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Carl von Ossietzky

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Master of Arts

Master Thesis

Titel:

Diffusion of Sustainability Innovations around Lynedoch EcoVillage

by:

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for:

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Abstract

In form of a qualitative single case study this thesis examines what people from industrialized countries such as Germany can learn about sustainability from Lynedoch EcoVillage, South Africa, and the associated 'Sustainability Institute' (SI), a non-profit trust based at and operating from Lynedoch EcoVillage which has been working in partnership with the School of Public Management and Planning (SOPMP) at the University of Stellenbosch. Besides a reflection on the terminology of 'Sustainability Innovations', the thesis offers an introduction to Everett M. Rogers' concept of the 'Diffusion of Innovations' (2003) which explains social change based on communication patterns. This concept is applied to the spreading of organic farming in the Lynedoch community and to related activities of the Sustainability Institute.

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List of Abbreviations

BDAASA: Biodynamic Agricultural Association South Africa

BEE: Black Economic Empowerment

e.g.: for example [Latin 'exempli gratia']

etc.: et cetera [Latin: and so forth]

EU: European Union

FAO: Food and Agriculture Organization of the United Nations

Fig.: Figure

GHG: Greenhouse Gas

GHG: Greenhouse Gases

IAASTD: International Assessment of Agricultural Knowledge, Science and Technology for Development

ibid.: ibidem [Latin: at the same place]

i.e.: id est [Latin: it is / meaning]

IPCC: International Panel for Climate Change

IPSRM: International Panel for Sustainable Resource Management

LDC: Lynedoch Development Company

MA: Millennium Ecosystem Assessment

NGO: Non-governmental organization

p.: page

pp.: pages

RSA: Republic of South Africa

SI: Sustainability Institute

UK: United Kingdom

UN: United Nations

UNEP: United Nations Environmental Program

WBGU: German Advisory Council on Global Change (German: Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen)

WCED: United Nations World Commission on Environment and Development

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My research raises questions about a western understanding of sustainability and I hope more intercultural research about sustainability is to follow. In the ways I have been inspired by the work of Antje Nahnsen, which showed me how powerful transdisciplinary research can be, I hope my thesis might also become an inspiration to others.

Section 1

1. Introduction

1.1 Ecosystem degradation, climate change and increasing inequalities

The Millennium Ecosystem Assessment (MA) report which was called for by the United Nations Secretary-General Kofi Annan states that "over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history [...] [resulting] in a substantial and largely irreversible loss in the diversity of life on Earth. […] Approximately 60% [...] of the ecosystem services examined during the Millennium Ecosystem Assessment are [considered to be] degraded or used unsustainably, including fresh water, capture fisheries, air and water purification, and the regulation of regional and local climate, natural hazards, and pests." (Millennium Ecosystem Assessment 2005, p.1) Some of the "consequences for human well-being" that the MA (2005, pp. 1-2) describes are potential "disease emergence, abrupt alterations in water quality, the creation of "dead zones" in coastal waters, the collapse of fisheries, and shifts in regional climate" and it sees the "decrease in the capacity of an ecosystem to deliver services […] as a principal factor causing poverty and social conflict." By changing prevailing terminology from "peak oil" to "peak everything", Heinberg (2007, pp. 1-2) describes the abovementioned phenomena even as a "Universal Ecological Dilemma, consisting of the interlinked elements of population pressure, resource depletion, and habitat destruction – on a scale unprecedented in history".

In addition to the estimations of the Millennium Ecosystem Assessment, the Synthesis Report of the Intergovernmental Panel on Climate Change (IPCC) reveals effects of the human interference with the global climate system. The extensive emission of greenhouse gases (GHG) into the atmosphere is considered to have been amplifying the effects of global warming, such as rises in temperature and sea levels. (IPCC 2007, p. 6) According to the IPCC (2007, p.13) "anthropogenic warming" can lead to "accelerating, abrupt, and potentially irreversible changes" such as the extinction of many species and an increased "risk[…] of extreme weather events" including "droughts, heat waves and floods as well as their adverse impacts". (ibid., p. 19)

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Global warming, resource exhaustion and ecosystem degradation raise the issue of international and intra-national inequalities. Regarding carbon emissions, developed countries[1] are seen as the main contributors to anthropogenic warming, whereas developing countries are likely to suffer most from its consequences. According to the World Resource Institute (2001, p.1), the industrialized countries, home to 20 percent of the world's population, have caused about 63 percent of net carbon emissions from fossil fuel burning and land use changes in between 1900 and 1999[2] and developing countries have contributed only a combined 37 percent[3]. The IPCC (2007, p. 19) also considers the regions "in the weakest economic position [...] [as] the most vulnerable to climate change" and the Millennium Ecosystem Assessment (2005, p. 2) assumes that those "facing the greatest challenges in achieving the Millennium Development Goals[4] coincide with those facing significant problems of ecosystem degradation."

Already today, about one out of seven people in the world, meaning 14 percent, is considered malnourished and thus not able to lead a healthy and active life. (World Food Program of the UN 2009 a, Online) Considering only developing countries this rate rises to 16 percent. Within the Southern parts of Africa even 41 percent of the people suffer from malnutrition. (World Food Program of the UN 2009 b, Online) Often, the "poorest, landless and female-headed households" who have little or no control over the food distribution network suffer most from hunger. The harmful effects of climate change will also most likely particularly affect the "poor" (compare IPCC 2007, p. 19 and Millennium Ecosystem Assessment 2005, p.2). These inequalities are considered the breeding ground for migration streams worldwide and for potential international and intra-national destabilization, violence and conflict, not only in developing but also developed countries. (Compare German Advisory Council on Global Change (WBGU) 2008, p. 1, and United Nations Habitat 2007, p. vi)

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[1] The terms developed, industrialized, Western, occidental and Northern countries will be used interchangeably and shall refer mainly to European countries such as Germany, France, the UK etc., to North American countries and also to Australia and New Zealand, even though the accuracy of the terminology is certainly limited. The terminology is not used to create dualistic pictures of 'two different parts of the world' but shall underline differences in culture and individual perceptions on sustainability which are later referred to within this thesis. The country South Africa is here categorized as a developing country even though the situation in South Africa is ambivalent in many ways as described in Section 3.

[2] North America accounted for 25 percent and Europe for 21 percent.

[3] The Middle East and North Africa accounted for 3 percent, Sub Saharan Africa for 4 percent and Developing Asia (including China and India) for 19 percent.

[4] Compare United Nations 2008.

1.2 Sustainability and 'transferable life styles'

During debates on solutions to the abovementioned problems such as environmental degradation, climate change and destabilization, the term 'sustainability' has gained more and more importance in many countries over time and recently, a terminology around 'Sustainability Innovations' or 'Sustainable Innovations' has evolved[5]. The most popular definition of sustainability has emerged out of the 1987 report of the United Nations World Commission on Environment and Development (WCED) 'Our Common Future' or 'Brundtland Report'[6]. It describes development as sustainable if it "implies meeting the needs of the present without compromising the ability of future generations to meet their own needs." (WCED 1987**)** This definition of sustainability is considered to incorporate aspects of both inter- and intra-generational equity. Beder (2000, p. 227) argues that even though there seems to be a world-wide consensus about the importance of these equity principles in the context of sustainable development, policies in the name of sustainability have so far actually been "reinforc[ing] existing inequities and creat[ing] new ones".

Following Paech (2005 a, p. 41) one reason for this could be that people from the "industrialized North" have so far suppressed all memory of a certain dilemma: while the worldwide transfer of the North's growth-oriented welfare model [and the according resource-intensive life styles] to all countries would undoubtedly lead to a collapse of the planet's biosphere, the governments of the North cannot inhibit developing countries from copying this welfare model. Reductionist concepts such as the Triple Bottom Line[7] have shaped 'Northern' perceptions about sustainability. (Compare chapter 3.) Even though some organizations concerned with climate change are calling for life style changes (Compare Wuppertal Institute et al. 2009 p. 4, Töpfer 2009 p. 38) and everyone can calculate his or her individual 'ecological footprint' (Compare Wackernagel et al. 1997 and Global Footprint network 2007) promotions of less resource-intensive and thus 'transferable[8] life styles' and consumption patterns have so far not been very effective.

[5] Compare chapter 3.
[6] The commission was lead by Gro Harlem Brundtland, the then Prime Minister of Norway.
[7] Compare Elkington 1994 and 1997.
[8] Following the "transferability approach" an economic system and patterns of consumption can only be sustainable if they can be continuously transferred without damaging the overall system.

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Not only is the Western concept of development, based on economic growth, consumption, "aid, trade, direct foreign investment via trans-national corporations, and technology transfer" (Fowler 2004, p. 8), still being imposed on developing countries, the resource intensive lifestyles have also been influencing the aspirations of millions. China and India, the two most populous countries in the world, accounting for 40 percent of the world's population[9], (World Resource Institute 2001, p. 2) have, for example, started to adapt to a Western diet based on meat and dairy as **"**eating meat is a mark of affluence"[10]. (Laurance 2008, Online. Compare Osnos et al. 2008, Inman, M. 2008) In China, "a new coal-fired power plant is built every 6 days" and "between 2000 and 2005 the number of cars rose from 4 to 26 million". (Wuppertal Institute et al. 2009, p. 3) Despite these developments, the situation seems to remain unaltered in Northern countries such as Germany. The report 'Sustainable Germany' of the Wuppertal Institute for Climate, Energy and Environment et al. describes the situation in Germany as follows: Even though "everyone agrees that it's time to change course [...] most people expect someone else to take the initiative. People urge politicians to take drastic action and draft new laws, big business declares that it is simply following consumer demand and that the consumer is sovereign, who in turn points out that one individual cannot really make a difference on his or her own. [...] Sustainability is on the agenda – as long as it doesn't get in the way, fits in with our existing lifestyles and doesn't affect existing economic structures." (Wuppertal Institute et al. 2009, pp. 2-3)

1.3 Giving sustainability a different direction: Lynedoch EcoVillage, South Africa

Lynedoch EcoVillage, a small settlement between Cape Town and Stellenbosch in the Western Cape Province of South Africa, incorporates a sustainability understanding based on the recognition and celebration of all forms of life and initiates processes of cross-cultural (self-)reflection. The village has been established in order to create "an inclusive living and learning community that would demonstrate in practice what it means to live in sustainable ways"

(Compare Paech and Pfriem 2004, p. 242) This transfer must be possible across time (intergenerational) and space (intragenerational). (Compare Paech 2005 a, p. 49)

[9] According to the United Nations (2009, p. 1) the world population will exceed 9 billion by 2050 and "most of the additional 2.3 billion people will enlarge the population of developing countries".

[10] In China, for example, meat consumption has risen from 20kg per capita in 1980 to 50kg per capita in 2008. Meat production is very resource intensive. (Compare Laurance 2008, Online)

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(Sustainability Institute 2009 a, Online) and which thus "promotes a sustainable lifestyle which incorporates and celebrates life, love, work, play, free enquiry, learning, creating, multi-cultural expression and spiritual practices." (Sustainability Institute 2003, Online)

In the year 1999, a non-governmental organization (NGO) called Lynedoch Development Company (LDC) bought the corresponding property of six hectares which is surrounded by commercially farmed vineyards and which was, at that time, mainly characterized by wasteland. This three million South African Rand (ca. US$ 500,000) purchase aimed at generating a pilot project in (sustainable) regional development and urban planning practices. In addition to the land the purchase included three residential houses, a dilapidated hotel and a restaurant including a dance hall.[11] In 2001, the NGO renovated the old structures on the property and developed new ones. The former restaurant and dance hall were turned into the main building forming the center of the village. Today, it contains a multi-purpose hall, a pre-school with facilities for about 50 children and a primary school with facilities for about 500 children, mainly from farm worker families from the Lynedoch community in which the ecovillage is situated. (Sustainability Institute 2009 a, Online) Furthermore, the Sustainability Institute, a learning-focused non-profit trust that works in partnership with the School of Public Management and Planning at the University of Stellenbosch is based in this main building. This institute is actively engaged both in many sustainability-related initiatives in the region and also in sustainability debates on a global scale[12]. (Sustainability Institute 2009 b, Online)

On the land surrounding the main building, 45 residential sites have been built and sold to people interested in building a house and living within the village. As the village "seeks to achieve social justice with respect to equitable access across diverse affordability levels and a mutual commitment to fight poverty and its negative long-lasting economic, cultural, psychological and social effects", (Sustainability Institute 2003, Online) 15 of those sites were explicitly reserved for people of low income who were receiving government subsidies. These were sold at very cheap prices, the other 30 sites were sold at market prices. All buyers

[11] During the Apartheid era (compare chapter 5.1.1), this restaurant was a party place for white students from the University of Stellenbosch. (Sustainability Institute 2009 a, Online, Lynedoch Film 2008, Online)
[12] Compare Section 3.

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of residential sites had to sign a contract stating that they would meet specific ecological criteria, for example regarding sanitation, waste, energy and building materials when constructing their house. The village seeks to "nurture nature by enhancing living systems while reducing consumption of resources and foster the learning and growth of every community member, whilst preserving their land holdings through proper stewardship, and ecologically sound use of resources". (Sustainability Institute 2003, Online) In 2004, commercial space, zones of limited traffic and a community garden where people can grow their own vegetables in line with organic methods were established. (Sustainability Institute 2009 a, Online

Both the village development and the Sustainability Institute were initiated by Eve Annecke, who has been working in organizational learning and as a trained educator and is now director of the institute, and by Prof. Mark Swilling, an accredited researcher and part of UNEP's International Panel for Sustainable Resource Management (IPSRM) who now coordinates the Sustainable Development Planning and Management Program of the University of Stellenbosch, which is under the auspices of the institute. (Sustainability Institute 2009 d, Online)

The village is supposed to function as a demonstration place not only for the people living and working within the village and the multiple school children but also for students and visitors coming to the Sustainability Institute. Besides the possibility to meet a variety of distinct people, the ecovillage offers practices such as meditation sessions or morning prayers with content stemming from different cultures and religions. According to the code of conduct, the village aims to provide "a safe space where South Africans from all backgrounds [regardless of age, gender, race, sexual orientation, financial resources, or spiritual and political beliefs] can live in peace with each other and in harmony with nature [...] [and] where people from all over the world can come and share in the life of the community while they learn, think, and create works of art and knowledge that will contribute to the making of a better world" and also "a place where all life is celebrated and beauty in all its forms [is] treasured for this and future generations." (Sustainability Institute 2009 a, Online)

2. Research Design

This research has followed an interdisciplinary, social science approach which strives to understand "people and programs [...] both in their uniqueness and commonality [...] [and] to hear their stories". (Compare Stake 1995, p. 1.) The following chapter is meant to give an overview of the research design and methodology of this thesis so as to make the research as transparent and comprehensible as possible. In 2.1, central research questions and the corresponding methodology are presented; in 2.2 research activities are illustrated in the chronological order in which they were conducted; in 2.3 the participant observations and problem-centered, guided interviews conducted are described in more detail; in 2.4 the evaluation process is explained; and in 2.5 shortcomings of the research design are discussed.

2.1 Research questions and methodology

The formulation of one or more research questions is a "central step" which determines the success of qualitative research. (Flick 2009, p. 132) According to Stake (1995, p. 15) it is "perhaps the most difficult task of the researcher". Thus, during the entire research process, these questions have to be reformulated and re-examined: during "the conception of the research design, the determination of the research field, the choice of cases and the choice of a form of data collection." (Flick 2009, p. 132) Flick (ibid., p. 133) furthermore argues that qualitative research requires a "clear understanding" of the research questions but, at the same time, the researcher should remain "open" to new and surprising findings.

As a single "explorative case study"[13] this research has been carried out based on the assumption that sustainable development requires a shift towards less resource-intensive, 'transferable' life styles in developed countries such as Germany.

In this context, the thesis aims to answer the following main research question:

What can people from Germany learn about sustainability from Lynedoch EcoVillage, South Africa, and the associated 'Sustainability Institute' and how can 'transferable' life styles and consumption patterns be actively promoted?

[13] Compare Yin (1989, p. 17).

In the course of the research process it was possible to narrow the main research question down to several specific research questions[14] based on several stages of reflection between and within the different research stages:

The research aims at revealing

- some of the sustainability concepts and paradigms of thought that have influenced the understanding of sustainability in Germany and other industrialized countries,
- what terminology regarding sustainability has evolved out of innovation terminology and which problems are related to 'Sustainability Innovations',
- what Lynedoch EcoVillage is and what is being done there,
- what the understanding of sustainability is at the Sustainability Institute,
- which innovations or patterns of behaviour are being promoted by the Sustainability Institute and
- how the diffusion of those patterns is being accelerated by the Sustainability Institute.

The methodology of this thesis consists of a combination of literature review, online research, participant observations and problem-centered, guided interviews. The first two questions could be answered by means of literature review and online research. The other questions required a confirmation of online research results through empirical research conducted within Lynedoch EcoVillage. (Compare 2.3) The last specific research question has been answered by applying Rogers' concept of 'The Diffusion of Innovations' (Rogers 2003) to the diffusion of organic farming which has occurred among some farmers operating near the ecovillage. Several organic and conventional farmers as well as other people related to organic agriculture in the Lynedoch region were chosen and interviewed[15]. Organic farming has been selected as an example as Rogers'

[14] According to Flick (2009, p. 134) such more specific research questions are helpful as they further "structure the field of examination".
[15] See list of interviews in the appendix. The exact names and contact details of the interviewees remain with the author even though permission for publication of the interview inputs was given by all interviewees.

concept is applicable to its context and related diffusion processes can be studied relatively easily. (Compare Padel 2001, p. 56.) Furthermore, it can exemplify the Sustainability Institute's understanding of sustainability and the patterns of behaviour that are being actively promoted by it. In contrast to many technological innovations[16] that the German government has been promoting in the context of sustainable development[17,] organic farming is considered to carry the potential to accelerate a shift towards 'transferable life styles'.

Whereas the specific research questions are answered in Sections 2 and 3, the conclusions drawn in Section 4 give answers to the main research question, i.e. what people from Germany (or other industrial countries) can learn about sustainability from Lynedoch EcoVillage and the associated Sustainability Institute and how a change of life styles and consumption patterns could be actively promoted.

2.2 Research activities in chronological order

The research for this thesis has been carried out in four separate research phases which covered five main topics. In the following, the research phases are indicated as 1. – 4., the covered topics as (1) – (5).

1. The period from December 2008 until January 2009 can be seen as a first research phase. It was carried out in Oldenburg, Germany, at the Carl-von-Ossietzky University. During this period, research about (1) the history of Lynedoch EcoVillage and the academic and developmental activities of the Sustainability Institute was carried out, using academic journals, the Sustainability Institute's website and other internet sources. This phase led to the decision to conduct research about a sustainability-related topic at Lynedoch EcoVillage.

2. At the end of January 2009, the author received approval from Prof. Swilling and Eve Annecke to be hosted at the EcoVillage. This marked the beginning of a second research period in Germany which lasted until the end of April 2009. It consisted of a review of secondary literature regarding four additional topics: (2) Innovation Theory, (3) Rogers' concept and its applicability to case studies, (4)

[16] Different terminologies and perceptions in this context will be explained in detail in Section 2 and 3.
[17] Compare German Federal Government (2002, p. 106).

perceptions about organic agriculture and organic farming, and (5) some historical and cultural aspects explaining Post-Apartheid South Africa.

3. Within the period from May 3rd until July 15th of 2009 the author lived at Lynedoch EcoVillage, South Africa, and was able to collect the empirical data for this thesis.

4. The final research phase took place from mid July 2009 until October 2009 and was, again, based in Oldenburg, Germany. The analysis of the interviews and the main share of writing took place during this phase. Figure 1 summarizes the research schedule.

Figure 1 Research schedule. Own illustration

2.3 Participant observations and problem-centered, guided interviews

Flick (2009, pp. 134-135) states that the results from "singular interviews" become more reliable when the interviews are combined with participant observations. This strategy has been pursued for this thesis. During the stay in South Africa, the author lived with a family in the ecovillage and worked 20 hours a week as an intern at the Sustainability Institute. For a few hours, she also worked on an organic farm near the village as part of the internship. Based on Flick's (2009, p. 288) descriptions, the observations had a procedural character and were carried out with "increasing concretization and concentration on main aspects of the research questions". Based on the findings of the participant observations[18] and preliminary talks, which were recorded as well, two different interview guidelines for problem-centered, guided interviews were developed in the course of the process. The questions developed were focussed on Rogers' concept of 'Diffusion of Innovations':

[18] Compare Jorgensen (1989, pp. 13-14).

a) Interviews of two organic and three conventional farmers as well as two other people related to organic agriculture in the region aimed at analyzing and reconstructing the communication networks in the diffusion of organic farming around Lynedoch.

b) Interviews of two staff members of the Sustainability Institute were carried out in order to test the findings of the other interviews (among others the findings about the role of the Sustainability Institute in the diffusion network) and to further clarify the Sustainability Institute's understanding of sustainability, about which some assumptions had already been made during literature review and the participant observations.

Based on Witzel's ideas on interviews the guidelines allowed for the occurrence of a "plot line developed by the interviewee him or herself", allowed for the interviewer to pose "problem-centered" questions (Witzel 1985, p. 237) and to give the interview a new direction if desired. (Flick 2009, p. 210) The interview guidelines contained both open and closed questions. Despite the guidelines, the interviews remained flexible. Depending on the course of the interview, sometimes questions were left out (if they had already been answered by the interviewee before) or spontaneous questions were added in order to clarify an answer. Each interview was started by the introduction of the interviewer, a description of the research purpose and some ice-breaker questions to make the interviewee feel comfortable. All interviewees have been asked for permission of taping the interview with a microphone, saving it as audio files and using the interview material for this thesis. This had also been the case for the preliminary talks. The appendix of this thesis contains a detailed list of the preliminary talks and interviews conducted.

2.4 Evaluation of interviews

The evaluation of the interviews was carried out in the form of a qualitative content analysis. A central aspect of such an analysis is the "use of categories which have often been derived from theoretical models." (Flick 2009, p. 409) The analysis contains five steps: theoretical considerations, preparation for "extraction" (the establishment of variables derived from the theory), extraction and interpretation of material, "processing" (combining similar information) and evaluation (analysis of "cases" and their relations to each other). (Compare Gläser

and Laudel 2009, p. 203.) The interview results were transcribed and analyzed according to these previously determined variables and category groups based on Rogers' concept of 'Diffusion of Innovations':

1. Organic farming and characteristics of the innovation

2. The adoption process of organic farming over time: innovativeness and socioeconomic variables

3. Communication channels and reconstruction of communication networks

4. The social system of the Lynedoch farming community (within which Lynedoch EcoVillage is situated) and opinion leadership

Furthermore, some additional variables were included within the interviews which were not derived directly from Rogers' Theory but aimed at testing the findings of previous research:

History of Lynedoch EcoVillage and the Sustainability Institute

Role of the Sustainability Institute in the diffusion process

The appendix contains two lists as examples of interview questions and evaluation variables that were used. One is an example of a farmer's interview, the other of an interview of a staff member of the Sustainability Institute. Even though the evaluation variables are listed according to the different questions, within the evaluation process, all answers were analyzed regarding all variables. This was done because the interviews contained some open questions and thus a specific answer sometimes contained information regarding several different variables.

2.5 Critical remarks and limitations

Rogers (2003, p. 106) refers to the "pro-innovation bias" as a common bias within diffusion research. It describes "the implication that an innovation should be diffused and adopted by all members of a social system, that it should be diffused more rapidly, and that the innovation should be neither re-invented nor rejected." (ibid.) As reasons for the pro-innovation bias, Rogers (2003, p. 110) mentions the dependence of researchers on institutions which have a certain interest in the spreading of an innovation and that "much diffusion research is funded by [such] change agencies". In the case of this thesis, the author was

working as an intern at the Sustainability Institute and the rent that she paid to her host at the village had been slightly subsidized by the organization. The author was, however, at no time dependent on the Sustainability Institute. She chose the topic herself, no wage was paid and her research trip was completely financed by a neutral party, the German Academic Exchange Service.

Rogers (2003, pp. 12-13) describes that "most of the new ideas whose diffusion has been analyzed are technological innovations" and that in the context of the pro-innovation bias, "diffusion researchers [...] [often] ignore the study [...] of anti-diffusion programs designed to prevent the spread of 'bad' innovations". (ibid., p. 107) This thesis follows Rogers' ideas and purposely does not examine the diffusion of a technological innovation but a local diffusion process of organic farming as an "information based innovation" and a "systems change". (Padel (2001, p. 51) Organic farming leads to a rejection, a limited use or an abolishment of different technological innovations such as chemical sprays, herbicides, and pesticides and could thus be considered an 'exnovation'[19], not an innovation. The Sustainability Institute is a non-profit trust that promotes organic agriculture and thus a counter player to commercial agents who try to accelerate the diffusion of specific pesticides or sprays. In the context of organic farming it could be considered an 'anti-diffusion change agency'. Due to the research design, the author was to some extent involved in the activities of the Sustainability Institute and also most of the interviews were conducted in an office at the institute. The author's relationship to the staff members was collegial and the author got to know some villagers very well and experienced life at the EcoVillage. On the one hand, this allowed the author to gain a deep insight into teaching programs of the institute, the institute's understanding of sustainability, conditions in the region of study and other structures relevant to the research questions. On the other hand, however, this thesis might also contain a bias, as the author had chosen the research design based on previously existing values, perceptions of the world and assumptions regarding organic farming, some of which have been affirmed during the author's stay at the EcoVillage and her contact to the Sustainability Institute. Those assumptions had evolved during the previous stage of literature review and consisted of the idea that chemical pesticides and herbicides in agriculture might

[19] Paech's (2005 a, p. 254) distinction between different "modes of change" such as innovation and exnovation is described in chapter 3.

be ‘bad innovations’ and should be avoided due to (potential) negative side effects[20]. It could be argued that these assumptions have led to an ‘exnovation-bias’ or, following Rogers (2003, p. 112), an “anti-innovation bias”. Despite the limitations that this bias might cause, Rogers actually calls for “a number of diffusion researchers with an ‘anti-innovation bias’” […] to correct past tendencies” caused by the pro-innovation bias. (ibid.)

Another aspect which might limit the quality of the research design is the choice of interviewees. Prior to the research trip one of the farmers in the region had been contacted via email. This farmer was an organic farmer living in the ecovillage. His connections to other farmers led to some of the interviews conducted later. This strategy was chosen in order to facilitate the contact of the European researcher to the South African farmers and to overcome the problems of “availability and approachability of potential interviewees”[21], also regarding cultural differences. To prevent a bias caused by the choice of interviewees, however, the author was able to choose additional interview partners independently from the contacts of the organic farmer after she had spent some time in South Africa.

Section 2

3. ‘Sustainability Innovations’ and a necessary debate

In Germany and other industrialized countries, the idea that innovations can contribute to sustainable development or even be the key to it has become popular not only within the corporate sector and in ‘innovation management’[22] but also within the academic world and politics[23]. The following chapter presents a reflection on the terminology of ‘Sustainability Innovations’.

3.1 Introduction to innovation terminology

The word ‘innovation’ is a rather vague, nonspecific term which is used in various contexts. The positive connotation of the term seems to be deeply embedded in Western societies. Especially in the business language but also in politics and the academic world, the term is of especially frequent use today. Within the context

[20] Compare chapter 5.1.4.
[21] Compare Gläser and Laudel (2009, p. 117).
[22] Compare Hauschildt and Salomo (2009).
[23] Compare Paech (2005 a, p. 7) and Brandt and Jochum (2009, p. 151)

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of the decline of the American car industry, for example, a lack of innovations was regarded as one of the key problems. (Schifferes 2007, Online)

The positive connotation of the word in Western countries such as Germany and its importance in business theories and innovation management is to some extent rooted in history. During the first half of the 20th century Joseph A. Schumpeter developed an influential socio-economic theory which shaped many peoples' understanding of entrepreneurship and innovations. To him, creative forces of entrepreneurial action were preconditions for the functioning of capitalism and the generation of economic growth. (Compare Arthur D. Little 1997 p. 29) Schumpeter coined the term „creative destruction" to describe how innovations can displace prevailing ideas, products, etc. and bring about social and economic change when put into practice. (Compare Schumpeter 1942.) In his opinion, innovations consisted of "implementation of new combinations" which appeared "discontinuous" compared to existing combinations. (Schumpeter 1931, pp. 100) Thus, partly due to Schumpeter's theory there is common belief in Western societies that innovations can be managed, planned and "implemented" to bring about positive social change.

To date multiple different definitions of the term innovation have evolved, which vary extensively in scope. Barnett (1953, p.7) offers a very general definition by describing an innovation as "any thought, behaviour or thing that is new because it is qualitatively different from existing forms" while Rogers (2003, p. 36) emphasizes individual aspects of perception and defines an innovation as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption"[24]. There are some very broad definitions of innovations based on the vagueness of the term. Kallen (1973, p. 447), for example, states that the term "innovation includes in its range the transformation in food, shelter, defense against enemies and disease, tools and technologies of production and consumption, forms of play and sport, rituals and liturgies of religion, precedents of law, inventions in science and thought, styles and attitudes in literature and the arts."

However, a more reductionist scheme of technological "product and process innovations"[25] is still shaping many peoples' understanding. Furthermore, a trend of differentiation of the innovation terminology and more and more compound

[24] See chapter 4.
[25] Compare Hauschildt and Salomo (2009, p. 9)

terms seems to have occurred over time. Consultants, for example, today call for "open innovations" (Chesbrough et al. 2006 p.1) and Hauschild and Salomo (2007, pp. 10-13), describe "system innovations" which either create "new system components while maintaining given system combinations" or "new system combinations while maintaining given system components". This trend of compound terminologies is still apparent.

3.2 'Sustainability Innovations'

Multiple attempts by politicians and managers have aimed at assigning sustainability-related beneficial characteristics to innovations. The German Federal Government in 2002 (p. 106), for example, praised (technological) innovations such as "the computer" as something without which the "lives [of the German population] would be unthinkable", as "the basis of rising prosperity, and at the same time the precondition for *efficient*, and hence environmentally sound, production and consumption." It also described "expenditure on research and development of new, innovative technologies [as] a key factor ensuring the quality of life for future generations." (ibid.)

Recently, a new compound terminology around 'Sustainability Innovations' or 'Sustainable Innovations'[26] has evolved. The fusion of two terms of strong positive connotation seems to have created a powerful and increasingly popular language which seems to receive a lot of attention[27]. Both the terms sustainability and innovation are indistinct and can thus be narrowed down into diverse, often extremely reductionist concepts. Elkington's 1994 concept of the triple bottom line (TBL), for example, includes "three pillars" of sustainability – economic, environmental and social sustainability" and expresses the idea that approaches towards sustainability need to address economic, environmental and social aspects simultaneously or simply to "integrate" them. (Compare Elkington 1994 and 1997) Despite the fact that the concept has been extensively criticized due to its reductionism[28] and its ability to be abused to pursue certain interests[29], it "found

[26] The term 'Sustainable Innovation' is being used even though (or possibly because) it is misleading. If one understands the term 'sustainable' simply as 'persistent', the expression 'Sustainable Innovation' becomes an oxymoron. An innovation in the sense of Schumpeter can never be something persistent as it triggers (positive and negative) change and will one day, be 'creatively destroyed' by future innovations.

[27] That is the reason why the term 'Sustainability Innovation' which is actually criticized within this thesis, has still been used as part of the title of this thesis.

[28] The environment with its life sustaining ecosystems cannot be considered separately from the two other "spheres". (Compare Maier-Rigaud 2000, p. 32.)

particular acceptance [not only] in the corporate sector [...] but also within governments and community groups" (Fowler 2004, p. 12) and has clearly influenced the terminology of 'Sustainable Innovation' or 'Sustainability Innovation'.

Charter (2007, Online) from the Centre for Sustainable Design, for example, defines "Sustainable Innovation" as "a process where sustainability considerations (environmental, social and financial) are *integrated* into company systems from idea generation through to research and development (R&D) and commercialisation. This applies to products, services and technologies, as well as new business and organisation models." Even in the context of the Vancouver Olympic Winter Games of 2010 the terminology was used. A Sustainability Innovation was considered "a product, service, process and/or technology which demonstrates a sustainability feature (a notable social, economic and environmental benefit), [which is] directly [linked] to the 2010 Winter Games, produces a measurable outcome, and is: new to the Games region, new to the Olympic or Paralympic Games, significantly scaled up through the 2010 Winter Games and brings, or has brought together unique partners to introduce the innovation"[30]. (Vancouver Olympic Winter Games 2008, Online)

Such reductionist definitions contain a notion of "structural conservatism" (Paech 2005 a, p. 7) as they leave unchallenged the structures behind the Western welfare model, resource-intensive life styles and the focus on economic growth[31].

Many debates on sustainability in Germany are based on the idea that economic growth could be 'decoupled' from resource consumption (compare Hennicke and Severin 2009, p. 3), as well as on three related sustainability principles "on which policies and measures for decoupling should be based" (ibid.): (eco-)efficiency, consistency[32] (or eco-effectiveness) and sufficiency. Eco-efficiency describes ways to increase resource productivity and thus producing the same amount of

[29] Compare Döring and Ott 2001, p. 317.
[30] Later, however, the term "Sustainability Innovation" has been replaced by "innovation in sustainability".
[31] Paech (2009 a, p. 26-27) shows that instead of understanding growth as a problem in the context of sustainability "it is also justified with the need to alleviate poverty and the injustice of unequal distribution [...] [even though, at the same time] the economic foundations of growth are being eroded."

[32] Compare Huber 1994.

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products or more with less material and energy inputs. Eco-effectiveness (or consistency) aims at "avoid[ing] anthropogenic destabilization [...] by contriving technological ways and means of maintaining an "industrial metabolism" that is effectively compatible with nature's metabolism at an optimum level of efficiency, even at large volumes of materials turn-over" (Huber, 2004, p. 5), meaning the creation of an industrial system that "fits in with nature" (compare ibid.) and the integration of "all material flow[s] and manufactured products into biological or technical processes to avoid any waste and polluting emission." (Compare Paech 2005 b, p. 52)

Paech (2005 a, pp. 49-50) observes critically that eco-efficiency and eco-effectiveness (consistency), even when combined with strategies of avoidance and risk reduction, form a reductionist, technical way and thus could not, alone, lead to sustainable development. He argues that those strategies only try to "optimize" the qualitative aspects of economic activities (e.g. by making production processes more efficient) without considering quantitative aspects such as the amounts and levels of consumption and production. According to Paech (ibid.) eco-efficiency and consistency "fail to neutralize the environmental impact of further expansions of production [...] [and] prevent society as a whole from making a cultural change towards sufficiency", a concept which brings into account more sustainable life styles and "modest consumption patterns". (Compare Paech 2005 a, pp. 89-92)

3.3 Innovation as a risky mode of change

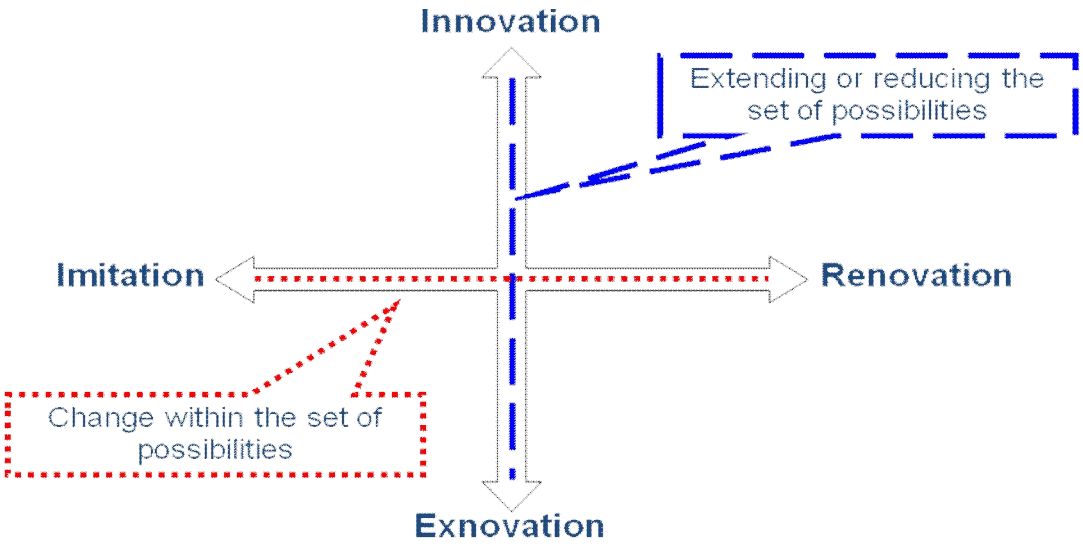
Paech (2009, p. 26) describes the "innovation orientation of modern market economies" as a factor which leads to pressure for economic growth and which can impede a sustainable development.

Figure 2 Growth versus Sustainability. Online (with permission): http://www.krankyscartoons.com/images/Growth_Versus_Sustainability.jpg [29.10.2009]

3.3.1 Modes of change

Paech (2007, p. 121) challenges the (ab)use of the word innovation as a positive but indistinct term and distinguishes between four "modes of change", further specifying the term "innovation". To him, an innovation refers to "a non-constant, non-linear mode of change, and a break with all things available and known, at least in terms of the context of the innovation at hand. Commensurate with the core question "How do new things come into being?", the problem solving potential of innovations is based upon *expanding* the pool of available solutions – regardless of whether they are new products, technical operations, organizational structures, institutions, etc. [...] Innovations require entering the realm of the unknown." (ibid.) Paech (2005 a, pp. 252-253) thus puts emphasis on the newness of innovations and understands them as the "addition of new options". In contrast to this he sees "exnovations" as the "removal of options". He "states that a sustainability-oriented innovation management should not only identify the new but also identify what should be replaced [by it] and thus what should be avoided or reduced". (ibid.) A different mode of change would be an "imitation" which means a reuse of "solutions which are not resulting from a discontinuous renewal (an innovation) but that are already known and proved and possibly already checked in the context of sustainability". "Renovation" means to enhance existing options so that they create new ways of usage or so that the useful life can be extended." (ibid., p. 254) Figure 3 illustrates the different modes of change.

Figure 3 Modes of change. Following Paech 2005 a, p. 254

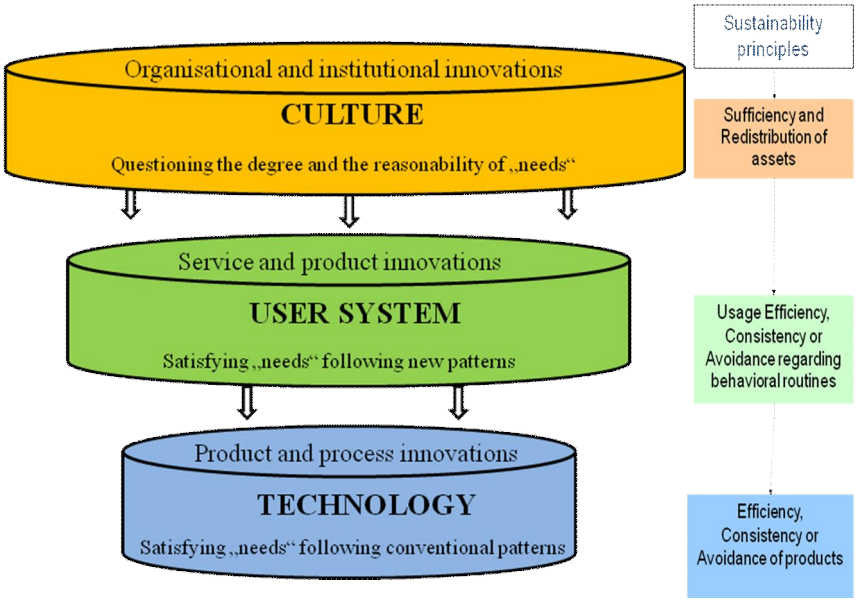


The aspect of newness and uncertainty brings about risk factors to each innovation. According to Paech and Pfriem (2004, p. 243) "most of the sustainability problems are nothing else but unintended side effects of former decisions" and innovation strategies. In the context of sustainability one can understand innovations such as the steam engine or the automobile[33] as causes for current problems. According to Peach (2009 b, Online and 2009 a, p. 25) there is an "Antidotal Syndrome" of innovations which means that "successive waves of modernisation become necessary in order to deal with the unforeseen environmental repercussions of respective foregoing [...] [innovations]."

To illustrate different levels that innovations can affect, Peach (2005, pp. 106-111) distinguishes between the three dimensions of Culture, User System (as a subset of Culture) and Technology (as a subset of User System). He argues that "those three dimensions each correspond with a certain innovation type" and sustainability principle (ibid., p. 109) as illustrated in Figure 4.

[33] Compare the theories of 'long waves' (Kondratieff et al. 1935, Schumpeter 1912/2006) and the one of 'bubbles and golden ages' (Perez 2002).

Figure 4 Decision dimensions and innovation types. Following Paech 2005 a, p. 110



At the basis level, needs or necessities[34] are culturally shaped. There are thousands of different ways that these needs can be satisfied. Needs are "translated" into possible physical or technical solutions via a meta-level called the user system. The user system thus predetermines the range of products and technologies that can be used to fulfil the needs[35]. For example, the need for mobility could be translated into technical solutions by the following user systems: motorized individual transport (e.g. cars), public transport (e.g. trains, buses and trams), air traffic (e.g. airplanes), etc. In the model, product and process innovations can be found on the lowest level as they show the lowest degree of "societal interaction". (ibid., p. 109) This means that they are least likely to create impulses for behavioural or cultural changes.

3.3.2 Negative rebound effects

Paech (2009, p. 25) argues that actually "no ecological uncoupling of economic growth measured in money is in sight. In an expanding economy, "boomerang effects" wipe out advances in dematerialisation or ecologisation as a result of

[34] According to Paech (2005, p.108) the belief that there are basic human needs that are incontestable is based on an idea of man as a weak "deficiency being". (Compare Gehlen 1997)

[35] This is a model and does not mean that all these solutions are situated on a "physical sphere" or even on a priced market as many needs can be fulfilled without influencing the physical sphere by inducing material flows etc. (Compare Paech 2005, p. 107) For example one can satisfy the need of leisure by just thinking about something nice.

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growing demand." Also Hennicke and Severin (2009, p.3) agree that the idea of decoupling can be misleading as there are enormous "counteracting social and economic reactions [...] [which] can "eat up" even massive increases in [...] resource productivities."

Even if innovations induce a sustainability benefit on one of the three abovementioned level, they can often have negative side effects on the same or on the other levels. (Compare Paech 2007, pp. 122-123) These so-called "rebound effects" can be differentiated into primary, secondary and tertiary rebound effects. Primary effects are based on the consumption of material, energy and other ecological aspects which are induced by production, use and disposal of the new physical infrastructure of the innovation. Secondary effects describe structural changes of market exchange or product processes; and tertiary effects describe effects due to social changes, especially changes in life styles and consumption patterns. (Compare ibid., p. 113) Furthermore these rebound effects can also be categorized as technical rebound effects, growth effects and psychological rebound effects. (ibid., pp. 111-113) Technological rebound effects could, for example, occur when a car is being made lighter by the replacement of heavy metal parts by light-weight plastic parts. This would make the car run more eco-efficiently but at the same time it would make it less eco-effective (consistent) as the production and disposal of the plastic parts would induce other ecological problems. (Compare Paech 2005 a, p. 111-112)

Paech (2009, p. 25) finds it "really dramatic when (well-meaning) sustainability innovations actually trigger additional energy and material flows" due to growth effects or psychological rebound effects. When the market introduction of a "fuel-efficient" car, for example, does not lead to a (partially) crowding-out of conventional cars but only to additional cars on the market or if an area-wide extension of wind turbines and photovoltaic panels for renewable energy production does not lead to a reduction in supply of non-renewable energies, growth effects with additional material and energy flows are generated and the overall effect regarding sustainable development can actually become negative. If the introduction of a so-called 'fuel-efficient car' leads to an increase of acceptance of cars as the predominant (or even as a 'sustainable') vehicle, the overall amount of cars might actually increase (psychological rebound effect). (Compare Paech 2005 a, pp. 112-113)

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These negative rebound effects and latent risks explain why purely technological innovations should not be considered 'Sustainability Innovations', and often do not contribute to sustainable development.

3.3.3 Positive rebound effects and 'transferable life styles'

Even though Paech describes such negative rebound effects, positive rebound effects can also occur. Those are (often latent) effects that a certain mode of change has on the cultural level which contribute to what Paech (2005 a, p. 31) calls "a 'substitution of needs' [...] and a change of predominant [over-]consumption patterns". As much as a technological innovation can imply (psychological) side effects that unintentionally lead to more resource-intensive life styles (such as the 'fuel-efficient' car), so too can positive psychological side effects of modes of change, for example exnovations, occur and lead to a shift in life style(s) towards 'transferable' lifestyles. The engagement in organic agriculture or even just the consumption of organic produce, for example, can lead to an intensified exposure to natural surroundings or increased awareness of environmental concerns and can, as a consequence, potentially lead to an even greater change towards 'transferable life styles'[36].

3.3.4 Innovation and cultural change

Paech's approaches aim at fostering change towards sustainability via a cultural level which has so far often been neglected in sustainability debates. Central to his theories is a process of self-reflection and the initial acknowledgement of the importance of culture. Paech reveals the cultural construction of 'needs' (and resulting consumption patterns and life styles). In Western sustainability debates these connections have so far been neglected. Hardly any attention has been drawn to the (possibly systematic) historical and cultural conditioning which forms the starting point of each and every individual action which, in turn, determines the pathway towards sustainable development.

Mechanisms on the cultural level are characterized by complex (communication) processes that should be considered when trying to approach sustainable development. When changes in consumption patterns and life styles are required, then there is a need to reveal deeply embedded, cultural and psychological patterns that can promote or hinder these changes. Rogers' concept which is

[36] Compare Section 3 and 4.

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introduced in chapter 4 is helpful for revealing some of these mechanisms. The concept of the 'critical mass' which will be described in chapter 4.2.6. is also of special importance.

Often an argument against changes of the Status Quo and the individual life style "is that humans are inherently competitive, greedy and blindly self-serving, implying that no matter how [...] good things are in society, there will always be 'corrupt' people who want to abuse others and seek dominance." "This argument by which many people justify their behaviour, however, is itself just a culturally shaped, historically evolved assumption." (Fresco and Meadows 2009, p. 69-70) Fresco and Meadows (2009, p. 73-74) state that "it is easy to see how this kind of assumption *manifested*, for if you look at the historical record of the human species thus far, we see an endless series of wars, genocides, conquests and power abuses. Given that this is the pattern we *recognize* [...] is it easy to assume that it must be "human nature" or "instinct" to behave in ways that are historically recurring. [However,] there is no scientific evidence that really supports the notion that any of our behaviors are strictly the result of our genes. Those behaviors that people often attribute to 'instinct' or 'human nature' can almost always be tracked to environmental influences. The notion of 'human nature' is largely mythological. It stems from primitive religious notions that the human being is either 'good or evil' inherently. The pursuit of people who seek to find the "gene" or the like which causes a particular behavior is essentially a form of superstition."

In the context of sustainability and culture, it is worthwhile to, once again, draw attention to the reductionism of sustainability concepts. The predominant understanding of the term 'sustainability' is not fixed but has evolved over time. In this context, Brand and Jochum point out that the different concepts and definitions have been socially constructed (2001, pp. 8-9) and that underlying "mindsets" actually determine the argumentation lines and the policies that are being carried out in the name of "sustainability". (ibid., pp. 7-8) These "mindsets" have been influenced by the European (or occidental) culture which has evolved out of the Renaissance (and thus the works of Socrates, Plato and Aristotle). According to DeBono (1997, pp. 23-26) this culture is characterized by "rationality [-driven] [...] categorical thinking and fixed rules" and "functions [...] [only] insufficiently in a world which is changing" due to an "inability of

'constructive thinking'".[37] It is thus not surprising that the predominant and most popular sustainability concepts seem to be the most categorical.

3.4 Vicious circles and innovations

Paech's explanations about the levels of culture, user system and technology, rebound effects and the Antidotal Syndrome described in chapter 3.3.2 show some parallels to Birkeland's theory of "Positive Development- From vicious to virtuous circles" (Birkeland 2008). Birkeland (2008, pp. 18-19) finds that "most high-tech innovation is still not directed towards sustainability [...] [but] generally increase[s] the disparity of wealth and power" due to "systemic biases": "intellectual paradigms[38] and institutional frameworks, as well as power relationships, [which] are biased in favour of innovations that benefit large corporations and/or bureaucracies". She sees the "investment in 'clean coal' instead of solar energy" as one example of those innovations which "only address symptoms" and actually happen "at the expense of reinforcing the capacity of nature to support us." (ibid.)

In line with the understanding of user systems, Birkeland argues that "land-use and transportation systems" are "given [...] [in their] existing physical configuration" and that the new solutions then considered (by government research) "will be limited to those products or building types that fit the industrial, rather than the ecological, order." (ibid., p. 239)

In this context she mentions "unsustainable vicious circles" (ibid., p. 239) related to innovations which "impede transformation to sustainable systems." When, for example, the design of a large building prescribes complex air-conditioning systems which "require a range of specialists in design, manufacturing, sales, distribution, installation, commissioning and maintenance", "vested interests in existing industrial systems" are created and with increasing complexity, more specialists are required which leads to "a need for regulatory, education and training programmes [...] which further entrenches current construction norms" and creates more resistance to change within the industry. (ibid. p. 239)

[37] According to DeBono (1997, p. 23) Aristotle's "logic of 'subsets'" has significantly influenced Western thinking. "Based on experiences from the past we build categories [...] which are like boxes with which we can analyse and disaggregate each new situation and experience. We judge which parts belong into which box: Something either has to belong to a category or has to be excluded from it – both at the same time does not work because that would be a contradiction."
[38] (such as a "development paradigm")

Parallel to Birkeland's argumentation, Paech (2005 a, p.7) describes economic and ecological "sunk costs" in the context of irreversibility. (ibid., p. 217-219) He calls for reversibility of the innovation and its structural effects on society and for an avoidance of risky technologies which would otherwise "turn whole generations into test objects". (ibid., p. 294) It becomes clear that the aspect of (ir)reversibility and the related "depth of impact" (Paech 2005 a, p. 40) of (often technological) innovations play a central role in the context of sustainability. Birkeland (2008, p. 21) also states that (eco-)innovations need to "change the *social* context in positive directions" and "expand future options through *reversible*, *adaptable*, net Positive Development".[39] (ibid., p. xv) She refers to a necessary shift "from [those] vicious circles to virtuous cycles" and a "redefinition of 'environmental impacts' as 'system design problems' [with which] we, as a society, become accountable for the consequences of our behaviour." (ibid., p. 247) The concept of virtuous cycles can be seen as a parallel to positive rebound effects and critical mass phenomena which will be described in chapter 4.2.6.

3.5 'Sustainability Innovations' redefined

The preceding chapter reflected critically upon the properties that are often assigned to innovations in the context of sustainable development. Based upon both Paech's and Birkeland's approaches, "Sustainability Innovations" should, in the following, be understood as

"systemic, organisational, institutional activities or services"[40] and all reversible, adaptable innovations which, in combination with imitations, renovations and exnovations, lead to net positive changes of the social and ecological context due to positive rebound effects or virtuous cycles, promote life styles that can be transferred across time and space and which contribute to (cross-cultural) self-reflection, "societal learning and behavioural change"[41].

Clearly, this provoking definition can neither serve as a standard working definition nor a fixed concept. The purpose of it is rather to acknowledge the

[39] "Positive Development refers to physical development that achieves net positive impacts during its life cycle over pre-development conditions by increasing economic, social *and* ecological capital. Positive Development would not only generate clean energy, air and water, it would leave the ecology better than before development." (Birkeland 2008, p. xv)
[40] Compare Paech 2005 a, p. 301.
[41] Compare Paech 2005 a, p. 300.

importance of other modes of chance for sustainability and to draw attention to the shortcomings of prevailing sustainability concepts and innovation terminology.

Rogers' concept of diffusion of innovations which is introduced in brief in the next chapter can not only be applied to innovations but also other modes of change. It offers a multitude of further insights into behavioural changes and is thus of high importance in the context of a sustainable development. It explains when and why some people adopt a certain "idea, practice, or object" (Rogers 2003, p. 36), when they change their behaviour and when they do not. In Section 3 of this paper, the diffusion of organic agriculture among the Lynedoch community in South Africa, which incorporates mainly exnovations, imitations and renovations and is characterized by relatively reversible processes, is analysed following Roger's concept. In Section 4, conclusions are drawn from the analysis.

4. Introduction to Rogers' concept of the 'Diffusion of Innovations'

"I have always found it very difficult to see my individual capacities to be separate from the kind of collective that I am part of."Professor Mark Swilling (Interview I6)

4.1 History of diffusion research

Diffusion research has originated from several studies on rural sociology which were conducted in the American agricultural sector between 1940 and 1960 (Summers 1983 pp. 15-16) and which aimed at building a model about the "adoption behaviour of individuals" concerning agricultural innovations. (Padel 2001, p. 40) Today, diffusion research is applied as an interdisciplinary approach. Multiple different disciplines have been involved depending on the types of innovations that have been analyzed[42]. The diffusion studies of technological agricultural innovations can be seen as a starting point of today's most popular diffusion models. A 1943 study by Ryan and Gross, which analysed the spreading of a hybrid corn variety among farmers in two communities in Iowa, has been

[42] Rogers (2003, pp. 44-45) mentions examples such as the use of the steel ax or horses in anthropology, postage stamps in early sociology, the kindergarten model in education, AIDS-prevention and family-planning methods in public health and medical sociology, news events and IT technologies in communication, new commercial products such as coffee brands or cell phones in marketing, several technical innovations in geography and many more.

especially influential. (Ryan and Gross, 1943 p. 15) During the years after this study the diffusion into agricultural communities of numerous other agricultural innovations were examined, for example weed sprays and fertilizers. (Rogers 2003, p. 44) Those early diffusion studies all showed a common research paradigm focusing on agricultural productivity and were conducted in the context of the Green Revolution. (Padel 2001, p. 40). Many scholars had been sponsored by American "colleges of agriculture at land-grant universities" (Rogers 2003, p. 54) which sought ways to commercialize the technological innovations by reducing their social resistance amongst others through information campaigns. Ryan and Gross (1943, p. 15) pointed to the importance of "commercial [communication] channels, especially salesman," as an "original sources of knowledge" and to "neighbours" as important "influences leading to acceptance". The study has formed the base of later diffusion models by describing the time pattern of the diffusion of hybrid corn as a "bell shaped curve".

4.2 Rogers' diffusion concept and its potential for sustainability research

Based on Ryan and Gross' and many other studies, Everett M. Rogers has over years built up an extensive concept containing many more aspects that can describe diffusion patterns. Rogers himself (2003, p. xviii) claims that "the diffusion of innovations explains social change, one of the most fundamental of human processes." As described in chapter 3.1 Rogers' understanding of 'innovations' is perception-based and he neglects the distinction between different modes of change. Rogers (2003, p. xvi) describes diffusion as a "general process, not bound by the type of innovation studied, who the adopters were, or by place or culture." His concept is thus applicable within a wide range of cases. Not only do innovations underlie processes of individual adoption or rejection, but other modes of change as well[43], such as "complex system change[s]" (Padel 2001, p. 56), perceptions and life styles. Rogers' concept offers the potential to reveal and reduce barriers to the diffusion of behavioural changes that can foster sustainable development. He reveals connections between behaviour and both individual characteristics and characteristics of the aggregate, i.e. the social system. His

[43] Rogers (2003, p. 30), for example, describes an exnovation, "not smoking in public places" as a diffusing innovation.

findings can be used by actors who want to foster certain behavioural changes[44], for example towards 'transferable life styles'. Interpersonal communication and related (critical mass) dynamics described by Rogers could play a crucial role for sustainability and could lead to a movement from 'vicious circles to virtuous cycles'[45].

According to Rogers (2003, p. 5) diffusion is „the process by which an innovation is communicated through certain channels over time among the members of a social system". It thus describes an adoption process that follows the "recognition of a need or problem, […] research, development, and commercialization of an innovation" and which precedes the [final] consequences" (ibid., p. 166) that an innovation has within a society.

The above mentioned definition reveals four categories on which Rogers' diffusion concept is based: (1) the innovation and its characteristics, (2) communication channels, (3) the time path of the diffusion and different adopter categories and (4) the characteristics of the social system in which the diffusion takes place. The following chapter will describe these categories. In Section 3 they are applied to the diffusion of organic farming around Lynedoch EcoVillage, South Africa.

4.2.1 The innovation-decision process

As mentioned before, Rogers (2003, p. 12) defines an innovation in terms of perception of the "individual or other unit of adoption." He justifies this by stating that "the perceived newness of the idea for the individual determines his or her reaction to it." (ibid.) Since innovations appear as something new to the individual, they contain aspects of uncertainty. Rogers describes an "innovation-decision process" as "an information-seeking and information-processing activity" to reduce this uncertainty. (ibid., p. 14) This process consists of five stages: (1) the knowledge stage, "when the individual is exposed to the innovation's existence and gains an understanding of how it functions; (2) persuasion, when the individual forms a favourable or unfavourable attitude toward the innovation; (3) decision, when the individual engages in activities that lead to a choice to adopt or reject the innovation; (4) implementation, when the

[44] Rogers' concept is already used extensively in marketing of commercial goods. (Compare Les Robinson 2009)
[45] Compare chapter 3.4 about vicious circles and innovations.

individual puts an innovation into use; and (5) confirmation, when the individual seeks reinforcement for an innovation-decision already made but may reverse the decision if exposed to conflicting messages about it." (ibid., pp. 216-217) The length of the innovation-decision period, that is the time required to pass through these stages differs from individual to individual. Some people "move rapidly from knowledge to implementation", while others take longer. (ibid, pp. 21-22)

4.2.2 The innovation and its characteristics

Rogers furthermore distinguishes between five characteristics of innovation that determine the "rate of adoption[46]" and which influence processes of individual risk-reduction. (ibid., p. 15)

The **relative advantage** is the "degree to which an innovation is perceived as better than the idea it supersedes" (Rogers 2003, p. 15), or the "ratio of the expected benefits and the costs of adoption" (ibid., p. 233), whether in economic terms or due to social prestige factors, convenience, or satisfaction. Again, the advantage is dependent on the perception of the potential adopters. The greater the perceived advantage is the more rapid the individual will adopt the innovation. Les Robinson (2009, p.1) considers personal control, time saving and social connection as especially influential relative advantages.

Compatibility is "the degree to which an innovation is perceived as being consistent with the values, past experiences, and needs of potential adopters." (Rogers 2003, p. 15) The more compatible an idea is with existing values and norms, the more rapidly it will be adopted and diffused.

Complexity is the "degree to which an innovation is perceived as difficult to understand and use." (Rogers 2003, p. 16) Some ideas are already known in detail to the members of a social system, some are perceived as extremely complex. The more difficult it is to understand an idea, the slower it will be adopted. Les Robinson (2009, p. 2) turns this relation around and calls this category "simplicity and ease of use" in order to show positive relations between all five categories of characteristics and the rate of adoption of the innovation ("the more ... the faster the adoption process"). In the analysis of the diffusion of organic agriculture

[46] The rate of adoption is the "relative speed with which an innovation is adopted by members of a social system, [...] measured as the numbers of individuals who adopt a new idea in a specified period, such as a year". (Rogers 2003, p. 221)

around Lynedoch EcoVillage in chapter 5 this category will also be described as "simplicity and ease of use".

Trialability is the "degree to which an innovation can be experimented with on a limited basis." (Rogers 2003, p. 16) If an individual can try out aspects of an idea or practice before he or she has to decide upon final or complete adoption, the uncertainty can be reduced. Thus "divisible" innovations, which can be partly tried out, will be adopted more quickly. (ibid.)

Observability is the "degree to which the results of an innovation are visible to others." (Rogers 2003, p. 16) If individuals can observe results this can also lower their uncertainty and lead to a faster adoption. Rogers refers to the importance of "peer discussion" among friends and neighbours in this context.
The study of Ryan and Gross (1943) supports the importance of observability and trialability in agriculture. It concludes that the diffusion of the new corn variety is accelerated by farmers' observations of neighbour properties and by individual trials on small farm divisions.
Rogers (2003, p. 221) estimates that the first five qualities can explain between 49 and 87 percent of the variation in the rate of adoption of innovations. Another attribute is the **ability of reinvention** of an innovation, meaning "the degree to which an innovation is changed or modified in the process of its adoption and implementation." (Rogers 2003, p. 217) The more "flexible in nature" an innovation is the easier it is to implement it in a "wide variety of ways" and the "more rapidly it diffuses". Rogers (ibid, p. 17)
Rogers' concept can be extended by adding a category of '**reversibility'** following Paech (2005 a, p. 217). If the initial investments or the adoption of an innovation leads to potentially high "sunk cost" this could be a barrier to adoption. At the same time, former adopted irreversible innovations can sometimes prevent other innovations from being adopted.

4.2.3 The communication channels

Rogers (2003, p. 18) defines communication as "the process by which participants create and share information with one another in order to reach a mutual understanding." He understands diffusion as a type of communication "in which the message content that is exchanged is concerned with a new idea." (ibid.)

Rogers describes different “means by which messages get from one individual to another” (ibid.) which he calls communication channels:

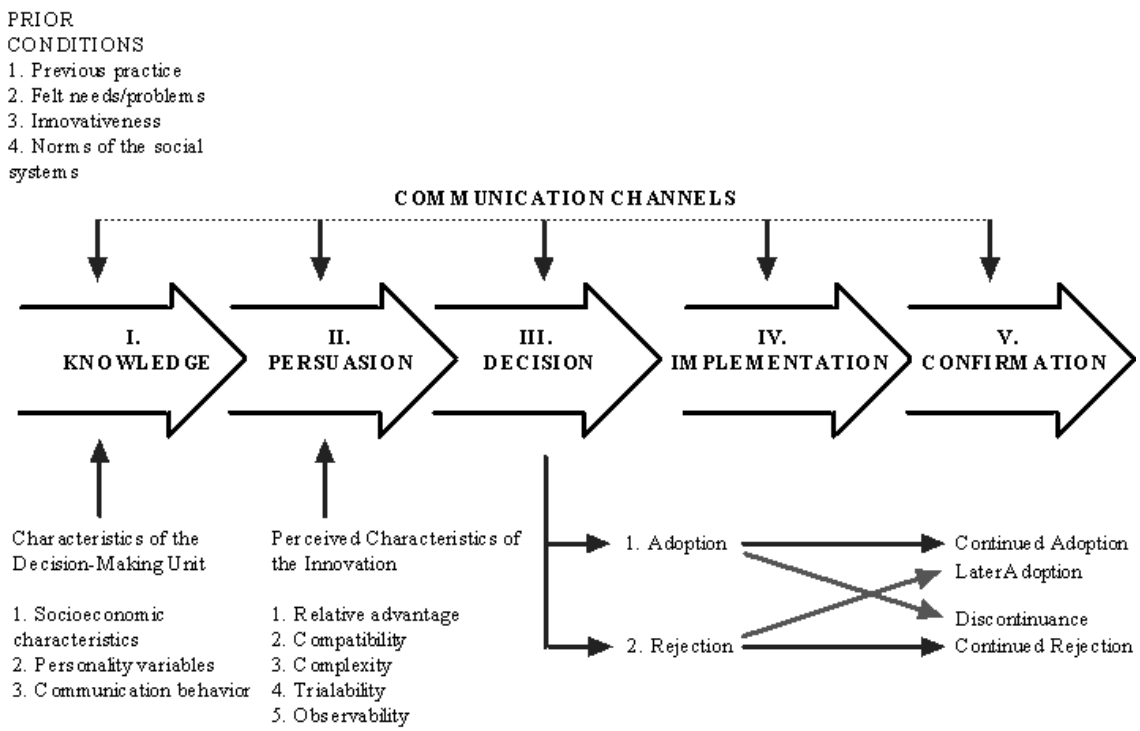
“Mass media channels are all those means of transmitting messages that involve a mass medium, such as radio, television, newspapers, and so on, which enable one or a few individuals to reach an audience of many.” (Rogers 2003, p. 18) Those channels are considered to be especially important at the knowledge stage of the innovation-decision process as well as for earlier adopters rather than for later adopters[47]. (ibid., pp.. 217-218)

In contrast to that, interpersonal channels involve a face to face communication between two or more individuals. (Compare ibid., p. 18) Those channels are considered to be more important at the persuasion stage of the innovation-decision process as well as for later adopters. (ibid., pp. 217-218)

As another category of communication channels, interactive communication via the Internet has gained more popularity in recent decades. (Compare ibid., p. 18) Furthermore, Rogers distinguishes between communication channels based on their source of origin. Communication channels originating from local sources are those channels linking an individual with sources from within the social system under study. (Compare Rogers 2003, p. 207) Local channels are considered to be of special importance at the persuasion stage of the innovation-decision process and for later adopters. (ibid., pp. 217-218) On the other hand, “cosmopolite communication channels are those linking an individual with sources outside the social system under study. Interpersonal channels may be either local or cosmopolite, while mass media channels are almost entirely cosmopolite.” (Rogers 2003, p. 207) Those cosmopolite channels are considered to be of special importance at the knowledge stage of the innovation-decision process and for earlier adopters. (ibid., pp. 217-218) Figure 5 gives an overview of the influence of communication channels on the innovation-decision process.

[47] Compare chapter 4.2.5 about adopter categories.

Figure 5 Innovation-decision process and communication channels. Following Rogers 2003, p. 170. Online: http://www.ucalgary.ca/~dmjacobs/phd/diss/Image74.gif [29.10.2009]



4.2.4 Heterophily and homophily

Rogers (2003, p. 300) emphasizes the importance of "inter-personal network influences on individuals convincing them to adopt innovations". Communication networks consist of "the interconnected individuals who are linked by patterned flows of information". (Rogers 2003, p. 27) In this context, Rogers describes a principle of human communication that is of special importance to the diffusion of innovations: "The transfer of ideas occurs most frequently between two individuals who are similar, homophilous." (ibid. p. 19). "Homophily appears when two individuals belong to the same group, live or work near each other, and share similar interests." When people live close to each other or share the same social status "homophilous communication [is] more likely to occur than heterophilous communication." (ibid.) It can also appear when people share similar beliefs or education. (ibid., p. 305) Homophilous communication is usually more effective and thus rewarding to the individual (ibid., p. 19) whereas heterophilous communication can lead to the exposure to "messages that are inconsistent with existing beliefs" and to "cognitive dissonance, [...] an uncomfortable psychological state." Thus, "homophily and effective communication breed each other [...] [,] the more communication there is between

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individuals in a dyad, the more likely they are to become homophilous." (ibid., p. 306) This means that people search for advice from other people who are similar to them and whom they trust to decrease the uncertainty about the innovation and to decide upon adoption or rejection.

4.2.5 The time path of diffusion and adopter categories

"It's possible they are [...] really not laggards at all, but innovators of ideas that are so new they challenge your paradigms!"(Les Robinson 2009, p. 8)

Time plays an important role in Rogers' model, not only within the innovation-decision process but also for the overall rate of adoption. According to Rogers (2003, p. 272) the adoption of an innovation over time usually follows a bell-shaped curve. Another concept related to time is the 'innovativeness' of individuals. This is "the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than the other members of a system." (Rogers 2003, p. 22) Based on empirical research Rogers distinguishes between different adopter categories referring to innovativeness.

When an innovation diffuses through a social system, at first there is only a small minority of people who adopt the innovation. Rogers (2003, p. 22) calls these people innovators. In the following this category is also called pioneer adopters or "pioneers"[48]. Rogers estimates that about 2,5 % of all members of a social system can be classified as the innovators (or pioneers). (ibid., p. 281) Based on the empirical research Rogers assigns certain characteristics to the different adopter categories. He describes the ideal innovators/pioneers as "venturesome" and risk-loving (ibid., pp. 282-283), as "active information seekers about new ideas" who have "a high degree of mass media exposure" and whose "interpersonal networks extend over a wide area, reaching outside their local system" (ibid., p. 22) "into more cosmopolite social relationships." They are considered to be able to deal better with uncertainty about an innovation than other adopters, often due to the "control of substantial financial resources" and "the ability to understand and apply complex technological knowledge". (ibid., p. 282) Rogers' reveals some similarities between his ideal innovator/pioneer and Georg Simmel's ideal "stranger", an "individual who is a member of a social system but who is not

[48] Rogers' term 'innovator' might be misleading as it could also be used for people who have invented the innovation or exclusively the very first adopter as a single individual.

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strongly attached to the social system." (Rogers 2003, p. 42, Simmel 1908/1964) Rogers understands the innovator/pioneer as a 'gatekeeper', as he or she allows the flow of new ideas into the social system but at the same time might not be respected by other members of the system. (ibid., p. 283)

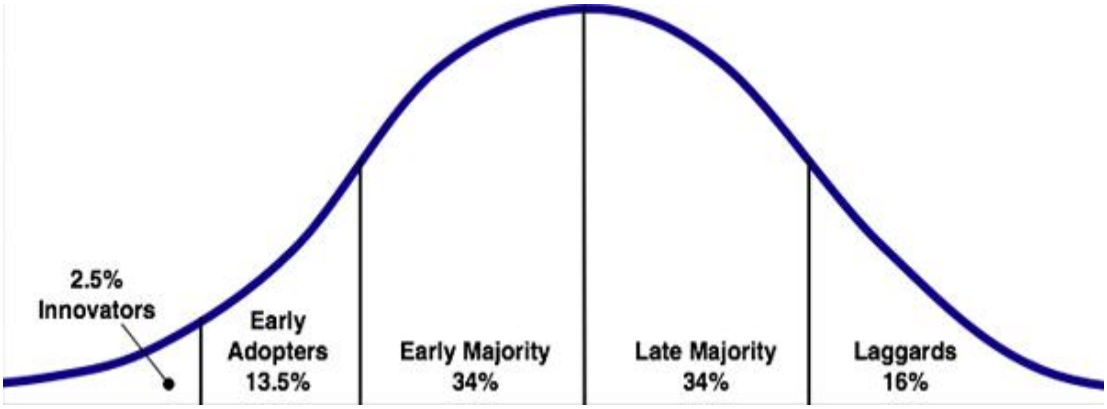
After the innovators/pioneers people of different characteristics will adopt the innovation. These early adopters are considered to be "localites", more integrated in the social system (Rogers 2003, p. 283) and account for an estimated 13,5% of all adopters. (ibid., p. 281) They gain esteem from their peers for the "successful, discrete use of new ideas" and hold "a central position in the communication networks." Thus, they are often used as "local missionaries" to speed up the diffusion. (ibid., p. 283)

The early majority adopt an innovation just before the average member of a system and together with the late majority make up about 68% of all adopters. These people interact frequently with their peers and represent a link between the early adopters and the late majority. (ibid., p. 283) "They follow with deliberate willingness [...] but they seldom lead." (ibid., p. 284)

Individuals within the late majority make up about 34% (ibid., p. 283), are sceptical towards the innovation and adopt mainly due to economic necessities or peer pressure. They only adopt when "most others in their system have already done so." Rogers considers them to have "relatively scarce resources" at their disposal and he states that they only adopt if the uncertainty of the innovation has already been removed due to the adoption by many others. (ibid., p. 284)

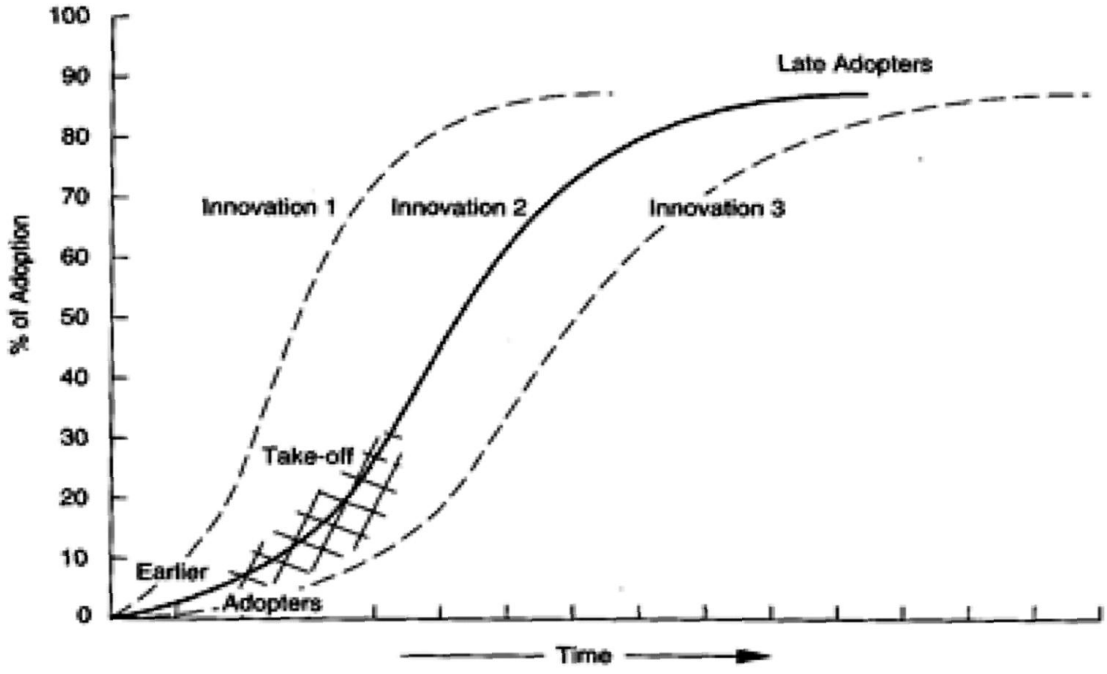
Laggards account for the last 16% of adopters in a system. (ibid., p. 283) They are suspicious towards innovations and change, tend to have traditional values and are oriented towards past decisions. Rogers understands that "their resources are limited" and they thus wait until an innovation has proved to be successful in the social system. (ibid., pp. 284-285) He further points out that the term "laggard" seems to be negatively connoted because the other adopters may have a strong "pro-innovation bias". (ibid., p. 285)

Figure 6 Adopter Categorization on the Basis of Innovativeness. Following Rogers 2003, p. 281. Online: http://earlyadopters.dk/wp-content/uploads/innovatiormodel.png [29.10.2009]



Based on the concept of innovativeness and the findings of empirical studies Figure 6 demonstrates again the bell-shaped curve including the categorization of adopters. Closely linked to this is the concept of the S-shaped curve of adoption. This represents the cumulative number of adopters over time. (Rogers, 2003, p. 272) Figure 7 shows typical S-curves.

Figure 7 The Diffusion Process. Rogers 2003, p. 11



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The innovations 1, 2 and 3 contain different characteristics and diffuse at a different speed. The single S-curve shows that, at first, when only a few people have adopted the innovation, further diffusion takes place rather slowly but after some time a "take-off" (Rogers 2003, p. 274), or acceleration of diffusion occurs. Rogers understands the "part of the diffusion curve from about 10 percent adoption to 20 percent adoption" as the "heart of the diffusion process", after which the diffusion of new ideas can often not be stopped anymore. (ibid.) Rogers assumes a normal distribution here as the diffusion of innovations reflects "human traits" which are often normally distributed. (Rogers 2003, p. 272) He admits, however, that this is just a "hypothetical example" based on assumptions such as that "the members of a social system have completely free access to interact with all other members." (ibid., p. 274)

4.2.6 The critical mass

"I stand in line if everybody is standing politely in line, but if people begin to surge toward the ticket window I am alert to be – though never among the first – not among the last." (Schelling 1987, p. 93)

Rogers relates the diffusion of innovations to aspects of social learning theory such as the idea that "one individual learns from another by means of observational modeling. That is, one observes another person's behaviour and then does something similar. [...] Modeling allows the learner to adopt the observed behaviour (much like the re-invention of an innovation." (Rogers 2003, pp. 342-343) The social embeddedness of individual decisions is also the basis for the concept of critical mass. In his book "Micromotives and Macrobehaviour" Schelling (1978, p. 94) gives the example of the "dying seminar", a seminar which is first attended by many people, then only by a couple of people and then, finally, given up by the remaining participants even though the interest was there among all former participants. (ibid., p. 91) In the case of the dying seminar it is an observed "absentee rate" which leads consecutively to more and more people staying at home, as they regard the seminar as not "worthwhile" when not "enough others" are attending. (ibid., p. 92) Schelling describes several such social critical-mass phenomena in which "people's behaviour depends on how many are behaving a particular way, or how much they are behaving that way". He gives further examples of "critical-mass models [which all] involve [...] some activity that is self-sustaining once the measure of that activity passes a certain

minimum level." (Schelling 1978, p. 95) Rogers (2003, p. 343) understands that the critical mass "occurs at the point at which enough individuals in a system have adopted an innovation so that the innovation's further rate of adoption becomes self-sustaining"[49].

4.2.7 The social system

Rogers' model allows for an analysis of human behaviour which takes into account both individual and societal aspects. The concept of the critical mass is one reference point in that context. Rogers furthermore gives some insights into the structure of social systems. He understands a social system as "a set of interrelated units [i.e. individuals, informal groups, organizations and/or subsystems] that are engaged in joint problem solving to accomplish a common goal." This system forms the "boundary within which an innovation diffuses". The system analysed in a diffusion study could, for example, "consist of all the peasant families in a Peruvian village, medical doctors in a hospital, or all the consumers in the United States." (Rogers 2003, pp. 23-24) Rogers also states that there is certain structure within all social systems, i.e. "patterned arrangements of the units in the system" (ibid.) which decrease uncertainty about human behaviour. The communication structure[50] and the networks[51] within the system are examples of such a structure. (ibid.) Another aspect is the system norms, "established behaviour patterns for the members of a social system". (Rogers 2003, p. 26) Rogers emphasizes that these structures determine the diffusion process, "over and above the effect of [...] individual characteristics" (ibid.) such as the different adopter categories (presented in chapter 4.2.5).

4.2.7.1 Communication networks and opinion leaders

Communication networks within the particular social system are of central importance. With reference to the adopter categories Rogers describes different roles that individuals can play in such networks. In contrast to the innovators or pioneers who are often "perceived as [...] deviant from the social system and [...] [embody] a status of low credibility by the average member of the system" (ibid., p. 26), there are also individuals who show closer "conformity to the system's

[49] Rogers (2003, p. 343) sees the critical mass as a "distinctive quality", especially of the rate of adoption of interactive media such as e-mail, telephones, fax, and teleconferencing.

[50] A communication structure describes "the differentiated elements that can be recognized in the patterned communication flows in a system." Rogers (2003, p. 24)

[51] Those will be described in chapter 4.2.7.1.

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norms" and who, due to their "social accessibility" and their interpersonal (peer) networks, can "serve as role model[s] for the innovation behaviour of their followers." These individuals are called "opinion leaders". (ibid., p. 27) According to the empirical research, the category of early adopters usually has the highest degree of opinion leadership[52], which has been very influential in the diffusion of innovations. (Rogers 2003, p. 283) Opinion leaders are considered to have relatively more exposure to mass media, are more "cosmopolite", and, in case the "social system's norms favor change", they are especially innovative. (ibid., p. 362 and p. 319) Depending on the innovation studied they also often show "higher socioeconomic status, more education, and [in the case of technological innovations] greater technical expertise." (ibid., p. 362)

4.2.7.2 Change agency and opinion leaders

In many cases, opinion leaders have been identified and used in diffusion campaigns by change agents, "individual[s] who influence [...] clients' innovation-decisions in a direction deemed desirable by a change agency." (ibid., p. 27 and p. 388) According to Rogers, change agencies are institutions that aim to "promote innovations" (ibid., p. 110) and want to accelerate the diffusion of a certain innovation. In the case of the hybrid corn, the "Iowa Agricultural Extension Service", a unit of a US government agency employing "country extension agents, who work as change agents with farmers" (ibid., p. 165) "heavily promoted" the diffusion of the seeds. (ibid., p. 32) However, change agencies might also be institutions which oppose a certain innovation, which want to accelerate exnovations or certain behavioural changes. In both cases, opinion leaders are of special importance to the change agencies, as opposed to change agents who often represent technical or commercial experts. They are not considered "outsiders" but are of high credibility to the members of the social system. Rogers believes that opinion leadership strategies can have "robust effects"[53] and that "the modeling and imitation by potential adopters of their near peer's experience" actually form "the heart of the diffusion process". (ibid., p. 330)

[52] Opinion leadership is the degree to which an individual is able to informally influence other individuals' attitudes or overt behaviour in a desired way with relative frequency. Rogers (2003, p. 27)

[53] He offers the examples of ten studies of effects of opinion leadership strategies in the medical sector. (Compare Rogers 2003, pp. 323-324.)

Section 3

5. The diffusion of organic farming around Lynedoch EcoVillage, South Africa

As described in Section 1, the evaluation of the interviews was conducted following variables based on Rogers' concept. In the following chapter the diffusion of organic farming around Lynedoch EcoVillage is presented based on the interview evaluation in combination with results from the literature research and the participant observations. Before these evaluations, a Section 5.1 will introduce the case study by providing some background information.

5.1 Background information

As an introduction to the case study, the following chapter provides some background information, especially to the Non-South African reader. A brief introduction to Post-Apartheid South Africa, societal challenges and agriculture in the country precedes an introduction to organic agriculture and its potential benefits with respect to sustainability and finally a brief excerpt about organic agriculture in South Africa.

5.1.1 Introduction to Post-Apartheid South Africa and societal challenges

The South African population is characterized by extreme diversity and fragmentation. Eleven official languages are spoken within the country and South Africa is characterized by people with a high variety of different cultural backgrounds, influenced for example, by the culture of the Zulu, the Xhosa (Mashele 2009, Online) or the descendents of European settlers. (Compare Ross 2008, p. 88) Tragically, however, the Apartheid system and the influence of an "Afrikaner ethnic nationalism" (Shepherd and Robins 2008, p. 7) shaped for more than 80 years the social norms in a common direction, one of oppression and exploitation. During the period of time before 1994 people were classified into groups of African/Black, Coloured, Indian/Asian or White depending on their heritage and ethnicity. (Compare Statistics South Africa 2002 b, Online) So called 'Black and Coloured' people were deprived of many fundamental rights and had no chance of getting decently paying jobs and reaching upper income levels. Due to "the colonial expansion in South Africa" starting with "the arrival of Dutch settlers at the Cape in 1652" (Kepe et al. 2008, p. 146), "indigenous people lost

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ownership of their land to white settlers" (ibid., p. 145) and thus, the majority of the land has been owned by a rich, mainly white elite. During the Apartheid system with its "policies of segregation" (ibid.) 'Black and Coloured' people were not even allowed to buy land except for properties situated within some small specified areas called "homelands". (Shepherd and Robins 2008, p. 7)

Even though the end of Apartheid officially ended in 1994, the country is still struggling with an extremely unequal distribution of income, land and other resources to this day. Kepe et al. (2008, p. 154) describe "increasing […] inequality", "the persistence of rural poverty" and "unemployment in the formal economy".

5.1.2 Agriculture in South Africa

Agriculture in South Africa in general has to be considered within the context of those challenges. Of the total land area in South Africa, only 12 percent is considered cultivable due to "climate-soil combinations". (FAO 2005, p. 2) The majority of the population does not have access to land resources and is thus dependent on production and diffusion systems externally controlled by large-scale agri-businesses mainly in the hands of a rich elite. Approximately 14 million South Africans, or one third of the total population, are vulnerable to food shortages even though enough food is produced and South Africa is a net food exporter. (ibid., p. 3) Statistics South Africa (2002a, p. 1) admits the importance of land ownership regarding agriculture and states that "the apartheid-based political geography of the country […] is important […] because there […] [are] mostly large-scale commercial farming operations in the part of South Africa designated for white ownership. These were substantially different from the largely small-scale and subsistence farming operations in the former homelands." A land reform in 1994 that aimed at redistributing some areas to "the previously dispossessed" (Crane 2006, p. 1035) focused on neo-liberal and free market approaches and the protection of private property rights. (Kepe et al. 2008, p. 154) This approach is considered to have failed by effectively assuring rights to white owners and supporting mainly "large-scale, commercial farming" (ibid.) leaving new approaches of land reform central to the future of South African agriculture.

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5.1.3 Introduction to organic agriculture

The Food and Agriculture Organization of the United Nation defines Organic Agriculture as an agricultural production system that approaches sustainability "consider[ing] potential environmental and social impacts by eliminating the use of synthetic inputs, such as synthetic fertilizers and pesticides, veterinary drugs, genetically modified seeds and breeds, preservatives, additives and irradiation." Within organic production systems "these inputs […] are replaced with site-specific management practices that maintain and increase long-term soil fertility and prevent pest and diseases." (FAO 2009 a, Online) There are, however, many more different definitions of what organic agriculture could be and multiple opinions about what can achieve by it. Within German-speaking countries, the term "Ökologischer Landbau" (ecological agriculture) deals as an umbrella term for many different approaches to organic agriculture. Vogt (2001, p. 47) distinguishes between different concepts that have evolved historically and that partly differ in ideology and methods, for example the "Natürlicher Landbau" (natural agriculture) based on "Lebensreform" and "Landreform" ideas, the "Biologischer Landbau" (biological agriculture), the "Organisch-biologischer Landbau Methode Müller-Rusch" (organic-biological agriculture method Müller-Rusch) and the „Biologisch-dynamische Wirtschaftsweise" (bio-dynamic approach to agriculture)[54]. Bio-dynamic agriculture is based on anthroposophic ideas following Dr. Rudolf Steiner's lectures which were held in 1924 in Silesia (then Germany now Poland). In line with Steiner's philosophy of holism and a connection between the physical, material and living spheres (bio) with psychic, transcendental or cosmic spheres (the dynamic) these lectures described the farm with its humans, animals and plants as one living organism that is connected to the cosmos.

Whereas the approaches of organic farming vary in their understanding of nature, soil fertility and use of humus, food quality and work and life, they all aim at producing healthy, high quality food and contain some lifestyle visions which promote changes towards harmonious social relations. (Compare ibid., p. 49)

Organic farming has often been presented as an alternative to conventional large-scale agriculture, i.e. the methods of the so called "Green Revolution" which rely extensively on irrigation and external inputs such as artificial fertilizers, pesticides

[54] Bio-dynamic agriculture as one form of organic agriculture plays a role in the case study.

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and weed sprays[55], which focus on productivity and efficiency and mainly rely on monoculture. (Compare Summers 1983, Pears 1980 and Griffin 1974) In contrast to that, all organic methods are considered to function more in line with the principles of natural systems and cycles and aim at an abandonment (or at least a limited use) of chemicals. Further important aspects of organic farming can include a deep understanding and enhancement of soil fertility and biological processes, crop rotation, produce cycles, use of compost and animal manure.

5.1.4 Potential benefits of organic agriculture with respect to sustainability

Many different social, environmental and so called sustainability benefits have been assigned to organic agriculture. The International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) admits that "despite significant scientific and technological achievements in our ability to increase agricultural productivity we [as Western scientists] have been less attentive to some of the unintended social and environmental consequences of our achievements" but "we are now in a good position to reflect on these consequences". (IAASTD 2009, p. 3) This statement reveals that some of the technological innovations of the Green Revolution included extensive risks that have not been taken into consideration but have created negative rebound effects.

By working with the principles of natural systems, organic agriculture, in general, enhances nature's capacities of "soil forming and conditioning, soil stabilization, waste recycling, carbon sequestration, nutrient cycling, predation, pollination" (FAO 2009 a, Online) and habitat provision. These ecological services are acknowledged and harnessed to make the agricultural production more resilient to external shocks such as droughts or pests. Central aspects of organic agriculture are soil building practices. These can include "crop rotations, inter-cropping, symbiotic associations, cover crops […] [or] minimum tillage". The soil structure can thus be improved increasing the "retentive abilities of the soil for nutrients and water" (FAO 2009 a, Online) and also enhancing the capability of the soil to capture CO_2. In such a way, mitigation of climate change can be enhanced. (FAO 2009 b, p. 16)

Organic agriculture also potentially increases water quality and availability. In light of the threat of increasing water scarcity due to climate change this is a

[55] These are some of the technological innovations which have initially been studied by diffusion scholars.

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strong argument in favor of organic agriculture. As only the use of natural substances such as potassium, phosphate, calcium and magnesium and organic fertilizers such as compost, animal manure and green manure is allowed, water resources do not become polluted by synthetic fertilizers. Furthermore the improved soil structure is able to enhance water filtration. (FAO 2009 a, Online) The reduction of chemical fertilizers also makes their production, which requires high quantities of fossil fuel and (non-renewable) energy, obsolete. (ibid.)

Genetically modified organisms aren't permitted within organic farming as they are considered to pose risks upon the human health and the functioning of natural systems that are not assessable. Biodiversity and the maintenance of "a healthier gene pool" both of plants and animals are highly valued as "the basis for future adaptation" to changing circumstances. Organic agriculture is considered to operate in line with the precautionary principle (compare ibid.) and it incorporates mainly reversible activities. Compared to industrial methods organic farming has a lower 'depth of impact' and can lead to rather positive than negative rebound effects. (Compare chapter 3.)

In the context of climate change, the IPCC (2007 p. 15) proposes adaptation strategies that are in line with organic agriculture, explicitly an "adjustment of planting dates and crop variety, crop relocation […] [and] improved land management, e.g. erosion control and soil protection". Regardless of how effectively people all around the world implement mitigation strategies, a certain degree of global warming is inevitable and thus there is a need for flexible adaptation measures. Although some authors argue that a superiority of organic agriculture "cannot be substantiated" due to a "lack of scientific studies" and that "conventional agriculture [...] use[s] the best available knowledge [...] [for the] safe, efficient provision of foods in abundance and at lowest price" (Trewavas 2001, p. 409) other studies show that it carries the potential for making harvests more resilient to changes in climate such as more intense and/or more frequent droughts or heavy rain events and can thus outperform industrial agriculture. (Holt-Giménez 2000, Online)

Several health issues have been mentioned in the context of organic agriculture. First of all, general positive health effects are considered to be related to being

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(and working) in natural surroundings[56]. The specific production conditions and the quality of the food are of further importance. The consumption of high quality, "health-promoting foods" can decrease the "burden of chronic disease[s]". (Compare IAASTD 2009, p. 6) and a reduced use of pesticides, herbicides etc. can not only decrease health risks to the consumer but also to the farmer. (FAO 2009 a, Online) Furthermore, a move away from highly mechanized industrial agricultural production and related food chains is considered to prevent the creation and "spread[ing] of infectious diseases". (Compare IAASTD 2009, p. 6)

Besides health issues, organic agriculture can also shift the focus to other needs in a local population and improve social relations. According to Barraclough (1980, p. vii), former Director of the United Nations Research Institute for Social Development (UNRISD), the capital-intensive agriculture of the Green Revolution, the "commercialization of production and exchange relations" and growing competition [has] forced small-scale farmers in developing countries to sell their land to larger agribusinesses leading to "increasing numbers of landless labourers trying […] [to live off] diminishing areas of poor quality lands". He describes an "accelerating dissolution of self-provisioning agriculture, both as a major element in peasant farming and as a subsistence base for the poorer rural strata" as a consequence. (ibid.) The IAASTD (2009, p. 4) also recognizes that in the future, the needs of "the rural poor, especially landless and peasant communities [and of] small-scale farms in diverse ecosystems" have to be taken into greater consideration.

Organic agriculture can offer new perspectives for regional production and distribution systems such as local markets and thus lead to a "maintenance and creation of regional human potential and knowledge potential." (Schäfer 2007, p. 111) The knowledge transfer fostered by organic agriculture leads to different crucial "learning processes for sustainability" based on "context-related or informal learning". Boeckmann (2007, pp. 133-134)

[56] In the Netherlands about three hundred therapy farms have been combining a "profitable agricultural enterprise with the care and support of a group of clients [...] [such as] mentally handicapped people, [...] psychiatric patients, ex-convicts, ex-addicts or even stressed managers". (Van der Schilden and Vink 2009, Online) Depending on the cultural backgrounds of the individuals, exposure to and reliance on natural surroundings might lead to positive health effects due to an increased sense of belonging and connectedness to nature.

These learning effects can appear on a very broad scale due to the "multifunctionality[57] of agriculture" (IAASTD 2009, p.4) and the different positive effects which organic agriculture can have on the individual and the society.

5.1.5 Organic agriculture in South Africa

The FAO (2009 a, Online) distinguishes between three different forms of organic agriculture concerning the main driving forces behind the conversion. While (1) "Consumer or market-driven organic agriculture" includes "consumers [who] take a conscious decision on how their food is produced, processed, handled and marketed" and "products [which] are clearly identified through certification and labelling.", (2) "Service-driven organic agriculture" can be found only in "countries such as in the European Union (EU), [where] subsidies for organic agriculture are available to generate environmental goods and services, such as reducing groundwater pollution or creating a more biologically diverse landscape". (3) "Farmer-driven organic agriculture" is based on "farmers[‘] belief that conventional agriculture is unsustainable" and on farmers' development of "alternative modes of production to improve their family health, farm economies and/or self-reliance." The last form is considered to be of special importance "in many developing countries, [where] organic agriculture is adopted as a method to improve household food security or to achieve a reduction of input costs" and where "produce is not necessarily sold on the market or is sold without a price distinction as it is [often] not certified." (ibid.) This categorization is an oversimplification of different phenomena related to organic farming. However, it illustrates that both national institutional and legal arrangements are of importance and that organic produce, certified or uncertified, can incorporate different motives of production and consumption.

In South Africa, organic agriculture is not subsidized and the institutional base behind it is (still) weak. Compared to the European markets, certification plays a minor role and according to the International Trade Centre (2009, Online) only

[57] According to the IAASTD (2009, p.4) "the concept of multifunctionality recognizes agriculture as a multi-output activity producing not only commodities (food, feed, fibers, agrofuels, medicinal products and ornamentals), but also non-commodity outputs such as environmental services, landscape amenities and cultural heritages."

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two certification bodies have evolved[58]. These, however, have seen a tremendous growth in certified organic agriculture since 2003. Byrne (2007, Online) states that between 2003 and 2005, "sales of organic food grown in South Africa - domestic sales and exports combined - jumped [from an estimated five million rand] to [...] 155 m[illion rand]" and that of the 230 certified organic or in-conversion operations in South Africa in 2005, 75% have started organic processes in the previous two years." He sees "the rate of conversion to organic farming [...] [having] accelerated" "after a slow start" and even the "South African retailers [now] [...], belatedly, falling in behind organics. Organic tomatoes, apples and potatoes are [considered] now widely available in supermarkets, from the mass-market Pick 'n Pay and Checkers chains to Woolworths." (ibid.)

Two "non-profit membership organisations" are officially promoting organic agriculture in South Africa through "public relations, teaching and training, publishing and other forms of information dissemination": the Organic Agricultural Association of South Africa and the Biodynamic Agricultural Association of South Africa (BDAASA). (Compare International Trade Centre 2009, Online.) According to the BDAASA (2009, Online) "the number of commercially active (bio-dynamic) farms remain very few". No farm is certified as Demeter[59] and only 43 farmers (of which a number are only part time farmers) are registered members of the BDAASA. According to the BDAASA this is due to "many factors, chief being the extremely difficult environment in which farmers, who are not part of the mainstream chemical agriculture, operate in [...] [the] country." (ibid.) The organization furthermore states: "The challenges are vast. Not only [are] [...] the South Africa climatic and soil conditions on the whole very difficult to work with organically, there is also no effective support structure for such farmers." (ibid.) In the context of genetically modified organisms (GMOs) the South African government is considered to have followed policies of weak regulation and free-market approaches[60]. The African Centre for Biosafety

[58] A staff member of the Sustainability Institute stated that certification is often avoided as the "process is very expensive" as "at the moment in South Africa, there are not enough certifying bodies in order to be able to have the necessary competition." (I 3)

[59] Demeter is an international standard for bio-dynamic agriculture. Compare Demeter-International e.V. 2009, Online.

[60] The GMO act of 1997 considered genetically modified organisms as beneficial and "contribut[ing] towards a globally competitive, profitable and sustainable agricultural sector". (Department of Agriculture, Pretoria, 2005, p. 6)

(2005, p. 2) criticizes that "the state's support for genetic modification has allowed South Africa to become a base for expansion into Africa, for the export of GM seed around the world, and as an experimental base for new GM crops not approved elsewhere." Conventional and industrial farming is dominating South Africa, even though there are some agents promoting organic agriculture.

5.2 Organic farming and characteristics of the innovation

The following chapters describe the application of Rogers' concept to the diffusion of organic farming around Lynedoch EcoVillage. Firstly, organic farming as a diffusing 'innovation' according to Rogers' understanding is further specified. Then, the characteristics of organic farming and relative advantages found within the Lynedoch region are presented.

5.2.1 Organic farming at Lynedoch as a diffusing innovation

For the analysis of the diffusion of organic farming around Lynedoch EcoVillage a general understanding of what is meant by organic agriculture has to be outlined. According to Padel (2001, p. 49) "most adoption [/ diffusion] research has been carried out on the adoption of single techniques, like the use of hybrid seed corn" whereas "organic farming is a complex system and the conversion to organic management affects the whole farm." Organic farming is actually not an 'innovation' but it can incorporate different modes of change. Padel argues that an analysis of the diffusion of organic farming is, however, possible[61]. (ibid.) Rogers' model does, indeed, allow for an application to organic farming as a 'diffusing innovation', as it is based on individual perceptions of the 'innovation organic farming'. In line with this understanding, the analysis of the diffusion of organic farming around Lynedoch EcoVillage has been carried out on the basis of the interviewees' perceptions. The farmers were asked which methods they considered to be organic farming methods and whether or not they perceived themselves as an organic farmer or not. (Compare Annex 2)

One small-scale farmer who is working in cooperation with the Sustainability Institute considered himself an "organic" or "natural" farmer (I 1), one farmer whose farm is part of the larger wine and leisure industry company, has started to convert to "bio-dynamic" farming (I 8), and a group of farmers who described

[61] Padel (2001, p. 49) concludes that the diffusion of organic farming shows slower diffusion rates than the single innovations but that the model is diffusion is still valid.

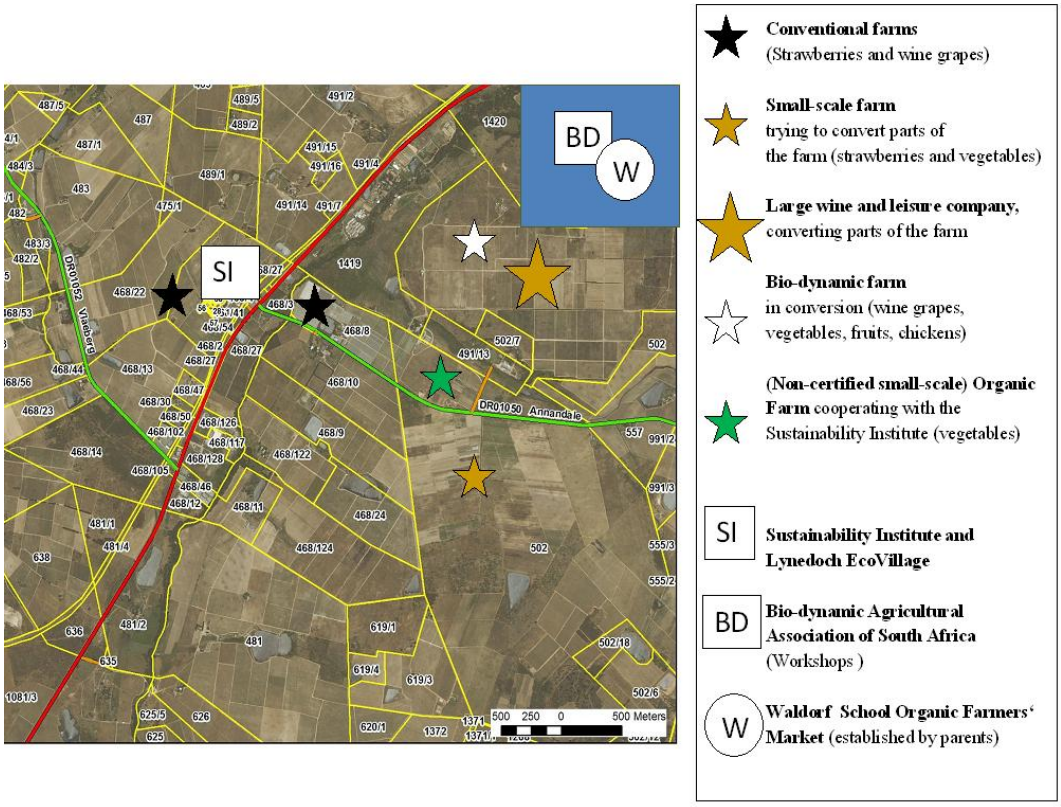
themselves as “poor”, “small-scale”, “conventional farmers”[62] are using different methods, both organic and conventional, and are “trying to get away from chemical fertilizers” (I 2). Two conventional farmers are still making extensive use of external, artificial inputs. One considered himself a “conventional” “hydroponic[63]” farmer (I 7) and one a non-organic farmer using “pesticides”, “fertilizers” and “applications” for “spray[ing].” (I 9)

The diffusion of organic farming has not been analyzed within the social system of Lynedoch EcoVillage[64] but within a larger social system, the farming community “Lynedoch” within which the ecovillage is situated. Lynedoch is situated within the “Stellenbosch district of the Western Cape province of South Africa [...] [and is thus part] of the broader regional cultural landscape known as the Cape Winelands”. (Pistorius and Todeschini 2004, pp. 67-68) Viticulture and farmland dominate the entire region, also the area in close proximity to the ecovillage in which the farmers have been interviewed.

Figure 8 gives an overview of the Lynedoch area, including the ecovillage, the farms and the produce and the institutions about which information has been gathered through the interviews. The Waldorf School Organic Farmers’ Market where workshop sessions of the Biodynamic Agricultural Association South Africa (BDAASA) take place is situated 1 kilometre further north east. It has also been analyzed regarding the diffusion of organic agriculture in the region.

[62] The small-scale farmers had previously worked together in a project that was initiated by the large wine company. In this context, Black Economic Empowerment (BEE) laws that aim at supporting previously disadvantaged groups, and attempts at land reform that redistribute land to emerging, small-scale farmers play a role.
[63] Hydroponic is a system in which plants are grown “without soil” and in which the “grower provides all [...] life sustaining forces to the plant”: “light, air, water, nutrients, heat, carbon dioxide [...] and a growing medium.” (Compare Hydroponics.com 2009, Online)
[64] See also chapter 5.5 about the social system.

Figure 8 Map of Lynedoch area and relevant farms and institutions. Own illustration based on map from the City of Stellenbosch



Among the interviewed farmers the general understanding of organic farming as a method was characterized as the "non-use [or extensive reduction] of pesticides" (Interview I 7) or other chemical inputs. Among the interviewees, both the "natural" and the (future) bio-dynamic farmer can be considered organic farmers as they are completely abandoning chemical inputs. In this regard, organic farming can actually be considered an exnovation (of former technological innovations).

However, organic farming can also incorporate imitations and renovations of traditional, indigenous knowledge. A member of the BDAASA stated that bio-dynamic agriculture can be considered a subset of or a means for "organic" or "sustainable agriculture" with the special characteristic that it "uses specific preparations [described by Rudolph Steiner during his teachings] for promoting certain qualities that take into account the macrocosm and the […] planetary movements". (Preliminary Talk PT 3 and I 5) One farmer converting to bio-dynamic farming explained that he "follows and has faith" in the "bio-dynamic calendar" because he "know[s] it works". (I 8) This calendar takes into consideration the constellation of planets such as the moon and gives advice to the

farmer on what to do during at different times throughout the year. The application of this knowledge of Rudolph Steiner's teachings and the use of his concrete "preparations" can be considered imitations and renovations. (The knowledge, upon which Steiner's preparations were based, of course, existed even long before Steiner's days. The BDAASA member explained that it had been used in Switzerland a long time before 1924. (I 5)[65] Methods used by the "natural" farmer form other examples in this context. Among other things, he uses "cattle" for ploughing. This again illustrates the importance of imitations (of existing ancient methods) and renovations (adaptation to the local circumstances such as soil structure) for organic farming. The replacement of tractors by oxen plough raised a lot of attention and an article about the farmer appeared on the front page of an influential farming magazine. (Compare Farmers' Weekly 2009, p. 1)[66] Despite the fact that different techniques play a role in organic farming in the Lynedoch region, in the following chapters organic farming is described as the abandonment of synthetic chemicals and thus an exnovation. This is done not only in order to reduce complexity but also because Rogers' concept focuses on individual perceptions and there is general understanding amongst the farmers that this aspect distinguishes organic farmers from conventional farmers.

5.2.2 The characteristics of organic farming and relative advantages at Lynedoch

In the Lynedoch area the conversion to organic farming appeared as a high-risk, knowledge based, observable exnovation which is characterized by reversible processes and implies multiple relative advantages compared to conventional farming.

Relative advantage of organic farming

The farmers around Lynedoch who have converted to or are converting to organic methods mentioned multiple different relative advantages of organic farming. Monetary reasons played an important, but not exclusive role. Organic produce can be sold at a higher price (I 2) and the farmer can operate within a niche

[65] And the concrete procedures seem to resemble other forms of indigenous knowledge. A South African woman living at the ecovillage whose parents followed the Zulu culture said she was surprised to learn from Steiner's preparations, as she didn't expect a German to promote such ways of farming such as putting a cow horn into the ground, which, according to her, resembled some farming procedures of the Zulu culture.

[66] One of the conventional farmers considered this technique inferior and thought that the natural farmer "is not gonna make it" (I 7)

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market with “still some control of the prices” and “not in competition with the bigger farmers who are farming conventionally with chemicals”. (I 1) Furthermore, it is a means to reduce costs and becoming more independent by avoiding the (increasingly) expensive external inputs which was very important to the small-scale farmers. (Compare I 1 and 2) However, the organic farmer considered the initial costs of conversion high. (I 1)

Another benefit or organic farming is a feeling of satisfaction about the work and the quality of the output of the work for the farmer. The organic farmer is content that he can “sell[...] to certain [...] people who are health conscious [and] [...] who appreciate the food that they eat.” To him, the “health benefits” of his products are especially important. Environmental benefits of organic agriculture have also been mentioned. The organic farmer thinks that when people are “buying from” him, “indirectly, they are supporting the conservation of nature”. (I 1) Others considered organic methods being “the best for the [enhancement of the] sandy soils.” (I 2) The bio-dynamic farmer sees the holism and non-reductionist thinking which underlies bio-dynamic agriculture as a central benefit. He states that bio-dynamic agriculture “is the only form of agriculture which works with the other 97%” instead of conventional agriculture which focuses on just 3% of the plant, the parts which are left after a plant has been burned. (I 8)

Concerning potential social benefits of organic farming, the case study revealed a paradox. Even though organic agriculture seems to have improved regional social relations to some extent by emphasizing local distribution channels and regional market structures and decreasing dependency on international channels, due to the premium prices many people are effectively (still) being excluded from the market. In the Lynedoch area, parts of the organic produce are sold at a weekly Organic Farmers’ markets at a nearby Waldorf school[67]. This market was initially set up by a group of parents who hoped not only to create a place where organic produce could be offered and sold but also for social benefits of organic farming to occur, such as having “a community [....] [develop] and grow out of it organically”. They wanted to do “something bigger than just selling things” and foster a “local food economy”. (PT 2) Even though some believe that this “has happened beautifully” and now people can experience the warmth of a community at the market (ibit.), due to the price structure of organic produce, others feel that

[67] The concept of the Waldorf schools is closely related to Steiner’s anthroposophist ideas and includes “the absence of corporal punishment”. (I 6)

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the "three quarters of the [South African] population [which] are poor [...] cannot afford [...] to buy at the market." A staff member of the Sustainability Institute is afraid that "Organic has been positioned as a very elitist, middle-class, wealthy product line in South Africa." (I 3) This might (still) limit organic agriculture around Lynedoch to function as a means to reduce social divides.[68]

However, the bio-dynamic farmer considered organic farming to decrease a central social problem of the region, alcoholism[69], due to the "polyculture [...] [which allows for the] staff [working on the farms to be] busy all year long and busy doing different things, all the time." (I 8)

The analysis revealed that while the adopters emphasized a multitude of motivations for the adoption, the non-adopters seemed to be oriented towards mainly monetary motivations. As the conversion to organic farming requires a lot of time, the two conventional farmers considered it very risky and disadvantageous. They felt that there is no "sufficient premium" and believed only as conventional farmers they could "make a profit". (I 7) The conventional strawberry farmer referred to customers' choices and pressure from retailers as a barrier to organic farming as "the retailers want[...] a seasonal crop not to be seasonal" but available all year long. (ibid.) Other barriers for him were the irreversibility of his investment in "infrastructure" such as strawberry "tunnels"[70] and the lack of support from the South African government. A conventional farmer claimed that "the government is a problem" as chemical pesticides are "registered" but organic pesticides such as certain "insects" are not. The small-scale farmers criticize the government's role in land reform and claim that they cannot afford to pay their labourers "the same money that the rich farmers pay."[71] (I 2)

[68] Chapter 5.5 reveals that the Lynedoch area is characterized by a social gap which is typical of South Africa.
[69] Also compare 5.5.
[70] The investment in such technological solutions are sunk costs to the farmer.
[71] The Sustainability Institute supports emerging farmers and operates as a facilitator for land reform processes since, according to the academic director, the "government [..] [might not be] prepared to take on existing power structures [...] [and shows] no commitment at all to land reform". It is working with the municipality of Stellenbosch in order to "release nearly 300 hectares of land for land reform" which, also according to the academic director, will be "hopefully of an organic agriculture as a basis of that." (I 6)

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Complexity of organic farming

Padel (2001, p. 54) describes organic farming as an "information-based [...] innovation" and "a complex system" which "affects the whole farm" (ibid., p. 49). All farmers found it "not easy." (I 1) A conventional farmer considered it "something very special[ized]" (I 9) referring to the complexity of organic farming. The bio-dynamic farmer stated: "We don't fully understand most of it but we just do it because we know it works. [...] We have faith in the [bio-dynamic] calendar." (I 8) As organic agriculture is based on functioning principles of natural systems it is certainly characterized by complexity. The approach of organic farming and especially bio-dynamic agriculture promotes recognition and a discourse about the limits of human knowledge and science. It "acknowledge[s] the [other] 97 %, work[...] with it and [...] [to have] questions and answers" related to it. In contrast to that, conventional technologies such as hydroponics replace natural systems in order to reduce complexity and gain "more control" to "manipulate the plant to perform" in a desired way (I 7).

Compatibility of organic farming

Rogers (2003, p. 15) emphasizes the importance of personal "values and past experiences" for adoption. In the case of organic farming as a knowledge based, complex system with incorporated high risks, the personal values and beliefs have, indeed, been a deciding factor in adoption or rejection. The adopters openly state that they have faith (I 8) in the methods or even practice organic farming "mainly because [...] [they] believe in it". (Lynedoch Film 2008, Online) The conventional farmers show resistance to organic methods which also seems to be based on individual values, beliefs and experiences. One insisted that "[the opponents of organic farming,] can say what they like. I am not interested in it" (I 9), the other, referring to the ancient method of using a plough with oxen, that "he knows that the guy is not gonna make it" (I 8).

Observability and trialability of organic farming

In the Lynedoch case observability and trialability played an important role. Both characteristics of farming carry the potential to decrease the risk of the potential adopter. In the Lynedoch case, the farms are in direct proximity to each other and most of the farmers stated that they had been observing different farm methods on other farms in the region. The small-scale farmers, for example, "regularly [...]

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visit" the organic farm. (I 2) Even though the entire systems don't change, some procedures can be practised on small divisions of the farms. Due to a successful development of the organic farm, some of the small-scale farmers are now trying organic methods in order "to get away from chemicals." (I 2) Compatible with Rogers' concept, this kind of imitation process occurred especially if the farmer was homophile in status and access to land. If not, the observations on other farms still had an impact at the knowledge stage of the innovation-decision process of the conventional farmers as they became aware of the different methods. (Compare I 7 and I 8)

Observability and trialability in the broader context

The organic farmer stated that he and the other small-scale farmer were "able to try" organic farming in the past as a corporate "Go Organic" initiative of the large wine and leisure company. (I 1) In 1999, during a time when the directors of the Sustainability Institute, Mark Swilling and Eve Annecke, had "executive positions" within the large company, this business was set up in order to support and work with five emerging farmers and promote organic agriculture. When that business "got bankrupt" about three years later, the organic farmer started to farm on his own and has since then been supported by the Sustainability Institute which Prof. Swilling and Ms. Annecke had founded by that time, after they had stopped working for the company. (I 6)

In the case of this large company, trialability and observability have not only played a role for the small-scale farmers and the Go Organic initiative but also in connection to the bio-dynamic farm which is operating on the other side of the property. The bio-dynamic farmer is part of the family who purchased the company in 1993. (I 3) Even though the bio-dynamic farm is held as a "separate business" (I 8) and operates independently, it can be considered a "controlled experiment" (I 3) on a division of the larger farm. The bio-dynamic farmer thinks that if his bio-dynamic wine grapes "prove [...] a success that might stimulate [...] [the large company] into converting the rest of the farm" and states that the managers "just feel it is a too risky proposal for now". (ibid.) This statement demonstrates, again, the importance of trialability due to the perceived high risk element of organic farming[72]. In 2007, the large wine company had already

[72] A staff member of the Sustainability Institute regards the large wine company as "innovative and pushing boundaries" due to the identification of central "partnerships" with "Non-

formulated a 10 year vision claiming that by 2017 “all viable farmland [should be converted] to organic farming practices” meaning “converting up to two hundred hectares, of which sixty hectares is planed with wine grapes.” (Newton-King and Schreuders, 2007, p. 13-14)

Observability and Trialability are furthermore of central importance to the entire ecovillage concept in the context of learning processes for sustainability. The village aims at creating “an inclusive living and *learning* community that would *demonstrate* in practice what it means to live in sustainable ways.” (Sustainability Institute 2009 a Online) Not only the ecovillage, however, is functioning as a demonstration place. The Sustainability Institute works in cooperation with the organic farmer and considers his operation a “demonstration farm” (I 6) where students are sent regularly to support the farmer and experience organic farming practices on the open field.

Potential for re-invention and reversibility

The potential for re-invention and reversibility is high in organic farming. In the Lynedoch case, the organic farmer emphasized the possibility of organic farming to “adapt everything according to your situation” referring to a trip to India where he had observed different methods which he then adapted according to the climatic and soil conditions in South Africa. (I 1)

Organic farming works in line with natural principles and is, in general, a flexible and reversible process which rather enhances than irreversibly damages the ecological conditions of the farm. That is one aspect that makes organic farming especially interesting regarding sustainable development[73]. Other agricultural methods, such as the use of monoculture and genetically modified seeds can be considered irreversible as they can lead to a degradation of the soil or farmers’ dependency on the seed company. In this context, the FAO emphasizes that organic farming follows the “precautionary principle” as it enhances biodiversity as a “basis for future adaptation” to changing circumstances. (FAO 2009 a, Online)

governmental [...] and development organizations” and other players which allowed for the company to “build innovations [...] that are separate to the business but can feed into the business or add value to the business.” (I 3)

[73] As described in chapter 3 reversibility is of special importance for sustainable development.

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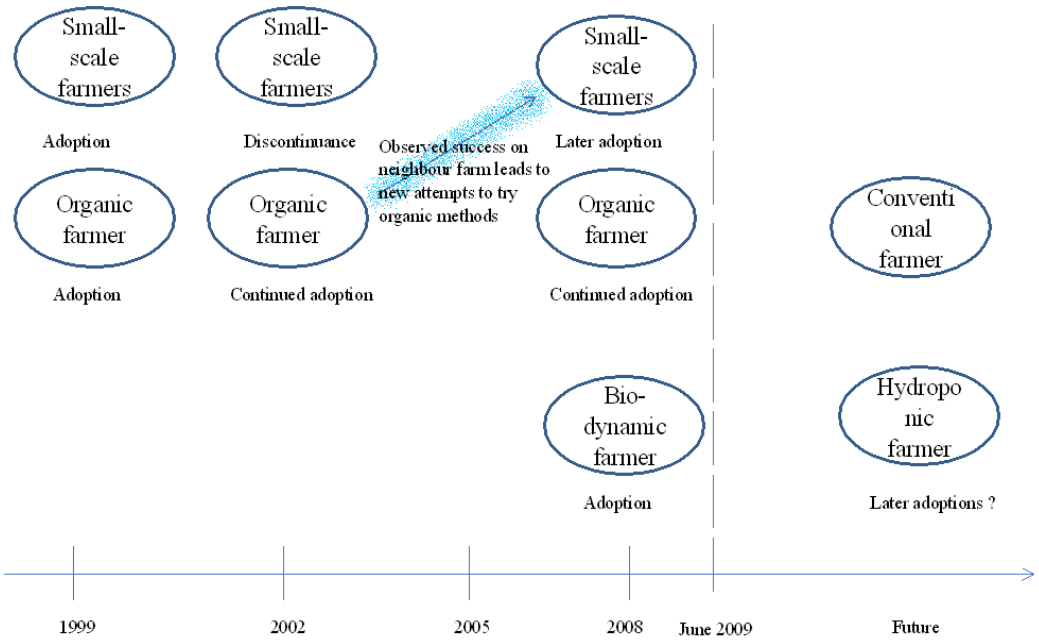
5.3 Time path of diffusion and different adopter categories

The time path of the diffusion of organic farming among the specified farms in the Lynedoch area has been reconstructed. Figure 9 illustrates when the different farmers converted to organic farming.[74] After the Go Organic initiative was dissolved due to financial failure only one of the five emerging farmers continued as an organic farmer. His relationship to the Sustainability Institute plays an important role in his continued adoption. The other farmers have been trying different conventional methods. After observing some success of the organic farmer on the neighbour farm, however, they have, again, started to try organic methods. Again, the observability of organic agriculture played an important role. The organic farmer stated: “Things like this are happening slowly especially in agriculture. People first want to see things work and then they want to try it. Like the small farmers across the road. They at first didn't believe me.” (I 1)

Even though the conventional farmers were convinced that their methods were superior to organic farming methods, they showed interest in reducing risk and, again, emphasized the importance of trialability and observability. The hydroponic farmer stated: “once we understand the risk, we would love to try it and maybe adopt it in the future.” (I 7) The conventional farmer was impressed by the macro goal of the wine company to convert vineyards on a large scale and stated: “Maybe they can show us something. Maybe they can convince me, or convince other people to do it this way. [...] They will do it in a big way. I am not so much against organic stuff but if they did it, [that would prove its feasibility as] I know what they do, they do good. That’s what I know.” (I 9)

[74] The research design does not allow for a representation of the findings in the form of a cumulative adoption curve as not all of the farms in the Lynedoch region could be analyzed. (Compare Figure 9)

Figure 9 Adoption over time. Own illustration based on research findings



As not every farm in the Lynedoch area could be studied, a detailed application of Rogers' concept regarding different adopter categories was not possible. However, based on the different dates of conversion, statements regarding different personal motivations for conversion or rejection and the analysis of some "socio-economic characteristics" and "personality variables" (Rogers 2003, p. 288-289), some assumptions could be made regarding innovativeness while considering a broader system of organic farming in South Africa. (Compare Fig. 10 in chapter 5.4.) However, these assumptions have to be considered in the context of the very small sample of farmers from the Lynedoch region.

The conventional farmers around Lynedoch were significantly older than the organic farmers[75] and one of them had had fewer years of formal education. According to Rogers (ibid.) both lower age and higher education can be considered typical characteristics of later adopters. According to Padel (2001, p. 47) "organic farmers [...] differ from farmers adopting other commercial innovations" such as chemical fertilizers in the respect that they "generally do not have purely financial motivations." The hydroponic conventional farmer, indeed, especially emphasized "profit" and understood "sustainability [...] [as still] being in business in 50 years time." (I 7)

[75] Rogers (2003, p. 288) who has compared a multitude of different diffusion studies has found that there is "inconsistent evidence about the relationship of age and innovativeness."

Even though Rogers (2003, p. 288) found that most early adopters have larger-sized farm units, organic farm units tend to be smaller, partly due to the "importance of small-horticultural and subsistence holdings in the organic sector". (Padel 2001, p. 44) In the Lynedoch case, there was no clear relationship between farm size and adoption but aspects of farm sizes and access to land clearly demonstrated the broader South African context previously mentioned. While the bio-dynamic farmer and the conventional farmers had large farms available, in the case of the organic farmer and the small-scale farmers the land under control was small and tenancy was insecure. (I 1, 2, 6) The hydroponic farm was significantly smaller than the other conventional farm and also this farmer described "scarcity of land" as one of his main "constraint[s]". (I 7)

The assignment of adopter categories was based on assumptions following statements of the BDAASA (2009, Online) which claims that "various people have been practicing bio-dynamic farming and gardening in Southern Africa for approximately 70 years." "Karl Adler […] [was] one of the first pioneers to use the preparations for compost making in 1937" but organic farming has still not become widespread. Under these assumptions, the farmers in Lynedoch who have converted can be classified as early adopters in the organic agriculture movement in South Africa. In the case of the small analyzed system of the few considered farmers around Lynedoch, the organic farmer and the small-scale farmers can be considered pioneers even though the small-scale farmers showed 'discontinuance' in adoption which means that they used organic methods, then abandoned them and then used them again. (Compare Fig. 9) For a more detailed analysis of adopter categories, the exact state of organic farming in a broader system (South Africa or the Cape Winelands for example) should be taken into consideration since "the [exact] level of adoption of organic farming in the respective countries" should be considered when evaluating individual innovativeness[76]. (Padel 2001, p. 43)

[76] This is, however, a difficult task as there are different statistical statements concerning the exact diffusion of organic farming in the country and no sufficient data available for the region. The report of the IFOAM (2008, p. 235), for example, only contains data about certified organic farming in South Africa which does not fully represent the actual situation.

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5.4 Communication channels and networks

The research revealed interpersonal, face-to-face communication and agricultural training programs as most important for the farmers. Because (organic) farming methods are complex and incorporate risks, the farmers tended to gather information from people whom they know and trust and who are homophile to them. The hydroponic conventional farmer, for example, who considered himself "a technical person" received information mainly from "*technical* specialists from seed[,] [...] fertilizer [...] [and] chemical companies." (I 7) One can assume that conversations among the farmer and the experts are not characterized by "cognitive dissonance, [...] [or] an uncomfortable psychological state" as the exchanged "messages [...] are [...]consistent with existing beliefs." (Compare Rogers 2003, p. 19)

Despite the proximity of the farms, there were hardly any communication flows between the conventional and the organic farmers and both seemed to operate in two separate communication networks.

The conventional farmer showed a high level of trust in his peer network out of which contact to specialists such as "a consultant" "from the wine industry" (I 9) was borne. He explained: "where I get all my information [from] is people I know and if they don't know they refer me to other people and I try to do what they say to me." (ibid.) He regularly attends "training programs" on "other premises" where he receives "lessons to sprays and fertilizers" and is "show[...][n] physically" how to use them. (I 9) During the participant observations several villagers had talked about their health problems related to the conventional farmer's pesticide spraying on the fields around the ecovillage during the summer months. When the conventional farmer was asked whether anybody had ever complained about his spraying he answered "nothing" and explained that he did what "stands on the labels", operated "very careful[ly]" and "strictly on the advice" of "the companies that distribute this stuff". (I 9)

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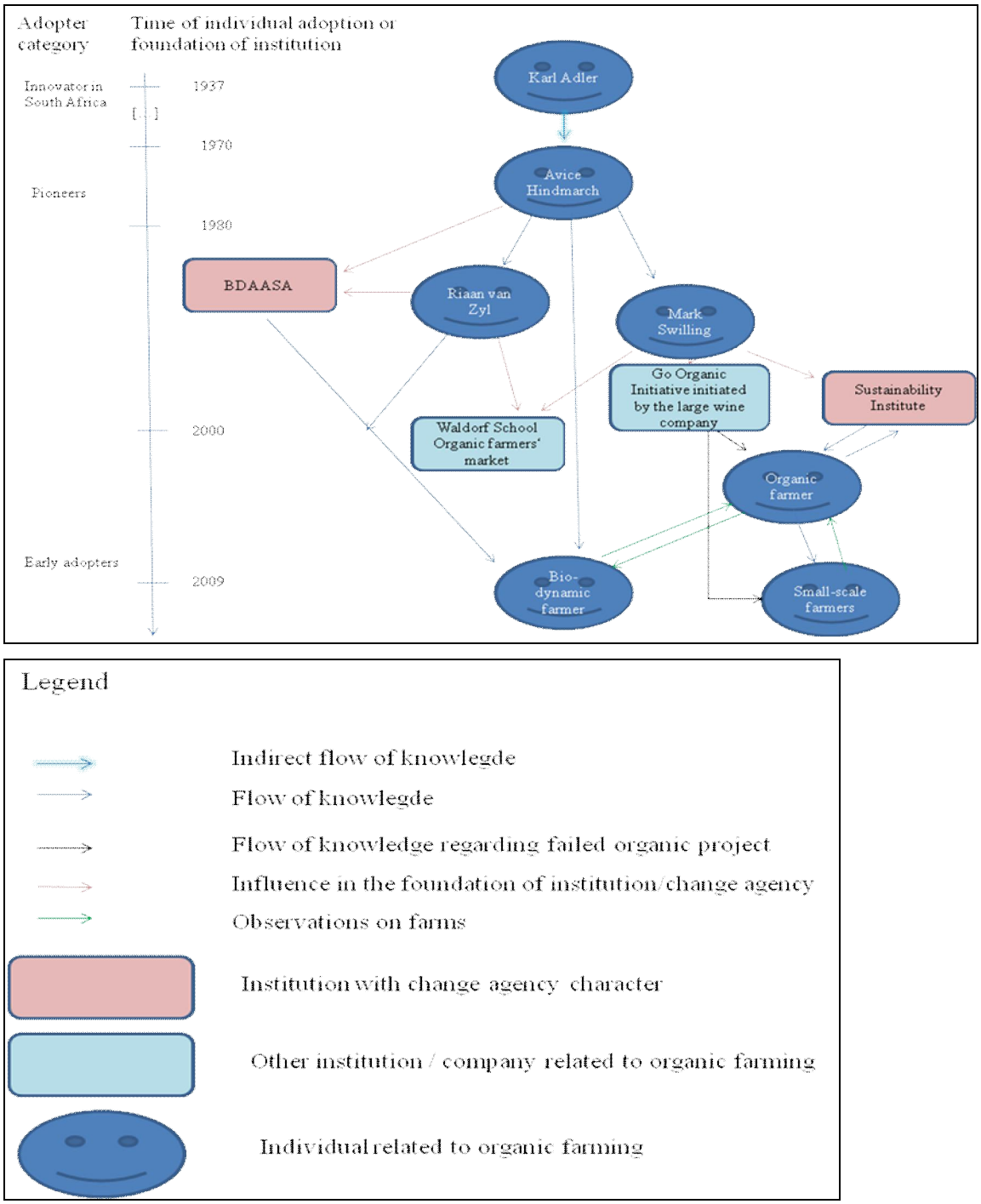
This communication gap in the Lynedoch area appeared in line with the existence of different change agencies promoting either the exnovation organic agriculture (the BDASSA and the Sustainability Institute) or the use of chemical inputs (technological innovations). The communication network and involved change agencies on the side of conventional agriculture could not be studied in detail. However, the existence of such commercial change agencies which are promoting the use of chemical inputs and thus the “opposite of organic farming” has been relevant to this study. Rogers (2003) does not explicitly mention competing innovations (modes of changes) and competing change agencies, but in the Lynedoch case, training programs organized by different change agencies and two separate communication networks have influenced the diffusion of organic agriculture.

The communication network and flows of knowledge around the adopters of organic farming has been reconstructed in the research process. It is illustrated in Figure 10. Furthermore, the relevant change agencies promoting organic farming (BDAASA and Sustainability Institute) and the individuals who had an influence during the foundation of these organizations are presented. The figure also contains farm observations from the farmers who have adopted organic farming.

Figure 10 Adoption over time, flows of knowledge and farm observations among the organic farmers. Own illustration based on research findings



In the reconstruction of the communication network, both the importance of homophily and the use of the organic farmer as an opinion leader by the Sustainability Institute became apparent. While Avice Hindmarch is considered

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by Prof. Mark Swilling a "huge name in the permaculture movement in South Africa" and involved in it "longer than anyone else" (I 6), he himself, together with Eve Annecke, is co-founder and director of the Sustainability Institute. (I 6) Both of them got to know Avice Hindmarch in the context of "the first [South African] ecovillage, where [...] [they] had a house" (I 6). Ms. Hindmarch, on the other hand, was involved in the founding of the BDASSA while Riaan van Zyl has been advising the bio-dynamic farmer via a bio-dynamic BDASSA workshop. Both Riaan van Zyl's and Mark Swilling's children have been attending the Waldorf school close to Lynedoch and as parents, they initiated the organic farmers' market. These three individuals represented in the middle of Figure 11 know each other well and formed a network of homophile people of extraordinary "personal value commitment". (I 6) All have, to some extent, had contact to the Steiner/Waldorf philosophy during their lives and appeared as proactive pioneers in the region. The diffusion of organic farming around Lynedoch is also an example of the influence of "social entrepreneurs"[77]. (ibid.)

Even though this group of opinion leaders shares common values and has been influenced by the same pioneers, two different change agencies have developed: the BDAASA and the Sustainability Institute. Whereas the BDAASA is focussing mainly on the promotion of bio-dynamic farming (compare BDAASA 2009, Online), the Sustainability Institute is operating in cooperation with the emerging organic farmer and promotes "land reform" projects in addition to organic farming. (I 6)

After an analysis of the social system, the Sustainability Institute as a change agency and its use of communication channels and opinion leaders are described in more detail.

5.5 The social system

Rogers (2003, p. 23) understands a social system as "a set of interrelated units [i.e. individuals, informal groups, organizations and/or subsystems] that are engaged in joint problem solving to accomplish a common goal." The villagers living at Lynedoch EcoVillage follow an explicit common goal of creating "an inclusive

[77] Mark Swilling went to a Rudolph Steiner school and assumes that that to him, this has been "quite an important kind of education for entrepreneurship because the absence of corporal punishment meant that [...] [he] never experienced fear growing up which made [...] [him] almost a total exception from virtually every South African." (I 6) He received an Ashoka Fellowship for Public Innovators in 1994. (Sustainability Institute 2009 e, p. 2)

living and learning community that […] demonstrate[s] in practice what it means to live in sustainable ways" and thus "[to] contribute to the making of a better world." (Sustainability Institute 2009 a, Online) The participant observation revealed a high commitment by the inhabitants to the ecovillage community. In this study, however, a larger social system was relevant despite some inhabitants of the ecovillage (especially Prof. Mark Swilling and Eve Annecke as directors of the Sustainability Institute, and the organic farmer and his demonstration farm close to the village) playing a role. This larger social system, which is described in this chapter based on the research findings, is Lynedoch, the farming community within which the ecovillage is situated. Lynedoch is situated in the district of the town Stellenbosch which was established by Governor van der Stel in 1679 and which was the very first "colonial expansion beyond the Cape Peninsula". (Pistorius and Todeschini 2004, pp. 67-68) The patterns revealed by this research which characterize this social system are not only typical for the region of the Cape Winelands but also illustrate the broader South African context[78].

The interviews revealed deeply rooted prejudices and a persistent divide between different groups of people. Multiple statements made during the interviews reflected certain "social identities" and revealed processes of 'othering', the formation and imposing of boundaries between different social groups. (Compare Nahnsen 2006, p. 15 and Simmel 1908) People who were perceived as belonging to one distinct group were referred to as "they" and those belonging to another group as "the others". These categories were made especially in the context of land and income distribution and sometimes ethnicity, and were used both by organic and conventional farmers.

The organic farmer stated: "Even though the poor might support the rich in getting richer by working for them, there is no connection. They, [the rich,] don't think about the poor people as part of the community and so do the poor on the other side." (I 1)

A conventional farmer stated: "There is rich people, poor people, all that. When it's poor people we try to help them. [...] We gave them a small piece of land where they could plant vegetables [...]. But [...] it wasn't very successful. They are

[78] Compare chapter 5.1.1. Despite the specific historical context of South Africa, still lessons to be learned for other countries can be derived from this case.

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not always very eager to work on that land. [But] [...] if they asked me again, it's there." (I 9) Another claimed that: "We would love to do something, but again, our constraint is land. Our view is that as valuable as [...] [it is,] empowerment needs to make business sense." (I 7)

When a small-scale farmer was asked whether or not other people from the surroundings came and talked to him about their farming methods he answered: "No, not the South African white farmers, so to say. [...] In the beginning we called a meeting with all the farmers to see how they can help us or assist us. And that [...] morning [...] only one farmer came. [...] I think they see us as a threat, [because of] all the changes [that are happening regarding land reform]. [...] For instance, [...] the municipality [...] [supported by the Sustainability Institute wants to] take all the vacant land from the farmers and they see us here [how we as emerging farmers received some land]. So don't expect anything from them." (I 2)

The interviewees referred to alcoholism and monoculture as central problems in the region. One farmer explained: "Most of the people who live in the area are coloured farm labourers, [...] brutalized people. They were paid in alcohol for many many years. In fact, some of them are still paid in alcohol. So alcohol is a big problem, and also the fact that they do a monoculture. So, every year is the same. And at this time of the year there is nothing for them to do." (I 8)[79]

5.6 The Sustainability Institute as a change agency

The Sustainability Institute operates as a change agency promoting sustainability thinking on multiple levels. As a local change agency it supports organic farming, land reform projects and learning for sustainability in the Lynedoch region. The historical connection between Lynedoch EcoVillage and the Sustainability Institute can be seen as a direct reaction to the social problems that characterize the broader Lynedoch community. Prof. Mark Swilling and Eve Annecke were initially working for the large wine and leisure company and promoting a "Corporate Social Responsibility" initiative to support farm workers of the region following a "vision [...] [of] a school surrounded by worker's housing". (I 6) The ecovillage has created a place to live for the brutalized farm workers where "the rich can in some ways subsidize the poor". (I 1)

[79] The participant observations revealed that a lot of children suffer from fetal alcohol syndrome.

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Regarding the promotion of organic agriculture Mark Swilling describes the related "starting point" (I 6) for the Sustainability Institute in the region as follows: "This region is high value agriculture which has been under the control of white people for longer than anywhere else in the history of South Africa and that comes with a whole bunch of social relationships, particularly farm workers who are the product of the generations of probably the worst form of exploitation ever in the whole history of South Africa. So socially, [...] agriculture in this part of the world is evil. It is a crime against humanity and nature. And that's what we [at the Sustainability Institute and at the ecovillage] are up against. There is no reparations. [...] White farmers are arrogantly assuming that the land belongs to them and there is no debt to be paid to the people they exploited or to the nature they destroyed." (I 6)

5.7 Communication channels and opinion leaders used by the Sustainability Institute

The interviews and the participant observations revealed that the Sustainability Institute is making extensive use of (potential) opinion leaders to promote organic farming, land reform policies, socially mixed communities and sustainability thinking[80]. Regarding organic farming, the most important opinion leader is the organic farmer who works in cooperation with the institute. He received training which was organized by the institute and was sent on a trip to India to gain specific knowledge about organic methods. The research specified him as an opinion leader because he has been sought out for advice by a large number of people from within and outside the region. (Compare I 1) Not only have the other small-scale farmers observed his fields and learned from his practices, his farm is used as a demonstration farm for the Sustainability Institute and students who are taking part in the courses at the institute and thus staying at the ecovillage are regularly sent there. Some of these students have started growing their own vegetables in their gardens after having experienced working on the organic farmer's fields. (I 1) Also within the ecovillage, the organic farmer is highly respected and sought for advice. (Compare I 6) As the farmer has previously worked with some of the other small-scale farmers and appears homophile to

[80] Even though this is not done according to a certain strategy of the institute and the director was unaware of Rogers' concept. (Compare I 6)

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them, it is very likely that their attempts to convert their farms to organic principles can be explained by his influence.

Besides the communication that takes place on the farm itself, the organic farmer also shares his views at the Waldorf School Organic Farmers' Market. As mentioned before Mark Swilling and others initiated the market to foster a local food economy and to create a place of community. Even though the market is considered too "elite" by some (I 6), it is a place where the organic farmer is able to not only sell his produce but also share knowledge about organic farming and spread it into the region.

Regarding sustainability issues in general, the Sustainability Institute also offers training sessions to staff members of the large wine and leisure company. Interestingly, these are held by a staff member of the Sustainability Institute who had previously worked for the company himself and who knows the business very well. (Compare I 3) Because he is able to adapt to the specific 'language' used within the company, he is more likely to have an impact on the staff members than somebody who is not familiar with it. The employees of the company might consider the staff member of the institute as similar or homophile to themselves and thus be more open towards messages regarding sustainability which are new and to some extent irritating.

The Sustainability Institute is also active in policy at the municipal level. The "Sustainable Stellenbosch" initiative promotes sustainable development throughout all of Stellenbosch through close collaboration with the "municipality, community and business sectors". (Sustainability Institute 2009 f, Online) In this case, especially students are involved doing research in the region, for example on "energy efficiency and renewable energy, solutions to animal traction and local food economies in Stellenbosch". Their participation in "ongoing forums and dialogues" is considered to positively influence "the future of Stellenbosch". (ibid.)

Even though the communication channels used by the institute demonstrate its regional focus on sustainability, Mark Swilling's and Eve Annecke's ambitions have never been limited to the regional or South African context alone. The institute operates academically on a global scale. Since 1998 Mark Swilling and Eve Annecke have been planning to set up a "leadership [school] for a more

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sustainable world." In 1999, they created the Sustainability Institute. (I 6)[81] As a respected researcher Prof. Mark Swilling promotes cross-cultural sustainability thinking on a global scale. As part of the UNEP's International Panel for Sustainable Resource Management (IPSRM) (Sustainability Institute 2009 d, Online) and during many other occasions he has brought South African viewpoints into global debates on sustainability. For example, he states that "global inequality is not only bad for those who suffer most, but also for those who benefit most" and criticizes the exploitation of African resources by the West by arguing that the gradual "decline in the real prices of resources is not a natural function of market transactions, but has only been possible because of the systematic oppression of people in developing countries, firstly through colonialism and then post-colonial relationships that were often forcibly engineered by Western governments". (Sustainability Institute 2009 c, Online) In the context of these global debates and in his academic work, Prof. Mark Swilling himself might be operating as an opinion leader.

Students can come to the ecovillage and take multiple courses related to sustainability issues at the institute. They can then receive a BPhil and MPhil degree in "Sustainable Development Planning and Management" from the University of Stellenbosch. (Sustainability Institute 2009 f, Online) Students come from all over the world with the majority coming from Sub-Saharan countries and some specialize in organic agriculture by taking part in the courses around "Managing Sustainable Agriculture for Development" in the "Sustainable Agriculture" Programme of the institute. (Sustainability Institute 2009 f, Online)

In interview I 6, Mark Swilling explained the importance of both organic agriculture and institutions such as the Sustainability Institute for sustainability: "If you want to eat in a way that builds a sustainable world then you have to be connected in one way or the other to organic agriculture. And for organic agriculture to really contribute to sustainability you need people who are going to relate to the soil as a source of life not as a medium, not as a material medium. And in order for that to happen, you need whole new generations of farmers who

[81] Before 1998 they had been teaching "governance, development, [...] [and] systems thinking" at the Public Management School at the University of Whitwatersrand in Johannesburg and were dreaming of "get[ting] out off [...] mass production of education and turn to a more intense, focused kind of activity [...] [with] a focus on leadership for a more sustainable world". (I 6)

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are not schooled in traditional, industrial agricultural science. And in order for that to change you need universities to be taken over, university agricultural faculties and departments and soil science departments to be taken over by people who understand not just sustainability but deep ecology and in order for that to happen you need institutions like ours [...] to just continuously pump out as many people as possible some of whom will go into agricultural education."

The most important communication channel, however, might be the ecovillage itself. Due to the high commitment of the villagers and the staff members of the institute, a "change-oriented" system evolved which supports the opinion leaders' innovativeness. (Compare Rogers 2003, p. 319) All students and guests who come to the village (for multiple reasons) experience a cross-cultural surrounding that is very atypical of the rest of the Stellenbosch district and also life styles that are more modest than those of many people in the Western world and the elite of South Africa. Students and visitors of the Sustainability Institute, for example, will be offered exclusively vegetarian dishes. They will help to clean the building[82], grow vegetables in the community garden or on the farm and will get the chance to talk and share ideas openly with people of multiple backgrounds, regardless of age, gender, race, sexual orientation, financial resources, or spiritual and political beliefs.

The fact that Mark Swilling and Eve Annecke themselves live within the village, in a house built out of locally available materials, gives the institute a lot of credibility and makes them role models in the village and the region. According to Mark Swilling "asking people in a society where the majority live in poverty to "live lightly" [and more modest] obviously makes no sense. But what does make sense is to argue that a decent lifestyle does not necessarily equate to building malls in seas of poverty, or high carbon infrastructures which use up resources that could otherwise be used on poverty [alleviation], or aspiring to consume [...] like privileged people when in reality very few can afford it." (Sustainability Institute 2009 c, Online)

The research revealed that the Sustainability Institute as a change agency played an important role in the diffusion of organic farming in the Lynedoch community. Not only did the Sustainability Institute make use of the characteristics of high

[82] They will do work that was during the Apartheid system almost exclusively done by certain groups of people.

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trialability and observability of organic farming by the establishment of a demonstration farm, it also operates with opinion leaders. Besides the Sustainability Institute, the BDASSA organization also accelerated the diffusion of organic farming but within this study its communication channels were not analyzed in detail.

Section 4

6. Conclusions

The research aimed at finding out what people from Germany can learn about sustainability from Lynedoch EcoVillage, South Africa, and the associated 'Sustainability Institute' and how 'transferable life styles'[83] and consumption patterns can be actively promoted.

Everett M. Rogers' concept of 'Diffusion of Innovations' offers the potential to reveal and reduce barriers to the diffusion of behavioural changes that can foster a sustainable development. Rogers reveals connections between behaviour and both individual characteristics and characteristics of the social system and thus symptomatic mechanisms underlying social change. Not only the characteristics of a potential behavioural change such as the perceived relative advantage but also certain communication processes within peer groups and networks around opinion leaders are of importance. Rogers' ideas have already been used extensively in marketing of commercial goods. (Compare Les Robinson 2009) This thesis sought to show that it can also be successfully used by (non-commercial) actors trying to foster behavioural changes towards 'transferable life styles'. The interpersonal communication networks and related (critical mass) dynamics described by Rogers could play a crucial role in fostering sustainability. In this thesis, Rogers' concept has been applied to the diffusion of organic farming around Lynedoch EcoVillage and the activities of the Sustainability Institute, a non profit trust.

[83] Following the 'transferability approach' an economic system and patterns of consumption can only be sustainable if they can be continuously transferred without damaging the overall system. (Compare Paech and Pfriem 2004, p. 242) This transfer must be possible across time (intergenerational) and space (intragenerational). (Compare Paech 2005 a, p. 49)

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Both the organic farm, which is operated in cooperation with the Sustainability Institute, and the ecovillage itself function as demonstration places. Not only Rogers (2003) but also Bruppacher (2003) and others emphasize the importance of demonstration places for the 'diffusion of innovations'. Rogers (2003, p. 389) states that "potential adopters of a new idea are aided in evaluating the innovation if they are able to observe it in use under conditions similar to their own" and distinguishes between "two quite different functions: (1) experimental demonstrations, which are conducted to evaluate the effectiveness of an innovation under field conditions and (2) exemplary demonstrations, which are conducted to facilitate diffusion of the innovation to other units." (ibid.) Bruppacher (2003, p. 330) points to the ability of "pilot and demonstration objects to reduce the perceived complexity and to make direct and indirect effects of innovations visible for the user." Demonstration places such as certain organic farms and ecovillages can increase the observability and trialability of new ideas. The research revealed that these categories have been especially important for the diffusion of organic farming. Experimental demonstrations allow for critical reflections and can help to reveal both positive and negative rebound effects of innovations and other modes of change. In this context, the research found out that especially exnovations (such as organic farming and the abandonment of pesticides) and other modes of change and the reversibility of innovations are of central importance for sustainable development.

The Sustainability Institute as a non profit organization, however, not only promotes organic agriculture but also new forms of South African land reform, socially-mixed ecological settlements and a sustainability understanding which is based on holism and the recognition and celebration of all forms of life.

In this context, people from Germany can learn from the Sustainability Institute and this case study of Lynedoch EcoVillage that sustainability policies should allow for cross-cultural reflection. If sustainability is exclusively being considered from within a 'Western box', the dominance of a very reductionist sustainability understanding will persist and shifts towards 'transferable life styles' will be doomed to fail.

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DeBono's (1997, p. 24-26) description of the typical Western thinking structure[84] illustrates why the Western culture has brought about sustainability policies that can actually be considered barriers to sustainable development. DeBono (ibid., p. 25) states that "the Western civilization developed a culture of thinking which is based upon analysis, judgement and reason. It works well in a stable surrounding, but only insufficiently in a world which is changing. When everything is changing, categorical understanding and fixed rules are of limited use. It is surprising that the Western civilization has never brought about a logic for 'constructive thinking' but only for the search of the truth; [...] We are obsessed with 'what is' and don't care much about 'what could be'." He further explains that what is considered 'reason' can be traced back to Aristotle and the "logic of 'subsets' [...] [the Western habit of] build[ing] categories [...] which are like boxes with which [...] each [...] situation" can be analyzed and disaggregated. (ibid.) Ironically and self-critically he states: "We judge which parts belong into which box: Something either has to belong to a category or has to be excluded from it – both at the same time does not work because that would be a contradiction." (ibid.)

Such criticisms of the Western culture seem to be continuously suppressed in industrialized countries like Germany. This leads to the persistent appraisal of extremely reductionist sustainability concepts such as the triple bottom line concept and an overemphasis of (technological) innovations in the context of sustainable development[85]. 'Innovations', 'economics', 'science', 'rationality' and 'mathematics' seem to be considered silver bullets for (sustainable) development without realizing that even mathematics is socially constructed, differs from culture to culture and only "reflects[...] a particular way of perceiving time and space, of classifying and ordering the world, [and] of conceiving of what is and is not possible." (Lizcano 2009, p. 30) Lizcano (ibid.) argues that the Western type of mathematics has only "impose[d] itself on [...] [so many] other [...] people" as "it has managed to hide the prejudices and superstitions upon which it is based".

In this context, Meyer-Abich (2001 a, p. 5) considers the "prevailing distinction between rationality and emotion [...] [as] wrong" and dangerous with respect to

[84] This description was surprisingly published in a mainstream innovation management publication.
[85] Due to rebound effects, well intentioned technological innovations can actually prevent changes towards sustainability as shown in chapter 3.

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sustainable development. According to him, “all people, who are driven by a need for rationality, are, in fact, following a very deep emotion”. He further specifies two contrasting “emotional state[s]” and asks for a revelation and open debate of the feelings that underlie our actions by stating that “the results of the prevailing anthropocentric science are [...] a lot more political than politics” as they are based on an “emotion that we [as human beings] were ‘interplanetary’ [and not bound to this planet] and that nature is hostile so that we have to fend it off and exploit the rest of the world.” In contrast to that, he considers “that we are nature that turned into human beings and [that we] live in community with nature. The rest of the world is thus not ‘nature’ external to us but it is our ‘connatural world’” and explains that “these terms [...] [that he is] choosing and using are expressions of [his] different feelings.” (ibid.) Meyer-Abich thus emphasizes that all sustainability policies and individual actions are based on specific emotional understandings of the world and of humans in it, and criticizes all attempts to “debate forms [and concepts] of sustainability on an academic level without questioning the [underlying] human self-concept” (Meyer-Abich 2001 b, p. 301) as well as the idea of man which “determines what we consider right and what we will consequentially do” (Meyer-Abich 2001 a, p. 5) “in the industrial economy”. (Meyer-Abich 2001 b, p. 301) Because Meyer-Abich understands humans as part of nature, he has, like Wolter and Jung (2005, p. 6), not an anthropocentric but rather a “physiocentric” world view and he asks people to finally “become aware of these [different] feelings.” (Meyer-Abich 2001 a, p. 5)

It is the anthropocentric world view which prevails in the industrialized West that actually underlies the extremely resource-intensive life styles that will have to be abandoned in order to foster sustainable development. While Lizcano (2009, p. 30) describes the Western culture as characterized by a “deep fear of nothingness”, Sellmann and Isenberg (2000, p. 12) find that, today, extensive consumption is practiced as a religion and that “the religious [the mystic, cultic or ritual] was not secularized by modernity but [...] determines the [...] [modern Western] culture more than any other factor”. In order to achieve shifts towards ‘transferable life styles’ and sustainable development, processes of cultural (self-)reflection and a revealing of the emotions which underlie individual actions and behavioural (consumption) patterns seem to be required indeed. The sustainability understanding described by the code of conduct of the ecovillage is based on a physiocentric world view and rituals stemming from different religions such as

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morning prayers and meditation sessions might oppose the Western 'fear of nothingness'.

Boeckmann (2007, p. 135) emphasizes the ability of organic farms to "transfer sustainability knowledge" and influence personal "ethic values", for example regarding "physiocentric ethics". (Compare ibid., p. 128.) Besides these processes of "personal learning", Boeckmann (ibid., p. 128) offers multiple other examples of sustainability-related learning processes from a very broad range of "learning fields" (ibid., p. 127)[86]. She describes these processes as parts of different forms of "informal learning" such as "reflexive learning from experiences" which take place on organic farms. (ibid. p. 116) Meyer-Abich (1999, p. 6) also understands organic agriculture as an example of a "blueprint of human life in the wholeness of nature."[87]

On the one hand, Lynedoch EcoVillage and the organic demonstration farm can be seen as places that generate such learning processes for sustainability. According to Nölting and Schäfer (2007, p. 212) organic farms as experienceable entities can demonstrate "concrete examples of sustainable development paths, life styles and production patterns" and offer practical and symbolic impulses for the realization of sustainable welfare." The consumption of organic produce alone can lead to positive rebound effects[88] on a cultural level, experimental work on an organic farm can foster these mechanisms even more.

Additionally, Lynedoch EcoVillage is a very interesting case as it fosters very personal cross-cultural reflections (also about the 'ideas of man') even more than an organic farm alone as the village draws together many people influenced by different cultures and religions and offers special cross-cultural activities. When people come to the ecological settlement, a whole range of different behavioural changes, for example the consumption and/or production of vegetarian and organic produce can be tested. At the same time, people can by choosing

[86] As examples for "content-related learning" she mentions, among other things, knowledge of "ecosystems", "alternative energy generation" and connections between food and health issues. Furthermore, she describes processes of "social learning" that can appear on organic farms such as an increase in the "openness towards alternative life forms" (and life styles), the "communication with fringe groups [...] and people who think differently" and the "responsibility for fellow men". She also finds forms of political and professional learning. (Compare Boeckmann 2001, pp. 127-128)

[87] Also compare the ecological and social benefits of organic agriculture described in chapter 5.1.4.

[88] Compare chapter 3.3.3.

themselves to live in the village even experiment with complete life styles. Whereas behavioural changes and also encounters with different people might appear risky in the individuals' normal surroundings, in Lynedoch EcoVillage very personal 'controlled experiments' can take place that can accelerate the diffusion of 'transferable life styles'. What is furthermore especially interesting about the Lynedoch case is the institutional set up of the Sustainability Institute. This enables successful initiation of communication processes which foster the adoption of organic farming and also 'transferable life styles' based on the use of opinion leaders[89].

In the future, sustainability research should put more emphasis on the role of cross-cultural reflection and the experimentation with alternative life styles. To foster sustainable development, demonstration places such as Lynedoch EcoVillage which allow for inter-cultural and inter-religious discussions and open debates about the 'idea of man' could also be identified or established in industrialized countries such as Germany.

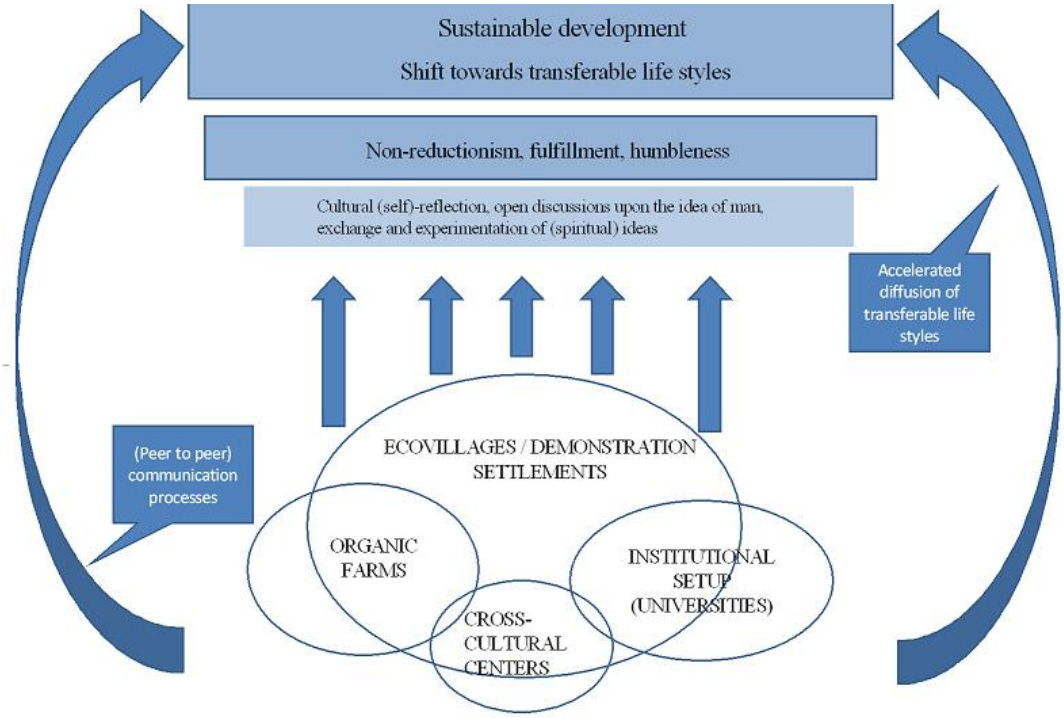
Even though a broad variety of ecovillages, organic farms and cultural centres already exists in Germany, so far, many of these facilities seem to have very limited communication networks. Sustainability research could reveal how the existing structures could be used to foster cultural (self-)reflection and 'transferable life styles' in Germany (and other industrialized countries) or if new 'places of cultural (self-)reflection' needed to be created. These places should be operated by non-profit institutional agents on a regional level in order to remain independent and also be able to identify and make effective use of opinion leaders in (peer) communication networks. As in Lynedoch, universities could help establish such institutional agents. In Germany, the trend toward initiating 'community outreach' programs at universities (compare Brandenburg 2009, pp. 45-47) could be supportive in this context. Sustainability research and teaching in Germany lack visible (academic) role models (and opinion leaders) who not only talk about sustainability-related topics but also live towards 'transferable life styles'. This problem becomes even more dramatic in the context of international climate politics when hundreds of politicians fly all across the planet claiming to

[89] Even though the director of the Sustainability Institute was unaware of Rogers' concept (Compare I 6), different persons related to the institute function as opinion leaders among the group of people that are especially homophile to them and upon which they have the biggest impact.

fight global warming while physically demonstrating the opposite. Academic sustainability centres in Germany should create regional connections to ecovillages or demonstration settlements which make region-based live styles observable and experienceable and which allow for open discussion of both differences and similarities between the different religions, cultures and 'ideas of man'. Furthermore, a movement towards actual interdisciplinary and transdisciplinary research with a stronger focus on psychology, theology and arts without an overemphasis on business administration and science is required.

Figure 11 illustrates how places of cultural (self-)reflection could contribute to sustainable development.

Figure 11 Places of cultural (self-)reflection. Own illustration based on research findings



In Germany as in South Africa, people of multiple religious and cultural backgrounds live together. This should be recognized as a gift and an opportunity for a shift towards 'transferable life styles' and sustainable development. Rogers' concept of the 'Diffusion of Innovation' can serve as a helpful framework for increasing communication between diverse groups of people, and for accelerating such a necessary shift.

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Appendix

Appendix 1: List of interviews and preliminary talks

Nr. of interview (I) or preliminary talk (PT)	Date of interview (Day.Month.Year)	Time of interview	Location of the interview	Interviewee's profession	Length of interview or PT (hours:min.:sec.)
PT 1	16.05.2009	approx. 08:30 AM	Stellenbosch Waldorf School Organic Farmers' Market	see below	00:07:24
PT 2	16.05.2009	approx. 09:00 AM	Stellenbosch Waldorf School Organic Farmers' Market	see below	00:09:55
PT 3	16.05.2009	approx. 09:45 AM	Stellenbosch Waldorf School Organic Farmers' Market	see below	00:02:34
I 1	02.06.2009	9:00 AM	Sustainability Institute	Organic farmer cooperating with the Sustainability Institute and living at Lynedoch EcoVillage	00:54:57
I 2	04.06.2009	approx. 03:00 PM	At the small-scale farmers' farm	Small-scale farmers	00:16:49
I 3	05.06.2009	2:30 PM	Sustainability Institute	Programme Co-ordinator of the Sustainable Agriculture Program at the Sustainability Institute	00:54:39
I 4	08.06.2009	10:00 AM	Sustainability Institute	Coordinator of the Stellenbosch Waldorf School Organic Farmers' Market	00:52:10
I 5	12.06.2009	12:00 PM	Sustainability Institute	Consultant for bio-dynamic agriculture in the BDAASA, Coordinator of the Stellenbosch Waldorf School Organic Farmers' Market	01:08:23
I 6	17.06.2009	12:30 PM	Sustainability Institute	Academic Director of the Sustainability Institute and Programme Coordinator: Sustainable Development Planning and Management in the School of Public Management and Planning, University of Stellenbosch	01:25:42
I 7	17.06.2009	5:45 PM	Farmer's office	Conventional farmer	00:29:38
I 8	24.06.2009	3:15 PM	Bio-dynamic farmer's office	Bio-dynamic farmer	00:29:11
I 9	26.06.2009	1:30 PM	Farmer's office	Conventional farmer	00:34:56

Appendix 2: Interview questions and analysis variables (Example of an interview with a farmer)

Analysis Category / Variable	Time of question (hour.min. sec.)	Question
Introduction		
Range of Icebreaker Questions for example:		Did you have problems finding me? How was your trip? Did the students come to work with you this morning?
Description of Interview Purpose, permisson of taping	00.01.00	I am a student from Germany doing research for my Master thesis here. I would like to find out more about agricultural methods within this region and the influence of the Sustainability Institute on those. If possible would you please answer my questions. Please let me know if you do not understand a question, then I can explain it to you. I would like to tape our interview and use it for my Master's thesis. Is that ok for you?
Questions:		
	00.01.33	Are you engaged in agricultural production? If not how are you related to agriculture in the Stellenbosch region?
Individual way of farming	00.01.44	Please name one to three key words that you would use to describe the way you are farming at the moment, for example industrial, conventional, traditional, bio-dynamic, organic or other terms.
Adoption/Non-Adoption	00.02.10	Since you have started farming have your procedures and methods of farming significantly changed?
Understanding of organic farming	00.03.45	For you what are the key elements of your way of farming? Name about three to five elements such as fertilizers, irrigation, crop rotation, organic manner, tracktor use etc. Which of these do you consider being organic farming methods?
Adoption/Non-Adoption	00.06.40	Do you consider yourself being an organic farmer?
Adoption/Non-Adoption	00.06.47	Please name some of the agricultural products that you produce and tell me which of these do you consider being organic?
Adoption/Non-Adoption	00.07.48	Of the organic products, how many percent have been certified?
Distribution system	00.08.56	Where do you sell your products? Are they being exported to other countries?
Relative (Dis)Advantage	00.09.40	For you, what are the benefits (or shortcomings) of organic farming methods and why are you (not) using them?
Compatibility	00.12.00	When you adopted the organic methods, was it a struggle or was it easy to implement them on your farm? And Why? (Would it be a struggle or easy to implement organic methods on your farm? And Why?)
Complexity	00.13.16	Do you think organic farming methods are hard or easy to understand? Which aspects especially?
Trialability	00.14.26	Were you able to first try the organic methods somewhere else? Where?
Observability	00.17.55	Did you observe somebody else using these methods? Who and when?
Time		
Innovativeness	00.19.03	When did you use the new (organic) methods for the first time? (Month and year)

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Personal variables (communication channels)		
Mass media exposure TV	00.20.30	Do you have a TV? How many hours per week do you watch TV?
Mass media expos. radio	00.20.47	Do you have a radio? How many hours a week do you listen to it?
Academic Journals	00.21.12	Do you read Academic Journals? How frequently? You can name them if you want.
Magazines	00.21.23	Do you read Magazines? Which ones and how frequently?
Books	00.21.40	Have you been using books to gain knowledge about agriculture?
Training	00.21.55	Who has been training and advising you in farming? Did you have a menthor, a relative or a friend teaching you? Name some of those people.
training programs	00.21.55	Have you attended training programs on organic farming? When and by which institutions?
Sustainability Institute	00.27.01	Was the Sustainability Institut, Mark Swilling or Eve Annecke involved in your training? How?
Opinion Leadership		
"	00.28.29	Have other people sought you for information and advice about agricultural methods?
"	00.28.32	Approximately how many people have come to you for advise? Name some of them.
"	00.32.52	Are your friends among the people who have sought advise about agriculture? If so name those friends.
"	00.33.38	How often do you travel more then 150 km per month?
"	00.33.52	How often do you travel overseas per year? (Number of month spent overseas per year.)
Reconstruction of diffusion network	00.34.12	In 2007, the large wine company published its macro goals for a 10 year vision claiming that by 2017 "all viable farmland [should be converted] to organic farming practices." They say this would "mean converting up to two hundred hectares, of which sixty hectares is planed with wine grapes".
	00.34.36	Do you know about this goal? What do you think about this goal?
Spontanous clarification question	00.36.10	And the advice that you give them is only for the farm workers? (On the piece of land that they gave to their farm workers.)
Reconstruction of diffusion network	00.36.22	In your opinion what were the reasons that made them determine such a goal?
Reconstruction of diffusion network		(Not asked as already answered before: Do you think the Sustainability Institute and/or Mark Swilling played a role in this context? To what extent and how?)
Reconstruction of diffusion network	00.37.24	Every saturday, there is an organic farmers' market at the Waldorf School in Stellenbosch. Please describe your perception on this market or your relation to this market in brief.
Reconstruction of diffusion network	00.40.10	Do you think the Sustainability Institute and Mark Swilling are playing a role in the diffusion of organic farming within the region? To what extent and how?
Reconstruction of diffusion network	00.41.05	(Spontanous question: And do you know if there are other projects that the Sustainability Institute is involved in which might trigger more diffusion? Where do you see this region in two or three years?
Social System	00.43.56	From your own perspective would you please briefly describe the social circumstances that characterize your neighbourhood and the town you live in?
Reconstruction of diffusion network	00.47.45	(Spontanous question: Is there also some kind of cross-subsidization? Maybe you can describe that in connection to the land that you get?)
Status and other personal variables		
Formal education	00.48.52	How many years of formal education have you experienced?
"	00.49.07	Are you holding an academic degree? Which one?
Land exposure	00.49.29	If you own land, how many hectars do you own?
"	00.49.54	Regardless of ownership, how much land do you have available? (answered before)
"	00.50.38	Has your individual access to land changed over time and why?
Farm size		How many percent of the available land do you use for agriculture or farming?
Sufficiency	00.51.32	Could you feed yourself by your products? And your family? Do you make a surplus?
Income		How many percent of your income is generated by the agricultural products?
Ethnicity	00.52.12	Which languages do you speak?
Happyness	00.52.34	If you could choose today would you prefer living a different lifestyle then your own?
	00.52.19	Are you happy and content with what you are doing?
Age	00.53.27	How old are you?
Perception on agriculture and religion	00.53.53	Do you see any connection between agriculture and religion or spirituality? How important is that for you?
		Thank you very much for your support.

Appendix 3: Interview questions and analysis variables (Example of an interview with a member of the Sustainability Institute)

Analysis Category / Variable	Time of question (seconds):	Question
Reception / Intro		Hello. Thank you very much for taking some time.
Range of Icebreaker Questions		Could you recover from your trip last week? Would you like some snacks?
Description of Interview Purpose and permission for taping		You will have to speak into this recorder. You know that I am a student from Germany doing research for my Master thesis here. I would like to find out more about the diffusion of organic agriculture within this region and the influence of the EcoVillage and the Sustainability Institute on it. Please let me know if you do not understand a question, then I can explain it to you. I would like to tape our interview and use it for my Master's thesis. Is that ok for you?
History of Lynedoch EcoVillage and the Sustainability Institute	<<0001>>-<<0090>>	The first questions deal with the evolvement of the EcoVillage and also the evolvement of the Sustainability Institute. I have been reading about the history of the EcoVillage online. I would love to know, however, more about your personal view on the evolvement and history of the ecovillage, especially on the development of this kind of vision for it. And to which extend has strategic planning of the village been involved. Who were the key players in this process? When did the University-NGO-Alliance evolve and would you call it University-NGO-Alliance? Please give a personal impression about that time.
History of the SI	<<1053>>-<<1065>>	Do you know of any other significant University-NGO Alliances that existed before the one here in Stellenbosch? Which ones?
Reconstruction of diffusion network	<<1189>>-<<1197>>	Have you been initiating other visionary projects before Lynedoch EcoVillage?
Reconstruction of diffusion network	<<1298>>-<<1304>>	Have you received any education regarding entrepreneurship, leadership and innovation?
Reconstruction of diffusion network	<<1404>>-<<1409>>	Did you intentionally use this knowledge for your activities in the Lynedoch region?
Spontanous clarification question	<<1481>>-<<1491>>	Are you familiar with Rogers' book Diffusion of Innovations? Have you intentionally used knowledge from this book?
Reconstruction of diffusion network	<<1563>>-<<1578>>	Can you tell me where you were trained, where you were receiving information from regarding broader sustainability issues or when you got conscious about sustainability aspects?
Understanding of organic agriculture at the sustainability institute	<<1978>>-<<2031>>	Now I would like to talk about Organic Agriculture within the Lynedoch region. Within my research I make distinctions between different types of agriculture such as industrial, conventional, traditional, bio-dynamic and organic farming. Could you first give me a brief description of the current state of agriculture within the region, from your viewpoint. Which are key elements that should be promoted regarding agriculture within this region?
Reconstruction of diffusion network	<<2228>>-<<2245>>	Do you remember when you became aware of organic farming for the first time? From where did you mainly receive information regarding organic agriculture and in which context? Was that in connection with the Waldorf and Steiner philosophy?
Spontanous clarification question	<<2362>>-<<2367>>	So before that time you were not really conscious about agriculture?
Spontanous clarification question	<<2372-<<2375	And also considering the consumer choices?
Reconstruction of diffusion network	<<2485>>-<<2497>>	Now I would like to talk about Organic Agriculture at the large wine company and your role. During which years were you and Eve Annecke employed there?In which positions were you working then?
Reconstruction of diffusion network	<<3056>>-<<3087>>	Was there an exchange of ideas? Do you see the flow of knowledge coming from the large wine company or vice versa?
Reconstruction of diffusion network	<<3168>>-<<3175>>	What does Sustainability mean to the owners of the large wine company? Does the bio-dynamic farm play a role in this? When did they start farming bio-dynamically?
Reconstruction of diffusion network	<<3301>>-<<3305>>	Which people might have influenced the bio-dynamic farmer and his wife so that they are now engaged in bio-dynamic farming?
Spontanous clarification question	<<3341>>-<<3349>>	And who is Avis?
Spontanous clarification question	<<3448>>-<<3452>>	Do you think I should rather talk to ... then to ...?
Spontanous clarification question	<<3503>>-<<3524>>	Why did the company rent out land to the organic farmer for the first time? What was the intention behind that? Land reform? Municipality?
Spontanous clarification question	<<3659>>-<<3671>>	And then it was you, the Sustainability Institute that picked out the organic farmer to support him further? (Do you actively support him?)
SI and use of opinion leaders	<<3695>>-<<3704>>	Is there an attempt to turn the farm to a demonstration farm?
SI as a chance agent	<<3780>>-<<3785>>	Are you guiding these contacts at the Sustainabiltiy Institute?

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Communication channels	<<3804>>-<<3806>>	And what is the relationship between the Sustain. Institute and the large wine company today?
Spontanous clarification question	<<3862>>-<<3877>>	Is the SI criticising wine as an elite product?
Communication channels	<<3974>>-<<3995>>	Now I'd like to talk about the farmers' market at the Waldorf School. What was your role within the development of this market? Whose vision was playing a key role for the way the market was organized? What was this vision about?
Reconstruction of diffusion network	<<4239>>-<<4267>>	Which other persons were involved in the diffusion of organic agriculture within the region? And if you can trade the influences back to one or two people who would those be?
SI as a chance agent	<<4505>>-<<4506>>	What are future projects at the SI considering organic agriculture?
Personal variables (communication channels)	Between <<4618>>-<<4731>>	
Mass media exposure TV	"	Do you have a TV? How many hours per week do you watch TV?
Mass media expos. radio	"	Do you have a radio? How many hours a week do you listen to it?
Academic Journals	"	Do you read Academic Journals? How frequently? You can name them if you want.
Magazines	"	Do you read Magazines? Which ones and how frequently?
Books	"	Have you been using books to gain knowledge about agriculture?
Internet	"	Do you have internet access? How many hours per week do you use internet access?
Socio-econ. Status and other personal variables	Between <<4732>>-<<4905>>	
Formal education	"	How many years of formal education have you experienced?
	"	Are you holding an academic degree? Which one?
Land exposure	"	If you own land, how many hectars do you own?
Travel frequency	"	How often do you travel more then 150 km per month?
	"	How often do you travel overseas per year? (Number of weeks spent overseas per year.)
Ethnicity	"	Which languages do you speak?
Happyness	"	If you could choose today would you prefer living a different lifestyle then your own?
	"	Are you happy and content with what you are doing?
Age	"	How old are you?
Perception on agriculture and religion	"	Do you see any connection between agriculture and religion or spirituality?
Spontanous clarification question	<<5011>>-<<5017>>	Can you tell me what this Schumacher collegue is?
		Thank you very much for your support.