexical borrowing between Afrikaans and English provides evidence for the constitution of multilingual repertoires including both languages. But how is this language choice exactly determined? Grosjean (1982) refuses the assumption of arbitrary choice and proposes a rule-governed strategy (cf. Sankoff and Poplack 1979) determined by the *domain* of speaking. The concept of *domain* has

19 Each translinguistic marker choice represents an “act of identity” (Le Page 1985: 3).

been developed by Fishman (1964), describing a bundle of social situations that are characterized by the settings and the relations of the actors' social roles in distinct thematic areas (e.g. office, family, school). Each setting comprises a range of accepted behavioural norms, including the choice of an appropriate linguistic variety or lect (cf. Bußmann 2002: 177f). Lüdi's addition that the setting or situation is neither objective nor static, but rather constructed in the process of interaction, attempting to suit the interlocutors' intentions (Lüdi 2000: 20), conforms with the prior presumptions about complexity.

Conscious choices in particular are socially meaningful when they e.g. include an infringement of social conventions, like an intended choice of a language the collocutor isn't capable of (cf. Gumperz 1982). Thus bi- or multilingualism requires a certain degree of *appropriateness* to attain the goal of successful communication. In reference to table 2, bi- or multi-lingual language practice is also restricted on the symbolic level by syntactic rules, and in the broader language context by its applicability and communicative validity, therefore evolving in a limited communicative space.

In a general understanding there are two options of reference to bi- or multilingual repertoires in a situational context. Firstly a speaker decides consciously between both languages, using either one or the other language. In the *monolingual mode* he stays (almost exclusively) within the continuum of one language. Secondly the speaker adapts to the communicative setting, referring to his whole multilingual repertoire. The choice of mono- or *bilingual mode* is adapted to the capacities of the communication partner and the formality of the situation, and thus results from a mutual agreement as to its appropriateness (Lüdi 2000: 20f). The bilingual mode is the less stable one, as translinguistic markers appear more often. This concerns the linguistic processes of borrowing and code-switching especially. Without entering the linguistic discourse too deeply, some characteristics of code-switching and borrowing processes might be summarized.

Specifics of code-switching

Code-switching²⁰ results from an overlap of rules and norms beyond linguistic bor-

20 *Code-mixing* is set apart from *code-switching* by the conformance of the grammatical structure between matrix and embedded language. While code-switching describes the shift between clearly distinguishable grammars, the grammatical structure of the matrix language in code-mixing processes is similar to the grammar of the embedded language. McCormick (1995: 194) states that code switching involves the "alternation of elements longer than one word", while code mixing involves "shorter elements, often just single words".

ders. We generally differentiate between *matrix* and *embedded* language, but the semi-otic organization of representation is based on the matrix language as Talmy (1985, 1995) assumes. That means that extracts of the lexicon (words) of the embedded language are made use of when these expressions are lacking in the matrix language or not known to the speaker. McCormick (2002: 224ff) differentiates here between *situational* (reference to topic dominated language shift; e.g. intimate versus technical topics) and *conversational* codeswitching (mainly unconscious, overlapping speech with pragmatic and stylistic functions). The first example shows an integration of the English adjective “expensive” to express cost intensity. The adjective fills the syntactic gap in the Afrikaans sentence according to the linguistic rules.

Dit is nou maar ‘n bietjie baie **expensive**. (Onderhoud met DW)

It is just very expensive. (Interview with DW)

The second example demonstrates the integration of an English verb “to change” into the Afrikaans future tense passive verb construction *sal* + past participle verb (prefix *ge-*) + auxiliary verb *word* (to become). The word order follows the syntactic rules of a relative clause.

Ons het besluit dat dinge sal moet **gechange** word. (Onderhoud met GB)

We decided that things have to change [need to get changed]. (Interview with GB)

While the adjective “expensive” substitutes the position of the Afrikaans pendant “duur” on a grammatical level increasing the expressive force of this sentence, the verb “change” was also lexically assimilated by integration into the verb construction. The English infinitive was “afrikaanized” by prefixation which apply to a regular Afrikaans verb form. Branford and Cloughton (2002: 208) classify this form of integration as “nonce-words”, as “*ad hoc* borrowings” from English abound in informal colloquial language. A counter-perspective suggests that the fact that their exclusive situational occurrence aims for stylistic effects (e.g. emphasis, expressive force) qualifies them as code-switching phenomena. Larger sets of embedded phrases are called “embedded language islands” (Myers Scotton 1993).

Now looking for the logic that choice for code-switching follows, recent discourses in linguistic theory (e.g. MacSwan 1999) convey an idea of mixed grammars as the main determinant for the translingual integration of lexical items. Words of the em-

bedded language are syntactically integrated with the same degree of convergence like those of the matrix language. This suggests that no third grammar is involved in the code-switching process.

The following types of code-switching processes can be distinguished.

Table 3: Typology of code-switching

Types according to	Sub-types	Sub-division	Characteristics
Functionality	Functional code-switching	situational	determined by setting, topic, collocutor; intended
		conversational	discursive-strategic shift with expressive function; intended
	Non-functional code-switching	psycho-linguistically motivated code-switching	unintended shift
Form (Grammar)	Intra-sentential		switching below the sentence level; intended and unintended
	Inter-sentential		switching at sentence borders or between clauses; intended and unintended

Source: Referring to Bußmann (2002: 139).

While the grammatical typology admits a higher degree of objectivity, the question about functionality contains a certain degree of subjectivity and fuzziness regarding the analytical interpretation, as the boundary between functional and non-functional code-switching is not always obvious to an external observer.

Based on the previous typology, the functionality of code-switching can be further

distinguished in terms of its *intentionality*. While functional situational shifts follow the intentions of the speaker to transfer information with a maximum of precision, non-functional shifts occur mostly unintentionally. Both kinds reveal insights into (conscious and unconscious) internalization of the different grammatical and social normative standards, as well as they giving hints about the constitution of their identity.

The specific strategies of the interviewees' (BFFAW farmers) language choice and codeswitching between Afrikaans and English will be traced in chapter 4.4.

Lexical borrowing

Lexical borrowing is part of the process of language shift. It needs to be differentiated from code-switching processes, as it conveys the incorporation of a foreign lexeme from a donor language into a recipient language, beyond the exclusive situational use (Muysken 1995: 190). Nevertheless the distinction between borrowing and code-switching is not always sharp. Languages are always in the state of change and exposed to language contact influences. Usually *loanwords* fill the lexical gaps of a recipient language, denoting new objects and contents that don't exist in that language. Lexical borrowing is conditioned by recent cultural, economic, political or social developments (Bußmann 2002: 193; McCormick 1995: 194), like the import of new products or the internationalization of technical language. Loans are either imported as non-integrated foreign words, keeping their characteristics of the donor language, or they are adapted to linguistic features of the recipient language. Several attempts to classify borrowing according to the degree of assimilation or integration or regarding semantic or construction-related features created non-transparent variety of classification terminology with overlapping explanations of loan formation processes (cf. Bußmann 2002: 193). The very general remark may perhaps be permitted that in the adaptation process loanwords undergo certain changes in meaning (semantic), spelling or pronunciation (lexical) and syntax (cf. Van Dulm 2007: 11f; Riehl 2009: 21).

Following the remarks of Branford and Cloughton (2002: 200) about mutual lexical borrowings in Xhosa, Afrikaans and English, the general three main types can be distinguished: loanwords with phonetic adaptation to the recipient language; *loanblends*, describing a combination of native (recipient) origin and borrowed (donor) lexical morphemes; and *loan translations* representing an imported meaning in a native (recipient) lexical word form. Lexical borrowing in language contact situations follows different (social) *motives* such as expressive force (e.g. in swearwords), an ex-

tension of the range of reference or the expression of solidarity, like in the adaptive use of foreign-language greetings (Branford and Claughton 2002: 200f).

Translation

At first sight, *translation* seems not to belong to multilingualism to the same extent that codeswitching or lexical borrowing do. But as the attempt to transfer the meaning of (linguistic) symbols adequately across linguistic borders, a major role is assigned to translation processes and outcomes for knowledge emergence as well. *Translation* is the controlled transfer of text from a source language to a target language, usually in written format and therefore fixed and repeatable (Bußmann 2002: 717f; Snell-Hornby et al. 1999: 37). To achieve an equivalent communicative effect, linguistic and cultural distances between the source and target languages need to be bridged. *Linguistic* or *multilingual equivalence* describes the validity within languages concerning representational reliability across the languages (cf. Iyengar 1993). Iyengar (1993: 174) argues that often “very non-literal translations are needed to achieve validity”. Newer functionalist approaches in the field of Translatology emphasize the aspect of intercultural conveyance beyond a concept of equivalence shifting to a target text-oriented translation practice (Königs 2001; Koller 1997). Dinda L. Gorlée (1991, 1994) further approached the integration of the idea of semiotics into the study of translation. In her semiotic concept input and output are both complex signs, which are open to creative interpretations that are integrated in the particular culture. In her understanding, input and output are *semiotically equivalent* if they are (representationally) congruent and admit only one semiotic connection of object, sign and interpretant (cf. Peirce). The aim of translation is therefore not the equivalence of the specific elements of source and target text; it is rather the creative reinterpretation of signs (Gorlée 1994: 124).

With this idea of constructive translation in mind, a further dimension is added to the picture of knowledge emergence. In the case of the Goedgedacht Cool World Climate Path project the process of translation, from English to Afrikaans and to Xhosa, precedes the final trilingual presentation. Two main strategies for translation are probable (Snell-Hornby et al. 1999: 142).

1) *retrospective: representing characteristics of source text as completely as possible (lexical or grammatical translation; ut interpretes the translation)*

2) *prospective: geared to the target culture and the communicative functions*

of the recipients (function-consistent translation of specialized text; ut orator the translated)

Unfortunately there is no longer any information available about the translators anymore so no indications exist about their translation strategies. Nevertheless, the outcome of their work is fixed on the boards of the path where it can be analysed in terms of diction and content.

Multilingualism and knowledge emergence

It may be summarized that code-switching, lexical-borrowing and translation are all processes in the space of multilingualism. While code-switching describes a spontaneous reference to a foreign language, lexical borrowing concerns the integration of foreign words into a language's lexicon and thus a long-term validity of a word with social acceptance. Consequently, significance in a code-switching situation is valid only in that situation, whereas the validity of loanwords is stable beyond a situational level.

The inclusion of translation is important to this project, as the translated texts are also based on different strategies. To achieve a high degree of semiotic congruence, translation may draw on loanwords (loan translations), which have undergone a standardization procedure (e.g. Branford and Claughton 2002: 199). If the loans are really integrated and socially internalized, then also their content remains stable.

Table 4: Comparison of lexical reference in code-switching, lexical borrowing and translation

	Scope	Acceptance	Motivation/ purpose/ aim	Other features	Terminology
Lexical reference in code- switching	immediate context (con- versation)	collocutors	stylistic effects; expres- sive force; gap-filling element	not repeata- ble, not fixed	matrix lan- guage and embedded language

	Scope	Acceptance	Motivation/ purpose/ aim	Other features	Terminology
Lexical borrowing	different contexts (conversation and text)	social (speaker group); political (declared to be standard)	extension of range of reference; social solidarity; convergence	repeatable, fixed	donor language and recipient language
Lexical reference in translation	immediate context (text), also other contexts	translator and reader	semiotic congruence	repeatable, fixed	source text and target text

Source: Own interpretation.

So which terms does multilingualism affect with regard to the emergence of “Climate Change Knowledge”? Tracking the traces of “Climate Change Knowledge”, it is necessary to differentiate two types of terminology which are vital to the discourse. On the one hand, *natural kind terms* represent the direct environment. Their context and utterance in language practice reveals insights into the perception of physical natural surroundings. Moreover natural kind terms are embedded in technical explanations within the specific domain of scientific language. Thus on the other hand *abstract scientific terms*, like “Climate Change” itself or “Greenhouse Gas Emissions”, belonging to this category, are part of the conceptualization of knowledge around “Climate Change” as well. They usually don’t only connect a symbol to an object (physical entity), as they rather convey a whole network of causal interrelations, involving natural kind terms (and their indexicality).

Transferring now the idea of translanguistic markers to abstract climate-related scientific language, which dominates the discourse across languages, it quickly becomes obvious that the direction of lexical transfer proceeds from English to Afrikaans. The English term “Greenhouse Gas Emissions” for example found its way into Afrikaans by way of lexical borrowing in the form of a loan translation, appearing inter alia as “kweekhuisgasuitlating” or “groenhuisgasvrystelling”. Both compound nouns follow a word by word literal translation. They lose their content

if their components are separated.²¹

From an analytical perspective, the “physiognomy” of multilingualism refers at first sight to linguistic signs. They are the units being identified as “foreign” or “different” from a standard. By attaching them to the symbolic level, aspects of meaning and content are also affected. If a content can’t be expressed using one’s language’s means, foreign words may fill this gap by code-switching. One example from an interview with a mother-tongue Afrikaans speaker, conducted in English, shows that there is neither an English nor an Afrikaans equivalent for expressing the isiZulu term “indaba”, which describes a gathering of tribe members to discuss vital matters.

I believe we should sit down as farmers and have a few day[s] indaba and say I want to share my twenty years of experience on growing onions in an organic way that you might not have known of. (Interview with Johnny Philander)

Although the speaker was already capable of a bilingual linguistic set, only the Zulu term represents the specific character of the meeting with the highest degree of semiotic congruence. Vice versa the significance of contents of integrated loanwords may have shifted. The original content may not be known to the speaker anymore or at all. Especially abstract scientific terms harbour a high risk of falling victim to misunderstandings or misconceptions. Chapters 5 and 6 will later show how “Greenhouse Gas Emissions” and “Climate Change” are conceptually framed in this regard.

Furthermore translinguistic markers, like code-switching, are relevant for the classification of the speakers, revealing their social identity through language practice (Lüdi 2000: 28; Le Page and Tabouret-Keller 1985). While some linguistic variables of the ascribed social status involve features of sex, origin and gender that are not controlled by the speaker himself, others depend on the salience of information that dominates the individual perception in a communicative situation (cf. Aronson et al. 2012). The indicated identity is of a different nature, being “manifested” or “claimed” or possessing an “emblemized” or “stigmatizing” connotation (cf. Lüdi 2000: 29). Especially the stigmatizing role of language mixture, conveying a low prestige status, plays a major role in the identity conceptualization of the BFFAW farmers. The status

21 Consulting the 1988 *Pharos Afrikaans-Engels/English-Afrikaans dictionary*, neither the Afrikaans “kweekhuis” or even “kweekhuisgas” nor the English “greenhouse” or “greenhouse gas” was included. So how are these concepts represented in the perception of the interview partners? To what extent is semiotic congruence achieved? Chapter 6 will summarize the results on this. (Du Plessis 1998, *Tweetalige Aanleerderswoordeboek – Bilingual Learner’s Dictionary*. Cape Town: Pharos Dictionaries.)

is grounded in the origins and history of Afrikaans, being politicized since colonization and during the Apartheid era.

2.4.2 Connections between Afrikaans and English in South Africa

Historical interconnections

In the South Africa's past the languages Afrikaans and English received specific connotations that map the politicization of languages in colonial times and during the Apartheid era. Excluding here the history of Khoesan and Bantu languages, which experienced a huge destruction and radical transformation through their relations to European settlers in the 17th century, it is important to remark that the speakers of the Khoesan languages especially have gradually shifted to Afrikaans (Mesthrie 2002: 14).

The key moment in South African history, including language development, was the arrival of the Dutch traders at the Cape in 1652. The community which grew after the settlement consisted of Dutchmen, Germans, Huguenot French refugees and smaller numbers of members of other European groups (Mesthrie 2002: 14). With the European settlers, a diversity of slaves was also "exported" to the Cape, including Eastern (Asian) and African slaves. This is the time to which the roots of the coloured population can be traced back. Their ancestry includes Khoesan, Eastern and African slaves as well as descendants of European settlers (Mesthrie 2002: 15). Children of slave women and European or Khoekhoe men were declared slaves by law (Roberge 2002: 82). Most of the Cape slaves, who were also linguistically diverse, used a jargonized form of Dutch to converse with their masters, but also for mutual communication (Roberge 2002: 85).

In 1795 during the Napoleonic wars, British forces entered Cape Town and occupied the colony as a naval base. After a brief transfer of power back to the Dutch between 1803 and 1806, the British colonials resumed power again, from then on starting to systematically increase their missionary activities of Anglicization. English became the official language of government, education and law (Mesthrie 2002: 15). Feeling oppressed by the British administration, the Afrikaner community moved inland away from the coast in the following years. During that time, "Afrikaans had evolved as a colloquial variety of Dutch" also containing some influences from other languages (Mesthrie 2002: 15). Finally the *Genootskap van Regte Afrikaners* led by S. J. du Toit, promoted the development of a new standard fundamentally distinct from Dutch (Stell 2011: 32) and as an "agent of national identification", excluding the *Boere*

(white farmers) from the urban population and the non-Whites (Scholtz 1964: 197).

After the abolition of the international slave trade in 1808, Afrikaans or Cape Dutch remained the main language of the former slaves. The roots of South African English go back to the arrival of the first civilian settlers at the Cape in 1820.

Rajend Mesthrie (2002: 16) ascribes the marginalized status of African languages to the selection principles of the missionaries. To translate the Bible they had to choose a variety of each language attributing a standard status to that variety. This resulted in an increase in prestige for the chosen dialects, and ultimately also the group of speakers. Nevertheless the African languages were associated with the rural areas, the periphery, enjoying a low prestige compared to the modern urban areas in the centre. The attempt of Africans to show their affiliation with this “modern” society by speaking English led to lexical borrowings, code-switching and neologisms (Mesthrie 2002: 16). But also the Afrikaners’ affinity to English endured. Although declaring Dutch the official language of their republics in Transvaal and Orange Free State during the 1850s, English remained strong (Mesthrie 2002: 17).

A “First Language Movement” started in the 1870s when Afrikaans served as a unifying factor for political empowerment. *The Genootskap van Regte Afrikaners* promoted Afrikaans as a medium of instruction and published dictionaries, grammars and religious texts (Roberge 2002: 83).

When Britain annexed the Orange Free State and the Transvaal in 1901 during the war, Alfred Milner, as yet the governor of the Cape, took over as administrator of those two Boer territories. For his services in Southern Africa, Milner was made a baron (1901) and a viscount (1902). He followed the goal to anglicize the Afrikaners and emphasized English as the language of schooling. The resistance of the Afrikaners to Milner’s policy brought Afrikaans to its status as a uniting and identity-constituting medium. Two institutions promoting this ideology of a “Second Language Movement”, based on Du Toit’s idea, were the *Afrikaanse Taalgenootskap* (1905) and *Afrikaanse Taalvereniging* (1906) (Stell 2011: 32; Pienaar 1943: 271). During that time, state education was already focused on white students and excluded black people, whose schooling was left to the churches (Mesthrie 2002: 18).

After the formation of the Union of South Africa in 1910, the dispossession of the black population was enhanced by the Land Act of 1913. English and Dutch were declared the official languages, until Afrikaans took over the position of Dutch in 1925 and became recognized as a fully standardized national language (Mesthrie 2002: 18; Branford and Claughton 2002: 205). This is the Afrikaans on which the contemporary Standard Afrikaans is also based (Roberge 2002: 84).

With the beginning of the Apartheid era in 1948, the Group Areas Act of 1953

and the Bantu Education Act of 1953 paved the road for a systematic segregation and suppression policy. These developments also had impacts on linguistic evolution within the country, imposing a “definite linguistic hierarchy” between English and Afrikaans and versus the African languages (Mesthrie 2002: 19). In education, both dominant languages were implemented in the school system, being introduced from Grade 1 onwards as obligatory; in secondary education, studying one of the two was a compulsory subject (Hartshorne 1995: 310). The resistance of the African people to the Bantu education system, and with their resistance to Afrikaans as a medium of instruction, led to a period of unrest in the 1970s and 1980s (Mesthrie 2002: 22).

With the beginning of the post-Apartheid era, after the first democratic elections in 1994, English became the most prominent lingua franca and the language of policy. By contrast the role of Afrikaans was not so clear. It became an important issue in the negotiation process between the ANC and the Afrikaner bloc. The political aim to empower the African population finally led to the decision to have eleven official languages, including Afrikaans and English.

Afrikaans and English today

Since the end of the Apartheid era in 1994, South African language policy has changed significantly. Indigenous languages, which previously had no official status, received the same official status as English and Afrikaans. The political framework finally represents South Africa as a country with a broad variety of languages. South Africa has eleven official languages, including Afrikaans, English and nine Bantu languages. The official languages belonging to the family of Bantu languages (Zulu, Xhosa, Ndebele, Swati, Sesotho, Sepedi, Setswana, Tsonga and Tshivenda) are spoken mostly by black South Africans as their first home language²² (mother tongue), who together comprise approximately 79% of the population, totalling 44.8 million people (Statistics South Africa, Census 2001). English and Afrikaans again belong to the Germanic branch of the Indo-European language family (Mesthrie 2002: 11). Besides the official languages, a number of further Bantu languages (Chopi, Kalanga, Shona, Makhuwa, Yao) and Romance languages (varieties of Portuguese and French) from immigrants of neighbouring countries as well as languages of the Indian branch of the Indo-European family (Hindi, Urdu, Gujarati) from Asian immigrants are spoken in the country (Mesthrie 2002: 11f). Moreover Arabic (Islam), Hebrew (Judaism) and Sanskrit (Hinduism) have been central features of religious cultural life in South Africa (Van Wyk 1978: 37).

22 Home language is equivalent to the concept of mother-tongue language or first language.

In terms of the recent linguistic trends between the censuses of 1996 and 2001, a decrease of the proportion of people speaking Afrikaans and English as their first home language was recorded. Here the percentage of Afrikaans speakers decreased from 14.4% in 1996 to 13.3% in 2001, while that of English speakers decreased from 8.6% in 1996 to 8.2% in 2001 (Statistics South Africa, Census 2001: 32).

The Census 2001 detected large differences in the language that is most often spoken at home depending on population group. Afrikaans was the predominant language among coloured people (79.5%), followed by English (18.9%). Among white people, 59.1% spoke Afrikaans, while 39.3% spoke English as their first language. Almost 93.7% of the Indian and Asian population spoke English. Amongst the black African population, Afrikaans (0.7%) and English (0.5%) played minor roles in household's most frequent language practice. Almost all (98.5%) spoke an indigenous language (Bantu or Khoesan) (Statistics South Africa, Census 2001: 36).²³

Afrikaans is the predominant first home language in the two provinces of the Western Cape (55.3%) and the Northern Cape (67.9%) (Statistics South Africa, Census 2001: 33). Focusing further on the Western Cape Province, in 2001 the main home languages spoken there were Afrikaans (55.3%), Xhosa (23.7%) and English (19.3%) (Statistics South Africa, Census 2001: 33). These numbers also reflect the languages that are most prominent in the work of the Goedgedacht Trust.

Linguistic interconnections

The Afrikaans of today is different from the Afrikaans of the 1860s, known as Cape Dutch, Kaaps etc. Branford and Claughton (2002: 205) describe it as an “unstandardised language of heart and home”. According to Van Rensburg (1983 in Roberge 2002: 83f), today three main varieties of Afrikaans must be distinguished. Besides *Orange River Afrikaans* (Namaqualand and southern Free State) and *Eastern Border Afrikaans* (Cape Dutch vernacular of settlers, in the Orange Free State and Transvaal) the relevant variety spoken by the interview partners of this project is *Cape Afrikaans*. It is described as the most intense form of the Kaapse Afrikaans spoken by Coloureds and Cape Muslims. It is based on the varieties of the slaves and of the Khoekhoe community in the Western Cape region. The Afrikaans of the Cape Muslims is hereby treated as a dialect of Cape Afrikaans (Roberge 2002: 83; LeCordeur 2011: 759).

23 With regard to classification by indigenous language, approximately one-third of all black Africans (30.1%) spoke Zulu, followed by Xhosa (22.3%), then Sepedi (11.9%), Setswana (10.3%), Sesotho (10.0%), Tsonga (5.6%), Swati (3.4%), Tshivenda (2.9%) and Ndebele (2.0%) (Statistics South Africa, Census 2001: 36).

In distinction to Standard Dutch, “Cape Dutch” incorporates for instance loanwords from Malay (*amper* “almost”; *baie* “much”), from Portuguese (e.g. *kraal* “cattle enclosure”) and Khoesan languages (from the semantic fields of animals, plants artefacts and places) (Branford and Claughton 2002: 206). But the major differences lie in grammar and pronunciation. Variations in pronunciation influenced spelling, or codification. For example, the orthography of the Dutch word *paard*, meaning “horse”, transformed into the Afrikaans noun *perd*, after having experienced a vowel length reduction and a vowel quality shift. In a grammatical respect Afrikaans differs from Dutch for example in its use of a double negative construction, the loss of grammatical gender and the fusion of subject and object personal pronouns. Despite their close relation, there is no mutual intelligibility between Afrikaans and Dutch *per se*; especially in rural areas, pronunciation could be extremely challenging for a mother-tongue Dutch speaker, as my Dutch husband experienced during two periods of my fieldwork.

Afrikaans has also influenced the development of South African English (SAE). South African English can differ from the standard English in terms of number concordance for example, using the third person singular form of “to be” (“is”) for the third person plural, or in terms of the position of adverbs, confusing the standard English syntactical word order (McCormick 2002: 320f). Language contact transferred Afrikaans loans into SAE (e.g. *Afr.* braai, *Engl.* barbecue; *Afr.* tekkies, *Engl.* sneakers; *Afr.* Apartheid, *Engl.* segregation), but also influenced it on the morpho-syntactic level. But borrowings from English to Afrikaans can also be traced (*Engl.* judge, *Afr.* juts or *Engl.* engine, *Afr.* enjin). *Ad hoc* lexical borrowings of English terms are more common in a creative informal language practice among less-educated people, including specialized words and swearwords (Donaldson 1991 in Branford and Claughton 2002: 208, 212).

Their status as “official lexical items” of Afrikaans is highly contested (Van der Merwe 1966: 214). McCormick (2002: 232) for instance identified the integration of calques (loan translations) as a very common pattern in a social setting of children attending a school with English as medium of instruction, but living together with Afrikaans-speaking parents. The increasing use of English-rooted words, including loanwords and lexical references in codeswitching processes, may not be grounded in the speakers’ conscious decisions. McCormick (2002: 232) states that the “speaker may not even know that it was originally English and that there is another word for it in Afrikaans”. Thus the challenge remains of finding the “right” or objective perspective to categorize a loanword as “foreign”.

Afrikaans and English in Goedgedacht language practice

Regarding the language practice of the Goedgedacht organization, Afrikaans and English have been identified as the most important languages. All in all, 17 persons from the whole group of interview partners (BFFAW farmers and Goedgedacht staff) perceived Afrikaans to be most relevant, whereas three pointed to English as the most frequent language. Another four persons reported a mixture of Afrikaans and English as common practice. According to the staff members the regular meetings are held in Afrikaans, due to the majority of employees speaking Afrikaans as their mother tongue. Presentations for the local community are usually adapted to the first language of the participants. The recent past showed that presenters providing a course in English and Afrikaans are far more easily available than those presenting in Xhosa. This concerns in particular the population group of black farmers, whose first language is Xhosa. The experiences of the Goedgedacht revealed that both groups possess a good linguistic competence in English as well. That is why the Goedgedacht Trust decided to offer the courses and presentations for the Xhosa speakers mostly in English. The Goedgedacht language policy allows every attendant to interrupt the meeting or presentation in cases of linguistic and contentual unclarity.

All internal documents as well as printed information pamphlets are available in Afrikaans and English, and in selected cases also in Xhosa.

The website of the Goedgedacht Trust (www.goedgedacht.org) is provided in English, because most of the donors are situated overseas. Here the majority of supporters are located in Europe. They include private persons from the UK and international aid organizations such as the Roman-Catholic *misereor* organization from Germany.

2.5 Summary

Knowledge can be defined as a complex system which is constructed through processes of interaction within the system and with its environment. The constructions offer an access to the empirical world. Within the frame of Cilliers' approach of complexity theory, knowledge is conceptualized as an emerging phenomenon that is characterized by non-linearity, self-organization and representation of its constituents. It is further expressed through and shaped by linguistic symbols (terms, words). The context determines the scope of linguistic symbols. The context (environment) is described as a system of orientation in which the interpreter and the information are located and

living conditions and the historicity that shaped the “assets” of the knowledge creator.

Language possesses an accumulation of terms that convey meanings. Signification is the process of attributing meanings to objects. The attribution of meaning is a *local* phenomenon, with restricted spatio-temporal validity. Meaning fulfils a representational function and has an extension (content) and an intention (purpose). Knowledge is strongly based on experiences. Experiential contents are propositions of reality (objects) and are characterized by experiential relativity. Knowledge is limited by metaphysical and empirical constraints.

The study of complexity offers access for the modulation of knowledge with the help of concept maps that visualize the relation or even a shift of local (ecological) knowledge and technical science-based comprehension. The modelling concept is reflected by the *Geomag*[™] metaphor.

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3. Methodology and the research process

The methodological framework of this project is determined by triangulations²⁴ at different stages of the research, in terms of varied methods, sources and perspectives, which help to develop a multidimensional discussion of the research question.

The purpose of this chapter is to present the methodological assumptions undergirding this research project, as well as to introduce the research strategy and the techniques applied for empirical data collection. The chapter defines the scope and limitations of the research design, and situates the research amongst existing research traditions dealing with knowledge and reality construction, which provided relevant explanatory and methodological approaches.

3.1 The research design: An outline

The complexity of knowledge emergence and transfer processes under the specific conditions of a multilingual setting requires a “reconstructive” research design (cf. Wohlrab-Sahr 2014: 4) which enables assertions about the How of the transfer process. Therefore this research project is conceptualized as a case study, since “a case study approach is particularly appropriate for individual researchers because it gives an opportunity for one aspect of a problem to be studied in some depth within a limited time scale” (Bell 1999). Case studies aim at the precise description and reconstruction of one “case”, whereby the conceptualization of a case is broad and includes individuals, social communities (e.g. families), organizations and institutions (cf. Flick 2012: 253f). The challenge is the identification of a case which is appropriate for the research question and the decision of the extent to which the context needs to be taken into consideration, and in turn the decision as to the methodological access.

The approaches of Sociology of Knowledge, as they are held by the prominent representatives Husserl, Schütz or Habermas, discuss the concept of the real *lifeworld* (Lebenswelt). In his approach to *Epistemological Constructivism*, Björn Kraus develops a systemic-constructivist notion of “Lebenswelt” that is based on Husserl’s lifeworld

24 The term *triangulation* might confuse as it literally implies a three-partly division of methods and sources, while in the case of data analysis the trinity of the analytical frame is obvious. Triangulation is discussed since the 1970s, when Norman Denzin presented a systematic conceptualization. Within the paradigm of qualitative social science research it generally describes the combination of two (or more) methods to increase its plausibility and to enrich the research results. In this sense triangulation is also employed in this research.

concept. By opposing the terms lifeworld (subjective reality) and life conditions (objective reality) he is able to assess their interrelation. He argues that the lifeworld of a person is neither arbitrary, nor externally controllable (Kraus 2006). In this sense this project analyses the area of tension between prescientific obviousness and a theoretically determined perspective on climate-related entities. This is only partially possible due to the complexity of interrelations and the various ways of accessing the field. Thus to be able to show different layers of the interrelation between language and society a mono-disciplinary approach does not suffice to capture the major aspects of the research question attached to this project. It follows that a transdisciplinary approach offers access to various interpretation and description opportunities in order to develop a complex and integrated discussion. This is enabled by a combination of methods of data collection and analysis focusing on the same subject. Following Denzin's (1989) approach to *Between-Method Triangulation* in the first step, non-reactive methods (for the analysis of text data) are conflated with reactive methods (interviews, group discussions²⁵) in order to increase the scope of the project. This form of explicit triangulation will enable a connection between the (written and oral) communication of climate change issues and of the analysis of the subjective meaning and relevance of "Climate Change" for the individual. Therefore the data material consists of application forms for the Goedgedacht "Black Farmers Funding Application Workshop", semi-structured (expert) interviews with Goedgedacht staff and a sample of members of the "Emerging Black Farmers", and (written) text material, in particular the "Cool World Climate Path" material as the main information source from the Goedgedacht Trust, which indicates the logos, pathos and ethos²⁶ of this organization.

But before describing the interview material itself, a short excursion to the problematique of *expert interviews* precedes. As one of the most prominent procedures in empirical social research, its research practice and analysis was for a long time shaped by methodological pragmatism (Meuser and Nagel 2009). The lack of effort to develop a proper definition of *expert interview* as opposed to other interview types has resulted in general confusion and inconsistency about its design and conception (Mieg and Brunner 2004). The expert interview is often marginalized or presented as

25 Group discussions helped in the explorative phase to identify the interview partners and to frame the topic. "Group discussion is a means of collecting data in one go from several people (who usually share common experiences) and which concentrates on their shared meanings, whereas a focus group is a special type of group discussion with a narrowly focused topic discussed by group members of equal status who do not know one another." (Payne and Payne 2004)

26 The reference here to Aristotle's idea of rhetoric modes of persuasion offers a useful structure in which communication can be screened and de-constructed (cf. e.g. Rapp 2012; Wells 2001).

a specific form of semi-structured interview (cf. Flick 1995: 109f; Hopf 2012: 353). Meuser and Nagel (2009) suggest that the determination of an expert needs to ask for the specifications which differentiate expert practice and knowledge from other forms of social practices, especially everyday practice. The researcher presumes that this specific knowledge is not necessarily exclusively obtainable for the expert, but is not accessible for everyone in the related space of action. This pragmatic consideration is connected to a sociological perspective and indicates a fundamental differentiation between layman and expert. Hitzler, Honer and Maeder (1994) define the expert as a person who possesses an institutionalized competence to construct reality. Thus expert knowledge is characterized by the chance to become hegemonic in a particular context of organizational operation, and thus structuring the conditions of other actors in a relevant way (Bogner and Menz 2002: 46). This definition applies mainly to four members²⁷ of the Goedgedacht Trust in the sense that they stand for a typical institutional problem theory about the “Problem of Climate Change” and institutionally specific solution strategies.

Compared to the interviews with the Goedgedacht staff, the decision to ascribe the status of *experts* to the local farmers followed the rationale of attributing the same status and validity to their knowledge about climate. The farmers are not institutionalized in an organization that explicitly deals with challenges of “Climate Change”, as they share at first sight only the attributes of being a small-scale farmer in the Swartland region, Western Cape, South Africa, and being in contact with the Goedgedacht Trust. They are only experts on their own lifeworld, which does not meet the demands of most of the social scientific discussions around *experts* (cf. Meuser and Nagel 2009: 465). The farmers do not fit into the classical sociological expert definitions, as they do not meet the criteria of professionalism and communicative skills (Potabenko 2002: 8). In the classical sociological discourse, *expert knowledge* has the status of specialized knowledge that the expert is aware and conscious of. Giddens (1988: 57) locates *expert knowledge* in the dimension of discursive consciousness, based on explicit bodies of knowledge.²⁸ This implies that this specific knowledge is bound in adequate terminology which enables an individual to explicate this information according to the context. Against the background of recent sociological discussions, Meuser and Nagel (2009: 470) argue that this explicit notion of expert knowledge is largely determined by an existing individual relevance, which is only partly or not at all reflexively available, and needs to be reconstructed

27 The persons concerned are Peter Templeton, Jaftha Hendricks, Shannon Paul and Johnny Philander.

28 In distinction to discursive consciousness, Giddens (1988) also defines practical consciousness, which can only be extrapolated by a reconstruction of implicit bodies of knowledge.

from the verbal utterance. Following this argumentation, the farmers' biographic necessity of producing specific (experience-based) knowledge in interaction with the (changing) natural environment, finally qualifies the group of small-scale farmers as *experts* within the framework of this project. The underlying assumption of this project, not to evaluate the validity of any climate-related knowledge, but to analyse the different ideas in relation to each other, claims an equal status of farmers' and Goedgedacht members' knowledge. This decision becomes relevant again when analysing the interview material. More explanations of the process of data collection and the concrete data sources are provided in chapters 3.5 and 3.6.

In the second step, the analysis of the knowledge emergence processes then again has to consider different dimensions in which the information exchange between the BFFAW farmers and the Goedgedacht Trust unfolds, including a linguistic, a discursive and an ethical perspective on the data material (cf. chapter 3.8).

The procedure of data analysis is shaped by these three perspectives, allowing different assertions about the data material according to their underlying approaches. The codification guideline thus revisits these aspects.

A *linguistic perspective* will elaborate on the How of the information transfer by dissecting the terminology, frequency and the semiotic congruence between the "Climate Change" messages of the Cool World Climate Path and the interview data. This procedure provides initial evidence about specific manners of the attribution of meaning to "objective entities" as well as to abstract scientific terms and helps to detect dominant *symbols*.

The *discursive perspective* refers to an essentialized idea of discourse analysis here, with a special reference to Reiner Keller's *Sociology of Knowledge Approach to Discourse* (SKAD). Starting from a general observation, there are basically four main principles of the *discourse concept* which can be essentialized from all professional discussions, which Gardt (2007: 30) describes as: 1) the link between the terms "discourse" and "text" under the aspect of the interconnectedness of texts; 2) the connection between the discourse concept and the idea of linguistic practice; 3) the return of discourse to society, describing the perspective of discourses as the expression of the thinking of the members; and 4) the emphasis of discourses as stimuli for social changes, not only picturing the social perception, but contributing to the ontological construction of social reality. Based on these factors, a *discourse* can be defined as the engagement with a *content* (topic), which a) is embodied by various forms of texts and expressions; b) is produced and sustained by a particular group; and c) pictures the knowledge and attitudes towards the (discourse) *content* while d) simultaneously shaping this *content* actively, which creates guiding principles for the

further social reflection on this content (Gardt 2007: 30f). Against the background of this definition discourse analysis is regarded as a method, namely a structured, rule-guided procedure for the disclosure of discourses (Gardt 2007: 31). In general terms it is described as lexical, sentence and text semantics and their extensions, by using the whole continuum of semantic methods.

These practical considerations are enriched by the rationale of Reiner Keller (2008), who combines in his approach the (German) traditions of Sociology of Knowledge, which focused especially on the genesis, distribution and institutionalization of knowledge on the micro-sociological level (e.g. Berger and Luckmann 2010), including a perspective of language practice, and Michel Foucault's considerations about institutional macro-conditions and mechanisms of knowledge production and circulation, such as the normative continuum and power relations (cf. Foucault 1969 and 1974).

From this standpoint, Keller's Sociology of Knowledge Approach to Discourse (SKAD) examines social practices and processes of communicative construction, transformation and stabilization of symbolic orders and their consequences in the specific institutional and material contexts. In the context of this project, this approach is adapted to the analysis of the production of knowledge about *ecological awareness* in the specific discourses of the Goedgedacht Trust and the local small-scale farmers, dissecting the extent to which they see themselves as *ecoconscious* individuals. In this regard, the SKAD assumes that these discursively produced "truths" (ecological awareness) do not affect the (ecoconscious) individuals completely. They are rather individually and creatively, but also resistively, adopted by the subjects, which creates backlashes on the discursive level (cf. Keller 2008: 133f).

A *third ethical perspective* reveals insights into the Why of the transfer process and gives hints about the Goedgedacht strategy in the choice of information. This perspective is considered particularly important for this case, because the implementation of organizational ethics into an individual moral system contributes to the way that "Climate Change" phenomena are individually perceived. The analysis is driven by the assumption that the identified "problem" has a different status in the sender group than in the recipient group, due to the impact of "Climate Change" on everyday life and its relevance to people's livelihoods. In this part, the ethos in the communication of Goedgedacht with the BFFAW farmers in the realm of a relationship of trust will also be discussed.

Although this project aims at developing a complex multi-perspective discussion about the area of tension between different alleged "objective truths" about a changing climate, it cannot avoid certain limitations; these will be described in the following.

3.2 Limitations of the research design: About generalizability

The question about which criteria are appropriate for measuring the quality and scientificity of qualitative research is often discussed in handbooks and scientific articles. The answers often remain general or unsystematic (Steinke 2012: 319). Steinke identifies three general positions in discussions about qualitative criteria: 1) quantitative criteria for qualitative research, 2) individual criteria for qualitative research and 3) post-modern rejection of criteria.

The very prominent idea of quantitative criteria suggests that the quality of qualitative research is evaluable through general criteria which have been adapted and reformulated from quantitative research, such as experimental-statistical studies and psychometrics. These universal criteria include objectivity (conformability of qualitative studies), reliability as well as internal (authenticity, plausibility) and external validity (transferability) (cf. Miles and Huberman 1994: 277ff).

The representatives of the second position doubt the transferability of quantitative criteria to qualitative research. Therefore they propose developing the appropriate criteria starting from the specific theoretical and methodological characteristics of qualitative research. The most prominent strategies are communicative validation²⁹, validation of the interview situation³⁰ and triangulation (Denzin 1994). As already described in subchapter 3.3, the combination of complementary methods, theories and data within one research project decreases the inherent distortions in a single method, theory or database. Triangulation has developed from an instrument of validation (Denzin 1978) to a methodological technique which contributes to an in-depth coverage of the object of investigation.

The radical post-modern approach of rejecting any criteria argues that the relation of criteria to a fixed reference system is impossible (Richardson 1994: 552).³¹ Resulting from this ambivalence of positions, Steinke (2012: 321ff) offers some strategies, which are also applied to this project. The results of qualitative research are reflected on and

29 By means of a “member check” the research results are presented to the subjects of analysis in order to evaluate their validity (cf. Terhart 1981, 1995).

30 The interview situation is reflected on in terms of substance and the relation between the researcher and the interviewee, and whether there is any evidence of a failure of a working alliance. In this regard their working cooperation should preferably contain trust, openness, willingness to cooperate and as low a power hierarchy as possible (cf. Legewie 1987; Kvale 1996).

31 Denzin (1990: 231) even defines postmodern ethnography by the texts, which are written in first person singular style and which already overcomes the gap between observer and the observed reality. This, Denzin argues, renders the questions about validity and reliability redundant.

evaluated as products of different decision and construction outcomes within the research process. Her criteria catalogue must be adjusted to each research design and contains inter alia the following suggestions which are also relevant to this project:

- *Intersubjective* transparency through the *documentation of the research process*³² enables the audience to trace the study step-by-step and to evaluate the results. The quality can be evaluated in the context of the study's own criteria. The application of *codification* procedures aims at a standardization of methodological proceedings.³³
- *Indication of the research* process reflects the adequacy of the research procedure in reference to the research question. Furthermore this criterion implies the choice of methods for data collection – questioning whether the methods are appropriate to the object of analysis – and asks to discuss the sampling strategy.
- The criterion of *Limitation* is important to test the limits of the scope, considering the research conditions and the minimum of aspects which need to be complied with to create the phenomenon described in the theory. This also helps to filter aspects irrelevant to the theoretical considerations.
- The *Reflection of subjectivity* during and after the research process offers an evaluation of the researcher's self-observation, personal preconditions, the relation of trust between the researcher and the subject of analysis.
- And finally the question of *Relevance* describes the pragmatic benefit of the project.

These criteria have been continuously reflected on during the research process and the data analysis and description.

There is no claim that the results of this project are representative within the paradigm of quantity. They are moreover a profound case *study* for the analysis of specific knowledge emergence in multilingual settings, with the intention of identifying patterns which can be generalized up to an abstract level. The study possesses an explorative character and offers a methodological access to the modelling

32 The research process here includes the preconception of the researcher, the methods and context of data collection, the transcription codes, methods of data analysis and information sources (Steinke 2012: 325).

33 These techniques are for example used in projects working with Objective Hermeneutics and Grounded Theory. The codification is divided in the processes of explication and systematic analyses in order to logically design a methodology (cf. Bohnsack 1999).

of complex systems in the context of cross-cultural knowledge exchange on the topic of “Climate Change”. Wherever similar studies and rationales can be assigned, they will be attached to the discussion.

3.3 Data collection

Since I was working together with the Goedgedacht organization, my project focuses in the first place on text and media data available from projects of the *Goedgedacht Trust* (Malmesbury). The following sections give a brief description of the stages of the process of data collection.

After visiting the Goedgedacht Trust in Riebeeksrivier, South Africa, for a three-week exploratory visit in January/February 2012, the first phase of data collection took place in November/December 2012, followed by a second phase in November/December 2013. The total of two months of fieldwork concentrated on *semi-structured interviews* with employees of the Goedgedacht Trust and local small-scale farmers, and yielded interview data as primary sources.

The Goedgedacht Trust offered the opportunity to focus on the group of attendants of four workshops of the Goedgedacht Trust on governmental funding. These ten-day workshops were offered for the local small-scale farmers and took place between September and December 2013 on the Goedgedacht Farm in Riebeeksrivier/South Africa. The seminars gave an introduction to options and application procedures for governmental funding. As the focus of analysis lies on the text material, presented on the *Cool World Climate Path*, in contrast to oral data, gathered through interviews, it was important to gain access to farmers who had already attended the workshop and during that visited the information path as part of the event. Besides accessing the application forms for all workshops as background information, I got the chance to interview most of the attendants from the second workshop (between 30 September and 29 October 2013), offering the starting point for a broader understanding of their interpretation of the impacts of a changing “climate” on their livelihood.

3.4 Data sources

As indicated above the application of mixed-method triangulation also implies the triangulation of different data sources (Bryman 1988: 131). Therefore three main types of data material have been combined in this research, embracing the various conceptions

of “Climate Change” in the specific research context. The sources can be divided into text material of the Goedgedacht Trust, other relevant external text material and audio data from interviews. All interviews are transcribed literally, also including grammatical deviations from the standard language from time to time. The following subsections present a brief description of the material’s quantity as well as its quality features.

The Cool World Climate Path

And they thought “cool” was a good word, because it’s got a certain level of slang in it, but it has also to do with “cool”, you know. You don’t wanna have it as a cool world, it’s not gonna be cool, it’s gonna be warm. (Interview with Peter Templeton)

The awareness of a global change in climate, as expressed in the provocative name for the information trail *Cool World Climate Path*, has been developed as a result of a number of Goedgedacht conferences held between 2000 and 2010 discussing the process and threat of global “Climate Change”, especially for the Western Cape region, and leading to an increasing fear on the part of the Goedgedacht Trust. Although initiatives like the project 90by2013³⁴ have been established, coming from within the ranks of the Goedgedacht Trust and dealing with “Climate Change” effects in a highly technical manner, the basic idea for the access of local people to this topic was “constantly coming back to the simplicity of the issue” (Interview with Peter Templeton).

Thus the *Cool World Climate Path* is a physical track which was initiated in 2011 by Peter Templeton, out of the ambition to design an information campaign specifically customized for children, and in a later stage of the conceptualization process, also for local farmers. The track is located at the Goedgedacht Farm in Riebeeeksrivier/Malmesbury and can be visited at any time.³⁵ According to Shannon Paul, who was largely responsible

34 “Project 90 by 2030 was established as a national project of the Goedgedacht Trust in July 2007, and registered as an independent NPO in August 2013. The project’s main purpose is to challenge South Africans to change the way they live and the way that they relate to the environment. We focus particularly on lifestyle change that can be measured through carbon footprint reduction” (cf. <<http://www.90x2030.org.za/view.asp?pg=info>> [18.06.2014]). Towards Climate Change, the initiative follows the explanations of the UN Environmental Programme or the IPCC (cf. <[http://www.90x2030.org.za/view.asp?ItemID=1&tname=tblComponent6&oname=Climate%20Inf o&pg=know&pbsub=science](http://www.90x2030.org.za/view.asp?ItemID=1&tname=tblComponent6&oname=Climate%20Inf%20o&pg=know&pbsub=science)>. [18.06.2014]).

35 Unfortunately the Cool World Climate Path has recently fallen into disrepair or disuse, also been removed from the website of the Goedgedacht Trust (<http://www.goedgedacht.org/>). This might be explained by the increasing focus on the Path out of Poverty (POP) projects.

for developing the texts of the trail, it addresses the regional challenges resulting from “Climate Change” in the Swartland Region of South Africa (interview with Shannon Paul, 18 December 2013). The project has a multilayered constitution which is intended to transport practice-oriented information and moral values at the same time in order to develop new ways of sustainable farming practice. In the “Goedgedacht worldview” “sustainable” means a widely community-independent means of efficient land use, in the case of the cooperative farmers on a subsistence or smallscale basis, and a respectful treatment of the environment (Interview with Peter Templeton).

The 160 tables of the *Cool World Climate Path* are the major tool for information transfer. All tables contain the information in English, Afrikaans and Xhosa. Nearly 5000 people per year are visiting the path on the farm, ranging from school classes of all levels and individuals with an interest to the farmers of the region who want to gain a deeper understanding of processes of environmental change (Interview with Jafta Hendricks). This information trail is an interesting starting point for tracing Goedgedacht’s ideas and values. The information on this path shows the concrete argumentation basis for Goedgedacht cooperations as well as the terminological transfer strategy between the three languages involved in communicating the messages.

The material, which has been provided digitally by the Goedgedacht Trust, has been analysed starting from the source texts in English, upon which the Afrikaans and later Xhosa versions were based. A more detailed description is provided in chapter 4.5.

Application forms of the Goedgedacht “Black Farmers Funding Application Workshop” (BFFAW)

The Goedgedacht Trust consigned the application forms of the local farmers who attended the BFFAW workshop to me, which helped eminently in gaining a broader understanding of the living conditions of the workshop participants. The 120 forms include personal details and information about land and household size, the ownership status, growth conditions and products, as well as personal visions for their own farming future. The application forms have been statistically analysed and will only be cited in anonymized form, with the permission of the Goedgedacht Trust. Appendices C and D include blank application forms in both English and Afrikaans.

Other publicly available text material

Besides the text documents of the Goedgedacht Trust, national policy papers such as *The National Climate Change Response White Paper* and *The National Climate*

Change Response Green Paper of the South African Government and other official policy papers, which are relevant information sources for Goedgedacht strategies, will also be taken into account, since their content may be traced in the Goedgedacht discourse. The text material of the Cool World Climate Path and the general policy and information documents will be analysed in terms of the frequency with which specific terminology and expressions appear, in order to define inductively (semantic) categories based on the material.³⁶ The first visits to Riebeeeksrivier in January/February 2012 and November/December 2012 provided a collection of strategy papers and basic policy documents (annual reports etc.) of the Goedgedacht Trust.

Expert interviews: Goedgedacht employees

Besides the written material mentioned, qualitative interviews with people who are employees of the Goedgedacht Trust, or at least closely involved in its climate-related work, play an important role in the comprehension of the subjective perspectives behind the information strategy.

Starting from this basis, the first two people of interest are Peter Templeton, the founder and Co-Director of the Goedgedacht Roman Catholic Trust, and Jafta Hendricks, the Manager of Goedgedacht's Climate Change Project. At first sight both men are incredibly different: Peter Templeton is a white, grey-haired, elderly British gentleman who is always accompanied by one of his small mongrel dogs. He holds a master degree in Development Planning from the London School of Economics, a Social Work degree and various more diplomas. He has 40 years of social work experience all over the world. I found him to be an open-minded and highly pensive person whose self-appointed mission is the fight against poverty and inequality (Interview with Peter Templeton).

On the other hand, Jafta Hendricks is a "black" South African, and a very passionate and experienced farmer who dropped out of school at Grade 4 and has laboured as a farm worker ever since, the last 18 years of that on the Goedgedacht farm. He is one of the busiest persons I have ever met – this means that besides his job as a manager at Goedgedacht, he is always available (and sought after) to help the local farmers with practical and technical assistance at any time. It took me more than three weeks and innumerable attempts (despite my constant presence) to accomplish the interview with him, due to the huge demand for his advice and support. He is a highly respected

36 A helpful programme for the analysis of primary data is the data management system atlas.ti. This programme offers e.g. tools to survey auto-processing, quantification after data codification and audio transcription. Cf. <<http://www.atlasti.com/index.html>>. [01.09.2015].

and appreciated person and the most important and vital connection to the local farmers. Nevertheless both men, Peter and Jafta, are fathers and grandfathers, who feel responsible towards future generations and who share their enormous passion for the natural environment and the mission to create an understanding for the causes of “Climate Change”. Johnny Philander puts it simply when he says: “So for me the two people who actually symbolize the Cool Climate Path are Peter and Jafta especially” (Interview with Johnny Philander).

A further interview with Shannon Paul also revealed precious information about the evolution of the Cool World Climate Path. Mrs. Paul is an Irish-South African woman who started as a virologist, working at medical school; later, after the birth of her children, she majored in English and Psychology and did her masters in Classical Studies. Since then she has taught English, including at a private high school in Cape Town, where she was the deputy principal, and at a small private junior school in Riebeeck Kasteel. Shannon Paul has been involved as a teacher in the Goedgedacht Path out of Poverty (POP) programmes for approximately nine years and was asked by Peter Templeton to take charge of the literature and research for the Cool World Climate Path. She wrote the English texts of the CWCP.

Besides the persons directly involved in the development of the Cool World Climate Path, I had the chance to interview Johnny Philander, who is a non-permanent, part-time employee of the Goedgedacht Trust and mainly responsible for capacity building on the Path Out of Poverty (POP) programmes. After growing up as a son of farm workers, Mr. Philander started with a diploma in Education from the University of the Western Cape and moved further to the topic of management, where his qualifications include a diploma in Project Management. He has about eighteen years of work experience in Capacity and Community Development. Mr. Philander conducted the workshops on governmental funding between September and November 2013 at the Goedgedacht farm and encouraged the attendants to create a personal vision for their small-scale businesses by sharing his expertise and trying to solve the bureaucratic challenges that the farmers face. Besides Jafta Hendricks, Johnny Philander is one of THE gateways to the farmers, due to their relationship of mutual trust.

All interviews were conducted in English (Appendix E), using a guideline that contained the following four main leading themes (cf. Hopf 2012: 350f; Moser 2011: 1) personal background information, with special emphasis on personal and intra-familial language use; 2) individual relation to and idea of the Goedgedacht Trust; 3) personal comprehension of environment and explanations around “Climate Change” and 4) the Cool World Climate Path.

Expert interviews: BFFAW farmers

In hindsight, there were two major challenges in terms of access to the farmers and conducting the interviews.³⁷ Firstly, the logistical coordination was undertaken by Johnny Philander and Jafta Hendricks, who share this trust-based relationship with the farmers. Without their network it would have been almost impossible to get the opportunity to meet and talk to the farmers as an “outsider”. The interviews were conducted in four different communities of the Swartland region: Riverlands, Mamre, Atlantis and Leliefontein, where we met approximately 60 farmers in total. Secondly, a specific challenge of interviewing was the choice of the appropriate communication language. As Afrikaans is the mother tongue of most of the farmers involved, the interviews had to be conducted in Afrikaans and then translated into English. Although I was prepared with an audio version of the interview guideline, read by a South African native Afrikaans speaker, which should have avoided comprehension mistakes due to my Afrikaans pronunciation, I was glad to receive support from two voluntary assistants (Johnny Philander and Usher D.), who are native Afrikaans speakers. The guideline in Afrikaans was handed to the interviewers with the instructions to conduct the interview literally by just reading the questions, following the idea of giving the same literal and symbolic stimulus to every interviewee. Although the interviewers had been introduced to the aim of the project, they were asked not to suggest any answers to the interviewees.

The guideline content consisted of the same four main topics as used in the expert interviews: 1) personal background information, with a special emphasis on personal and intra-familial language use; 2) individual relation to and experiences with the Goedgedacht Trust; 3) personal experiences with and explanations around “Climate Change”; and 4) feedback on the Cool World Climate Path (Appendix F).

The ethical contract between me and the farmers stimulated that only statements in anonymized form can be published, and effacing local or personal references that might make it possible to draw conclusions about the speaker. Original quotations in the text, usually in Afrikaans, are indented, while the translations in English always

37 In my Magister thesis (De Ruijter 2007) I worked on the morpho-phonological description of the Bantu language Bungu in Southern Tanzania in order to develop an orthography. Through my six months of fieldwork in the Mbeya district I gained wide experiences in cooperating with informants of different age, sex and social status. I am aware of possible challenges resulting from divergences of culturally specific definitions of social status regarding my sex, origin or age and constantly worked on minimizing the effects of these factors in my study.

appear below in italics. To avoid the impression of creating a “single BFFAW farmer” by citing without reference, the different speakers are indicated by a two-letter code. As the quotations do not contain any indication of the interviewees’ sex, only the male form of the third person singular personal pronoun will be used in references.

3.5 Ethical clearance and informed consent

As this dissertation has been developed as part of a Joint Doctoral Supervision Cotutelle Agreement between Prof. Dr. Ulf Engel, University of Leipzig, and Prof. Dr. Johan Hattingh, University of Stellenbosch, the project needed to fulfil the doctoral regulations of both universities. In the case of Stellenbosch University in particular, the methods of data collection had to pass a multi-stage *Ethics Screening Process*, in which any risks to the research subjects have been evaluated. *The Standard Operation Procedure* (SOP) is monitored by the Research Ethics Committee and follows the overarching objective “to promote and ensure a culture of ethically responsible research at Stellenbosch University in the social, behavioural, economic and educational sciences, in short the Humanities”. (Research Ethics Committee 2011: 4) Describing the procedure briefly, in the first step of the screening process each researcher is asked to submit their research proposal and the completed Departmental Ethics Checklist³⁸ to the departmental chair for further assessment by the Departmental Ethics Screening Committee (DESC). The checklist covers ethical considerations for i.a. the methods of data collection and processing, the role of participants, as well as questions regarding the legal access to information (Departmental Ethics Screening Committee 2012b). In the case of collecting data through reactive methods, as also applies to this project, *Informed Consent Forms* (Appendices G and H) needed to be developed in the specific languages, in this case English and Afrikaans. The information forms contain a brief description of the project, the intended role of the participant, the risks and the researcher’s contact information, as well as an explanation of the voluntary nature of participation. During the fieldwork these information forms were handed to the interview partners, who were asked for their consent before participating. In the next step the decision of the DESC is forwarded

38 “The checklist serves as a heuristic tool (i.e. a guideline) to assist the researcher in evaluating the potential ethical risks associated with the research. The emphasis should be on an honest and critical reflection on, and deliberation about, the risk of unjustifiably impacting negatively on the research participants and other stakeholders involved in the research and not on the completion of the checklist as a mere bureaucratic necessity” (Departmental Ethics Screening Committee 2012a: 2).

to the Secretariat of the Research Ethics Committee (REC), where a sub-committee performs a preliminary review and decides on the necessity of a full ethics review. This is not necessary if the project considered to be of minimal or low ethical risk research. In such cases, the status is registered and a letter of approval returned to the supervisor and researcher (Research Ethics Committee 2011: 40).

This project has been declared “low risk” research, “in which the potential exists for minor emotional discomfort, e.g. the subject matter may have a low degree of personal, social or political sensitivity that could cause embarrassment to participants. This risk can be easily mitigated by a sensitive approach by the investigator” (Research Ethics Committee 2011: 35). The methods for data collection and processing of this study were thus approved and ethically cleared according the standards of scientific integrity of the University of Stellenbosch. As a result, all names of persons, in particular that of expert participants, were mentioned in this study at the basis of explicit informed consent. Were interviews are reported, participants are anonymised by only mention initials.

3.6 Data analysis

After the presentation of the data corpus, the question about the strategy of analysing it systematically still remains. Three different perspectives on the texts will offer the opportunity to interlink varying insights to reveal a more complex picture of specific perception characteristics. The data are analysed by looking through the following three major lenses on the material: 1) a linguistic perspective, 2) a discursive perspective and 3) an ethical perspective. The tripartite structure of analysis also determined the structure of the codification guideline and is explained further in the following.

3.6.1 A linguistic perspective

After identifying the terminological proportions in both contexts (Cool World Climate Path and the interviews and discussions with the farmers), by framing the set of the most prominent symbols, a closer look at the linguistic dimension of the information is interesting due to the fact that, besides different social backgrounds, linguistic borders are also crossed in the communication between the Goedgedacht Trust and local small-scale farmers. Information is transferred from an English-

thought conception to an Afrikaans and Xhosa “consumer version”. In the case of the Cool World Climate Path, Shannon Paul explained that the translations of the original text were as faithful and literal as possible (Interview with Shannon Paul). Here the academic field of *Translatology* provides useful frameworks for the classification of the text material regarding the types of transfer processes and offers explanations for possible translation malfunctions. The choice of an appropriate translation method here is related to the text type and the purpose of translation (Hönig and Kußmaul 1982). The translation processes (or translation techniques), which refer to smaller text units, are then determined by the translation method and the linguistic pair (Wotjak 1985; Schreiber 1993: 54f). The translation method, as already stated, is *literal*, which in the next step leads to the four levels of translation techniques, divided into lexis (L), grammar (G) and semantics (S) and ancillary operations (A) (Schreiber 1999: 152). Derived from this, the material of the Cool World Climate Path is screened with regard to mainly the following main aspects:

- (L1) Lexical loan (implementation of a lexical unit)
- (L2) Lexical substitution
- (L3) Lexical structure change
- (G1) Word-by-word translation
- (G2) Permutation (rearrangement of constituents)
- (G3/4) Expansion or reduction (of the number of words)
- (S1) Semantic loan (verbalization of equivalent content features)
- (A) Comments, annotations, preface or postface (e.g. cultural specific abbreviations)

The symbolic references are discussed according to their *semiotic congruence*. The example of “Greenhouse Gas Emission” will depict differences of symbolic representations that appear through lexical loan or a word-by-word translation. As this project is not primarily focused on the linguistic perspective, this functioned as a “side perspective” on the data material, and as such examples will be integrated into the general analytical results.

3.6.2 A discursive perspective

The focus of the *discursive perspective* lies on the interdependency of context and *content* of the information that is transferred in reference to the “Cool World

Climate Path” and the explanations of the Goedgedacht staff. The analysis aims mainly at detecting the logos (scientific “facts” and types of logical arguments³⁹ and evidence; line of argumentation) of the Goedgedacht ideology by using a *qualitative content analysis*.

The goal of the qualitative content analysis is the systematic processing of communicational material. After having been developed in the 1920s as a tool for the systematic analysis of large text data material, the focus of current versions goes beyond an exclusive analysis of superficial content, as it subjects also latent meanings to critical scrutiny (Merten 1983). The challenge of qualitative content analysis is to maintain the systematics of content analysis (adherence to systematic analytical procedure, embeddedness of the communication, quality criteria) for steps of qualitative analysis without a hasty quantification (Mayring 2002: 469). In the analytical process also the communication context (medium, information sources, transmitter and recipient) needs to be taken into account (Mayring 2002: 471). The qualitative content analysis claims to fulfil the quality criteria of intercoder reliability (objectivity, reliability, validity of the codes, independently from the codifier) and follows a scheme of codification rules (cf. Krippendorff 1980 and Mayring 2012: 469f). Therefore it can include a software-based text analysis. In this project, the programme atlas.ti⁴⁰, which also allows quantifications (Mayring 1999: 110f and 2012: 475), was used.

For a framing of the space of knowledge production, the structure of the Cool World Climate Path information is set in relation to the interviews with the farmers. The discussion is guided by the comparison of 1) the relevance of topics or concepts and 2) their embedding into the system of orientation. Here the frequency of appearance of specific codes⁴¹ and expressions helped to define inductively (semantic) categories based on the material. As the personal experiences and “assets” – such as educational experience, language competence and living situation – of the persons involved differ a lot they might indicate some basis for differing outcomes. Sources of this background information are e.g. the application forms of the workshop on governmental funding, which include the interviewed farmers.

In the next step, the concepts are deconstructed through a comparison of content.

39 I am referring to the *sullogismoi* as types of logical arguments defined by Aristotle that apply deductive reasoning to arrive at a conclusion (cf. Rapp 2012).

40 A helpful programme for the analysis of primary data is the data management system atlas.ti. This programme offers e.g. tools to survey auto-processing, quantification after data codification and audio-transcription (cf. <http://www.atlasti.com/index.html>). [15.05.2014].

41 According to Mayring codes are terms which condense specific words or text passages on an abstract level in order to identify a superordinate system (cf. Mayring 2012: 472).

The subjective interpretation here is rasterized by the following primary codes: a) explanations of observations, root causes and impacts; b) the implicit classification of risk awareness; c) responsibility perception; and finally d) the evaluation of chances. It will be analysed to what extent parallel versions of “Climate Change” exist.

3.6.3 An ethical perspective

The discourses of Environmental Ethics precisely address the two basic moral questions that are also attached to the background of this case: (1) Which entities are intrinsically valuable, good or bad? And (2) What makes an action right or wrong?

In the 1970s, Environmental Ethics emerged as a sub-discipline of Philosophy discussing the assumed moral superiority of human beings to members of other species on earth (Brennan 2008). Furthermore it considers the rational arguments for the assignment of values to the natural environment. While Environmental Ethics questions the rationale behind the attribution of values and status, in his constructionist approach Paul Watzlawick (2004) focuses on the first and second order of reality of the communicative dimension of this assignment process.⁴² Here the creation of a second order reality, according to Watzlawick, is neither conscious nor rational, but rather results from coincidences and individual experiences during a lifetime and are thus subjective. So to deconstruct the constitution of “Climate Change Knowledge”, the underlying moral rationale is as important as the way that these norms are shaped and transferred. In this context not only the selection and quality of the Goedgedacht messages, but also their contextualization in an ethical dimension are important, as Goedgedacht intends to raise the awareness of everyone’s own responsibility for “Mother Nature” and the “Global Climate”. Here the question about the origin of Goedgedacht’s authority and self-appointed expertise on this topic becomes interesting. The ethical perspective focuses on the interrelation of intentions and expectations, as well as claims of objectivity in contrast to subjective reality perception. This last part of the analysis adds a larger perspective of philosophical and political discourses about “environment” and “climate” to the results from the linguistic and discursive study.

The codification guideline in this regard included the following aspects for analysis: 1) the values and normative standards, 2) the degrees of emphasizing norms in terms of priorities, frequency, explicitly and 3) the emotional appeal (pathos). The results are

⁴² If things themselves are intrinsically valuable, meaning good in themselves, it follows that there is direct moral duty for moral agents to protect them or to refrain from damaging them (cf. O’Neil 1992; Jamieson 2002).

4. Framing the case

Before presenting the interview data itself, this chapter 4 serves to introduce the project cooperation partners, namely “Emerging Black Farmers”, in detail. Why is it so important to describe the broader socio-economic historical background of the group? In reference to Paul Cilliers (2000: 107f), only this historical embedding enables a contextualization of the complex system itself. “Traces” or “effects” of history remain distributed throughout the system and can be identified in the interconnections (of the elements) and their arrangement. This leads to the first basic argument that the system of “Climate Change Knowledge” of the local small-scale farmers is highly influenced and shaped by the exchange with and the influence of these socio-economic historical preconditions. “Preconditions” bear a notion of a structural framing, since in the moment of the interview situation they have already influenced and focussed the perception and by consequence the message of the speaker. The description of the farmer’s “lifeworld” hence functions as a key to further analysis and understanding of the data itself.

A second basic argument conforms to Cilliers’ (2000: 108) assumption that there exists a global behaviour of the system, which is constituted by “patterns of traces”. Transferring this idea to a system of “Climate Change Knowledge”, this would mean that a predominant structure of accumulated individual traces provides the basis for the integration of climate-related symbols. Characteristics of complex systems thus emerge through interactive processes between elements (symbols) within the network of traces. Cilliers further assumes here that individual traces can belong to more than one pattern and that a specific pattern cannot be extracted again. It can be assumed that despite the diversity of individual traces, enriching the systems interconnectedness, there might exist something like a shape or a major narrative that is specific to the body of knowledge of the “Emerging Black Farmers”, as they share similar historical preconditions.

I disagree with Cilliers’ (2000: 108) assumption that these traces do not correspond to ideas or symbols, encoding information only at a very low level. Instead I assume that individual traces, shaping global or group-specific “patterns of traces” encode objects at a high level, influencing this system of “Climate Change Knowledge” in its basic appearance and limiting the representational functions. Chapter 7 will examine whether this conjecture applies to the context of “Climate Change Knowledge” of the “Black Emerging Famers”, who I will now introduce in the following.

The group of interest for this study consists of 117 small-scale farmers from mainly four towns in the Western Cape Province of South Africa: Riverlands, Mamre,

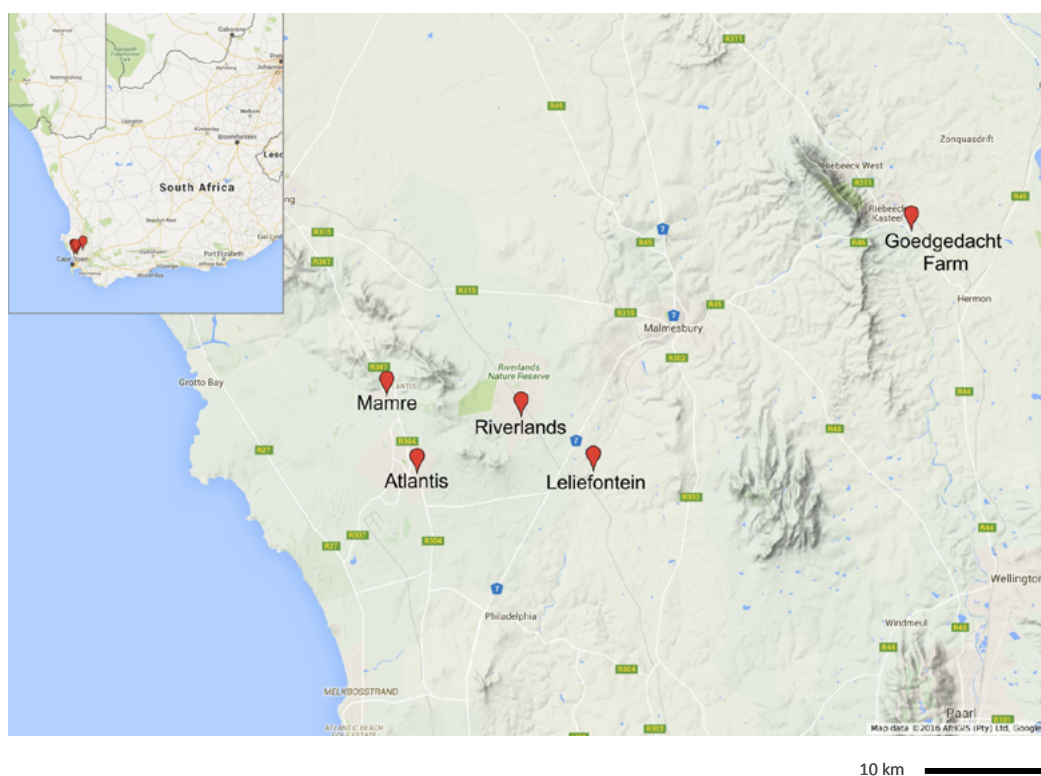
Atlantis and Leliefontein. All four places are located between 50km and 70km north of Cape Town and are spread across an area of approximately 80km². Due to their regional adjacency, I have summarized the four towns mentioned and refer to them henceforth as the *Swartland region*. This aligns with the way that the Goedgedacht Trust terminologically clusters the farms they are cooperating with from this region. All farmers in this cluster have in common that they applied for and attended the “Black Farmers Funding Application Workshop” (BFFAW) of the Goedgedacht Trust. This is why I will refer to them hereinafter as “*BFFAW farmers* or *BFFAW participants*”. The framework is a descriptive summary of the information gathered through the application forms and from the interviews with the group of farmers. Some historical background information regarding educational conditions and recent South African land policy will help to “read” the data and to contextualize the socio-economic constitution of the group of participants, to which also the 21 interview partners belong. Focusing in the next step (subchapter 4.4) especially on the interviewees, some detailed insights into their language preconditions, practice and preferences display the linguistic dimension in which the knowledge about and around “Climate Change” emerges. Finally some background information about the Cool World Climate Path contributes to a broad framing of the case.

Before introducing the group of participants and their socio-economic living conditions, a short overview about climatic and political aspects of the region shall introduce the reader to the current living environment of the BFFAW farmers. If necessary, generated figures will be compared to the Data of the South African National Census 2011.⁴³

43 The South African National Census 2011 is the third census conducted by Statistics South Africa, the South African national statistical service. This census included for the first time a geo-referenced frame of often informal dwellings to develop as complete as possible a national address index (Laldaparsat 2007).

4.1 The Swartland region

Map 1: Location of BFFAW farmers' residences: terrain map of the Swartland area



Source: Google Earth [20.02.2016].

4.1.1 Climatic features

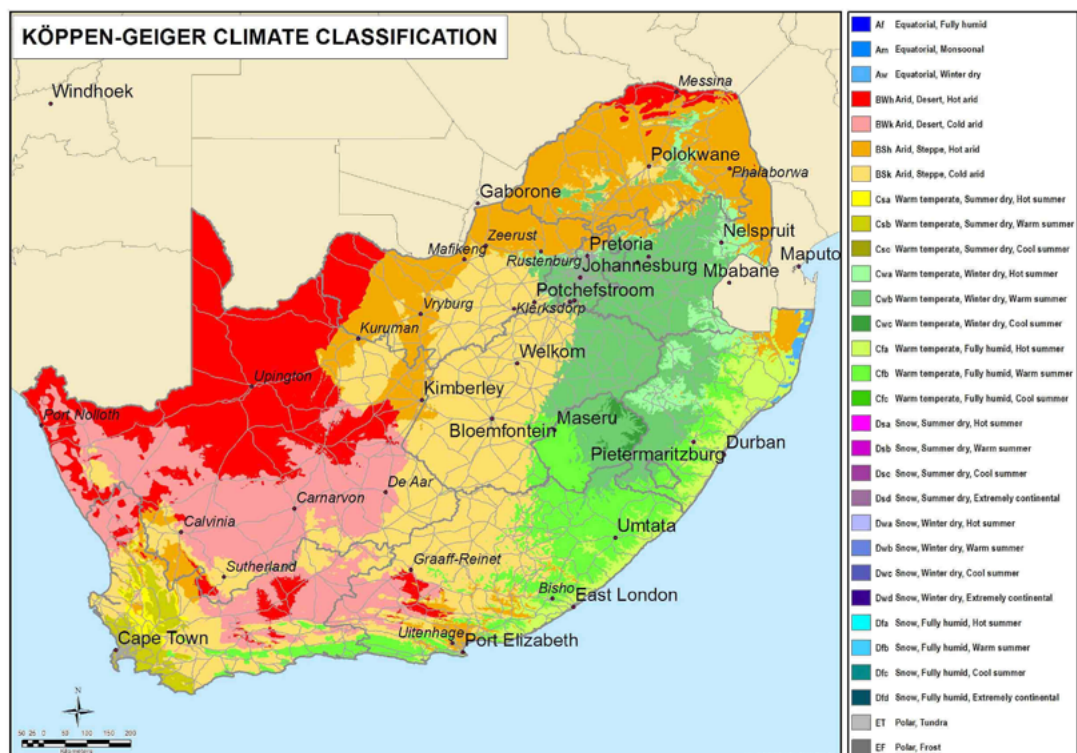
The Cape region is characterized by a Mediterranean climate, which distinguishes the Capeland considerably from other neighbouring sub-Saharan climates. Such a climate usually occurs on the western sides of continents. The Mediterranean climate is characterized by moderate temperatures and contrary rainy weather. The cold oceans of the coastal area induce mild summers and provoke more fog than rain (McKnight et al. 2000). The indexing traces back to the climate classification of Wladimir Peter Köppen and Rudolf Geiger, who distinguished five main climate types⁴⁴, according to the relation between climate and vegetation, and several climate sub-types in reference to the precipitation conditions⁴⁵ (Kottak et al. 2006; Peel et al. 2007). Despite being

44 Köppen and Geiger differentiated vegetation of a) Equatorial climates, b) Arid climates, c) Warm temperature climates, d) Snow climates and e) Polar climates (cf. Kottak et al. 2006: 259f).

45 The precipitation conditions are divided according to the proportion of condensation [winterdry (w), summerdry (s), fully humid (f) and monsoon (m)] and by differentiating summer

almost a century old and having been reviewed in recent geographical discourses, this classification model is still the most common initial point for climatic regionalization and the assessment of global climate models (Peel et al. 2007: 1633). According to the Köppen-Geiger classification the Swartland region belongs to the group Csa, as figure 1 reveals.

Figure 1: Köppen-Geiger climate type map of South Africa



Source: CSIR (2016).

The climate type Csa is characterized by a warm temperate climate with dry summers. It exhibits an average temperature of the warmest month above 20° C and an annual average temperature below 20° C. The precipitation of the coldest month is equal to at least triple the rainfall of the warmest month. The average summer precipitation is below 40 mm. Furthermore, the temperature of the warmest month is above 22° C. A minimum of four months of the year are warmer than 10° C (Kotttek et al. 2006: 260).

The Cape Peninsula also belongs to the world's six continental Floral Kingdoms. The *Capensis* contains more than 9,000 vascular plant species, of which 69 per cent are endemic.

and winter temperature.

4.1.2 Political administration

The Western Cape Province is one of the nine provinces of the Republic of South Africa. It consists of six districts and 24 municipalities. It has an area of 129 370 km². There are 5.4 million people living in the Western Cape. Its Constitution was adopted in 1998 and is available in the official languages of the province, i.e. Afrikaans, English and Xhosa. The province is governed by Prime Minister Helen Zille⁴⁶ whose Democratic Alliance (DA) controls 26 out of the 44 seats of the provincial legislature.⁴⁷ The provincial government “makes and administers provincial laws in its areas of jurisdiction (e.g.: liquor licences, provincial planning, cultural matters, recreation, roads and traffic). It shares certain areas with national government, such as health, education and social services”⁴⁸, whereas the local governments “provide basic services, as well as promote a safe and healthy environment, and community development”⁴⁹. The two local municipalities which relate to this project are the City of Cape Town Metropolitan (Mamre, Atlantis) and the Swartland Municipality (Riverlands, Leliefontein).

During the late 1900s, the railways arrived in an area adjacent to Chatsworth, where a school and church were build for the informal residents; this place was named Riverlands. This village was established to serve as a water point for passing trains.⁵⁰ It is not yet a popular tourist destination, but still administers the school and a church of the Moravian congregation. The primary school is also the place where the interviews with the farmers were conducted.

The village Leliefontein is a small farmstead located approximately 5 km south-east of Riverlands. It should not be confused with the village Leliefontein located in Namaqualand, in the Northern Cape Province, or the Leliefontein near the city of Paarl. Both towns, Riverlands and Leliefontein, belong to the local government of the Swartland Municipality, which is located on the northern boundary of the City of Cape Town Metropolitan Municipality, adjoining the N7 as the main route towards Namibia (see map 2).

Both places are located in the southern part of this communal district, some 50 km north of Cape Town.

46 Elections are held every five years; the fifth provincial parliament was elected on 7 May 2014.

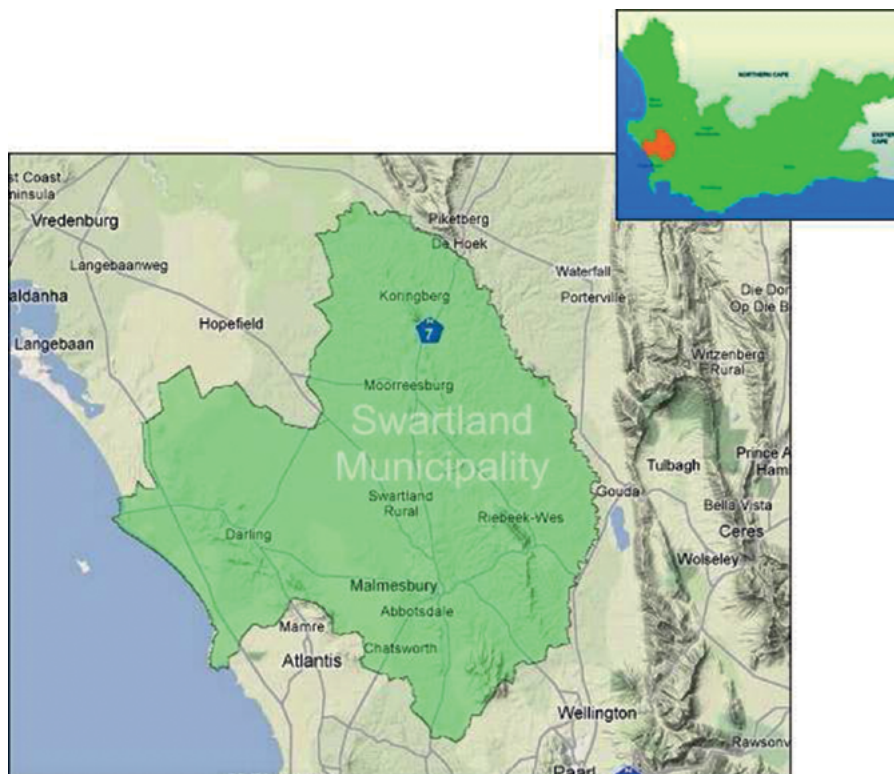
47 The figures are adopted from the Western Cape Government's official website. See <http://www.westerncape.gov.za/your_gov/70>. [28.08.2014].

48 See <http://www.westerncape.gov.za/your_gov/#local>. [28.08.2014].

49 See <http://www.westerncape.gov.za/your_gov/#local>. [28.08.2014].

50 See <<http://www.malmesburytourism.co.za/malmesbury-map.htm>>. [24.09.2014].

Map 2: Location of the Swartland Municipality



Source: WesternCapeProvincialGovernment2014. <http://www.westerncape.gov.za/your_gov/5>. [28.08.2014].

The towns Atlantis and Mamre are situated near the boarder to the Swartland Municipality and close to the other two towns. Even so they do belong to the City of Cape Town Municipality, where they are located in the northern part.

Mamre was previously known by the name Groene Kloof, founded in 1701 by the Dutch East India Company. Named after the biblical Mamre (Genesis 13:18), Graaf Van Clarendon, the governor of the Cape, gave it to the Moravian mission society in 1808. They built their first church in 1816 (Raper 1987: 295).

Different from Mamre, Atlantis was established in the 1970s during the Apartheid era as an industrial centre in the court-yard of Cape Town. Because of the reduction of subsidies and the high transportation costs, the continuous relocation of many companies closer to Cape Town city has meant that Atlantis has experienced large job and business losses, which culminated in the global economic crises in 2008/2009. Thus the economic pressure on the population is high and has resultet in a high degree of crime. The Chinese consumer electronics company Hisense opened a factory there in June 2013, creating 1 200 jobs, and once again Atlantis was boosted as a manufacturing hub (Phakati and Ensor 2013). Nevertheless the concerns of the

farmers one again brought up the question about the influence of this (kind of) factory on the environment's integrity.

Map 3: Location of the Cape Town Metropolitan Municipality



Source: WesternCapeProvincialGovernment. <http://www.westerncape.gov.za/your_gov/33>. [28.08.2014].

4.2 A historical outline

By analysing the application forms of the participants of the “Black Farmers Funding Application Workshop” it became clear that these cannot be discussed without a historical framing. Especially the parameters which influence socio-economic living conditions are determined by medium-term policies of Apartheid and the post-Apartheid era. Therefore short historical overviews of the condition of the education system, the occupational policy and the relevant land reforms, deliver an idea of how to read the data.

4.2.1 School education

In terms of school education, the indications ranged mainly between “grade”, “standard” and “NQF level”. It became clear that the designation of *standards* and *grades* does not label an educational level in synonymous terms, and as such a brief preceding excursion into the history of education in the 20th-century South African will give an idea of the distinction.

Standards and Grades

On 19 January 1949 the government of the Union of South Africa appointed the *Commission on Native Education*⁵¹ to re-conceptualize the education system of South Africa for the African population, which had hitherto been the responsibility of mainly Anglican and Roman-Catholic Christian missionary organizations. The commission concluded its work in 1951 with the *Report of the Commission on Native Education*⁵² and essentially recommended a take-over of the mission school system by the Union government. The recommendations of the *Commission on Native Education* provided the basis for the *Bantu Education Act* of 1953. This law set out a framework for a government-controlled and inferior school education for “Bantu” people (i.e. all Africans), which the Act defines as “natives”, meaning “any person who is or is generally accepted as a member of any aboriginal race or tribe of Africa” (Union of South Africa 1953: 258). The underlying racist ideology was obviously expressed and put into practice by this policy. The following quote by Dr. Hendrik Verwoerd, South African Minister for Native Affairs (and later on Prime Minister from 1958 to 1966) illustrates very explicitly and forthrightly the prominent concept of social separation and subordination in South Africa during this time, while speaking about his government’s education policies:

There is no place for [the Bantu] in the European community above the level of certain forms of labour [...] What is the use of teaching the Bantu child mathematics when it cannot use it in practice? That is quite absurd. Education must train people in accordance with their opportunities in life, according to the sphere in which they live. (Ball 1996: 177)

51 The commission was also referred to as the Eiselen Commission, named after its chairman Werner Willi Max Eiselen. Eiselen (1899-1977) was a South African anthropologist and linguist, who studied in South Africa and Germany (Hamburg).

52 The report was also called the Eiselen Report.

Francis Wilson (2012: 88) mentions that this attitude was probably why mathematics was no longer taught as “a core subject in black schools”. The subject remained in the school curriculum, but in the period of 1958 to 1965 only 431 “black” students in total passed the mathematics matric examination (cf. Horrell 1968: 58f, 71f.; Giliomee 2012: 80f.).

Thus the law aimed mainly at a systematic and static development of a little-educated population group and disabling this group from competing with the privileged "white" minority on the job market, in order to force them to serve as low-wage workers. The private schools of church agencies, which had been an alternative for better education of "black" and "coloured" people, were liquidated completely by the Bantu Education Act. Furthermore, Bantu education created racial stereotypes, depicted as traditional, static and rural people, and promoted these in public schools (cf. Hartshorne 1992: 41; Hlatshwayo 1988; Kallaway 1984). The school system of “native” people was structured in ten consecutive *Standards* with a school-leaving examination known as a 'matriculation' at the end of Standard 10. The language policy of the Bantu education after 1954 included eight years of mother-tongue education (MTE), while English and Afrikaans were taught as second languages. In the last two school years (Standard 9 and 10) the medium of instruction was exclusively one of the two official languages, English and Afrikaans (Giliomee 2012: 82).

Until the early 1990s, the first two years of compulsory schooling were called Grade 1 and 2. A child attended to Grade 1 in the year it turned seven. In the year it turned eight, it was supposed to compete Grade 2 and in the year it turned nine, it did Standard 1. From the early 1990s the Standard system was done away with and children now complete twelve Grades – but Grade 12, the final year, is still referred to as Matric. This change certainly resulted from the project to rid the South African education system from its Apartheid and Bantu education stigma (cf. Kallaway 2002). The official current South African Basic Education System is officially structured into three *bands*, called *General Education and Training* (GET), *Further Education and Training* (FET) and *Higher Education and Training* (HET). The GET is further divided into three phases: Foundation Phase (Grade 0/R-3), Intermediate Phase (Grade 4-6) and Senior Phase (Grade 7-9). Compared to the Standard system the GET level contains Standards 2-7 and the FET level Standard 8. The Grades 10, 11 and 12 belong to the FET band and culminate in the matriculation certificate (see figure 2).

Figure 2: Overview of Basic Education System in South Africa: FET and GET band

Band	Phase	Grade
General Education and Training (GET)	Foundation Phase	0/R
		1
		2
	Intermediate Phase	3
		4
		5
	Senior Phase	6
		7
		8
Further Education and Training (FET)		9
		10
		11
		12/ Matric

Source: Based on SAQA (2014b).

NQF level

Returning to the variety of answers given on the application forms, a third spontaneous indicator of the farmers' individual qualification was the NQF level (*National Qualification Framework level*). Here, too, a brief excursion into the evolution of this policy will reveal a little about the underlying idea of this categorization.

The roots of the *National Qualifications Framework* (NQF) can be traced back to the labour movement in the 1970s, when African trade unions demanded higher wages to secure people's livelihoods. This request was constantly rejected, with the main argument of "black" workers' low educational status, and thus a lack of skills to

justify increasing their wages. A proposal by the *National Union of Metalworkers of South Africa* (NUMSA) in 1989 represented one of the first milestones to increase the skills of workers through systematic training. The idea to grade the different levels of training standard and success, but also the basic education achievements, was based on the intention to enable the workers to change their employer by being able to prove their qualifications and skills comparably and nation-wide. The *Congress of South African Trade Unions* (COSATU) adopted the proposal and integrated the idea in their “Jobs for all – No retrenchments campaign” (COSATU 1991: 21f.), formulated here as a priority demand that “Workers should be retained not retrenched. There should be a nationally integrated education and training framework” (COSATU 1991: 22). At the same time COSATU got involved in the *National Education Policy Initiative* (NEPI) (1992, 1993), initiated by the *National Education Co-operating Committee* (NECC)⁵³, which discussed and developed proposals for a restructuring of the formal education system away from racial and sexist argumentations⁵⁴ for disparities in quality and quantity of education. The twelve NEPI reports did not aim at presenting solutions, but to create the basis for an informed discussion about the transformation of the education system (cf. Niedrig 2000: 99). In contrast to the NEPI discussions of oppositional social scientists and pedagogues, an *Education Renewal Strategy* (ERS) was developed and published in 1991 by the *Department of National Education* (DNE) as a reaction to the pressure of economic recession with the goal to freeze the education costs for an increasing amount of “black” students at the level of 1990. Besides the cost reduction, the curricula development and the transformation of administrative structures evoke the impression of being modified stabilizers of structural injustice against the background of the Apartheid regime (Niedrig 2000: 98; Collins and Gillespie 1998).

In 1992 the Department of Labour and the Trade Union Federations formed a task team and eight working groups to discuss a necessary new national training strategy for South Africa. The working groups also consisted of members of the ANC Education Department and the Democratic Alliance. As a result of the discussion in 1994 three documents⁵⁵ were published which formed the basis of the *South African*

53 The NECC was founded after the crisis conference of the Soweto Parents Crisis Committee in 1985 and consisted of “progressive” pedagogues and education researchers of South Africa. The slogan “People’s education for people’s power” emphasizes the aim to promote a fundamental change of social inequalities, based on the racial ideology of the Apartheid regime (cf. Niedrig 2000: 98).

54 The framework is based on the five NEPI principles “non-racism”, “non-sexism”, “democracy”, “a unitary system” and “redress” (NEPI 1993: 6f).

55 These documents are the ANC Policy Framework for Education and Training (1994), the

Qualifications Authority Act (SAQA, Act No. 58 of 1995) (RSA 1995), which was enacted as a law on 4 October 1995. Working since 1996, a team of international and local specialists developed a framework that brings together the elements of training and education system together more efficiently (SAQA 2014a). As outcome of the efforts of the SAQA working group, in 2008 the *National Qualifications Framework* (Act No. 67 of 2008) was finally ratified, replacing the South African Qualifications Authority Act. It incorporates the new South African education policy, adapting to an “increasingly competitive global environment” (SAQA 2014a). The framework considers a rapid global spread of technology and an intensified international nexus of all spheres of political, economic and public sectors. The conclusion is that educational quality and variety needs to be adapted to this development, but also a new type of student, and in a later stage of worker, is needed, who is more creative, efficient and flexible through a commitment to life-long learning (SAQA 2012: 2). Of course, local farmers are not a target group for becoming “flexible generalists” (Ball 1996). But by facing new economic pressures and insecurities in a “globalized” (post-Apartheid) world, there arises a need to become and stay able to adapt to quick changes in their (social, economic and finally natural) environment. In practice all skills, (academic and occupational) qualifications and trainings should be classified according to a ten-level ranking system, each level of which is defined by a *Level Descriptor*, each of which in turn consists of the following ten categories (SAQA 2012: 3): a) scope of knowledge; b) knowledge literacy; c) method and procedure; d) problem solving; e) ethics and professional practice; f) assessing, processing and managing information; g) production and communication of information; h) context and system; i) management of learning and j) accountability. The spontaneous question arises about how the established Level Descriptors of the NQF meet the goal of measuring and depicting the qualifications and skills adequately. One very obvious item for categorization is the individual school or academic qualification level. The NQF itself does not reveal to what extent and in which way uncertified working experience can be considered in the assignment process.

Despite this fundamental uncertainty, the framework offers an abstract and theoretical idea of the type and extent of the farmers’ knowledge, as they have already assigned themselves to a specific NQF level or according to the Standard or Grade of school drop-out. Although the official documents emphasize that Level Descriptors do not describe years of study (SAQA 2012: 5), they “provide a broad indication

Discussion Document on a National Training Strategy Initiative (1994) and the CEPD Implementation Plan for Education and Training (1994) (see SAQA 2014).

of learning achievements or outcomes that are appropriate to a qualification at that level” (ibid.). The following table 5 is adapted from the SAQA (2012) and summarizes the categories according to the NQF levels:

Table 5: Summary of Level Descriptor Category contents in relation to NQF levels 1-4

Level Descriptor Categories	NQF level 1	NQF level 2	NQF level 3	NQF level 4
General aspects	Reference to familiar contexts, learning in supervised environment	Reference to familiar contexts, learning in supervised environment	Reference to clearly defined context, but increase of self-reliance	Reference to related fields of study
a) Scope of knowledge	General knowledge in at least one field of study ⁵⁶	Basic knowledge in fundamental areas of study and in at least one field of study	Knowledge of fundamental one field of study areas of study and of key concepts in at least one field of study	Knowledge of fundamental areas of study and of key concepts, theories and rules in more fields of study
b) Knowledge literacy	Awareness that knowledge develops over time and is characterized by different sources and people	Understanding that specific knowledge develops through own active participation (Learning by doing)	Understanding that knowledge can only be applied if it is understood	Understanding that knowledge in one field can be applied to related fields. (Not how it can be applied!)

⁵⁶ Fields of study can be interpreted as training disciplines.

g) Producing and communicating of information	Report information accurately (oral and written)	Accurate information management and repetition, own opinion on given information	Produce a coherent line of argumentation and presentation of a position	Reliable and accurate oral and written communication and presentation of information
h) Context and system	Ability to understand and contextualize the individual environment	Ability to understand and contextualize the individual environment in a wider context (larger scale)	Systemic understanding of the operating environment and ability of measuring it with key instruments	Systemic understanding of the operating environment in a wider context
i) Management of learning	Self-management of learning tasks and use of various resources, under supervision	Disciplined and well-structured learning method, under supervision	Learning within a managed environment	Take responsibility for own learning success within a supervised environment and evaluate performance against given criteria
j) Accountability	Teamwork competence	Efficient time management, work efficiently in team	Contribution to team efficiency	Decide and carry responsibility for actions, ability to address deficiencies

Source: Based on SAQA (2012: 5-8).

The recent South African education policy highlights the importance of referring to the new standardized system for qualification comparison. Therefore the indications of qualifications within the Basic Education System, in terms of Standards and Grades, can be set in relation to the categories of the *National Qualifications Framework*, according to the following figure:

Figure 3: Basic Education System in South Africa – Comparison of Grades and Standards in relation to the NQF level

	Grade	NQF level	Standard
General Education and Training (GET)	0/R		
	1		
	2		
	3		
	4	NQF 1	2
	5		3
	6		4
	7		5
	8		6
	9		7
Further Education and Training (FET)	10	NQF 2	8
	11	NQF 3	9
	12/ Matric	NQF 4	10

Source: Based on SAQA (2014b).

4.2.2 Occupational qualification

As the National Qualification Framework was developed to grade and certify educational, academic, but also occupational skills, the current occupational situation of the farmers is likewise highly influenced by the NQF.

The Occupational Qualifications Sub-Framework

In reference to the *National Qualification Framework*, the South African government has commissioned three coordinated qualification sub-frameworks which conduce to the NQF as a single integrated system: the Higher Education Qualifications Sub-Framework (HEQSF), the General and Further Education and Training Qualifications

Sub-Framework (GFETQSF) and the Occupational Qualifications Sub-Framework (OQSF)⁵⁷. Especially the OQSF⁵⁸ seems at first sight to consider more focussed the farmers working experiences, because it contains besides a knowledge and theory component also a working experience component and a practical skills component. As the Minister of Higher Education and Training, Dr. Bonginkosi (“Blade”) Emmanuel Nzimande⁵⁹, mentions:

It is clear from SAQA’s investigation that the demand for occupational qualifications is greatest at NQF levels 1 to 6 and I agree that the QCTO [Quality Council for Trades and Occupations⁶⁰] should focus the major part of its work at those levels. (Republic of South Africa 2013: 3)

This seems also consistent with the qualifications of the BFFAW farmers in this project, which mainly range between NQF level 1 and 4, as chapter 4.2.1 will show. But, this framework again was developed for the purpose of “classifying, registering and publishing quality assured national qualifications” (QCTO 2013: 9) and can thus be summarized as a major national accreditation initiative driven by the Department of Labour. Nonetheless, this initiative mobilizes both financial and human resources to develop more appropriate training for specific work-related on-the-job training, besides general theoretical education. The development

57 All together three Quality Councils (QC) have been established to develop and manage each of the sub-frameworks of the NQF: the Council on Higher Education (CHE) for the HEQSF, Umalusi for the GFETQSF and the Quality Council for Trades and Occupations (QCTO) for the OQSF.

58 This framework has been conceptualized and drafted by the Department of Labour, supported by the German Association for Technical Cooperation (GTZ; now GIZ) (South African Department of Labour 2008). Furthermore it is approved by the Minister of Higher Education and Training (Notice 1040 of 2012; Government Gazette No. 36803 of 30 August 2013) in terms of the National Qualifications Act, 2008 (Act No. 67 of 2008) and as contemplated in the Skills Development Act, 1998 (Act No. 97 of 1998).

59 Dr. Nzimande has been a member of the South African Communist Party (SACP) since 1988, where he has held the position of the General Secretary of the SACP since July 1998. He is also a member of the African National Congress (ANC) National Executive Committee, a member of the ANC National Working Committee (NWC) and the Chairperson of the Financial Sector Coalition Campaign (FSCC). Dr. Nzimande was appointed as the first Minister for Higher Education and Training in South Africa in May 2009 (cf. URL: <http://www.sahistory.org.za/people/emmanuel-bonginkosi-nzimande>; [18.09.2014])

60 The Quality Council for Trades and Occupations established in terms of the NQF Act of 2008. It is tasked to achieve the objectives of the NQF and to develop and manage the OQSF (QCTO 2013: 5).

of an “occupation” here is demand-driven (FAO 2010: 20) and was initiated in a collaborative effort by the industrial sector and the Department of Labour. After the establishment of an advisory committee, roles, skill levels and course curricula are defined and can be embedded in existing courses, for example at agricultural colleges or universities or be certified autonomously with higher diploma to degree level. In this study *A review of experiences of establishing emerging farmers in South Africa*, the Food and Agriculture Organization of the United Nations (FAO) finds that a long-term strategy of land reform requires an enhancement of systematic and work-related training (FAO 2010: 20).

The definitions given in the OQSF provide some idea of how the required knowledge is systematized and shaped by the official political discourse. The professional terminology differentiates between a three-level structure of qualifications, starting with a more general understanding of, firstly, *Qualification* which is described here as a

planned combination of learning outcomes which has a defined purpose or purposes, intended to provide qualifying learners with applied competence and a basis for further learning and which has been assessed in terms of exit level outcomes, registered on the NQF and certified and awarded by a recognised body. (QCTO 2013: 5)

Secondly the framework defines *Occupational Qualification* as a

qualification that consists of a minimum of 25 Credits associated with a trade, occupation or profession. It results from work - based learning, consists of three components (knowledge, practical skills and work experience) and has an external summative assessment. (QCTO 2013: 5)

The third level is the *Occupational specialisation* which includes a

skills set related to an occupation and which may be more or less complex than that of the occupation to which it is linked. (QCTO 2013: 5)

All these criteria are more or less fulfilled by the farmers – theoretically, especially regarding their farming experience and practice, but still the lack of certified knowledge prevents them from becoming acknowledged as the “experts” that they are.

4.2.3 Land reform and tenure status

A brief chronology of South African land policy over the last hundred years indicates that the situation of the BFFAW farmers does not result primarily from individual choices, but is rather determined by the socio-political conditions of this period of South African history.

Referring to Beinart and Delius (2015: 669), the “[a]lienation of land from Khoisan and Africans to whites resulted from conquests between the seventeenth and nineteenth centuries, as settlers and colonial states expanded their authority into the interior. This expansion required both violence and legal measures: annexations, the survey and privatisation of land and a new colonial civil authority.”

With *The Natives Land Act* of 1913 (Act No. 27/191), South African land policy finally recognised the dispossession of land that has already been established during the preceding decades in the 19th century (Beinart and Delius 2015: 669).

Important to mention is the fact that “[i]n the Cape, the Act was of no legal effect. [...] It took many years before the controls over squatting and sharecropping transformed rural realities into a more uniform pattern of labour tenancy” (Beinart and Delius 2015: 669). Without delving into the history of this act too deeply, it is important to mention at this point that the South African history of land reforms was no straight process with nation-wide consistency, but evolved into locally specific variations.

Nevertheless, while the *Natives Land Act* in general aimed to constrain further dispossession, it in effect led to the administrative expropriation of the “native” population, and thus exacerbated the highly unequal land distribution structure impaired during the Apartheid system from 1948 onwards. Under this act the spatial separation of different ethnic groups, especially by forcing the “black” population to live in narrowly limited “Native Reserves”, also called “Bantu Homelands” or “Bantustans”, led to high disparities with regard to socio-economic resources and capacities. This system also increased the amount of migratory labour, especially in the agrarian economy and the mining sector, because it “prohibited the establishment of new farming operations, sharecropping or cash rentals by blacks outside of the reserves, which made up only 7.7 per cent of the country’s area” (Deininger 1999: 664). Furthermore *The Natives Land Act* permitted the government to implement a permission to occupy (PTO) system, which authorized the strengthened tribal authorities to regulate and to allocate land in the dominated areas. PTO titles were allotted to residents as land titles “but were often exploited by traditional and colonial authorities” (McCusker 2007: 7). With further legislative acts, such as *The Bantu*

*Authorities Act*⁶¹ of 1951, followed in 1959 by *The Bantu Self-Government Act*⁶², the Union of South Africa intensified the territorial segregation with “White” and “non-White” South Africans and shifted the governance from “direct” to “indirect” rule (Van den Berghe 1966: 411). Van den Berghe (1966: 412) already concluded in 1966 that “the ‘Native Reserves’ are being restyled into semi-autonomous puppet states or protectorates under a quasi-traditional aristocracy”. Determined by the ambitions for separation, in 1950 the South African government founded an advisory council under the direction of Professor Frederik Rothmann Tomlinson, which was called the *Commission for the socioeconomic development of Bantu areas within the Union of South Africa* (also known as *Tomlinson Commission*). This institution pursued the objective of producing scientifically “objective” arguments for the Apartheid segregation policy founded on scientific analyses. Facing a remarkable population growth between 1955 and 1969, with an increase of the population density from 60 to 110 persons per square mile (Simkins 1981: 271; Tomlinson 1983: 366; Evans 1997: 243), the recommendations of the commission included the following three primary policies. Firstly, the *separation* of farmers from non-farmers was intended to differentiate them according to their sustainable minimum income from agricultural production, treating them as “economic units”. Secondly a land *rehabilitation* policy was formulated to recover overgrazed and eroded farming areas. And thirdly the *industrialization* of the homelands to recompense the landless people and those who would foreseeably be dispossessed of their land, by creating 50,000 jobs per year (Evans 1997: 240, Tomlinson 1983: 366). Thus the Bantu Authorities system was fused with a policy for economic development, forcing the chiefs to adapt their traditional governing practice to a regional economy. As a result the subsistence capacities of the reserves dropped dramatically after the 1950s “to the point of nonexistence” (Evans 1997: 244f).

After the abolition of the several race-based acts – the Natives Land Act was repealed by President F.W. de Klerk in 1993 – a three-part land reform was initiated by the ANC government (Deininger 1999). Since the end of Apartheid in 1994, land reform and redistribution have become serious topics and driving forces of post-Apartheid political change. The new tripartite policy entailed restitution, land tenure reform, and land redistribution in order to foster reconciliation and to recompense

61 The Bantu Authorities Act reinforced the structures of traditional and tribal authoritarian governance in the separated areas (McCusker 2007: 7).

62 The Bantu Self-Government Act strengthened the status of the eight “black national units”, the Bantustans, by declaring them to independent states with local autonomy, enhancing anew the tribal legislation (McCusker 2007: 7).

inequalities resulting from Apartheid (South African Department of Land Affairs 1997: 10ff., 32f.). The general aims of this policy were to redress the injustices of Apartheid, to foster national reconciliation and stability, to underpin economic growth and to improve household welfare by alleviating poverty (Kariuki 2004: 7). All restitution cases were initially treated by the Land Claims Court and Commission, established in 1994, whose current focus is limited to matters in dispute (Hall 2015). However, experience has shown that even in cases of quick legal decisions, “the inability of the vast majority of the population to furnish written evidence makes this option feasible for only a small part of the population” (Deininger 1999: 664). While the redistribution strategy focuses on the general imbalance of land distribution by enhancing a willing buyer-willing seller approach to transfer land from “white to black” communities (Moseley 2008: 324), the land tenure reform has been developed to regulate the land rental market and includes the reform of tenancy laws. Although a land tenure reform will “benefit rural livelihoods, facilitate infrastructure and service provision, and economic development”, Adams et al. (1997: 9) argue that land tenure reform itself is not enough, but needs to be “accompanied by access to inputs, credit, extension services and markets and when government takes other actions to stimulate investment”.

After almost 15 years of experience observers criticized that only a small amount of farmland has changed hands and that restitution has proceeded slowly (Turner and Ibsen 2000). Consequently, the South African Government reconsidered the redistribution policy and substituted this radical form of redistribution and tenure reform with an enhanced decentralized planning strategy aimed at promoting a class of “black” commercial farmers (Moseley 2008: 323). This effort gave rise to the establishment of the Land Redistribution for Agricultural Development (LRAD) Program. It consists of various sub-programmes which focus on agricultural development, settlement and non-agricultural enterprises, like eco-tourism projects. This model of “negotiated land reform” was heavily influenced by external actors, such as the World Bank, who argued that radical land redistribution restricts economic growth and the development of free markets (Moseley 2005: 48). The overall goal of this land reform is the transfer of 30 per cent of all agricultural land over a period of 15 years (South African Ministry for Agriculture and Land Affairs 2012), relying on the voluntary sale of commercial farms at fair market prices (Moseley 2005: 48; Deininger 1999). The initially projected timeframe of five years had to be adjusted to reality, and was consequently extended until 2014. Attached to the reform are sub-programmes which

include shared equity schemes⁶³, LRAD grants⁶⁴ for commercial agricultural activities and the establishment of communal farming areas⁶⁵. The strategic goal behind these efforts was to promote economic development in rural areas by establishing a group of “black, market-oriented farmers”, who produce agricultural goods most efficiently (cf. FAO 2009: 25). Since 2006 the LRAD strategy has been successively replaced by the Proactive Land Acquisition Strategy (PLAS). Structural changes in 2010 put the proactive PLAS in the position of the only land acquisition model of land redistribution in South Africa. This supply-driven model, that is still operating with the “willing-buyer, willing-seller” principle, has put the state into the position of the lead driver, buying the land directly from private owners. The Department of Land Affairs then “identifies beneficiaries to whom this land can either be leased or transferred in private ownership” (Hall 2009: 81).

Theoretically speaking, the way has been paved for the “emerging farmers” to become independent subsistence or small-scale, up to commercial farmers. The next subchapter will outline whether theory and practice meet in reality.

4.3 The *BFFAW farmers*: Socio-economic conditions

Introducing the living conditions of the 117 BFFAW farmers, the next sections will give

63 The South African Ministry for Agriculture and Land Affairs describes shared equity schemes as follows: “Participants can make the requisite matching own contribution, and receive equity in an agricultural enterprise tantamount to the value of the grant plus the own contribution. Because under the terms of LRAD, the grant is intended for people actively and directly engaged in agriculture, the grant recipient in the case of the equity scheme will be both a co-owner and employee of the farm. The purchased equity should be marketable in order to retain its value” (South African Ministry for Agriculture and Land Affairs 2012: 2).

64 The grants are conceived as follows: “They [the farmers] will access the grant and combine it with normal bank loans, approved under standard banking procedures, and their own assets and cash to purchase a farm. These farmers will typically have more farming experience and expertise than those accessing land for subsistence or food-safety-net-type activities” (South African Ministry for Agriculture and Land Affairs 2012: 2).

65 The South African Ministry for Agriculture and Land Affairs presumes that the target groups already produce under legal tenure conditions, as the next quotations exemplifies: “Many people living in communal areas already have secure access to agricultural land, but may not have the means to make productive use of that land. Such people would be eligible to apply for assistance so as to make productive investments in their land such as infrastructure or land improvements. These projects may take on the character of food safety-net projects, or may be more commercially oriented” (South African Ministry of Agriculture and Land Affairs 2012: 2). This assessment determines strategic planning, although it doesn’t agree with reality of the small-scale farmers. The following subchapter 4.3 will elaborate on that.

an idea of their qualifications, household size, land tenure status, agricultural practices and products as well as some specifics about the different types of cooperations that some of these farmers are involved in. All data are based on the indications provided on their application forms, and will be presented in anonymized form. What needs to be emphasized is that the presented tables only represent this specific group of farmers, and as such they may diverge from official national regional or topic-related statistics.

The distribution of male and female participants is highlighted in table 6.

Table 6: Distribution of male and female participants

Workshop group	Female	Male
I (02.09.-19.10.2013)	17	22
II (30.10.-29.11.2013)	10	29
III (04.11.-19.11.2013)	8	31
Total	35 (29.9%)	82 (70.1%)

Source: Own calculations.

Table 6 demonstrates an increasing disparity in the amount of female and male participants between workshops I and III. While in the first workshop an almost equal number of women and men are recorded, the numbers of workshop III show an imbalance of approximately 1:4. Attendance at the workshops was 29.9 per cent females and 70.1 per cent males. These figures are representative of the authoritarian constitution of most of the households, which would usually be officially represented in public life by a male person. As this project does not focus on gender inequalities, sexual distribution will not be reflected systematically in the analysis.

The farmers were offered both an English and an Afrikaans version of the application forms. As table 7 on the following page shows, in total 42.7 per cent (corresponding to 50 people) of the farmers chose the English form, while 57.3 per cent (or 67 applicants) decided to use the Afrikaans version.

Table 7: Applicants' choice between English and Afrikaans application form

Workshop group	English form	Afrikaans form
I (02.09.-19.10.2013)	23	16
II (30.10.-29.11.2013)	17	22
III (04.11.-19.11.2013)	10	29
Total	50	67

Source: Own calculations.

The result would suggest that there might be an equal status of English and Afrikaans in the lives of the farmers. But, even if an English form was chosen, in many cases the answers were given in Afrikaans. The introduction of the interview partners (see chapter 4.4) will elaborate on the strategy behind this discovery, by discussing their language preferences.

Apart from collecting personal contact details, the application forms are thematically structured into three parts: individual qualifications, living conditions and the farming practice.⁶⁶

4.3.1 Educational and occupational qualifications

Aiming to receive an impression of the individual qualifications,⁶⁷ the associated question was formulated as an open question without any prescribed specifications. As a result, the diffusion of answers varies between *school education* and *occupational qualifications*, including non-specified courses and experiences. In total 11 farmers stated explicitly that they did not have any qualifications (in a broad sense). A further 21 farmers did not specify their qualifications by not answering the question at all. The question about qualifications is an interesting one since it gives an initial impression about some standardized cognitive features of accessing knowledge as a basis for the data analysis in the next stage of this project.

66 The different parts of the form are presented in a reconfigured order.

67 Question 22: What qualifications do you have?/ Vraag 22: Watter kwalifikasies het jy?

School education

Again considering the farmers's responses on the application forms, the following table 8 is deduced from an overview of the South African Qualifications Authority (SAQA) about the attribution of qualifications and part qualifications (SAQA 2014b) and illustrates the distribution of farmers on the different qualification levels, as they could be summarized from the variety of answers.

Table: 8 Overview of school education of BFFAW attendants

Qualification		NQF Level	Farmers
		1	2
		2	2
Grade	8	1	3
	9		4
	10	2	4
	11	3	4
	12	4	9
Standard	6	1	3
	7		1
	8	0	0
	9	0	0
	10	4	1
Matric (Standard 10/Grade 12)		4	6
Total		22	39

Source: Own calculations.

The figures show that, overall, 39 out of 117 farmers stated their school educational qualification when asked for their qualifications. A total of 13 of these farmers can be assigned to the NQF level 1, which describes the learning achievement of *Intermediate* and *Senior Phase* in the *General Education and Training* (GET). According to the *Level Descriptors* (SAQA 2012: 5), the competences of the farmers attached to NQF level 1 (or Level 1) can be condensed as follows:

A Level 1 qualification is characterized by general knowledge and basic reading, writing and numeracy skills and the ability to apply him-/herself to a task under direct supervision or guidance. Furthermore, within the scope of a Level 1 qualification, the

person gained a problem-recognizing and -solving competence regarding (familiar) everyday situations and is able to recall, collect and organize information as well as to understand symbolic systems. The person is then able to demonstrate an understanding of the context in which he/she operates, including scheduling tasks and accessing relevant resources. Finally Level 1 reflects the ability to work in a team and to identify and adapt to values and ethics in a specific environment, as well as to develop individual values and ethical standards.

A total of 6 farmers fulfil the official qualification requirements of NQF level 2 (or Level 2) by having completed Grade 10, or Standard 8. They exceeded the GET band and can prove *Further Education and Training* (FET). Their expertise and skills on Level 2 officially comprise specific knowledge, which is related to a relevant subject area of education or work and can be demonstrated in relevant activities. Advanced numeracy and literacy skills belong to Level 2, as do a disciplined and well-structured method of learning and organizing information, a problem solving competence regarding routine problems and the ability to apply personal ethics and values to a specific context (SAQA 2012: 6). These capabilities are applicable for many job roles.

Altogether, 3 farmers dropped out of school after Grade 11 and would thus be linked to NQF level 3 (Level 3). In abstract terms they are certified to gain expertise and skills in relevant subjects self-reliantly and are able to interpret information and to present it in a well-structured and reasonable manner.

Finally, a total of 16 farmers fulfil the recommendations of NQF level 4 (Level 4). They have gained the matriculation certificate, thus completing the FET band within the Basic Education System. These farmers are attested a high level of knowledge in a subject and good argumentative, evaluative and problem-solving capacities. Students on this level might envision a working career in a supervisory position or a university career. Summarizing the results, the school qualifications range between no formal school education and NQF level 1 to 4. According to the official NQF framework the competences of the farmers vary in very general terms between these features:

- In general) Learning from narrow to wider contexts, but always under supervision/mentoring
- a/b) From basic to specific knowledge and the ability to generate knowledge from and connect it to related fields
- c) From numeracy and literacy to the establishment of efficient and appropriate learning techniques

- d) From problem identification to complex and adaptive problem solution
- e) From identification to compliance and wider contextualisation of ethical standards
- f) From basic numeracy and literacy to capacity of interpreting and evaluating text contents
- g) From information repetition to communication (including features of logos and pathos)
- h) From the ability to contextualize direct environment to a systemic understanding of wider scope
- i) From self-management under supervision to a self-responsible learning performance
- j) From ability to work in a team to a contributor to team efficiency right up to developing team leading competences

All in all, 18 farmers indicated explicitly that they were illiterate and were accompanied during the workshop by someone who was able to read and write. They cannot be linked to an NQF level by means of school educational features. Having been asked how a South African citizen receives his/her NQF level, especially if they have no official certification or proof of their skills, the Goedgedacht Catering Manager Ms. De Bruin (2014) shared the following insight with me:

i think if they want to apply to a job and you don't have any qualifications a lot of people won't even look at it and if you want to apply for a NQF level then you at least did grade 10, but here's also a thing that we do in south africa where you study in the evenings, you get classes three times a week and in two years time you have your matric. i don't really know how the apartheid schooling in that years worked, but my dad went to school in that years and he was only allowed to finished at grade 7, then he left school to work on a farm with his dad, so its tough to really find work without any qualifications. in south africa you also need good references otherwise you won't [find] any work, you only will be semi-permanent on a farm working in the vineyards or a in a restaurant cleaning dishes. (Skype conversation with Salome de Bruin⁶⁸)

Her observation describes a reality that many of the small-scale farmers also face. It already points to a status of incapacity to work in a legal framework above the

68 Ms. de Bruin is employed at the Goedgedacht Farm in Riebeeksrivier and one of the Managers responsible for the Catering Service. She is a 30-year-old lady who is descended from a family of farm workers.

level of subsistence production.

Occupational qualification

Besides the farmers mentioned who reported certified proof of their educational experiences, the vast majority do not possess any documentation confirming or describing their skills or expertise. Thus the question remains of which NQF level the farmers fit into, if they have no qualifications in the form of degrees, but only experience-based knowledge? How can they compete for jobs, if their knowledge cannot be proven or “verified” by certificates?

Before elaborating on the political inventions concerning this topic, the following table presents further acquired expertise, including occupational qualifications, which was mentioned by the BFFAW farmers.

Table 9: Overview of occupational qualifications of BFFAW attendants

Qualifications	Extent	Farmers	Total
Agricultural farming experience	2 years	1	28
	4 years	1	
	10 years	1	
	20 years	2	
	40 years	1	
	Not specified	21	
Livestock farming experience	20 years	1	5
	Not specified	4	
Development programme for farmers (n.s.)		3	17
Course in farming/kursus in landbou		14	

Source: Own calculations.

The figures show that 28 farmers mentioned having agricultural experience, ranging between two years and a non-specified timeframe, which often covers the period from childhood to present adulthood. This expert knowledge is usually not verifiable in terms of qualifications, but rather “learning by doing” expertise. The same applies to

5 farmers who emphasized their livestock farming experience. Besides the applicants who mentioned their experience a further 17 persons indicated courses in farming (*Afr.* landbou) or from a development programme for farmers. Although the context of the courses is not exactly determinable, they are an interesting indicator of an increasing political awareness about the historical fragmentation of qualificational standards in the range of education and occupation within the country.

The farmers' indications show that the training and courses related to the OQSF start to find their approval, although still only a small number of farmers finally make use of the opportunities. One could speculate that this fact might result from a lack of self-confidence and a residual mistrust of national institutions and policies on the farmers' side, or an insufficient communicative access to the farmers.

4.3.2 Available means of telecommunication

The Census of 2011 revealed that 34 per cent of households in the City of Cape Town Municipality have a landline connection, while 91.3 per cent possess a cellphone. Officially speaking, the Western Cape differs only minimally with 30.8 per cent of the population contactable via landline and 88.9 per cent owning a mobile phone. In both cases, less than 50 per cent of households have internet access (Statistics South Africa 2012). The application forms reveal a completely different distribution of access to means of telecommunication. Working out the *availability* characteristics, the data revealed that 106 farmers from the group have a mobile phone, and 89 of these can only be called via mobile phone. An amount of 17 of the farmers are available via landline (and partly via mobile phone), while 11 farmers do not have access to their own communication tools at all. Only two farmers provided an email address. The available means of communication is an interesting feature, because these data reveal on the one hand that the farmers are in a position to communicate with each other flexibly and are available independently of their location. This is not a chosen practice in each case, because not even 50 per cent (46 farmers) of all BFFAW farmers actually have access to electricity in their house⁶⁹. On the other hand, the information demonstrates the status of internet connections in their common communication practice, but also their information access strategy for e.g. weather forecasts and climate phenomena, which is insignificant in both cases.

69 A total of 54 farmers explicitly stated that they do not have access to electricity, while 17 persons did not answer the question.

4.3.3 Land size and tenure status

While the farmer's qualifications and available means of telecommunication provide insights into the system of knowledge production, the data of this paragraph map their living and agricultural production conditions.

Household size

The application forms indicated that in most cases between 1 and 9 people belong to the households of the group of BFFAW farmers, as table 10 shows, whereby the majority of the households comprise 1 to 3 people.

Table 10: Number of people living on the farms of the BFFAW participants

People living on the farm	0	1	2	3	4	5	6	7	8	9	10	10+	Not specified	Total
	9	11	17	12	6	9	7	2	2	1	0	3	38	117

Source: Own calculations.

The amount of farm workers (table below) includes family members as well as employees. The numbers here range between 1 and 5 people who work on the farms, despite 4 exceptional cases in which the enterprise size is even larger. Farms without residents apply to the case of farmers who e.g. live in town while their farms are situated out of town.

Table 11: Number of people working on the farms of the BFFAW participants

People working on the farm	0	1	2	3	4	5	6	7	8	9	10	10+	Not specified	Total
	9	20	30	8	9	3	0	0	0	0	2	2	34	117

Source: Own calculations.

The farms without workers might have been interpreted as extra employees, who are hired in addition to the productive capacity of the household itself, or include farmers who have received land and are just about to start their agricultural production. The farms involved without residents and without workers, 9 in each case, are not the same. In terms of human resources, these figures reveal a concentration of small-scale agro production capacities.

Land size

Land size also corroborates the small scale of production capacities. It mainly varies, in almost 60 per cent of the cases, between 0.5 ha and 4 ha. These spatial restrictions illustrate the limitation of potential crop yields.

Table 12: Size of farmland accessed by BFFAW participants

Size of farmland (ha)	Number of farmers
< 0.5	4
0.5	12
0.5 – 1	16
1.1 – 2	9
2.1 – 3	10
3.1 – 4	17
4.1 – 5	4
5.1 – 6	3
6.1 – 7	1
8 – 10	8
11 – 20	0
21 – 30	2
> 30	2
Not specified	29
Total	117

Source: Own calculations.

Tenure status and title deeds

Tenure status adds a further perspective on the farmers' legal environment. Although the application form offered only the choice between owning and renting the land they

live on⁷⁰, the group of participants is divided into four subgroups, as table 13 shows.

Table 13: Land tenure status of the total of 117 BFFAW participants

Land tenure status	Total		Title deeds		No title deeds		Not specified title deeds	
	#	%	#	%	#	%	#	%
Own	27	23.1	5	4.3	14	12	8	6.8
Rent	37	31.6	0	0	12	10.2	25	21.4
Informal	9	7.7	0	0	0	0	9	7.7
Not specified	44	37.6	0	0	12	10.2	32	27.3
Total	117	100	5	4.3	38	32.4	74	63.2

Source: Own calculations.

The label “informal” was added by the farmers themselves. Most people with an unspecified ownership status might also belong to the farmers who occupy land informally. Almost 50 per cent of the whole group thus live with an insecure property status. The application forms reveal that only 27 of the 117 local farmers own the land they live on. Only 5 of them have title deeds. It is important to mention here that these are the only 5 farmers in the whole group who are in a position to prove their ownership status at all. A further 14 farmers from this group of owners stated that they do not have title deeds, whereas 8 farmers did not specify an answer here. One-third of the collective group rent their land, although 12 do not possess an official rental contract. By looking at the overall average ratio of farmers who explicitly state that they do not have title deeds, it becomes clear that these 32.5 per cent are not exceptional cases, but the most common living circumstances. The estimated number of unreported cases in the group with unspecified title deeds might even raise this percentage. According to some of the farmers, a common practice is to conclude an informal (handshake) agreement with the owners, who often live overseas. It is not uncommon for these undocumented contracts to be even inherited from one generation to the next, on both sides. At first sight this seems to be a win-win situation: the disadvantaged farmers get the opportunity to secure their livelihoods on a small

70 Question 5: Do you own ... or rent ... the land?/ Vraag 5: Is jy die eienaar van die grond ... of huur jy die grond ...?

piece of land, whereas the owners are safe in the knowledge that their land is being made and kept fertile. At second glance, the lack of legal documentation keeps the farmers in the state of subsistence production, with the sword of Damocles above them since they might be expelled from that land at any time. Furthermore, without official title deeds they are denied access to funding opportunities, and therefore not able to diversify and upgrade their practices to increase their household income and thus reduce the risk of being affected by external shocks.

The figures show the high degree of insecurity farmers face. Compared to the official data from Statistics South Africa (2014) for the Swartland region, it becomes obvious that, at 23.1 per cent, the proportion of owned land within the group is far below the regional average of 52.2 per cent. Also, at an estimated 50 per cent in the project cluster, the level of informal land occupation is significantly higher than the 17.3 per cent indicated by the official statistics of the South African government.

Table 14 : Tenure status in the Swartland district, South Africa 2013

Tenure Status	Ratio (%)
Rented	28%
Owned and fully paid off	43.6%
Owned but not yet paid off	8.6%
Occupied rent free	17.3%
Other	2.4%
Total	99.9%

Source: Statistics South Africa 2014, URL: http://beta2.statssa.gov.za/?page_id=993&id=swartlandmunicipality [21.08.2014].

What do these deviations reveal? They demonstrate that the level of insecurity relating to living conditions is even higher in the cluster of the BFFAW farmers than in the average distribution of the Swartland region.

Furthermore, the application forms showed that more than half of the farmers have had access to their current farmland for less than 10 years (table 15). These numbers correlate with the post-Apartheid era, in which most of the former farmworkers have become independent from their former landlords and received the opportunity to access their own farmland for agricultural production.

Table 15: Duration of access to current farmland of BFFAW participants

Duration of access to land (years)	Number of BFFAW participants
Less than 5	15
5 – 11	41
11 – 20	10
21 – 30	4
31 – 40	6
More than 40	4
Not specified	37
Total	117

Source: Own calculations.

All in all, land size and tenure status illustrate the moderate success of the land reorganization efforts (land redistribution projects and farm-equity schemes) that the Restitution of Land Rights Act from 1994 has initially initiated. The willing buyer-willing seller practice has not worked out for the small-scale farmers of the Swartland region, because the implementation of this system has been very difficult. Many of the potential buyers are offered the chance to purchase land without being involved in the initial negotiation process or without even having seen the land (Deininger 1999). In the case of the farmers from Atlantis, in a land redistribution attempt from December 2013 the City of Cape Town Metropolitan Municipality obviously intended to move the farmers to alternative agricultural land in order to lease or sell the land to external investors. The farmers criticized that after having restored the soil to fertile farmland they might be forced to move to alternative, less fertile areas, where they assume the crop yields to be lower (besides climatic insecurities). According to the farmers, after they were asked to apply for a piece of farmland, which they did in the range of 0.5ha to 5ha, the distribution mechanisms of the City of Cape Town Metropolitan Municipality did not consider their claims with regard to farmland quality and location.

Although a number of initiatives have been introduced to address the challenge of post-settlement support, such as the Comprehensive Agricultural Support Programme or the Micro-Agricultural Finance Initiative of South Africa (MAFISA), which provides microcredit, the subsidies do not necessarily trickle down to the small-scale farmers due to the impossibility of applying without proper tenure contracts or ownership certificates or title deeds.

4.3.4 Farming in practice

Connected to the size and status of the land is the question of agricultural practice on a small-scale level. The analysis includes the range of agricultural products as well as the resources which can be mobilized. Both aspects will be elaborated on in the following.

Agricultural practices and products

To get an idea of the diversity of farming products, the applicants were asked in an open question to name said products in terms of the past, present and future prospects. The variety of answers can be divided into two major product groups: agricultural products and livestock products. Table 16 summarizes the answers.

Table 16 : Agricultural and livestock farming products of the BFFAW farmers

Agricultural and livestock farming products	19. What have you farmed in the past?/ Waarmee het jy in die verlede geboer?	17. What are you farming?/ Waarmee boer jy?	18. What do you want to farm?/ Waarmee wil jy boer?
Vegetables (includes cabbage, beetroot, carrots, potatoes, spinach, pumpkins, green beans, green peppers, mushrooms, lettuce)	43	47	52
Onions	7	9	13
Flowers (includes flower seedlings)	0	9	8
Herbs	4	4	4
Organic composting	0	2	1
Fruits	1	1	3

Chicken (includes poultry, hens, broilers, laying hens, slaghoenders, hoenders, braaikuikens)	30	29	34
Pigs	57	53	58
Cattle	15	9	30
Sheep	11	12	32
Goats	14	12	19
Horses	2	4	4
Cows	2	3	8

Source: Own calculations.

In many cases more than one product was mentioned at the same time. In some cases, when the farm business was just starting up, only question 18 was answered. The answers showed that various types of vegetables belong to the main agricultural products, followed by onions and flowers. Especially in Atlantis and Riverlands some of the farmers mentioned a focus on flower production for new market access. One farmer from Riverlands connected this idea to a vision of a public garden, to which the local people could come for relaxation or for taking wedding photos. In this specific case the regular floods, destroying the flower beds, cannot prevent the farmer from investing again in this business. This raises the questions about the rationale of farming practices in general.

Livestock farming is dominated by chicken and pig husbandry. Despite the high risk of losing livestock through robbery, illness or by not being able to ensure food security for the animals, a plurality of the farmers would even increase the production of especially cattle, sheep and goats, as the dependency on climatic shifts seems to be much lower in this field of production.

Furthermore the question about water sources revealed the following main origins, depending on geo-spatial conditions. The option “municipal water” was not offered by the form itself, but was added by the farmers.

Table 17: Water sources used by BFFAW farmers

Water sources	Number of BFFAW participants
Municipal water	19
River/ Rivier	12
Dam/ Dam	9
Borehole/ Boorgat	40
Spring/ Fontein	12
None/ Geen	20
Not specified	16
Total	128

Source: Own calculations.

Due to their geographic position, river water and spring water is used mainly in Mamre and Riverlands. The expensive and irregular municipal water is purchased in every location, but predominantly in Riverlands. In most cases where water is obtained from boreholes, it is often shared between different users. The use of ground water carries the risk of being regenerative only under specific conditions, as it is renewed by percolation of rainfall or surface water. Soil conditions and precipitation intensity are the main factors behind a successful regeneration. If the soil has reached a critical degree of drought, it is not able to absorb the water. The shift of rainfall patterns also caused heavy floods in the winters of 2012 and 2013 in the Western Cape region, which shows that the concentration and reduction of rainfall occurrence to singular events with a higher degree of intensity, increases at first sight the risk of soil erosion rather than of poor groundwater renewal. In Mamre, a town which was spared by recent floods, a discussion with farmers in which I proposed this risk, showed that my concerns are not shared; in fact they were vehemently rejected. The farmers agreed upon the fact that neither floods nor a limitation of groundwater would influence their farming success substantially. A lack of experience has not yet convinced the farmers of a possible threat.

Furthermore the application form also asked about means of production by listing a range of equipment for agricultural production. The farmers were asked to specify their usage of each item. The form offered the options “own” and “share”, while the answer “accessible” was again added by the farmers themselves. It describes a sharing practice which is not based on a mutual investment, but on the generosity of the equipment owner.

Table 18 : Equipment used by BFFAW farmers

Equipment	Own/Eie	Share/Deel	Accessible	Not specified	Total
Wheelbarrow/ Kruwa	62	21	10	29	122
Spades, picks, forks/Grawe, pike, vurke	71	20	14	17	122
Tractor/ Trekker	2	26	6	87	121
Grop/Eg	5	17	6	97	125
Disc/ Skottelploeg	2	14	8	94	118
Plough/Ploeg	2	17	8	91	118
Scraper/Skrop	1	12	8	97	118
Rotorvator/ Kap(skaar)ploeg	1	15	7	95	118

Source: Own calculations.

The distribution of answers reveals that smaller farming tools, like a wheelbarrow or forks, do carry a higher probability of being owned by the farmers. The more expensive the equipment is the less affordable and available it is for the farmers. The system of communal equipment use is shown to be very prominent and productive and indicates a low degree of agricultural production. The considerable number that did not specify answers about some of the equipment might neither own, nor have access at all to these tools. The deviating total number is mostly attributable to occasional cases of indication of ownership and sharing at the same time.

One final question about the annual inputs that are used on the farm ⁷¹, the actual answers to the question, indicating a sporadic and low use of chemicals, herbicides, pesticides and fungicides and a moderate use of fertilizers, are not as interesting as the attached question about the “amount” or “hoeveelheid”. This is because this specification was understood in two different ways: firstly the amount of input in the measuring the units kilograms (kg) and tons (t), and secondly the amount of financial

71 Question 13: What inputs do you use on the farm and how much per year?/ Vraag 13: Wat is jou insette in die plaas per jaar en hoeveel is dit?

expenses of the material indicated per year in Rand (R) or Rand per maand (R p/m). This ambiguity in the interpretation of the question brings us closer again to the focus of this project. If a simple question can already be interpreted in different ways, what happens if an abstract explanation meets individual experience?

Cooperations and market access

In the context of land redistribution projects in the Western Cape, two broad categories have succeeded: 1) farms that are owned and run by the beneficiaries, usually white commercial farmers, and 2) farms that are run in equity-sharing arrangements, in which the (white) farm owner and the farmworkers become shareholders of the enterprise in a partnership. The second type of redistribution projects was mainly implemented in the 1990s in the Western Cape Province, and is mostly successful in the wine-growing sector, but does not serve as feasible option on a smaller production scale. Nevertheless, the BFFAW farmers also adapted to the national agro-political reforms, forming different types of legal cooperation which are also based on shared investment. In terms of shared equity schemes, these cooperatives are based on the idea of strategic commercialization by merging their crop yields in order to access new markets in addition to local ones. Mr. Philander, the capacity manager of the Goedgedacht Trust, describes the current reality of the farmers in the following way:

No, they're more like they know each other. But the one group, [name deleted; refers to the location Mamre] they have what we call a cooperative, a coop., and two other groups are organized in cooperatives as well, farming cooperatives. So we do have quite a few coops, cooperatives, but most of the farmers are not registered as a business, they are not part of a coop. They farm as a sole person, but they are not registered as a C. as well, it's not a business registration. And that's something that we discussed as well. We're not just talking about you doing a bit of farming here, but don't you wanna move, you know, forward and become a fully fledged commercial farmer with a registered business name or registered farm. It is a challenge. (Interview with Johnny Philander)

Mr. Philander paints a very gloomy picture of the farmers' reality. The lack of any official legal status as a professional prevents the farmer from making progress in diversifying his income. As an organizational form, the cooperatives again offer new opportunities for sharing the profit, but also the general business risk. Johnny Philander further evaluates the chance for success of these institutional forms as follows.

Most of them prefer to continue to just extend half a hectare into two hectares or one hectare. That's their ideal for now. I don't see them necessarily becoming part of a coop. They've been farming for too long on their own. So it will be extremely difficult to form one organization, especially because of the trust issues as well. There is this sort of deep seated mistrust almost, not towards government alone, but also amongst the farmers. So I rather protect my peace of farming here, what I do here, and sell it. One of the ideas that I tried to push was you can stay as your own small farmer, but you can access markets as a group, you know just get all your carrots together instead of having 200 kilograms of carrots you can have five tonnes and sell the five tonnes as a whole. You can still, you know, distribute the money afterwards, but I can see a problem in that as well, because if I brought 200 kilograms I can later claim, but look I actually had half a ton. So it is a challenge, not only the access to markets, but how do you combine what you have to and how do you negotiate for prices. If you have a small volume they can just say, that's what we're going to pay you for that. But if you have larger volumes, it's easier to start negotiating and who's going to take that responsibility to negotiate? Who has got the capacity? If they get somebody in from the outside to do that, that person might do something else as well and they don't trust him. (Interview with Johnny Philander)

He highlights the importance of trust for any cooperative success and intimates that the lack of trust in particular hinders the farmers when it comes to accessing new spheres of economic practice. Thus not only external factors determine their financial situation, also subjective convictions towards their fellow farmers limit the extent of improving success.

4.3.5 Conclusion: The vulnerable character of the BFFAW farmers

The analysis of the application forms shows that up until now the segregating structures of the Apartheid regime have determined the living conditions of the poor. The range of answers given exemplifies the interpretation diversity of open or underspecified questions. Only by contextualizing them within their historicity and in terms of the socio-political conditions, do they reveal insights into the living circumstances of the farmers. Even these conditions, being spatially and temporally stable only on a low level, create the farmers' vulnerability as presented before (cf. Müller-Mahn 2010). Defining vulnerability within the approaches of disaster risk reduction, the socio-economic context exposes the farmers to the risk of hazards (cf. Blaikie et al. 1994; Cannon 2008; Müller-Mahn 2010). The degree of inability to buffer these hazards by

economic, personal or social means, determines the level of disease resulting from it. Thus a low level of livelihood security increases the risk of being affected by changing conditions, for example economic, legal and even climatic. This approach helps to configure the socio-economic space in which knowledge production evolves. The lack of educational and occupational certification, as related to the National Qualification Framework, decreases the farmers' competitiveness on the job market. Furthermore the predominantly insecure tenure status and deficiencies in commercial farming expertise limit the potential success when obtaining external investment partners.

Depending on the location, the farms might be deficient in terms of water availability or be more prone to floods or droughts. All these circumstances determine the coping capacities and frame the farmers' scope of action. Moreover, the high dependency on crop yields on a subsistence or small-scale level increases the degree of vulnerability to "Climate Change". To counteract this situation, the South African development policy of informed participation for these vulnerable groups, as formulated in the Green Paper on an Environmental Policy for South Africa (Republic of South Africa 2010) and the following White Paper on an Environmental Policy for South Africa (Republic of South Africa 2011), intends on the one hand to increase awareness of climatic changes, to develop mitigation strategies on national, regional and local levels and to strengthen the resilience of the most vulnerable people, including the small-scale farmers. On the other hand policy follows a perspective of economic growth and is driven by the idea that a commercialization of farming practice, creating a social environment for "emerging farmers", will mitigate the sensitivity of the very same. The data exposed relating to this, that the farmers do not command useful experience in planning and managing commercial agricultural production above subsistence level, as they have only recently, in the post-Apartheid era, started to farm individually and to access local markets on an individual basis. Inconsistent land reforms prevent chances to expand agricultural production. The farmers have reacted with different types of cooperations with which they try to access new markets and to reduce the risks for their individual business. The success of the cooperations depends on the accumulated investment resources, the crop yields, but most of all on the organizational structure and relationships of trust between the partners. Johnny Philander summarizes the situation of the farmers with their specific challenges as follows.

The other major ones if we talk about the regional challenges, access, access to land. Not just access to land, but I mean I want to call it communal property. That pieces of land designated for small farming, that the municipality provides within their municipal area. For me that's the first challenge. Second challenge

is access to existing markets, economies of scale. I'm talking about delivering, small farmers getting together and once they go to the market delivering about a hundred tonnes of a specific, let's say green beans or pumpkins, a hundred tonnes deliver that to the market as a collective access to markets, is an issue in economies of scale. So the third one for me also would be besides the access to land, access to markets, that would be the technical skill of the farmers needs to be improved on a bigger scale. They have the expertise for one hectare, two hectares, but I doubt whether they have the expertise to, you know, to do it on fifty hectares. I want to qualify that statement. It's not just about finding people to work on the land, it's about managing the finances. It's about making sure that your cash flow is okay for the next year. It's about the insurance of your crop that is on the land. It's about the four things that you need to manage: planning, organizing, you have to control, and then the final one is not actually part of management, but it's part of the leadership you have to be able to lead people on the farm or where you are. That is a major challenge, because we have a history of Apartheid and if I'm a black farmer, people might not respond the same way to me as the owner of the farm, as they would have to a white owner. I'm guessing, but for me that is one of the challenges, because I grew up on a farm and I know of black farm owners who do have a struggle with employees. (Interview with Johnny Philander)

Considering this evaluation of Mr. Philander, the question remains of where to start implementing the development of climate-smart agriculture that lowers e.g. carbon emissions, is more resilient to climatic changes, and stimulates agricultural production, as formulated in the *National Climate Change Response Policy*⁷² (Republic of South Africa 2014). As an important step, the *National Climate Change Response Policy* aims with its Precautionary Principle⁷³ at strengthening awareness among the South African population of their own responsibility by “prioritising the development and maintenance [...] of the science-policy interface and knowledge management and dissemination systems to ensure that climate change response decisions are informed by the best available information”⁷⁴ (Republic of South Africa 2014). Thus the South African Government plans to “invest in education and awareness programmes in rural areas and [to] link these to agricultural extension activities to enable both subsistence and commercial producers to understand, respond and adapt to the challenges

72 See also: <<http://www.climateresponse.co.za/>>. [22.08.2014].

73 “The Precautionary Principle – a risk-averse and cautious approach which takes into account the limits of current knowledge about the consequences of decisions and actions”, c.f. <<http://www.climateresponse.co.za/home/gp/3>>. [22.08.2014].

74 See also: <<http://www.climateresponse.co.za/home/gp/4>>. [22.08.2014].

of climate change”⁷⁵ (Republic of South Africa 2014). This is where the political strategy meets the work of the Goedgedacht Trust, which finally implements a climate change awareness idea on a local level and provides practical examples for informed participation projects, especially on poverty reduction.

For a further contextualization besides the socio-economic setting of the case, the further section will elaborate specifically on the 21 interview partners, by analyzing their linguistic preconditions and practice.

4.4 The interview partners

Focusing on the specific subgroup of the BFFAW farmers, this subchapter elaborates on the linguistic preconditions, including the specific language skills, family languages and languages of education of the interview partners. It will further summarize their linguistic preferences and attitude towards individual languages. The answers regarding their information access reveal the major sources and practices for engaging with the topic of “Climate Change”.

4.4.1 Linguistic preconditions

To dissect the farmers' linguistic repertoire they were asked to provide information about the main languages spoken by themselves, their parents and their children. Furthermore, the questions aimed to gain insights about the family languages, describing the languages spoken in close family interactions, as well as the languages of schooling.

Language skills

The question about the interviewees' main language (*Afr.* hooftaal) revealed that 100 percent of the 21 farmers identify Afrikaans as their first language. Five individuals stated that they speak English as their second language. And in total four farmers are fluent in Xhosa. Asked secondly for the main language of their father and mother, the farmers also mostly identified Afrikaans as the first language of their parents. Only in one case each were Xhosa and German mentioned as the mother's first language.

75 See also: <<http://www.climateresponse.co.za/home/gp/5.2>>. [22.08.2014].

But not only was the mother tongue of the interviewees themselves and their parents asked about, also the language abilities of the following generation, the children, were surveyed. The results showed that 18 farmers also identified Afrikaans as the main language of their children, but 13 of them explicitly mentioned that they have some ability in English as a second language. The constant reference to the children's English proficiency suggests that the interviewees consider it to be highly important and relevant for this generation.

Family languages

While the question about language skills looks at participant's language abilities, the question about language use within close family interactions targeted the most intimate language practice. The whole group described Afrikaans exclusively as the most dominant language. Three people explicitly stated that they do not mix the languages in family interactions at all, but instead restrict their inner-familiar conversations to Afrikaans only. One might speculate that they also make limited use of obvious English loanwords.

'Waar nou dieselfde familieledede meer as twee tale gebruik, bv. kinders praat Afrikaans en ouers of grootouers praat Xhosa, meng julle die tale bv. Afrikaans en Xhosa, of hou julle die tale uit mekaar uit of praat julle elkeen 'n ander taal?' 'Ons meng nie tale nie.' (Onderhoud met AH)

'If now the same family members use more than two languages, for example the children speak Afrikaans and the parents and grandparents speak Xhosa, are you mixing the languages, for example Afrikaans and Xhosa, or do you distinguish between them or speak each one a different language?' 'We don't mix languages.' (Interview with AH)

As further 13 farmers indicated that they practise a mix of Afrikaans and English. The way that these interviewees subjectively interpret their language shift, can basically be divided into two forms according to their intentionality. The first form describes an *intentional shift* between the languages. The associated answers imply that Afrikaans and English are each different languages, isolated from each other and clearly delimitable. The interviewees therefore distinguish between speaking either Afrikaans or English, depending on the recipient's language. In linguistic terms, this principle could also be defined as a functional *situational type of codeswitching*, in which language shifts occur due to a variant main language of the recipient, the topic or the place of the communication. The given answers are not restricted to an innerfamiliar context of language practice.

Nee, ons praat net so maar Afri ... nee, deurmekaar maar. As ek nou met u gesels alleen nog hoogafrikaans. En als ek Engels spreek en 'n persoonjie inkom dan sal ons oorswitch na Engels toe. (Onderhoud met CD)

No, we speak only Afri ... no, but mixed. If I am talking to you then only in standard Afrikaans. And if an English speaking person comes in, then we switch over to English. (Interview with CD)

Ons is almal net Afrikaans. Ons het nog nooit andere tale gepraat nie, behalwe Engels. En immers praat ons net mit iemand wat mit ons Engels praat, so. (Onderhoud met MA)

We are all just Afrikaans. We haven't ever spoken other languages, despite English. And we always talk to somebody who speaks English to us, so. (Interview with MA)

Ons praat Afrikaans. As annerssprekende by ons kom, dan kan ons inval by hulle. (Onderhoud met CM)

We speak Afrikaans. When people who speak a different language come around, then we can join in [with their language]. (Interview with CM)

There are also family constellations in which not all family members share the same mother tongue. Furthermore, they do not even master the language of certain family members, as the next quotation shows.

Ek wou eintlik Xhosa leer. Die oupa weet nie wat julle praat. (Onderhoud met SD)

I actually want to learn Xhosa. The grandfather doesn't know what you are talking about. (Interview with SD)

This gap might appear especially inter-generational. There is no evidence about how exactly the families handle the different language capacities; nevertheless they seem to practise a mode of communication which enables all family members to participate in the inner-familiar communication.

But there is also a second interpretation mode of code-switching, namely a *non-intentional* language shift. The switching between the lexicon of Afrikaans

and English appears unintendedly within a single conversation. Although the interviewees try to distinguish clearly between both languages, they are used in a mixed mode on sentence, phrase and word level in everyday language practice. This subjective reflection is reminiscent of *non-functional code-switching*, a type of language production which describes an unintended shift between two languages. The interview partners interpret the high degree of English loanwords in Afrikaans as a shift between two separate languages.

As hulle kan praat die taal, dan praat hulle, ja (laughter) ... Afrikaans, maar dit word gemeng ook ja. (Onderhoud met RP)

If they can talk the language then they talk the language, ja (laughter) ... Afrikaans, but it does get mixed. (Interview with RP)

Ja jong, weet jy wat, ons praat Afrikaans, Engels – jy bly in die Kaap. Kyk, en ons meng. Afrikaans en Engels meng ons Kapenaars. (Onderhoud met RS)

You know, we speak Afrikaans, English – you live in the Cape. [There is not an exact English equivalent of the Afrikaans term “die Kaap” – as a region it is more or less the same as the present-day Western Cape Province.] Look, we mix. We people from the Cape mix Afrikaans and English. (Interview with RS)

Ons Afrikaanse mense, ons praat mos maar nou gemix in Afrikaans. Jy denk jy praat Afrikaans maar dat altied miskien Engels, of twee woorde wat Engels is, maar meeste maar Afrikaans. Maar ons mix dat so ons gewend is, ons mix die taal. (Onderhoud met CA)

We Afrikaner, we namely mix in Afrikaans. You think you speak Afrikaans, but there is all the time a bit of English, or two words that are English, but most of the time Afrikaans. But we mix because we are used to it, we mix the language. (Interview with CA)

The question remains whether to conceive their code-switching as a mixture of two languages or as the result of a linguistic incorporation process in a language contact situation. An objective distinction in this regard is difficult, because this would be tantamount to the decision about the higher validity of the (rational) outsider or the (intuitive) insider perspective. Nevertheless, what becomes clear is that English is

perceived as the “other” language, isolated from Afrikaans and not belonging to the group identity. The language Afrikaans serves as a unifying element and at the same time as a distinctive feature.

Languages of schooling

The interviewees identified in 19 cases Afrikaans as the medium of instruction in their school education. Two more farmers mentioned English as a second language of instruction, introduced from Standard 6 (Grade 8) onwards. Moreover, the question asked about the mother’s and father’s language of schooling revealed a total of 15 mothers and twelve fathers received their school education in Afrikaans. In one case the mother did her schooling in Khoekhoe, a Khoisan language, and the father was taught in Arabic, as he was a practising Muslim. The interviewee himself did his schooling in Afrikaans. In one case the father attended a school that teaches in Xhosa. Another mother was taught in English at school. Generally the question about the parents’ school education was often complemented by the information that the school days were limited to the first one or two years. A further eleven parents (four mothers, seven fathers) didn’t attend school at all. The generation of the farmers’ children were mostly taught in Afrikaans (16 cases), and in four cases in a mixed mode of Afrikaans and English. One farmer could not answer the question because he has no children.

The data showed that the share of non-schooling decreases from one generation to the next. It revealed further that the role of English as a medium of instruction tends to increase in chronological order between the three generations.

4.4.2 Linguistic preferences

The linguistic preferences of the interview partners include information about language preference, which has been extracted from a retrospective reflection about the language skills and language of schooling, and the attitude towards the relevant languages, mainly Afrikaans and English. The linguistic preferences shall give an idea about the sentiments towards these languages and the farmers’ evaluation of their relevance and status.

Language preference

To get an idea of their language preferences, the interview partners were asked if they would have retrospectively chosen the same language of schooling for themselves and

for their children again. The hindsight perspective enables them to set their linguistic acquirements in a historical relation to their current personal socio-economic situation. A majority of 15 farmers answered that they were satisfied with their language of education, which is Afrikaans, while six interviewees would not choose the same medium of instruction again for themselves. Despite their mode of satisfaction, a total of eleven interview partners would have rather received a more English-intense education. A further four farmers feel Xhosa is missing in their personal linguistic repertoire.

Opinions are slightly different when it comes to the children's language of schooling. While eight interviewees would have chosen the same language (Afrikaans) again, the majority (eleven farmers) would retrospectively rather choose English instead of Afrikaans as a medium of instruction for their children. Besides the languages of education, the interviewees mentioned Xhosa in seven cases and in eight cases an unspecified amount of "further languages" as a relevant addition to the children's language repertoire.

The comparison shows that the farmers are basically content with their language of schooling, although many of them would have appreciated a well-founded teaching of other languages, especially English. Moreover they see a higher necessity for their children to access a greater variety of languages.

Language attitude

In this case, the term *language attitude* means an evaluation of a language or language practice with a positive or negative connotation. As language preference refers to a more descriptive assessment of like and dislike, the attitude will give some explanations of the often experience-based reasons for specific evaluations.

To explain the reason for the indicated necessity of multilingualism, the interviewees mention the challenge and strategies of adapting to the linguistic conditions of the social and economic environment in four different *domains*. The first one is adaptation to the language competence of the communication partner in the immediate *situational environment*.

Ek sê, wat omstandighede is, en daarvanaf kyk jy met wie jy te doen het en nou besluit jy watter taal goed sal wees. As 't nou 'n bruin persoon is dan sal eerste opslag wees Afrikaans. Maar ook dan hang dit af uit watter 'area' hy kom. As jy is 'n keer in die stad, dan is 't Engels wat die eerste taal is, maar ook Afrikaans hopelik. (Onderhoud met GB)

I am saying, what are the circumstances, and from this point you see whom you are dealing with and which language would fit. If it is now a "brown" person then

the first attempt is Afrikaans. But then it still depends on the area he comes from. Once you are in town then English is the first language, but hopefully Afrikaans too. (Interview with GB)

The second domain concerns an adjustment to the linguistic conditions of the social groups in the direct *living* (or regional) *environment*.

Nee, nee, kyk, op die huidige oomblik, volgens wat ons nou gesien het, vir my sou 't beter wees as hulle die vyf tale ken wat in Afrika aandui, sien? As hulle drie kan vat, Engels die hooftaal, ja ek sou 't verkies want. Die rede hoekom ek 't sê, ek het mos groot geword in die Xhosa's, nè, ons het in de wêreld tussen Xhosa's groot geword, en my vrou kan 't nie lekker verstaan nie, maar ek was, omdat ek nou groot geword het met hulle, sien? (Onderhoud met LD)

No, no, look, in this time, after what we have seen, for me it would have been better if they [the children] know the five languages which are spoken in Africa, you know? If they can catch up with three, English as main language, yes I would prefer that. The reason why I am saying this, I grew up in the Xhosa's [area], and my wife can't understand it very well, but I could, because I grew up with them, you see? (Interview with LD)

Some interviewees summarize that the current social constitution of South Africa, presumably that of the post-Apartheid era, makes it necessary to be capable of more languages than Afrikaans. This third domain refers to an adaptation pertaining to the challenge of social participation in an obvious larger *national environment*.

Ek sou hulle stuur dat hulle al twee tale ... vandag is ons mos tweetalig, of drietalig. (Onderhoud met DW)

I would have sent them [the children] so that they [can learn] both languages ... nowadays we are bilingual, aren't we, or trilingual. (Interview with DW)

Nee, soos altyd sê dat onse land nou is in drie tale opgedeel is. Jy moet Engels, Afrikaans en Xhosa kan leer. So ek sou wil anspoor om al drie tale te bemagtig. (Onderhoud met CA)

No, as I am always saying our country is separated into three languages. You must be able to learn English, Afrikaans and Xhosa. So I would have encouraged [my kids] to learn all three languages. (Interview with CA)

Fourthly, language competence is described as the key to economic participation in times of an increasing influence of foreign countries. Multiple language access, especially English, offers chances and perspectives for a successful participation in an *economic environment*.

Engels, omdat 't meer in die business wêreld is ... [daar] is alles in Engels.
(Onderhoud met LK)

English, because it is more [common] in the business world ... [there] is everything in English. (Interview with LK)

Nee, eintlik wil ek dat my kinnere die ander taal ook leer, soos Xhosa, en meer Engels. Want as ons kyk daar is maar meer Engels wat ons kry. (Onderhoud met JV)

No, basically I want my children to also learn the other language, like Xhosa, and more English. Because if we look around there is more [and more] English that we get. (Interview with JV)

Although the importance of multilingual competence is frequently emphasized, the importance of Afrikaans is still pointed out, along with its role as an overall family language and therefore also as the basic language of identity.

Ja, ek dink dis baie belangrik vir kinders in sy moedertaal opgevoed moet word. Alhoewel 'n tweede taal baie belangrik is in Afrika, in geval van die Engels. Maar die taal wat die kind 't maklikst is en ook jou omgewing waar jy in bly, jou eerde tel ook baie. (Onderhoud met GB)

Yes, I think it is very important for children to be schooled in their mother tongue. Although a second language is very important in Africa, in the case of English. Just the language that is the easiest for a child and in the environment where it is staying, you first one also counts a lot. (Interview with GB)

U weet, 'n mens se moedertaal is baie ingewikkeld, jy weet nie dat er ander tale is nie. Want, soos ek self sê, op skool is my Engels beter as my Afrikaans gewees het. Daarom sê ek vir jou, is baie beter in die gedag en die lewe en jy weet nie, as jy drietalig is. (Onderhoud met CM)

You know, a person's mother tongue is very complicated, you don't know that there are other languages. Because, as I am saying [about] myself, in school my English was

better than my Afrikaans. That's why I tell you, it is even better in the mind and in life and you don't know, if you are trilingual. (Interview with CM)

But there is also an opposite, more critical perspective on Afrikaans. It is historically founded on and reminiscent of the era under the Apartheid system.

Ek sou weer Engels gekies het omdat Engels kan meer vryheid kom. Afrikaans is eintlik op ons afgedwong. (Onderhoud met LK)

I would have chosen English again, because English offers more freedom. Afrikaans has actually been forced upon us. (Interview with LK)

Through the experienced pressure of the “coloured” population to speak Afrikaans, English derives a status of an instrument for freedom. Although the statement conveys an emphatic refusal here, Afrikaans still serves as an element of identity construction and self-assignment (“op ons afgedwong”) to the suppressed group of “Coloureds”.

4.4.3 Intermediate result

The status of Afrikaans and English is not equal, due to South African history. During the Apartheid era, the Bantu education school system promoted Afrikaans as a medium of instruction, while the systematic teaching of English was not accessible to the marginalized (suppressed) group of Coloureds. Under Apartheid, Afrikaans thus functioned as a political instrument for the exclusion of a specific population group (Coloureds). As such it was internalized into the individual, but also the social memory of this group, by which this exclusion has become an integral part of individual identity. This is evaluated in two main ways, with a positive or a negative connotation. The predominantly positive or neutral selfreference to Afrikaans aligns with Scheffer's (1983: 97) observations, who described that “[coloured] persons in the non-metropolitan area [outside Cape Town] are almost exclusively Afrikaans speaking and live in an uncomplicated, predictable Afrikaans-oriented linguistic universe”.

At present, Afrikaans is still more prominent, but its role is shifting for the interviewees from the dominant language of all domains to one language with a diminished status within a multilingual repertoire. For their generation (and the next one) English has become an important tool for new socio-economic participation in different environments (situational, living, national, economic), or socio-economic

spaces. LeCordeur (2011: 760) sees some reasons for an increasingly redundant role of Afrikaans in the speakers' intention to offer their children better perspectives for educative and professional success, by adapting to the increasing hegemony of English in post-Apartheid South Africa.

Most of the farmers indicated that they practise a mixture of different languages, mostly Afrikaans and English. From a linguistic perspective, the interviewees draw very sharp distinctions between Afrikaans and English as isolated languages. The differentiation between an intentional and a non-intentional language shift based on the evaluation of the language practice by the farmers themselves. From a linguistic perspective the outcome, namely a mixture of both languages on sentence, phrase and word level, can be either defined as code-switching, or explained in the context of loanword typologies as a product of language contact processes.

4.4.4 Information sources

Besides the linguistic preconditions and preferences, a general overview about the specific sources, or media, that the BFFAW farmers use to inform themselves regularly, shall additionally outline their routines of information access. The most influential media that were mentioned during the interviews can mainly be divided into five *source categories*: television, literature (newspapers, books), internet, conversations and organizations. All categories describe a different set and form of information.

TV programmes

Having been asked where they mainly obtain their weather and climate-related information from, several interview partners pointed to the daily TV weather programme of the 7.30 p.m. *Nuus* show on SABC 3⁷⁶ in Afrikaans as their main source. But other daily programmes are also frequently consulted for staying up to date.

Voorheen was dit van half ses tot sesuur op TV 2 was dit "Land", wat ek kan nou nie meer lekker die program se naam onthou nie. Dan het ons weer Saterdag, het ons twaalf uur ook 'n program gehad oor landbou, daai. (Onderhoud met IG)

76 The daily thirty-minute news programme of SABC is presented in an English version at 6.30 p.m. and an Afrikaans version at 7.30 p.m. Cf. <<http://www.sabc.co.za/wps/portal/SABC/tvguide>> [23.03.2015].

Before it was from half past five to six o'clock on TV 2 called "Land", I can't exactly remember the name of the programme anymore. Then there was on Saturdays, at twelve o'clock we had a programme about agriculture, there. (Interview with IG)

The programme that the interviewee is referring to is "Living Land", screened on SABC 2 on Saturdays at 5.30 a.m. It is interesting that the interview partner calls the broadcasting station "TV 2", because this was the official label from 1975 to 1996. In the early 1990s the SABC restructured their television channels and TV 2/3, as a commercial black channel, was renamed Contemporary Community Values television (CCV) (Horowitz 1996: 126). This restructuring of the SABC was "clearly congruent with, and widely perceived to be part of, the National Party's strategy of protecting its control in broadcasting under the guise of market-based reforms." (Horowitz 1996: 126) In 1996, two years after the end of the Apartheid regime, the SABC stations were renamed SABC 1, 2 and 3. This change was combined with the effort to increase local content and to air in all eleven official languages. In the case of the interviewee, probably the most influential years of TV watching have led to his designation of the broadcaster.

Oor die TV-set, oor die draadlose hoor ek hoe die mense praat en hoe die 'government' ook maar nou praat hulle nou van die ysberge, die ys in Alaska wat nou, wat die son 'burn' nou, sy kop uitsteek en weet nie wat te stel, die ys is mos water en dat 't eintlik vir ons 'n groot probleem is. En ons moet maar ophou, [en] baie voorsigtige manier dinge doen en so an. (Onderhoud met LD)

Via the TV, via the wireless how the people are speaking and how the government is also now telling about the icebergs, the ice in Alaska, of which the sun is burning the heads [peaks] and I don't know how to put it, the ice is just water and that this is basically a big problem for us. And we have to stop, [and] doing things in a more careful way and so on. (Interview with LD)

The shows are broadcast on national stations in Afrikaans and English, and open a new perspective on global phenomena. They create a certain level of awareness of processes on a supranational scale. Furthermore these daily or weekly programmes contribute to an up-to-the-minute reference to current developments, including environmental changes.

Literature

The type of books that the farmers mention, belong to the non-fiction literary genre more than to the categories of epic, tragedy or comedy. In this case, this field especially comprises books belonging to the non-fiction subgenre of professional or technical literature, and newspapers or magazines. The professional books refer to a more general set of knowledge aiming at conveying concepts and systems of time-independent conclusions.

Dat kom van die boeke, koopboeke. (Onderhoud met RA)

It [information] comes from the books, commercial books. (Interview with RA)

Oh, by die skool, nie baie hoog nie, ek het maar so by standard vier omgedraai, maar daardie tyd is standard vier mos amper standard ses se werk (laughter) So ek het nie baie opvoeding, maar ek het baie geleer, in die tyd het ek baie geleer, vir myself geleer met boeke en met gesprekke met ander mense, en dan natuurlik baie geleer as jy so op kursuse gaan. So 'n mens leer eintlik baie. (Onderhoud met RP)

Oh, at school, not very high, I have turned only at Standard four, but in those days Standard four was almost Standard six, wasn't it, (laughter) So, I didn't have much education, but I have learned a lot, I learned a lot over time, [I] learned for myself with books and with conversations with other people, and [one] learned of course a lot by attending courses. So a person actually learns a lot. (Interview with RP)

The newspapers keep their readers up to date on a daily or weekly basis. They concern recent developments and incidents in different spatial contexts (regional, national, global).

Elke dag koop ek twee koerante, "Die Burger" en daai ander een, daai Indian ou, en dan die meeste emissions wat die koerante nou van praat is China eintlik, is China as hulle wys, partykeer wys hulle fotos, gaan daai gasse in die lug in, en hoe die mense suffer op die strate en so aan. (Onderhoud met WS)

Every day I buy two newspapers, "Die Burger" and that other one, that Indian guy, and then most of the emissions that the newspapers are talking about is [are from] actually China, is China as they demonstrate, especially they show photos where gases are fuming into the air, and how the people are suffering in the streets and so on. (Interview with WS)

Internet

As the term internet doesn't qualify the exact medium, as it could equally refer to magazines, books or TV/films, it appears as a separate category. Furthermore, on the one hand it displays at least basic ICT skills, and on the other hand it functions as a separate medium of communication besides book, newspapers and television.

Internet, ja. (Onderhoud met TL)

Internet, yes. (Interview with TL)

Die meeste van my inligtings wat ek eintlik op die oomblik weet oor boerdery is wat ek opgelees het in die biblioteek en op die netwerk, wat ek research in gedoen het. Dat is maar hoe ek my inligtinge kry. (Onderhoud met LK)

Most of the information that I am actually currently have about farming is what I picked up in the library and in the network [internet?], where I did my research in. That is how I get my information. (Interview with LK)

As the application forms regarding the BFFAW farmers' access to means of telecommunications (chapter 4.3.3) revealed, only 14.5 percent of the whole group of 117 participants possess a landline, and less than 50 percent of the group have access to electricity in their homes. This implies that using a computer and the internet necessitates the extra effort of creating access. By using the internet it is not clear how the users are selecting the information from a surplus of data. It would be interesting to see which strategy the internet users follow and how they screen and interpret the information in order to integrate it into their general ideas. Unfortunately there are no hints to generalize from the data in this regard.

Conversations

Intra-group communication amongst the farmers represents a fundamental source of information gathering and exchange.

Ja, ek gesels sommer met my bure oorkant. Dan sê ek man, het jy gesien hoe dit nou weer gereën het? Het jy gesien hoe warm dit nou weer is? Dan gesels ons daarvoor, dan sê ons dit is nou weer die tyd wat ons nou het. Ek sê want jy kan nie meer op dieselfde tyd plant nie. En nou ek gesels nou altyd met my bure, met mense, boere wat ook boer met groente en goed, en met varke en beeste en so aan, en hulle praat ook daarvoor oor die klimaat wat verander. (Onderhoud met RP)

Yes, I just talk to my neighbours on the other side. Then I say, did you see how it has just been raining again? Did you see how warm it has been again? Then we talk about it, and then we say that this is the time that we now have. I am saying so, because you cannot plant at the same time. And now I talk all the time with my neighbours, with people, farmers who also farm vegetables and things, and with pigs and cattle and so on, and they also talk about the climate which changes. (Interview with RP)

Ja, ek het kommunikasie saam met hulle gehad, gepraat, gesels. Ek het saam met hulle inligting gesoek. (Onderhoud met JV)

Yes, I communicated with them [other farmers], talked, chatted. I looked for information together with them. (Interview with JV)

In the communication between the group members, observations are shared and explanations are constructed, resulting from the variety of inputs, which are based on experience and different educational backgrounds. The answers indicate a general consensus about the fact that something in the environment is changing.

Organizations (e.g. Goedgedacht)

There are also a variety of institutions to which the farmers have access and which provide them with information. One of these organizations is the Goedgedacht Trust.

Hoekom ... om, ek dink, eintlik te wil boer ... met groente saam ... het ek inligting gaan soek, gekry by Goedgedacht. (Onderhoud met AH)

Why ... to, actually I think to farm ... with vegetables ... I looked for information, got it from Goedgedacht. (Interview with AH)

Ja, ek het maar altyd gegaan daar. Landbou is baie betrokke by ons. So die nuus wat deurkom kry ek maar meestal van hulle af, soos van Goedgedacht af, en ander instansies natuurlik wat help vir ons. (Onderhoud met RS)

Yes, I have always gone there. [Western Cape Department of] Agriculture is very involved at our place. So the news I usually get from them, like from Goedgedacht, and of course also [from] other agencies that help us. (Interview with RS)

As an information source, on the one hand organizations systematically distribute information related to their institutional profile. On the other hand they serve as information memories, to which their target groups, in this case the farmers, have access to. Here the Goedgedacht Trust offers a combination of information provision, e.g. in the form of the Cool World Climate Path, and accessible practical assistance and advice.

A combination of sources

Presumably the most common routine of information gathering and exchange is a combination of different sources and practices, as the following quotations show.

Ek is baie lief vir die “Landbouweekblad”, as miskien nou. Ek lees dat graag. Ek soek altyd inligting rond. TV speel baie groot rol, landbouprogramma wat in die oggend opkom, en Saterdag oggend ook, en kyk altyd na daai. En dan interact ek maar mit meerdere boere, kleinboere en so. (Onderhoud met GB)

I like the “Landbouweekblad” very much, for example. I like to read it. I am always looking for information. Television plays a major role, farming programmes, which are broadcast in the evenings, and also on Saturday evening, [I] am always watching those. And I further interact with several farmers, small-scale farmers and so. (Interview with GB)

Ons praat onder mekaar. Ons kry tydskrifte en dinge, is ook so bietjie inligting. En dan die opleiding wat ons kry hier by Goedgedacht help ook vir ons baie om ‘n bietjie nuwe metodes te gebruik. (Onderhoud met DW)

We speak amongst ourselves. We get magazines and things, [that] is also a bit information. And then the education that we get here at Goedgedacht helps us also a lot to use [get in touch with] new methods. (Interview with DW)

The information which is frequently received via television and newspapers is discussed in a context of other persons affected. This suggests that a certain degree of social agreement within the group of small-scale farmers about the contents of climate change exists. The experience-based “facts” and the gathered background

information merge in this communication to form a new framework for explanations of environmental changes they have observed.

Outsider perspectives

The perspectives of two Goedgedacht members give an idea about their imagination of the farmers' access to information.

So I think it's interesting, because I think the farmers are so aware of what is happening. I don't think they're lacking in knowledge. I think they are putting themselves out there where they have access to information and at least if they are not in the position to access books or magazines, they're accessing other people who have that knowledge. And I think they're helping intelligent about it. And I think they're very aware of working with the environment and not against it. (Interview with Shannon Paul)

Generally the assessment of the BFFAW farmers' background is shaped mainly by experience-based expertise and knowledge gained through intra-group conversations. This knowledge contains a certain degree of awareness and problem identification capacity of an affected group, but probably lacks the competence to create solution strategies out of a vulnerable situation.

You know, the world is moving from an acute shortage of information to an information surplus. And, you know, the people they can get information out there. They can go on to the internet and find anything they want, you know. It's not difficult. So we're not looking to get them to, we just want to show the gaps that are hindering their progress, you know. So we don't want to get them too many pamphlets, because there's a lot of it. There's a lot of information around here. The Farmers Weekly's, you know, all sorts of stuff. What we want to do is make sure that they have access to it and know how to get there. And that information is available outside our little pamphlets, you know. That's not terribly useful, and expensive. (Interview with Peter Templeton)

This quotation illustrates Goedgedacht's attempt on the one hand to make a variety of information available. On the other hand it expresses the challenge of selecting further information, which may contribute to an advance of their living circumstances, including their farming practice. The way to enable the farmers to select the relevant advice is to create an awareness of the basic problem. Only by defining the root causes and causalities of the problem, the farmers might develop adaptation strategies to changes in climate.

4.5 The *Cool World Climate Path*

4.5.1 *The genesis of the Cool World Climate Path*

The Cool World Climate Path is a physical, feet-on-the-ground experience that highlights the key challenges associated with climate change and offers real-world tools to empower people to address these challenges in a concrete, holistic and meaningful way. Appealing to a diverse audience – from school pupils to emerging black farmers – the focus of The Path is on ensuring that participants leave transformed, inspired, enthused and empowered, returning to their home environments confident in their ability to change their world for the better. As such, The Path is a one-of-a-kind, real world text book representing the most holistic and interconnected system of exhibits on the subject of climate change, sustainability and environmental responsibility. As much of it will be experimental, every component that is added is viewed as a pilot, a test case. Yet each aspect of The Path is evaluated according to its ability to be scaled up and rolled out to other parts of the country, even other parts of the world. We all have our own path to follow through this world. It is our hope that this Path will help all who walk it to choose a path of reverence for planet earth and respect for all who share it. (Goedgedacht Trust 2012a)

The “Who we are?” on the Goedgedacht Trust’s web-page of the Cool World Climate Path expresses straight to the point what the exact expectations of their visitors are, namely to reflect information provided, to internalize the rationale and to put it into practice in their own lives. But how exactly has this idea been established? The following section will give some background information about its origin by letting the Goedgedacht members who are involved tell the story themselves.

The beginnings

In around 2010 the idea arose for the creation of a physical educative trail. At the time Peter Templeton, one of the founders of the Goedgedacht Trust, had the idea of creating a platform to share information and educate people about the whole topic of “Climate Change”. This special mediation form as a physical trail, on which physical impressions are combined with written information, should appeal to a broad audience.

Peter obviously being so passionate about the environment and always looking at ways to promote the environment and caring for your environment on the

farm came up with this idea of the trail. So the trail had to, it ran around a part at the farm where there was already in place things like the vegetable garden or gum trees or the bio digesters. The path ran along between those things. So they had to be part of what we were doing. When we first set on to discuss it, I tried to establish from Peter who was the target audience. Was he aiming at emerging farmers, was it aimed at junior school children, high school children, university students, visitors to the farm – who was it aimed at? And in the end the sort of consensus was that it had to be for junior school children who were rural. So it wasn't going to be a trail that was going to be for some of the government schools in Cape Town to come up for the day. If they came that was wonderful, so we had to accommodate them in the literature, but we mainly had to accommodate our local rural children in the language, the use of the language. (Interview with Shannon Paul)

Starting with a concept for school children, at a later stage the course was also designed to meet the needs of local farmers.

After the idea for the path had been developed under the label “Blue Crane Climate Path”, the name was changed to connect to a larger audience.

At first when we started, we called it the Blue Crane Climate Path, because the blue crane is the national bird of South Africa. But then we changed from Blue Crane into Cool World, because to make it a cooler place, make it a greener, make it a better place and make it cool. So the Cool World self suits everyone, the older people the adults, as well as the youth, because everyone wants to be cool nowadays. He wants to be a cool guy. That's why we changed it. It's a mind game. (Interview with Jafta Hendricks)

It started off as the Blue Crane and then we had a new group of people that came in at the early days and said: 'Oh, that's boring. Everything is Blue Crane'; blue crane is the national bird; and they said: 'No, it's too boring. Everybody's got Blue Crane.' And so we have to identify with young people. And they thought “cool” was a good word, because it's got a certain level of slang in it, but it has also to do with “cool”, you know, you don't wanna have it as a cool world, it's not gonna be cool, it's gonna be warm. (Interview with Peter Templeton)

The title “Cool World Climate Path” thus resulted from the attempt to also attract the young generation by using certain slang. If they could identify with the Path, then they would also be more open to the underlying message.

When I spoke to Peter the first time in February he was so passionate about Mother Earth. We spoke about the four pillars of the POP programme, personal development, education, health and then care for the planet. But he never referred to care for the planet, he spoke about “Mother Earth”. And I could pick up immediately that looking after the environment is extremely important for him. I think in one or another way it was translated or moved over and moved over to Jafta as well. Because Jafta has become, I don’t know how to call it, maybe a “mini-fanatic” in terms of looking after stuff. But on the other hand it’s also, I believe, his background in using hope on a daily basis. That has also been a huge sort of push for him and he could sort of marry what the Cool Climate Path is doing and what his own beliefs... So for me the two people who actually symbolize the Cool Climate Path are Peter and Jafta especially. (Interview with Johnny Philander)

The two main originators of the Climate Change Path idea were Peter Templeton and Jafta Hendricks. Driven by their own passion for the “Care for Mother Earth” they designed a vision to bring (the global narratives of) this topic to local people of the Swartland area.

The authors

After Peter Templeton had the idea for the Path, he contacted Mrs. Shannon Paul to develop a structure and to work on the content. Her experience as a teacher in various contexts qualified her to find an effective way to order the information and to choose the appropriate language (terminology).

Peter asked me if I would write the literature for it. I do a lot of writing and I’m passionate about the environment. And I was an English teacher, so I taught English. And I also taught English not only to English-speaking students, I taught it to a lot of Xhosa students. So I was used to work with children whose first language was not English. And so Peter asked me if I would get involved and do the literature and the research. But we did have two scientists on the team, a botanist and an environmentalist from the University of Cape Town, and we also had one of the farm workers on the team and Peter and myself. So we did all the brainstorming together at the beginning. (Interview with Shannon Paul)

Finally the concept was developed by a small expert team, with the help of external academic advisors.

‘And the two scientists from Cape Town they’ve been doing their Master’s degree?’
 ‘No, they were lecturers. They already had their, one had a doctorate degree. No, they were lecturing already. And still a young woman, very well educated, and they checked all the information afterwards. It was checked by a number of people, you know, that the information was correct and accurate.’ (Interview with Shannon Paul)

Finally the first basic version of the CWCP “storyline” in English was developed by Mrs. Paul.

She [Shannon Paul] just wrote the copy. She put the whole thing together. She didn’t promote. There was another guy called Bryn [last name deleted]. Who did a lot of the work in promoting it, but Bryn he used to work for us, but he doesn’t work for us any more, and to some extent the path has fallen into disrepair, you know, it’s not kept up as good as it could be kept up. But I think there is going to be an increasing sense of interest coming up now, you know. We’re going to do a lot of permaculture work, and in the next couple of years. And it will slowly gain in strength, that whole path. (Interview with Peter Templeton)

The translations into Afrikaans and Xhosa were carried out afterwards by a professional translation agency in Stellenbosch.

The Afrikaans, I felt, could have been done more in-house, but I think Annie and Peter were quite worried and in fact they actually did speak to an Afrikaans teacher. She teaches Afrikaans first language. And she said that technical terms could be quite tricky translating, particularly for rural people. Where there would be a very academic term, that as a translator she would use, that would not necessarily be the word that a rural farm worker would use. Annie found this translating company that were prepared to translate as true to the English text as it could possibly be. And they had instructions that in both the English and the Xhosa, I don’t know if it is like that or not, but that they shouldn’t refer to academic language, even if that was the easier way for them to go. When I was writing in English I’d constantly say “Would they understand this word or should I use a simple word?” or “That word is much too difficult”. If there was a child in grade 2 or 3 they wouldn’t know what that word meant. And we’re already teaching them new concepts. So don’t try and teach them new language at the same time. Try and keep the language as simple as possible. Which was difficult, because if you do get a group of university students coming around, you don’t want it to be so rudimentary, that they get bored, so it was finding that balance the whole time. I think we did it. I hope we did it. I’m not sure, but I hope so. (Interview with Shannon Paul)

When it came to the quality of the translations, the basic instruction was to avoid technical academic terms, in order to make the information accessible for a broad audience. The focus lay on finding an easy way to transport the general ideas and not to exclude specific groups by using too specialized terminology.

Audience

The actual audience consists mainly of school classes and local small-scale farmers.

You know, our boards on the climate change are in the three languages. We wanted to be as broad as we can. But we don't have a kind of a measuring tab that we know how much people are remembering. When the farmers come here to do the course they will be shown all our climate change programmes, you know, all the different things. Whether it sinks in or not, you know, we don't know, you know. (Interview with Peter Templeton)

Mostly the farmers first come into contact with the Path during workshop stays on the Goedgedacht farm.

I think we developed a potentially good relationship with the Black Emerging Farmers. Most of them promised that they will come back again on their own to the Cool Climate Path and really pick up on some things that they need more information on. (Interview with Johnny Philander)

They usually return to the Path to get some more information about the practical features it offers.

We work with the farmers, but that's in the sense of not the most direct way of working with them. The most direct way of working with our climate change policy, our most important one is the climate change path, which is not functioning at the very high level of operation at the moment, and also the leadership college, which we have started here. (Interview with Peter Templeton)

But private individuals are also welcome at the Path. Here too the most attractive components are the practical installations.

Individuals, groups, it's a whole mix. For instance today I wait for someone from Elandskloof, they phoned me on Monday. They come today to see the bio

digesters. They want to see the bio digesters, you know it's fine. Anytime during the day is okay. (Interview with Jafta Hendricks)

Private persons come to see the bio digesters, you know it's fine. So that's what you want to see, what you want to do here, not only groups with appointment. Even if you didn't make an appointment, even if you show up on a week you can walk the path on your own. You are more than welcome to walk the climate path. (Interview with Jafta Hendricks)

Private persons usually visit the Path to get practical inspiration and guidance for improving their living or farming practice.

Preliminary considerations on content

The basic considerations were driven by the institutional goal of linking to a broad spectrum of basic knowledge. But also the fact that the audience would consist of different linguistic speaker groups needed to be taken into account.

So for example the language is less academic and more colloquial than we would have done it if we were catering it for another group of people. Even the questions had to be questions that junior school children could understand. But then it would also be suitable for people who perhaps didn't have a good education. When I say good education, in the past of this country many children maybe got as far as grade 6 maximum, some even less than that, so it had to be easy enough that they could read it and understand it. But it still had to be educational. So at the same time that it was asking questions and providing information it had to be educational and it had to be understandable. But it ended up in a broad range of people with a broad range of educational backgrounds and language ability. And that was part of the decision to put all the boards into the three languages, to have them in English, Afrikaans and the Xhosa. And as I said to you earlier that made some logistical nightmares for us, because English is fairly concise, Afrikaans is probably even more concise – the sentences became shorter – and then the Xhosa didn't have words for things like climate change or sustainability and so they had to be explained in long sentences in Xhosa. And so the Xhosa section of the boards became very, very long. And the way that we had to compensate for that was to make their font sizes smaller. (Interview with Shannon Paul)

The specific practical challenges that resulted from this effort were three texts, each containing the same information, but differing fundamentally in their length due to the linguistic structure of the three languages.

The terminology was carefully chosen with the aim of improving the knowledge that the visitors already possessed and adding new, up-to-date information.

All the sort of common terminology that are used in global warming, climate change was incorporated deliberately and even in the Xhosa I saw that in translation it they actually use the word often in English, because they've been accepted into the Xhosa language. They use them as well. No that was very intentional. So that became sort of the educational point of what we were doing. It was no good doing a trail, giving the people information that they already knew. And the idea behind it as well was not that it was static, hat we do this one and then it's over. The idea was is that scientists learned more about climate change, as climate started to change, as the way people were thinking changed, which always happens with things like climate change, that the boards could be changed, updated, improved. And that's why they slip in behind the boards. The boards are covered with a sort of a plastic. And so they can be updated. (Interview with Shannon Paul)

Critical voices

Critical reflections come from the Goedgedacht members themselves. The ambitious attempt to represent so many different dimensions of the topic "Climate Change" has resulted in a surplus of information, which starts to overstrain the audience from a certain point onwards.

So they mention from water to electricity, everything is there. I think, from my point of view, there is enough information at Goedgedacht self. So ya, people just need to start use it. Once again, too much information, it's like the climate change path too much information will confuse them again. So ya, my belief is that people are just fail about this climate change, because they don't know enough. (Interview with Jafta Hendricks)

The experience also showed, that the way the concepts are explained might fail to educate due to the complexity of their information.

Yes, it will. But we'll change it, because I don't think the boards have been a success as we thought they would. They're too complicated, but I will not take them down, because I don't have an alternative and an alternative costs money. And I'm not in the position to change it yet, but I will change it. And I will make it more fun. And I will try very hard to see and get people that come here and want to work here. (Interview with Peter Templeton)

But in Goedgedacht's view the identification of the problem is the first step towards improvement.

The climate change path in years to come will develop a more multi-purpose range of things. At the moment it's a little bit too sophisticated for a lot of children. And it's too long, and it's too wordy, and it's too boring. And it doesn't really give you passion. So we are hoping that with this young people coming that there'll be ways in which they themselves will make a contribution to making the path more interesting. And we'll make it more interesting. We've got a climate change maze, that started, but it's very young, very small, very immature, and we'll have a lot of different things that people can do: the pig tractor, the worm farm, the bio digesters, the fog harvester, you know, all that things will add to their understanding of how you can harm less in a very loving way that doesn't destroy, our nature, and, you know, you can live more peacefully on the planet. So we're hoping to make people conscious of that. (Interview with Peter Templeton)

Thus the continuous adaptation of the composition and content of the Path is the way to successfully convey the message and to educate.

4.5.2 The structure of the Cool World Climate Path

This Path is intended to make you more aware of some of the problems and challenges that we face in conserving the delicate balance of our world for people today and for future generations and to encourage you to take responsibility, in whatever small way you can, in making a difference. 'We' means all of us who are breathing the air on this planet; don't think it is someone else's responsibility. Take ACTION now. (CWCP, Introduction board 1)

The visitors of the Cool World Climate Path are welcomed with this introduction, which clearly states the aims of the project and the intentions of the designers, which are to inform about the "Problem of Climate Change" and for participants to reflect on their own role as human beings in exchange with the natural environment. The final imperative in capital letters emphasizes the urgency and importance of internalizing the notion of personal responsibility. The following statement points to the character of the problem by adding the idea of a "crisis" and creating a situation of "debt" out of this responsibility:

‘The climate crisis is a result of our living beyond our planet’s means’. Yvo de Boer (Executive Secretary of the UN Climate Convention). This has created a huge ecological debt, in the same way that we get into financial debt by living beyond our means financially. (CWCP, Introduction board 2)

As an environmental crisis, or natural disaster, is the result of natural hazards, there is one step missing in this argumentation. The human behaviour itself causing natural hazards does not automatically also cause a crisis. The natural disaster scenarios moreover consider regional socio-economic preconditions of vulnerability, which provide the framework for a critical situation and determine its impact. This further dimension especially needs to be considered in the discussion about debt by bringing in the living conditions of the local farmers.

A third introduction board, targeting mostly the young visitors, tries to involve the reader by creating a game in which the visitors are asked to identify with detectives who solve the crime of destroying “Mother Earth”. In fact the background story evokes more the impression of a heroic story, as it again puts the visitor in the situation of being responsible for the survival of “millions”:

The Detective Theme; You are two detectives named Sherlock and Watson. You work undercover for the ‘Goedgedacht Earth First Agency’. This case is code named ‘Operation Earth’. A crime has been committed. It is the talk of the world – every news agency is covering it. Everyone is desperate to get this crime solved. The first victim is Mother Earth (but thankfully she is not dead – just gasping for air), but there could be many more victims if you don’t act fast. It is suspected that Mother Earth has been poisoned. Yes, I hear you gasp. Poisoned! So all you young detectives put on your Sherlock thinking caps (which will also protect you from the sun), grab your sniffer dogs, magnifying glasses and sunblock, and start gathering the facts about the crime. The future of millions may lie in your hands. Only you can save Mother Earth and all future victims, by discovering who the culprits of this crime are and make them change their nasty ways. The answers may surprise you, even shock you. Good luck as you follow the Black Carbon Footprints that the perpetrators have left on the crime scene. Remember to whisper – anyone could be listening. Check over your shoulder that you are not being followed. (CWCP, Introduction board 3)

This imaginary role play creates a contradiction in the whole argument of the Goedgedacht: The person being one of the perpetrators of “Climate Change”, and being a part of mankind, is at the same time the outside hero “detecting the crime” and saving Mother Earth, and in turn humanity. This produces a kind of internal conflict for which the only

solution can be to change oneself through reflection and a modification of habits.

Aside from this it is doubtful whether anyone who is not familiar with British criminal literature of the late nineteenth century, or at least aware of the detective stories of Sherlock Holmes and Watson, will be able to identify with the fictional characters of Sir Arthur Conan Doyle. But again the Goedgedacht strategy makes it clear that raising awareness is the first step towards changing habits.

The path is structured in three different categories, marked by three sets of coloured signs. Green signs are conceptualized mainly for agriculturists, horticulturists, and conservationists, thus including the farmers. Red signs are about comprehension, explaining complex phenomena which are tested in advance by a questionnaire available in a pamphlet⁷⁷. The black signs provide general information. They are roughly divided into seven central themes:

- 1) boards 1 – 22 Earth in Crisis – Whose gas is that?,
- 2) boards 23 – 36 Oceans and Fresh Water – Something fishy is going on!,
- 3) boards 37 – 40 Solving a Crisis Successfully – There is Hope,
- 4) boards 41 – 60 Trees, Plants and Food – The Good, The Bad and The Yummy,
- 5) boards 61 – 68 Population Impact – What’s growing and what’s not?,
- 6) boards 69 – 74 Recycling – New life for the discarded,
- 7) posters 75 – 89 Renewable Energy – From black to neutral.⁷⁸

The content of the topics thus ranges between problem identification of climate change and its impacts on flora, fauna and civilization as well as coping strategies, but in the sense of contributing to a sustainable use of energy resources and the reduction of one's personal “Carbon Footprint”. In 76 cases the explanation texts start with the introduction “Did you know ... ” or “Het jy geweet ... ” usually followed by a scientific fact. This phrasing invites the readers to reflect on their own knowledge of the specific topic.

Geographically the 2 km route goes out for 1km and then returns the same way. The

77 The pamphlet is obtainable in English, Afrikaans and Xhosa and serves as a guide for the path. It mainly contains a painted map and a questionnaire.

78 The Afrikaans equivalent labels the topics as follows: borde 1 – 22: Die aarde in ’n krisis – wie se gas is daardie?; borde 23 – 36: Oseane en vars water – alles is nie pluus nie!; borde 37 – 40: Die suksesvolle oplos van ’n krisis – daar is hoop.; borde 41-60: Bome, plante en voedsel – die goeie, die slegte en die njammie.; borde 61 – 68: Bevolkingsimpak – wat groei en wat nie?; borde 69 – 74: Herwinning – nuwe lewe vir weggooigoed.; plakkate 75 – 89: Hernubare energie – van swart tot neutraal.

1.6 km Olive Route continues into the olive groves and returns via the Conference Centre to the starting point. It is interrupted by 7 “Reflection zones” which contain a practical sun screen and are designed to provide a point to have a break and digest the information provided.

And that when they get to the huts, they were there to provide cool, because going maybe ten boards in the heat that you get here, you could overheat, so there were places to sit and cool down and then the posters were around them with reflective questions on them. (Interview with Shannon Paul)

The following map illustrates the route and gives an impression of its setting.

Map 4 : Cool World Climate Path route



Source: Goedgedacht Trust 2010a, <www.goedgedacht.org/who-we-are/our-environmental-footprint/the-cool-world-climate-path/cool-world-map/>. [13.05.2014].

4.5.3 The questionnaire

Fill in answers on the cards provided and at the end score yourself on how environmentally aware you are. (CWCP, Introduction board 1)

So being “environmentally aware” implies being able to answer the 50 questions by knowing the explanation given on the path. As such, properly reproducing of the mainly technical facts presented on the path, seems to indicate a distinctive consciousness on the part of the visitor. To rank the results, the pamphlets provide the following grading system ⁷⁹:

Your score:%

If you scored 50% or less – Oh dear. You really need to learn a lot more about our world if you are going to be able to make a difference. You should do the trail again some time soon.

If you scored 51 – 65% – Not bad, but you need to brush up on some environmental issues. Perhaps you should do some extra reading and investigating on the Internet if possible.

If you scored 65 – 79% – Very good. You are clearly concerned about our planet and have made sure you are informed. Please go out and tell others what you know.

If you scored 80% or more – Brilliant. You are a great ambassador for planet earth. With more people like you we could make a difference and turn a crisis around. Keep up the excellent work

If you scored 100% – please immediately ask the President for a job so that you can represent South Africa at the next United Nations Climate Conference in 2011, which is here in South Africa. If there were more people like you, the earth would not be in crisis, but remember ACTION speaks louder than words. It is what you DO and not just what you KNOW that will make a difference. (Pamphlet of the Cool World Climate Path)

Finally the pamphlets put the result into the following perspective:

No matter what your final score was, do everything you can to reduce your Carbon Footprint, because someone with a high score may in fact have a high Carbon Footprint, and someone who scored low on the knowledge test may in fact have a low Carbon Footprint, it all depends on your lifestyle. (Pamphlet of the Cool World Climate Path)

At this point the test results are relativized, as they are at first sight based mainly

⁷⁹ To calculate the result, the following explanation is given: “Score yourself on the Red questions and the answers for 38 – 50. Add up your points. Double your score to give yourself a mark out of a hundred or a percentage. If you scored 41/50 then you have 82%” (Pamphlet of the Cool World Climate Path).

on educational and cognitive preconditions. A reference back to the person's way of life emphasizes the slant that action is the thing that matters. But still the basis for any practice is knowledge.

4.5.4 Practical installations on the Path

As already mentioned, the Path also contains specific installations, which are designed to be used on a household level in order to increase the independency from external institutions. These offers are created so as to be multiplied by the visitors, who adopt them and promote them in their own local communities.

And that was the first time I'm saying this, but if you come and you look at the vegetable garden and you're a farmer and you've seen how you make compost, then it's easier for you to go and make the compost yourself and come back again in future. Then we can take you to the solar part. Then you have to get back, digest the information, think about it; am I going to use it, am I not going to use it? Then I think one of the things that I need to do is to make sure that once we believe we follow them up how many of them, what percentage started doing something similar in their own communities, and what the effect was of what they started doing at the latest stage. (Interview with Jafta Hendricks)

In anticipation of chapter 5.3.1, it can be stated that, when asked about the most impressive features of the Cool World Climate Path that stick in their mind, these elements in particular were mentioned by the interview partners. The following description from the Goedgedacht website serves to give an impression of these items (Goedgedacht Trust 2012a).

Fog Harvester: This experimental installation has proved a highly successful way of using the 'edge effect' to harvest the fog and mist of the West Coast and convert it into water that is stored in tanks to see us through the long dry summers. A similar method of collecting water is used in arid environments as diverse as the deserts of Chile and in the high mountains of Nepal.

Earth Bricks: Compressed earth is used to make the brick of the future. Using a fraction of the energy required to make a cement or clay brick, our Earth Bricks are 'Agreement' certificated for use in any conventional structure.

Biodigester: This intriguing installation shows how sewerage and other waste

from the average home can be used to produce methane gas for cooking. Stored below ground for safety reasons, exciting graphics show visitors exactly how one of the most efficient and easy-to-implement domestic recycling systems works.

Solar Park: Our newly completed Solar Park consists of an array of locally built photo voltaic panels generating significant power for the farm.

Biodiversity Corridor: Stretching from the Kasteelberg to the Paardeberg, and consisting of more than 20 kilometres of uninterrupted Fynbos (the endemic vegetation of the Cape Floral Kingdom, recognised as one of the smallest but richest in the world) our biodiversity corridor is the longest stretch of Fynbos outside of a reserve. Designed in consultation with specialists from Stanford University, it represents a willingness on the part of local farmers to preserve this rich and threatened resource. A shorter walk through the Renosterbos is also under construction.

Climate Change Crops (C3) Exhibit: With global temperatures on the increase and precipitation erratic and unreliable, our C3 exhibit has attracted the attention of many. Originally designed to show emerging farmers a wider range of arid crops and how to grow them, the exhibit has grown to be a treasure of best practice in this critical area.

The Multicrop Matrix: A three dimensional puzzle that 'fits' several compatible crops together to optimise use of light, water, nutrition, as well as human and animal intervention, as nature intended. The goal is to empower emerging farmers to produce more produce, more cost effectively, using less space, fewer pesticides and less chemical fertiliser.

Animal Tractors: The incomparably elegant system of confining animals (generally in a pen or a mobile coop) to harness their natural inclination to peck, scratch, root, till and fertilise the land in order to prepare, clean or maintain it. Pig, cattle and sheep tractors will soon be followed by chicken and bunny tractors.

Organic Vegetable Gardens: Two organic vegetable gardens provide the perfect place to show kids where food should come from, and to demonstrate best practice to visiting emerging farmers. We also provide community gardens, complete with irrigation and all the advice locals need to grow their own produce. The next step will be a Cool World Farmer's Market that will provide them with a reliable and regular outlet to the public.

Wonderbag: Manufacture and sales of the incredible Wonderbag, an insulated cooker that reduces carbon emissions, saves electricity and creates jobs. Recently

awarded first prize in the 2011 Climate Change Leadership Awards (CCLA) Climate Hero Award for Communities and/or Individuals.

Light up your House: A project that makes a small solar pack consisting of solar panel, inverter and 5 LED lights available to people living in shacks and farm cottages without electricity.

Cool Loo: Last but – as our younger visitors will insist – not least; a composting toilet that doesn't flush, doesn't connect to the mains, doesn't even lead to a septic tank, but does supply us with clean, healthy, pathogen-free fertiliser.

The interviewees were also asked what they remember most of all from the CWCP.⁸⁰ The question aimed to isolate the contents, which they kept in mind and which can also be assumed to be of certain relevance for their personal lives and their everyday practice as well. The analysis indicated that mostly practical features made the biggest impression on the farmers. As already introduced in chapter 4.5.4, these items are designed on the one hand to decrease people's dependency on public energy providers, and on the other to increase the sustainability of their farming practice.

Most impressive was the production of biogas. It was the feature that was mentioned most often. The gas that the interviewees talk about is methane, a product of the decay processes in the "Biodigester". The gas can be used for cooking or lighting.

Omdat dit vir my baie gefassineer het, ek stel eintlik baie belang in die biogas projek wat hulle daar tentoon gestel het. (Onderhoud met LK)

Because that has fascinated me a lot, I am actually very interested in the biogas project that they presented. (Interview with LK)

Daar is gas wat hulle self generate. (Onderhoud met TL)

There is gas that they generate themselves. (Interview with TL)

Uhm, die gasvervaardiging. Hoe hulle die gas vervaardig, dit is in my ... dit is net fantasties. (Onderhoued met IG)

Uhm, the gas production. How they produce the gas, it is in my 9 it is just fantastic. (Interview with IG)

⁸⁰ The question was formulated in Afrikaans as follows: Wat het die grootste indruk op jou gemaak?

The multicrop matrix presents an optimized combination of different crops, is presented improving sustainable capacities the farmers possess. These alternative methods of space-reduced agriculture are especially adapted to the resources of the small-scale farmers.

Die groente het baie groot impak gemaak. Die tuin het baie impak gemaak. Die kruie afdeling het my impak gemaak. Die bome het 'n impak gemaak op my en het my gemotiveer meer om te plant en op daai manier te plant. (Onderhoud met CA)

The vegetables have made a big impression on me. The garden deeply impressed me. The herbary impressed me. The trees have made an impression on me and motivated me to plant more and in this manner. (Interview with CA)

Connected to the aspect of limited space, for some of the participants the idea to include animals systematically in the fertilization and cultivation of land was very new. In this regard the pig tractor contributed to a sustainable way of farming and animal husbandry on a small piece of land.

Ja, as ek nou net dink aan die diere wat ek het, die varke wat ek het, en ek kan met my varke, kan ek in a kamp sit en ek het nie nodig om a trekter te gebruik nie, net goed beplan. Dan sit ek my varke in a stuk land in, vir drie maande, dan is my land omgeploeg, en hy is bemes ook, 'n baie goeie idee, baie goeie plan. (Onderhoud met IG)

Yes, if I think about the animals that I keep, the pigs that I keep, and with my pigs, I can put in an enclosure and I don't need to use a tractor, just good planning. Then I put my pigs on a piece of land for three months, then my land is ploughed and also fertilized, a very good idea, a very good plan. (Interview with IG)

Especially the earthworm farm was mentioned several times.

Ek was nogal baie beïndruk met die erdwurm plaas. Daai is baie interessant gewees want ek het nooit geweet mens kan erdwurms so (laughter) kweek nie, en dan hoekom kweek mens erdwurms, en wat is hulle doel? Daai was vir my baie interessant gewees. En die son panele was vir my ook fantasties, né, daai is die twee, die son panele en nou kan mens mos geld bespaar, as mens son panele op is. Hy gee mos vir jou elektrisiteit en gee vir jou alles, so jy bespaar eintlik baie. (Onderhoud met RP)

I was very impressed by the earthworm farm. That was very interesting, because I didn't know that one can cultivate earthworms like that (laughter), and also why you cultivate earthworms and what is their purpose? That was very interesting for me. And the solar panels were also fantastic for me, you know, there are these two [aspects], the solar panels and that one can just save money by having such panels. It just gives you electricity and all of that, so that you actually save a lot. (Interview with RP)

The earthworm installation, as well as the pig tractor, belongs to the idea of organic composting. A reduction of chemical fertilizers does reduce the costs and increases the farmers' independence, as the next quotation also indicates.

Ja, wat ek sal eintlik toepas is die soos ons gewys van die drup stelsel daar. En dit is vir my baie, ek sal dit toepas op my boerdery, die drup stelsel want dit bespaar aan water en jou grond bly nat. Jy hoef nie spesiaal water te gee nie. En ook die erdwurm plaas daai is ook baie nuttig wat ek kan gebruik in my tuine en so. En dan die kompos, want as jy nou 'n vrag kompos gaan koop dan betaal jy oor die duisend Rand waar ek hom self kan maak met al die goed wat ek afhaal, dit sal darem geld bespaar.

Yes, what I should make use of is the drip irrigation we've been shown. And that is for me very, I should adopt it on my farm, the drip irrigation because it saves water and your soil remains wet. You don't have to use special water. And also the earthworm farm is very useful for my gardens. And then the compost, because as you buy a load of compost then you pay more than a thousand Rand, whereby I can make it by myself with all the things that I garner, that's why this will save money.

In addition, the idea of creating a recycling cycle was convincingly presented by the Goedgedacht information campaign. It contains the aspect of sustainable resource use and therefore a reduction of costs for resources, but also for energy access.

Ja, ek het gegaan na Goedgedacht en gekyk na die klimaatverandering, wat hulle het op Goedgedacht. As ek kyk na die recycles wat hulle daar het gedoen, alle weergebruik is bruikbaar en dis 'n baie goeie voordeel wat die klimaatverandering wat 'n mens na moet kyk. (Onderhoud met JV)

Yes, I went to Goedgedacht and looked for the climate change [the Cool World Climate Path] that they have at Goedgedacht. As I looked at the recycles there, every re-use is useful and this is a huge advantage of climate changes where one has to pay attention to. (Interview with JV)

The aspect of costs in particular was repeatedly emphasized. Every low-cost option of reducing the regular expenses is very welcome and associated with a high degree of replication potential.

Jy weet, kom ek sê vir jou alles was vir my interessant op Goedgedacht, net met die kennis wat hulle al oor die jare opgedoen het en die eenvoudige manier hoe hulle dinge daar doen en tog 'n sukses daaruit behaal. Veral daai stukkie bo op die berg, van daai water, ja en daai wurms daar, en alles daar is baie interessant. Dit word op 'n manier gedoen, op 'n goedkoop manier, veral daai gas ook wat daarso is en daai dinge, wat mens nooit in jou lewe kon aan gedink het nie, maar wat jy nou iets uit geleer het wat daar aangaan. So daar is baie goeie dinge wat jy hier op hierdie grond kan toepas wat vir jou goedkoop, op 'n goedkoop manier, vir jou 'n lewe kan gee of waardeur jy iets kan bereik. (Onderhoud met DW)

You know, I will tell you everything that was interesting at Goedgedacht, only with the knowledge that they collected over the years and the simple way in that they do things successfully. Most of all the area in the mountain with that water [fog harvester], yes and these worms there, and all of that is very interesting. It is done in a way, in a low-cost manner, especially the gas there and all these things, that one would have never ever thought of, but which you now learned about. So there are many good things that you can apply, which are low-budget, that can give you an inexpensive life or by which you can achieve something. (Interview with DW)

Ja, as daar inligting is, veral vir ons boere dan, dan, dan sal ons dit baie waardeer, because dit strek mos vir ons tot voordeel, even daai solar panels en al daai goeters wat daar is, dit kan ons net tot voordeel strek, veral hier waar ons nou so duur betaal vir krag. (Onderhoud met DW)

Yes, if there is information, most of all for us farmers, then, then we appreciate that a lot, because we profit from that, like these solar panels and all those things there, they can only help us, especially when we pay so much for energy. (Interview with DW)

The Path reached its goal of awakening the attention and bringing some concepts closer to the farmers. It effectively served at first sight more as an inspiration for the improvement of farming practice, rather than accomplishing its ambition of creating awareness about the topic of “Climate Change”.

Everything, yes. I say you save a lot of money. I have my own bio digester, if I use my candles, or green bulbs, use the green bulbs, I try to encourage them. We put in all the house the green bulbs, small solar panel on the roofs. We try to do that and use it. And I also encourage them by saying it's not always to make money, if you save money you also make money. I you use all the renewable energies more and more your bills at the end of the month will be smaller and smaller. But like I say, it's a mind game. But the world changes. They are busy changes, slowly but surely. Slowly but surely. (Interview with Jafta Hendricks)

Almost no reference was given by the interviewees to any “educational” concept of “Climate Change” as presented on the information boards. Thus *practicability* represents the most important property that the information needs to possess, if it is to stick in the minds of the farmers and hence be relevant in their evaluation.

4.5.5 Information sources

It is also interesting to note that the introduction boards of the Cool World Climate Path even indicate the information sources which form the basis of the path's content.

Information on this trail was sourced from experts in the field, Al Gore's [sic] 'An Inconvenient Truth', various Internet web sites, WWF's The New Climate Deal pocketguide, WikiAnswers and Life in Balance. We are indebted to these sources for the information provided. (CWCP, Introduction board 2)

Two of the sources indicated in particular – the documentary film “An Inconvenient Truth” and the pocket guide of the World Wide Fund for Nature (WWF) – are clearly recognizable in the texts of the path, not only because they are quoted (with and without reference), but also in terms of the attitudes they already convey.

The following short excursions will briefly introduce these two main sources. While the film “An Inconvenient Truth” raises questions about the medial commercialization of “Climate Change”, the WWF pocket guide reveals insights into the way that the organizational appeal of the WWF is structured.

An Inconvenient Truth

The documentary film “An Inconvenient Truth”, directed by Davis Guggenheim, was premiered at the Sundance Film Festival in 2006. It deals with the climate

education campaign of the former US Vice President Al Gore, who tried to raise the public's awareness of the climate "threat" caused by human misconduct. The documentary film tries to transfer the scientific climate debate around 2006 to a generally accessible medium, in a cognitive sense. As an experienced politician who is skilled in Aristotle's modes of persuasion⁸¹, here Al Gore divides the audience into those who follow his emotional and vigorous appeal and arguments and those who allege a conspiracy, who don't trust the moral and scientific background of an American politician. Since its release it has become a highly contested production, and the subject of lively debate in the media and on scientific platforms with regard to its reliability (CBS Interactive Inc. 2006; Borenstein 2006; Peck 2007; Matzig 2010; Buß 2007).

In 2006, the UK Government, Welsh Assembly Government and Scottish Executive decided to integrate *An Inconvenient Truth* into the science curriculum and thus to send a copy of the documentary film to all secondary schools in England, Wales and Scotland.⁸² The most prominent critic of this decision was Stewart Dimmock, a lorry driver from Dover and father of two teenage children, who tried to block this resolution by legal means. He accused the government of "brainwashing" the students (Stewart Dimmock, cited in McLeod 2007) and claimed that the film contains "serious scientific inaccuracies, political propaganda and sentimental mush" (Stewart Dimmock cited in Peck 2007). The case launched by Dimmock in September 2007 against the Secretary of State for Education and Skills in the High Court of Justice of England and Wales didn't result in the prohibition of the film, being banned, but the judge Michael Burton, from the High Court in London ruled that there are nine alleged errors in the film which need to be accompanied by a guidance explaining them, which has to be presented to the students before its presentation (Peck 2007; Matzig 2010). The errors mainly concern non-verified causalities and correlations on a global scale that Gore presents as scientific facts. Nevertheless his logos convinces the general public of the importance and urgency of the topic.

In her documentary, the filmmaker Carola Lichtenberg, who followed Al Gore on his benefit tour through concert and cinema halls all over the world, analysed the success of his campaign. She came to the conclusion that Al Gore has developed his persuasiveness by becoming inseparably one with his concern, climate policy (Lichtenberg 2007; Buß 2007). Thus embedded in the logos appeal is the ethos, the authoritative trustworthiness regarding the topic. By creating replicable causalities

81 See also chapter 3.

82 "The Climate Change Resource Pack has been sent to more than 3,500 schools and is aimed at key stage 3 pupils (11 to 14-year-olds)" (MacLeod 2007).

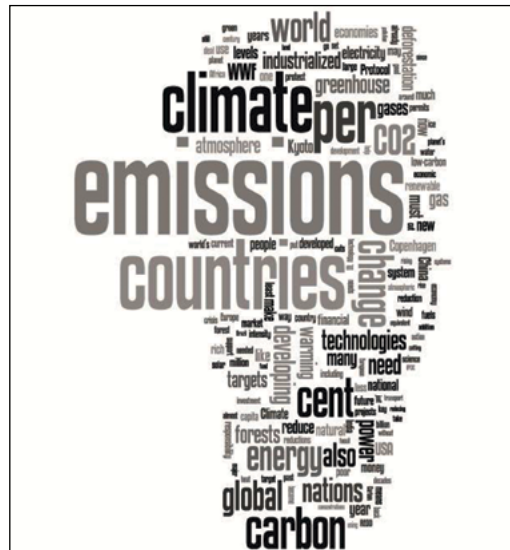
verified with “facts” and examples, the presenter suggests the adoption of this specific knowledge and convinces the audience of his/her qualification.

A similar strategy can also be extracted from the Cool World Climate Path. By creating a knowledge base with an underlying connotation of “threat”, the awareness of the visitor is raised and a collective responsibility is deduced from this. I will later elaborate on how far the notion of this threat is congruent with the perceptions of the farmers.

The New Climate Deal pocket guide

The New Climate Deal pocket guide (WWF 2009) is a 48-page information brochure published by the World Wide Fund for Nature⁸³ which draws a clear line between climate change and crisis and links global ecology with global economy. As the following figure shows, the most prominent terms by quantity used in the guide are quite technical. The scale of reference is mainly connected to the global level on which the “nation” and “countries” represent the relevant agencies. The explanations are centred on the outcomes of “emissions” of “gases”, “CO₂” and “carbon”.

Figure 4: Word cloud of “The new climate deal: A pocket guide” (2009)



Source: WWF 2009; created with wordle.⁸⁴

83 “WWF’s mission is to stop the degradation of the planet’s natural environment and to build a future in which humans live in harmony with nature, by: conserving the world’s biological diversity, ensuring that the use of renewable natural resources is sustainable, promoting the reduction of pollution and wasteful consumption” (WWF 2009: back cover).

84 Wordle.net is a tool for generating word clouds. The clouds give greater prominence to words that appear more frequently in the source text. The freeware is available under www.wordle.net.

By using all available font styles and by highlighting selected passages or terms with differing colours, the focus of the reader is additionally directed to central concepts of the WWF-specific discourse. The problem identification is straight and monocausal: anthropogenic CO₂ (WWF 2009: 10). The resulting effects (including a rise in global temperature, climate and weather of all kinds becoming more extreme, melting glaciers and ice sheets on land causing sea levels to rise), in reference to the Fourth Assessment of the IPCC, culminate in the prediction that “All that could be just the start...” (WWF 2009: 11) and phrases like “We are sailing very close to the edge. There is little margin for error” (WWF 2009: 14). These vague prospects of “non-assessability” create a latent fear of the negative impacts before reaching a tipping point.

By introducing the Kyoto Protocol, financial implications of emission reductions on supra- and international levels (carbon markets; private and public sector involvement) are indicated. The final proposed solution of a “New green deal” is shaped by “fair” emission rights (to nations according to their population) with the goal of reducing the carbon intensity and therefore increasing its efficiency. For this purpose the document suggests considering the “responsibility and capability index”⁸⁵ based on Greenhouse Development Rights, to place the responsibility on nations and national action plans.

The statements in the guide, which refer explicitly to the stance of the WWF, can be divided into three categories: convictions, standpoints and solutions.

Convictions contain often hypothetical causalities of which the WWF is convinced. They contain the notion of a future improvement by following their suggestions.

WWF also believes there should be an emergency review clause, so the world can react promptly to any worsening in the news from scientists. (WWF 2009: 20)

WWF believes these countries can no longer shelter behind their formal status as developing countries. (WWF 2009: 21)

WWF believes that integrating emissions from these sectors into the national targets of developed countries would deal with the majority of their emissions. (WWF 2009: 24)

WWF believes that the risks of nuclear proliferation, waste disposal, accidents and future shortages of uranium fuel make it an unsafe, unwise and unsustainable option. (WWF 2009: 31)

85 The index combines responsibility evaluation (development of per capita emission) with the national capacities for emission reductions (based on wealth indices).

WWF believes the key is to foster technological cooperation through developing Technology Action Programmes for developing and spreading key technologies. (WWF 2009: 33)

WWF believes the world should be able to use REDD⁸⁶ to cut net deforestation worldwide to zero by 2020. (WWF 2009: 41)

The *standpoints* describe expectations that WWF formulates towards the nation-state agencies.

WWF says the emissions from developing nations need to deviate from business-as usual as quickly as possible, reaching 30 per cent lower than they would otherwise have been by 2020. (WWF 2009: 22)

WWF says that is not enough. After eight years, the Adaptation Fund is still not operational. The industrialized countries, which are mainly responsible for climate change so far, have to accept their responsibilities by paying to protect the most vulnerable victims. (WWF 2009: 26)

WWF says nations need to make a special effort to maximize the benefits of ecosystem-based adaptation. It will probably deliver the best value for money. (WWF 2009: 28)

The text offers also *solutions*, which again address the national actors and recommend mostly economic interventions for emission reduction.

WWF asks that ALL industrialized countries make binding commitments to achieve cuts of 40 per cent from 1990 levels by 2020. (WWF 2009: 20)

WWF proposes that developing countries draw up national low-carbon action plans. (WWF 2009: 23)

The least developed countries may want to draw up low-carbon development plans as part of their development strategies, and WWF encourages them to do so. (WWF 2009: 23)

86 “Reducing Emissions from Deforestation in Developing Countries – aims to repeat what happened in Costa Rica and Paraguay on a global scale by providing incentives for conserving forests rather [sic!] than converting them. It was first proposed by a Coalition of Rainforest Nations led by Costa Rica and Papua New Guinea in 2005, and was supported in Bali in 2007” (WWF 2009: 41).

The combination of convictions, standpoints and solutions creates a chain of argument to convince the audience of the WWF idea of best practice, but also of the moral legitimacy of this institution.

The dominant reference to the national and global scale points to the dimension and interconnectedness of “Climate Change” as a phenomenon of global interest and relevance, but on the other hand it doesn’t relate to the specific challenges of everyday subsistence practices on a local scale. This fact might reduce the degree of engagement with the topic by the local farmers. The deconstruction of the interviews will give more insights into the specific construct of the farmers’ “Climate Change Knowledge”.

4.6 Summary

After this long chapter a short pause for reflection is needed.

The examination of the BFFAW farmer’s broader socio-economic living context has shown that the separation during the Apartheid era has not yet transferred into a state of social inclusion. Even these living conditions, being spatially and temporally stable only on a low level, also determine the farmers’ high degree of vulnerability (cf. chapter 4.3). Their socio-historical marginalization with regard to education, financial and residential security as well as to social integration, leads to a low degree of mobility in physical and digital space. Chapters 5 and 6 will discuss if these structures do consequently restrict the contextual framing of their “Climate Change Knowledge”.

Furthermore the analysis of the farmers’ linguistic preconditions and preferences revealed that although Afrikaans is still the most prominent language, the farmers’ linguistic practice shifts towards multilingualism, emphasizing the increasing importance of English, especially in the domains of education and economics. The fact that interviewees draw very sharp distinctions between Afrikaans and English as isolated languages, underlines the importance of a coexisting terminological set and semiotically congruent equivalents in both languages regarding the description of “Climate Change” phenomena.

The following chapters 5 and 6 will demonstrate that the structural preconditions elaborated in this chapter, that in terms of the study of complex systems can be defined as the “systems’ history”, can be traced in the BFFAW farmers’ contextualization of “Climate Change”. By cutting the farmers’ statements into parts in order identify relevant clusters; chapter 5 discusses the most dominant aspects of “Climate Change” in relation to them to the farmers’ everyday reality. Chapter 6 then treats two specific content clusters that exemplify either a real (physical) phenomenon (“weather”) or an

concept (“Greenhouse Gas Emissions”), and reconstructs the interconnection of their symbolic elements.

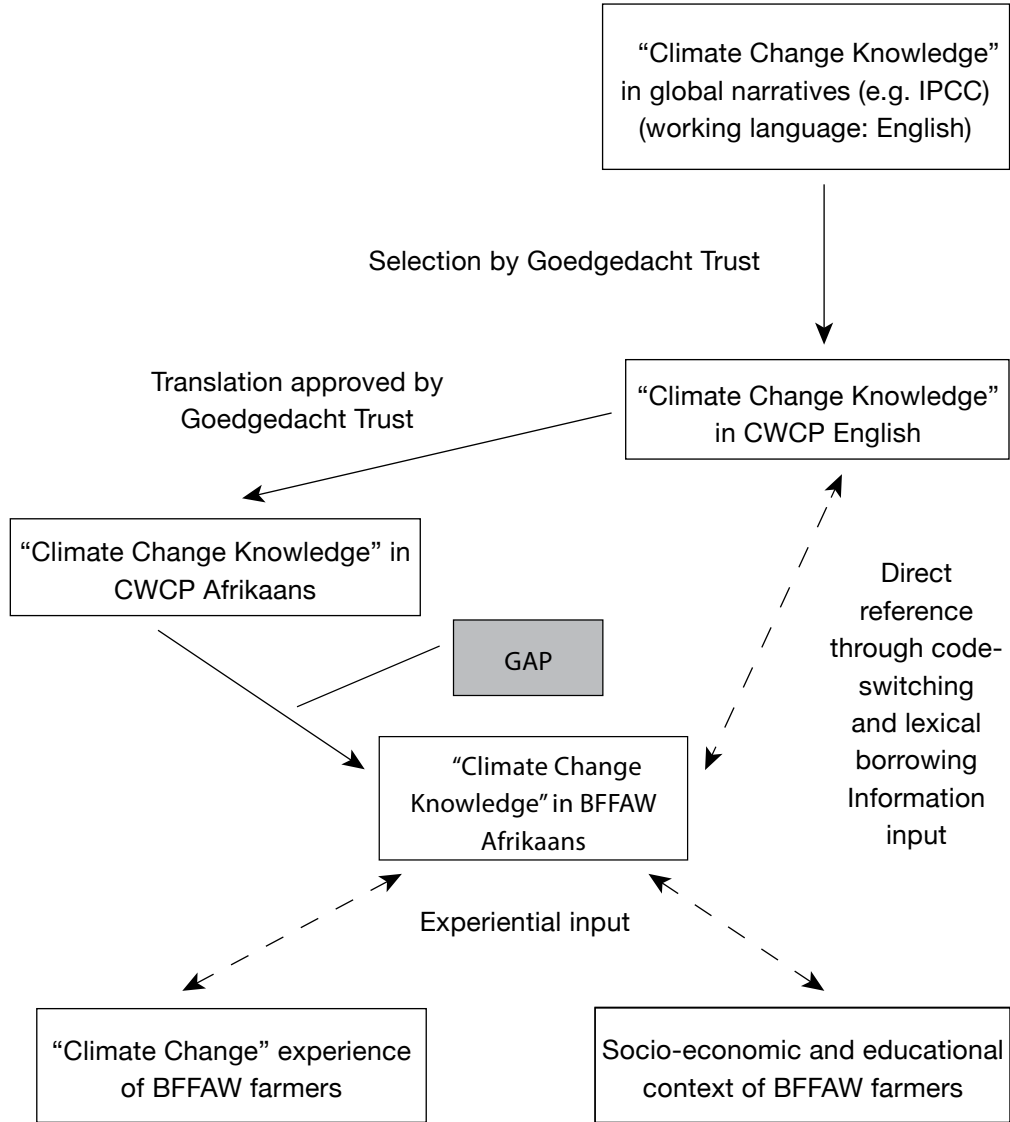
5. The contents of “Climate Change”: different perspectives

Having finally reached the point when abstract theoretical and methodological considerations meet a concrete data set, some preliminary remarks will explain the procedure structuring this chapter. It is assumed again that “Climate Change Knowledge” does not exist per se, but is in fact creatively produced or constructed. In the context of this project three aspects of knowledge are presented in contrast to each other. They are divided by their linguistic features, differentiating between English and Afrikaans, and their discursive affiliation to scientific or colloquial discourses.

Firstly, as chapter 4.5 has indicated, the English texts of the Cool World Climate Path display a global narrative on the topic of “Climate Change”. Although aiming at keeping a local reference, the information included is directly influenced and shaped by scientific discourses. Secondly, the Afrikaans translation of the English CWCP board texts illustrate the attempt to transfer the (semiotically) equivalent information into the local language that is most frequently spoken by the target group of the “Emerging Black Farmers”. This version of “Climate Change Knowledge” is accurate and (semiotically) equivalent depending on the degree of translational precision. Thus a difference between the English and the Afrikaans text versions of the Cool World Climate Path evolves mainly on the symbol and language level of system-context interrelations (cf. table 2).

While the knowledge of the CWCP is intended to be equivalent in English and Afrikaans, the third and most crucial knowledge set is the idea of “Climate Change” of the BFFAW farmers. Their perception is expressed in Afrikaans and therefore comparable to the Afrikaans explanatory sets of the CWCP without the crossing of linguistic borders.

Concept map 1: Interrelation of “Climate Change Knowledges”



Source: Own interpretation.

The concept map above equally visualizes the *hierarchy of knowledge* as it applies to the specific case of the Goedgedacht Trust in exchange with the BFFAW farmers. Selected topics of the global discourse in the context of the IPCC have been (subjectively) chosen by the Goedgedacht Trust according to their local relevance. They are formulated in terminologically technical English and transferred in a comparable contentual equivalent in Afrikaans. This is the version in which they are consumed by the BFFAW farmers.

Between the farmers’ descriptions with a colloquial or strongly experience-based notion of “Climate Change”, and a scientific understanding of “Climate

Change” a gap or break can be traced. It can be observed that a form of knowledge emerges along this gap, driven by the individual attempt to organize and balance abstract information with individual experience and socio-economic or educational preconditions that mainly determine the farmers’ *lifeworld*. Here the educational, socio-economic and attitudinal diversity of the BFFAW farmers as described in chapter 4 is also displayed in the variety of answers and may help to explain the appearance of specific content clusters.

By contrasting the CWCP “Climate Change Knowledge” in English and Afrikaans with the “Climate Change Knowledge” of the BFFAW farmers, the gap takes shape and the differences between the bodies of knowledge become visible. From the interconnections it can be concluded that the specific continuum of “Climate Change Knowledge” that is communicated by the BFFAW farmers is framed in comparison and distinction to the knowledge set of the Cool World Climate Path.

The analysis of the interview data was a multi-stage process driven by the goal of re-organizing the existing information in order to model “knowledge” in different dimensions. Here the programme atlas.ti offered adequate features for a systematic codification and subsequent summary. The data were filtered according to the following procedure:

- 1) In the first step the “raw” text material was codified by using the codification guide. This guideline has been developed out of the three foci given by each perspective (linguistic, discursive, ethic) and predefines relevant main categories for analysis (in the context of the research question). The subordinate categories applied here are: *Terminology* (symbols); “Climate Change” *Contextualization* (content and content cluster); and *Ethical implications* (normative standard, pathos and emphasis of ethos).
- 2) Following the dissection of the text, the fragments underwent a second codification round. In this stage the passages were re-sorted by a simultaneous assignment of new codes to their concrete *contents*. This means *content clusters* were identified and sorted according to their frequency. This “ranking” enables a proposition about the prominence of each cluster. For example, for the description of “Climate Change Knowledge” this means for example the text fragments of the code “Problem in practice” were screened again in order to isolate larger units of explanatory interconnections. The result is a list of content clusters dealing with specific challenges of “Climate Change” that were mentioned in the interviews.

- 3) In the next step the content clusters were analysed according to the frequency of dominant *terminology* and the coherence of the *contents* (e.g. climate-weather, seasons-weather, ground-soil). Interesting here is the contrast of the specific spatio-temporal contexts in which the termini are used, in order to compare the content and its embedding into the individual system of interpretation.
- 4) The results were compared to the interview responses of the Goedgedacht employees and the relevant passages of the Cool World Climate Path in English and Afrikaans in terms of terminology and the coherence of the information and “contentualization”.

The goal of this exercise was to extract the relevant information and set the perception of the BFFAW farmers in relation to a scientific approach in order to create a multi-layered picture of the object of analysis, namely “Climate Change Knowledge”. Here the diversity of associations can only be systemically represented by abstracting the elements of the content. A closer look at the data with its symbolic and contentual diversity makes immediately clear that the information contents have to be organized in a meaningful way to depict their constitution reasonably. This process is based on a subjective interpretation of the researcher. Thus *concept maps*, which represent the elements graphically, help to externalize the knowledge by isolating the (abstract) elements from the content in order to trace their interconnections and to restructure and finally visualize their semantic units (content clusters). The concept maps have been derived from the interpretation of the data sources by the author, Susann de Ruijter, and therefore represent only one possible version of symbol constellation.

Furthermore I will emphasize again that all quantitative statements need to be relativized within the context of this project and do not serve as a validation of substance or integrity of knowledge; they rather simply describe and organize the encountered knowledge structures of the group of BFFAW farmers.

With regard to the three perspectives of analysis the following structure arises for the discussion of the data material in this chapter. While subchapter 5.1 explains the strategy of contextualization, subchapter 5.2 frames the statements about “Climate Change” under the foci of basic observations, root causes, risk awareness, responsibilities and finally chances, and contrasts the concepts of the BFFAW farmers with those of the Goedgedacht Trust.

In subchapter 5.3 a selection of *content clusters* are decomposed and the dominant *contents* extracted. By using concept maps, each content cluster is re-modelled. In terms of the content clusters presented, chapter 5.4 elaborates in conclusion on the

constellation of their constraints within the system of orientation which tremendously shape reality perception.

5.1 Contextualizing “Climate Change”

The enormous challenge that I faced when I started to think about the presentation of the data containing “Climate Change Knowledge” in its marvellous complexity, was how to divide the elements and interconnections into describable pieces. As mentioned before, Paul Cilliers (1998: 70) already noted that the challenge for the modelling of complex systems results from the necessity to create a model that is equivalent in its complexity. This concerns not only the systematization in order to extract a structure, but also the decomposition of portions that are sufficiently describable. From the aim of not transferring an abstract interpretational system onto the data, but rather of generating a structure inductively, results in the necessity that the internal chapter organization should reflect this approach.

The focus in this first part will lie on “Climate Change” in its explanatory structure, tracing some *indicators* of change description. I will use examples to demonstrate the way in which both “Climate Change Knowledges” approach for instance root causes, effects, threat potential and chances of “Climate Change”. The aim is to describe the specifics of different manifestations.

The guideline

As a tool for systematization, a guideline will help to trace the constitution of “Climate Change” perception. The outline possesses the following structure:

- Framing “Climate Change”: indicators
- Identifying “Climate Change”: basic observations
- Tracing “Climate Change”: root causes
- Perceiving “Climate Change”: impacts
- Concerning “Climate Change”: responsibilities (expectations)
- Encountering “Climate Change”: chances
- Evaluating “Climate Change”: risk awareness and threat potential

The structure attempts to reconstruct “Climate Change” in a (fairly) chronological approach. Assuming the recognition of the phenomenon under the symbol “Climate

Change” as the first step, first basic observations create an idea of the aspects (symbols) that are associated with this phenomenon. The framing of “Climate Change” also includes the definition of root causes and the assessment of immediate impacts on the individual's life, pointing out the relevance for their individual lifeworld. With the question of responsibilities, chances and risk awareness the analysis enters a meta-discourse about normative moral standards, shedding light on expectations, prospects and the evaluation of “Climate Change” phenomena. Particularly the self-positioning of the individual (interviewee), assigning himself to one (e.g. decision-maker) or another role (e.g. victim), determines the outcome of this analysis.

The related symbols were mostly extracted from answers of two different styles. On the one hand the farmers were explicitly requested to associate freely about the terms “Climate Change”, “Greenhouse Gas Emissions” and the “Cool World Climate Path”. On the other hand they were asked to elaborate on their experiences as farmers with changes to the natural environment⁸⁷, the challenges (*Afr.* uitdagings) for farming in the Swartland region⁸⁸, the effects of changes of natural environment on their farming practice⁸⁹ and their personal challenges in reference to the natural environment.⁹⁰

While the first questions ask about primarily environmental changes on an experience-related professional and personal level, the next ones attempt to investigate how the farmers associate changes with the symbol “klimaatverandering”.⁹¹

The following set of symbols was isolated, each one addressing a different aspect of “Climate Change”. The most prominent symbols according to the frequency of their appearance are:

- 87 Het jy in die afgelope jare aan jou boerderypraktyke verander? Indien wel, hoekom? a) Wat het jy verander? b) Hoekom, sou jy sê, was dit nodig om jou boerderypraktyke te verander? (*Engl.* Did you change your farming practice during the last years? If yes, why? a) What did you change? b) What are in your opinion the reasons for the necessity to change your farming practice?/Why was it necessary to change the way you are farming?)
- 88 Wat is die algemeenste uitdagings met boerdery in die Swartlandstreek, volgens jou?; Wat is die oorsake van hierdie uitdagings? (*Engl.* What are the most common challenges in the Swartland region for farming from your point of view?; What are the reasons for these challenges?)
- 89 Het jy veranderings in jou natuurlike omgewing opgemerk wat jou bedryf raak? a) Indien wel, watter veranderings? (*Engl.* Did you experience changes in your natural environment which touch your work? a) If yes, which ones?)
- 90 Watter uitdagings het die verandering in die natuur en weer vir jou persoonlik veroorsaak? (*Engl.* What are your personal challenges with the change of nature and weather?)
- 91 Is daar enige iets anders wat jy vir my wil vertel oor klimaatverandering? (*Engl.* Is there anything else which you want to tell me about climate change?); Hoekom, sou jy sê, is klimaatverandering 'n onderwerp wat vir hierdie streek saak maak? (*Engl.* Why do you think climate change is a relevant topic for this region?)

- 1) Weather
- 2) Finance, costs, profit
- 3) Seasons
- 4) Water/ Irrigation
- 5) Tenure status, access to land
- 6) Illnesses, pests
- 7) Ground, soil consistency
- 8) Security, crime, theft
- 9) Alien species (*Afr.* Indringerplante)
- 10) Water pollution (*Afr.* Besoedeling)
- 11) Transport

First it can be stated that the isolated contents connected to these symbols mostly bear a notion of different types of challenges. All of these symbols are more or less outcomes or effects of “Climate Change” addressing different areas of everyday life. While “finance”, “tenure status” and “security” concern the socio-economic space and the context that frames the challenge, while “weather”, “water” and “seasons” relate to experienced or observed shifts that are directly related to “Climate Change”. The symbol “illnesses and pests” includes diseases as well as illnesses of plants. Connected to each symbol are contents and content clusters that shape the nature of the problem with respect to one specific area, but also contributing to the whole system of “Climate Change Relevance”.

Thus the second part of this chapter will draw attention to *isolated contents*. The symbolic system that is specific to the topic of “Climate Change” offers the media (linguistic signs) with which contents, thus larger contexts of meaning, are created. *Content clusters* are then the accumulation of contents which all connect to the same field. The contents themselves differ in their symbolic repertoire and their *interconnection*. The interconnections that I will analytically refer to are derived from the text data and appear content-specifically. Thus despite having successfully identified a major symbol of the knowledge corpus, the basis is indeed provided, but the complex nexus is still not unravelled.

Reconstructing content clusters

Again the challenge that derives from the endeavour of modelling is to abstract the encountered diffusion in order to present the findings in a reasonable way. The rationale that I decided to follow is to firstly describe the thematic breadth of the

content clusters in order to illustrate how they are constituted. I will confine the description to the most fruitful clusters connected to the symbol “weather”, as this helps as an example to show the diversity of interconnections, also in contrast to the thread drawn on the CWCP. The symbols are *implicit* in the sense that they don’t follow a stimulus in the question that consequently controls their appearance. They rather follow patterns of individual logic and appear depending on their relevance. Furthermore, these symbols represent the sub-space of *embodied knowledge*, which is bound to the body and thus related to experiences. Furthermore the *explicit* symbol “Greenhouse Gas Emissions”, freely associated by the BFFAW farmers in direct comparison to the CWCP descriptions, shall illustrate the assumed gap between both knowledge sets. The analysis contains the embedding into the *system of orientation* in which all content clusters are located, in chapter 6.3. I am aware that each content cluster contains evidence of some of these indicators to different degrees. Therefore the description of these complex interconnections needs to be narrowed to some general pattern that is detectable with regard to a selection of contents, that can be compared between the BFFAW farmers and the Cool World Climate Path.

5.2 Framing “Climate Change”: the problem character

The causal chain of “Climate Change” that the Cool World Climate Path communicates is very explicit and clearly linked to an anthropogenic idea of its origin (cf. Appendix A). It could be briefly summarized in a domino causal line as humanity causes (Greenhouse Gas) emissions, which in turn cause “Global Warming”, which induces “Climate Change” (Information board 21), resulting in negative effects on flora and fauna, leading to the final conclusion that humankind is responsible for stopping or reversing this process. The interviews reveal whether the farmers follow the same line of thought when asked about “Climate Change”. Information board 22 of the CWCP condenses the underlying rationale and chain of reasoning which the whole of the rest of the information path also follows.

21. Did you know that Global Warming leads to climate change? In 2009 worldwide there were more extreme floods and landslides caused by heavy rain, droughts, snowstorms causing avalanches, heat-waves, wildfires, lightning (because of warmer air), storms, tornadoes (inland storms) and hurricanes (storms of very strong winds that originate in the ocean - because oceans are warmer more hurricanes are occurring), typhoons (like a hurricane but formed in a different ocean). (CWCP, Information board 21)

21. *Het jy geweet dat aardverwarming lei klimaatverandering? In 2009 was daar wêreldwyd meer ekstreme vloede en grondstortings veroorsaak deur swaar reën, meer droogtes, sneeustorms wat sneeustortings veroorsaak het, hittegolwe, weerlig (as gevolg van warmer lug), storms, tornado's (binnelandse storms) en orkane storms wat bestaan uit baie sterk winde wat in die oseaan ontstaan – omdat oseane warmer is en meer orkane voorkom), tifone (soos 'n orkaan, maar in 'n ander oseaan gevorm). (CWCP, Information board 21)*

Information board 21 mentions the direct interconnection between “Global Warming” and “Climate Change” by retrospectively enumerating the diverse negative effects. Information board 22 follows it directly, and provides evidence for the veracity of the causality between “Global Warming” provoking mostly negative effects that fall under the label “Climate Change”.

22. Did you know that there is proof that Global Warming is actually happening? We call them Indicators. Indicators tell us that something is seriously wrong with our planet. Glaciers (ancient thick ice that flows extremely slowly) all over the world are melting and receding and some have disappeared. On our own continent of Africa, Mount Kilimanjaro in Tanzania used to have a thick covering of snow and a glacier. The snow cover is now very thin and the glacier has disappeared. Melting ice caps at the poles are another indicator, and there are many others. (CWCP, Information board 22)

22. *Het jy geweet dat daar bewyse is dat aardverwarming regtig besig is om plaas te vind? Ons noem dit indikators. Indikators sê vir ons dat iets ernstigs verkeerd is met ons planeet. Gletsers (baie ou dik ys wat uiters stadig vloei) oral oor die wêreld is besig om te smelt en te daal en sommige het verdwyn. Op ons vasteland van Afrika het berg Kilimanjaro in Tanzanië altyd 'n dik bedekking van sneeu en 'n gletser gehad. Die sneeubedekking is nou baie dun en die gletser het verdwyn. Smeltende yskappe by die pole is nog 'n indikator en daar is baie ander. (CWCP, Information board 22)*

Although it would apparently be easier to reduce the amount of answers to those which fit into a few abstract categories, this section tries to mirror and sort the whole range and not to delimitate it by prior selection. The interviews reflect a mixed variety of associations ranging between general observations, reflections about root causes and the explanations of possible causalities. Only very few associations are value-free; the majority contain negative connotations, while others express the helplessness of the affected group. This thematic breadth already points to the wide range of possibilities for reflecting about “Climate Change”. Very generally speaking, “Climate Change” can be associated with the necessity to adapt changes that are occurring, especially when in the position of a farmer.

Ja, as ek hoor van klimaatverandering dink ek net aan veranderings wat al weer gedoen moet word. Weet, jy sal nou net moet veranderings doen, jy sal nou weer moet aanpas. Dit is maar nou net 'n aanpassing. Party sal nie, party mense wat daar nie alledaags is, hulle sal dit nie sien nie, maar jy as boer, jy sal gou sien die swane rus. Hier moet veranderings kom, hier is verandering in die lug in daai. (Onderhoud met RS)

Yes, when I hear about climate change I only think of changes that will have to be made again. You know that you will now have to make changes, you will now have to adapt once more. It is just an adaptation. Some won't, some people who lead their everyday lives won't see it, but if you are a farmer, you will quickly notice that the swans are resting. Changes will have to come, it means there is change in the air. (Interview with RS)

The farmers find themselves in a reactive position, being somehow forced by the transitions to change their farming habits. The following examples illustrate the thematic breadth of further connotations.

Son, droogte, siekte, voedsel, water, ja. (Onderhoud met MA)

Sun, drought, illness, food, water, ja. (Interview with MA)

The variety in this very short answer demonstrates the spectrum of associations. What can be extracted from these five words is that “sun” and “water” are basic constituents involved in “Climate Change”, whereas “illness” and “drought” are outcomes of this process. “Food” is an urgent necessity and an instable result of small-scale farming. It designates the concrete essential element of life security, which is mostly affected by changes, especially when related to vulnerability.

5.2.1 Identifying “Climate Change”: basic observations

The analysis revealed that associations of the farmers do rather relate to sensory perceptions, mostly observations, than to cognitive references derived from theoretical bodies of knowledge. A first content cluster which could be identified concerns physical observations, therefore referring spatially to a local and temporally to a short- to mid-term scale of reference. The constructions of these contents are based on objective evaluations, and are thus of subjective quality, as they are not derived by measurement related to a larger scale of comparison.

One major content within this cluster is a shift of common *weather* patterns. Phenomena belonging to this content describe atmospheric conditions and include drought, temperature, precipitation and wind.

Klimaatverandering ... is van droogte, nat en ryp. (Onderhoud met AH)

Climate change ... is about drought, moisture and frost. (Interview with AH)

This association mentions drought, wet conditions and frost as elements of “Climate Change”, but doesn’t qualify how they are specifically involved. Meanwhile other statements describe an increase of precipitation,

Ek dink onmiddelik aan die warmte en koue. Kyk ons het nooit so baie sneeu gehad soos ons nou het nie, soos almal ... mens voel nog dat dinge verander en dit is a baie groot verandering in mens se lewe. (Onderhoud met RP)

I immediately think of heat and cold. Look, we never had as much snow as we have now, like everyone ... one can feel that things are changing, and they are big changes in one’s life. (Interview with RP)

or the intensification of heat,

Hitte, al warmer, ons ondervind dit nou. Gister was dit so warm. Dit maak ’n mens bang as dit so warm is en dit raak al warmer. Wat kan ons maak? Ons kan nie tot 38 grade. Dan es het vir ons te hoog. Maar dit raak al warmer. (Onderhoud met MM)

Heat, already warmer, we experience it now. Yesterday it was so warm. It makes one frightened when it is so warm and it gets even warmer. What can we do? We cannot [work] up to 38 degrees. That is too high for us. But it still is getting warmer. (Interview with MM)

as well as of wind and storms.

Klimaatverandering kan ’n bietjie gevaarlijk wees, soos donnerweer slaan, die wind beginne skielik opstaan, kan iets’s se takke afruk. Kan baie gevare laat plaasvind, miskien werk kan vergaan, sukke goeters. (Onderhoud met CA)

Climate change can be a bit dangerous, such as thunder and lightning, the wind suddenly begins to blow, can pull off something's branches. Can cause many dangers maybe work can be destroyed, such things. (Interview with CA)

All associations share the idea of growth or intensification of “Climate Change” with negative effects.

In reference to changes of weather, the imbalance of the system has been observed in particular in the form of immediate shifts between heat and cold,

Ja dit is onmiddelik; hitte, en dan weer koue. Die gedrags patrone van die hitte. En soos ek nou voorheen gesê het die gedrags patrone van die weer, dit is ... maar wanneer ek nou hoor van klimaatsveradinerings is dit onmiddelik, gaan dit oor warm en koud. Dit is seker maar die twee wat ek kan gebruik. (Onderhoud met IG)

Yes it is immediate, heat and the cold again, the behaviour patterns of heat. And as I said before the weather patterns, that is ... but when I now hear of climate change it is immediate, it's about warm and cold. These are surely the two that I can use (Interview with IG)

or the latent feeling that familiar weather patterns have changed unnecessarily.

My eenvoudige antwoord is: omdat die klimaat nie reg is nie. Soos dat moet nie wees nie. Dit maak, dat an die einde van die dag, dat daar 'n ding is, onbalans. Die reën was eintlik nie nodig nie en het net skade berokken, en dit is weer eens, klimaatsverandering. (Onderhoud met GB)

My simple answer is: that the climate is not right. It doesn't have to be like that. It makes that at the end of the day, there is something, imbalance. The rain was actually not necessary and has caused damages, and this is clearly again climate change. (Interview with GB)

A second content of physical observations refers to *seasons*. Now seasons describe the periods which share climatic properties. They can be described in reference to their position in the annual cycle oriented towards the lunar calendar.

Ja, ek kyk nou wat die mense sê en dan kyk of dit nou werklik gebeur. Hulle sê dit gebeur en dit is die oorsaak wat laat dit gebeur. Nou kyk ek ook maar, dan sien ek dit gebeur, dan moet ek ook nou maar nou vergelyk. Dit is natuurlik nou soos wat hulle sê, maar kyk, soos die jaar voor laasjaar het ons baie min reën gekry in die

winter. En nou dié jaar het ons weer baie meer reën gekry. So dit kan seker deel wees van die climate change, want soos Oom [name deleted] gesê het, sy goed het almal verdrink want die reën was geweldig baie in hierdie wintertyd. Die winter was ook 'n bietjie, bietjie meer langer, ander winters is weer 'n bietjie korter. Wat nou hier in dié jaar nou nie baie gebeur het nie, dit was ryp. Dit het nie eintlik baie geryp nie, en toe is ons alweer in die somer. Ander jare dan kry jy daar ryp dit weer vreeslik lang tyd, dan noem hulle dit 'n droë winter. En maar dan ryp dit weer maar dan is daar nie baie reën nie. Dié jaar was daar weer meer reën en minder ryp gewees. (Onderhoud met DW)

Yes, I just look around at what the people are saying and then see if it is really happening. They say that happens and this is the cause for this happening. Then I also look around and I see it happens, and then I also have to compare. That is of course as what you say, but look, as the year before last year brought us very little rain in the winter. And now this year we received a lot more rain again. So that can certainly be a part of climate change, because as Uncle [name deleted] said, his things were all drowned because the rain was so heavy in the wintertime. The winter was also a little bit longer, and other winters are again a bit shorter. What has not happened a lot in this year was the frost. It didn't freeze very much and then we are back in the summer again. In other years it freezes terribly or a long time, then you call it a dry winter. And when it freezes then there is not much rain. This year we had more rain and less frost. (Interview with DW)

Images of seasons are also connected to common farming practice, such as planting and harvesting periods. These images refer basically to the planting and harvesting rhythms within the farming cycle.

Ja, ons moet seker, 'n mens moet seker weet daarvan, want veral as jy 'n boer is dan moet jy weet van klimaatsverandering want jy gaan mos nou boer. So klimaatsverandering sal nou vir jou sê wat jy nou kan doen en wat jy nou nie kan doen nie. As jy nou sou iets plant wat jy nou ook sal verloor dan moet jy ook bietjie weet oor klimaatsverandering en jy moet ook weet want alles wat jy plant kan jy verloor, want jy het dit nou natuurlik op die verkeerde tyd geplant. Wat ons gewoonlik al die jare geplant het, hier van Septembermaand af was dit planttyd, kan jy nou, moet jy nou hier Oktobermaand moet jy plant want dan is die ryp nou al 'n bietjie weg. Nou plant jy Oktober, Novembermaand, dan kan jy nou plant. (Onderhoud met WS)

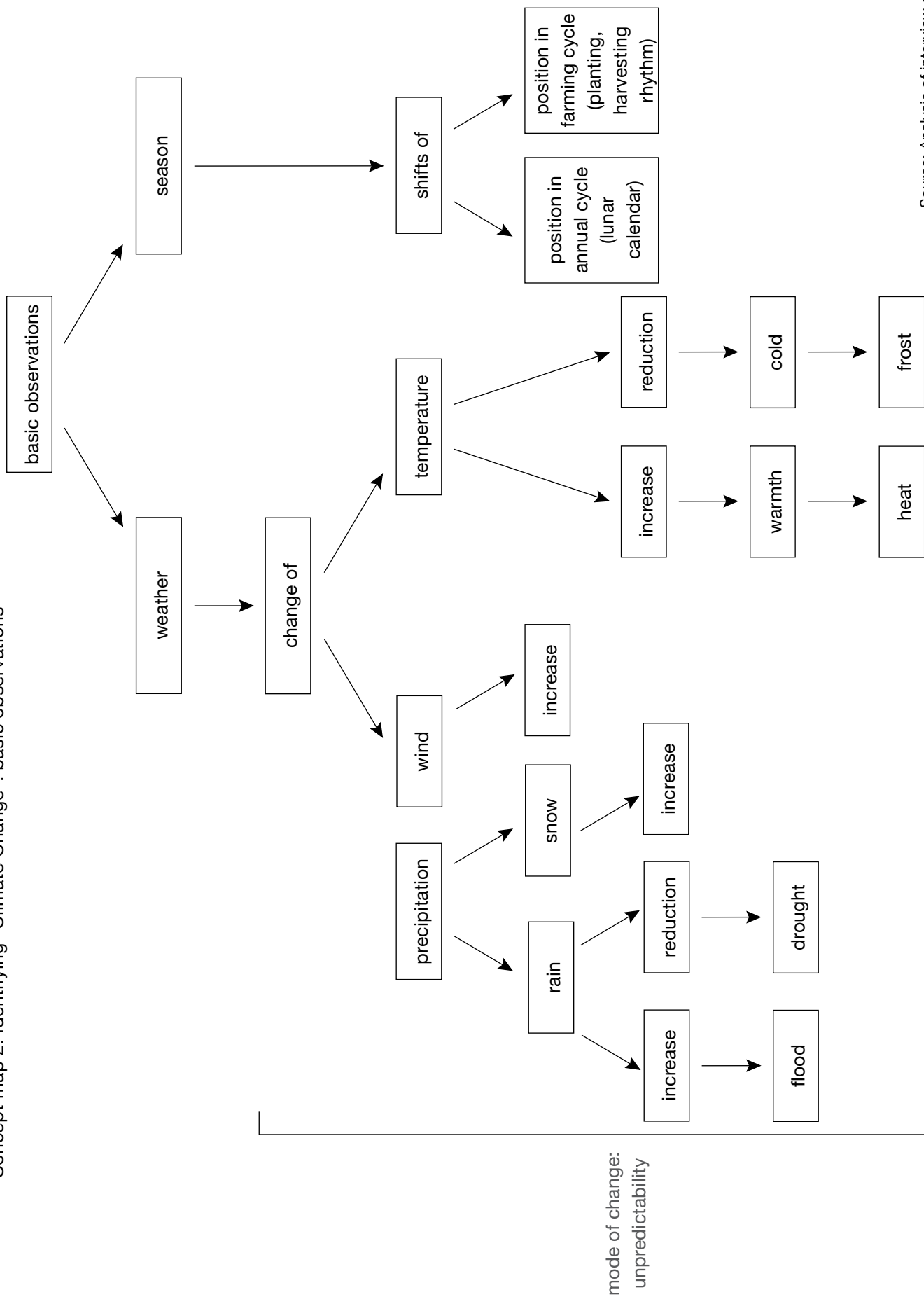
Yes, we surely have to, one has to know about it, and especially if you are a farmer then you have to know about climate change. So climate change will tell you what you can do and what you can't do. When you plant something what you will lose

then you have to know a bit about climate change and you also have to know, that you can lose everything that you plant, because you planted at the wrong time. What we usually planted in all the years, from September onwards was the planting period, you can now, now you have to plant in October, because then the frost has gone. Nowadays you plant in October, November, that is the time you can plant.
(Interview with WS)

The shift of seasons induces confusion on the farmers' side. There is no reference they can adapt to. The only way to achieve a successful farming outcome is to observe the shifts and adapt to them quickly.

The farmers' references relate mostly to an experiential or sensory level of perception that determines the recognition of "Climate Change" aspects. Spatio-temporally speaking, the BFFAW farmers refer to their immediate local and regional environment, contextualizing the phenomena within the limitations of their own experience in a short- to mid-term frame.

Concept map 2: Identifying "Climate Change": basic observations



5.2.2 Tracing “Climate Change”: root causes

In a different content cluster the answers predominantly try to give explanations about the root causes of “Climate Change”. The topic of root causes implies that, besides an initial source for a specific development an effect also results from a process that interconnects both. Therefore both roots and the contemplated impacts are closely linked.

First, as regards root causes the analysis indicated that they refer on the one hand prominently to the role of human behaviour as a source of climatic transformation. This applies to the texts of the Cool World Climate Path as much as it does to the interviews with the BFFAW farmers. On the other hand a major catalyst is a metaphysical entity. Here the BFFAW farmers' strong relation to the Christian religion becomes obvious.

The role of agency that is connected to the description of causation suggests that the personal references within the system of orientation are of main relevance for the description of this content cluster. I derived two major groups that are involved in the causation of “Climate Change”: humans (in general) and a metaphysical entity. All root causes are clearly and explicitly identified as actors that are more or less conscious about the effects of their action. A coincidental occurrence of different non-anthropogenic causes has not appeared as a possible or probable explanation. The following passages illustrate this assumption.

Root cause: humanity

The most frequent reference that is associated with root causes of “Climate Change” identifies a group of humans or mankind as the perpetrators of “Climate Change”. This attribution is dominated by the two symbols “negligence” and “technologization”. The Goedgedacht Trust gives relevance to a third symbol, as they link the whole chain of argument from root causes to responsibilities to the concept of “Carbon Footprint”.

Negligence refers to the moral side of “Climate Change” origination by identifying a characteristic trait of moral deficiency. It contains different degrees of personal referencing by the speaker. In the first quotation, the interviewee identifies with the universal group of humans in the fact that they share the basic characteristic features of being human.

Ja, dis seker maar mensenalatigheid. Want dis die mens wat maak dat ons in hierdie situasie in sit. (Onderhoud met RS)

It is surely still human negligence. Because it's mankind that is responsible for us being in this situation. (Interview with RS)

In the second quotation too, the attribute of negligence includes the speaker and still refers to the general, non-specified group of humans. The statement is combined with a reference to a low degree of risk awareness and a moral appeal for responsibility.

Somtyds is ons mense nalatig teenoor die natuur, en ek ken ons moet die gemeenskap onself meer bewus maak wat die natuur vir ons kan aanbied. (Onderhoud met CD)

Sometimes we humans are negligent with nature, and I know we have to become more aware in the community about what nature can provide for us. (Interview with CD)

The topic of negligence also remains prominent in the next citation. The interviewee describes greed as a part of human nature as a motivation for this negligence. In this example the personal reference “ons” concerns more precisely the group of small-scale farmers in which the speaker includes himself.

Onself, ons is nalatig, as gevolg van sekere dinge wat ons ook nie kan bekom nie, as gevolg van geld. Kapitaal kan ons nie sekere dinge bekom om weer krag te set in die grond en basies is ons ook self verantwoordlik vir die tipe dinge, want ons doenie wat ons moet doen nie. (Onderhoud met MA)

We ourselves, we are negligent, as a consequence of particular things that we can not accept, as a consequence of money. Capital cannot give us these things to recover the ground and basically we are responsible ourselves for this kind of things, what we don't do and what we don't have to do. (Interview with MA)

The examples of negligence are limited to the identification of attitudinal preconditions as a basis for climate-related behaviour. Negligence suggests the approval of mankind's, including the individual's own, fault for climate-destructive behaviour. What is interesting is that this symbol doesn't appear – in English or in Afrikaans – on the Cool World Climate Path at all.

The second basic symbol of this content cluster relates to the progressive technologization of lifestyle. In contrast to the evaluation of moral aspects, practical aspects of human behaviour that are causal for the emergence of “Climate Change” are explicitly assigned in this content cluster. After a short description of the observed

shifts, the next interviewee identified humans as perpetrators and in turn technical devices and their mode of operation as causes for climatic change.

Ek het so min geles deesdae. Verlede jaar was dit warmer as nou. Hoekom is dit so? Die seisoene is nie meer wat dit was nie. Yes, jy weet nie wat jy moet saai nie, wat jy moet plant nie. Soos nou, septembermaand was dit baie nat. Ons konnie plant nie. Augustusmaand het ons oërspoel, so te sê. Oktobermaand toe kon ons eerst plant. Automaties is ons goed alles agteruit. Dis deel van die klimaatchanging mos wat nou hier angaan, lieve Vader, ons mense wat dit veroorsaak met al onse engines, met al onse elektriese toestelle, wat windmill, wat is daai wind ... [windenergie]? Maar dit is ons mense wat aardverwarming laat plaasvind met al onse elektrisiteit toestelle en al onse motors, die nuuste modelle en uitlaatgasse wat daar uitkom, verskillende soorte uitlaatgasse. Is ons mense wat veroorsaak. (Onderhoud met MM)

I hardly read these days. Last year it was warmer than now. Why is it like that? The seasons are not what they used to be. Yes, you don't know what to sow or to plant. August has flooded us, so to say. We could only plant in October. Automatically our things are backward. That is part of climate change that concerns here, dear Father, we humans that cause this with all our engines, with all our electrical devices, the windmill, what is this wind ... [wind energy]? But it is us humans that cause global warming with all our electrical devices and all our motors, the newest models and emissions that come out of it, different sorts of emissions. It is us humans that cause [climate change]. (Interview with MM)

Not explicitly mentioning mankind as perpetrators, but following the recent line of argument, this identifies an increased use of technical devices, here vehicles, as a basic condition for “Climate Change”.

Ah ek weet nou nie, dit klimaat verandering, soos ek nou maar hoor, maar dit is seker nie my eie opinie nie, maar as ek dan ook kennis neem van wat gese word dan is dit, ja, jy kyk die uitlaatgasse van die voertuie, jy kyk die hoeveelheid voertuie wat op dit paai is, hulle veroorsaak dalk dis alles hitte. (Onderhoud met IG)

Ah, I don't know. This climate change, as I just hear, but this is surely not my own opinion, but if I am taking into consideration what has been said then it is, yes, you see the emissions of the vehicles, you see the amount of vehicles that are driving on the roads, they possibly cause all this heat. (Interview with IG)

Root cause: metaphysical entity (Bible, God)

As already mentioned Christianity plays a major role in the lives of the BFFAW farmers and determines the evaluation of root causes, in particular by referring to the texts of the Bible.

Ja, ek glo, maar kyk ek weet nou mos nie hoekom sal die Bybel so sê wat jare gelede geskryf gewees het, hy voorspel dat dit wat ek vandag sien gebeur vandag. (Onderhoud met DW)

Yes, I believe, but look, I don't know why the Bible, which was written years ago, would say so, it predicts that which I see happening today. (Interview with DW)

Identifying a metaphysical entity, here the Christian God, as a source of “Climate Change” often also implies a situation of inevitability, in which earlier predictions come true.

Uhm, en ek is maar tevrede ook. Ek glo maar ek kry die dag van die Here af, maar ek meen ons mens moet seker maar ons continent environment meer beskerm. (Onderhoud met IG)

Uhm, I am just contented. I believe that I get the day from the Lord, but I think we humans also have to save our continent's environment even more. (Interview with IG)

The interviewee is also emphasizing the role and responsibility of humans in contributing to positive developments. Even more explicit and underlining humanity's actually destructive acts, is the ostensive reference to biblical passages, like Romans 8:20,21, which speaks about the redemption of Creation, to which mankind belongs, and hope, guiding the way to salvation. The statement hints at the direction of human nature, where we have acted against Creation and are getting a “payback” in the form of “Climate Change”.

Hy sê dat die natuur wat geskep is deur God, om selfs ek en u deel uitmaak, vra ook self 'n Verlosser [he is referring to Romans 8:20,21 in the Bible], want as u vat, ons sal nou net praat van die gasse wat vir u gestel word, weet u, daai groot skepe mit daai miljoene liters olie en baie kere, as 'n skip-ramp plaasvind op see, diepsee, en dan die nadeel, ek meen die lewe, die seelewe en almal, daai soek God

syn Skepper en dat maak deel uit van dat hulle, dat die Woord sê dat selfs daai diere sig na die Here toe om ook vir hulle te help, en nou kom ons wat terug dat 't nou veroorsaak dat, ons as die mens, wat self die natuur besoedel en benadeel en hy doen net wat verkeerd is. En dit is eintlik my antwoord. (Onderhoud met GB)

He says that the nature that has been created by God, which also me and you are part of, also asks for a Redeemer [he is referring to Romans 8:20,21 in the Bible], because as you continue, we don't have to speak of the gases that appear to us, you know, those big ships with these million litres oil and often, when a shipwreck happens on the sea, the deep ocean, and then the inconvenience, I suppose life, the sea life and all of that, those look for God's Creator and this belongs to them, that the Word says that even those animals look for the Lord to help them as well, and now there's something coming back to us, that is causing this [climate change], we as humans, who are polluting nature ourselves and damage and doing things that are wrong. And this is actually my answer. (Interview with GB)

In contrast to the retrospective interpretation of the biblical texts, which allegedly predicted “Climate Change” and present it as “God’s will”, stands its comparison with its sudden appearance like a devil. Here “Climate Change” conveys a short-term, almost spontaneous notion of destructive force.

Ja man, hoe kan ek nou sê, wat kan ... Klimaatverandering is 'n ding wat maar kom, dis amper soos 'n duiwel, soos 'n spook, hoe sê hulle, wat in die nag in kom, in die nag in, as jy jou kom kry die ander dag is dit maar so ... Byvoorbeeld, my wingerd staan nou baie mooi. Ek kom die next oggend daar, sien ek my druive is almal weg. Jy ly verliese. Dis net dat dit 'n hoë risiko is. Boerdery is maar net 'n risiko en klaar. Want ek kan nou 'n dinge geplant het en môre kom die ryp en hy vat alles weg van my af. Maar dit is waarmee ons maar moet saamlewe vandag ... die wat 'n boer is. (Onderhoud met RS)

Yes man, how can I say, what can ... Climate change is a thing that just comes, it's almost like a devil, like a ghost, how do they say, that comes in the night, when you rub your eyes the next morning, it is just there ... For example, my vineyard is now standing very nicely. I come there the next morning and see that my grapes are all gone. You suffer losses. It's just that it is a high risk. Farming is just a risk, and that's that. Because I can plant something now, and tomorrow the frost comes and takes everything away from me. But this is what we just have to live with today ... those of us who are farmers. (Interview with RS)

Referring to God’s will as a reason for “Climate Change” adds a further aspect to the reactive character of action opportunities. It indicates the idea that there is no

escape or alternative for this development which could be sustainably influenced by humanity.

The reference to a metaphysical entity further involves belief as a basic mechanism for the verification of its truth. The fact that God caused “Climate Change” can not be verified by observation or measurement like the other root causes identified.

Also of interest here is the perception of the unpredictable character of “Climate Change”, which will also play a role in chapter 6.1.

Root cause: industry

In opposition to humanity or God as perpetrators of “Climate Change”, the ambiguous group of “industry”, which includes for instance the symbols “factory” and “company”, describes a group of “others” to which the interviewee does not primarily belong. The determination of a whole sector differs from the first two root cause(r)s as the actor role is connected to (administrative) positions, for instance the steering committee, and not to individuals. By referring to these institutions and not identifying with this group, the interviewee also surrenders the responsibility for being a source or causing negative climatic changes.

Ah, ek weet nou nie, dit klimaat verandering, soos ek nou maar hoor, maar dit is seker nie my eie opinie nie, maar as ek dan ook kennis neem van wat gesê word, dan is dit, ja, jy kyk die uitlaatgasse van die voertuie, jy kyk die hoeveelheid voertuie wat op dit paai is, hulle veroorsaak dalk dis alles hitte. En dan kyk jy die fabriek wat steenkool gebruik en hierdie hitte gaan in die lug in. So in ander woorde, dit sê vir my, as ek nou dan my bietjie kennis gebruik wat ek het, dat die hitte verdamp onmiddelik, of verbrand onmiddelik die vog wat daar is. So dit is wat ek dink wat ons daar klimaat nou so laat verander. (Onderhoud met IG)

Ah, I don't know, this climate change, as I just hear it, but this is surely not my own opinion, but if I am considering what is said, then it is, yes, you see the emissions of the vehicles, you see the amount of vehicles that are around, they possibly cause all this heat. And then you see the factories that are using coal and this heat goes into the air. So to say it differently, this tells me, if I am using the little knowledge I have, that the heat immediately evaporates, or immediately combusts the moisture there. So this is what I think that causes climate changes. (Interview with IG)

Although the interviewee in the last quotation was ultimately not sure about the actual contribution of “Climate Change”, he mentions the increase of traffic and the mode of manufactory production as basic influential factors impairing the quality of air.

Thus the symbol “technologization” is connected to this content at this point as well. In the next quotation, “industries” are also identified as perpetrators, additionally already mentioning the impact of changing weather or climate.

Die woorde wat ek aan dink as hulle praat van klimaatverandering dan is dit iets te doen met die gasse en die verskillende industries, uh, wat die weer se klimaat verander. (Onderhoud met WS)

The words I am thinking of when you talk of Climate Change, then it has something to do with the gasses and different industries, uh, what changes the weather's climate. (Interview with WS)

The idea of the actual contribution of industry to “Climate Change” is very imprecise, and remains a more or less general imputation.

Outsider perspective

I will complete the picture by also presenting the outsider perspective of the Goedgedacht Trust. The staff members conveyed a clear attitude in terms of the root causes of “Climate Change”, identifying anthropogenic actions as the source. Peter Templeton further distances himself and the organization (“we believe”) from any interconnection with a metaphysical entity.

We believe at Goedgedacht the whole climate change issue is man-made. It's not that God created climate change. It's man-made. (Interview with Peter Templeton)

The Goedgedacht Trust clearly identifies the “Carbon Footprint” concept as a basis for the evaluation of “Climate Change” influence.

And all of life depends on our ability to have this symbiotic balance between heat and cold and, you know, not getting captured in this cloud of carbon fog, that's going to slowly emerge on the planet. I mean, it is so, the whole Carbon Footprint concept, is so important for human life. (Interview with Peter Templeton)

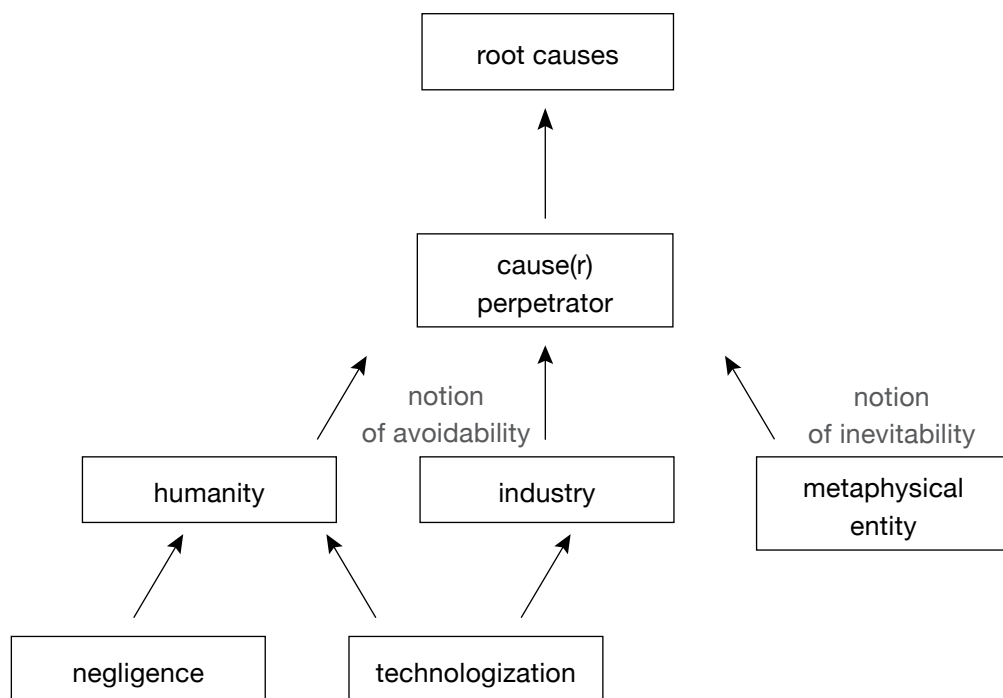
The “Carbon Footprint” measures the average emissions resulting directly or indirectly from actions or production processes for goods. These are basically caused by individuals, institutions or nations. Thus every good can (theoretically) be classified by the amount of emissions produced during its creation, enabling an objective

evaluation of its contribution to global warming and finally “Climate Change”. The same logic applies to human behaviour, as a person's lifestyle determines the degree of their involvement in “Climate Change” processes.

Well I can only think, they use only little carbon, you know. They are not big carbon users. So they're not the main causes of the problem. The main causes of the problem are the factories on the other side producing cement. (Interview with Peter Templeton)

In the case of the BFFAW farmers Mr. Templeton ascribes to them a basically marginal role for the adverse development of “Climate Change”. This raises the question of their actual responsibility in contributing to a sustainable reduction in emissions. Chapter 5.2.4 will elaborate on this.

Concept map 3: Tracing “Climate Change”: root causes



Source: Analysis of interview data.

5.2.3 Perceiving “Climate Change”: impacts

Not only environmental changes themselves are observed and addressed, but impacts of a different range are also spontaneously mentioned as aspects of vital relevance. Not only are the impacts of “Climate Change” concerning in farming practice, but they

are also connected to other spheres of vulnerability in daily life: security, employment, tenure status, and illnesses. It seems that a diffuse idea of environmental change, and with it of farming practice, determines the interpretation of its spheres of influence. The effects or impacts are assigned in direct or indirect causal interrelation to the sparsely defined root causes of “Climate Change”.

Impact: alien species

One impact that is set in relation to the developments of “Climate Change” is the settlement of alien species. The appearance of exogenous species seems to coincide temporally with the appearance of “Climate Change”.

Ja, ek kan sê hier by ons is sekere bome, uitheemse spesie, en mense het beginne wonder hoe om van die goed ons water raak. Daar kom amper soorte swamme soos ‘n siekte wat die boom optel, wat eintlik die boom op die einde van die dag ook maar uitwis. So dis deel wat ek sien wat klimaatverandering aan die ding doen. (Onderhoud met AP)

Yes, I can say here we have certain trees, alien species, and the people started wondering where in the world our water is. There are these sorts of fungi [they are] like a sickness that infests the tree, which finally eliminates the tree. So this is partly what I see climate change is doing to [affect] the things. (Interview with AP)

Both the previous and the following quotations demonstrate the causal interconnection between the symbol “alien species” and the symbol “drought” (“droogte”). The dehydration of the ground leads to reduced fertility and finally to a reduction or even elimination of crop yields.

Die droogte die is te veel. Alienbome, hulle trek aldie water uit die gront uit. Dat maak dat die gront nie vrugbaar is nie. Want hoe gaan ons eet? Ons moet lewe. Hoe gaan ons eet? As daar nie water is om die groente te laat groei, wat gaan ons eet. Want die basiese, die main-dinges, ons moet eet sodat ons kan lewe, om gesond te bly. (Onderhoud met MA)

The drought is too much. Alien species, they suck the water out of the ground. This reduces the fertility of the ground. But how are we going to eat? We have to live [survive]. How are we going to eat? If there is no water to let the vegetables grow, what are we going to eat? Because the basis, the main things, we have to eat to live, to stay healthy. (Interview with MA)

Impact: illnesses

There is also an interpretation of “Climate Change”, which not only involves the environment but also affects the human body itself.

Ja ek dink, ek weet nou nie of ’t nou ouderdom is nie, maar ek het nou kwaaltjies opgedoen wat ek nie eers in my lewe gehad het nie. Wat ek op myself dink julle moet klimaatverandering syn, haha, dis maar al wat ek daarvan kan sê. (Onderhoud met AP)

Yes I think I don't know if it is not age, but I am now facing diseases which I never had before in my life. That makes me think that must be climate change, haha, that is what I can say about it. (Interview with AP)

He might have said it with a cynical undertone when suggesting that not only internal physical processes of aging, but also external climatic changes influence his individual wellbeing. Nevertheless, a causal contextualization becomes clear.

Illnesses refer not only to the human body, but also affect the local flora and fauna. Cattle suffer especially from increasing temperatures

Siekte, man, siekte. Klimaatverandering gaat gepaard mit siekte, want ons moet ... somtyds is dit té warm, nee. Dan moet ons worrie, wat veeboere is, van onse beeste. Kyk, ’n vark en ’n hoender kannie by warmte staan nie. Beeste ook nie. So ons moet vroe op die oggent weg mit hulle, ‘saëns, ’s middags laat met hulle werk. Ons worrie van ons lande, want ons geplant het, daar gaan miskien risikoos wees, sien? Ons het nie veel geld om werk oor te doen nie. Ons het ook nie implemente om die werk oor te doen nie. So ons is maar afhanklik. (Onderhoud met MA)

Illness, man, illness. Climate change goes along with illness, because we have ... sometimes it's too warm, isn't it. Then we cattle breeders have to worry about our livestock. Look, a pig and a chicken cannot stand warmth [heat]. Neither can cattle. So we have to leave with them early in the morning, in the evening, late afternoons we work with them. We worry about our land, because what we have planted, there are probably going to be risks, you see? We don't have much money to do our work. We also don't have implements to repeat the work. So we are dependent. (Interview with MA)

The perceived vulnerability to “Climate Change” of both cattle and crops in turn affects the economic security of the BFFAW farmers, pointing out the impacts on the financial sphere of everyday practice.

Impact: finances

The content cluster which unfolds in reference to the symbol “finance” mainly contains aspects of *costs* and *investment capacities*, which are closely linked to and dependent on political practice in the Western Cape province.

The *costs* of agricultural production are perceived to be rising in different fields simultaneously. This increase affects expenditures for maintaining farming production as well as for the employment of farm helpers. The first quotation explains the dependence on electricity from companies (mainly ESKOM), who determine the prices. The lack of independence through the absence of alternative electricity production forces the farmers to adapt to any price increase by paying the higher rates.

Vir ons klein boere om te boer, die kostes van elektrisiteit is besig om vir ons dood te wurg, [...], die boere wat langs mekaar, die bure, ek het nou gesien in die Noord-Kaap, daai mense het 'n miljoen rand uitgehaal vir 'n sonkragstasie, wat al hulle plase en die amount van geld wat hulle ... dit is goed vir klimaat verandering. Dan is daar nie meer sulke klomp gasse want die hoeveelhede raak minder, en as ons nie dit gaan kry nie dan gaan ons een van die dae sonder elektrisiteit sit. (Onderhoud met WS)

For us small farmers to farm, the cost of electricity is strangling us to death, [...], the farmers that are next to each other, the neighbours, I have seen in the Northern Cape, those people have taken out R1 million for a solar power station for all their farms and the amount of money that they ... it is good for climate change. The amounts of gasses decrease, and if we don't do the same, then one of these days we will sit without electricity. (Interview with WS)

A similar situation of dependence appears regarding the watering costs. The increase of drought periods reduces the availability of natural watering through rain and also induces the necessity to increase the purchase of municipal water for this purpose.

Water. Geen van ons hê die boorgatwater, hè. Ons moet van die munisipale water gebruik. (Onderhoud met MM)

Water. None of us has borehole water, he. We have to use the municipal water. (Interview with MM)

This development culminates in watering costs that sometimes even exceeds their total monthly income.

'Ek moet natmaak. Vanoggend het ek gelet gestaan op die weer geset: gaan reën 30 persent, weer 'n stukkie natgemaak en seven o'clock toe het nog geen reën nie. Hoe moet ek gaan natmaak? En daar gaan die munisipaliteit my aanslaan. Want ek maak eintlik gewoonlik van ses tot dit is lekker nat, nè. Ek dink hulle slaan ons nie an nie. Ek dink so, ek weet nie seker nie. My water is hemelhoog. So hoog, dat hy kom nou uit 2000 Rand uit.' 'Een maand?' 'Plusminus ja. Dit kry ek totaal nie as inkomste nie.' (Onderhoud met MM)

'I have to irrigate. This morning I watched the weather: it will rain 30 percent, watered again a bit and seven o'clock it still hadn't rained yet. How should I irrigate? And there the municipality strikes me. I usually water from six until it's properly wet, you know. I think they don't strike us. I think so, but I don't know for sure. My water [costs] is soaring. So high, that it reaches 2000 Rand.' 'One month?' 'Pretty much, yes. I don't even earn that much in total.' (Interview with MM)

The rising costs affect not only expenditures for energy and watering, they impact upon the capacities to employ sufficient labour workers.

Meeste van die tyd is dit arbeid, dis arbeid en kapitaal, kapitaal is die belangrikste. Jy kan arbeid kry, maar jy kan nie die mense aanhou vir die tye wat jy graag wil om sê produksie of skoonmaak, onkruidbeheer en so aan, want die kapitaal is alles nie daar nie. (Onderhoud met WS)

Most of the time it is labour, it's labour and capital, capital is most important. You can get labour, but you can't keep the people on for the time that you need for production or cleaning, weed control and so on, because the capital is not there. (Interview with WS)

The financial implications of "Climate Change" are not only described regarding their immediate effects and oriented towards the present or past, but visions and projections about the future also exist. The following critical appeal establishes a relation between the ignorant human behaviour driven by greed, and "Climate Change" as a tolerated side effect, with the result of negative long-term effects for future generations. Avarice for money is described as a limiting factor avoiding any sustainable independence from energy companies and consumers who refuse to invest in more cost-intensive sustainable energy sources.

Die basiese ding vir my die geldgierigheid speel so groot rol. Dat die mens net om sy bankbalanssterkte hou en hy gee nie om wat hy an die einde van die dag aan die natuur doen nie, die skade wat hy berokken, so lang as wat hy op sy money per

jaar of per maand in sy bankrekening inpomp. Maar wat sal 't ons baat ten einde van die dag, wat is oër vir ons kleinkinders, ons agterkleinkinders, vir die natuur homself, want dit ly almal. (Onderhoud met GB)

The basic things for me, the greed plays a big role. That a human just holds the level of his bank balance strength and doesn't care what he does to nature at the end of the day, the damage that he is involved in, as long as he puts his money into his bank account annually or monthly. But what will it help us at the end of the day, what is left for our grandchildren, our great-grandchildren, for nature itself, because that will all suffer. (Interview with GB)

“Climate Change” is perceived to be increasing the pressure on the financial capacities of a small-scale farming household. The financial situation is closely linked to the whole question of *investment capacities* and adaptation capacities. In the discourses on vulnerability to poverty coping capacities, which buffer external shocks in the first step and enable a sustainable adaptation in the second step, relate to different spheres of livelihood security. One of these coping capacities is financial resources or at least access to financial capital. The reality shows that the general economic situation of small-scale farmers prevents them from adapting to changing farming requirements by their own means. The next quotation reflects critically on the position of the small-scale farmers and their inability to cope with increasing costs.

Ja, as 'n mens moet kyk na die uitdagings in die Swartland, dan praat ons van ons. Swartboere is maar mense wat nie die kapitaal het nie om die boerdery suksesvol te laat ontwikkel. (Onderhoud met JV)

Ja, if someone is looking for the challenges in Swartland, then we speak about us. Swartland farmers (or "black" farmers) are just people that don't have the capital to develop farming successfully. (Interview with JV)

The result of adaptation incapacity is a constant retention of accustomed (low-budget) farming practices.

Ek boer maar nog op die manier soos ons grootgeword het. Mens wil 'n bietjie verandering maak maar as jy nou nie die finansies het nie en daai goed om 'n verandering te maak nie, dan boer jy maar op dit wat jy nou het. (Onderhoud met DW)

I still farm in the way we were brought up. One would like to make some changes, but if you don't have the finance and those things to make a change, you just continue farming on that which you have at the moment. (Interview with DW)

As the small-scale farmers are not able by themselves to generate investment capital that is needed for the adaptation of farming practice, the application for governmental funding seems the only chance to participate in the regional agricultural production developments. Experience showed that gaining access to (governmental) funding or subsidies is regarded to be as difficult because of two aspects. Firstly, the formal procedure is too sophisticated and complicated for the applicants.

Die grootste uitdaging wat die meeste boere, of sal ek sê die swartkleinboere, finansiële en hoe om by die finansies uit te kom. Ek dink die grootste probleem is eintlik hoe om die prosesse wat hulle deur moet maak om daar uit te kom is 'n bietjie moeilik. Baie van die manne wat saam met my op die training was, ek sal nie sê hulle is ongeskool nie, maar hulle is nie op so'n hoë vlak om daai klomp forms goed in te vul nie. Ek dink hulle het baie leiding daar nodig. En aan die ander kant is 't die bestuur van die besigheid, daar is nog baie aandagpunte by die bestuur van die besigheid finansiële. (Onderhoud met LK)

The biggest challenge that most of the small-scale farmers, or should I say black small-scale farmers, has is financial and how to work out finances. I think the biggest problem is actually figuring out the processes to get out of that is quite difficult. Many of the men who attended the training with me, I wouldn't say that they are uneducated, but they are not on such a high level to fill in those forms correctly. I think they require much guidance. And on the other side it's the business management, there are still many issues regarding the financial [side of] business management. (Interview with LK)

Besides the application forms, which need to be completed correctly to be considered, business plans need to be developed as well, formally outlining the project idea. This whole procedure poses a huge challenge for the small-scale farmers, who are usually not educated when it comes to preparing this kind of paperwork. Workshops like those of the “Black Farmers Funding Application Workshop” of the Goedgeacht Trust remain rare, and although they provide assistance in the procedure, the success rate is still low according to the workshop presenter Mr. Philander.

A second aspect concerns the range of political decision making, which is described as non-transparent. The evaluations are based on experiences of refusal and depict the farmers' frustration and disillusion about their possibilities.

Omdat finansies so 'n probleem is om te kry. En mense sit met die opleiding maar hulle kan nou niks daarmee maak nie want daar is nou nie finansies of hulp wat hulle nou verder kan mee aangaan om daai opleiding wat hulle nou daar gekry het te kan uitlewe en toepas op die stukkie grond wat hulle het nie. (Onderhoud met DW)

Because it is such a problem to get finance. And people attend the training, but they can't do anything with it because there is no finance or assistance with which they can continue in order to put the training they received there into practice and apply it on the piece of land they have. (Interview with DW)

Die nasionale regering kyk om na die mense toe, maar die probleme wat ons mee sit, is dat ons kenne die nasionale regering nie. As ons kyk, die nasionale regering se geld kom op provinsiale vlak en die provinsiale regering is eintlik wat in die pad staan van die kleinboere. (Onderhoud met JV)

The national government is looking after the people, but the problems that we also have is that we don't know the national government. As we look around, the money of the national government goes to the provincial level and it is in fact the provincial government which stands in the way of the small-scale farmers. (Interview with JV)

The distribution policy of the Western Cape provincial government is critically pictured as intentionally refusing subsidies for small-scale farming.

Nee, nie altyd nie, want almal bly nie baie in die kleinskaal boerdery nie. Almal is meer gespits op die 'commercial' boerdery en vergeet somtyds om die kleinskaalboere te bring, daar waar die commercial boere is. En die kry baie min kennis of steun van die provinsiale regering. (Onderhoud met CD)

No, not always, because not everyone stays in small-scale farming. Everyone [politicians] is more pointed towards the commercial farming and they forget sometimes to also sustain the small-scale farmers, where the commercial farmers are. And they get less information and support by the provincial government. (Interview with CD)

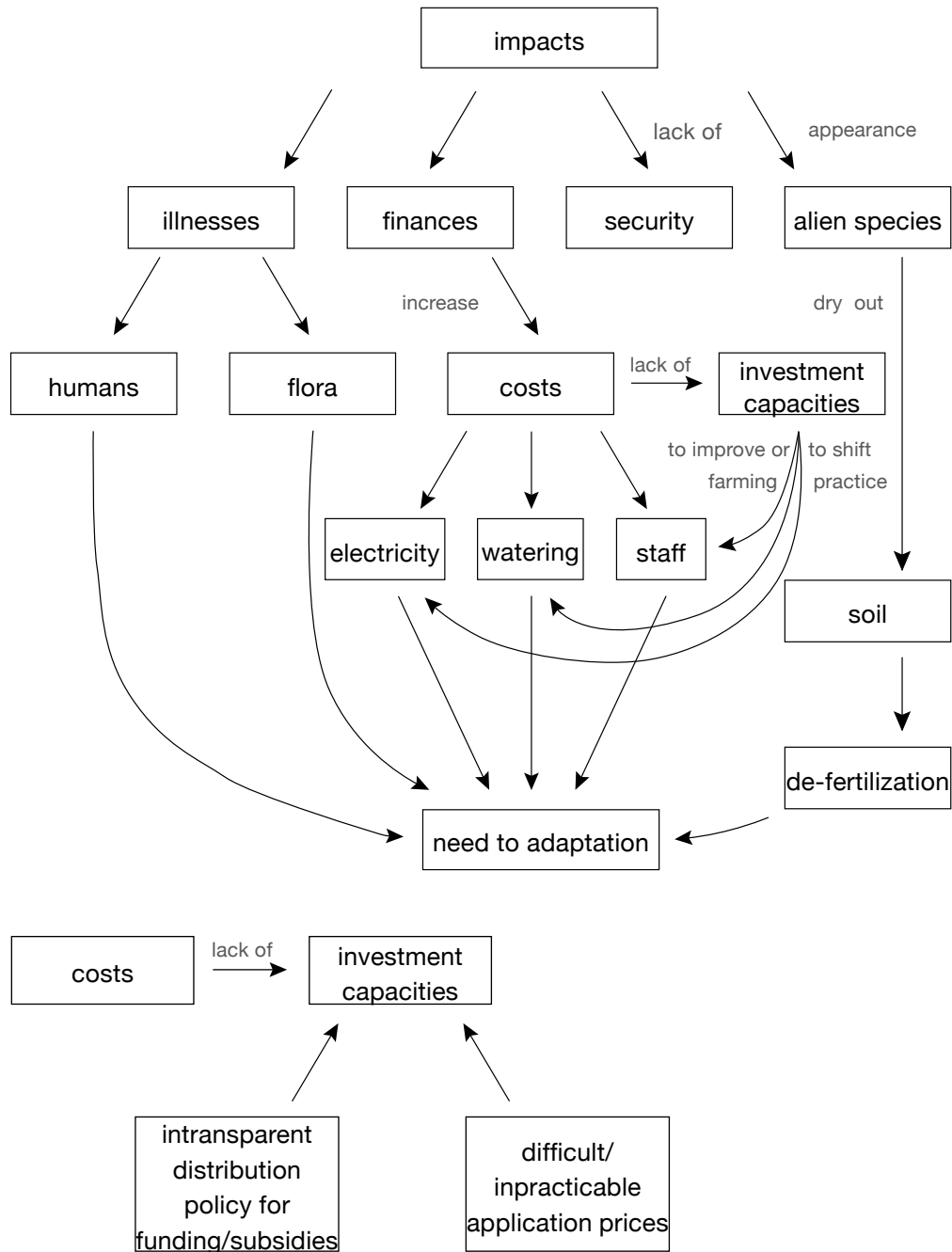
Die Wes-Kaapse regering se beleid raak my as 'n mens moet kyk na die kleinboere ontwikkeling. Dit word eintlik nie gekyk na die kleinboere ontwikkeling nie. Ons weet dat hulle finansies word meer belê aan die grootboere. (Onderhoud met JV)

The policy of the Western Cape government concerns me when looking at the peasant development. In fact it is not focussed on peasant development. We know that they provide more financial support to commercial farmers. (Interview with JV)

The question arises whether the low rate of governmental funding commitment results from inappropriate formal applications or from the political endeavour to empower

the commercial farming sector in the long run. As chapter 4 elaborated, attempts to establish a structure of cooperative farming initiatives amongst the BFFAW farmers failed so far; such a political strategy would keep the farmers in their vulnerable state of living, as their competitiveness remains at the lowest level and below.

Concept map 4: Perceiving “Climate Change”: impacts



Source: Analysis of interview data.

5.2.4 Concerning “Climate Change”: responsibilities

Like the topic of root causes, the question about responsibilities is also highly connected to personal referencing within the system of orientation, because at first sight only humans or a metaphysical entity in a wider sense can take responsibility. But political and economic institutions also represent important actors in this regard. Responsibility refers to a mode of behaviour, bound to a clear idea of ethical or at least a norm-conform standard. Persons or institutions responsible are on the one hand active “Climate Change” participants in a *constitutive role*, which is reflected mostly retrospectively, and/or on the other hand mainly reacting to changes in an *adaptive manner*, but still bearing responsibility for further developments. This subchapter introduces reflections of BFFAW farmers and Goedgedacht employees about the responsibilities of the different actors in the context of “Climate Change”.

I will briefly anticipate here that the definition of responsibilities in the context of “Climate Change” vastly influences the constitution of risk or threat awareness (cf. chapter 5.2.6) by revealing the perception of one's own role and involvement into the process of “Climate Change”.

Individual responsibility

The question of individual responsibility is a major topic in the discourse of the Goedgedacht Trust and on the Cool World Climate Path. Instructions for sustainable, “climate-conscious” behaviour especially belong to the sphere of responsibility. A strong emphasis in the form of an emotional appeal stresses the organisation's clear position towards each person's duty.

It is impossible to stand back and say I've done my bit for climate, you haven't.
You will never do enough for climate until the whole world goes on to renewable energy, as one. (Interview with Peter Templeton)

The clearly formulated aim to limit the world's energy supply to renewable sources exceeds even the objectives of the UNFCCC.⁹²

92 The United Nations Framework Convention on Climate Change, which has been ratified by 195 countries, entered into force on 21 March 1994. It recognized the existence of a “Problem of Climate Change”, defining the overall objective of “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame

As Mr. Templeton continued:

So, I am saying you'll never doing that whoever you are, and you should never sit back and be complacent to and think we'll I've done my bit. You haven't done your bit. You'll never have done your bit until everybody is on renewable energy.
(Interview with Peter Templeton)

Mr. Templeton emphasizes particularly the individual's role for achieving the goals of the transition of energy supply, attributing a global responsibility to every human ("you") from an external position. But which notions exist with regard to responsibility-taking? The next passage will reflect on this question.

Notions of inclusion and exclusion

Interesting in this content cluster is the fact that there exist two versions of "individual responsibility" expressed by the indexical "we" that appears in two connotations. Referring to Braun (2015), *indexicals* are linguistic expressions with shifting references dependent on the context. Mostly pronouns, demonstratives and adjectives are studied in this regard, as their precise content is determined by the context in which they are used.

An *indexical* which is relevant to the notion of responsibility is the Afrikaans pronoun "ons" (*Engl.* we). The explanations of the Cool World Climate Path mostly apply the first person plural personal pronoun "we" (*Afr.* ons) to indicate perpetrators or persons responsible for "Climate Change". This pronoun, which is usually denoted as the grammatical plural of the first person singular personal pronoun "I" (*Afr.* ek), does not refer to a group of people in that literal sense. In both languages it is not further differentiated by any extended plural constraint like sex, respect, deixis or animat. It rather suggests that the group of persons involved includes the sender as well as the recipient, in this case the visitor as well as the Goedgedacht staff. The introduction of the Cool World Climate Path explicitly mentions who exactly is included in the personal denomination "we" referring to all human beings, including the reader.

'We' means all of us who are breathing the air on this planet; don't think it is someone else's responsibility. Take ACTION now. (CWCP, Reflection Zone 1)

sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner" (United Nations General Assembly 1992: 9).

'Ons' beteken almal van ons wat die lug op hierdie planeet inasem; moenie dink dit is iemand anders se verantwoordelikheid nie. TREE nou op. (CWCP, Refleksie-sonne 1)

Tracing this expression in the interviews, the Afrikaans plural first person personal pronoun “ons” also appears in the function of an indefinite personal pronoun, like “one”.

Ons kan baie dinge doen in 'n kweekhuis en 'n tunnel as ons net water het.
(Onderhoud met MA)

We can do a lot of things in a greenhouse or a tunnel if we have water. (Interview with MA)

The most common alternative connotation communicates a general statement about a (locally defined) group to which the sender belongs, but which doesn't include the recipient.

The speaker more or less refers to the group of “small-scale farmers” with which he identifies himself.

Ja, dan sal ek sê: eens was 't nie so nie. Ons het nie eers kweekhuisgasse gehad nie. So ek sal sê: dit een van die goed wat bydra tot die verandering van klimaat, want eers jare was die goed nie daar nie, toe was daar nie klimaatverandering gewees nie. (Onderhoud met AP)

Yes, then I would say: in the past it wasn't like that. We didn't have Greenhouse Gases before. So I want to say: this is one thing which contributed to the change of climate, because in the first years was this thing not there, then climate change was not there. (Interview with AP)

The responsibility may refer to the speaker himself or at least a group that includes him. The next quotation differentiates internally between “experts” and “non-experts” and calls to follow the experts' assessments. Also here “ons” (“Ons moet kennis neem van wat die kundiges sê [...]”) excludes the experts and demonstrates the self-reference of the interviewee with the group of non-experts or small-scale farmers.

Ek weet nie, ek is seker maar een van daai ou mense wat maar soos ek sê elke dag vat soos dit kom. Uhm, en ek is maar tevrede ook. Ek glo maar ek kry die dag van die Here af, maar ek meen ons mens moet seker maar ons continent en environment meer beskerm. Ons moet kennis neem van wat die kundiges sê, en ons moet ook dan daarop reageer en dan kyk wat ons kan doen om te help dat

dinge kan verander. (Onderhod met IG)

I don't know. I am certainly one of the old people who say take every day as it comes. Uhm, and I am contented. I believe that I'll get the day from the Lord, but I think that we humans need to save our continent and environment better. We need to take note of what the experts say and we have to react to that and to see what we can do to help make things change. (Interview with IG)

This observation admits some suppositions about the mode of identification with abstract topics, surrounding “Climate Change” or “Greenhouse Gas Emissions”. As the Goedgedacht Trust is trying to create a feeling of responsibility and connectedness through this inclusion, the farmers implicitly define an exclusive reference group in the sense of “fellow sufferers”.

The role of industry

As already discussed in the context of root cause(r)s of “Climate Change”, the very unspecific group of “industry” is identified as one actor that shapes “Climate Change” evolution. Depicting briefly the evaluation of their responsibility, the outsider perspective of Mr. Philander confirms the assumption that pointing to this sector unspecifically reduces the subjectively perceived degree of a person's own stake in this process.

S: So that means feeling not responsible personally for these [changes]?

J: No, not at all. It's somebody else. When I was driving with someone the other day and they were saying: 'Sure, look at all the fog and stuff, all these many big factories and so on.' And you know, it's not just that. It's what we do as well. (Interview with Johnny Philander)

Mr. Philander emphasizes again the clear individual responsibility that also determines the rationale of the Goedgedacht Trust, which does not exclude anybody.

The role of politics and policy

In theory the role of policy is of a different content to those of the individual and industry. While personal, lets call it “industrial”, responsibility concerns a constitutive moral accountability for “Climate Change” regarding its emergence (root causes), the consideration of political actors emphasizes their responsibility in relation to impacts, most of all financial support, in a reactive manner.

Here especially the role of the national South African and regional Western Cape Government is discussed very critically. And again the economically marginalized situation of the small-scale farmers, who find themselves under a high pressure to adapt (their farming practice), requires practical and financial support from these official institutions. The basic criticism is that despite the fact that the government creates a framework for agricultural production which includes small-scale farming, the persons in charge are unavailable to implement support in cooperation with the farmers.

Ek sou sê die government is die grootste probleem. Hulle maak wette wat hulle anderdaniges met uitvoer, en jy kry nie die mense wat in daai departmente wat verantwoordelik is om vir ons klein boere te help nie. Jy kry hulle nie hier nie, hulle is office bound. (Onderhoud met WS)

I would say the government is the biggest problem. They create laws that you are obliged to comply with, and you don't reach the persons in charge of these departments that are responsible for helping us small-scale farmers. You don't get them here, they are office bound. (Interview with WS)

The result is disappointment about the disinterest experienced in the challenges of the local small-scale farmers, who continue to struggle to secure their livelihoods.

Man, die provinsie, ek sal maar sê ons is klein boere, ons is maar altyd in agterstand. Daar is nie eintlik lekker hulp van even die plaaslike regering nie. Daar is nie eintlik lekker hulp nie. Ons moet al die tyd wat ons nou hier bly moet ons maar self sukkel en opkom met ons eie dinge. (Onderhoud met RP)

Man, the province, I would say we are small-scale farmers, we are always behind. There is actually no good support even of the local government. There is basically no effective support at all. All the time that we now have here, we have to struggle ourselves and get on with our own things. (Interview with RP)

More precise, but less negative, is the next interviewee's description of the farmers' situation in abeyance that results from their financial dependence on external capital investments in the form of subsidies.

Landbou sê mense was, is, is, is altyd meer al die jare in kontak van ons nou op dié grond is. Hulle het nou weer vanoggend, weer vir ons die trekker gebring, en so aan, so ons is altyd in kontak met hulle. Maar die finansies is ook nou nie so wat 'n mens kan sê daar kom. Hulle het nou vir ons die grond gegee, hulle het vir

ons al die goeters gegee, maar daar is nou nie finansies wat hulle vir ons voorsien wat ons nou kan sê ons kan boerdery begin nie. Net 'n begin te kan maak, sodat jy op jou eie bene kan staan. (Onderhoud met DW)

[Department for] Agriculture the people say was, has, has, has intensified the contact during the years with us, who are on this land. They have again this morning, again brought the tractor to us, and so on, so we are always in contact with them. But the finances are not what one could say is coming. They have given the land to us, they have given all the things to us, but there is now no capital for us with which we could say we can start farming [agricultural production]. To make a start so that you can stand on your own feet. (Interview with DW)

Despite the governmental willingness to support the small-scale production, the implementation seems to neglect the need for financial investment capacities, with the result that productive capacities remain low.

The mood of disappointment is mixed with very few optimistic expectations and a high motivation to become a successful agricultural producer.

Ja, ek kry baie, want ek is gekies as die 'ministerial project' wat die minister vir my honderd persent gaan ondersteun met die finance. Ek moet net my vyf hektaar grond van die CPA [Community Property Association] uitkry, en dan word my finance vir my gegee. My businessplan is klaar geskryf so ek wag nou net vir die reaksie om my grond te kom toets en dan begin ons. (Onderhoud met CD)

Yes, I get a lot, because I was chosen as the 'ministerial project' that the minister supports me one hundred percent with finance. I just have to get my five hectares of land from the CPA, and then I will be given finance. My business plan is complete and so I am now waiting for the reaction to test the ground and then we start. (Interview with CD)

Projects like the “Black Farmers Funding Application Workshop” of the Goedgedacht Trust enable farmers to begin participation in formal application procedures, increasing or even creating a chance that they will receive subsidies.

The experiences described in chapter 5.2.3 taught so far that support is only available in exceptional cases and connected to a high degree of insecurity in the case of the small-scale farmers.

Just to complete the picture, NGOs like the Goedgedacht Trust also suffer from the government's alleged unwillingness to mobilize financial resources for “Climate Change” activities.

S: And do you get support from the official national side with this?

J: Not really. Not that much as we want to. One of the big reasons why we can't go that fast as we like is funding. So if you get more funding, then we go faster. And it's like a year ago climate change was number one, on everybody's lips was climate change, but it's like what in the last six months people start to forget about the climate change. Like HIV-AIDS, everybody knows about it, but nobody likes want to talk really about or want to get involved. In that indabas. So that is what make me a little bit worried. But ya, not really enough. If you get more support, than we can do more for our people. (Interview with Jafta Hendricks)

The reason for the lack of subsidies that Mr. Hendricks describes, is perceived to be linked to the absence of governmental recognition of "Climate Change" as the problem. The following outsider perspective of Mr. Templeton reinforces this impression.

Outsider perspectives

The Goedgedacht Trust differentiates between responsibilities of diverse "Climate Change" actors and their responsibility for firstly the natural environment and secondly the most affected group of small-scale farmers. As the beginning of this subchapter indicated, the general individual responsibility is emphatically stressed in the Goedgedacht discourse. This individual responsibility addresses every human without exception, including the BFFAW farmers. What is similarly interesting and revealing is their reflection on the role of the national governments in their responsibility as "climate activists".

Responsibility on a national level, which includes political decisions as well as policy frameworks for entrepreneurial business, is closely linked to the concept of the Carbon Footprint, which calculates the emissions resulting from action on an individual or institutional basis and enables an evaluation of the scope of influence and deduced from that the responsibility for action. Mr. Templeton offers a negative appraisal of the acceptance of responsibility in the first step, and the implementation of a global sustainable policy for renewable energy supply in the second.

And there is the problem if you do it with, or you are one of the perpetrators of the problem, like you are part of the industrial revolution, which is when the whole issue began, started to become a problem, then you got to pay for that. And you got to pay people money, you know, in countries that have no guilt about carbon. They never had anything to do with the industrialisation of the world. And any of that stuff is gonna cost rich countries, or the richer countries a lot of

money. So they don't want to talk about it. So you can't do enough for climate, to make people aware of it. It is impossible to stand back and say I've done my bit for climate, you haven't. You will never do enough for climate until the whole world goes on to renewable energy, as one. You know, the sun, the wind, the ocean, everything is useful as heat props, what everywhere that you can get energy going – until the whole world is on that. And it is right out of, you know, electric cars are everywhere, there's no carbon being used, until that happens the debate is not in anywhere. And anywhere the debate is becoming too late now, you know, the things rising too fast. The carbon counts are going up too high. It's gonna be almost unachievable. So, I am saying you'll never be doing that whoever you are, and you should never sit back and be complacent too and think we'll I've done my bit. You haven't done your bit. You'll never have done your bit until everybody is on renewable energy. (Interview with Peter Templeton)

This evaluation describes a discrepancy between perpetrators' guilt and their actual (re-action) on the other hand. He essentially appreciates the ambitions to create a global network of responsibilities, but identifies economic reasons for the delay in activism. But if the industrial countries would grasp the mantle consistently, they would also have to compensate for the threat or risk that “Climate Change” causes for the passive victims, who ultimately include the small-scale farmers. Furthermore Mr. Templeton points out the speed of implementation of international conventions, such as the UNFCCC (1992) feeling under pressure of the recent statistics and prognoses.

Summary

Two out of three root cause(r)s of “Climate Change” appeared again in the elaboration of responsibilities. The third one, namely the metaphysical entity, was not contextualized again in this regard. There was no expectation towards God formulated that expected salvation of “Climate Change” in a narrow sense. The expectations addressed primarily the present-day actors which are in a position to shape and frame the handling of “Climate Change”.

Taking into consideration the marginal role of the BFFAW farmers as active actors in the “Climate Change” formation process, by creating what is in fact only a negligible Carbon Footprint (cf. chapter 5.2.2), the rationale of the Goedgedacht Trust still does not exempt them from the group of persons responsible. Their discourse deals particularly with the causation of “Climate Change”, deriving the goal of conscientizing the local community from that.

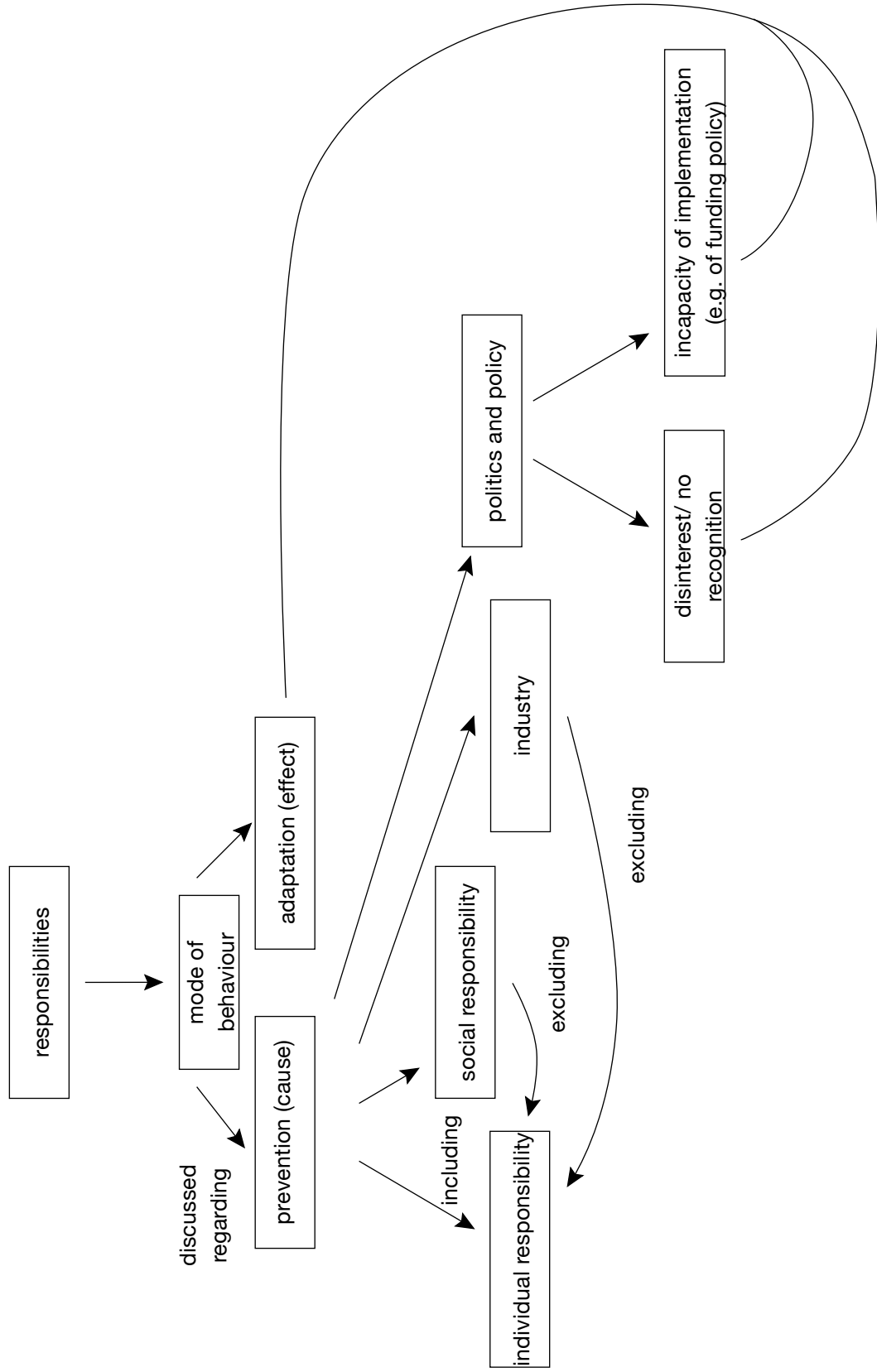
Mr. Templeton's remarks further set responsibility into a global perspective with nation state actors, while the farmers' referencing remains on the national scale and below.

In contrast, the fundamental question of responsibility is not addressed in the same way amongst the farmers. Although recognizing an individual ethical responsibility to preserve the environment, their statements are far more driven by questioning the adaptive possibilities from a reactive position. Thus the interviewees evaluate "Climate Change" in terms of its immediate impacts on their individual livelihood security, mainly putting themselves at the centre of discussion. Their interest does rather not concern the responsibilities of the perpetrators in the sense of a moral awareness rather less so than their discourse concentrates on the "adaptive side"⁹³ of "Climate Change", which includes availability and distribution of funding opportunities. In this regard the national South African and provincial Western Cape governments are quickly identified as actors responsible. Concept map 5 on the following page exemplifies the results.

Here the Goedgedacht Trust adapts to this evaluation, but still emphasizing the aspect of the moral responsibility of institutions, as international companies and nation states.

93 In this regard it is important to differentiate clearly between mitigation and adaptation. Both are two aspects of the handling of "Climate Change". Referring to the definition given in the IPCC Fourth Assessment Report (2007: 750), adaptation refers to the ability of a natural or human system to respond and adjust to climate change, including for instance forms of anticipatory and reactive or private and public adaptation. In comparison, mitigation includes anthropogenic interventions taken to reduce the sources or enhance the sinks of greenhouse gases, thus to eliminate the long-term risks or hazards of climate change permanently. Following this understanding mitigation reduces the impacts of climate change and hence the adaptation challenge, whereas adaptation is selective by taking advantage of positive impacts in order to moderate negative ones (IPCC 2007: 750).

Concept map 5: Concerning “Climate Change”: responsibilities



Source: Analysis of interview data.

5.2.5 Encountering “Climate Change”: chances

Within the framework of a constructive discourse, the question of *chances* becomes vital. Therefore the interviewees were asked where they see their chances of sustaining livelihood security under the influence of “Climate Change”. The question aimed at extracting the potential of farming from the perspective of small-scale farmers, also discerning their vision for themselves and their agricultural production in general.

Two main content clusters appeared, dealing either with the *physical handling* or the *mental handling* of “Climate Change”. Both approaches reactively derive strategies for action from an eventuating challenge that enforces the need for change.

Physical handling

The explicit question of chances of “Climate Change” with a focus on the Swartland region revealed a whole range of practical suggestions. These ideas are mainly visions of farming improvement that demonstrate the innovative potential of the small-scale farmers.

Oh, groente is daar ook geleenthede, dis maar nou net jy moet vervoer het en die onkoste van water en elektrisiteit is nou baie duur. (Onderhoud met DW)

Oh, there are also opportunities in vegetables, it is just that you need to have transport, and the costs of water and electricity are now very high. (Interview with DW)

The interviewees of the preceding and the following quotation, exemplifying vegetable production and pig husbandry as chances, both emphasize simultaneously the challenge of putting such plans into action. They indicate the restrictive role of financial resources which exceed their own capacities.

Die beste geleenthede wat daar nou vir boere bestaan is maar natuurlik nou die vark. Dit is nou die beste geleenthede wat daar nou bestaan. Maar jy het natuurlik nou 'n probleem met die voedsel, met die kos van die vark. Dit is nou maar 'n bietjie baie expensive. Maar in die varkbedryf self is daar goeie geleenthede. (Onderhoud met LD)

The best opportunities that exist for farmers are of course pigs. These are the best opportunities that there are at the moment. But of course one has a problem with the feed, with the food for the pigs. It is just very expensive. But in the pig industry itself there are good opportunities. (Interview with LD)

In more general terms the *physical side* is closely linked to the symbol “adaptation”, which is perceived in a short-term perspective of the BFFAW farmers as a reactive adjustment of practices. The actual occurrence of change initiates the adaptation efforts.

Ek sal sê, water is eintlik die belangrikste mos nou vir die boere, en spekbome vir die klimaatverandering en so aan, iets soos daai nette en tonnels. Jy gaan minder grond gebruik om die produksie of jou onkruid beheer. Jy het mos nou nie meer daai tipe van goed nodig. (Onderhoud met WS)

I would say, water is actually the most important for the farmers, and elephant bushes [bot. Portulacaria afra] for climate change and so on, something like nets and tunnels. You need less land to handle your weed management. You don't need these types of things anymore. (Interview with WS)

Adaptation relates to the diversity of mostly disadvantageous impacts that result from “Climate Change”.

Ja, die oorsake van die uitdagings is natuurlik, hoe kan jy nou sê, hier's baie uitdagings. Dit is ook maar, jy sal maar net moet aanpas. Mens moet maar net aanpas, dis al. En daarvolgens voortgaan. (Onderhoud met RS)

Yes, the causes of the challenges are natural, how can one put it, there are many challenges here. It's a matter you will just have to adapt. One simply has to adapt, that's all. And carry on accordingly. (Interview with RS)

The strategy is often characterized by a “trial and error” mentality, combining experiential knowledge with limited available production capacities.

Ja, ons moet mos eksperimenteer om by die klimaat aan te pas. (Onderhoud met MM)

Yes, we just have to experiment to adapt to the climate. (Interview with MM)

Adaptation is strongly evaluated as a “challenge”, as the next quotation shows. It further indicates the immediacy of the impacts due to low-margin agricultural production and limited coping capacities.

Ja, die groot uitdaging is om aan te pas by klimaatverandering. En dis 'n ding wat 'n boer eerste oplet, dis 'n ding wat die boer eerste sien. (Onderhoud met HS)

Yes, the big challenge is to adapt to climate change. And this is something that a farmer notices first, it's something the farmer sees first. (Interview with HS)

Adaptation refers from this second short-term perspective to the daily weather conditions that determine decisions about appropriate practice.

Ek sê eintlik die klimaat is môre warm, net koud, so ek pas maar aan.

I just say the climate is either warm or cold tomorrow and I just adapt.

The previous example demonstrates the common confusion between “climate” and “weather”. Briefly anticipating chapter 6.1, the major difference between both is the temporal continuity that frames “weather” as a short-term temporal phenomenon and “climate” as the long-term trend of “weather” patterns under a relative stability with predictable character.

A long-term perspective, like the one of the Goedgedacht Trust, transcends the limitations of immediate temporal association, proposing a fundamental change of individual lifestyle. Moreover Mr. Hendricks derives practical chances for small-scale farmers in the Western Cape Province from the circumstance that large-scale farming has also been permanently affected by “Climate Change”. The sinking profit margins for commercial farmers might reduce their interest in agricultural production, which again offers a chance for “Emerging Black Farmers” to enter the agricultural sector and expand their business capacities.

When I think about climate change I think it's a challenge, for me. It's not that nightmare, that I'm afraid. I'm only concerned everyone sees it that way. I think people can still do a lot to make a change, to change the climate change, change their lifestyle. For me it's like in the, if I look ten years from till now, ten years back, people were living their lifestyles more, better lifestyles, better quality lifestyles, but in the last couple of years it's like even the farmers they just want to make money on the big lands of them. They don't care about the planet. So that's what makes me sad in a way. But whatever now most of the big farmers selling their farms and I think the black farmers will get more and more of the farms and then things will slowly start changing. That's my belief. So I look forward and I work towards that goal. And I'm sure we can change climate change. That's my big goal. Before I go I want to change climate change. Hahahaha. (Interview with Jafta Hendricks)

There is some disagreement with regard to the long-term success in adapting especially small-scale farming practice under the effort of the reduction of carbon emissions. One first position envisions “reversion”, thus the re-introduction of ancient farming practices, as the key to sustainably impeding “Climate Change”.

Maar soos weer teruggee en ons gebiede skoonhou, netjies wees, en weer lewe soos ons daai tiepe mense altyd gelewe het, soos ons weet van Mamre, of ons omgewing 'n beter plak maak. (Onderhoud met MA)

But as we return and keep our area clean, be neat, and live again as our kind of people have always lived, as we know it from Mamre, or make our environment a better place. (Interview with MA)

A second counter perspective doubts the success of “reversion” and climate-conscious action on a small scale. This person points out the negligible contribution that individual behavioural adaptation on the part of the BFFAW farmers has already made and still makes on impacts such as drought.

Droogte, baie droogte en ons doen minner met die karre ry, ons doen meer loop, ons perdry, donkiekar, ons moet nie teruggaan na die oustyl se doen nie. Dit sal klimaatverandering nie help nie. (Onderhoud met SD)

Drought, much drought and we ride less with a cart (carriage), we walk more often, we ride a horse, donkey carriage, we should not go back doing things the old style. This will not help climate change. (Interview with SD)

Precisely these suggestions for adaptive action are also distributed by the Goedgedacht Trust. As most promising effort, Mr. Philander describes his evaluation of the small-scale farmers’ chances by emphasizing the adaptation by means of technologically innovative improvements. The following quotation, which I have not cut down to a simple statement in order to preserve the larger context, contains suggestions for practical implementation of self-interest, such as the bio digester and solar panels, but also action alternatives that serve a social interest, like recycling. His proposals work on a small scale with low investment costs.

Climate change is if you just look at the word, it’s a relatively new term for people. People know about Goedgedacht, but they don’t necessarily know about the Cool Climate Change Path. When I got here and I went on the climate change path, I mean five words for me, actually six, this thing came to my mind: first one was

innovation; second one was reducing costs for whatever you do; the third word for me was the one that used the word recycle, but re-use whatever is around you, you can use again and that was for me actually a new concept, I think that we just become used to just throwing stuff around; then the fourth word for me was a challenge, a challenge to get people to, it's not enough to just walk the path and learn about what's going on, but the challenge for me lies in how do you get your own bio digester to work at home?, how do you get your own solar energy panels at home?, how do you get that to work and how does that relate to your day-to-day life in terms of savings? So the fourth word is challenge. And for me the fifth word is a necessity, it has become a necessity. I'm in my own head, I'm trying to think, you know how can I recycle at home, what can I recycle? I already changed a few things at home, because of the Goedgedacht Cool Climate Path. I'm so looking forward to the perma-culture project and everything that goes with it. How to save water to make sure that we have enough stuff to cover the ground, to keep the moisture in? So in terms of my own personal life I believe that the Cool Climate Path and what it stands for will soon become a necessity for every single person in this area. I just think the challenge once again will be to take people beyond coming to visit and taking the technology and high-quality technology, because I see it as some form of renewable technology for that technology to be taken back to homes and to be implemented. Then I believe the Cool Climate Path will be really, really successful. (Interview with Johnny Philander)

Mr. Hendricks cuts right to the chase about the underlying rationale of the suggestions offered by the Goedgedacht Trust, and he concludes that it is precisely eco-conscious action which has the positive side effect of cost minimization.

And I also encourage them by saying it's not always to make money, if you save money you also make money. If you use all the renewable energies more and more your bills at the end of the month will be smaller and smaller. But like I say, it's a mind game. But the world changes. They are busy with changes, slowly but surely. Slowly but surely. (Interview with Jafta Hendricks)

The Goedgedacht Trust communicates a clear position towards root causes of "Climate Change", identifying the roots as outcomes of human action. The evaluation of responsibilities is also strongly influenced by the idea of anthropogenic "Climate Change", declaring every human a person responsible for causation. The overall question left concerns regarding the chances, or vision of appropriate reactive behaviour, that derives from this standpoint.

And if we are starting to destroy the planet, why can't we start healing the planet again? And heal ourselves. And so our children have a brighter future. It doesn't

make sense to raise them and to give them education about mechanical stuff, electricity stuff and the planet is going under. What's the point? So that's why. We need to reverse the whole climate change indaba or make it go away. If we make create it, we can make it disappear. But then we need to take hands with other countries as well. All of Africans need to take hands. So that's why they keep on going doing what they do on climate change. (Interview with Jafta Hendricks)

Mr. Hendricks once again emphasizes the global responsibility and fundamental importance of “reversion”, convinced as he is that adaptation including reversal ambitions is the right way to sustainably mitigate “Climate Change”.

Mental handling: raising awareness

The *mental handling* is contentually dominated by the idea of raising awareness.

There is a broad consensus between the Goedgedacht Trust and the BFFAW farmers about the need for information about climate-related interrelations and causalities. Only differentiated knowledge provides the basis for strategic and successful reaction, whether it refers to the adaptation of agricultural production or to the conscious handling of resources.

All the farmers need to know more about climate change, how to deal with it on your farm. Because it doesn't make sense if I practise climate change [adaptation] at Goedgedacht and my neighbour right beside me do it the old-school way, with poison and stuff, it affects me again. So I can't really make then a difference. The old rally [way] needs to change, then we start making progress. So that's why we need to encourage the farmers to change their believing and their farming ways, activities. That's why climate change it's that important. And the Western Cape is a lovely place. It's nice to look at, the mountains make it beautiful, but slowly but surely we damage nature. We need to do something, definitely. Soon. (Interview with Jafta Hendricks)

Already indicating to the importance of awareness as a chance, the next quotation addresses the BFFAW farmers' fear that emerges from unpredictable changes in the natural environment. The interviewee accentuates the pointlessness of the fear felt by many small-scale farmers.

Die klimaatverandering is mos met die tyd gekom en is nou op ons, en ek dink as ons meer bewus raak van ons omgewing wat ons het bly dan ... Ons hoef nie so baie scary te wees nie, because as jy jou kind van kleinsaf leer om die natuur lief te

hê dan sal hy alles inset om daai natuur te bewaar. Kyk, wat vir hom die nodigste is om 't te bewaar. (Onderhoud met CD)

Climate change has just come over time and has now reached us, and I think if we are more aware of our environment what we have left ... We don't have to be so scared, because as you are teaching your child from the beginning to love nature then he will try everything to preserve nature. Look, what is most important is to preserve it for him. (Interview with CD)

This perspective is also shared by the “outsider” Mr. Hendricks who emphasizes further the unavoidable need for adaptation.

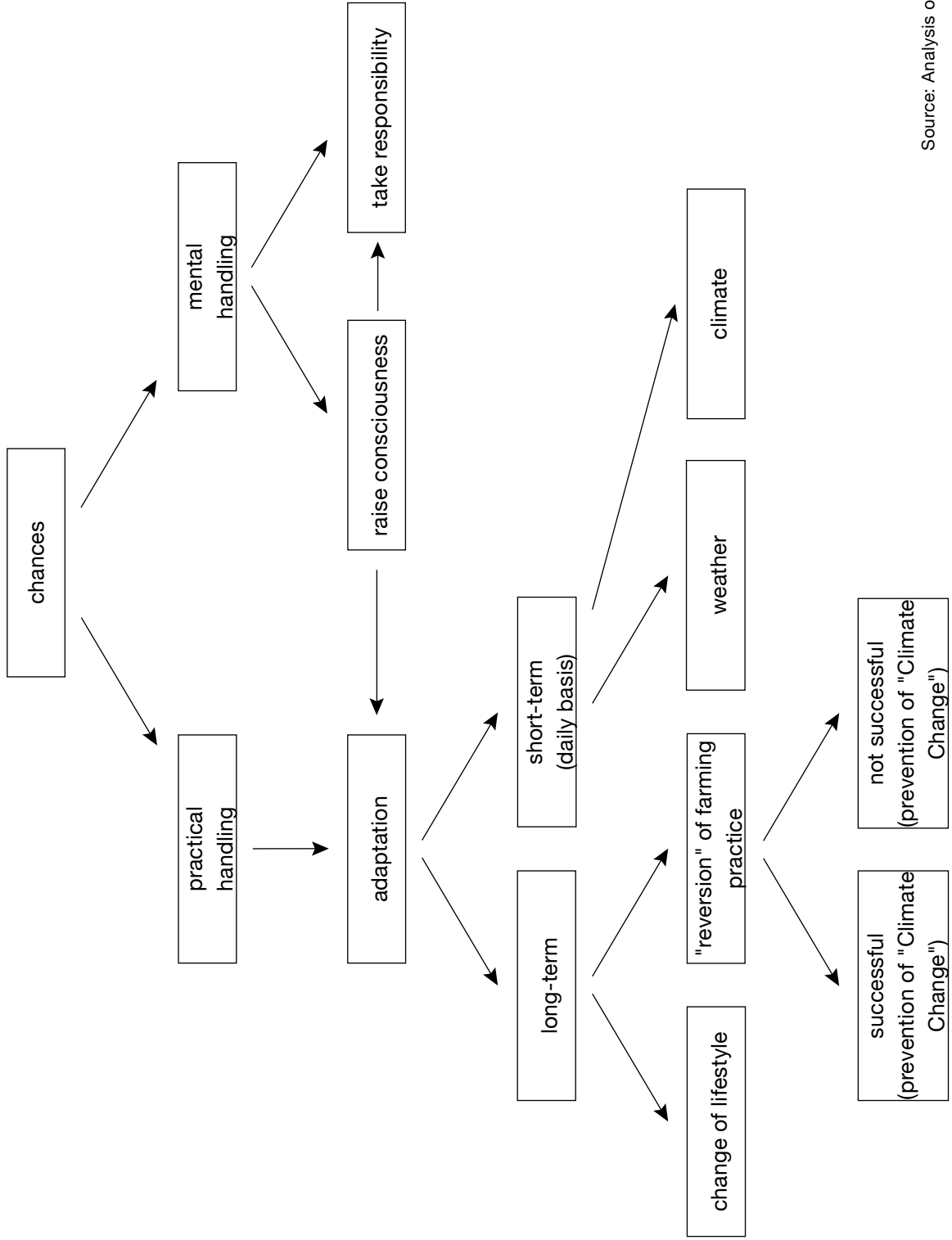
The ones who believe. There's others who believe, but ya, because they're so scared about the climate change. They don't want to change everything. So but you have to make changes. Because the climate change, you need to change. You can't just stay as you are, you get left behind if you don't change. (Interview with Jafta Hendricks)

The mental handling of “Climate Change” emphasizes the necessity of consciousness and awareness. Both states of perception enable a mode of decision which contains reactive, but also preventive action approaches.

Summary

The content cluster of “chances” is mainly determined and limited by two capacities: knowledge (mental handling), namely the contextualization of information and observations, and financial capital for physical handling. In this specific content, “mitigation” and “adaptation” in particular are two of the strategies which appear in the discourse around coping with “Climate Change”. While “mitigation” represents the Goedgedacht strategy of interventions which reduce Greenhouse Gas Emissions in the long run, “adaptation” represents the farmers' actual radius of intervention, which is mainly limited to short-term adjustment to “Climate Change” effects. Still both strategies emphasize a reactive notion and describe an unavoidable demand for action. While the description of adaptability is closely linked to phenomena of short-term temporality, the projected success of the chances involves a long-term outlook. The evaluations range between the underlying feeling of threat and confident optimistic activism.

Concept map 6: Encountering "Climate Change": chances



Source: Analysis of interview data.

5.2.6 Evaluating “Climate Change”: risk awareness and threat potential

To put the statements of the BFFAW farmers in relation to each other, a general explanation of what *risk awareness* involves is important.

Firstly, *awareness* in general is closely related to the perception and therefore knowledge of a specific situation or fact; in this case it concerns the natural environment. Bringing back to mind the constraints of perception, like the physical limitations of sensory experience, at this point, the indexical character of the natural environment, and in particular natural kind terms, gains in importance (cf. chapter 2.2.3). Relationality and relativity of *awareness* establish the idea that *awareness* emerges in the space between real events, which are limited in a way by sensory perception such as observation, and their interpretation, thus the representational construction. With its close relation to individual patterns of meaning attribution, awareness represents *consciousness* of a phenomenon or concept. The last fact is especially vital to the idea of awareness, as it illuminates the recognition of “Climate Change” on the one hand and (implicitly) indicates its relevance, and thus the ascription of its importance, for the BFFAW farmers on the other hand.

Most of the farmers’ general awareness is driven by the recognition of “change” in different facets. It is closely connected to the identified observations and impacts, with the general undertone of disorientation that results from the unpredictable character of “Climate Change” in particular.

Man ek is nou nie so goed op hierdie goeters nie, ja, maar ek weet daar is ‘n verandering, deur al die seisoene is daar ‘n verandering, want jy weet nou nie meer wanneer dit winter en wanneer dit somer is nie.” (Onderhoud met RP)

Man I am not so good with these things, yes, but I know that there is change, through all the seasons is change, because you don't know anymore when it's winter and when it's summer. (Interview with RP)

Secondly, it is necessary to introduce a scientific approach of *risk* vs. *threat* at this point that has only gained in importance during analysis, enabling a differentiated perspective on the interview data. There seem to exist two distinct versions of “*change awareness*”, depending on the (socio-economic) position of the speaker. To create an idea of the symbol *risk*, the system-theoretical perspective defines risk in distinction from *threat*. Both modes of perception are oriented towards harm and damage, whose occurrence is insecure in the immediate moment (Luhmann 1990: 138). The

further differentiation now between risk and threat determines the interpretation and rationalization, and in the last step the decision for action. While perception of *risk* implies that “Climate Change” (or more general environmental changes) is based on human decisions, being differentiable in dichotomies like conscious and unconscious or intended and unintended, *threat* refers to external harm independently of one's own decisions (cf. e.g. Luhmann 1991: 148). The distinction between risk and danger induces a further distinction between decision-maker and victim (person affected). Decision-makers command a degree of participation (active involvement) and the acceptance of possible consequences of their own action. The individual risk perception thus determines the decision for individual action based on the awareness of problem definition and solution with or without an individual scope of influence. Individual risk perception is therefore further determined by the degree of individual involvement and capacities for influence. By contrast, shocks emerge if the impacts are based on external decisions, out of one's own radius of decision, which leads to a perception of threat (passive involvement). Depending on their positioning as a decision-maker or victim, perspectives on the problem of “Climate Change” also differ between the BFFAW farmers and the Goedgedacht Trust. In terms of the risk concept of Beck's (1986: 249-374) theoretical approach to modernization in *Reflexive Modernization*, “Climate Change” risks are democratic in the sense that they ultimately affect everyone and every place. The transgression of (constructed) global problems across national boundaries creates a forced “community of fate”⁹⁴ that is vital for the survival of anyone (Beck 2007: 323). This standpoint is also shared by the next interviewee, indicating the importance of “Climate Change” as a unifying problem.

Man, ons gesels hier onder by die boere, en dan gesels ons baie as ons kom by opleidings. As opleidings kom, sal daai gesprek altyd daar wees onder by boere. Want dit raak almal, of jy 'n veeboer is en of jy 'n groenteboer is, dit raak nou net vir almal want almal het belang by dit ... die kos op die tafel sit. (Onderhoud met RS)

Man, we talk here among the farmers, and then we talk a lot when we get to training sessions. During training sessions that conversation will always take place among farmers. Because it affects everybody, whether you are a livestock farmer or a vegetable farmer, it just affects everybody because everybody has an interest in it ... putting food on the table. (Interview with RS)

94 Beck (2007: 353) refers here to the global problem awareness that results from a possible adverse effect on every human, creating the “community of fate” (dt. “Schicksalsgemeinschaft”).

This macro-sociological focus criticizes the discourse of institutions like the IPCC that is reproduced by the Goedgedacht Trust, which frames the emergence of a scientific understanding of terms like “Greenhouse Gas Emissions” (and with this “Climate Change”), locates it on a global scale, but often doesn’t focus on the degree of perpetration beyond national responsibilities. Such an approach widely neglects “locality”, with its specific socio-economic aspects, not regarding preconditions and impacts below a national perspective and active role. The conceptual “globality” that is conveyed renders the precise identification and localization of root causes impossible, at the same time suggesting a spatial equality of “Climate Change” risks. Although “Climate Change” is a global phenomenon, its effects have specific local and regional manifestations.

Taking into consideration the actual reality of everyday lives of the BFFAW farmers, risk awareness results from their living situation of being part of a marginalized group under unstable, vulnerable living conditions (cf. chapter 4.3). Agricultural production on a small scale is affected even by little changes in the environment, which has further immediate implications for the security of their livelihoods. This interconnection is the basis for the farmers’ disputation with this topic and the perception of “Climate Change” as a threat.

Ja, die groot uitdaging is om aan te pas by klimaatverandering. En dis ‘n ding wat ‘n boer eerste oplet, dis ‘n ding wat die boer eerste sien. (Onderhoud met RS)

Yes, the big challenge is to adapt to climate change. And this is something that a farmer notices first, it’s something the farmer sees first. (Interview with RS)

The perceptions of the BFFAW farmers are primarily based on:

1. *self-reference* as a decision-maker or victim in the context of “Climate Change”, which enables a theoretical distinction between risk (active involvement) and threat (passive involvement),
2. the mode of *reflection*, describing to what extent “Climate Change” is associated with root causes and impacts of the second and third order,
3. the specific *spatial (local) socio-economic aspects* of root cause and impact.

The analysis of the interviews showed that the lines between perceptions of risk and threat blur by combining active and passive elements of involvement and decision making. This fuzziness originates in the causal connection of risk and threat and

their mutual dependence in a human-nature interface. Assuming that humanity are originators of anthropogenic “Climate Change” that influences the ecological system in the long term, creating risks, in return the natural environment also influences (or affects) in return outcomes of socio-economic practice by creating new threats.

In the case of the farmers, the uncertainty of risk perception results from an inconsistency between external expectations that institutions like the Goedgedacht Trust, for instance, establish towards their mode of involvement, trying to increase their consciousness and to engage them with preventive and adaptive climate-conscious action, thus decision-making and the practical means for this. Of course awareness of people's responsibility for “Climate Change” does exist amongst the farmers on the one hand (cf. chapter 5.3.4), but on the other hand a distinctive perception of the actual capacities for intervention (chapter 5.3.5) exists as well, relativizing the scope of action. Therefore the distinction between risk and threat is not only related to the initial origination of “Climate Change”, with which the farmers identify through being part of humanity, but also to the framing of the current radius of action, ranging between reactive adaptation and preventive behaviour leading to a reversal of negative effects.

Consensus between BFFAW farmers and the Goedgedacht Trust exists regarding the general *importance* of the topic itself. For the BFFAW farmers the relevance of the topic becomes visible for instance in the presence of the topic in everyday communication. But it is necessary to emphasize here that the attribution of meaning to the terminology of “Climate Change” only takes place in the case of an individual's own involvement as a person who experiences shocks effecting their ability to sustain their livelihood.

Ja, mens sou nou once in a while, wanneer mens nou eers in 'n probleem is, dan begin jy nou besef dit is waarvan die mense praat. (Onderhoud met DW)

Yes, one would once in a while, once you find yourself in a problem, then you start realising that this is what the people have been talking about. (Interview with DW)

The fact that the problem has become “real” creates an awareness of risk or threat that further determines the radius of action for the farmers and requires adaptation.

Ja, ons moet seker, 'n mens moet seker weet daarvan, want veral as jy 'n boer is dan moet jy weet van klimaatsverandering want jy gaan mos nou boer. So klimaatsverandering sal nou vir jou sê wat jy nou kan doen en wat jy nou nie kan doen nie. (Onderhoud met WS)

Yes, we surely have to, one has to know about it, especially if you are a farmer then you have to know about climate change and what you have to farm. So climate change will tell you what you can do and what you can't do. (Interview with WS)

Het vir ons laat besef watter waarde ons heg aan hang van onself af. Hoekom het dit gebeur? Waar het ons verkeerd gegaan? Wat moet ons doen om 't te verbeter? Sien? En as ons daar uitgevoer het, of ons dat daar eintlik toepas dan het toe sit. (Onderhoud met MA)

To our understanding it depends on us which value we are attributing. How did this happen? What have we done wrong? What can we do to improve? You see? And after having carried it out, if it actually has practical value. (Interview with MA)

The next quotation displays the insider perspective and awareness of the farmers' incapacity to cope in the next step with these changes, which are linked in second and third order to hunger and financial difficulties.

Klimaatverandering, eh, maak mense of boere, maak hulle moeilik. Hulle weet nie eintlik wat moet hulle eintlik doen. (Onderhoud met CA)

Climate change, eh, make people or farmers, makes them edgy. They just don't know what to do. (Interview with CA)

Both examples describe a situation of threat for the farmers, which results on the one hand from a lack of understanding of causal interrelations (knowledge) and on the other hand from the incapacity to prevent harm through climatic changes, putting them in a reactive position which allows only *post hoc* adaptation. Reasons for this situation are the unpredictable character of "Climate Change" and the farmers' limited resources, in particular financial capital.

A very prominent undertone in this regard is the notion of helplessness that is related to the perception of threat. The inability to influence the changes as such in combination with a lack of capacity to assess their origin and to buffer them creates a mood of pessimism.

Ek sê nie, da het die wetenskap 'n baie mooi naam gegee, klimaatsverandering, maar an einde van die dag sê ek vir jou, man, is maar net dat ... Kyk, ons is nou al oor die 50, ons praat maar net dat die weer sal verander en dat die dinge wat

ons sien wat gebeur, en dat is baie nadelig, because vir diere en die mens, en die natuur homself ook. Dit is moeilik om te bepaal. (Onderhoud met GB)

I don't say the science gave it a very nice name, climate change, but at the end of the day I tell you, man, but not that ... Look, we are now all beyond the 50s, we just say that the weather will change and that the things that we see are happening, and that is very disadvantageous, because for animals and human, and nature itself, too. It is difficult to determine. (Interview with GB)

In the following example, subjection and a high degree of unpredictability of weather phenomena lead to a comparison with the devil.

Ja man, hoe kan ek nou sê, wat kan, klimaatverandering is 'n ding wat maar kom, dis amper soos 'n duiwel, soos 'n spook. Hoe sê hulle, wat in die nag in kom, in die nag in, as jy jou kom kry die ander dag is dit maar so, byvoorbeeld my wingerd staan nou baie mooi. Ek kom die next oggend daar, sien ek my druiwe is almal weg. Jy ly verliese. Dis net dat dit 'n hoë risiko is. Boerdery is maar net 'n risiko en klaar. Want ek kan nou 'n dinge geplant het en môre kom die ryp en hy vat alles weg van my af. Maar dit is waarmee ons maar moet saamlewe vandag, die wat 'n boer is. (Onderhoud met RS)

Yes man, how can I now say, that can, climate change is something which just comes, it is almost like a devil, like a spook. How do they say, that comes at night, in the night, if it gets to you the other day is it merely like this, for example my vineyard has grown very well. The next morning I came, I saw my grapes are all gone. You suffer losses. It is just that it is a high risk. Farming is just a risk full stop. Because I can now plant things and tomorrow comes the frost and he is taking away everything from me. But this is what we have to cope with today, those who are farmers. (Interview with RS)

In this regard, evil spirits whose only intention is to bring misery and mischief signify the character of “Climate Change”.

These expectations contrast with the experienced unpredictable character of “Climate Change” (cf. chapter 5.2.1), which put the small-scale farmers in the position of victims, being exposed to shocks and therefore perceiving impacts as threats.

But to complete the picture I will conclusively present a counter perspective that emphasizes the importance of eco-conscious behaviour driven by moral obligation to future generations. The implicitly acknowledged feeling of threat should be encountered with the teaching of moral standards and the sharpening of responsibility awareness.

Die klimaatverandering is mos met die tyd gekom en is nou op ons, en ek dink as ons meer bewus raak van ons omgewing wat ons het bly dan ... Ons hoef nie so baie scary te wees nie, because as jy jou kind van kleinsaf leer om die natuur lief te hê dan sal hy alles inset om daai natuur te bewaar. Kyk, wat vir hom die nodigste is om 't te bewaar. (Onderhoud met CD)

Climate change has just come over the time and has now reached us, and I think if we are more aware of our environment what we have left ... We don't have to be so scared, because as you are teaching your child from the beginning to love nature then he will try everything to preserve the nature. Look, what is most important is to preserve it for him. (Interview with CD)

This focus on the future includes the notion of education of the following generations to raise their awareness and to enforce a sustainable manner of eco-conscious practice.

Ek dink wat ons moet begin in hierdie land self is 'n projek oor hoe ons ons kinnners oplei van kleinsaf en vir hulle leer van die natuur en waarvoor die natuur is, waarvoor daai bome is, inheemse bome, wat is die nadele en voordele daarvan ... En ek dink ons moet eintlik op klein ouderdom begin by die crèches, tussen vyf en twaalf jaar oud, sodat hulle nie die riviere en wat daarmee gepaard gaan so besoedel, soos as ons voorouers en ons self gedoen het. En vir alles in Atlantis waar 'n ryk waterbron is, hoe ons dit kan benut tot ons voordeel vir die toekoms en vir almal ons voortbestaan. (Onderhoud met LK)

I think what we have to do in this country are projects which educate our kids from the beginning, teaching them about nature and the role of nature, the role of these trees, indigenous trees, what are the disadvantages and advantages ... And I think we have to start from infancy with the kindergarten, in the age between five and twelve years, so that they won't pollute the rivers and things that belong to them, like our ancestors and we ourselves have done. And about everything in Atlantis where we have an ample water supply, how we can use it for our advantage for the future and for all times. (Interview with LK)

Summarizing the different perspectives, a general relationality emerges to phenomena that appear locally and affect the farmers' livelihoods directly. Thus the reference within the system of orientation positions the farmers' threat awareness on a local scale, referring temporally mostly to a short-term retrospective within the timeframe of an individual lifetime.

Outsider perspectives

The perspectives of “outsiders”, meaning people who are familiar with the socio-economic environment and the challenges of the BFFAW farmers that result from “Climate Change”, is particularly interesting as it puts their position into perspective.

Beginning with a general assessment of the Cool World Climate Path, Peter Templeton explains the main goals of the Goedgedacht strategy: conscientizing people to promote sustainable climate-conscious action.

Ya, sensitisation, consciousness, concern, understanding and finally I think important is that you would be driven to action, that you will be action-orientated at the end of what you learned here, ya. (Interview with Peter Templeton)

A sharpened consciousness is based on the access to information and understanding (knowledge), including the emphasis of a moral responsibility for nature.

So they will learn about nature in a way that they hopefully haven't been taught before, so we'd like the people to give them an impression and to give them a love of the earth. And also to show them that the earth is generous and responsive, if you look after it, and you can grow enough food to feed yourself first of all. Secondly you can get so skilled you can feed you family. And thirdly you become so good at it that you can make surplus produce that you can sell to the community. (Interview with Peter Templeton)

But these are only the goals of the Cool World Climate Path – raising awareness through information – the reality instead teaches that there is still a gap between this general awareness and the farmers' consciences. In the next quotation, Mr. Templeton emphasizes in this regard the aspect of the farmers' unknowingness fairly drastically. His evaluation already contains moments of disappointment. The personal reference “they” to which Mr. Templeton is referring to includes especially the target groups of the Goedgedacht Trust's climate awareness campaigns, like the Cool World Climate Path.

There's never enough that you could do around conscientizing people around climate. It's a completely dead subject for many people. They are not that interested. They can't see it. They don't feel it. They hear about terrible storms or hurricanes in the Philippines or great problems in various parts of the world, but they don't necessarily identify it as it has something to do with climate change.

They can't see it. It's like, you know, the early days of AIDS. AIDS in the early days, this is about thirty years ago, it was called "slims disease", because everybody just got very thin. They didn't know what it was. They couldn't understand. They just got thin and died. So you know it's not good having slims disease. No one was particularly concerned about it. They never identified it was part of sex or sexual relationships with anybody. It was just – you got it. And no one knew how. It's a similar kind of feeling you get with climate. (Interview with Peter Templeton)

By comparing individual awareness of "Climate Change" with the recognition of AIDS, Mr. Templeton implicitly emphasizes the role of perception or perceptibility of causal interconnections. From an "ignorant attitude" towards AIDS or "Climate Change" results the lacking causal relation of a symbol ("Climate Change"), that identifies a problem, such as the phenomena of a changing environment. Mr. Philander confirms this evaluation by using the same comparison with AIDS. Both recognize spatial (personal) distance as one of the main reasons for the lack of awareness.

I believe in, you know, if you just talk purely information, it's people know the information. It's the same with HIV/AIDS. People know what it is, people know what it does, people know what to do not to get it, but the attitudes of people, in terms of the one thing people are saying is: "It's not going to happen to me." And whenever there's a big storm overseas or a major tragedy, people just say we're so lucky to live here in South Africa. And for me that's a red light, because you're thinking it's never going to happen to you. And we're just continuing. (Interview with Johnny Philander)

The two appraisals imply that immediate spatial closeness determines the risk or threat awareness of the local farmers, while "globality" increases the imaginary distance through a lack of sensory perceptibility leading to a low degree of personal identification.

Mr. Philander's criticism further relates to the implementation on the individual level, transferring and integrating climate-conscious behaviour into daily life praxis. And here the question of "negligence" (cf. chapter 5.2.2) comes up again. The following short excerpt from a conversation with Peter Templeton depicts the position of the farmers in their role as originators of "Climate Change". Although belonging to humanity as such, their factual role in causative practice is almost negligible. Summarizing that he doesn't identify the small-scale farmers as the responsible perpetrators, he further evaluates the degree of risk awareness to be low amongst the farmers.

P: Well I can only think, they use only little carbon, you know. They are not big carbon users. So they're not the main causes of the problem. The main causes of the problem are the factories on the other side producing cement.

S: But the farmers are the ones going to the park and informing themselves about their Carbon Footprint, so that might increase only the [awareness on the wrong side of the problem].

P: They might, it's the degree of consciousness in everybody that's so weak. That we can, you know all about it, do you think I stop and use my car less, because I know about it?

S: Hopefully yes.

P: The truth of the matter is, I don't, you know. And I mean that's the criminal negligence of all of us. We're all kind of living for the moment. But I don't think to myself, how do I get to Malmesbury to do my shopping for the week? I just get into my car and get to Malmesbury and do the shopping. And the contribution that I make by getting in the back of a buggy that was going into Malmesbury is infinitesimal, it's tiny, you know. Now the farmers are in the same position, you know. They might not know so much about climate change as I know, I'm not an expert, but I don't think that they're going to be moved, because they can't see it. It's the slim disease story, you know. We can't see it. We cannot see it. What are you talking about? Climate change? We have had a wet winter, what do you mean it's drying up? We had eight hundred millimetres of rain this winter." (Interview with Peter Templeton)

In this conversation Mr. Templeton goes beyond the simple question of origination. He addresses his personal contribution to carbon emissions and confesses that he is also a "victim of negligence" (cf. chapter 5.2.2). A similar claim was made by Mrs. Paul, who admits that there is still a huge difference between risk awareness and the actual implementation of eco-conscious behaviour in everyday practice, especially when one's own lifestyle would be sustainably affected by any adaptation to eco-conscious activities through personal sacrifices.

Now what is interesting with the rural farm worker and rural farm children is they have a very, very small Carbon Footprint, because they don't fly overseas, they don't have motorcars. So they probably have the smallest Carbon Footprint imaginable, they're eating healthy food that they are growing their selves in their gardens. They do very little damage to the environment. A few of them have bicycles, very few, and you could say okay, manufacturing those bicycles is a certain amount of carbon emission etcetera, but on the whole their Carbon Footprint is very, very small compared to for example yours and mine. And we are very aware of trying to keep our Carbon Footprint as small as possible, but you're still going to fly home for Christmas. (Interview with Shannon Paul)

And I'm still flying to Scotland to see my grandchild. I'm not going to say, I'm not going to do it, because I want to keep my Carbon Footprint down. So, ja.
(Interview with Shannon Paul)

The two conversations with Mr. Templeton and Mrs. Paul represent the attitude and behaviour of the broad social majority, sharing a mode of convenient lifestyle. Both statements raised the question of how far risk awareness and eco-conscious behaviour coincide. The reflection that the farmers are in fact not the major perpetrators of "Climate Change" positions them in the role of passive involvement. The fact that they don't participate to the same extent in an eco-critical lifestyle narrowly limits their scope of influence on eco-conscious practices, like the reduction of their Carbon Footprint.

But there is a huge difference in the appraisal of the conceptual side of "Climate Change", describing the farmers' ability to address "Climate Change" issues verbally in the discursive terminology of a global narrative, and the access to "Climate Change" phenomena on a spatially local scale, being derived from experiences.

So I think it's interesting, because I think the farmers are so aware of what is happening. I don't think they're lacking in knowledge. I think they are putting themselves out there where they have access to information and at least if they are not in the position to access books or magazines, they're accessing other people who have that knowledge. And I think they're helping intelligence about it. And I think they're very aware of working with the environment and not against it. You know, don't plant a crop that needs huge amounts of water and requires shade when you don't have any shade, that's not going to work. (Interview with Shannon Paul)

Mrs. Paul describes an intuitive dealing and adaptation of the farmers that results from their experience and which is geared to the specific situation of small-scale farming under the local climatic conditions. She depicts a sort of general awareness that emerged from people's access to knowledge through perception and experience. Mrs. Paul shares this valuation with Jafta Hendricks, who has years of practical cooperation experience with the BFFAW farmers.

Not really, like I say, we keep it simple and the farmers, the Emerging Black Farmers, these guys who grows up in nature, they know nature, long before maybe those professors. No, they know nature, they can just, maybe they know what we talk about, but they don't use that fancy big words, but they know the same stuff. But in the moment that somebody starts talking then you will be surprised how much they know, because they are on site everyday and they know exactly what's going on. (Interview with Jafta Hendricks)

Mrs. Paul shares the appraisal of Mr. Hendricks and also indicates the fundamental gap between the scientific terminology (symbols) and the imagination of the farmers, leading to a disconnection of symbol and content.

They may not even understand what that term [Greenhouse Gas Emissions] means at all. (Interview with Shannon Paul)

Mr. Philander also conforms to Mr. Hendricks and Mrs. Paul with regard to the farmers' access to scientific terminology, because it is at first sight out of touch with everyday life. He adds further that not only the symbols themselves are not accessible to the farmers, but also the contents that are shaped by scientific discourse do not apply to the lifeworld reality of the local farmers.

That's a good question. The Afrikaans, I believe, this is now from my experience in the workshops, I believe that people don't understand these terms at all, even from the interviews. People that are expected to know. We spoke about Greenhouse and people talked about tunnels and so on. So I think there's a problem with the terminology. If we talk, when there are advertisements and so on they talk about reduce your Carbon Footprint. I mean if someone who is on the farm, on a farm, when they buy a can of coke or a bottle of coke, Carbon Footprint doesn't make any sense. Hahaha. They just throw it away. If you go to a normally primary school, anywhere in this vicinity, besides the model sea schools now, if you go to a normal, coloured or Xhosa-speaking school and you look at the school terrain, you will see litter all over. That's an indication that even though they do, you know, all these studies at school, they talk about Carbon Footprint, the Greenhouse Emissions, everything else, pollution, it doesn't really, it's left on the school grounds. It doesn't actually leave and they don't take the principles home, the same challenge that I had earlier with the Cool Climate Path and the farmers taking it to their farm. So the application of that still is a huge, huge issue. Even trying to find bins for recycling, where you can put your plastic in, I promise you, I've been all over. It's so difficult and so expensive to just buy these bins that are clearly marked. It's a nightmare, it's an absolute nightmare. And it's supposed to be easy accessible. If we talk about recycling and so, it doesn't really make sense for our people. And there's no difference between Afrikaans and English-speaking people, Xhosa-speaking people, because Xhosa-speaking people still have English as their second language, the same as Afrikaans-speaking people, and we don't have English-speaking people, as a first language coming to our workshops. (Interview with Johnny Philander)

According to the evaluation of Mr. Hendricks, the aspect that information is indeed available, but not contentually accessible by the farmers, leads to a feeling of threat.

I think, from my point of view, there is enough information at Goedgedacht itself. So ya, people just need to start use it. Once again, too much information, it's like the climate change path too much information will confuse them again. So ya, my belief is that people are just failed about this climate change, because they don't know enough. And [if] you do not know enough some things you start get afraid of. And that's so wrong. You don't have to be afraid of climate change or anything. It's like if you are in the dark, you switch off electricity lights and it's dark, a little bit afraid or you don't know the dark enough, what's in the dark, what's inside. So ya, but there's enough information. (Interview with Jafta Hendricks)

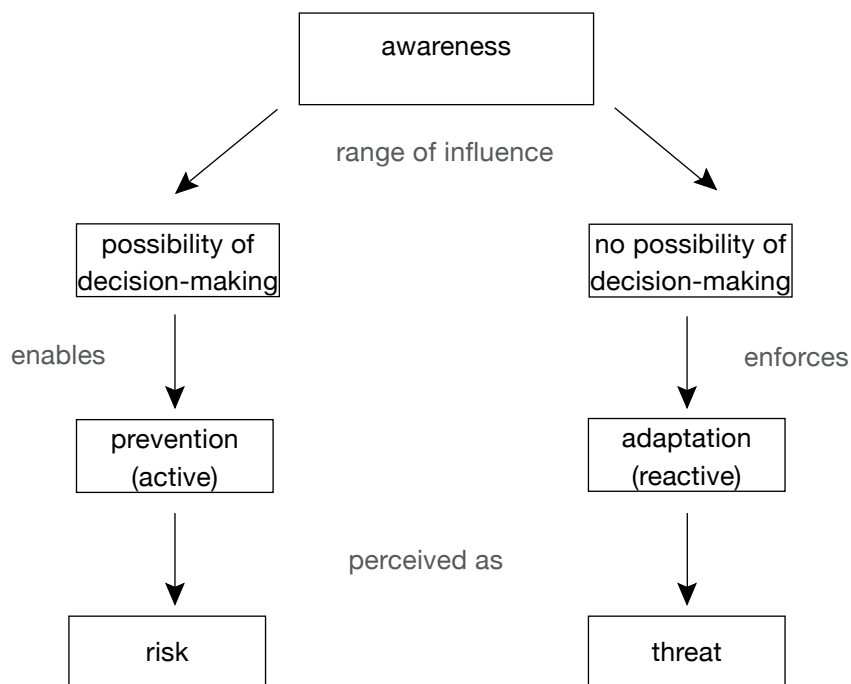
Concluding that the small-scale farmers are on the one hand identified as non-relevant perpetrators of “Climate Change” and on the other hand only aware within the context of individual sensory perceptibility on a spatially local scale, this would suggest a definition of their awareness as “threat awareness” in terms of a restricted radius of the farmers’ scope of influence.

Summary

As awareness of “Climate Change” exists amongst the BFFAW farmers. Despite recognizing that “Climate Change” has anthropogenic roots, the actual contribution of the farmers is almost negligible due to their lifestyle. They find themselves in a reactive situation, forcing them to adapt, and not in the position as an influential decision-maker. The result is a feeling of helplessness and fear, experiencing “Climate Change” as a threat more than a risk. What became further clear through the interviews with the Goedgedacht employees and the farmers themselves is the fact that spatial distance has a tremendous influence on the farmers awareness and interpretation of “Climate Change”, which is conceptualized within the spatio-temporal frame of immediate local relation and their own lifetimes. The connection of scientific terminology belonging to the global narrative of “Climate Change” is only accessible to the farmers within a limited scope. Although they recognize relevant symbols (e.g. “Greenhouse Gas Emissions”), the content is often incomplete or not available.⁹⁵

95 Chapter 5.3 exemplifies the construction of the relevant contents and content clusters belonging to the symbols “weather” and “Greenhouse Gas Emissions”.

Concept map 7: Evaluating “Climate Change”: risk awareness and threat potential



Source: Analysis of interview data.

5.3 Summary

In general the interviewees express their pessimism about the current situation of being in a marginalized social position and therefore directly affected by environmental changes which concern the security of their livelihoods. Condensing the manifestations of different aspects of “Climate Change” that have been exemplified, the following passage elaborates on the basic contrasts.

The BFFAW farmers’ *basic observations* are characterized by sensory perception and thus linked to their immediate spatio-temporal environment. By contrast, the Cool World Climate Path refers to a wider spatio-temporal range, describing change on the basis of scientific (objective) measurement results.

The farmers’ evaluation of *root* causes complies partially with those of the Goedgedacht Trust when it comes to the anthropogenesis and the prominent role of industry, but it also proposes the possibility of influence of a metaphysical entity. The differentiation in the perception of root causes becomes most obvious in the observation of the indexical “we” or “ons”, which limits the group by ex- or inclusion of the interviewee.

Representations of “we” and “ons” can be differentiated as follows:

- 1) Speaker includes himself in a general group (“we humans”) – without exclusion
- 2) Speaker includes himself in a specified group (“we small-scale farmers”, “we at Goedgedacht”) – by simultaneous exclusion of “others” (“they”) → comprising a notion of fellow suffering

Representations of “they” usually exclude the speaker himself from a group of “others” (“the industry”) and appear often in reference to institutions.

The mentioned *impacts* are highly determined by the vulnerable living conditions of the BFFAW farmers, such as security, employment and tenure status, which also influence their farming practice. They convey a negative connotation, as they create new challenges for livelihood security. The impacts that the farmers derived causally from “Climate Change” concentrate on the deficiency of financial capacities, including costs and investment capacities, and the appearance of new forms of illnesses, affecting humans, flora and fauna. The appearance of alien species further coincides temporally with the emergence of “Climate Change” and is perceived as a result of the recent environmental transformations.

The basic observations and the description of impacts equally imply that the small-scale farmers are affected doubly. Firstly they perceive effects of “Climate Change” that belong to changes in the natural environment, most of them related to farming practice and being directly causally deduced from observations. Secondly they describe indirect consequences, so to say of second order, that concern capacities to sustain their livelihoods as small-scale farmers. The crucial issues here involve predominantly financial and personal capacities. These symbols are revisited again later in the definition of responsibilities.

The underlying question of responsibilities, which basically frames the moral expectations towards individual and social action, conveys different perspectives of the Goedgedacht Trust and the BFFAW farmers, although agreeing on two foci. The first focus strongly emphasizes the necessity to react to “Climate Change” in order to reverse it. The assignation of responsibility results directly from the identification of root cause(r)s and the anthropogenic starting point of “Climate Change”. It aims at moral recognition and, on this basis the evaluation of action alternatives. The Goedgedacht employees emphasize a “Climate Change” constitutive role for the individual and the institutional levels of personal reference that includes political and economic agencies and the individual equally. In this context the Goedgedacht Trust refers to the concept of Carbon Footprint as an indicator to determine the degree of responsibility. The farmers do indeed accept their individual responsibility

within their limited radius of operation, although they actually leave a low Carbon Footprint. A second focus is indirectly deduced from the impacts of “Climate Change” on the livelihoods of the local small-scale farmers, thus describing a second-order responsibility, which concerns the accountability of predominantly political actors for mitigating “Climate Change” effects. The content of responsibility in this second focus emerges again from the socio-economic living conditions, which are characterized by vulnerability.

Mentioned opportunities or *chances* that emerge from “Climate Change” are divided into a mental and physical side of response. Both, the mental handling of raising awareness and taking responsibility, and the practical handling of lifestyle and farming adjustment lead at first instance to adaptation as a short- and long-term strategy for sustainable livelihood security. In the second instance, especially the Goedgedacht Trust suggests the overall goal of “Climate Change” reversal as a chance for sustainable eco-stability. This again demarks a point where the actual low contribution to “Greenhouse Gas Emissions” of the small-scale farmers encounters the moral expectations towards their action, raising the question of their range of actual influence.

Precisely this space tremendously influences the perception of “Climate Change” as a risk or threat, by defining the decision-making instances. Despite their being generally aware and conscious, the farmers experience “Climate Change” as a *threat*, due to a feeling of helplessness and their uncertainty of interpreting and contextualizing the changes adequately in order to be able to adapt to them. The small-scale farmers’ position as “victims” with a restricted scope of influence in a reactive position also limits their perception of noticeable action opportunities.

6. Reconstructing content clusters

Picking out the two most fruitful contents that demonstrate the differences between the knowledge sets, I will present the cluster “weather” to exemplify how the content clusters differ in their symbols and interconnections, leading to different knowledge structures. Starting with the content cluster of the symbol “weather”, this subchapter further elaborates on the free associations that belong to the symbol “Greenhouse Gas Emissions”, as extracted from the data.

6.1 “Weather” (“weer”)

As a basis for the positioning of the contents that are related to the clusters “weather” and “weer”, I will refer to the German Meteorological Service (2015a and 2015b), which offers a definition for “climate”, “weather” and “weather condition” that I will briefly present in the following. The understanding of “climate” overlaps with the definition in the IPCC glossary (2012). Regarding the interconnection between “climate” and “weather”, the IPCC states that “Climate in a narrow sense is usually defined as the average weather”, and therefore the two are directly intertwined. What is missing is a proper and sufficient definition of weather itself.

The following scientific standard definition of the relevant symbols have been adopted from the national German Meteorological Service (DWD 2015a and 2015b), which specializes in monitoring meteorological developments, running one of the world’s largest libraries on “weather” and “climate”.

Weather: This describes the condition of the atmosphere in a (closely) defined place or space at a well-defined (specific) time that is defined by meteorological elements and their interaction. It differs from “climate” in that climate comprises the extreme processes and conditions over a long-term period. Root causes for weather lie in the warming of the earth’s surface and, resulting from this, the overlaying air layers in depending on latitude and altitude, the land- sea-distribution, orography and so on. Weather is quantified by parameters of weather elements, such as air temperature, barometric pressure, wind direction and speed, precipitation and population (DWD 2015a).

Weather condition: In the German geographic terminology, there is a further differentiation between “Wetter” (*Engl.* weather) and “Witterung” (*Engl.* weather condition). Weather condition focuses on the effects and outcomes of weather. It describes the general and average or the dominant character of weather conditions in a

specific time frame lasting between a few days and whole seasons. Typical types or courses are differentiated according to the most prevalent weather situation (DWD 2015a).

Climate: The term originates from the Greek word “klimatos” which means “tilt” or “obliquity” and describes the axial tilt between the earth's axis and its orbital plain around the sun. “Climate” is defined as the interrelation of weather phenomena which characterize the average conditions at a specific place or a limited (narrow) space (region). It is represented by characteristic qualities (averages, extrema, frequency etc.) over a referential period, usually on the basis of 30 years, as defined by the World Meteorological Organization (WMO) (DWD 2015a).

Climatic factors: This refers to those factors of a (defined) space, which influence the climate elements and in turn the climate of a place. They cause different climates as well as differences in climates. They include geographic factors (interrelation of meteorological parameters and latitude); orographic factors (interrelation of meteorological parameters and altitude) and site-specific factors (site-specific conditions like urban, rural space or soil consistency, influencing for instance temperature, wind and humidity) (DWD 2015a).

Summarizing the descriptions, the following general characteristics of “weather” might be extracted:

- Weather phenomena convey a short-term notion that refers to atmosphere and the physical landscape.
- Climatic factors influence weather and climate equally.
- Central symbols for the description and statistical analysis of both phenomena are temperature, humidity, precipitation and wind.

The sharp distinction between “weather” and “climate” along the spatio-temporal lines offers an independent space of orientation for the subsumption and evaluation of the natural phenomena belonging to these contents.

6.1.1 “Weather” contents of BFFAW farmers

As the general ideas about “Climate Change” (chapter 5.2) yielded, the interviewees mentioned the linguistic symbol “weer” (*Engl.* weather) nine times in the context of their free associating about “Climate Change” or when asked if they had changed their farming practice and for which reason. In general words they remarked that they had observed a change in weather patterns. By reconstructing these contexts with the

help of a system of orientation, the contents begin to take shape. Due to the fact that the descriptions are mainly based on subjective observations, the contents are also contextualized in reference to their individual experience. It is interesting to mention here that the symbol “weather” doesn’t explicitly occur in the texts of the CWCP. Neither a definition of weather, nor of its interrelation with weather conditions and climate is provided by the information path on this descriptive level.

In the interviews there is sometimes hardly a differentiation between “weather” and “climate”, which leads to explanations like the following:

Die weerklmaat is wat verander hier, want dan kry ons warm weer, dan kry ons koud weer ... en dan waai die wind ... en so, nee daar is groot verandering.
(Onderhoud met LD)

*The weather climate is what changes here, because then we get warm weather, then we get cold weather ... and then the wind blows ... and so, no there is a big change.
(Interview with LD)*

The “weather climate” to which the interviewee is referring means weather in regard to temperature, thus warmth and cold, and wind. It is contextualized as a constant shift between these different temperatures in combination with changing wind patterns. “Climate” seems to describe the constellation of temperature and wind in a specific familiarized shape that is now transforming. This example shows that the distinction between “weather” and “climate” is not that sharp in the common understanding. In fact the two terms “weather and climate” in particular are fluently applied synonymously, primarily referring to the short-term description of current atmospheric conditions.

Ek sê eintlik die klimaat is môre warm, net koud, so ek pas maar aan. (Onderhoud met TL)

*I just say the climate is either warm or cold in the morning and I am just adapting.
(Interview with TL)*

In abstract terms this example demonstrates how the attribution of meaning shifts by merging the symbol “climate” with the scientific content of “weather”.

Content clusters

When talking about “Climate Change”, a process of shifting or transformation is expected. Thus the most general proposition which can be deduced from the answers

is that weather patterns are changing. A closer look at the interview material reveals how exactly they are transforming. From the interviews with the BFFAW farmers, two clusters were isolated which can be assigned to three main hypernyms: a) precipitation (rain and snow), b) temperature and c) wind.

To “feed” these umbrella terms I will briefly explain the generalizing strategy I followed. To assign larger contents to categories or clusters, I coded the text passages by looking for keywords or symbols which appear in the following scientific meteorological definitions of these contents.

Precipitation: is in general terms water in the atmosphere that falls down to earth due to gravity. Its typology specifies between types (alluvial, dispersed, precipitated or falling) and the final state (liquid or solid). The types that appeared in the interviews are rain (falling, liquid) and snow (falling, solid) (DWD 2015b: Niederschlag).

Temperature: describes a physical condition of atomic particles. It is quoted in the SI-unit Kelvin (K), Fahrenheit (°F) or Celsius (°C). Related to climate, temperature differentiates objectively between warmth and cold, appearing in extreme forms as type (frost) and heat (DWD 2015b: Temperatur).

Wind: describes moving air that is characterized by direction and velocity. Wind originates from compensation currents between high and low pressure areas (cf. Astor 1997: 402). Knowledge about the wind type in combination with other weather elements is important for operational and numeric weather prediction (DWD 2015b: Wind).

Interconnections

The interconnections of symbols that could be generated from the statements refer to three types: 1) intensification, 2) reduction and 3) (un-)predictability. The interconnections considered are of a *direct* nature, thus those that are explicitly mentioned and illustrating change. In contrast, *indirect* interconnections can only be traced with appropriate background information or by presuming a causal nexus. The interconnection of two symbols often describes an outcome or effect that finally creates a causal chain of explanation with implications for a consequent adaptation.

I will use following interview excerpts to introduce the three types and the way they connect with the symbols.

1) Intensification

Intensification describes either an increase of intensity or a growth of amount.

a) *Precipitation*

An intensification of rainfall was observed with the outcome of land flooding.

Ja, ek het nou, hierdie jaar is eintlik vir my 'n jaar gewees wat nie vir my lekker was nie, ons het baie reën gehad en my tuin het heeltemal oorspoel, en ek het my Irisse in gesit maar my Irisse het ek gesien ek moet hom op 'n ander plek sit want dit is te nat daar waar ek hom in gesit het, so ek gaan volgende jaar dan sit ek hom op 'n ander plek, want dit is te nat, en ja, en ek het nou eers kan skoon gemaak het aan my grond, is nou eers droog. So ons het baie water gehad, ja. (Onderhoud met RP)

Yes, I have, this year actually was a difficult year for me, we had a lot of rain and my garden was completely flooded. I planted my irises but I saw I would have to put them in another place because it was too wet where they were, so next year I would have to put them in another place, because it is too wet, and yes, and I only could clean things up now, now that it is dry. So we had a lot of water, yes. (Interview with RP)

The consequence that the interviewee mentions is firstly the loss of the plants, and in the next step an action approach of replanting at another place.

As the next citation shows, besides the increased amount of water there is a disparity of water distribution: heavy rains here and in other places drought and no irrigation opportunities.

Ek wil nie weer voorspel nie, baie boere het 't nodig. Soos by my half hektaar vir die koptkole, vir die blomkole, vir die onions, daars baie water. Wy het 't nodig daar, en boere het water nodig by damme, wat ek nou 'n bietjie ongelukkig voel. Hoekom dit nou gereën het, maar daars baie mense wat 't nodig het op verskillende plekke? Die boerdery, as hulle water nodig het vir spraying en so, moontlik is daar mense wat gelukkig gewees het dat dit so gereënd het. Dan bespaar hulle mos weer water. (Onderhoud met SD)

I don't want to predict the weather, many farmers need it. Like my half hectare for cabbage, for cauliflowers, for our onions, there is much water. We need it there, and farmers need water in the dams, and I feel unhappy about it. Why do many people at different places need it, although it rained? The farms, they need water for spraying and so on, there are possibly people who would have been happy that it rained so much. Then they (can) save water again. (Interview with SD)

Secondly, an intensification of snowfall was also observed, reaching a new record according to the assessment of one BFFAW farmer.

Kyk ons het nooit so baie sneeu gehad soos ons nou het nie. Soos almal mens voel nog dat dinge verander en dit 't is 'n baie groot verandering in 'n mens se lewe. (Onderhoud met RP)

Look we never had so much snow as we had now. Like a lot of people feel that things change and that it is a very big change in a human's life. (Interview with RP)

The interviewee here further indicates an impact of the increase in snowfall without any positive or negative evaluation, but indicating the high degree of change.

b) Temperature

Ek dink onmiddelik aan die warmte en koue. (Onderhoud met RP)

I immediately think of warmth and cold. (Interview with RP)

Like in the first citation mentioned, a disparity between warmth and cold determines the interviewee's imagination of "Climate Change". While this statement is not contextualized at all, it is even more common to refer to more pronounced temperature conditions, such as "heat", as the first part of the next quotation shows.

Op die oomblik, ek sal nou nie sê water nie, want daar kan 'n plan gemaak word met die water en so, jy kan 'n boorgat maak en so, maar die warmte, ons is verskriklik warm in die Swartland, en as dit warm raak dan raak dit regtig warm. So, dit is eintlik daai uitdaging is daar en pes natuurlik, in hierdie Swartland is daar baie peste. (Onderhoud met SD)

At the moment, I would not really say water, because a plan can be made when it comes to water, you can sink a borehole, but the heat, it is incredibly hot in the Swartland, and when it gets hot it really gets hot. So it is, that challenge is there and pests of course, here in Swartland we have a lot of pests. (Interview with SD)

c) Wind

An increase of wind is presented here as part of the changing weather patterns.

Seker maar die weer patrone is die grootse uitdaging. Uhm, ek sal nou sê, by voorbeeld as jy praat van kool brand, as die son vreeslik warm is en jy het nie genoeg water nie, dan brand jou kool. En dan kry jy ook die wind omstandighede waar hy baie sand waai. As jou plantjies nog klein is dan waai hy hom sommer heeltemal toe. (Onderhoud met IG)

Certainly the weather patterns are the biggest challenge. Uhm, I would say, for example if you talk about cabbage burn, when the sun burns awfully warm and you don't have enough water, then your cabbage burns. And then there are also the wind circumstances where a lot of sand is blowing. When your little plants are still small then it will just blow them away. (Interview with IG)

2) Reduction

Just like the increase in rainfall, the reduction of rain also appeared as a token of “weather” description. It results in drought, and in turn a decrease in crop yields.

Ek sou sê dit is die weer patrone, dit is meeste, en ons het hierdie jaar, het ons nou goeie reën gehad. Die vorige twee of drie jaar het ons baie swak reën gehad, en die uitdagings was groot gewees. Daar was verliese gewees, groot verliese. Ja. (Onderhoud met DW)

I would say there are the weather patterns, that are mostly, and we had this year, we had now good rain. The last two or three years we had very poor rain and the challenges (problems) have been big. There have been losses, big losses, yes. (Interview with DW)

The decrease in rainfall is expressed even more emphatically by describing the necessity of constant watering as a result of drought as a negative effect.

Ja nee, daar is drastiese verandering, dis hier die reën. As 'n mens hier by February Maart kom, die temperature wat jy hier het, jy sal moet heeldag natgooi, jy sal nie jou water kan toemaak nie. Dan sien jy net, soos daai pampoene, hulle raak geel, kolle in daai blare en so aan. So dis 'n geweldige verandering van ons hier gekom het, verskriklik. (Onderhoud met WS)

Yes no, things are changing drastically, here it's the rain. If one reaches February, March, the temperatures that you get here, you have to water the whole day, you won't be able to shut off your water. Then you see, like those pumpkins, they become yellow, form spots on the leaves and so on. So it's an enormous change since the time we arrived here, enormous. (Interview with WS)

In both cases, the increase and the reduction, the amount of rainfall serves as orientation for the BFFAW farmers when looking for a change in weather patterns.

3) (Un-)predictability

Connecting the idea of change to increase and reduction, a third dimension of change

that is directly expressed concerns the predictability of changing weather phenomena. The fact that weather shifts in divergence from familiar patterns limits the action radius of the observer to reactive measures.

Kom ek sê vir u, die weer is onvoorspelbaar. Die weer is heel deurmekaar. Dit is maar hoe dit is, want ons het onlangs gehad, ek dink is twee weke terug, ons het groot reën gehad in die land en daai reën het net skade veroorsaak, so dat die weer baie nadelige gevolge het vir die oeste volgende jaar. (Onderhoud met GB)

Let me tell you, the weather is unpredictable. The weather is very confused. That is how it is, because we recently had, I think it was two weeks ago, we had huge rain in this area and this rain has caused damages, meaning the weather caused many disadvantageous consequences for next year's harvest. (Interview with GB)

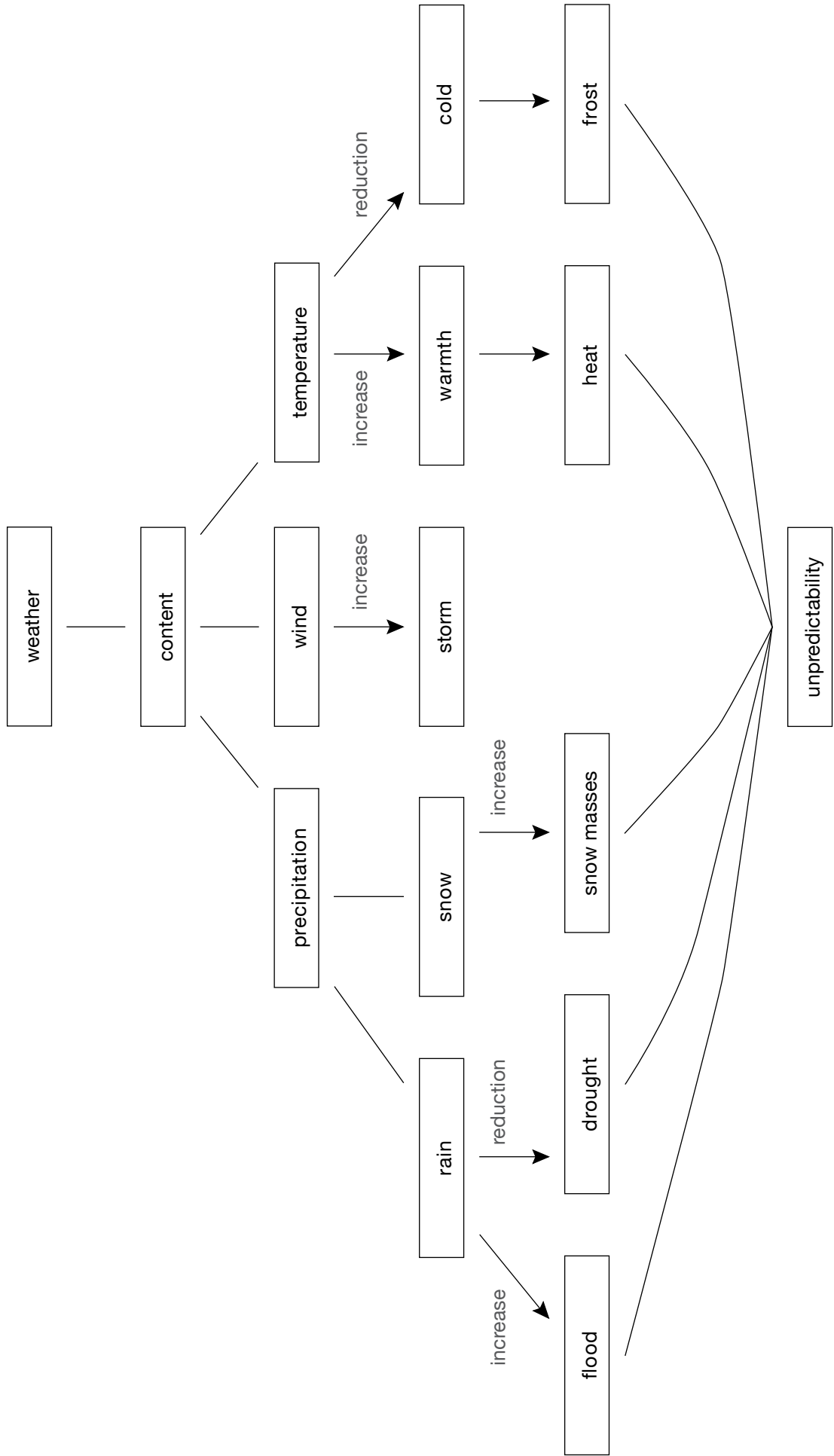
Predictability is often connected to a temporal experience of weather patterns or “habits”. Unpredictability thus appears if specific shifts between different weather conditions do not occur at the expected time. Another example of unpredictability appears for example in the content cluster of “seasons” (cf. also 6.3). Concept map 8 on the following page derives from this overview.

6.1.2 “Weather” contents of Cool World Climate Path

“Weather” is approached differently in the texts of the Cool World Climate Path than it was constructed by the BFFAW farmers. Codifying the CWCP texts in order to pick out the same symbols (precipitation: rain, snow; temperature; wind) as those that were isolated from the interviews with the BFFAW farmers the following interconnections were derived: 1) intensification and 2) (un-)predictability. The interconnection “reduction” by contrast appears in this content cluster only marginally and *indirectly*, as for instance by mentioning “drought” and thereby implying the “reduction of rain”. The focus of the CWCP texts lies instead on the emphasis of intensification and maximization towards a projected climax, as the excerpts will show below. Differing from the presentation of the BFFAW interview citations and in keeping with the origination process of the CWCP, the texts are presented in English by their Afrikaans equivalent in italics.

As a basic observation it can be stated that the symbols appear literally in the CWCP texts between two and ten times in each language. Not all of them possess an explanatory character. Thus the following subsumption has not been subjected to a further selection process, but instead displays the whole range of appearances.

Concept map 8: Weather concept of BFFAW farmers



Source: Analysis of interview data.

1) Intensification

a) Precipitation: rain

The only form of precipitation that the Cool World Climate Path puts into a larger context is “rain”. The symbol “snow” is only mentioned as a general indicator of global “Climate Change”.

22. Did you know that there is proof that Global Warming is actually happening? We call them Indicators. Indicators tell us that something is seriously wrong with our planet. Glaciers (ancient thick ice that flows extremely slowly) all over the world are melting and receding and some have disappeared. On our own continent of Africa, Mount Kilimanjaro in Tanzania used to have a thick covering of snow and a glacier. The snow cover is now very thin and the glacier has disappeared. Melting ice caps at the poles are another indicator, and there are many others. (CWCP, Information board 22)

22. Het jy geweet dat daar bewyse is dat aardverwarming regtig besig is om plaas te vind? Ons noem dit indikators. Indikators sê vir ons dat iets ernstigs verkeerd is met ons planeet. Gletsers (baie ou dik ys wat uiters stadig vloei) oral oor die wêreld is besig om te smelt en te daal en sommige het verdwyn. Op ons vasteland van Afrika het berg Kilimanjaro in Tanzanië altyd 'n dik bedekking van sneeu en 'n gletser gehad. Die sneeubedekking is nou baie dun en die gletser het verdwyn. Smeltende yskappe by die pole is nog 'n indikator en daar is baie ander. (CWCP, Information board 22)

Despite this reference, there is no further embedding of “snowfall” into a regional or local context. “Global Warming” as the most significant root cause, linearly leads causally to increased rainfall, which again affects the soil consistency in terms of floods and landslides.

A first contextualization of “rain” appears on Information board 29. This text not only identifies “Global Warming” again as the root cause of a change in weather patterns, it also outlines the impacts that “Climate Change” has on farming production, relating this to the regional scale of the Western Cape Province and below.

29. Did you know that global warming will affect rainfall patterns? Some places might get drier, others will get wetter. The timing of rainfall might change (e.g. from winter to spring) and it might become more difficult to predict when it will rain. It is predicted that the southwest of the Western Cape will get 5-30% less rain during winter and autumn. In November of 2009, unseasonable storms hit the Western Cape, this has affected the olive, grape (and wine) and fruit industries.

Yes, even the olive crops on Goedgedacht have been affected by Climate Change. At other times wheat, grain and fodder crops have been affected. The Garden Route in South Africa is experiencing drought, which was preceded by terrible flooding. (CWCP, Information board 29)

29. Het jy geweet dat aardverwarming reënvalpatrone sal beïnvloed? Sommige plekke kan droër word, ander natter. Die tyd waarin die reën val, kan verander (bv. van winter na lente) en dit kan moeiliker word om te voorspel wanneer dit gaan reën. Daar word voorspel dat die suidweste van die Wes-Kaap 5% tot 30% minder reën gedurende die winter en die herfs sal kry. In November 2009 het buitentydse storms die Wes-Kaap getref en dit het 'n invloed gehad op die olyf-, druiwe- (en wyn-) en vrugtebedryf. Ja, selfs die olyfoeste op Goedgedacht is deur die klimaatverandering aangetas. Ander kere is die koring-, graan- en voer-oeste geraak. Die Tuinroete in Suid-Afrika ervaar tans 'n droogte, wat voorafgegaan is deur geweldige vloede. (CWCP, Information board 29)

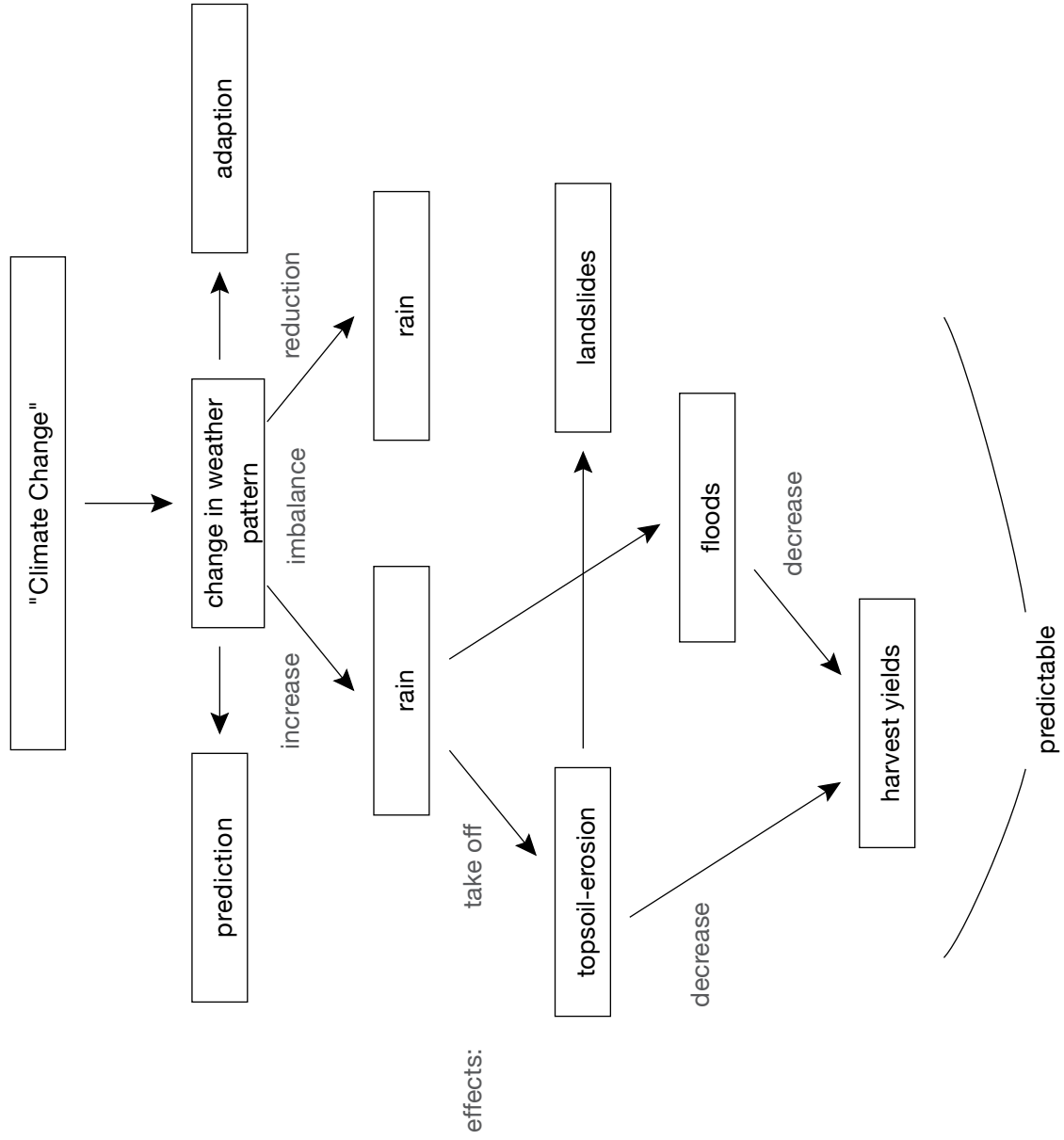
A more detailed description of how increased rainfall affects the soil appears on Information board 49. It further presents an advanced causal relation between floods and the erosion and poisoning of topsoil, ultimately leading to a decrease in harvest yields.

49. Did you know that in heavy rains and even in strong winds topsoil is washed or blown away. These soils are rich in nutrients. You prevent erosion (the washing away of soil) particularly on sloped land by channelling water, stabilising sand with old tires, and making use of natural contours when ploughing and planting. Without soil nothing will grow. So soil needs to be looked after too. Chemicals poison soil and get into ground water which can then also be poisoned. (CWCP, Information board 49)

49. Het jy geweet dat in swaar reën en selfs in sterk wind word bogrond weggespoel of weggewaai? Hierdie grond is ryk aan voedingstowwe. Jy verhoed erosie (die wegspoel van grond) veral teen skuins hellings deur water te kanaliseer, sand met ou bande te stabiliseer en gebruik te maak van natuurlike kontoere wanneer geploeg en aangeplant word. Sonder grond sal niks groei nie. Daarom moet grond ook opgepas word. Chemikalieë vergiftig grond en kom in grondwater wat dan ook vergiftig kan word. (CWCP, Information board 49)

Taking the contextualization of the symbol “rain” as an initial example, the concept map 9 on page 236 visualizes the underlying cluster in which this symbol is causally involved, using “Climate Change” here as a general placeholder as the starting point of the causal chain.

Concept map 9: CW/CP symbol "rain"



Source: Analysis of CW/CP material.

b) Temperature

The symbol “temperature” is highly interesting, as it is also embedded in a larger explanatory chain. “Temperature” appears first in interconnection with “Greenhouse Gases”, comprising carbon dioxide and methane, by emphasizing their role in global thermo-stability.

3. Did you know that gases in the atmosphere such as carbon dioxide, methane (which is more even more potent than carbon dioxide) and nitrous oxide maintain the average temperature on earth? We call the gases in the atmosphere Greenhouse Gases (there are others beside the ones mentioned). Correctly balanced Greenhouse Gases are beneficial to life on earth. (CWCP, Information board 3)

3. Het jy geweet dat gasse in die atmosfeer, soos koolstofdioksied, metaan, (wat selfs sterker is as koolstofdioksied) en distikstofmonoksied die gemiddelde temperature op aarde handhaaf. Ons noem die gasse in die atmosfeer kweekhuigasse (daar is ook ander buiten dié wat genoem is). Kweekhuigasse wat korrek gebalanseer is, is voordelig vir alle lewe op aarde. (CWCP, Information board 3)

The following Information board 5 now explains the consequences of imbalanced “Greenhouse Gases”, especially carbon dioxide, affecting the atmosphere’s ability to filter cosmic radiation and to offset thermal imbalances on the planet, with the effect of raising temperatures, called “Global Warming”.

5. Did you know that the Greenhouse Gases, in the right balance, absorb and radiate just the right amount of heat from the sun’s rays so that it is never too hot or too cold on earth, BUT Greenhouse Gases that are incorrectly balanced (for example if there is too much carbon dioxide) in the atmosphere then less heat from the sun’s rays escapes and more heat is trapped by our thin layer of atmosphere and the earth heats up more and more. This leads to **GLOBAL WARMING.** (CWCP, Information board 5)

*5. Het hy geweet dat die kweekhuigasse, in die regte balans, net die regte hoeveelheid hitte van die son se strale absorbeer en uitstraal sodat dit nooit te warm of te koud op aarde is nie, MAAR indien kweekhuigasse nie korrek gebalanseer is in die atmosfeer nie (as daar byvoorbeeld te veel koolstofdioksied is), ontsnap minder hitte van die son se strale en meer hitte word deur ons dun laag atmosfeer vasgevang en die aarde word warmer en warmer. Dit lei tot **AARDVERWARMING.** (CWCP, Information board 5)*

The information provided on this board already points towards the next symbol, “Greenhouse Gas Emissions”, with which a direct causal interrelation also exists.

Information board 6 contains a whole linear chain of argument, identifying humans as the perpetrators (“we”) of the atmosphere’s pollution through carbon emissions, leading to the unavoidable increase of temperature, or “Global Warming”.

6. Did you know that if we continue to pollute our atmosphere with carbon dioxide and methane the temperature on earth is just going to keep rising? Remember our atmosphere is so thin that it is equivalent to a coat of thin paint on a piece of furniture. The earth could warm up by 1.5 to 4.5 degrees by the year 2050. (CWCP, Information board 6)

6. Het jy geweet dat, indien ons aanhou om ons atmosfeer met koolstofdioksied en metaan te besoedel sal die aarde se temperatuur net aanhou styg. Onthou dat ons atmosfeer so dun is dat dit ekwivalent is aan 'n dun lagie verf op 'n meubelstuk. Die aarde kan 1.5 tot 4.5 grade warmer word teen die jaar 2050. (CWCP, Information board 6)

In the next step, and following on from this causally, this rising temperature triggers the melting of the polar ice caps, ultimately threatening fauna systems as well.

Red: Polar bears live in the Arctic Circle (North Pole). Rising temperatures are causing the ice caps there to melt. Polar bears are becoming endangered because: (CWCP, Question 16)

Rooi: Ysbere woon in die Arktiese Sirkel (Noordpoolsirkel). Stygende temperature is besig om te veroorsaak dat die yskappe daar smelt. Ysbere is besig om bedreig te raak, omdat: (CWCP, Vraag 16)

A second impact of rising temperatures that exemplifies the threat for nature involves the oceans, which are heating up with the consequence of killing fish feed, such as phytoplankton; following the food chain, in the next step this also means the death of the fish.

34. Did you know that as the oceans warm the plankton and krill on which many fish feed are killed by the warmer temperatures? Oceans are also being over-fished faster than they are replenished. By-catches unintentionally kill many fish and sea birds are often caught in nets, and they are simply thrown back dead into the sea. Sewage and industrial effluent also contaminate the oceans. Toxic

algae thrive in warmer oceans and crustacean such as mussels suffocate. Illegal fishing also occurs. Some countries still kill whales. Coral reefs are being bleached by pollutants (a third is at risk of extinction). How gloomy all this is! (CWCP, Information board 34)

34. Het jy geweet dat, soos die oseane warmer word, die plankton en kril waarvan baie visse leef, sterf weens die hoër temperatuur? Oseane word ook vinniger oorbevis as wat dit aangevul word. Byvangste veroorsaak ook onbedoeld dat baie visse sterf, en seevoëls word dikwels in nette gevang en eenvoudig dood teruggegooi in die see. Riool- en nywerheidsuitstromings kontamineer ook die oseane. Toksiese alge floreer in warmer oseane en skaaldiere soos mossels versmoor. Onwettige visvangs kom ook voor. Party lande maak steeds walvisse dood. Koraalriwwe word verbleik deur besoedelaars ('n derde loop die risiko van uitsterwing). Hoe mistroostig is dit nie alles nie! (CWCP, Information board 34)

The extinction of (more) species is thematized again in later contexts and still presented as an effect of the overall root cause of “Global Warming”.

36. Just as worrying as the extinction of many fish species is the extinction of many frogs and amphibians that live in wetlands, rivers and lakes. The numbers have declined by half over the last thirty years. Less rain, warmer temperatures, damming of rivers for human use and agriculture, and pollution of habitats (where they live), have all contributed to the problem. (CWCP, Information board 36)

36. Net so kommerwekkend as wat die uitsterwing van baie visspesies is, is die uitsterwing van baie paddas en amfibieë wat in moeraslande, riviere en mere woon. Die syfers het gedurende die afgelope dertig met die helfte afgeneem. Minder reën, warmer temperatuur, opdamming van riviere vir menslike gebruik en landbou, en besoedeling van habitats (waar hulle woon), het alles bygedra tot die probleem. (CWCP, Information board 36)

The climax is reached on Information board 64, by describing the high degree of destruction and again the extinction of other species through increasing temperatures in combination with forms of destructive human action and other effects of “Global Warming”.

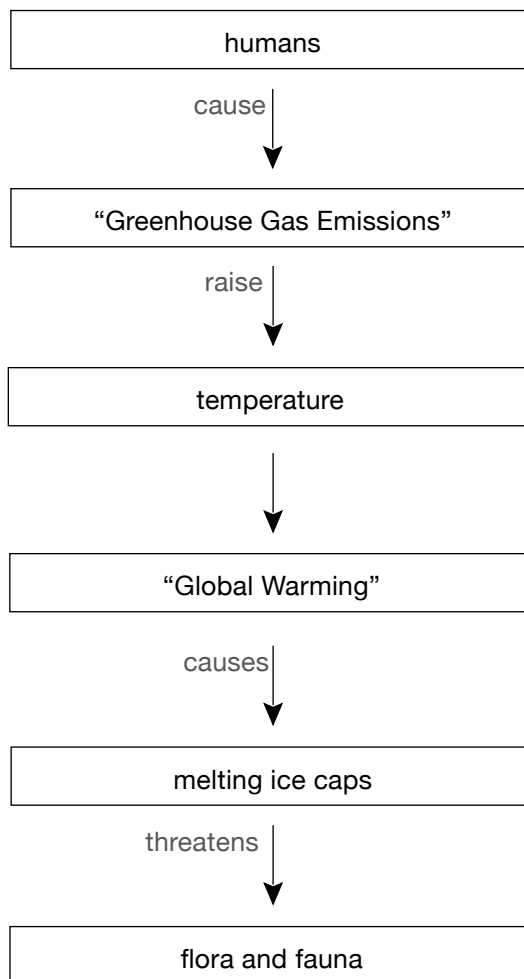
64. Did you know that the greatest cause of animals, insects and plants becoming extinct now is through their habitats being destroyed? When a tree is cut down not only are Carbon Sinks and oxygen factories destroyed (remember a tree uses carbon dioxide and releases oxygen) but the homes of many creatures, and plants, are also destroyed. Food sources are also destroyed. More and more land is used

for development and farming, in addition water scarcity, rising temperatures, and pollution, all contributes to extinction of species. (CWCP, Information board 64)

64. Het jy geweet dat die grootste oorsaak daarvan dat diere, insekte en plante nou uitgestorwe raak, is dat hul habitats vernietig word? Wanneer 'n boom afgekap word, word nie slegs koolstofputte en die suurstoffabriek vernietig nie (onthou 'n boom gebruik koolstofdiksied en stel suurstof vry), maar die tuistes van baie wesens en plante word ook vernietig. Voedselbronne word vernietig. Meer en meer grond word gebruik vir ontwikkeling en boerdery. Hierbenewens dra waterskaarste, stygende temperature en besoedeling alles by tot die uitsterwing van spesies. (CWCP, Information board 64)

The following concept map illustrates the network of symbols that structures this content, which integrates the symbol “temperature” into a line of linear causal interrelations.

Concept map 10: CWCP symbol “temperature”



Source: Analysis of CWCP material.

c) Wind

The symbol “wind” appears as an effect of “Global Warming” and root cause for erosion at the same time. The linear causal consequence is the decrease of plant growth with the implicit effect of decreasing harvest yields.

49. Did you know that in heavy rains and even in strong winds topsoil is washed or blown away. These soils are rich in nutrients. You prevent erosion (the washing away of soil) particularly on sloped land by channelling water, stabilising sand with old tires, and making use of natural contours when ploughing and planting. Without soil nothing will grow. So soil needs to be looked after too. Chemicals poison soil and get into ground water which can then also be poisoned. (CWCP, Information board 49)

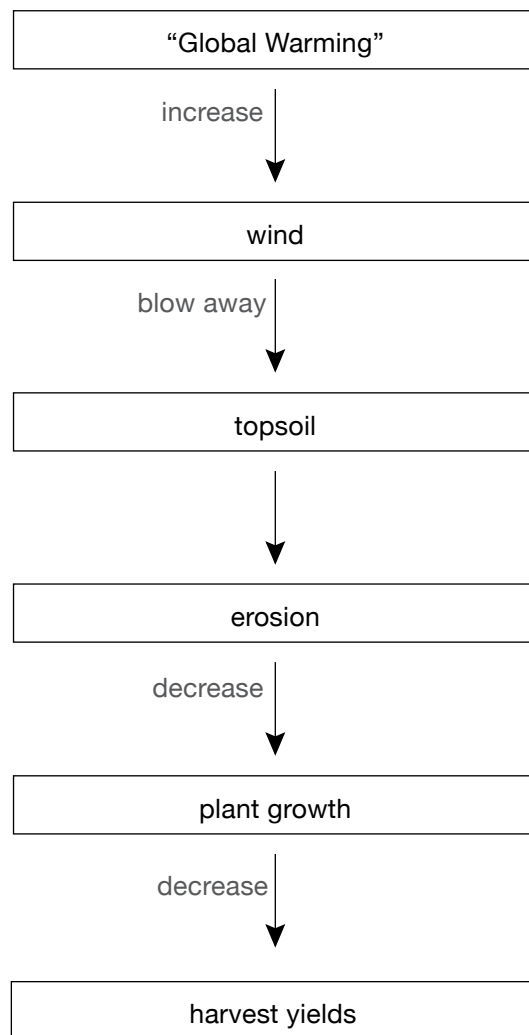
49. Het jy geweet dat in swaar reën en selfs in sterk wind word bogrond weggespoel of weggewaai? Hierdie grond is ryk aan voedingstowwe. Jy verhoed erosie (die wegspoel van grond) veral teen skuins hellings deur water te kanaliseer, sand met ou bande te stabiliseer en gebruik te maak van natuurlike kontoere wanneer geploeg en aangeplant word. Sonder grond sal niks groei nie. Daarom moet grond ook opgepas word. Chemikalieë vergiftig grond en kom in grondwater wat dan ook vergiftig kan word. (CWCP, Information board 49)

But “wind” is also represented as a chance for alternative energy acquisition. In addition to hydroelectric power and solar energy, the use of wind energy seems to contribute sustainably to the long-term reduction of carbon dependency.

89. Renewable Energy - Alternatives to fossil fuel (coal, oil, petrol, and diesel) and nuclear energy are being investigated around the world. Wind Energy (wind farms), Hydro Energy (water and wave action), and Bio fuels (fuels made from crops and vegetable oils) and Hydrogen Fuel Cell Vehicles (that only emit water and heat) are some of the alternatives. At Goedgedacht we remain alert to all these developments. (CWCP, Reflection zone 7, Information board 89)

89. Hernubare energie – Alternatiewe vir fossielbrandstof (steenkool, petrol, en diesel) en kernkrag word oor die hele wêreld ondersoek. Windenergie (windplase), hidro-energie (water- en golfbeweging, en biobrandstof (brandstof vervaardig uit gewasse en groente-olies) en waterstofbrandstof-selvoertuie (wat slegs water en hitte vrystel) is enkele van die alternatiewe. By Goedgedacht bly ons bedag op hierdie ontwikkelings. (CWCP, Refleksie-sone 7, Information board 89)

Concept map 11: CWCP symbol “wind”



Source: Analysis of CWCP material.

2) (Un-)predictability

What is interesting in comparison to the BFFAW conceptualizations is the fact that the identified changes seem to be predictable. This is in contrast to the evaluation of the farmers, who explicitly mentioned the unpredictability of weather changes as an inherent characteristic of “Climate Change”.

On our trail you will learn about many plants and trees that are suitable for a warming climate. We are expecting less rain to fall in some areas, and more in others, as the globe warms up and as more and more Greenhouse Gasses are emitted. We need to prepare ourselves for these changes in our climate. We need to grow plants that need little water, as all the water we have will be needed for

humans (and remember the population is expanding at an alarming rate). You will also be shown examples of plants and trees that are what we call exotic (alien to South Africa) and even invasive (spread easily by seed) or have invasive root systems, but they may still be good in that they absorb carbon and may even provide us with food, or they may not be so good in that they have very thirsty roots and take water from other plants and compete for space. (CWCP, Reflection zone 2)

Op ons voetslaanpad sal jy leer van baie plante en bome wat geskik is vir 'n warmer-wordende klimaat. Ons verwag dat, soos die aarde warmer word en meer en meer kweekhuisgasse vrygestel word, minder reën in sommige gebiede sal val en meer in ander. Ons moet onself voorberei vir hierdie veranderinge in ons klimaat. Ons moet plante kweek wat min water nodig het, aangesien al die water wat ons het nodig het, vir mense sal wees (en onthou die bevolking is besig om teen 'n onrusbarende tempo aan te groei). Jy sal ook voorbeelde getoon word van wat ons "eksoties" noem (uitheems aan Suid-Afrika) en selfs indringend (wat maklik deur saad versprei) of wat indringende wortelstelsels het, maar hulle kan nog goed wees in die sin dat hulle koolstof absorbeer en ons dalk selfs van voedsel voorsien, of hulle mag dalk nie so goed wees nie, in die sin dat hulle baie dorstige wortels het en water van ander plante neem en meeding om ruimte. (CWCP, Refleksie-sone 2)

It is interesting in this excerpt that two versions of "we" exist in close proximity to each other. The first one – "*We are expecting less rain [...]*" – primarily excludes any reader from belonging to the group of BFFAW farmers, as this utterance projects an expected decrease of rainfall which seems to be predictable. Referring back to the explanations of the farmers, although a shift of rainfall patterns was observed, no assumption about further developments was expressed. The second "we" appears in the sentence "*We need to prepare ourselves for these changes in our climate*" and indeed includes the writer and the reader, as it addresses the mutual need for adaptation. At this point it fails to reference the collective task of active climate-conscious interventions.

29. Did you know that global warming will affect rainfall patterns? Some places might get drier, others will get wetter. The timing of rainfall might change (e.g. from winter to spring) and it might become more difficult to predict when it will rain. It is predicted that the southwest of the Western Cape will get 5-30% less rain during winter and autumn. In November of 2009, unseasonable storms hit the Western Cape, this has affected the olive, grape (and wine) and fruit industries.

Yes, even the olive crops on Goedgedacht have been affected by Climate Change. At other times wheat, grain and fodder crops have been affected. The Garden Route in South Africa is experiencing drought, which was preceded by terrible flooding. (CWCP, Information board 29)

29. Het jy geweet dat aardverwarming reënvalpatrone sal beïnvloed? Sommige plekke kan droër word, ander natter. Die tyd waarin die reën val, kan verander (bv. van winter na lente) en dit kan moeiliker word om te voorspel wanneer dit gaan reën. Daar word voorspel dat die suidweste van die Wes-Kaap 5% tot 30% minder reën gedurende die winter en die herfs sal kry. In November 2009 het buitentydse storms die Wes-Kaap getref en dit het 'n invloed gehad op die olyf-, druiwe- (en wyn-) en vrugtebedryf. Ja, selfs die olyfoeste op Goedgedacht is deur die klimaatverandering aangetas. Ander kere is die koring-, graan- en voer-oeste geraak. Die Tuinroete in Suid-Afrika ervaar tans 'n droogte, wat voorafgegaan is deur geweldige vloede. (CWCP, Information board 29)

In the next citation, Shannon Paul explains the roots of the Goedgedacht Trust's strategy of reacting to projected changes of a non-specified "they" (*"I think what **they** are predicting for this area [...]"*) from which the Trust derived its awareness campaign for the local farmers.

I think what they are predicting for this area, look it's already very hot and very dry here during the summer. We had in the past ten years, had winters where we had very little rain. This past winter we had some very good rain. But we've had winters that have been followed by droughts in the past ten years. And so I think the concern for this area is that we're going to get hotter and drier. And it's farmland. It's a farming area. And all the crops that the farmers are growing, the most suitable crops, for what could potentially be for a hot dry area, so very little water to feed the crops etcetera. And so I think the idea is to try and get the farmers to say: Are we farming the best crop for the future? Obviously you need to feed people, you need food security, but you also need to look at what the limitations will be. And water could potentially be the biggest limitation, and enormous heat. (Interview with Shannon Paul)

Fearing a potential threat seems to be one of the motivations to become active against "Climate Change". In her view, spatially and temporally close projections of increasing extremes emphasize the necessity for (re-)action.

6.1.3 Summary

Very basically, the BFFAW farmers do not clearly distinguish between the symbols “weather” and “climate”. They rather use both terms almost synonymously to describe the atmospheric conditions in immediate relation to their individual everyday lives and farming practices. The Cool World Climate Path does not explicitly refer to “weather” at all.

On a sublevel, the symbolic reference differs between the Cool World Climate Path and the explanations of the BFFAW farmers. The small-scale farmers refer predominantly to an intensification or reduction of precipitation, temperature and wind with an unpredictable character, unlike the explanation of the CWCP, which explains shifts from a scientific perspective that enables the prediction of developments in weather and climate. Consequently, the causal interconnections and the embedding into the spatio-temporal system of orientation also vary between both perspectives. While the strong sensory notion of the farmers leads to short- to mid-term and locally anchored descriptions of direct causalities, Goedgedacht derives indirect interconnections with prospects of the quality of “Climate Change” developments from scientific discourses.

6.2 “Greenhouse Gas Emissions” (“Kweekhuisgasuitlaging”)

The concept of “Greenhouse Gas Emissions” leads even deeper into the sphere of complexity than the generated content clusters of “weather”. The nexus of “weather” seems to possess a complicated structure, as cause and effect interrelations; despite differing between the CWCP texts and the BFFAW farmers’ explanations, the explanatory patterns are founded on a difference in the understanding of the system “weather”. While “knowledge gaps” about alleged causalities can be filled with observations and their embedding into the larger context of “weather”, the question of “Greenhouse Gas Emissions” as an abstract symbol shifts the content cluster into the direction of *complexity*. Not being able to draw on experience by observation, the explanatory outcome of the BFFAW farmers is unpredictable and inconsistent, and cannot be traced back to a single conceptual origin.

The need for spontaneous associations creates a situation in which emergent knowledge results from the reproduction of internalized knowledge and the creation of individual interpretation patterns by relevance.

The concept of *Greenhouse Gas Emissions* (GGE) in general describes an effect of (global) warming in the atmosphere, which resembles the effects of a greenhouse. It result from the interplay of shortwave radiation which permeates the atmosphere unhindered and long-wave radiation transmitted by the earth's surface, which is absorbed and transformed into warmth by the atmosphere (Astor et al. 1997: 366). Here the main absorbers are atmospheric water vapour and carbon dioxide. This role of carbon dioxide leads to the conclusion that its increase through emissions, for instance from industrial production and vehicles, results in a constant warming of the world climate. Some other gases, such as methane (rice cultivation and cattle-breeding), nitrous oxide (expanding and cooling agent) and chlorofluorocarbon contribute similarly to this process (Astor et al. 1997: 366).

6.2.1 GGE on the Cool World Climate Path

The specific interpretation of the Goedgedacht Trust can be traced in the material of the Cool World Climate Path (CWCP). Table 25 (Appendix B) contains all passages which include the term “Greenhouse”. It gives an overview of the manner and context of the word's usage and its explanations. To sum it up, the definitions mostly convey an abstract idea of GGE in the context of a balanced (eco) system. “Greenhouse Gas Emissions” is not presented as a threat per se; only emissions above a critical point provoke an imbalance of the system and create a threat.

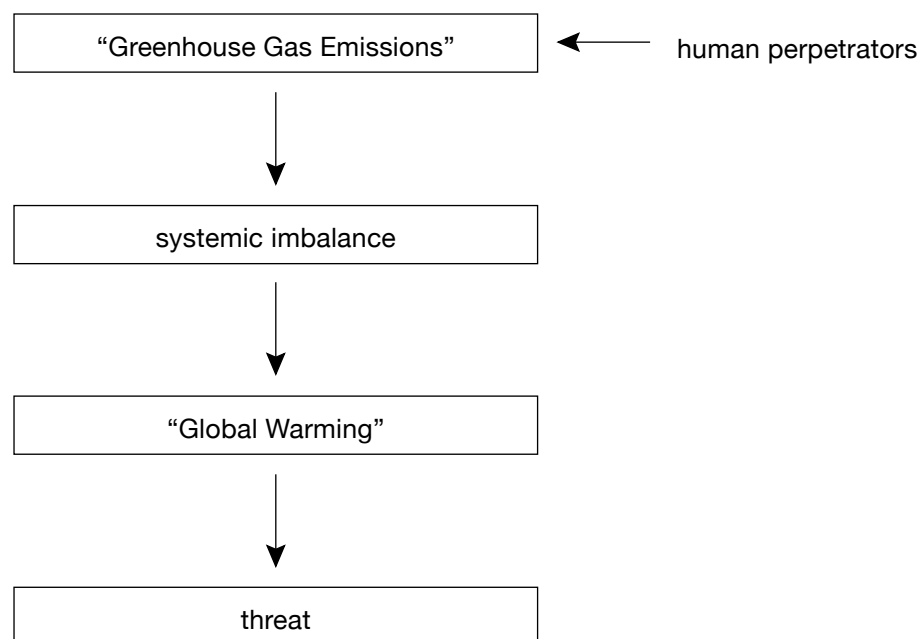
Did you know that gases in the atmosphere such as carbon dioxide, methane (which is more even more potent than carbon dioxide) and nitrous oxide maintain the average temperature on earth? We call the gases in the atmosphere **Greenhouse Gases** (there are others beside the ones mentioned). Correctly balanced Greenhouse Gases are beneficial to life on earth. (CWCP, Information board 3)

*(Het jy geweet dat gasse in die atmosfeer, soos koolstofdioksied, metaan, (wat selfs sterker is as koolstofdioksied) en distikstofmonoksied die gemiddelde temperatuur op aarde handhaaf. Ons noem die gasse in die atmosfeer kweekhuysgasse (daar is ook ander buite dié wat genoem is). **Kweekhuysgasse** wat korrek gebalanseer is, is voordelig vir alle lewe op aarde. (CWCP, Informatie bord 3)*

The Cool World Climate Path gives further information about the relationship between “Greenhouse Gas Emissions” and the atmosphere and the composition of the

air we breathe in technical terms, using abstract figures. The text constantly refers to anthropogenic carbon emissions on a global scale, and as a primary cause of “Global Warming”. The following concept map illustrates the construction of the content for the symbol “Greenhouse Gas Emission” in the texts of the Cool World Climate Path:

Concept map 12: CWCP symbol “Greenhouse Gas Emissions”



Source: Analysis of CWCP material.

6.2.2 GGE and the BFFAW farmers

In contrast to the CWCP, the spontaneous associations of the farmers reveal a whole mixture of ideas about “Greenhouse Gas Emissions”. In five cases the interviewee admits having no idea of the concept at all. The further answers repeatedly relate literally to greenhouses, often in combination with a graphic imagination.

‘Wat kom in jou gedagtes op wanneer jy die uitdrukking »Kweekhuisgasuitlatings« hoor?’ ‘Kweekhuis? Ons het ’t wel sien. Ons het daai gesien. Maar nou weet ek nou nie hoe bou jy hom op. Ek kan dit nie sê met myself, maar ek weet wat het bedoel. Dis mos ’n ding in wat ’n mens groei, ’n kweekhuis. Sit ek op die regte pad?’ (Onderhoud met HC)

*'What comes into your mind when you hear the term »Greenhouse Gas Emissions«?'
 'Greenhouse? We have of course seen it. We have seen that. But now I don't know
 how to build it. I cannot explain it with my own words, but I know what it means.
 This is a thing in which a person plants, a greenhouse. Am I on the right track?'
 (Interview with HC)*

The graphic imagination concerns a greenhouse (in general) as a place to cultivate plants. By connecting the graphic idea, resulting from a literal interpretation, to the term “emissions”, the interviewees start to contextualize the concept being asked about within their individual interpretation patterns, as the next quotations show. The first conveys the idea that the greenhouses themselves produce gas emissions.

Ek het nie baie kennis van hom nie: Kweekhuisgasuitlaatings. Nee kyk, ek is jammer om te sê, want ek weet nie watter gasse gee die kweekhuis af nie. Die kweekhuis is mos vir my ... ons kweek klein plantjies in 'n kweekhuis totdat ons hom kan uitplant. En nou watter gasse hy afgee weet ek nie, ek is nie honderd persent seker daaroor nie. (Onderhoud met IG)

I don't have much knowledge about him: Greenhouse Gas Emissions. No look, I'm sorry to say, because I don't know what gases the greenhouse emits. The greenhouse is for me ... we cultivate small plants in a greenhouse until we can plant them. And now what gases he emits, I don't know, I am not a hundred percent sure about that. (Interview with IG)

The following passage demonstrates a spatial distinction between emissions and the physical greenhouses of the term GGE. Greenhouses, as useful items under specific conditions (water and compost), putatively contain the solution against the harmful gases. The fact that the gases are expected to gather towards an “unaffected” area, unveils the underlying idea of the interviewee that the emissions appear to be locally or regionally restricted within certain boundaries.

Eers kom maar op baie dinge: die gasse wat daar uitlaat, kom na ons toe. Dat maak dat die mense siek is ... kanker ... watter kanker? Keelkanker, mens kry bloed vorms van kanker as gevolg van Eskom, maar ek hoor van kweekhuise dan is ek nogal bly. Maar kom die gasse na ons toe, gaan ons die kweekhuise run. Ons kan baie dinge doen in 'n kweekhuis en 'n tunnel as ons net water het. Water en kompos. (Onderhoud met MA)

First there come many things: the gases, which come out there, heading towards us. This makes the people sick ... cancer ... which cancer? Throat cancer, people get

blood forms of cancer [blood cancer] as result of Eskom, but I hear of greenhouses then I am quite glad. But if the gases are heading towards us, we have to 'run' the greenhouses. We can do [plant] a lot in greenhouses and tunnels if we have water. Water and compost. (Interview with MA)

But a temporal restriction also appears, limiting the appearance of “Greenhouse Gases” to a short-term emergence with the allegedly logical identified causal effect of “Climate Change”.

Ja, dan sal ek sê: eens was 't nie so nie. Ons het nie eers kweekhuisgasse gehad nie. So ek sal sê: dis een van die goed wat bydra tot die verandering van klimaat, want eers jare was die goed nie daar nie, toe was daar nie klimaatverandering gewees nie. (Onderhoud met AP)

Yes, then I would say: in the past it wasn't like that. We didn't have Greenhouse Gases before. So I want to say: this is one thing which contributed to the change of climate, because in previous years this thing was not there, then climate change was not there. (Interview with AP)

In other cases the gases are the central object of association. These images comprise different types of gases from various sources, which are either harmful to health or inflammable. The following quotations illustrate the differentiations, of for example possible sources.

‘Kweekhuisgasse is dié petrol, chemical industries met die, uhm ... gasse wat ... daai is ...’ ‘Koolstofgoed?’ ‘Ja, ja.’ (Onderhoud met WS)

‘Greenhouse gases are the petrol, chemical industries with, uhm ... gases that ... that is ...’ ‘Carbon stuff?’ ‘Yes, yes.’ (Interview with WS)

Meanwhile the next citation emphasizes the dangerous “gases in the air”, having appeared only recently and still away from the Swartland area,

Die gasse wat nou in die lug is, ja, daai gasse is baie gevaarlik vir mens en vir diere, 'n swaar aanpak op die plaas en omgewing. Ons is baie rustig, ons is baie ver van fabriek af en hierdie goeters. Ons is baie ver. Hier kry jou nog baie diere en so an. Die lug het nog baie krag hier. (Onderhoud met CA)

The gases that are recently in the air, yes, these gases are very dangerous for humans and animals, a difficult examination at this place and surrounding area. Here at our place it is very quiet. We are far away from the factories and these things. We are very far [away]. Here you still get many animals and so on. The air still has lot of power here. (Interview with CA)

The dangerous notion of gas in the following passage results from the association with a gas explosion.

As 'n mens hoor die woord 'gas' dan dink hy net an gevaar, want gas ontplof. Maar ek, daar's één nadeel wat ek an dink. Maar an die anner kant dink ek dat kan die regering nie iets doen an om dit miskien te stop? (Onderhoud met GB)

When someone hears the word "gas" he then only thinks of danger, because gas explodes. But I, this is one disadvantage that I am thinking of. But on the other side I am thinking, can't the government possibly do something to stop this? (Interview with GB)

Besides the conceptualization, the underlying mood is either "ignorant", in combination with low risk awareness,

Daai [kweekhuisgasuitlating] sal dit nie so 'n groot probleem wees nie. Ek kan wel sê dis is. Die gasse kan gemonitor word en hanteer word. (Onderhoud met JV)

This [Greenhouse Gas Emissions] is not going to be such a big problem. I can well say that is the case. The gases can be monitored and be handled. (Interview with JV)

Ek weet nie. Dit raak my nie direk nie. (Onderhoud met TL)

I don't know. That doesn't directly concern me. (Interview with TL)

or, in most of the cases, containing pessimistic future prospects, like that of an imminent death of humanity,

Dan sterf ons dadelik, jy gaan gouer dood, ja. (Onderhoud met MM)

Then we are dying immediately, you die sooner, yes. (Interview with MM)

or of the last days of earth.

Wat in my gedagtes opkom is dat die aarde is besig om sy laatste dae te oorleef.
(Onderhoud met LK)

What comes into my mind is that the earth is busy to live her last days. (Interview with LK)

The farmers' associations of "Greenhouse Gas Emissions" thus refer in substance to greenhouses, as places of cultivation, or gases in a broad sense. The interconnection of these separated items with the process of emission is not congruent with the information of the Cool World Climate Path, firstly regarding its degree of abstraction, but also regarding its evaluation of threat and relevance. While the CWCP presents the idea of a "balanced system" as a chance and the Greenhouse Gases as pre-existing factors, the farmers' interpretations are far more driven by the notion of incapacity to influence a recent appearance of this phenomenon. In general the division between the phenomenon itself and the terminus, which is a relatively modern label, also creates a gap of perception. Connected to the (discursive) appearance of the term, the farmers' implicit deduction indicates that the emissions of Greenhouse Gases also emerged only in recent times.

Furthermore some general sources (petrol, chemicals, industry) and effects were identified. While the health-related effects of "Greenhouse Gas Emissions" mentioned on the CWCP are restricted to breathing problems, such as asthma, the side effects the farmers identify are cancer, diabetes and high blood pressure through stress.

6.2.3 Summary

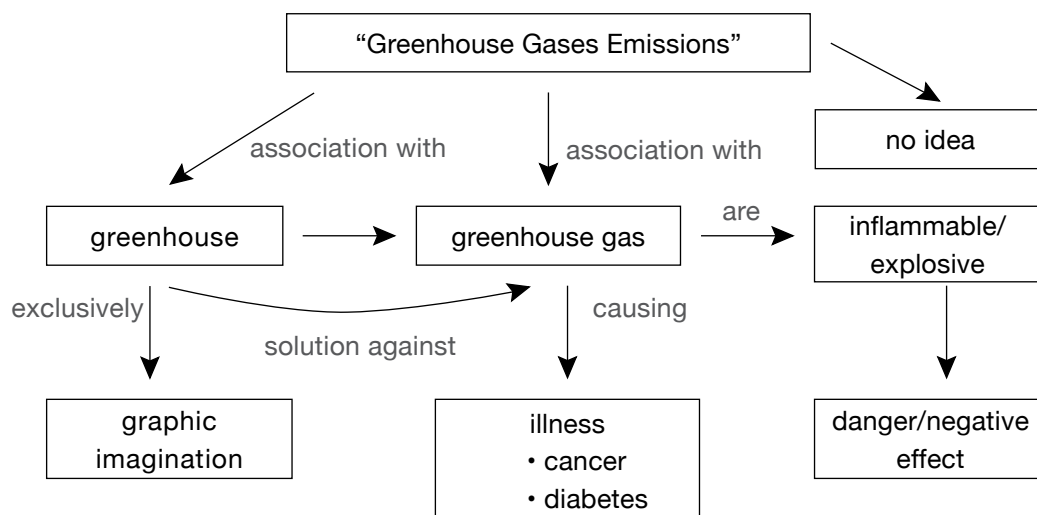
It can be argued that the phrase "Greenhouse Gas Emissions" itself distorts the image of this abstract concept, which is based on interpretations *a posteriori*. While not being familiar with the concept of "Greenhouse Gas Emissions", the farmers follow the strategy of separating the compound term into its semantic units (greenhouse, gas, greenhouse gas, emission) in order to create a sense (attribute meaning) out of these terminological fragments. As a result the abstract concept of "Greenhouse Gas Emissions" loses its content if its semantic components are separated.

Transferring further the idea of translanguistic markers to abstract climate-related scientific language, which dominates the discourse across languages, it quickly becomes obvious that the direction of lexical transfer proceeds from English to Afrikaans. The English term "Greenhouse Gas Emissions", for example, most likely found its way into Afrikaans by means of lexical borrowing in the form of a loan translation,

appearing in the Goedgedacht context inter alia as “kweekhuisgasuitlating” and “groenhuisgasvrystelling”. Both Afrikaans compound nouns follow a word-for-word literal translation (cf. chapter 2.4.1).

The following concept map can thus be derived from the results.

Concept map 13: The conception of “Greenhouse Gas Emissions”



Source: Analysis of interview data.

6.3 Restructuring content clusters: a system of orientation

The frame of reference is divided into different dimensions of orientation. Each dimension specifies the relation between the symbols, distorting the line between them. As content clusters consist of various contents and recognizing that the system of orientation contextualizes each content in a particular way, the challenge arises of defining a general structure for each content. Nevertheless I will present some dominant patterns that distinguish the contextualization of the BFFAW farmers from those of the Cool World Climate Path. The specific manifestations of spatial, temporal and personal classification are exemplified along the elements of “Climate Change” contextualization (cf. chapter 5.2).

The following sections each include a table, which condenses the specific placement of the basic aspects of “Climate Change” introduced previously within the system of orientation.

6.3.1 Spatiality (*local, regional, national, global*)

Spatial referencing differs between the BFFAW farmers and the Goedgedacht Trust. While *impacts* for instance are depicted on the Cool World Climate Path with examples on all four relevant levels (local, regional, national and global), the farmers mainly relate to their individual living environments, rarely transcending the local and regional levels. Table 19 gives an overview of the localization of the presented symbols within the system of orientation.

Table 19: Spatial localization of “Climate Change” within the system of orientation

Manifestation of spatiality	Goedgedacht Trust (employees and CWCP)	BFFAW farmers	Sample content of reference or comments
local	evidence for “Climate Change”	basic observations	fields have to be cultivated differently
	impacts	impacts	financial deficits
		“Greenhouse Gas Emission”	
	“weather”	“weather”	
regional	evidence for “Climate Change”	basic observations	the Swartland region is becoming hotter
	impacts	impacts	flooding of farmland
		“Greenhouse Gas Emission”	
	“weather”	“weather”	
national	evidence for “Climate Change”		South Africa is facing socio-economic stress through “Climate Change”
	impacts		South Africa has to react with a “National Climate Change Response Strategy”

global/ international	impacts	(impacts)	rising sea water level
	risk awareness		"Climate Change" is a global phenomenon beyond national borders
global/international	evidence for "Climate Change"		melting polar caps
	"Greenhouse Gas Emission"		enlargement of ozone hole
	"weather"		climatic zones are shifting

Source: Analysis of interview material and Cool World Climate Path texts.

The two appraisals of "Climate Change" imply that immediate spatial closeness determines the perception of the local farmers, while "globality" increases the imaginary distance through a lack of sensory perceptibility leading to a low degree of personal identification. The difference becomes most visible in the farmers' content clusters of "weather" and "Greenhouse Gas Emissions". Here the "weather" phenomena relate to sensory experiences such as thermo reception and observation (visual perception), also considering experiences of the peer group of "Swartland small-scale farmers", and thereby establishing causal relations of the direct natural environment with a short range of validity. In contrast, the concepts of "Greenhouse Gas Emissions" vary vastly between graphic imaginations of greenhouses and ideas of emissions as a danger. This insecurity, which is represented in the diversity of answers, is based on the one hand on the conceptual distance of this scientific construction, which has not been accessible to the farmers through school education. On the other hand insecurity originates from the degree of abstraction of causal interrelations that are produced in this concept, involving extraterrestrial radiation as well as globe and atmosphere as reflectors, each on an abstract scale, with the basic aspiration towards a general scope of application. At this point, there is no longer any direct sensory relation.

A difference in the mobility of BFFAW farmers and the Goedgedacht employees might contribute to the explanation of the two foci. While the farmers basically limit their radius of movement of intra-familial and occupational interactions to the local

and regional area, the interviewed Goedgedacht staff possess moreover an interactive network beyond these levels. Their resources to access a broader variety of information and perspectives also scale up their explanations of “Climate Change”.

6.3.2 Temporality (short-term, lifetime, long-term; reference to past, present, future)

As the following table 20 concludes, temporality plays a major role in the conceptualization of *root causes* and *impacts* of “Climate Change”.

Table 20: Temporal localization of “Climate Change within the system of orientation

Manifestation of temporality	Goedgedacht Trust (employees and CWCP)	BFFAW farmers	Sample content of reference (notions)
short-term		basic observations	e.g. shifts of weather
		impacts	
	risk awareness	threat potential	immediate effects lead to short-term adaptation
		“Greenhouse Gas Emission”	in close relation to weather
	“weather”	“weather”	
		“climate”	
mid-term	basic observations	basic observations	e.g. shifts of seasons; begin of Global Warming since the 1970s
	impacts	impacts	
	risk awareness	(threat potential)	
	“Greenhouse Gas Emission”	“Greenhouse Gas Emission”	
	“weather”	“weather”	

long-term	root causes	root causes	prediction of CC by Bible
	risk awareness		
	“climate”	“seasons”, “weather”	
	responsibility		challenges for future generations
	chances		possibilities for future generations
prospective	responsibility		for improving adaptive capacities; esp. directed towards political and economic actors
	chances	chances	
retrospective	evidence for “Climate Change”	basic observations	
	root causes	root causes	
	impacts	impacts	
	responsibility	responsibility	deduced from the identified root cause(r)s; often individual actors
		threat potential	
	“Greenhouse Gas Emission”	“Greenhouse Gas Emission”	
	“weather”	“weather”	

Source: Analysis of interview material and Cool World Climate Path texts.

Basic observations, such as the farmers’ construction of the content “weather”, relate mostly to an experience-based representation of these symbols and contents and thus often to an immediate short-term temporality on a daily basis. Especially the perception of their “change” is bound to short-term referencing, as the next quotation exemplifies.

Wat sal ek nou sê? Almal weet so maar gister het ons weer donnerweer gehad met ’n paar druppels water, so eintlik drie weer gehad gister, reën, agterna weer warm. Gister het ’t ook weer gereënd, donnerweer met druppels, agterna toe was dit

warm. Die oggend was dit weer ietsie kouerig en so an. Die weer bly nie in stand nie, hy bly nie warm nie, hy change in die dag en so an. (Onderhoud met CA)

What shall I now say? Everybody knows but yesterday we had a thunderstorm with a few drops of water, so we actually had three weathers yesterday, rain, afterwards warm again. Yesterday it also rained again, thunderstorm with drops, afterwards then it was warm. This morning it was again a little bit cold and so on. The weather doesn't stay even, it doesn't stay warm, it changes during the day and so on. (Interview with CA)

The BFFAW farmers further construct “change” with a medium-term temporality that refers to a period within the frame of an individual lifetime, in relation to outcomes or impacts of “Climate Change”, such as financial losses through bad harvests, which they ascribe to “Climate Change”.

Ek sou sê dit is die weer patrone dit is meeste ... en ons het ... hierdie jaar het ons nou goeie reën gehad. Die vorige twee of drie jaar het ons baie swak reën gehad, en die uitdagings was groot gewees ... daar was verliese gewees, groot verliese. Ja. (Onderhoud met IG)

I would say it is mostly the weather patterns ... and we have ... this year we had good rain. The past two or three years we had very bad rain ... and the challenges were telling ... there were losses, big losses. Yes. (Interview with IG)

Long-term temporal references relate predominantly to the *roots* of “Climate Change” as they communicate the underlying idea of its beginning, and from this point provide initial hints about subsequent causal chains. Here a broad variety of truth versions exists that aims to determine the definite starting point of change. An example here is the perspective of the Goedgedacht Trust; temporally speaking the systematic occurrence of “Climate Change” is clearly associated with the Industrial Revolution of the late 18th and early 19th centuries.

And there is the problem if you do it with, or you are one of the perpetrators of the problem, like you are part of the Industrial Revolution, which is when the whole issue began, started to become a problem, then you got to pay for that. (Interview with Peter Templeton)

As previously mentioned, “Global Warming” has been identified by the Goedgedacht Trust as the main *root* cause for “Climate Change”. In this respect the Cool World Climate Path offers a long-term perspective on the temporal manifestation of “Climate

Change”, which is explicitly mentioned on Information board 9, defining the 1970s as the initial period.

9. Global Warming was first predicted in 1896. In the 1970s the first really noticeable increase in temperatures began – Global Warming had started! Did you know that 2005 was the hottest year recorded on earth and in some countries 2009 was the hottest year. (CWCP, Information board 9)

9. Aardverwarming is die eerste maal in 1896 voorspel. In die 1970's het die eerste regtig opmerkbare toename in temperature begin – aardverwarming het begin! Het jy geweet dat 2005 die warmste jaar op aarde was wat opgeteken is, en in sommige lande was 2009 die warmste jaar. (CWCP, Information board 9)

Temporal assignments of similar precision did not appear in the explanations of the BFFAW farmers.

Temporality and “change”

As the last quotation already indicated, the temporal reference is of basic importance for the evaluation of change, the extent of affectedness. Temporal shifts are often connected to the notion of *unpredictability* in the sense of sudden or shifting occurrences beyond familiar patterns. These shifts mainly concern decisions for farming practice and the impact on farming success. Thus temporal references relate secondly to the status of (un-)predictability. The “customary” character of the symbol “seasons” exemplifies this assumption. The conceptualizations of “seasons” comprise a level of comparison. As regularities of annual periods, their shift can only be observed by comparing it to previous years. Briefly summarizing the content cluster of “seasons” here, it combines two conceptualizations of periodic systematization.

On the one hand there are periods that are constructed by social convention, like orientation based on the lunar calendar, which are institutionalized in legal terms. The symbols connected to this cluster comprise “spring”, “summer”, “autumn” and “winter” as well as the month names (“January” – “December”). If climatic properties that qualify a division by season or month shift in their position of the annual cycle, like in the case of season creep⁹⁶, the accustomed idea of the year’s structure also changes and needs to be adapted. The identification of shift does not necessarily coincide with an intensification of weather patterns. The whole concept is rather

96 The term “season creep” describes the shift of seasons caused by “Climate Change”.

constructed close to the scientific idea of “climate” from a mid-term perspective.

Ek het so min gelees deesdae. Verlede jaar was dit warmer as nou. Hoekom is dit so? Die seisoene is nie meer wat dit was nie. Yes, jy weet niet wat jy moet saai nie, wat jy moet plant nie. Soos nou, septembermaand was dit baie nat. Ons konnie plant nie. Augustusmaand het ons oërspoel, so te sê. Oktobermaand toe kon ons eerst plant. Automaties is ons goed alles agteruit. Dis deel van die klimaatchanging mos wat nou hier aangaan, liewe Vader, ons mense wat dit veroorsaak met al onse engines, met al onse elektriese toestelle, wat windmill, wat is daai windenergie. Maar dit is ons mense wat aardverwarming laat plaasvind met al onse elektrisiteit toestelle en al onse motors, die nuuste modelle en uitlaatgasse wat daar uitkom, verskillende soorte uitlaatgasse. Dis ons mense wat veroorsaak. (Onderhoud met MM)

I hardly read these days. Last year it was warmer than now. Why is it like that? The seasons are not what they used to be. Yes, you don't know what to sow or to plant. August has flooded us, so to say. We could only plant in October. Automatically everything is behind. The part of climate change at least what concerns us here, dear Lord, we humans with all our engines, with all our electric devices, that windmill, that is the wind energy. But it is us humans that cause global warming with all our electricity devices and all our cars, the latest models and emissions they emit, different sorts of emissions. It is us humans who cause [climate change]. (Interview with MM)

On the other hand there is an idea of periods of professional practice, being symbolically identified as “planting” or “harvesting season”. Here the actual condition of the weather determines the decision for either planting or harvesting, independently of the official national conventions of the annual structure that follows the lunar calendar.

Die uitdagings is, ja jy weet nie elke dag watter seisoen jy het nie en, ja, jy voel somtyds jy wil nou kool plant, jy mag nou iets anders plant en dan ... jou water, as jy nie jou eie bron het nie, dan kan jy ook maar niks doen nie. Maar as jy die regte aanleiding en die regte lyne het om 't te doen dan gaan jy 'n sukses van alles maak. (Onderhoud met CD)

The challenges are, yes, each day you don't know what season you get, yes, sometimes you feel like planting cabbage, you have to plant something else and then ... your water, if you don't have your own well then you are stranded. But if you have the right guidance and [red] line you can turn everything into success. (Interview with CD)

Both ideas of “seasons” are characterized by the experience of unpredictable shifts of (short-term) weather or (long-term) climatic changes. There is no reference that the small-scale farmers can adapt to. The only way to achieve a sustainable farming outcome for them is to observe the shifts and to consult the media on a daily basis and adapt to them quickly.

Retro- and prospectives

A further dimension of temporal referencing appeared by reconstructing the short-, medium- and long-term aspects. This dimension sets these temporal aspects in further relation to the immediate situation of referencing, meaning the moment of utterance creation. The referencing can transmit either a *retrospective* or a *prospective* perspective on an event or phenomenon. The elements are clearly linked to one of the references. While the description of root causes contains a retrospective character, the definition of responsibilities communicates a prospective necessity for specific patterns of behaviour.

The following table exemplifies the *combinatory types of temporal referencing* by topic as they appeared in this research.

Table 21: Combinatory types of temporal referencing

Temporal referencing	Retrospective	Prospective
Short-term	<i>Basic observations:</i> impact of recent weather shifts on current harvest yield	<i>Adaptation:</i> decision for planting of farming products
Medium-term	<i>Impacts:</i> failure of inter-generational farming practice (through “Climate Change”)	<i>Responsibilities:</i> instructions for sustainable “Climate Change” intervention
Long-term	<i>Root causes:</i> constant “Climate Change” since the beginning of mankind; predictability of “Climate Change” through Bible	<i>Chances:</i> future perspectives for next generation through “Climate Change”

Source: Analysis of interview material and Cool World Climate Path texts.

6.3.3 Personality (society/politics/industry, self, metaphysical entity)

The integration of personal references offers a range of dichotomies that condition “Climate Change” perception (see table 22). They are closely linked to one another and overlap with each other. These distinctions appear along different aspects of group definition, varying in size and scope. The aspect of *responsibility* will exemplify these differentiations.

The indexical character of pronominal referencing in particular plays a huge role in distinctions that appear.⁹⁷ A *we-ons-distinction* can be spoken of if the speaker creates a situation of inclusion. By using this indexical in a specific notion, the speaker defines his affiliation to a specific group, and at the same time his distance from another. The reflective position for “Climate Change” perception is derived from his membership. One prime example is the association of the Goedgedacht staff with the general group of “we as humans” in the question about responsibilities for “Climate Change” that is derived from the explanation of root causes. The Goedgedacht Trust pursues the aim of convincing people of the truth of substantial “Climate Change” and the importance of eco-conscious action. Affiliation to this general group suggests a responsibility for pro- and reactive behaviour. On a contrastive level, the farmers’ predominant association with the group of “we as small-scale farmers”, as a cluster of fellow sufferers who are equally affected by negative impacts of “Climate Change”, concurrently excludes all “others” who are not impacted in the same way. The focus lies on the temporally and locally immediate environment, determining the first-order affiliation. Here the responsibility is forwarded to groups who possess a larger set of intervention capacities beyond adaptation.

This leads to a second distinction, which is most visible in the references to society, politics and economics, which often relate to the structural living context that shapes the system of vulnerability in which the BFFAW farmers exist. It is

97 Referring to Braun (2015), *indexicals* are linguistic expressions with shifting references dependent on the context. Mostly pronouns, demonstratives and adjectives are studied in this regard, as their precise content is determined by the context in which they are used. An *indexical* which is relevant to the notion of responsibility is the Afrikaans pronoun “ons” (*Engl. we*). The explanations of the Cool World Climate Path mostly apply the first person plural personal pronoun “we” (*Afr. ons*) to indicate perpetrators or persons responsible for climate change. This pronoun, which is usually denoted as the grammatical plural of the first person singular personal pronoun “I” (*Afr. ek*), does not refer to a group of people in the literal sense. Neither of the languages differentiates further by means of any extended plural constraint like sex, respect, deixis or animat. It rather suggests that the group of persons involved includes the sender as well as the recipient, in this case the visitor as well as the Goedgedacht staff.

dominated by a *we-they distinction* that establishes the speaker's personal exclusion or inclusion. Here the speaker's position also implies different expectations for (re-)action and limits the scope of (estimated) action. Different to the *we-ons* distinction, this distinction aims primarily at exclusion, emphasizing the borders between groups which share an (inter-)dependent relation to each other. To continue the example of responsibility assessment, the BFFAW farmers identify the Western Cape Government as a complementary actor for handling the impacts of "Climate Change" on a larger sustainable scale.

The content cluster of risk awareness and threat potential contains a *decision-maker-victim distinction* of personal referencing that determines the evaluation of "Climate Change" as a threat or danger by depicting a human actor capable of conscious behaviour. The contrast of "we as small-scale farmers" versus "they as the provincial government" for instance confronts the perceived position as "victim" with the scope of action and responsibility of political agency.

By ascribing himself to either one or the other group, the speaker creates and fills the space of "Climate Change Activism" and locates himself within this network.

Table 22: Personal localization of "Climate Change within the system of orientation

Manifestation of personality	Goedgedacht Trust (employees and CWCP)	BFFAW farmers	Sample content of reference (notions)
individual (self)	root causes	root causes	"we" as root causes
	responsibilities		we-ons distinction
		risk awareness/ threat potential	decision-maker-victim distinction
		"Greenhouse Gas Emissions"	
	"weather"	"weather"	"embodied" perspective
metaphysical entity		root causes	predictability
industry	responsibilities	responsibilities	we-they distinction
	"Greenhouse Gas Emissions"	"Greenhouse Gas Emissions"	

politics	responsibilities	responsibilities	we-they distinction
	risk awareness	risk awareness	
	“Greenhouse Gas Emission”		

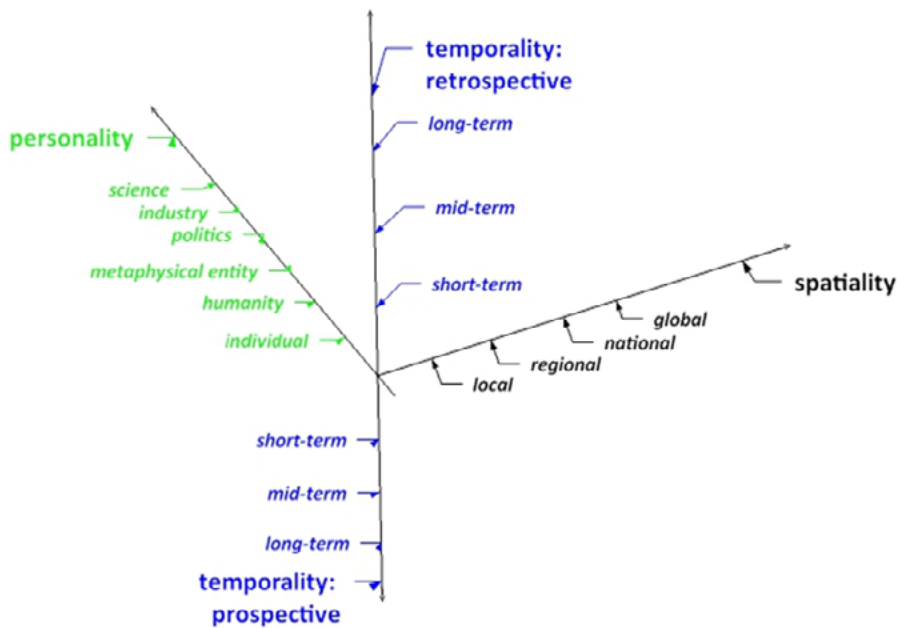
Source: Analysis of interview material and Cool World Climate Path texts

6.4 Summary

The multi-stage analysis presented in this chapter 6 has resulted in a sufficient degree of abstraction that enables a (3D) modelling⁹⁶ of the content clusters, as imagined in the Geomag metaphor (chapter 2.1). Therefore at this point finally a practical example of localizing a content cluster within the system of orientation is presented.

Figure 5 shows the system of orientation as it applies to this case study.

Figure 5: System of orientation (side view)



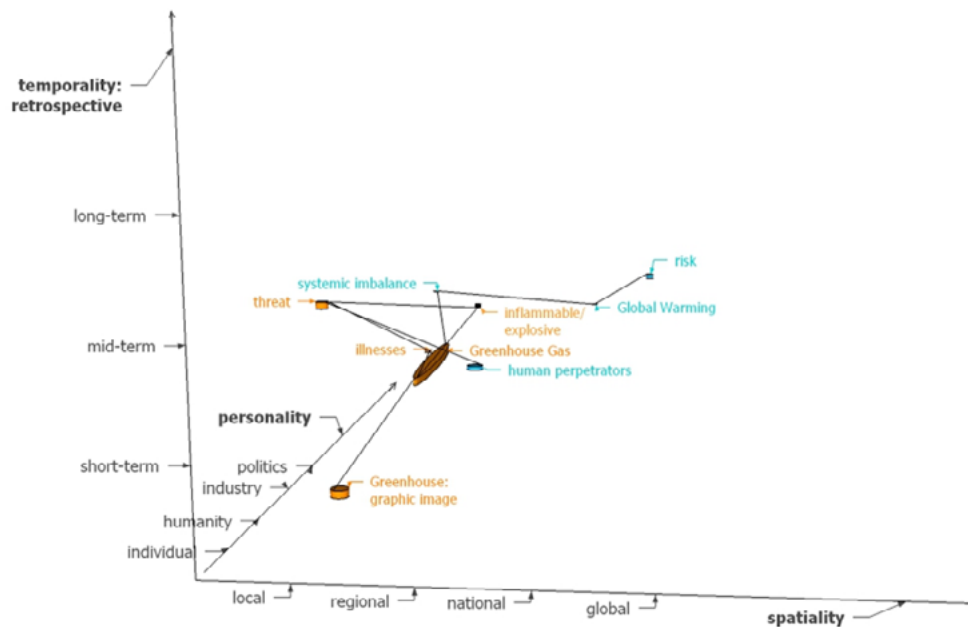
Source: Own interpretation.

The system consists of three axes that enable a spatio-temporal localization (in black and blue) as well as the reference to relevant personalities or agencies (in green). The scaling on the three different axes is deduced from the references given in the

96 See Appendix I (p. 324) for an electronic animation of this 3D modelling.

interviews. As such the system applies fairly closely related to this specific case.

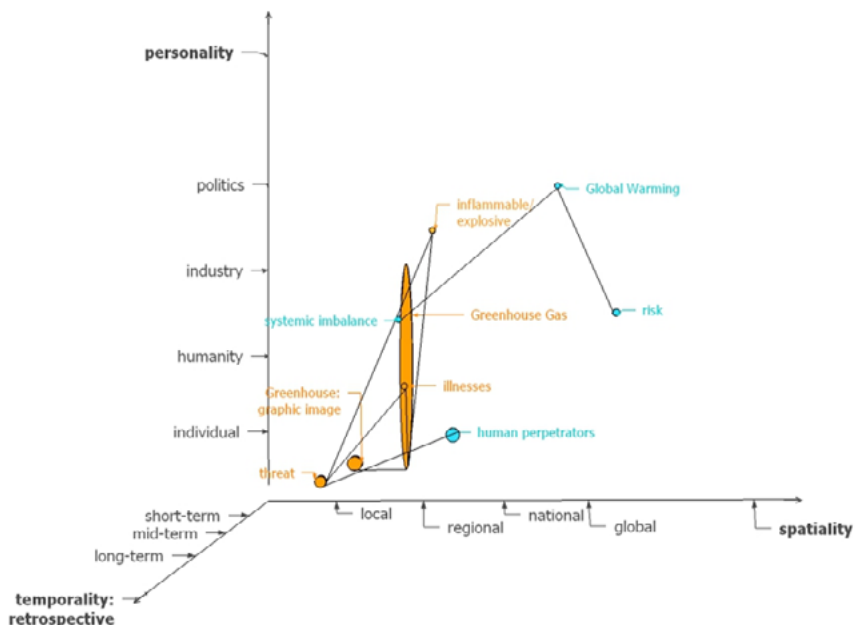
Integrated into this coordinate system, figure 6 shows the content cluster of “Greenhouse Gas Emissions” as it is described in chapter 6.2. The construction differentiates by colour between the input of the Goedgedacht Trust in blue and the symbols of the small-scale farmers in orange, while it displays at the same time their complex interweaving. The isolated symbols vary in size depending on their prominence of appearance.



Source: Own interpretation.

And so it happens that the farmers’ symbol “Greenhouse Gas”, for example, refers spatially mostly to the Swartland region (local) while it is at the same time associated on the personal scale with the industry, the farmers themselves and humanity, especially regarding the aspects causation and impacts of “Climate Change”, as figure 7 (top view) on the following page demonstrates.

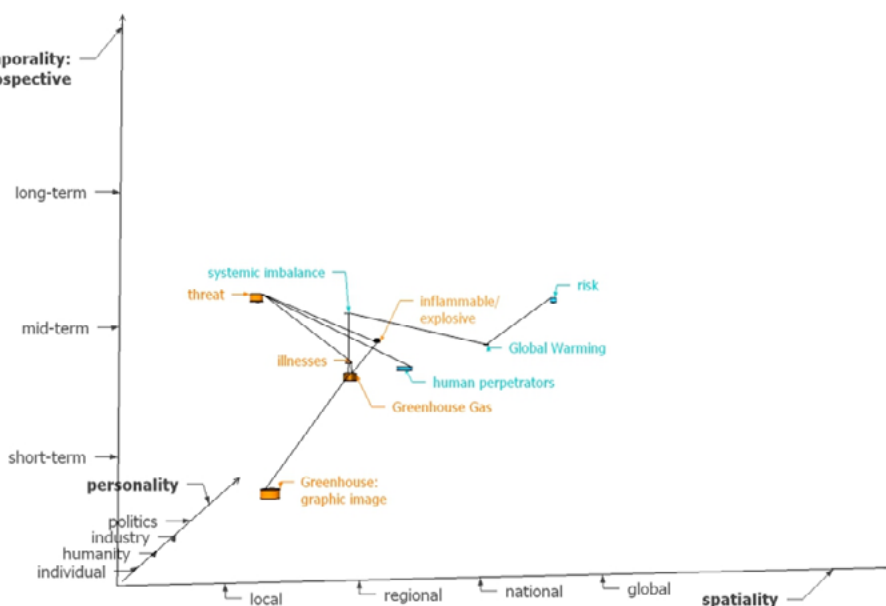
Figure 7: Content cluster: Greenhouse Gas Emissions (top view)



Source: Own interpretation.

The symbols are connected here by lines, creating a network. Depending on their localization within the system and the distance between the symbols, also the length of the interconnections varies.

Figure 8: Content cluster: Greenhouse Gas Emissions (front view)



Source: Own interpretation.

The front view of the 3D model (figure 8) visualizes further, for instance, the farmers' differing temporal localizations of the graphic image of "Greenhouse(s)", imagined with farming practices in tunnels, for example, and the positioning of the symbol "threat", that conveys a mid-to-long-term notion. In comparison to the farmers' sense of "threat", the Goedgedacht Trust attributes the idea of "risk" still to the mid-to-long-term level, but also with a national and global reference that emphasizes again the anthropogenic character of "Climate Change" and therefore the responsibility of humanity.

The divergent contextualizations of the Goedgedacht Trust and the farmers indicate that the content of the global master narrative of the abstract stimuli "Greenhouse Gas Emissions" is not just exactly reproduced by the farmers. This implies that it is not automatically available or relevant to the small-scale farmers. Explanations therefore might be, for example, a low degree of semiotic integration into the linguistic system of Afrikaans, coexisting with symbolic connotations or a lack of relevance of this concept for the farmers.

The construction demonstrates on the one hand that a content cluster fulfils the premises of complex systems, as well as it gives, on the other hand, an idea of how such a theoretical modelling can be put into practice (3D model). An animated model of the "Climate Change Knowledge" continuum is presented in Appendix I.

7. Conclusion: After having muddled through...

Although a community of “Climate Change” sceptics does exist, the most powerful narrative is the one of political action and political activism, which fundamentally agrees on the existence of anthropogenic “Climate Change” and defines a “standard set” of terminology and generalizations about root causes, impacts and prognoses. The aim of this project was to develop another perspective along these dominant narratives. It has resulted in a research design that is based on confronting small-scale farmers in South Africa’s Western Cape with terminological stimuli from these global narratives, analysing how these terms become operationalized and integrated in the construction of social reality.

By having involved a methodology of data analysis that is guided by fundamental assumptions of complexity theory, it was possible to frame knowledge around “Climate Change” as a fluid system that is shaped by constant intra- and inter-systemic exchange processes. The analytical focus concentrated on detecting the individual internalized contentual elements and interconnections. Starting from here, a local perspective on “Climate Change” was developed, adding an experiential notion to this global phenomenon.

The data set has been deconstructed with regard to six general aspects of “Climate Change” which provide an overview of the most crucial thematic fields: the description of basic observations, the detection of root causes, the description of impacts, the attribution of responsibility, the discussion of chances and finally the evaluation of risk and threat in the context of “Climate Change” awareness (cf. chapter 5).

Which conclusions can now finally be drawn after deconstructing and reframing the data set while recalling the research question mentioned at the beginning, which traces the construction of social reality in the phenomenon of “Climate Change”? This last chapter summarizes the results. This first part frames the space in which “Climate Change Knowledge” emerges by focusing on its external conditions. It is followed by reflections on the constitution process and a summary of the theoretical terminology applied. The chapter finishes with an evaluation of the applicability of complexity theory.

7.1 Framing the knowledge continuum

Analysis of the context of this project has shown that there is a difference between “Climate Change” contextualization among BFFAW farmers and that of the

Goedgedacht Trust. Between these different “knowledges” exists a gap that can be understood as a continuum of contentual relevance and distances between the concepts. Two principal reasons occasion this fact.

The first major reason here lies in people’s *access to different information sources*. The BFFAW farmers’ “Climate Change Knowledge” is constructed on the basis of educational resources, often without school education at all or below the matric level. Those prerequisites are combined with information from local newspapers and South African news programmes (SABC2) and further framed through communicative interaction with neighbours and other rural small-scale farmers (“fellow sufferers”) (cf. chapters 4.3 and 4.4). Focusing on the farmers who contributed to this project as interview partners and derived from the schooling experiences they specified, their educational outcomes mainly meet the NQF level descriptors (cf. chapters 4.2 and 4.3) on the basic level, defining their skills at least as basic in numeracy and literacy, with specific knowledge and the competence to identify a problem, to repeat information and to adjust to ethical standards. The analysis has shown further that despite having completed the matric, many farmers do conform to a limited extent to the NQF definitions of advanced skills with regard to the topic of “Climate Change”. Their contextualization of the content clusters “weather” and “Greenhouse Gas Emission” revealed that the connection of information to related fields and the systemic understanding of wider scope are limited to a spatio-temporal immediacy with regard to experiential relativity. As regards the NQF competences, the farmers themselves evaluate their self-management and team-leading skills to be restricted to working under supervision, due to their history as farm workers without managerial tasks and experience during the Apartheid era. Their team-working competence stops when it comes to the establishment of farming cooperatives, which Mr. Philander ascribes to a lack of trust amongst the group and towards political actors. The farmers interviewed are open to adaptive problem solution and welcome guidance on practical low-budget solutions, but only rarely respond to challenges of “Climate Change” on their own initiative. One reason here is seen in the limitation of individual investment resources and the farmers’ restricted access to financial (funding) capital.

A second reason for the contentual distance between Goedgedacht and the farmers’ concepts can be found in their differing motivations to deal with the topic of “Climate Change”. As such, different aspects of the topic are concerned in their conceptualization. While the BFFAW farmers constantly refer to their own living conditions, weighing the impacts and chances, the Goedgedacht Trust follows an ethical rationale of radical value position with the aim of raising awareness. The moral standard of a general human responsibility, on an individual and social level, that the

Goedgedacht Trust conveys is derived from their comprehension of an anthropogenic “Climate Change” and the conviction of reversibility. The Goedgedacht Trust formulates instructions for sustainable climate-conscious action. Information board 31 of the CWCP for example suggests:

Don't waste water. Fix leaking taps [...], don't leave taps running, take a quick shower instead of bathing, close the tap when you brush your teeth [...], put a brick in the toilet cistern to use less water, use 'grey' water to water the garden, water the garden in the morning, collect rain water in tanks for use in the garden and for washing.

Most of the Goedgedacht Trust's suggestions are practical in the sense of relieving households financially, but not with regard to the mobilization of investment capital for adaptation and improvement of farming practices. As such they are only partially useful for the BFFAW farmers, whereas the integrated practical installations of the Cool World Climate Path enjoy great popularity (cf. chapter 4.5.4). The encouragements for people to adapt their behaviour, given for instance on Information board 31, implicitly reveal information about the Goedgedacht Trust's evaluation of the farmers' radius of intervention, exclusively describing actions on an individual, small scale. This brings up again the question about their “Carbon Footprint” and the actual influence of small-scale farming on “Global Warming” and “Climate Change” (cf. chapter 5.2). From the data it can be concluded that neither the BFFAW farmers nor the Goedgedacht employees in fact believe that small-scale farming and the everyday practice of the local farmers contribute to “Global Warming” to a considerable degree. Nevertheless the Goedgedacht Trust insists on a mutual responsibility and the attempt to adopt eco-conscious behaviour independent of an individual's scope of influence.

7.2 Framing “Climate Change Knowledge”

Having a closer look at the constitution processes of “Climate Change Knowledge”, the following figure 9 demonstrates that the contextualization practice consists of two basic stages: a) perception and b) contextualization of 1) “Climate” in the first step and b) “Change” in the second. This whole process is limited by the broader socio-economic living context and, the historicity, of the system and brings up the question of relevance. The outline of “Climate Change Knowledge” emergence shows further that these stages are chronologically successive.

		a) Perception	b) Contextualization	generate
Broader socio-economic context limits the scope	1) Climate	<ul style="list-style-type: none"> • Experience • Sensory perception • Education 	Which role does it play for my livelihood security?	Relevant symbols
	2) Change	<ul style="list-style-type: none"> • Transformation • Needs to have a relation to reference point 	Within a system of spatio-temporal orientation	Interconnections (increase, decrease, intensification, reduction, shift)

Source: Own interpretation.

In the case of the BFFAW farmers, perceptions of “Climate” (1a and b) are rather based on experience or sensory perception than being deduced from educational resources. Its contextualization is driven by the question: Which role does “Climate” play for my livelihood security? It is therefore dependent on the *relevance* of climatic features to means of subsistence of the BFFAW farmers. *Relevance* here is highly determined by *experiential relativity* (cf. chapter 2).

In the process of perception, relevant objects are connected to symbols that appear in word form. Thus this stage can be defined as a process of *symbolic ascription*.

In a second step (2a and b), this perception is contextualized or set in relation to a spatio-temporal system of orientation to enable a description of transformation or “Change”. The common understanding of the term “Change” suggests the transformation of a status quo that is measurable or observable. “Change” thus always also comprises at least one reference point and a retrospective comparison of a minimum of two statuses. The extracted descriptions of “intensification”, “reduction”, “decrease”, “increase”, “(un-)predictability” and “shift” represent the terminological manifestations of *symbolic interconnections*.

The embedding into the broader socio-economic context shows that, in the case of the BFFAW farmers, the specifically vulnerable constitution of their livelihoods leads to a higher degree to an emphasis of financial and natural capital resources as being of personal value, while the Goedgedacht Trust constantly underlines a universal

value for global society. The content clusters of the BFFAW farmers deviate from a simple description of domino causal interconnections as they constantly accentuate the experiential “side effects” of “Climate Change” with regard to their own vulnerability and immediate spatio-temporal references.

The symbolic representations of natural kind terms, like those belonging to the content cluster “weather”, appear mostly as a form of *embodied symbol*, whose further contextualization, by an interconnection of symbols, is dependent on the speaker’s sensory experience again with an often short-term local spatio-temporal relativity, that reflects the socio-economic living conditions (cf. chapter 6.1). Here the assessment of *predictability* illustrates the fundamental difference between the perceptions of the BFFAW farmers and the Goedgedacht Trust.

The example of the symbol “Greenhouse Gas Emission” proved that especially contents of *abstract symbols* are not contextualized in a group-specific manner. One reason for this might be the diversity of educational resources and a limited access to information resources, and with this a lack of access to this concept with its high degree of abstraction (cf. chapter 6.2). From a linguistic perspective, this example has shown that access to a foreign-language symbol, in this case through lexical borrowing, does not automatically integrate the content into the target language.

No structural contrast between Afrikaans and English texts became obvious in the discourses. It can only be concluded that access to a specific linguistic repertoire limits the options of representational diversity. The choice between Afrikaans and English determines understanding by its social status more than by linguistic features (cf. chapter 4.4). The fact that French, German and English, as the major languages of international discourses in humanities and sciences, do still occupy a dominant position, poses a challenge to the lexicon of less prominent languages like Afrikaans. It leads to a high degree of lexical borrowing and literal translations.

The result is extended content clusters connected to one symbol (cf. “Greenhouse Gas Emission”).

The supposed gap between the concepts of the BFFAW farmers and the Goedgedacht Trust emerges in the field between the following deduced dichotomies of symbolic manifestations:

- experience-based (subjective) versus fact-based (objective) perception
- embodied (sensory) versus abstract symbols

The contents, interconnections and contextualizations are characterized by the following attributes:

- unconscious versus conscious
- unpredictable versus predictable
- pre-scientific versus scientific
- non-intentional versus intentional
- adaptive (re-)action versus preventive action
- awareness and negligence
- threat and danger

Some patterns overlap, some clash, but all content clusters finally coexist beside each other. This means that they are equal in their importance as contributors to “Climate Change Knowledge”. Overlaps are, for example, the contrastive pair of “awareness” and “negligence”. They are opposed characteristics of the attitude and habitus towards “Climate Change” and climate-conscious action in particular. But at the same time Goedgedacht representatives are “aware” that they are “negligent” in their action, although being aware of and acknowledging “Climate Change”. And further “negligence” again can be “conscious” and “unconscious” but leading to the same result of action and so on.

The example of Greenhouse Gas Emission has further shown that a content cluster may comprise both, embodied (greenhouses, illnesses and pests) and abstract symbols (explosiveness or systemic imbalance) to describe a complex content.

A clash of symbolic characteristics means in a broader sense that content clusters may contain contradictory manifestations, that they are disagreeing – including opposite aspects of spatiality, locality or personality – but still they do belong to the same content cluster and thus knowledge continuum. A clash thus describes the tension that one element belongs to two or more manifestations.

It might be summarized that the contrast between the attributes opens up a continuum that represents the breadth and variability of “Climate Change Knowledge”. It proves that no single straightforward reality of this topic exists. Thus there exists no single representation or truth about “Climate Change” and therefore no unique knowledge about this topic. In fact, different manifestations exist concurrently. This finding is especially important for the negotiation of truth claims that form the basis for strategic interventions. This insight suggests to consider local expert knowledge, like those of the small-scale farmers, as equal to academic expert knowledge and as a further puzzle piece of the whole “Climate Change” picture.

As the construction of “Climate Change Knowledge” is complex, it needs to be addressed with a rationale that considers this complexity.

7.3 “Climate Change Knowledge” and the study of complex systems

In this project knowledge is defined as a system which is constructed through processes of interaction within the system and with its environment. As a multi-layered construct its de- and reconstruction require an approach which provides appropriate analytical concepts and a methodological set that addresses the components and their exchange processes. Here the *study of complexity* offered an interesting and important means of access as it concentrates on the elements of a system and their interconnections from which complexity results. Cilliers further conceptualizes knowledge as an emerging phenomenon that is characterized by non-linearity, self-organization and representation of its constituents. His emphasis on the system’s historicity adds a necessary “broader context” which captures the socio-economic living conditions of the small-scale farmers.

Although the roles of each influential factor are not comprehensively determinable, the “Climate Change Knowledge” of the BFFAW farmers fulfils the criteria of an emergent system, as it is constructed through internal negotiation processes aimed at a meaningful balance and complementation between information. It is thus constituted by these underlying processes. As the contentual result (content clusters) is neither exclusively reducible to the farmers’ experiences nor to resources like the CWCP knowledge set, it can therefore be described as an independent cognitive continuum that results from non-predictable creative processes of meaning attribution. These processes are non-linear and self-organizing in the sense that the various individual cognitive products cannot be condensed to one simple explanatory pattern, while in contrast the scientific technical explanations may be summarized as one consistent narrative based on an academic consensus about causalities and relationality.

Tracing the output of the stimulus for “free association”, it becomes clear that this knowledge must be shaped by non-linear processes which create differences in content, scope and reference. Furthermore, the broadness of the free associations demonstrated that the stimulus “Greenhouse Gas Emissions” did not convey an intrinsic (contentual) idea, but that it rather receives its representational meaning by its interconnection with other symbols and its localization within the system of orientation in the sense of a *distributed representation*. All of these aspects fulfil the basic criteria of complex systems.

The focus of this project, not to describe which knowledge the farmers construct, but rather to detect from where (representational) gaps result, led to the following three major influential factors: educational background, language practice, socio-economic

conditions. All of them do not interact symbolically with the topic of “Climate Change” at first glance. They rather leave their traces in understanding, determining the focus of perception and interpretation. Thus as a historical environment, in the sense of Cilliers’ complexity approach, they leave their “traces” in the discourse to a relatively high degree. It has become clear that symbols do not convey a meaning per se, but that meaning is rather assigned individually or within historical limitations.

There are two main contexts with which the system interacts. Firstly the *broader (socio-economic historical) background context* determines the preconditions and limits the space of perception and interpretation. The second discursive context is represented by a spatio-temporal system of orientation, in which the symbols and contents are embedded. It became clear that knowledge description is only precise within fuzzy limitations. This work represents only a snapshot of a fluid, constantly changing system with intra- and extra-systemic feedback effects.

The level of content clusters can be identified as the *level of complexity*. While *contents* as primarily networks of linearly interconnected symbols that belong to a larger knowledge context, are reducible to the interconnections and elements, *content clusters* are neither reducible nor abstractly generalizable in a simple linear way. As such they are not predictable either. A second fact that characterizes in particular “Climate Change Knowledge” as a complex system is the diversity of combinatory possibilities. A combination of *complex* and *complicated* contents and content clusters leads to the final result of *complex knowledge*. If elements (contents) of a system fulfil the premise of complexity (cf. chapter 2.3.5), the larger system is also attributed to this type. The impossibility of reducing the statements to simple linear explanatory systems supports this evaluation.

This thesis finally provides a methodological toolset to set distinct space-specific and power-specific discourses in relation to each other.

7.4 Outlook

This project has shown that complexity theory offers an interesting and important mental design for the understanding of knowledge emergence. Further studies on other topics of social relevance might help to develop a standardized toolset to model individual and social knowledge. The analytical results of this project further open the discussion about knowledge supremacy and invite a rethink of the expert status of knowledge partners, especially regarding the standardization of knowledge corpora.

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Interviews

List of interviewees

Interviewee	Description	Interview Date and Place
Peter Templeton	Co-Director and founder of the Goedgedacht Trust	17.12.2013, Riebeeksrivier
Jafta Hendricks	Manager of the Climate Change Projects of the Goedgedacht Trust	28.11.2012, Riebeeksrivier
Shannon Paul	Originator of the Goedgedacht "Cool World Climate Path" texts	18.12.2013, Riebeek Kasteel
Johnny Philander	Capacity Development Manager at the Goedgedacht Trust	14.12.2013, Riebeeksrivier
CA	Small-scale farmer, participant of the "Black Farmers Funding Application Workshop"*	03.12.2013
AP	Small-scale farmer, participant of the "Black Farmers Funding Application Workshop"	03.12.2013
RP	Small-scale farmer, participant of the "Black Farmers Funding Application Workshop"	03.12.2013
JV	Small-scale farmer, participant of the "Black Farmers Funding Application Workshop"	03.12.2013
MM	Small-scale farmer, participant of the "Black Farmers Funding Application Workshop"	03.12.2013
CD	Small-scale farmer, participant of the "Black Farmers Funding Application Workshop"	03.12.2013
HC	Small-scale farmer, participant of the "Black Farmers Funding Application Workshop"	03.12.2013
MA	Small-scale farmer, participant of the "Black Farmers Funding Application Workshop"	03.12.2013
RA	Small-scale farmer, participant of the "Black Farmers Funding Application Workshop"	03.12.2013
TL	Small-scale farmer, participant of the "Black Farmers Funding Application Workshop"	03.12.2013

LD	Small-scale farmer, participant of the “Black Farmers Funding Application Workshop”	04.12.2013
CM	Small-scale farmer, participant of the “Black Farmers Funding Application Workshop”	04.12.2013
GB	Small-scale farmer, participant of the “Black Farmers Funding Application Workshop”	04.12.2013
HS	Small-scale farmer, participant of the “Black Farmers Funding Application Workshop”	04.12.2013
LK	Small-scale farmer, participant of the “Black Farmers Funding Application Workshop”	04.12.2013
SD	Small-scale farmer, participant of the “Black Farmers Funding Application Workshop”	04.12.2013
IG	Small-scale farmer, participant of the “Black Farmers Funding Application Workshop”	04.12.2013
DW	Small-scale farmer, participant of the “Black Farmers Funding Application Workshop”	04.12.2013
RS	Small-scale farmer, participant of the “Black Farmers Funding Application Workshop”	04.12.2013
WS	Small-scale farmer, participant of the “Black Farmers Funding Application Workshop”	04.12.2013

* The interview partners of the group of BFFAW farmers are anonymized and the referred hometowns not specified, due to the research ethics agreement.

** All names made explicit in this list and in the text on the basis of informed consent.

Appendices

Appendix A

Table 23: Cool World Climate Path: Appearance of the term “Climate Change”

Appearance	English version	Afrikaans version
Introduction board	This Path is our Path – yours and Goedge-dacht’s, and it will constantly, as climate changes , be a work in progress; we therefore encourage your feedback and contributions.	Hierdie pad is ons pad – joune en Goedge-dacht s’n, en dit sal voortdurend, soos klimaat verander , ’n onafgehandelde taak wees; daarom moedig ons jou terugvoering en bydraes aan.
Information board 1	Learn about our atmosphere, Global Warming, Carbon Emissions, Greenhouse Gases, Carbon Footprints, Deforestation, Carbon Sinks, Aforestation, Climate Change and Indicators.	Leer oor ons atmosfeer, aardverwarming, koolstofvrystellings kweekhuisgasse, koolstofvoetspore, ontbossing, koolstof putte, bebossing, klimaatverandering en indikaturs.
Information board 10	Worldwide it averages out to 4 metric tonnes / person/year and the aim, to combat Climate Change , is 2 metric tonnes of CO ₂ / person/year.	Wêreldwyd kom dit uit op ’n gemiddeld van 4 metrieke ton/persoon/jaar en die doelwit, ten einde klimaatverandering te beveg, is 2 metrieke ton CO ₂ /persoon/jaar.
Information board 15	(Desertification is ‘the gradual transformation of habitable land into desert and is usually caused by Climate Change or by the destructive use of the land.’)	(Verwoestyning is “die geleidelike transformasie van bewoonbare grond in woestyn en word geleidelik veroorsaak deur klimaatverandering of deur die destruktiewe gebruik van die grond.”)

Information board 21	Did you know that Global Warming leads to Climate Change ?	Het jy geweet dat aardverwarming lei klimaatverandering ?
Question board 11	Emissions of the gases that cause climate change must be cut by at least 80% by 2050 compared to 1990 levels.	Vrystellings van die gasse wat klimaatverandering veroorsaak moet teen 2050 met minstens 80% verminder word vergeleke met 1990-vlakke.
Reflection zone 2	What affect do you think Global Warming and Climate Change will possibly have on bird, insect and animal life?	Watter uitwerking dink jy sal aardverwarming moontlik hê op die voël-, insek- en dierelewe?
Information board 22	Yes, even the olive crops on Goedgedacht have been affected by Climate Change .	Ja, selfs die olyfoeste op Goedgedacht is deur die klimaatverandering aangetas.
Information board 48	Crops that are sustainable are those that can withstand Global Warming and Climate Change and are well adapted to the region in which they are grown.	Gewasse wat volhoubaar is, is dié wat aardverwarming en klimaatverandering kan weerstaan en wat goed aangepas is by die streek waarin hulle gekweek word.
Question board 24	They are water-wise trees, have few natural enemies and are easier to grow than fruit trees - a good sustainable crop to grow for Climate Change .	Hulle is waterwys, het min natuurlike vyande en is makliker om te laat groei as vrugtebome – 'n goeie volhoubare gewas om te kweek vir klimaatverandering .

Reflection zone 7	75. The Olive Peace Grove - This is Goedge-dacht's biggest, oldest and most ambitious Climate Change project. It has been run for the past 15 years.	75. Die Olyf-vredesboord – Dit is Goedge-dacht se grootste, oudste en mees ambisieuse klimaatveranderingsprojek . Dit loop reeds vir die afgelope vyftien jaar.
Reflection zone 7	87. Climate Change Crops (C3) Project - We're also looking into alternative crops which local farmers, including poor black farmers, can grow that are hardy enough to handle a hot, dry climate while giving them a quicker return on their time and energy than olives?	87. Klimaatveranderings gewasseprojek (C3) – Ons ondersoek ook alternatiewe gewasse wat plaaslike boere, met inbegrip van swart boere, kan kweek wat gehard genoeg is om 'n warm, droë klimaat te hanteer, terwyl dit vir hulle 'n vinniger opbrengs op hul tyd en energie gee as olywe.

Appendix B

Table 24: Cool World Climate Path: Appearance of the term “Greenhouse”

Appearance	English version	Afrikaans version
Information board 1	<p>Theme 1: Earth in Crisis (Black Notices 1-22): Whose gas is that? Learn about our atmosphere, Global Warming, Carbon Emissions, Greenhouse Gases, Carbon Footprints, Deforestation, Carbon Sinks, Afore-station, Climate Change and Indicators.</p> <p>1. Did you know that the most vulnerable part of earth is our atmosphere? It is very thin. On a clear day we can see Table Mountain from Goedge-dacht. Table Mountain is about 84 km from the farm, which is about the height of the part of the atmosphere that protects earth. Not much is it?</p>	<p>Tema 1: Aarde in krisis (swart uithangtekens 1-22): Wie se gas is dit? Leer oor ons atmosfeer, aardverwarming, koolstofvrystellings kweekhu- isgasse, koolstofvoet-spore, ontbossing, koolstof putte, bebossing, klimaatverandering en indikaturs.</p> <p>1. Het jy geweet dat die kwesbaarste deel van ons aarde ons atmosfeer is? Dit is baie dun. Op 'n helder dag kan ons Tafelberg van Goedge-dacht af sien. Tafelberg is omtrent 84 km van die plaas af, wat ongeveer die hoogte is van die deel van die atmosfeer wat die aarde beskerm. Nie veel nie, is dit?</p>

<p>Information board 3</p>	<p>3. Did you know that gases in the atmosphere such as carbon dioxide, methane (which is more even more potent than carbon dioxide) and nitrous oxide maintain the average temperature on earth? We call the gases in the atmosphere Greenhouse Gases (there are others beside the ones mentioned). Correctly balanced Greenhouse Gases are beneficial to life on earth.</p>	<p>3. Het jy geweet dat gasse in die atmosfeer, soos koolstofdiksied, metaan, (wat selfs sterker is as koolstofdiksied) en distikstofmonoksied die gemiddelde temperatuur op aarde handhaaf. Ons noem die gasse in die atmosfeer kweekhuisgasse (daar is ook ander buiten dié wat genoem is). Kweekhuisgasse wat korrek gebalanseer is, is voordelig vir alle lewe op aarde.</p>
<p>Information board 4</p>	<p>4. Did you know that 80% of the Greenhouse Gases in the atmosphere is made up of carbon dioxide? BUT the air we breathe is made up of:</p> <ul style="list-style-type: none"> • 79% nitrogen • 20% oxygen • 1.5% water vapour • 1% argon and other gases • 0.03% carbon dioxide <p>Humans and animals breathe in oxygen via their lungs, which is carried by the red blood cells of the body to all the organs, tissues and cells that require oxygen. Carbon dioxide is collected by the red blood cells and exhaled by the lungs.</p>	<p>4. Het jy geweet dat 80% van die kweekhuisgasse in die atmosfeer bestaan uit koolstofdiksied? MAAR die lug wat ons inasem bestaan uit:</p> <ul style="list-style-type: none"> • 79% stikstof • 20% suurstof • 1.5% waterdamp • 1% argon en ander gasse • 0.03% koolstofdiksied <p>Mense en diere asem suurstof in via hul longe. Die suurstof word deur die rooibloedselle van die liggaam na al die organe, weefsels en selle gedra wat suurstof nodig het. Koolstofdiksied word deur die rooibloedselle versamel en deur die longe uitgeasem.</p>

<p>Question board 2</p>	<p>2. Questions:</p> <p>Red: Greenhouse Gases contain carbon dioxide and the air we breathe contains carbon dioxide.</p> <p>a) 80 % carbon dioxide in Greenhouse Gases and 0.03% in air. b) 0.03% carbon dioxide in Greenhouse Gases and 80% in air. c) 30% carbon dioxide in Greenhouse Gases and 8% in air.</p>	<p>2. Vrae:</p> <p>Rooi: Kweekhuisgasse bevat ... koolstofdioksied en die lug wat ons inasem bevat ... koolstofdioksied.</p> <p>a) 80% koolstofdioksied in kweekhuisgasse en 0.03% in lug. b) 0.03% koolstofdioksied in kweekhuisgasse en 80% in lug. c) 30% koolstofdioksied in kweekhuisgasse en 8% in lug.</p>
<p>Information board 5</p>	<p>5. Did you know that the Greenhouse Gases, in the right balance, absorb and radiate just the right amount of heat from the sun's rays so that it is never too hot or too cold on earth, BUT Greenhouse Gases that are incorrectly balanced (for example if there is too much carbon dioxide) in the atmosphere then less heat from the sun's rays escapes and more heat is trapped by our thin layer of atmosphere and the earth heats up more and more. This leads to GLOBAL WARMING.</p>	<p>5. Het hy geweet dat die kweekhuisgasse, in die regte balans, net die regte hoeveelheid hitte van die son se strale absorbeer en uitstraal sodat dit nooit te warm of te koud op aarde is nie, MAAR indien kweekhuisgasse nie korrek gebalanseer is in die atmosfeer nie (as daar byvoorbeeld te veel koolstofdioksied is), ontsnap minder hitte van die son se strale en meer hitte word deur ons dun laag atmosfeer vasgevang en die aarde word warmer en warmer. Dit lei tot AARDVERWARMING.</p>

<p>Information board 8</p>	<p>8. Let's think about what can cause carbon dioxide and other Greenhouse Gases to increase in the atmosphere - we burn fossil fuels (such as coal) in our power stations to make electricity, we cut down forests (deforestation), industry adds further pollutants, exhaust fumes of cars and trucks (they burn fossil fuels in the form of oil, petrol and diesel), making of cement, and aviation fuel.</p>	<p>8. Laat ons dink aan wat kan veroorsaak dat koolstofdiksied en ander kweekhuigasse toeneem in die atmosfeer: Ons brand fossielbrandstowwe (soos steenkool) in ons kragstasies om elektrisiteit te maak, ons kap woude uit (ontbossing), die industrie voeg verdere besoedelaars by, motors en vragmotors stel uitlaatgasse vry (hulle brand fossielbrandstowwe in die vorm van olie, petrol en diesel), sement word gemaak, en vliegtuigbrandstof.</p>
<p>Information board 13</p>	<p>13. Did you know that when forests are cut down or destroyed and not replanted we call this deforestation? A forest (and oceans and grasslands) are Carbon Sinks – they can absorb carbon from the air and store it (and use it) – about half the Carbon Emissions produced by humans are absorbed by the oceans and forests. About 28 million acres of trees are cut down or burnt every year. Deforestation contributes to Global Warming; accounting for a quarter of global Greenhouse Gas emissions – a Carbon Sink (good) is turned into a Carbon Source (not good when it was a Sink).</p>	<p>13. Het jy geweet dat wanneer woude uitgekap en vernietig word en nie herbeplant nie, dit ontbossing genoem word? Woude (en oseane en grasvelde) is koolstofputte – hulle kan koolstof uit die lug absorbeer en dit berg (en gebruik). Omtrent die helfte van die koolstofvrystelling wat deur mense veroorsaak word, word deur die oseane en woude geabsorbeer. Omtrent 28 miljoen acre bome word jaarliks uitgekap of afgebrand. Ontbossing dra by tot aardverwarming en is verantwoordelik vir 'n kwart van die aarde se kweekhuigasvrystellings – 'n koolstofput (goed) word omgesit in 'n koolstofbron (nie goed nie).</p>

Appendix C

12. What equipment do you have access to? Please also indicate if it is your own or you share it with others:

- Wheelbarrow own share
 Spades, picks, forks own share
 Tractor own share
 Grop own share
 Disc own share
 Plough own share
 Scraper own share
 Rotorvator own share

13. What inputs do you use on the farm and how much per year?

- Chemicals Amount: -----
 Herbicides Amount: -----
 Pesticides Amount: -----
 Fungicides Amount: -----
 Fuel Amount: -----
 Fertiliser Amount: -----
 Other: (type) ----- Amount: -----

14. How many people live on the farm? -----

15. How many people work on the farm? -----

16. Is there a school on your farm? Yes No

17. What are you farming?

1. -----
2. -----
3. -----
4. -----
5. -----
6. -----

Please complete all the questions so that we can see if you qualify.

1. Name: -----

2. ID number: -----

3. Address: -----

Erf number of farm/smallholding: -----

4. Contact numbers: (cellphone): -----

Landline/Telkom: -----

Other daytime phone number (shop etc): -----

5. Do you own or rent the land?

If own, do you have title deeds? Yes No

6. How many years have you been on this land? -----

7. Size of land: -----

8. Do you have your own rain gauge? Yes No

Annual rainfall on your farm: ----- mm.

9. Type of soil: ----- pH of soil: -----

Who did your soil analysis?

(eg Bemlab, Eisenburg, etc) -----

10. Do you have electricity? Yes Phase -----

No

11. What source of water do you have?

River Dam Spring Borehole

None

You know how to farm, and you're good at what you do. But how do you get the money to pay for a bigger dam? Or the tractor, shed, tools, or whatever it is you need to take you to the next level and make you competitive? You've heard there's State funding available, but where do you start? What do you need? How do you fill in all those forms they ask for?

If this sounds like the situation you're in, you need to come to the **Black Farmer's Funding Application Workshop**, a 10 day free workshop, at Goedgedacht Farm, that will show you how the process of applying for State funding works. The workshops will tell you all you need to know about preparing a business plan, completing an application, and then following up afterwards for the best chance at success.

How much does it cost?

The workshops are free of charge. We'll even pay you a R240 transport allowance.

When is it?

There will be four workshops from September to December 2013. Each one is 10 days long, with time off in-between to allow you to return to your farm and family. Please see the dates in this application form.

What do I need to qualify?

Applying for State funding requires a lot of paperwork, and there will be many applicants for this course. So we can only accept the applicants who have the documents and paperwork requested in the form below. You need to complete the whole form to qualify. If you are unable to complete the form yourself, someone else may complete it for you, and you may bring someone with you to the workshop to complete the forms there. Please enter their details in question 24 at the end of the form.



The NLDTF relies on funds from the proceeds of the National Lottery. The Lotteries Act and regulations guide the way in which NLDTF funding may be allocated. The NLDTF wants the grants to make a difference to the lives of all South Africans, especially those more vulnerable, and to improve the sustainability of the beneficiary organisations. Available funds are distributed to registered and qualifying non-profit organisations in the fields of charities, arts, culture and national heritage, and sport and recreation. By placing its emphasis on areas of greatest need and potential, the NLDTF contributes to South Africa's development.

DO YOU NEED STATE FUNDING TO IMPROVE YOUR FARM?



WE WILL SHOW YOU HOW TO APPLY FOR THE STATE FUNDING THAT YOU NEED TO BE A MORE SUCCESSFUL FARMER

24. Do you need to bring someone with you who can read and write? No Yes

If yes: Name: _____
 Contact details: (cellphone) _____
 (landline/Telkom) _____
 (other) _____

25. When would you like to attend? Mark your choice from 1 to 4, with 1 being most preferred and 4 being least preferred:

- September 2nd, 3rd, 4th, 5th, 9th, 10th, 16th, 17th, 18th and 19th (10 days)
- September 30th, October 1st, 2nd, 3rd, 14th, 15th, 16th, 17th, 28th and 29th (10 days)
- November 4th, 5th, 6th, 7th, 11th, 12th, 13th, 14th, 18th and 19th (10 days)
- December 2nd, 3rd, 4th, 5th, 9th, 10th, 11th, 12th, 17th and 18th (10 days)

Once you have completed this form, please hand it to Jaftha Hendricks at Goedgedacht Farm as soon as possible, email it to jafthagoedgedacht@gmail.com or post it to BFFAW Applications, Goedgedacht Trust, PO Box 458, Malmesbury, 7299. If you have any questions, call Jaftha Hendricks on 022 482 4369 or 073 766 2630.

I declare that all the details on this application form are correct to the best of my knowledge:

Name: _____
 Date: _____
 Signature: _____

18. What do you want to farm?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

19. What have you farmed in the past?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

20. Have you applied for State funding before?

Yes No

Date: _____
 To whom? _____

21. Have you ever written a business plan?

Yes No

(If yes, please bring it with you to the workshop)

22. What qualifications do you have?

23. Other qualifications:

(Wife, children, manager, etc.)

Appendix D

12. Tot watter toerusting het jy toegang? Dui asseblief ook aan: is dit jou eie of moet jy dit met ander deel:

- Kruiwa eie deel
 Grawe, pikke, vurke eie deel
 Trekker eie deel
 Eg eie deel
 Skottelploeg eie deel
 Ploeg eie deel
 Skrop eie deel
 Kapiskaar/ploeg eie deel

13. Wat is jou insette in die plaas per jaar en hoeveel is dit?

- Chemikalieë Onkruiddoder Hoeveelheid: -----
 Plaagdoder Hoeveelheid: -----
 Swamdoder Hoeveelheid: -----
 Brandstof Hoeveelheid: -----
 Kunsms Hoeveelheid: -----
 Ander: (tipe) ----- Hoeveelheid: -----

14. Hoeveel mense woon op die plaas?

15. Hoeveel mense werk op die plaas?

16. Is daar is skool op jou plaas? Ja Nee

17. Waarmee boer jy?

1. -----
2. -----
3. -----
4. -----
5. -----
6. -----

Voltooi asseblief al die vrae sodat ons kan sien of jy kwalifiseer.

1. Naam: -----
2. ID nommer: -----
3. Adres: -----
4. Erfnommer of plaas/plot: -----
5. Kontaknommers: (selfoon): -----
6. Landlyn/Telkom: -----
7. Ander foonnommer gedurende die dag (winkel, ens): -----

8. Is jy die eienaar van die grond

9. of huur jy die grond ?

10. Indien jy die eienaar is, het jy die kaart en transport? Ja Nee

11. Hoeveel jare is jy reeds op hierdie grond? -----

12. Grootte van die grond: -----

13. Het jy jou eie reënmeter? Ja Nee Jaarlikse reënval op jou plaas: ----- mm.

14. Tipe grond: ----- pH van grond: -----

15. Wie het jou grond ontleed?

(bv. Bemlab, Eisenburg ens) -----

16. Het jy elektrisiteit? Ja Fase -----

Nee

17. Watter bron van water het jy?

Rivier Dam Fontein Boorgat

Geen

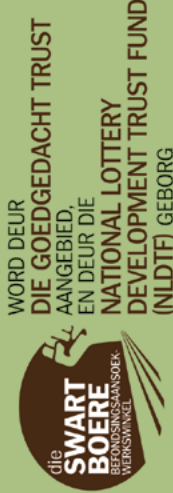
Jy weet hoe om te boer en jy is goed met dit wat jy doen. Hoe kry jy egter die geld om vir 'n groter dam te betaal? Of die trekker, stoor, toerusting, of wat dit ook al is wat jy benodig om jou na die volgende vlak te neem en jou mededingend te maak? Jy het gehoor dat daar Staatsbefondsings beskikbaar is, maar waar begin jy? Wat het jy nodig? Hoe vul jy al daardie vorms waarvoor hulle vra, in?

Indien dit klink na hoe jy nou voel, moet jy die **Swart Boere Befondsingsaansoek Werkswinkel** bywoon. Dit is 'n 10-dae gratis werkswinkel wat jou sal wys hoe die aansoekproses vir Staatsbefondsings werk. Tydens die werkswinkels sal jy alles leer oor wat jy nodig het om 'n besighheidsplan te skep, 'n aansoekvorm te voltooi en na die tyd op te volg vir die beste kans op sukses.

Hoeveel gaan dit kos?
 Die werkswinkels is gratis. Ons sal selfs vir jou 'n R240 vervoertoelaag gee.

Wanneer is dit?
 Tussen September en Desember 2013 sal daar vier werkswinkels by Goedgegacht plaas gehou word. Elke een is 10 dae lank, met af tye tussenin, sodat jy terug kan gaan na jou plaas en familie. Stien asseblief die datums op die aansoekvorm hieronder.

Wat benodig ek om te kwalifiseer?
 Dit vereis baie papierwerk om vir Staatsbefondsings aansoek te doen, en daar sal baie boere wees wat aansoek doen om die kursus by te woon. Ons kan dus slegs die aansoekers met al die dokumente en papierwerk wat in die onderstaande vorm vereis word, aanvaar. Jy moet die hele vorm voltooi om te kwalifiseer. Indien dit nie vir jou moontlik is om self die vorm te voltooi nie, mag iemand anders dit vir jou voltooi, en jy mag iemand saam met jou na die kursus bring om die vorms te voltooi. Vul asseblief hulle besonderhede in vraag 24 aan die einde van die vorm.



Die NLDTF maak staat op fondse uit die opbrengste van die National Lottery. Die Wet op Loterye en regulasies rig die manier waarop die NLDTF die fondse mag toewys. Die NLDTF wil nie dat die toelae 'n verskiel maak in die lewens van alle Suid-Afrikers, vermaandegeneratiewe meerkwessies, en om die volhoubaarheid van die begunstigde organisasies te verbeter. Beskikbare fondse word aan geregtigde en kwalifiserende nie-winningsgewende organisasies in die valde van welsyn; kuns, kultuur en nasionale organisasies en sport en ontspanning verdeel. Deur klem te plaas op gebiede met groter behoeftes en potensiaal, dra die NLDTF by tot die Suid-Afrikaanse ontwikkeling.

18. Waarmee wil jy boer?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

19. Waarmee het jy in die verlede geboer?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

20. Het jy al voorheen om Staatsbefondsing aansoek gedoen?

Ja Nee

Datum: _____

By wie? _____

21. Het jy al ooit voorheen 'n besigheidsplan geskryf?

Ja Nee

(Indien ja, bring dit asseblief saam na die werkwinkel toe)

22. Watter kwalifikasies het jy?

23. Ander kwalifikasies:

(Vrou, kinders, bestuurder, ens.)

24. Moet jy iemand saam met jou bring wat kan lees en skryf? Nee Ja

Indien ja: Naam: _____

Kontakbesonderhede: (selfoon) _____

(landlyn/Telkom) _____

(ander) _____

25. Wanneer wil jy dit bywoon? Merk jou keuse vanaf 1 tot 4, waar 1 jou eerste keuse is en 4 jou laaste keuse is:

2de, 3de, 4de, 5de, 9de, 10de, 16de, 17de, 18de en 19de September (10 dae)

30ste September, 1ste, 2de, 3de, 14de, 15de, 16de, 17de, 28ste en 29ste Oktober (10 dae)

4de, 5de, 6de, 7de, 11de, 12de, 13de, 14de, 18de en 19de November (10 dae)

2de, 3de, 4de, 5de, 9de, 10de, 11de, 12de, 17de en 18de Desember (10 dae)

Handig hierdie vorm asseblief so gou as moontlik by **Jaftha Hendricks** by Goedgedacht plaas in, sodra dit voltooi is, epos dit aan **jafthagoedgedacht@gmail.com** of pos dit na **SBBAW Aansoeke, Goedgedacht Trust, Posbus 458, Malmesbury, 7299.**

Indien jy enige vrae het, kontak Jaftha Hendricks by **022 482 4369** of **073 766 2630.**

Ek verklaar dat al die besonderhede op hierdie aansoekvorm na die beste van my wete korrek is:

Naam: _____

Datum: _____

Handtekening: _____

BENODIG JY STAATS- BEFONDSING OM JOU PLAAS TE VERBETER?



VIND UIT HOE OM
AANSOEK TE DOEN OM DIE
STAATSBEFONDSING WAT
JY BENODIG OM 'N MEER
SUKSESVOLLE BOER TE WEES

Appendix E: Interview guideline

The interview will focus on the idea of climate change that the Goedgedacht organization conveys. I am interested in mayor concepts and language practices/habits. Also your own (individual) comprehension of climate and its relevance for this specific region is interesting and important to me.

The interview will take 30 to 45 minutes.

Is there anything which you want to ask me?

Background Information on Interviewee

Date: _____

Name: _____

What is your job title?

What primary functions does your job involve?

How would you describe the organisation you work for?

How long have you been involved in the Goedgedacht Organisation?

What is your highest educational degree? (school or academic)

Interviewee's Family Languages

Which language would you identify as your first language?

Which language would you identify as the first language of your mother and father?

Which language would you identify as your children's first language(s)?

In which language did you do your schooling?

Your mother?

Your father?

Your children?

Would you, retrospectively, have chosen the same language as your language of learning as you in fact had?

Would you, in hindsight, have chosen the same language of learning for your children as you in fact did?

Which language(s) are currently used in your close family interactions?

When two (or more) languages are used in the family (e.g. children speak Afrikaans, father (or grandparent) speaks Xhosa), are you mixing up (e.g.) Afrikaans and Xhosa – or do you mostly distinguish clearly, using either the one or the other?

How would you rate your own Afrikaans-Xhosa bilingual abilities: equal, Afrikaans dominant or Xhosa dominant?

How would you rate the Afrikaans-Xhosa-English trilingual abilities of your children?

Which role does Afrikaans / English / Xhosa play in Goedgedacht from your point of view?

General Statements on Climate Change of Goedgedacht Organization

Please name 5 words to characterize/describe the main goals of the climate related work of Goedgedacht.

Have these goals and activities changed over time?

What are the most important reasons why your organization supports climate change education?

What are your personal motives to get involved in the Goedgedacht projects?

How would you characterize the way/strategy your organisation communicates climate change related knowledge/information?

What kinds of information are available? Which campaigns does Goedgedacht have?

Do you get support from the official national side? If yes, which kind of support do you get? (financial, ideological...)

Do you find your goals supported by/reflected in the policy of the Western Cape Provincial Government?

Knowledge evolving processes at Goedgedacht

Are you discussing climate related topics in team meetings?

How does a “typical” meeting (in the case of climate change) take place? (languages, discussion guideline, feedback rules...)

Could you name three major concepts/terms which come up/are discussed regularly?

How are you structuring the different types of input? (Record of proceedings, formulation of main points, definition of main goals/strategy...)

Is it possible to get access to these records?

Do you think the language competence is relevant for the efficiency of the discussion? (Are you all talking about the same thing?)

How does Goedgedacht cope with different experience and knowledge preconditions? (How are you making clear that you are all referring to the same thing?)

What is your own strategy to “keep it simple”?

Which are the target groups of the Goedgedacht campaigns on climate change?

How do you identify the needs for understanding/lack of knowledge of this group/s?

How do you get in contact with the different (target) groups?

What do you think are primary motivations for people to consult you/ to take the opportunity to get informed by Goedgedacht?

Where would you in general identify a lack of (environmental) climate related understanding? (of the people/groups you are working with) What are the major misunderstandings from your experience?

Can you identify gaps in the perception/understanding of these technical climate concepts between English-speaking and non-English-speaking groups?

Is it difficult to explain ideas like “the Carbon Footprint” or “Greenhouse Gas Emission” to the for example local farmers?

After almost 20 years of Goedgedacht experience – how would you evaluate the effects/ success of the Goedgedacht information policy?

Has the information strategy been adapted during the time (e.g. in relation to the feedback you got)?

Personal comprehension of climate change/ priorities of concepts

Can you name just 3 to 5 terms/concepts which come into your mind when you think about climate change?

How would you name them in Afrikaans?

Can you tell me more about: (the terms mentioned before)

a) _____

b) _____

c) _____

d) _____

e) “the Carbon Footprint”. Why is this concept so important? (It is one of the major slogans of e.g. the “Cool World Climate Path”.)

Why do you think climate change is a relevant topic for this region? What are the specific challenges of a changing climate in this region?

What are the most common problems resulting from that from your point of view?

What are in your opinion the reasons for these challenges?

Which adaptation strategies could you identify? How are the farmers reacting to that?

Cool World Climate Path

Where does the name and idea for the “Cool World Climate Path” originate? (Is “cool” meant in the youth slang “awesome, terrific,” as well as in the bipolar contrastive equivalent to the concept of “global warming”)

Since how long is the Path open for visitors?

What is the idea/goal of this information path (crusade)?

Which promotion strategy do you have? (How did they take notice of the opportunity of the Climate Path?)

Can you give an idea of the frequency of visitors? (How often are how many people visiting the path on an average?) (some general figures)

Who are the people which are interested in the information you are giving? (What are their motivations for the visit?)

Which feedback did you get until now?

What are the plans for the path?

Do you have further things which you find important for me to know?

Am I allowed to use your name to quote you in my thesis?

Thanks for you patience and openness!

This preliminary version applies only to the Goedgedacht employees. The questions will also be translated into Afrikaans.

Appendix F: Riglyn vir onderhoud

Die onderhoud gaan oor hoe jy reken die natuurlike omgewing jou alledaagse lewe beïnvloed. Ek wil ook graag hoor hoe jy die Goedgedacht Trust ervaar het.

Party vrae oor taal is vir my interessant as algemene agtergrondinligting.

Die gesprek sal 'n halfuur tot 'n driekwartier neem.

Is daar enigiets wat jy vir my wil vra?

Agtergrondinligting oor die persoon met wie die onderhoud gevoer is

Datum: _____

Naam: _____

Wat is jou adres or waar woon jy?

Watter soort werk doen jy? (Wat is jou beroef?)

Wat is die belangrikste take waaruit jou werk bestaan?

Kan jy vir my die Goedgedacht organisasie beskryf?

Hoe het jy by Goedgedacht uitgekom?

Wat is jou hoogste vlak van opvoeding?

Huistaal van die persoon met wie die onderhoud gevoer is

Watter taal, sou jy sê, is jou hooftaal?

Watter taal, sou jy sê, is jou ma en pa se hooftaal?

Watter taal, sou jy sê, is jou kinders se hooftaal of -tale?

In watter taal het jy skoolgegaan?

Jou ma?

Jou pa?

Jou kinders?

Sou jy weer dieselfde taal vir jou skoolopvoeding gekies het as jy nou self kon besluit?

As jy nou daarvoor dink, sou jy weer dieselfde taal vir jou kinders se skoolopvoeding gekies het as jy kon oor besluit?

Watter taal of tale praat julle as naby familielede op die oomblik met mekaar?

Wanneer dieselfde familie twee of meer tale gebruik (bv. die kinders praat Afrikaans, en die pa of 'n grootouer praat Xhosa), meng julle dan die tale (bv. die Afrikaans en die Xhosa), of hou julle die tale uitmekaar en praat óf die een óf die ander?

Hoe goed, sou jy sê, is jy in Afrikaans en Xhosa: dieselfde, Afrikaans beter of Xhosa beter?

Hoe goed, sou jy sê, is jou kinders in die drie tale Afrikaans, Xhosa en Engels?

Watter taal van die drie bogenoemde tale word die meeste in Goedgeacht se werk gepraat, volgens jou ervaring?

As daar sekere dinge is wat jy nie verstaan nie, hoe los jy dit op? Vra jy iemand?

Indien wel, vir wie?

Watter taal gebruik jy dan?

Jou ervaring van die Goedgeacht Trust

Watter oeste plant jy op die oomblik op jou plaas?

Hou jy ook vee of ander diere aan?

Het jy in die afgelope jare aan jou boerderypraktyke verander? Indien wel, hoekom?

- a) Wat het jy verander?
- b) Hoekom, sou jy sê, was dit nodig om jou boerderypraktyke te verander?

Hoe het jy jouself oor ander praktyke informeer?

Waar is die beste geleentheid vir boerdery in die Swartlandstreek, volgens jou?

Wat is die algemeenste uitdagings met boerdery in die Swartlandstreek, volgens jou?

Wat is die oorsake van hierdie uitdagings?

Wat is die hoofredes waarom jy by Goedgeacht raad gevra het of die kans gebruik het om by hulle inligting te kry?

Oor watter dinge of kwessies vra jy inligting by Goedgeacht?

Gee hulle vir jou 'n wegspringplek (oplossings) vir die boerderyprobleme wat jy teëkom?

- a) Indien wel, watter oplossings?

Kry jy amptelike ondersteuning van die nasionale regering? Indien wel, watter soort ondersteuning (bv. geld, boerderybeginsels ...)?

Reken jy die Wes-Kaapse Provinsiale Regering se beleid hanteer die dinge wat jou raak?

Persoonlike begrip van verandering in die natuur en klimaat

Het jy veranderings in jou natuurlike omgewing opgemerk wat jou bedryf raak?

- a) Indien wel, watter veranderings?

Watter uitdagings het die verandering in die natuur en weer vir jou persoonlik veroorsaak?

Wat is, in jou opinie, die oorsake vir hierdie uitdagings?

Noem asseblief net drie tot vyf woorde of idees wat by jou opkom wanneer jy aan klimaatsverandering dink.

Vertel my asseblief meer oor elke begrip wat pas genoem is.

a) _____

b) _____

c) _____

d) _____

Is daar enige iets anders wat jy vir my wil vertel oor klimaatverandering?

Hoekom, sou jy sê, is klimaatsverandering 'n onderwerp wat vir hierdie streek saak maak? Presies watter probleme word in hierdie streek deur klimaatsverandering veroorsaak?

Wat kom in jou gedagtes op wanneer jy die uitdrukking 'kweekhuisgas-uitlatings' hoor?

Gesels jy oor sake wat met klimaatsverandering verband hou?

a) Indien wel, waar en met wie?

b) Oor watter onderwerpe sal julle dan gesels, byvoorbeeld?

Die Cool World Climate Path-projek

Het jy al die Cool World Climate Path besoek?

a) Indien wel, hoekom het jy gegaan?

Wat het die grootste indruk op jou gemaak?

Verskaf die Cool World Climate Path nuttige inligting wat jy kan toepas en in jou boerderypraktyke gebruik?

a) Indien wel, watter inligting?

Oor watter ander sake sou jy graag inligting by Cool World Climate wou kry?

49) Is daar ander dinge wat jy graag wil hê ek moet weet?

Dankie vir jou tyd en openhartigheid!

Hierdie voorlopige weergawe geld net vir die persoon wat die werksessie oor regeringsbefondsing bywoon. Die vrae is in Engels opgestel, en is ook in Xhosa vertaal.

Appendix G



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvenoot • your knowledge partner

STELLENBOSCH UNIVERSITY CONSENT TO PARTICIPATE IN RESEARCH¹

CONSTRUCTING CLIMATE CHANGE KNOWLEDGE: A CASE STUDY OF GOEDGEDACHT TRUST IN THE WESTERN CAPE/SOUTH AFRICA

You are asked to participate in a research study conducted by Susann de Ruijter, from the Unit for Environmental Ethics/ Department of Philosophy at Stellenbosch University. The results of this research will be contributed to a PhD (doctoral) dissertation.

You were selected as a possible participant in this study because you are 1) either working for the Goedgedacht Trust, or 2) you are a participant in a Goedgedacht project, residing in the Swartland region and working as a farmer.

1. PURPOSE OF THE STUDY

This project studies the ideas of climate change of the Goedgedacht Trust and how they may differ from the ideas that farmers of the Swartland region may have of climate change. This study should give a better understanding of the individual experiences of the natural environment and the challenges following from it as they are relevant for the livelihood of the farmers of the Swartland region in South Africa. The thesis should furthermore reveal different understandings of environment and its change as it is treated in different languages and will discuss the reasons for these differences.

2. PROCEDURES

The research consists of three main phases and a final feedback workshop.

- 1) The first phase will take place in December 2013. In this stage you are asked for your permission to be audio taped during the Goedgedacht Workshop for Governmental Funding. The records will be analyzed anonymously. Furthermore you are asked for your consent to participate in a personal interview that I will conduct, which will take 30-45 minutes. The interview will also take place on the Goedgedacht Farm and will only be audio taped with your prior consent.
- 2) The second phase is currently planned to take place in April and May 2014. For this stage you are asked for your assistance by completing a questionnaire which will be sent to you by E-mail and/or post mail, including all return documents. If these modes of communication is not available to you, I will deliver the questionnaire to your home, and will collect it again from there.

¹ Translations of this Consent Form, once approved, will be prepared in Afrikaans and Xhosa.

- 3) The third phase of data collection is planned for October/November 2014, and will entail follow-up interviews to close gaps, or verify certain points. In this phase I might ask you again for your participation in a personal interview which will help to answer questions which only came up during the first and second phases of this study.

You are cordially invited to participate in a final workshop which is planned for March 2015 to discuss results of this project. The concrete place and time are not yet scheduled at this point of the research.

3. POTENTIAL RISKS AND DISCOMFORTS

There are no right or wrong answers to the interviews or questionnaires. My interest lies in your personal experiences and ideas.

No results from the audio records, the interviews or the questionnaires will be made known to other participants or to the Goedgedacht Trust.

You are free to stop your participation in this research at any stage.

4. POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

The research is only possible with your assistance! With your participation you will contribute to a better understanding of your individual experiences with the natural environment, and a better understanding of communicating that experience to a broader audience.

5. PAYMENT/COSTS FOR PARTICIPATION

There will be no financial costs for you resulting from your participation in this research project. You will also not receive any payment for your participation.

6. CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of the data material will be kept behind lock and key in my apartment. Electronic data will be stored in files that are password protected. All data will be exclusively kept in my own property. All data will also be analyzed anonymously, and will be reported in my doctoral thesis in generic terms.

7. PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

8. IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact:
Susann de Ruijter (Researcher)
Phone: (++49) 341 927 5492
Fax: (++49) 341 973 7048
Mail: ruijter@uni-leipzig.de

Prof. Dr. Johan Hattingh (Supervisor)
Department of Philosophy
Stellenbosch University
Stellenbosch 7602
South Africa
Phone: (++27) (021) 808 2418
Fax: (++27) (021) 808 3556
Mail: jph2@sun.ac.za

9. RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research participant, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development at the University of Stellenbosch.

SIGNATURE PAGE

CONSTRUCTING CLIMATE CHANGE KNOWLEDGE: A CASE STUDY OF GOEDGEDACHT TRUST IN THE WESTERN CAPE/SOUTH AFRICA

SIGNATURE OF RESEARCH PARTICIPANT OR LEGAL REPRESENTATIVE
--

The information above was described to _____ by _____ in _____ [Afrikaans/*English/*Xhosa/*Other] and I _____ am in command of this language or it was satisfactorily translated to me. I was given the opportunity to ask questions and these questions were answered to my satisfaction.

I hereby consent voluntarily to participate in all three phases of this study.
I have been given a copy of this form.

Name of Participant

Name of Translator (if applicable)

Signature of Participant or Translator

Date

SIGNATURE OF INVESTIGATOR

I declare that I explained the information given in this document to _____ and/or his/her translator _____. He/She was encouraged and given ample time to ask me any questions. This conversation was conducted in _____ [Afrikaans/*English/*Xhosa/*Other] and [no translator was used/this conversation was translated into _____ by _____].

Signature of Investigator

Date

Appendix H



UNIVERSITEIT-SELLENBOSCH-UNIVERSITY
jou kennisvenoot • your knowledge partner

UNIVERSITEIT SELLENBOSCH TOESTEMMING TOT DEELNAME AAN 'N NAVORSINGSTUDIE¹

DIE OPBOU VAN 'N KENNISBASIS OOR KLIMAATSVERANDERING: 'N GEVALLESTUDIE VAN DIE GOEDGEDACHT TRUST IN DIE WES-KAAP, SUID-AFRIKA

Ek wil jou nooi om aan 'n navorsingstudie deel te neem wat gedoen gaan word deur Susann de Ruijter van die Eenheid vir Omgewingsetiek in die Departement Filosofie aan die Universiteit Stellenbosch. Die uitslag van hierdie navorsing sal in 'n PhD-tesis (vir 'n doktorsgraad) gebruik word.

Jy is uitgekies as iemand wat aan hierdie studie kan deelneem, want 1) jy werk vir die Goedgedacht Trust of 2) jy neem aan 'n Goedgedacht-projek deel, jy woon in die Swartlandstreek en jy boer.

1. DOEL VAN DIE STUDIE

Hierdie projek gaan die Goedgedacht Trust se manier van dink oor klimaatsverandering ondersoek, en kyk hoe dit dalk verskil van hoe boere in die Swartlandstreek oor klimaatsverandering dink. Hierdie navorsingstudie behoort ons te help om beter te verstaan hoe die natuurlike omgewing en die probleme wat dit meebring, mense persoonlik beïnvloed, en hoe dit die oorlewing van boere in Suid-Afrika se Swartlandstreek beïnvloed. Die navorsingstudie behoort ook te wys waar mense verskillend oor die omgewing en die veranderinge daarin dink, soos gesien kan word in die manier waarop verskillende tale daaroor praat, en die redes vir hierdie verskille sal in die tesis bespreek word.

2. PROSEDURES

Die navorsingstudie bestaan uit drie hoof fases en sluit af met 'n werksessie vir terugvoering.

- 1) Die eerste fase sal in Desember 2013 gebeur. Wat ek nou van jou wil vra, is jou toestemming dat ek 'n klankopname van jou by die Goedgedacht-werksessie oor regeringsbefondsing mag maak. Ek sal die opname ontleed sonder om die deelnemer se naam daaraan te koppel. Ek gaan jou ook vra of jy sal instem om aan 'n persoonlike onderhoud met my deel te neem; dit behoort 'n halfuur tot 'n driekwartier te duur. Die onderhoud sal ook op die Goedgedacht-plaas gedoen word, en ek sal nie 'n klankopname daarvan maak as jy nie vooraf toestemming gegee het nie.
- 2) Ek beplan op die oomblik om die tweede fase van die navorsingstudie in April en Mei 2014 te doen. Vir daardie fase wil ek jou vra om my te help deur 'n vraelys in te vul wat ek vir jou per e-pos of landpos sal stuur, saam met alles wat nodig is om dit terug te

¹ Hierdie toestemmingsvorm is in Engels opgestel en, nadat dit goedgekeur is, in Afrikaans vertaal.

stuur. As jy op nie een van hierdie maniere kan pos ontvang nie, sal ek die vraelys by jou woonplek kom aflewer en dit weer kom haal.

- 3) Die derde fase waarin inligting ingesamel sal word, word vir Oktober/November 2014 beplan. Dit sal bestaan uit opvolgonderhoude om inligting te kry wat ek kortkom of sekere sake uit te klaar. In daardie fase sal ek jou dalk weer vra om aan 'n persoonlike onderhoud deel te neem om sekere vrae te help beantwoord wat eers in die loop van die eerste en die tweede fase van hierdie navorsingstudie opgeduik het.

Ek nooi jou graag uit om ten slotte deel te neem aan 'n werksessie wat ek vir Maart 2015 beplan en waar ek die uitslag van hierdie projek sal bespreek. Die presiese plek en tyd is nog nie op hierdie tydstip vasgestel nie.

3. MOONTLIKE RISIKO'S EN ONGEMAKLIKHEID

Daar is geen regte of verkeerde antwoorde tydens die onderhoude of vir die vraelys nie. Waarin ek belangstel, is jou persoonlike ervarings en menings.

Ek sal geen uitslae van die klankopnames, die onderhoude of die vraelyste aan ander deelnemers of aan die Goedgedacht Trust bekendmaak nie.

Jy kan op enige tydstip ophou om aan hierdie navorsingsprojek deel te neem.

4. MOONTLIKE VOORDELE VIR STUDIEDEELNEMERS EN/OF DIE SAMELEWING

Sonder jou hulp sou hierdie navorsingsprojek onmoontlik gewees het! Deur deel te neem, help jy ons om beter te verstaan hoe jy persoonlik die natuurlike omgewing ervaar en hoe daardie ervaring aan 'n breër deel van die samelewing oorgedra kan word.

5. BETALING VIR/KOSTE VAN DEELNAME

As jy aan hierdie navorsingsprojek deelneem, sal dit jou geen geld kos nie. Jy sal ook niks betaal word omdat jy deelneem nie.

6. VERTROULIKHEID

Enige inligting wat in verband met hierdie studie bekom word en waaraan jy uitgeken kan word, sal vertroulik bly en slegs met jou toestemming bekendgemaak word of as die wet dit vereis. Vertroulikheid sal bewaar word deurdat ek die materiaal met al die inligting toegesluit in my woonstel sal hou. Elektroniese inligting sal bewaar word in lêers waarvoor 'n mens 'n wagwoord nodig het om dit oop te maak. Ek sal alle inligting net in my eie besit hou. Ek sal ook alle inligting ontleed sonder om die deelnemer se naam daaraan te koppel.

7. DEELNAME EN ONTTREKING

Jy kan kies of jy aan hierdie studie wil deelneem of nie. Selfs al stem jy in om deel te neem, kan jy steeds op enige tydstip onttrek sonder dat daar enige nadelige gevolge sal wees. Jy kan ook weier om enige vrae te beantwoord wat jy nie wil nie, en steeds 'n deelnemer bly. Die navorser kan jou ook vra om aan die studie te onttrek indien omstandighede dit vereis.

8. BESONDERHEDE VAN NAVORSERS

As jy enige vrae oor die navorsing het of as enigiets jou pla, kontak asseblief gerus:

Susann de Ruijter (navorsers)
Telefoon: ++49 341 927 5492
Faks: ++49 341 973 7048
E-pos: ruijter@uni-leipzig.de

Prof Dr Johan Hattingh (studieleier)
Departement Filosofie
Universiteit Stellenbosch
Stellenbosch 7602
Suid-Afrika
Telefoon: ++27 21 808 2418
Faks: ++27 21 808 3556
E-pos: jph2@sun.ac.za

9. REGTE VAN NAVORSINGSDEELNEMERS

Jy kan op enige tydstip jou toestemming terugtrek en ophou deelneem, sonder dat daar enige nadelige gevolge sal wees. Jy doen afstand van geen wettige aansprake, regte of remedies deur aan hierdie navorsingstudie deel te neem nie. Vir enige vrae oor jou regte as studiedeelnemer, skakel met me Maléne Fouché in die Universiteit Stellenbosch se Afdeling Navorsingsontwikkeling (mfouche@sun.ac.za; 021 808 4622).

ONDERTEKENINGSBLAD

DIE OPBOU VAN 'N KENNISBASIS OOR KLIMAATSWERANDEKING: 'N GEVALLESTUDIE VAN DIE GOEDGEDACHT TRUST IN DIE WES-KAAP, SUID-AFKRKA

NAVORSINGSDEELNEMER OF WETLIKE VERTEENWOORDIGER SE HANDTEKENING

Die inligting hier bo is deur _____ aan _____ in _____ [Afrikaans/*Engels/*Xhosa/*ander] verduidelik – 'n taal waarmee ek, _____, gemaklik is, of dit is bevredigend vir my getolk. Ek het kans gekry om vroe te vra, en ek is tevrede dat dit beantwoord is.

Ek stem hiermee vrywillig in om aan hierdie studie deel te neem.

Ek het 'n afskrif van hierdie vorm ontvang.

Deelnemer se naam

Tolk se naam (indien van toepassing)

Deelnemer of tolk se handtekening

Datum

NAVORSER SE HANDTEKENING

Ek verklaar dat ek die inligting wat in hierdie dokument verstrekk word, aan _____ en/of sy/haar tolk, _____, verduidelik het. Die deelnemer is aangemoedig en het genoeg tyd gekry om my enige vroe te stel. Hierdie gesprek is in _____ [Afrikaans/Engels/Xhosa/ander] gevoer en [geen tolk is gebruik nie/die gesprek is deur _____ in _____ getolk].

Handtekening van navorser

Datum

Appendix I: The "Climate Change Knowledge" continuum (Animation)

