HUMBOLDT-UNIVERSITÄT ZU BERLIN

Faculty of Life Science

Ecovillages as Change Agents of Societal Transformation - Exploring a framework to assess their transformative impact

thesis in the study program: Integrated Natural Resource Management

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Complexity

“[...] complexity and context are essential for operating in many different situations. In order to make sure decisions are relevant, we have to understand the context of decisions, and the complexity of the situation. My take on complexity is that it is a key set of concepts which are essential for understanding how the world works” (OSTROM in RAMALINGAM 2012).

Theory

“Obviously, our theories will always be simpler than the worlds we study, or we are trying to reproduce these worlds rather than a theory of these worlds. Given the complex, nested systems of the biophysical world, however, we need to develop a social science of complex, nested systems” (OSTROM et al. 2011).

Transition

mid-15century, from Latin transitionem (nominative *transitio*) "a going across or over" (ETYMONLINE.COM 2015).

Transformation

1400, from Old French transformation and directly from Church Latin *transformationem* (nominative *transformatio*) "change of shape" (ETYMONLINE.COM 2015).

To sustain

from Latin *sustinere* (support, uphold the course of, keep in being) and from *sub* (up from below) and *tenere* (to hold) (STEVENSON 2010).

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1 Introduction

In the light of persistent environmental problems such as biodiversity loss, climate change, ground water and soil degradation (JÄNICKE et al. 2001) as well as instability of socio-economic systems, a change from dominant regimes towards resilient, sustainable systems seems ever more necessary.

In 2011, the independent scientific Advisory Council on Global Change (WBGU) advising the German Federal Government, called for the necessity of structural change to live within planetary boundaries – named the Great Transformation (WBGU 2011). In its report, the WBGU highlights the role of change agents "pro sustainable development [with] corresponding strategies" that should be supported by a proactive state (WBGU 2011: 5). Its post-Rio 2012[1] press release asks them, "Pioneers, please take over" as the times of large-scale international meetings with no relevant outcome has past (translated, WBGU 2012).

Ecovillages are change agents as models of sustainable lifestyles implementing structural change and intending a political statement. They are intentional communities with larger settlement structures designed and owned by their inhabitants, oriented to live within ecological boundaries and fulfill their socio-cultural needs of community, autonomy, participation and personal development. As complex socio-ecological systems they show a diversity of innovative sustainable practices, institutions and systems of these: They share common goods, property and sometimes income as well as norms and values of a sustainable lifestyle. Established ecovillages show that sustainable societal systems are possible.

There is potential that these change agents can alter the 'mainstream' regime. Ecovillages emerged from civil society and have formally and internationally organised, interact more intensely with the political and scientific sphere and offer increasingly popular seminars to the public. However, their immaterial aspects of community and autonomy as well as their diverse approaches towards sustainability make their impact complex to assess. Recent research acknowledges ecovillages as change agents contributing to a societal transformation by a "silent revolution" creating small-scale places of resilience (KUNZE 2015). However, no framework allows assessing their impact on changes to the interlinked elements of the

[1] Third international United Nations Conference on Sustainable Development in Rio de Janeiro.

established regime, centering them as complex socio-ecological systems and diagnosing barriers and opportunities to overcome the (re)production of unsustainble practices.

This thesis developed such a framework using concepts on multiple levels of change (GEELS 2011a), complex socio-ecological systems (OSTROM 2006, POTEETE et al. 2010) and practices-as-entities (SHOVE et al. 2012). It is explored how to integrate the change agent's valued stable practices that formed institutions (rules, norms, forms of organisation). The transformative impact of a change agent is conceptualised as a process of diffusion (SCHOT et al. 2008) of its innovative socio-ecological (ZAPF 1989, CAULIER-GRICE et al. 2012) practices and institutions. Finally, the case of Ökodorf Sieben Linden is analysed in a mixed-method approach to show the explanatory potential of the developed framework.

1.1 Research Objective

The objective of this research is a conceptual framework that allows assessing the (potential) transformative impact of change agents such as ecovillages. It is aimed at researchers, decision-makers in environmental policy making as well as ecovillage actors in institutional or representative positions.

This assessment could help diagnose barriers and opportunities for the change agent's transformative potential. The thesis provides a definition for the transformative impact of a change agent as well as variables and indicators that could be used for its assessment. Analysing one case with the help of the framework shows if the theoretical concept can help identify patterns in the observed phenomena. This could contribute to a wider political and scientific acknowledgement of communal socio-ecological niches with sustainable solutions and help to understand their function for society.

An assessment of the impact is not the main objective of this study but its exploration, conceptualisation and application aim at providing a reliable first basis for an assessment.

1.2 Research Questions

It is hypothesised that ecovillages are change agents impacting societal transformation towards sustainability. How can this be understood, conceptualised and assessed? The main research questions are subdivided by guiding questions:

1. What are the dynamics of societal transformations?

- What are prominent theories and frameworks in transformation research?
- What are actors, characteristics, mechanisms, barriers and drivers of transformations?

2. How is the transformative impact of a change agent defined and how can it be conceptualised?
   - What role do change agents play in transformation?
   - How can their transformative impact be defined?
   - Which variables and respective indicators can be used to assess the transformative impact of change agents?

3. What are the common characteristics of ecovillages as change agents and which of these could have an impact on societal transformation?
   - What are established ecovillages in Germany?
   - What are their common characteristics?
   - Which qualities and characteristics make them a change agent?
   - How could their impact on societal transformation be assessed?
   - What are barriers and opportunities for ecovillages to achieve wider impact?

A conceptual framework is derived from these questions.

4. Does the conceptual framework show patterns that indicate a transformative impact of one exemplary case? Do the empirical findings show further relevant variables for assessing the change agent's transformative impact?

To address the research questions, this thesis explores mechanisms and characteristics of ecovillages that could work as variables and indicators for assessing their transformative impact. For a better understanding of these complex actors and larger change processes, concepts on transformation and complex socio-ecological systems are reviewed (see Chapter 2.2). From this, a first conceptual framework is developed (see Chapter 2.5). After outlining the methodology used, Chapter 4 describes ecovillages and identifies established German ecovillages and their common practices and institutions. In Chapter 5, potential indicators for the assessment of the transformative impact are discussed with the help of the framework variables. One case is analysed with the help of expert interviews, participatory observations, a media content analysis and an online survey with ecovillage seminar guests (see Chapter 6). Finally, the results are discussed, recommendations are given and areas for future research are suggested (see Chapter 9).

2 Literature Review & Framework Deduction

The following chapter gives an overview of definitions as well as frameworks and theories in transformation and sustainability research which are the base for a conceptual framework in this thesis.

2.1 Research Area & Definitions

Transition and transformation are often used interchangeably. Transformation or transition research of the 21th century is mainly concerned with a radical system change *towards* sustainability – a structural change towards a sustainable society within planetary boundaries (WBGU 2011, GEELS 2002, GRIN et al. 2010, GEELS 2011b). A **societal transformation** is the change from one stable system of interlinked configurations to a newly established regime (GEELS 2011b). Inertia – being stuck in one configuration by (re)producing activities – could be overcome by better knowing the interlinked elements of the system (ibid.) Sustainable solutions are available, however they often are blocked by existing investments or other lock-ins or practiced in niches (ibid., GRIN et al. 2010).

Karl Polanyi, political economist, coined the word transformation with his 1944 publication "The Great Transformation" which looked back at political regime changes towards a democracy as transformations (POLANYI 1944). More recently, transformation research concentrated on a regime change towards sustainability. A distinction is made between transformation research, that tries to understand transformation processes and its causes, and transformative research and transition management that actively supports the process of designing societal change (WBGU 2011, SCHNEIDEWIND et al. 2013). The normative aspect – the transformation has a direction and shall be designed - is a challenge for science self-understanding (SCHNEIDEWIND et al. 2013, WISSEN 2013, SCHNEIDEWIND et al. 2014). The direction of societal needs has to be questioned constantly as its goal is the complex, partly imprecise or far-reaching 'sustainability'.

For this research, **sustainable development** is in line with the Brundtland report to meet "the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987: 37) and is approached from several dimensions - economy, society and environment (IUCN 2006: 3). More specifically, sustainable development means to live within ecological boundaries by protecting the climate and be in line with the two degree goal of global warming by 2050, decarbonisation of energy systems and the global restructuring of

the energy, land use and urban systems without decreasing their performance (WBGU 2011). Sustainability has common good[2] characteristics – there is rivalry in its 'consumption' but limited exclusion of others from it. Hence, there is no incentive for private actors to invest but rather social dilemmas and free riding problems that exist. To internalise these externalities, a common approach is the call for public authorities (HARDIN 1968, OLSON 1971 [1965]). More recent research has shown that also groups of people can successfully self-organise and manage resources in a collective sustainable way (OSTROM 1990, 2006) which is used in this thesis to conceptualise ecovillages as complex socio-ecological systems aiming for sustainability.

Rebound effects are an overcompensation of saved resources by increased consumption, e.g. when new technology increases energy efficiency but this is offset by behaviour changes (IRREK 2011). This effect showed more so that a change in personal attitude or culture is necessary – social rather than just technological innovations - for a sustainable life. Hence, recent publications on transitions have more of a social science 'lens' and are focused on the empowerment of change agents and a transformative discourse (AVELINO 2011, SEYFANG et al. 2012, SCHNEIDEWIND et al. 2013, KUNZE et al. 2014, SCHNEIDEWIND 2014).

Change agents are role models of sustainability with corresponding strategies and play a major role for systemic change (WBGU 2011). As key players but niche actors, they must "move away from a marginalised existence and increase their impact through widespread inclusion in social routines" (WBGU 2011:7). The proactive state should assist them (ibid.). The WBGU draws the picture of change agents as lighthouses radiating - providing orientation and security and showing the way with climate-friendly solutions. Apart from the awareness that resistances are part of the change process, change agents can further ensure that four promoter roles on power, expert knowledge, relations and process are filled out (KRISTOF 2010). Further success factors are a high qualification, social competence and motivation of change agents. On the other hand, mayor challenges are the process of learning, identifying factors and patterns of successful change as well as having supportive political framework conditions (ibid.).

[2] Types of goods: 1) private goods where exclusion is easy but consumption by an individual subtracts from the availability of other consuming it e.g. food; 2) common-pool resources where subtractability occurs and exclusion is difficult e.g. a communal pasture; 3) club goods where subtraction is low and exclusion is easy e.g. daycare centres; 4) public goods where consumption is not subtractive nor is exclusion possible e.g. air (OSTROM et al. 1977).

The assessment of a change agent's **transformative impact** is explored and defined in this thesis with the help of a conceptual framework. It is proposed to be a change agent's contribution to societal change, its innovative socio-ecological practices and institutions, its points of interaction with a wider society and the effect these have (see Chapter 2.5).

Assessments are diagnostic, process-oriented tools identifying areas of improvements rather than evaluations which are product-oriented and result in a final grade or score. Impact assessments are used to support policy-making by stating a problem, looking at the impact of potential policies as well as its advantages and disadvantages (EU COMMISSION 2015: 17). The framework developed in this thesis looks more at the impact a change agent could have on the change of a system. This can help diagnosing areas of improvement but is not focusing policy assessment.

Innovations are different or new approaches, practices, products and processes that are not widely adopted (ROGERS 1962). They promise new solutions. For social innovations multiple definitions exist as the research area is relatively new and cross-sectoral (ZAPF 1989, CAULIER-GRICE et al. 2012, ADERHOLD et al. 2014, Chapter 2.4.2). One of the earliest German publications by sociologist Wolfgang Zapf defines them as "new ways to reach goals, especially new forms to organise, new regulations, new lifestyles that change the direction of social change, solving problems better than earlier practices and hence are worth imitating and institutionalising" (translated, ZAPF 1989). A classic in innovation research is the "Diffusion of Innovation" by Everett M. Rogers, sociologist in communication studies, summarising all knowledge available at that time on innovation processes with a focus on agricultural technology developments (ROGERS 1962). Two ideal types of norms are conceptualised: traditional and modern norms which determine the innovativeness opinion of leaders (ibid.: 72). An adoption process can be distinguished by different stages (awareness, interest, evaluation, trial, adoption, discontinuance) and different groups of consumers are defined depending on the time of adoption of an innovation (innovators, early adopters, early majority, late majority, laggards) (ibid.). The innovation's diffusion is mainly influenced by the innovation itself, communication channels, timing, and the social system (ibid.). The theory is helpful for analysing single innovations and has inspired Strategic Niche Management (see Chapter 2.4.3). The importance of communication channels is reflected in 'points of interaction' in this thesis framework (see Chapter 4.4).

Niches are the places where radical innovations are generated or practiced (GEELS 2002, 2011b). Here, sustainable solutions are available, however they often are blocked by existing investments or other lock-in (GEELS 2011b, GRIN et al. 2010). Ecovillages are such niches, also called grassroots or community-based initiatives referring to their bottom-up, unconventional or communal character. As complex socio-ecological systems, a framework for their assessment is explored in the following chapter.

2.2 Frameworks on Complex Systems & Transition

Frameworks provide an overview of the significant entities and their interconnections. They provide orientation, a common language for case study comparison and set the context of a research (PUNCH 2005: 53). In transition or transformation research, a shared conceptual model or framework to better understand transition and its relevant variables is still emerging. "Transitions, with their broad scope, long time-horizon and intrinsic complexity, are difficult to grasp in a single simulation model" (HALBE et al. 2015). A widely accepted mid-range[3] theory that can serve as a transition framework is the system-oriented Multi-Level Perspective (MLP) (GEELS 2011a). For a 'grand' framework other research areas such as Institutional and Resource Economics with experience in dealing with complexity, multi-level and -actor interaction as well as path-dependencies can be helpful (HALBE et al. 2015). Elinor Ostrom's framework for socio-ecological system analysis (SES Framework) shares characteristics with transition research models. It could be adopted to a "multi-tier transition framework" using e.g. the MLP for the upper tier and develop a shared understanding of the micro-level variables and processes at the lower tier (HALBE et al. 2015: 205).

The following chapter summarises on a basic level the influential frameworks in Institutional and Resource Economics and Transition research deducting a conceptual framework.

2.2.1 Different Dimensions of Stability: The Multi-Level Perspective

The Multi-Level Perspective (MLP) was developed by Frank W. Geels to understand socio-technological transitions on multiple dimensions – their cause, patterns and mechanisms. Social variables such as user practices, regulations or culture play a major role in the MLP:

[3] Mid-range theories do not explain every aspect of the topic under investigation and admit that there are still areas of ignorance. They "consist of limited sets of assumptions from which hypotheses are logically derived and confirmed by empirical investigation. These theories do not remain separate but are consolidated into wider networks of theory. [...] Rather than pretend knowledge where it is infact absent, it expressly recognizes what must still be learned in order to lay the foundation for still more knowledge" (MERTON 1968: 68-9).

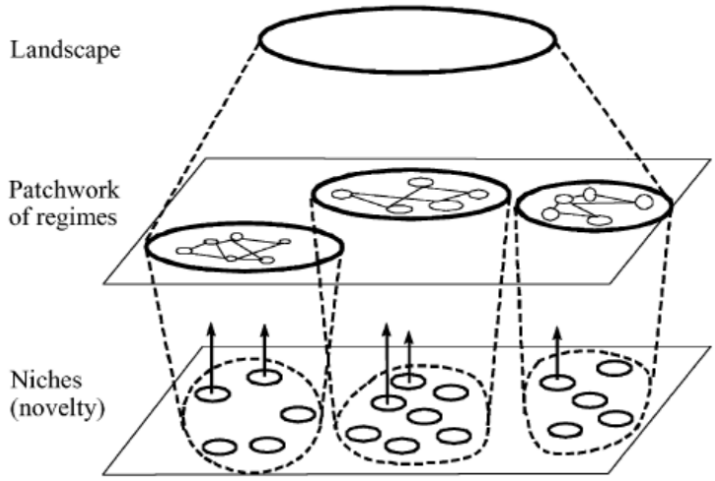
"Only in association with human agency, social structures and organizations does technology fulfill functions" (GEELS 2002: 1257). The MLP is derived from historical case studies. It is illustrated with qualitative longitudinal technology case studies such as the transition from sailing to steam ships. In this case of transitions in the transportation sector, heterogeneous elements like physical artefacts, skills, organisations, natural resources, scientific elements and legislative artefacts are linked. A socio-technical transition is a change from one such a socio-technological interlinked configuration to another.

The MLP describes transitions within a set of three levels of different stability: landscape, regimes and niches (GEELS 2002, 2011b). In the **landscape** are the deep structural trends – the stable context for interacting actors - emerging from the material and spatial arrangements of human infrastructures and containing "a set of heterogeneous factors, such as oil prices, economic growth, wars, emigration, broad political coalitions, cultural and normative values, environmental problems" and demographic trends (GEELS 2002: 1260). Landscape changes occur very slowly.

The **regime** consists of the established practices and (in)formal rules that enable and constrain activities within communities, that are reproduced and stabilise the present systems. Transitions are "defined as shifts from one regime to another" (GEELS 2011a: 26). The regime consists of seven dimensions: technology, user preferences, markets, culture, industry, policy and science. Regime rules are e.g. regulations, lifestyles and cognitive routines.

Niches are source of radical innovations and learning processes. They provide the 'seeds of change' (GEELS 2002: 1260). Change agents such as ecovillages can be understood as socio-ecological niches. Strategic Niche Management (see Chapter 2.4.3) describes internal niche processes necessary for niche development.

Figure 1: Multiple levels as nested hierarchy



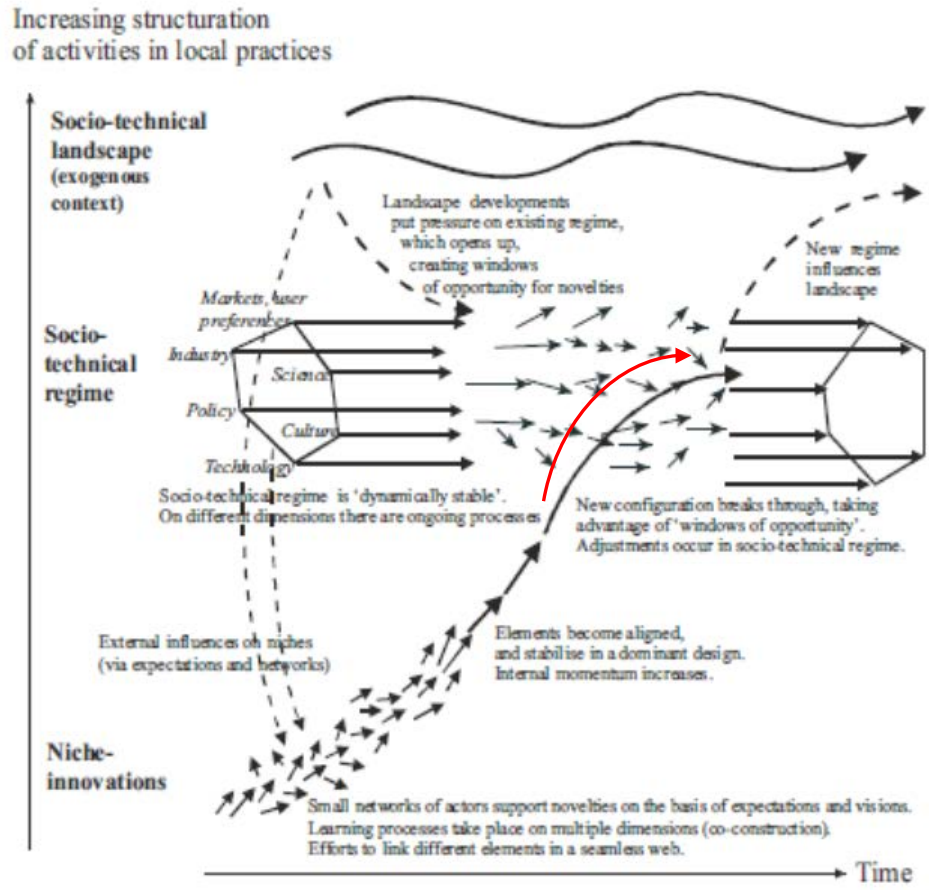
Source: GEELS 2002: 1261

Lock-in effects stabilise the existing regimes. They occur through economies of scale, sunk investments in industry, shared beliefs, power relations in the political sphere or lifestyles of households (ibid.; GRIN et al. 2010). Innovations can occur "incrementally, with small adjustments accumulating into stable trajectories" on all regime dimensions (GEELS 2011b: 27).

Shifts in the landscape or tension in the regime can create **windows of opportunity** for innovations to break out of the niche level. The general transition pattern is that: "(a) niche-innovations build up internal momentum, (b) changes at the landscape level create pressure on the regime, and (c) destabilization of the regime creates windows of opportunity for niche innovations" (GEELS 2011b: 29). History has shown that transitions often occur through developments at the landscape level that exert pressure on the regime. Niche success depends on the level of its development and correspondence to the regime. Niche innovations can also gain high internal momentum because of e.g. resource investments, cultural enthusiasm or political support (ibid.).

Figure 1 shows transitions from a Multi-Level Perspective including a red arrow that indicates the **transformative impact** of niches when altering the existing regime.

Figure 1: The Multi-Level Perspective on transitions and a niche's transformative impact (red arrow) altering the existing regime



Source: adapted from GEELS 2002: 1263; GEELS 2011b: 28

Agency and the normality of everyday life are not central in the MLP (GEELS 2011b: 30). An analysis of two bottom-up sustainability cases with the MLP and Social Practice Theory shows that that besides its vertical analysis, a horizontal analysis of specific practices and how they cut across multiple regimes in everyday life is necessary when analysing civil society groups (HARGREAVES et al. 2011). Before reviewing theories on social practices-as-entities of a change agent (see Chapter 2.4.1), understanding its complexity on multiple levels and centralising agency is deducted from frameworks in the forthcoming chapters.

2.2.2 Analysing Complex Socio-ecological Systems: The SES Framework

The multi-tier, ontological[4] SES Framework is a diagnostic tool for socio-ecological systems (SES). It is derived from research on the Commons[5]. Socio-ecological systems are linked, multivariable, evolving and non-linear. The framework reduces the complexity of human-nature interaction by helping to identify multiple actors and levels as well as the causal relationships between the systems attributes (OSTROM 2006). It breaks down the systems into smaller and smaller subsystems. These different levels are called tiers. At the highest level the framework shows broader contextual variables such as the resource system, its users and their governance system. They are set into relation with each other through their interactions and outcome.

For a detailed diagnosis of a socio-ecological system, the attributes of the framework are broken down into second-tier variables (see Figure 2) and can be broken down even further. Not all sub-systems can be found at every case. The variables rather serve as a diagnostic guide on what has proven as of relevance in many cases of (sustainable) natural resource management. The SES allows identifying the combination of variables relevant for individual cases. Over time, with different incentives and actions under different governance systems, interactions and outcomes vary. Resource users and their official that understand the system's feedback can craft the necessary adaptive policies and reach a preferred outcome.

For this thesis, the ecovillage is seen as a socio-ecological system. The ecovillage community manages a diversity of resources, aims to act sustainably and influences others through their action but is also influenced by its context. The structure of the SES might help in better understanding their activities and diagnose their impact on multiple levels.

[4] Ontological frameworks show the entities that exist in the research context. Ontology studies the nature of reality and asks: what is the base of our knowledge?

[5] Commons are common pool-resource and public goods where exclusion of consumption by others is not easy (e.g. pastures, lakes, forests). For these types of goods, social dilemmas such as free riding and degradation of resources can occur, leading to sub-optimal outcomes for a group of people trying to self-organise.

Figure 2: The SES Framework with second-tier variables of its contextual variables

Social, Economic, and Political Settings (S) S1- Economic development. S2- Demographic trends. S3- Political stability. S4- Technology. S5- Government resource policies. S6- Market incentives. S7- Media organization.	
Resource System (RS)	Governance System (GS)
RS1- Sector (e.g., water, forests, pasture, fish) RS2- Clarity of system boundaries RS3- Size of resource system* RS4- Human-constructed facilities RS5- Productivity of system* RS5a. Indicators of the system* RS6- Equilibrium properties RS7- Predictability of system dynamics* RS8- Storage characteristics RS9- Location	GS1- Government organizations GS2- Non-government organizations GS3- Network structure GS4- Property-rights systems GS5- Operational rules GS6- Collective-choice rules GS6a-Local Collective Choice autonomy* GS7- Constitutional rules GS8- Monitoring & sanctioning processes
Resource Units (RU)	Users (U)
RU1- Resource unit mobility RU2- Growth or replacement rate RU3- Interaction among resource units RU4- Economic value RU5- Size RU6- Distinctive markings RU7- Spatial & temporal distribution	U1- Number of users U2- Socioeconomic attributes of users U3- History of use U4- Location U5- Leadership/entrepreneurship* U6- Norms/social capital* U7- Knowledge of SES/mental models* U8- Dependence on resource* U9- Technology used
Interactions (I) → Outcomes (O)	
I1- Harvesting levels of diverse users I2- Information sharing among users I3- Deliberation processes I4- Conflicts among users I5- Investment activities I6- Lobbying activities	O1- Social performance measures (e.g., efficiency, equity, accountability) O2- Ecological performance measures (e.g., overharvested, resilience, diversity) O3- Externalities to other SESs
Related Ecosystems (ECO) ECO1- Climate patterns. ECO2- Pollution patterns. ECO3- Flows into and out of focal SES.	

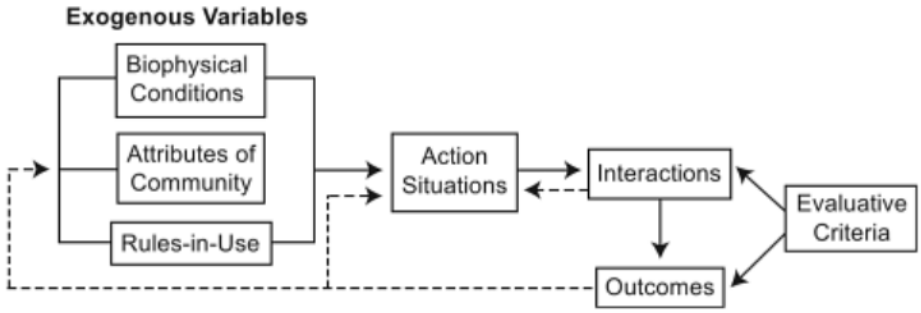
Source: OSTROM 2006

2.2.3 Focus on the Change Agent & Action Situation: The IAD Framework

To focus the SES Framework on an action arena where innovation is practiced by a change agent, the Institutional Analysis and Development (IAD) Framework is combined with it. The IAD Framework was developed to better analyse rules and factors that influence sustainable management of the Commons or a preferred outcome (OSTROM et al. 1994). Compared to the SES it is somewhat 'simpler' and more condensed by not specifying sets of second-tier variables. Central in the IAD is the action arena with an action situation and actors (see Figure 3). It is directly influenced by the exogenous factors of a resource which are represented in the left cluster: bio-physical characteristics of the resource system, attributes of

the community (users, providers and policymakers) as well as the rules-in-use (operational, collective-choice and institutional rules[6]) which may change over time.

Figure 3: Institutional Analysis and Development (IAD) Framework centering action situations



Source: POTEETE et al. 2010: 41

The right cluster consists of the patterns of interactions, the outcomes and their evaluative criteria. Undesired outcomes in natural resource management can be free riding or other social dilemma as there is e.g. low monitoring or insufficient rules-in-use. The action arena can be analysed for its actors and their roles, positions as well as cost and benefits (OSTROM et al. 2011: 323). Interactions and outcomes can be evaluated by criteria such as equality, sustainability or accountability.

The IAD and the SES shall be used as a basic frame for the conceptual model of this thesis as they structure complex systems focusing on an action situation with multiple actors framed by the conditions of their immediate environment on multiple levels. Furthermore, through its feedback loops, changes over time and path-dependencies are included in the frameworks.

2.2.4 Change Processes: Institutions Evolving from Stable Valued Practices

Central in the two presented Institutional Economics frameworks are institutions. Compared to practices which happen on an everyday basis, institutions are stable organisational structures as well as stable, valued, recurring patterns of action (GOODIN 1998: 21). These are formal rules such as contracts and informal rules such as norms but also entities like organisations. They consist of prescriptions of what *must (not)* or *may* be done. Besides stability, standardisation and reproduction are their major characteristics. The innovative

[6] Operational level rules organize daily interactions; collective-choice rules decide on how operational rules are formed; constitutional rules constrain who participates in collective-choice decisions (HESS et al. 2007).

practices and institutions of a change agent are a focal point of the forthcoming conceptual framework. They are interlinked, shape each other and represent different levels of stability and hence the level of the change agent's impact.

Institutions often provide a valued service as they (should) structure and facilitate life through organisation. They further organise collective action – in society, economy or a group of people e.g. by creating conditions on positions, entry, information or payoff (OSTROM et al. 2011). Shaped by powerful actors they can also be a historical burden: "[I]nstitutions are in essence just ossified past practices and the power imbalances and bargaining asymmetries embodied in them" (GOODIN 1998: 10). Shaped by customs, culture, values and routines, they can form self-consciously (e.g. by imitation of rules by others or fast bio-physical changes) as well as unconsciously (e.g. by forgetting due to not performing or enforcing it or by language loss) (OSTROM et al. 2011). They have an emergent character as even formally organised and initiated institutions develop through processes of self-organisation in groups which cannot be controlled by the individual (ibid.). For an overview of working definitions see Table 1. Practices are defined in more detail in Chapter 2.4.1.

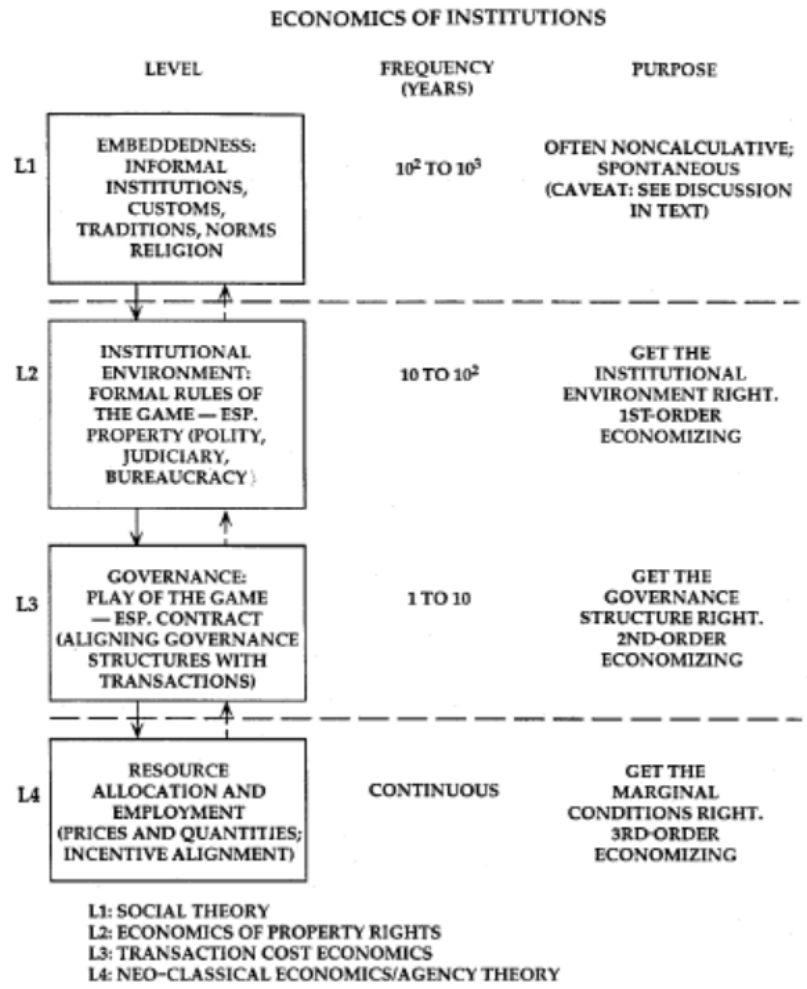
Table 1: Overview of working definitions: Values, Institutions, Norms, Formal Rules and Practices

	Working definitions	**Examples (context dependant)**
Values	Conception of the desirable that engages moral consideration. Values are a social concept or "the social properties of persons who share a universe of meaning [and a common language]" (VAN DETH et al. 1995: 35).	Discipline, resourcefulness, environmental protection, efficiency, self-expression, aesthetic concerns, secularism.
Institutions	"the prescriptions that humans use to organize all forms of repetitive and structured interactions" (OSTROM et al. 2011: 4).	Formal and informal rules, organisations.
Norms	Informal rules that should be met for the better of a community/group as they govern repetitive relationships and are based on intrinsic values (OSTROM et al. 2011: 322).	Truth-telling, humility, shared family dinner, roast on Sundays.
Formal rules	Enforced prescriptions on what is required, prohibited, or permitted (OSTROM et al. 2011: 319).	Contracts, legislation.
Practices	Practices-as-performances of an everyday action; practices-as-entities composed of three interdependent elements: material, skill/competence and image/meaning (SHOVE et al. 2012).	Driving a car, washing clothes, eating vegetarian.

Figure 4 provides an overview of the scope and diversity as well as the research areas that deal with institutions (WILLIAMSON 1989). It shows that institutions evolve in different time frames and are analysed by different research disciplines accordingly. The core of society, its values and norms (Level 1) change very slowly. They are analysed by social scientists and considered as the context by most economists. Level 2 provides the 'formal

rules of the game' like property rights which also change slowly with rare 'windows of opportunity' bringing sharper changes to the established regime. Level 3 is concerned with governance action 'playing the game' with contractual rules trying to get the governance structure (markets, hybrids, firms and bureaus) right. Level 4 is concerned with the marginal conditions (price, incentives, output) and is analysed by neo-classical economists. New Institutional Economists are mainly concerned with analysing the level 2 and 3.

Figure 4: Williamson's framework distinguishes four levels of socio-economic stability



Source: WILLIAMSON 1989: 26

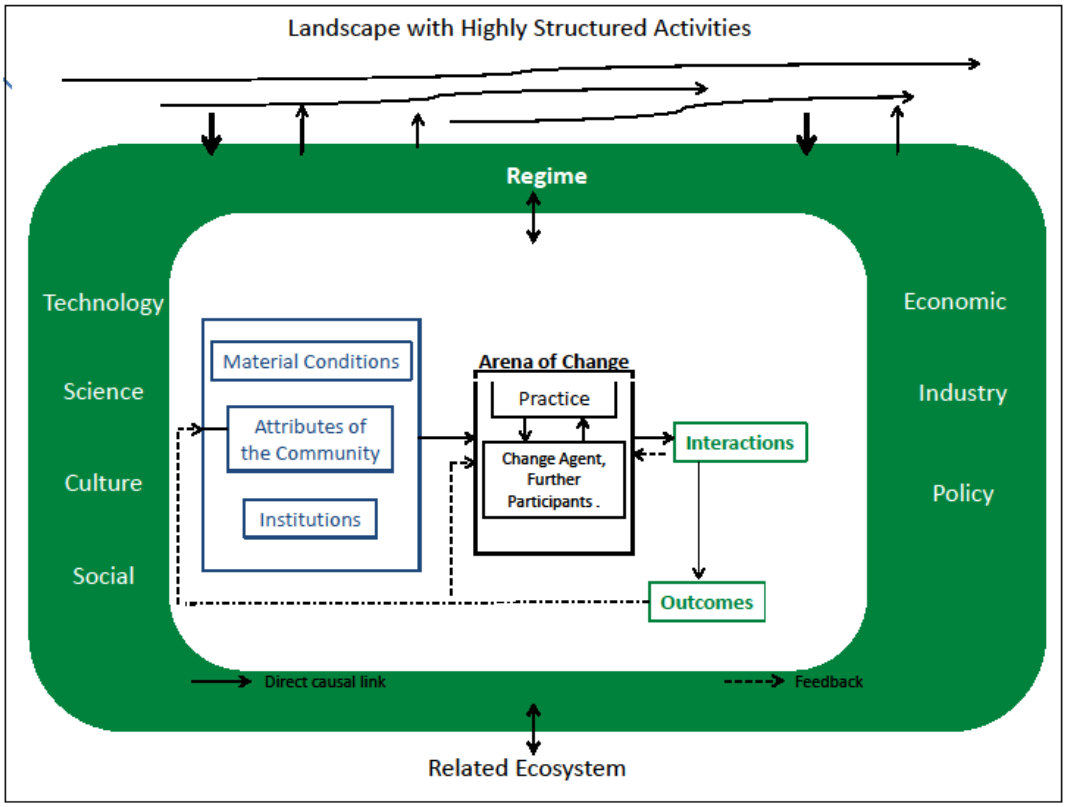
The framework by Williamson has some similarities with the MLP where at the highest level (the landscape) changes occur very slowly and at the lowest level change is continuous. On the MLP's highest level, change frequency decreases due to an increasing level of (im)material structurisation. In Williamson's framework, change frequency decreases as economists' decision making ability decreases. For economists, informal institutions have a spontaneous character. Furthermore Williamson's framework is 'only' looking at institutions

– the ways human interaction is organised – while the MLP includes the material world (like the SES and IAD framework).

2.3 A First-tier Framework Deducted from Theory

While the SES helps a better understanding of complex situations looking at multiple tiers and variables, the IAD focuses actors in an action situation, in our case change agents in the arena of change. Both SES and IAD allow analysing interlinked elements of socio-ecological systems that are relevant for certain outcomes of interactions especially on the micro level of action. The MLP takes a broader perspective to diagnose variables especially for societal change. Deducted from these theories, a first-tier of analysis is suggested to study the transformative impact of change agents (see Figure 5).

Figure 5: The first-tier of a conceptual framework for a more local, multi-level analysis of societal transformation influenced by a change agent



Source: developed from SHOVE 2012, GEELS 2011a, GEELS 2002, OSTROM 2006, POTEETE et al. 2010

For this thesis, the arena of change is a central point of analysis. For an ex-post analysis it could be checked over different points in time. There – compared to mainstream action - innovative action is practiced by the change agent and other participants. This could be

analysed on a **micro-situational level** looking at the changing elements of a practice (see Chapter 2.4.1).

On the **micro level**, the arena of change is affected by the feedback from interactions of the change agent with other participants such as visitors or policy-makers and the immediate environment as well as the resulting outcomes. The arena is further influenced by the left cluster of contextual variables: the surrounding biophysical and material world, certain attributes of the community and its institutions. The broader variable 'institutions' is replacing the IAD variable 'rules'. Besides rules, institutions include norms and forms of organsiations which seem relevant for an explorative analysis of the change agent which is self-organised in a community. Institutions form out of stable, valued and life-structuring practices evolving from and influencing the arena of change. A newly established institution has higher chances of long-term impact compared to practices due to the higher level of stability.

The broader setting around the change agent - the 'mainstream' **regime** - consists of rather stable established practices and institutions. It can be analysed as a set of interlinked elements from seven dimensions: technology, science, culture, policy, industry, economic and social. An impact by the change agent on this level could be defined as a transformative impact altering the interlinked configuration of the regime establishing a new practice, institution or system of these.

On an even higher contextual level, being most structured and changing less often is the **landscape** with e.g. demographic trends, values and infrastructure. Landscape dynamics can lead to lock-ins of the current regime but can also create 'windows of opportunity' for a change agent's practice or institution to alter the regime.

2.4 Second-tier Variables to Assess Change Processes & Change Agent Impact

For a more detailed analysis of each level, second and third tier sub-variables can be used in a similar way to the SES framework. In this chapter, theories on Social Practice, Social Innovation and Strategic Niche Management are used to suggest such sub-variables as well as indicators especially relevant for community-based change agents such as ecovillages. The conceptual framework is presented at the end of the chapter.

2.4.1 Practices as Variables to Analyse Everyday Change: Social Practice Theory

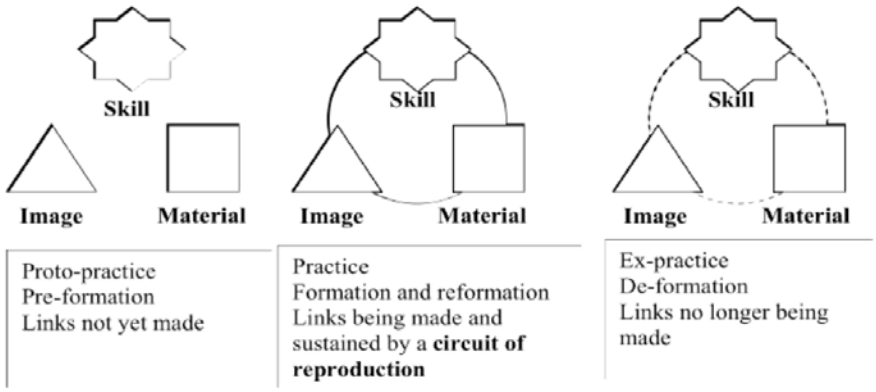
Social Practice Theory (SPT) looks at transition in practices rather than in systems and regimes (SHOVE et al. 2012). The relevance of practices stands out in relation to the abstract concept of climate change that is beyond 'everyday' cognitive capacity of the mainstream society but is much affected by everyday action. As an 'everyday' unit of analysis, practices can be helpful in analysing a change agent's activities on a micro and micro-situational level.

Rather than using 'hierachies' or 'levels', Social Practice Theory argues for a non-hierarchical relational model and sees society as a network of places, actors and information. Although the ontological assumptions of the presented theories differ, the mere understanding of practices-as-entities can provide second- and third-tier variables to better understand and assess interactions and outcomes of innovative change agents with other actors. Furthermore, concentrating on socio-ecological practices rather than (just) individuals is further helpful to conceptualise ecovillage complexity and diversity breaking it down to the elements of a practice and how these diffuse into society.

SPT recognises practices-as-performances and practices-as-entities. Individuals are seen as the carriers of practices. Practices-as-performances recognises the aspect of 'doing', its immediate character and the reproduction of patterns of the practices-as-entities. As entities, practices are composed of three elements that hold an interdependent relationship: **materials**, **skills**/competences and **image**/meaning. For example the practice of organic gardening consists of 'materials' such as land and seeds, 'skills' on crop rotation and 'ideas' such as long-term soil improvements.

According to SPT, the three elements of a practice are interlinked, shape each other and (their links) change over time. These elements can be used to analyse the **micro-situational level** where a change agent and other participants conduct practices with newly combined elements. In the moment of executing a practice - when all of its elements are coming together - are moments of potential reconfiguration of a practice (see Figure 6). Small changes induced by a change agent could change all subsequent configurations of the practice. The attaching and detaching process of 'meaning', 'material' or 'skill' can have a wider impact on the cultural landscape (SHOVE et al. 2012: 36).

Figure 6: The micro-situational level: Changing practices from proto-practices to practices and ex-practices



Source: PANTZAR et al. 2006 in HARGREAVES et al. 2011

Practices can exist in bundles (e.g. based on co-location or co-dependence) or in tighter complexes. Looking at related practices like driving a car or riding a bicycle one can find shared elements amongst them. Links between practices can be broken e.g. when the material element changes through new technology in cars, knowledge on giving hand-signals, changing oil or reading a map becomes antique, is either forgotten or dormant. Breaking links can also occur between multiple practices with similar elements. The dynamics of practices is shaped by their history as the physical artefacts of old practices remain.

The elements of a practice have shown to be especially shaped by the following variables and processes (SHOVE et al. 2012) which are used as variables to analyse the change agent's practices on the micro-situational level (see Chapter 4.3and 6). Material is much dependent on aspects of **access** and **transportation.** For example, areas accessible by waterways could exclusively order heavy machinery or household items like stoves which shaped their history. Competence or skill is influenced by the level of **abstraction of information.** Deriving general guidelines for a practice helps with its **reversal** in a new location (which depends much on previous practical experience). Skills that are successfully transferred are those that exist in globally common settings like giving a speech however they are often adapted when **migrating**. Meanings are observed to be **accumulating** rather than old meanings disappearing[7]. Driving was initially associated with social class, masculinity and status and later the image of individuality was added. Meaning is further influenced by marketing

[7]To conceptualise 'meaning' Shove et al. acknowledge but do not consider the elements' relative, contextual and emergent character but concentrate on rather uncontested symbolic associations like sport practice's meaning being associated with fitness.

activities where brands are creating images for products or activities with a specific meaning like freshness or fitness. Meanings can extend to other practices through a process of **association** and **re- or de-classification** e.g. the freshness of air extending to the freshness of laundry which can lead to an increase in 'freshness'/laundering demand.

The elements of a practice can also be found in the contextual **micro level** variables in the left cluster of the presented framework (see Figure 5):

- 'Material' in 'material conditions',
- 'Skills' within the 'attributes of the community',
- 'Meaning' or 'aspiration' is an attribute of the community but also a variable shaping 'institutions' and 'practices'. In a self-organised change agent community, institutions express stabilised valued preferences and aspirations.

SPT further outlines that practices can be changed by the influence of related practices (e.g. cycling is much influenced by the material aspects of driving), the social, material and financial resources that the practice generates or requires, the physical ability or expertise necessary, related past experiences and the social network of the practitioner. Practices can expire through organisational changes, inconsistent internal rewards, lack of symbolic significance or when they are not embedded in a wider network. Practices reproduction is ensured by global diversity (e.g. in material versions of cars), standardisation (e.g. through driving schools), feedback and reward levels, the community of practitioners (e.g. peer-to-peer relationships), the financial and social necessity and the level of identification with the practice. These could be further assessment variables for the framework.

2.4.2 Selecting the Change Agent's Practices & Institutions: Socio-ecological Innovations

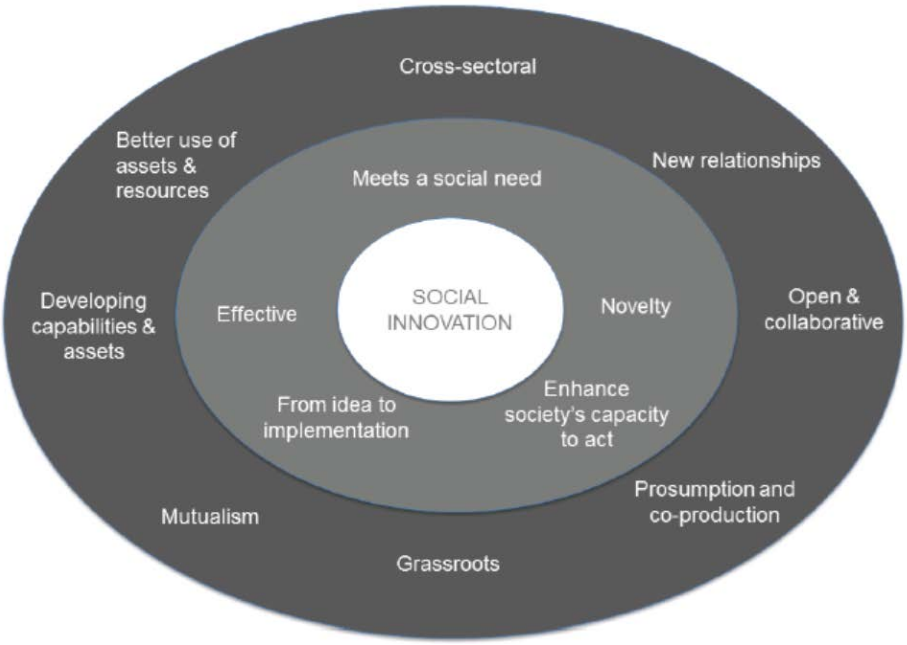
Innovations are different or new approaches that are not widely adopted but are practiced by niche change agents. Social innovations are its practices, institutions or systems of these that could change the existing social regime leading to a societal transformation.

Multiple definitions exist for 'social innovations' as the research area is relatively new and cross-sectoral. The term is used on in the context of societal change; governance, capacity building and empowerment; organisational management; social entrepreneurship and the development of new products, processes and services (CAULIER-GRICE et al. 2012). "Social innovations are new solutions (products, services, models, markets, processes etc.)

that simultaneously meet a social need (more effectively than existing solutions) and lead to new or improved capabilities and relationships and better use of assets and resources. In other words, social innovations are both good for society and enhance society's capacity to act" (Caulier-Griece 2012: 18). Their aim and means are both social. The EU Commission's definition is similar although they do see the aim at the enhancement of the "individuals' capacity to act" (EU COMMISSION 2013). Theories on social innovations can provide some insights on potentially desired qualities in societal transformation. They can serve as assessment criteria for a change agent's practices and institutions.

Figure 7 shows the core elements and common characteristics of social innovations. They can be used as assessment criteria of the socio-ecological innovativeness of change agents' practices and institutions as they share many similarities with ecovillages' activities. At the core of social innovations is their characteristic of absolute or relative novelty – in a sector, a region, a market, for a user or new in their application. Compared to an invention, innovations are implemented ideas – they are already practiced by a small group and they are more effective than existing solutions which could be measured by e.g. higher quality, user satisfaction or cost reduction.

Figure 7: Core elements and common characteristics of social innovations



Source: CAULIER-GRICE 2012: 18

For social innovations, the aim or vision are often desirable values such as dignity or quality of life. Social innovations should empower by enhancing societies capacity to act through

"creating new roles and relationships, developing assets and capabilities and/or better using assets and resources" (CAULIER-GRICE et al. 2012: 20). Through participation and access to resources, power relations could be changed and empowerment of socio-political activity stimulated.

Common characteristics of social innovations are their open and collaborative character such as e.g. open source projects or urban community gardens (ibid.). They often exist across sectors and may link them. They can lead to a 'better use of resources and assets' as otherwise they would remain unused or below their potential (e.g. using unused rooms, skills, material). In the area of consumption they can blur the boundaries between consumer and producer as users co-design products and services. New roles and relationships can be created that can lead to new models of governance, cooperation or participation (e.g. consumers as producers, ill people as caretakers or students as teachers). Furthermore, skills and assets empowering actors to meet their needs are common. Social innovations are often based on reciprocity or mutualism which leads to an exchange of goods or services and they tend to emerge from the bottom up – from decentralised, peripheral and networked grassroot movements like ecovillages.

In this thesis, the characteristic of a better use of assets and resources is understood as an ecological criterion in the sense of resource efficiency. This ecological criterion can further be extended by comparing the greenhouse gas emission balance produced by the conventional and innovative practice or institution. The concept of social innovations is used to conceptualise socio-ecological innovations (see Chapter 2.5).

2.4.3 Diffusion Processes: Strategic Niche Management

Like the MLP, the SPT is not particularly focusing on niche change agents and their aim to initiate change. Strategic Niche Management proposes that niches have ways of internally managing diffusion processes so they are more successful in changing the regime. The diffusion is a process that would lead to the widespread adoption of a change agent's innovative practices and institutions. Assessing the diffusion-related interactions and outcomes could give insights on the potential transformative impact change agents have. The innovation's diffusion is mainly influenced by the innovation itself, communication channels, timing and the social system (ROGERS 1962). Strategic Niche Management focuses on innovations "(1) serving long-term goals such as sustainability, (2) radical novelties that face a mismatch with regard to existing infrastructure, user practices, regulations, etc." (SCHOT et

al. 2008: 539). Set in context to the MLP, niche innovation have shown to not lead to regime change by themselves. External processes in the regime and landscape are rather influential for transitions. Niches are often isolated missing a connection to broader developments and struggle to keep up their sustainable practices in a wider unsustainable regime (SEYFANG et al. 2012). To analyse niche processes, SNM has been applied to the transition town movement (SEYFANG et al. 2012). Transition towns are a community-based model aiming at more sustainable lifestlyles which has been replicated globally in 400 towns and cities within five years but discontinued growing in scale. Most initiatives were, after an initial phase of major interest, mainly limited to a small group of environmentalists failing to manage expectations of other participants.

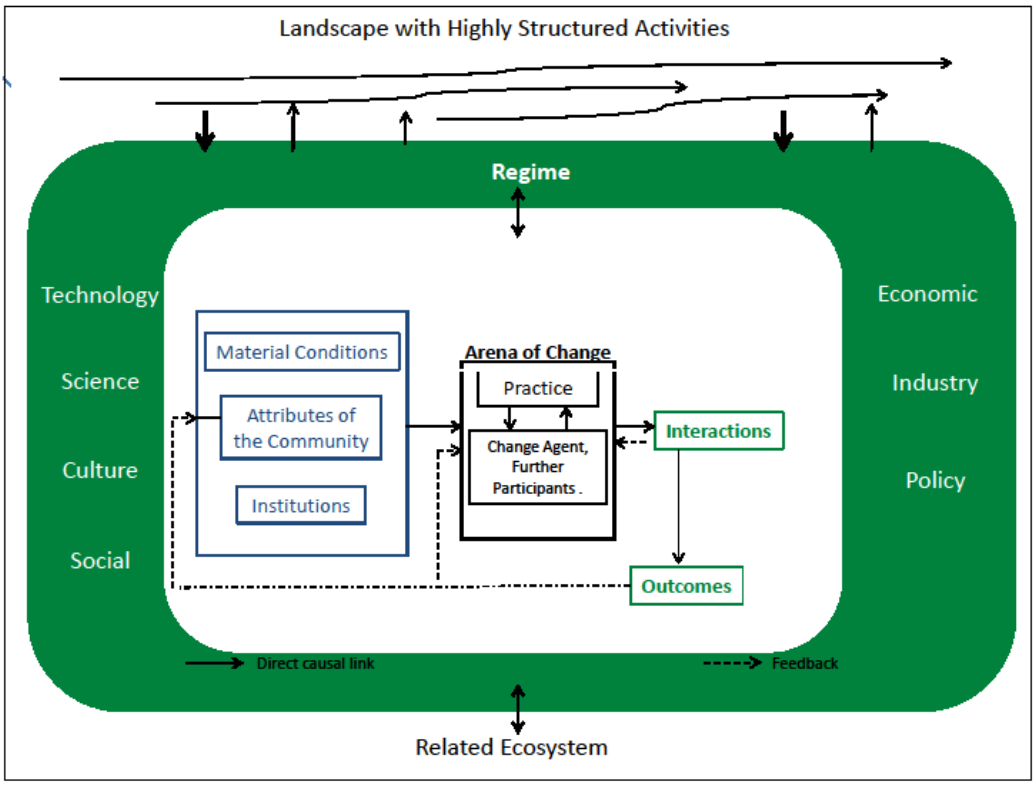
Three major processes have shown as important for niches success (SCHOT et al. 2008: 540, SEYFANG et al. 2012) and could be useful for qualitative indicators on the **micro level** studying the diffusion-related interaction of a change agent with other participants: 1) **Managing and articulating expectations and visions**. Visions show a route or direction for learning processes, can attract attention and legitimise niche protection. Expectations should be "widely shared, specific, realistic and achievable" (SEYFANG et al. 2012: 384). External expectation management can be difficult as visions often do not go (fast enough) into the implementation phase and the public looses interest. 2) **Building social networks** is important for new technologies to have supporters – 'broad' networks with different stakeholders and 'deep' networks providing a diversity of resources (financial, social, expertise). Besides internal networking, external networking with businesses, charities, political parties or local and national government is important (ibid.). 3) **Learning processes** that contribute to everyday knowledge as well as to 'second-order learning' where people question the regime system are both relevant. Learning processes take place at multiple regime dimensions on e.g. technical aspects, infrastructure, industry networks, markets, user preferences, cultural and symbolic meaning, regulations or societal and environmental effects. First order learning takes place at trainings e.g. on organisation, second order learning can be achieved e.g. encouraging to rethink systems and framings.

The diffusion of innovative practices and institutions can lead to outcomes such as their **replication** within the niche, "bringing about aggregative changes through many small initiatives" (SEYFANG et al. 2012: 384), its **growth in scale** with more people participating and the **translation** of niche ideas into a language that mainstream can understand and/or value.

2.5 A Framework for Assessing the Transformative Impact of Change Agents

In the first part of this chapter, relevant first tier variables of transformations and complex socio-ecological systems were outlined and summarised in a conceptual framework (see Figure 2). On a micro-situational level, in the arena of change, fast interactions take place: In the process of practicing, the elements that a practice consists of can circulate and potentially reconfigure. Participants are the change agents as practitioners of socio-ecologic innovations, its part-time members, scientists, policymakers or other guests. This arena can produce highly stable, organised, structured and valued practices that influence institutions over time. These institutions are situated on a more stable micro level. Together with the local material conditions and attributes of the community, they can influence the arena of change. The interactions taking place here and its outcomes can be analysed and assessed. They are further surrounded by the regime level which is characterised by higher stability than the micro level and clustered by dimensions or sectors. Most stable is the highly structured landscape. Analysing its condition can help identify 'windows of opportunities' or 'lock-ins' for societal transformation.

Figure 2: A framework for a multi-level analysis of societal transformation induced by a change agent



Source: developed from SHOVE 2012, GEELS 2011a, GEELS 2002, OSTROM 2006, POTEETE et al. 2010

For a more diagnostic approach, second and third-tier variables were discussed in the second part of this chapter. Table 2 combines them in the format of the SES framework. The understanding of practices-as-entities and the variables influencing their change processes help to conceptualise the micro-situational level. The interlinked relationship of practices and institutions is shown as institutions are one entity of the contextual variables that influence the arena of change together with material conditions and attributes of the community. The micro level contextual variables are deducted from Institutional Economics (see Chapter 2.2), especially the SES framework (see Chapter 2.2.2) and further variables identified in Chapter 2 that could be relevant for the transformative impact of a socio-ecological change agent. Strategic Niche Management (see chapter 2.4.3) variables can be classified as interactions and outcomes and provide the third-tier variables of the diffusion process which is later analysed with the help of one case (marked red in Table 2). The regime and landscape are derived from the MLP (see Chapter 2.2.1) with market and user preferences subordinated under the economic dimension.

Table 2: Second- and third-tier variables to assess a change agent's innovative socio-ecological practices and institutions and their transformative impact potential

Material and biophysical Conditions (MC)	**Institutions and Practices (IP)**
MC1- Location (access, transportation) MC2- Size of system MC3- Material, physical entities, technologies MC4- Distinctive markings MC5- History of material or infrastructure MC6- Social, material and financial benefit or cost MC7- Dependence (social, material and financial) MC8- Level of stability MC9- Spatial & temporal distribution	IP1- Practices IP2- Rules IP3- Norms IP4- Values, symbolic meaning/image, ideas/aspirations IP5- (Non-)Government organisations IP6- Property-rights systems
Assessment Criteria:	**Attributes of the Community (C)**
1) Change Agent's Socio-ecologic Innovativeness AC1- Absolute or relative novelty e.g. in a sector, a region AC2- Implemented ideas/practiced AC3- Comparably more effective and resource efficient than existing solutions AC4- Valued qualities/meeting a social need AC5- Empowerment by a) Use of un- or underused resources and assets b) Co-design of products and services c) Creation of new roles and relationships d) Development of empowering skills and assets e) Open and collaborative character f) Based on reciprocity or mutualism AC6- Future-oriented ideas and solutions **2) Transformative Impact Potential** Analysis of interactions and/or outcomes in the context of regime and landscape trends	C1- Type of change agent e.g. Ecovillage, repair café C2- Number of participants C3- Skills, techniques, expertise, abilities C4- Mental models C5- Promoter roles C6- Conflict hearing & solution finding procedures C7- History of participation/ (related) past experience C8- Socioeconomic attributes of participants C9- Points of Interaction C10- Time resources
Interactions on the micro-situational level	**Outcome on the micro-situational level**
I0- De-/attachment of elements (reconfiguration & circulation) a) Association, de- and reclassification processes, b) Access to or use of new material, c) Abstraction of information & reversal in a new location.	O0- New practice e.g. a) New or added meaning, b) New material, c) Migrated new skill.

Interactions on the micro level	**Outcome on the micro level**
I1- Diffusion Management e.g. a) Managing and articulating expectations & visions, b) Building social networks, c) Learning processes.	O1- Diffusion Outcome e.g. a) Translation, b) Replication/Imitation, c) Growth.
I2- Reproduction of practice e.g. a) Standardisation/Institutionalisation, b) Level of identification/symbolic significance, a) Conflicts among practitioners*/Resistances	O2- Adopted socio-ecological practice O3- Retention of socio-ecological practice O5- Abandoned or forgotten practice O6- Practice turns into an institution
Landscape and regime trends	**Transition dynamics**
- Technology - Society - Economy e.g. - Culture - Industry - Policy - Science - ECO: Climate & pollution patterns.	– Windows of Opportunity – Lock-ins – Transformation – Reconfiguration – Technological Substitution – De-alignment and re-alignment.

Source: developed from SHOVE 2012, SCHOT et al. 2008, GEELS 2011a, GEELS 2002, OSTROM 2006 and KRISTOF 2010.

It is assumed that the diffusion of ecovillage practices and institutions is synonymous with it having an impact on society. A **transformative impact** would be the wider adoption of its practices or institutions changing the established regime. This change could be e.g. a shift in lifestyles or established contracting practices (GEELS 2011a: 26). The proposed assessment criteria for a transformative impact consist of 1) the socio-ecological innovativeness of the change agent's practices and institutions and 2) its diffusion processes. The innovativeness criteria assesses the character of practices and institutions: their novelty, potential for meeting a social need, enhancing societies' or individuals' capacity to act and improving resource efficiency (see Chapter 2.4.2). In a second step, the potential transformative impact is derived from an analysis of the diffusion processes of the change agent's innovative practices and institutions in the context of the regime and landscape developments.

3 Methodology

This research is in line with epistemological views of Critical Realism acknowledging that reality is provisional beliefs as "the scientist's conceptualisation of reality is simply a way of knowing that reality" (BRYMAN 2004:12). It is accepted that hypothetical constructs accounting for regularities do not have to be directly observable if their effects are observable. This research is further in line with a constructivist position that e.g. culture or organisation is continuously (re)constructed which people are not constrained by but can create and shape actively (BRYMAN 2004: 16). It is acknowledged that formal organisation

and long-lasting culture can constrain people in their action, however, resistances require new solutions that make people reshape culture.

To answer the research questions, a deductive research strategy is enhanced by a qualitative mixed-methods case study design. In a sensitising process it aims to achieve an operational concept for the assessment of the transformative impact of change agents such as ecovillages. In the sensitising tradition, research is seen as a "process in which meanings of concepts are developed" and refined prior operationalisation (BLAIKIE 2009: 137). A conceptual framework or diagrammatic representation is visually "indicat[ing] patterns of relations, time sequences, or causal connections between aspects of social life" (BLAIKIE 2009: 173). In this case, the patterns of relations between ecovillage impact, the variables influencing it and the indicators to assess it. Once the theoretical language is defined in a conceptual framework, it can be transformed into empirical concepts (operationalisation).

In the social sciences the criteria reliability, replication and validity are used to evaluate research (BRYMAN 2004: 28) which are integrated in the following description of the strategy and methods used.

3.1 Deductive Research Strategy

Given the complexity of the activities by ecovillages, several theories and frameworks such as the Multi-Level Perspective, Socio-Ecological System Analysis and Social Practice Theory, were used to deduct a hypothetical framework to study mechanisms of societal transformation (Research question 1) and derive a conceptual framework to assess the transformative impact of these niche change agents (Research question 2 and 3). By using a deductive research strategy studying different established frameworks and theories, reliability of the derived framework is reinforced and a theoretical replication where theory can guide foreseeable outcomes is given. The approach is limited by the literature selected focusing on the area of social transformation and change including institutional change as the researcher's academic background lies in Integrated Natural Resource Management. For an empirical representation of the framework, it needs to be operationalised with observable indicators (operationalisation) (see Chapter 5). As the deductive research strategy produces abstract patterns of relationships between the dependant variable *transformative impact* and its independent variables and indicators, the expert interviews are empirical inquiries with the goal of enriching and modifying the framework. Internal validity is concerned with the analysis of causality between the dependent variable (in this thesis *transformative impact*)

and its independent variables (BRYMAN 2004: 28). This causal relationship between variables is analysed through the framework's application to one case.

A critical point of this research strategy is that it requires the "exclusion of personal values and political commitments" (BLAIKIE 2009) which is seen as a bias in transformation research with the normative goal *towards* sustainability. There is a normative aspect in this thesis - as in a desired sustainable society within planetary boundaries – however, the research is conducted with objectivity in mind and practice.

3.2 Case Study Design

Initial research is done for multiple cases as there is diversity in ecovillage approaches to and interpretation of sustainability. Scientific and policy literature on ecovillages as well as the websites of German ecovillages were used for an initial overview of ecovillages and their description - their activities, characteristics and points of interaction with society (Research question 4).

To identify the most prominent ecovillages in Germany and understand their institutions and practices, the international Global Ecovillage Network databank (GEN_2 2015) which hosts a profile on more than 1.000 socio-ecological communities, was searched according to the following criteria:

- Self-assessed category status of an "established ecovillage",
- Located in Germany,
- Non-hierarchical decision making structure,
- Established for a minimum age of five years,
- 40+ inhabitants,
- GEN membership and
- A website which states their model character.

Seven cases were selected by these criteria representing rather large, steady and potentially more complex socio-ecological communities. Furthermore, all seven ecovillages share a non-hierarchical participative decision making structure with no clear leader which differentiates them from accusations of being sects. The cases are part of the Global Ecovillage Network, through which they share a vision and interact within a formalised network. By comparing these cases, common characteristics and mechanisms can be uncovered and generalised

which improves theory building (BRYMAN 2004: 55). By referring to common practices of the cases, external validity, which refers to the representativeness of a research project, is established in the first part of the thesis (POTEETE et al. 2010: 82; BRYMAN 2004: 51). Reacting to the criticism of multi-case study designs that their focus is on the comparison and neglects the individual context (Dyer and Wilkins 1991), one of the seven ecovillages is analysed with the help of the conceptual framework. No detailed description of the 'internal' and community processes of ecovillages is done as such studies already exist[8]. The area under investigation lies more in the 'outside' of ecovillages – their interactions and outcomes with a wider society.

3.3 Mixed-method Approach

A combination of different research methods is used in a methodological triangulation to analyse one case with the help of the conceptual framework. A triangulation of methods or mixed-method approach aims at compensating weaknesses of one method such as the interviewer bias in the expert interviews or subjectiveness of observation in the participatory observation by using more objective methods such as the media analysis and online survey. Mixed-method approaches increase reliability of research findings and add "a sense of richness and complexity to an inquiry […] enhancing the credibility and persuasiveness of a research account" (BRYMAN 2003: 1143). Furthermore, the research method of expert interviews that is used to modify the conceptual framework uses a source triangulation interviewing ecovillage experts, researchers and policy experts.

3.3.1 Participatory Observations

Participatory observation is a form of field research and provides empirical descriptions of the way of life of a social group (BLAIKIE 2009: 234). The level of observation and participation of the researcher can vary. There can be subjective biases to this method including the selection of data to be recorded, the potentially skewed interpretation by 'halo effects' of first impressions and possible conflicts between the role of being researcher and participant (RAINER et al. 2013: 391). The field research can, however, deliver a rich empirical picture especially for an explorative phase of the research and is considered "the qualitative method *par excellence*" (BLAIKIE 2009: 234) providing primary data.

[8]For detailed studies see e.g. LAMBING 2014, KUNZE 2009b, KUNZE 2009a, Miller 2012, ERGAS 2010, CHITEWERE 2010, KIRBY 2003).

The participatory observation for this research is used during the explorative stage of the research and enriches the final case analysis through anecdotal examples. The observations were guided by the descriptive question on common characteristics of ecovillages (Research question 3) and the exploration on which reviewed theories provide variables to conceptualise their impact (Research question 2). Observations were conducted at common 'points of interaction' where guests can experience the ecovillage either as a short term visitor getting a tour (open Sunday), as a short-term inhabitant working onsite (co-working) or as a seminar guests receiving training or recreation. Participatory observations were conducted at an open Sunday tour in April 2015 and a co-working week in June 2015 at two ecovillages near Berlin. Participatory observations at a seminar in July 2015 at a left-leaning alternative commune that was initially assumed to be an ecovillage helped to differentiate project types and define ecovillages for this thesis. The researcher participated as a guest in all three projects and tracked observations using an observation log.

3.3.2 Content Analysis of Print & Online Media

Mass media like online or print articles are widely distributed in the public and their content is assumed to have a high impact (BONFADELLI 2002: 14). They are further easily accessible and directly observable. A media analysis is commonly conducted as a content analysis (ibid.). In this thesis, the content consists of print and online sources which are analysed through a directed content analysis where the conceptual framework delivers the code for data analysis (see Chapter 3.4). By analysing 'points of interaction' mentioned and qualities perceived as well as barriers and opportunities for a societal impact, the conceptual framework is tested for its applicability (Research question 4). The print media analysis can be seen as a demonstration of the topics of interest to journalists 'translated' to a wider society. The online media analysis shows the national topics of interest in online searches around ecovillages and by social media users. The media analysis further explores the topics of interest and tone when reporting on ecovillages and variations in time.

The online analysis consists of a Google trend and a social media analysis. Both are used for the framework application in the case study analysis. They were further used in a more general search to explore topics of interest around ecovillages ("Ökodörfer" in German) (Research question 3). The Google trend analysis shows popular searches around this term. The social media analysis looks at tweets and social media post around this term through the analytical website tool on www.topsy.com.

The print sources are the archives of two national newspapers: the weekly newspaper DIE ZEIT and the daily newspaper Süddeutsche Zeitung. The archives cover the print editions dating back to 1987 for Süddeutsche Zeitung and to 1946 for DIE ZEIT. The print search covers the archives for one exemplary ecovillage ("Ökodorf Sieben Linden"). Both newspapers are read by a rather educated social milieu. They do not represent the full or main print coverage on ecovillages as the press archives of some ecovillage reveals that the local press is a major outlet that reports on them. However, for this thesis, the two national newspapers were chosen to receive an impression of the wider national coverage of one case.

3.3.3 Semi-Structured Expert Interviews

Interviews are popular qualitative data collection tools as they allow the access of "people's perceptions, meanings, definitions of situations and constructions of reality" (PUNCH 2005: 168). Semi-structured face-to-face interviews allow planned and standardised questions but leave room for other questions or direction of answers to unfold.

Prior the four expert interviews, small informal meetings were held with most experts and a presentation of the evolving concept was held at the German Environment Agency as part of the explorative process. This gives a sense of direction on the experts' expertise, feedback on the conceptual ideas of the research project and an impression on ecovillage knowledge in an environmental science and policy field. The semi-structured interviews were conducted with politicians and scientists with a research record or interest in ecovillages or societal change:

- EPE1: Environmental Policy Expert 1: Expert on change processes consulting the Federal Environmental Ministry, no ecovillage experience,
- EPE2: Environmental Policy Expert 2: Consulting the Federal Government on global environmental change, no ecovillage experience,
- EPE3: Environmental Policy Expert 3: Working in environmental policy consultation for the Federal Environmental Ministry, experience with ecovillages through project work,
- EE1: Ecovillage Expert 1: Working in an institutionalised position for the Global Ecovillage Network, lived at Ökodorf Sieben Linden for several years.

Indicators for 'transformative impact' as well as barriers and chances of ecovillages as change agents are discussed (Research question 2 and 3). A bias might arise due to political interests of the interviewees leading e.g. to the holding back of information or giving desired

answers. Still, the expert opinions add to the reliability of the conceptual framework. One interview with an expert in an institutionalised ecovillage position might further help to understand the underlying reasons for the potential transformative impact of the change agent. The questionnaire of the semi-structured interview is in the Appendix (see Figure 12). The interviews are transcribed and the data is used to modify the conceptual framework.

3.3.4 Online Survey

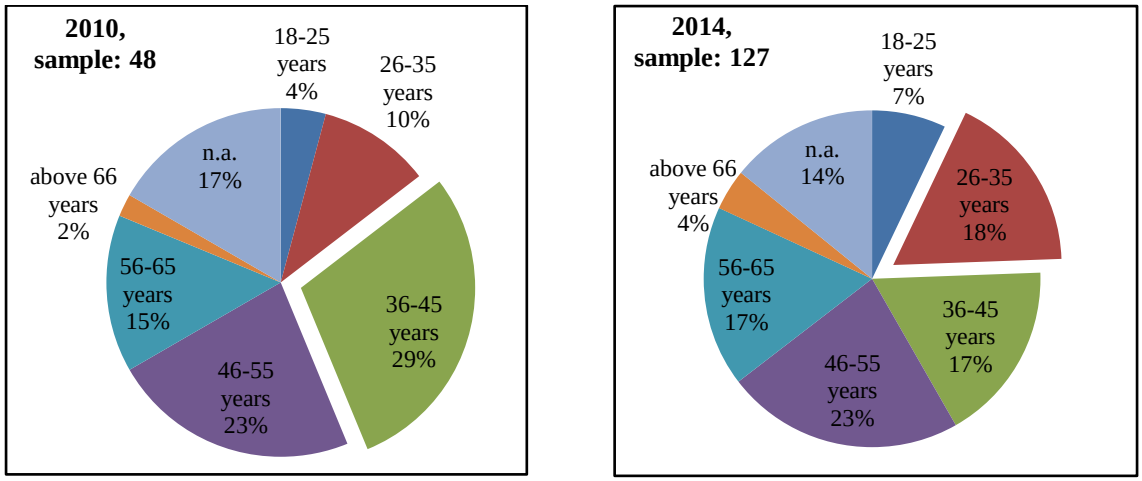
An anonymous online survey with participants of Ökodorf Sieben Linden courses was conducted in September 2015 with the help of the tool Lime Survey. The survey questionnaire (see Figure 13 in the Appendix) was created by the researcher in consultation with the Ökodorf Sieben Linden education staff who also distributed the emails. It begins with an open-ended question on special impressions during the visit. It further asks if a new skill, material or idea was learned and replicated, for the type of seminar visited and the reason why this was done in Ökodorf Sieben Linden. It continues by stating practices and institutions from Ökodorf Sieben Linden in a matrix and asking about the perception, understanding, acceptance and (potential) implementation by the seminar guests. It further asks about resulting projects or networks due to the time at the ecovillage and experienced barriers along the way. The survey concludes with a small section on socio-demographic data. Half of the questions are open-ended to receive relatively unbiased answers.

The survey consists of 13 questions derived from the variables and indicators of the conceptual framework and aims to show if the conceptual framework can help assess the transformative impact of Ökodorf Sieben Linden (Research question 4). It was designed to provide some insights on the interaction processes and outcome for seminar guests in 2010 and 2014, particular ‘learning processes’, ‘social networking’ and ‘modified replication’. It did not ask about the guests’ expectations and potential growth in scale but the open-ended questions left space for some to answer these questions.

The survey was send to all guests of seminars in 2010 and 2014. It was analysed 10 days after being online. 48 guests from 2010 and 128 guests from 2014 answered constituting the sample. The return rate of the 2014 sample was at 12.2% nearly double the amount of the 2010 return rate. The age structure of the sample was similar in both years with slightly more 2014 participants between 26 and 35 years. The monthly net income was indicated by around 80% of the sample in both years (see Figure 8). In 2010, 44% of the samples’ income is below 1.300€ and for 25% it is between 1.300€ and 2.600€ per month. In 2014, the share is

more evenly at around 30% for each of these income brackets. In both years, around 12% of the sample have a net income of above 2.600€ per month.

Figure 8: Age structure of the Ökodorf Sieben Linden survey sample (2010, 2014)



A bias for a transformation research design might be that seminar participants represent niche actors and not the wider society. However, the survey represents the impact Ökodorf Sieben Linden had at an immediate point of interaction comparing two different years. A further selection bias of seminar guests with especially good or bad experiences and with internet affinity might exist. A detailed analysis of all results will be provided to the ecovillage by spring 2016.

3.4 Directed Content Analysis for Data Analysis

For the data analysis of the expert interviews, media and survey data, the qualitative method Directed Content Analysis is used. In a deductive approach, directed by theory, it allows to "validate or extend conceptually a theoretical framework or theory" (HSIU-FANG HSIEH 1999: 115). Theory, in this case the emerging first framework of this thesis, is used to identify variables that act as coding categories. Like a guide, they give direction and structure. Comparing the empirically found patterns with the predicted patterns outlined in the hypothised framework allows to detect or reject patterns of association (YIN 2011: 16). Patterns indicate a relationship between variables which is weaker than in causality. There is a potential bias because this method could be used to check for supportive, rather than contradictive evidence, for the concept or theory (HSIU-FANG HSIEH 1999: 117). Hence, the data is checked prior directed analysis for unexpected insights. Furthermore, the survey design of semi-structured interviews and open-ended questions leave room for alternative issues to arise.

Evidence from interviews and meetings in the explorative phase is collected in notes as protocols. Only the expert interviews are transcribed. Further data are the online and print media as well as survey data. For the data analysis, the predetermined coding categories are the variables and indicators developed in the conceptual framework (see Chapter 5). Data not matching the predetermined code receives a new code and helps to identify variables for theory enrichment. The content analysis tool MAXQDATA is used to organise the different sources of data and code them. Chapter 6 presents major findings with corresponding citations. Patterns of associations from the hypothesised framework are verified, modified or rejected which contributes to the development of a modified framework.

4 Ecovillages as Change Agents of Societal Transformation

Ecovillages are defined as "sustainably oriented, intentional communities with their own settlement structure" that aim to be a role model for a sustainable life (LAMBING 2014: 6). Ecovillages can be intentional or traditional communities, are consciously designed, locally owned, involve participatory processes and regenerate social and natural environments (GEN 2015). Their approaches towards sustainability differ depending on the local context. They often practice ecological farming and building, are organised with common goods and property and value sustainable lifestyles. They are places to meet and exchange as well as sites of social and technical experimentation. Many ecovillages share their experience in workshops, volunteer weeks or visitor tours to (inter)national visitors.

As small-scale, societal models of sustainable living, ecovillages are gaining relevance as well as research attention (e.g. BALTICECOVILLAGES.EU 2013, E5.ORG 2013, LAMBING 2014, KUNZE 2009b, KUNZE et al. 2014). Most research concentrates on their social and ecological dimensions (e.g. KUNZE 2009, Miller 2012, ERGAS 2010, CHITEWERE 2010, KIRBY 2003) and less on their economic dimension (KLODT 2014, RIC 2015). Other topics found in research on ecovillages are the potential to employ the model for the rural development (RUMMER 2005), their regional image and acceptance (CENTRGRAF 2009) and the relevance of their lifestyle for the environment (SIMON 2004). Recently, there is research interest for 'reality labs' in ecovillages (LEUPHANA UNIVERSITY LÜNEBURG 2015).

Ecovillages can offer a change to mainstream perspective as compared to mainstream society their socio-ecological practices and institutions around self-sufficiency, communality and

solidarity are rather niche phenomena. Ecovillages can be seen as system innovators creating resilient, self-sufficient communities (KUNZE et al. 2014) and their inhabitants are described as pioneers of work and time (LAMBING 2014). As "Models of Lived Sustainability"[9] they could provide solutions in light of the global ecological crisis (UBA 2013).

Ecovillages can be seen as an agglomeration of socio-ecological innovations which mutually reinforce each other. Applying the social innovation guide by RÜCKERT-JOHN et al. (2014), the high level of individual initiative, collaboration and innovation necessary in ecovillages suggests difficulties in a wider societal replication of this mode. However, this thesis suggests that ecovillages might inspire individuals to take up single socio-ecological practices, elements of these practices, institutions or a set of these. Cutting across all sectors, ecovillages are regarded as change agents contributing to a societal transformation by a "silent revolution" from the *bottom-up* by creating small-scale places of resilience (KUNZE 2015). A recent *top-down* example is found in the Netherlands where special permission was granted to Ecovillage Boekel to experiment without adhering to the Dutch construction law (VLEMS 2015). The Dutch Crisis and Recovery Act allows selected change agents to potentially change the law if improvements in sustainable construction can be proofed. This might be a milestone and a sign of political acknowledgement for one of these civilian projects' efforts.

Ecovillages have formally organised in the international association Global Ecovillage Network (GEN) in 1995. GEN International supports knowledge exchange and networking and has been a consultant for the Economic and Social Council of the United Nations since 2000 (GEN-EUROPE.ORG 2014). It is an umbrella organisation that is sub-divided by continents aiming to represent more local interests. The international organisation and formalisation of a bottom-up movement is the outcome of the globalisation of intentional communities which started in the 1960ies and 1970ies (OVED 2012). The GEN association defines a set principles (GEN 2015) which can be understood as a set of shared values to integrate the four dimensions of sustainability (see Table 3). The association further provides a "Community Sustainability Assessment" for communities self-assessment (GEN.ECOVILLAGE.ORG 2014). The network initially tried mainstreaming their vision and values which proved to be difficult (STENGEL 2009: 20). A strong focus for GEN is hence

[9] A two year project from Mar 2013 until Feb 2015 funded by the German Environment Agency aimed at starting a national dialogue on ecovillages. It was supported by a website, data bank and educational events.

strengthening the network of sustainable projects: "Our greatest contribution to the Great Turning towards sustainability will be by way of building strong and active partnerships with sustainability initiatives in the world's towns and villages – to see ourselves as the research, training and demonstration centres for sustainable communities in a more localised and bioregional world" (GEN Manifesto 2008: 2 in WAGNER 2013). This marked a development of ecovillages „From Island to Networks" (DAWSON 2013).

Table 3: The Global Ecovillage Network's four dimensions of sustainability

Social Dimension: • Recognising and relating to others, • Sharing common resources and providing mutual aid, • Emphasising holistic and preventive health practices, • Providing meaningful work and sustenance to all members, • Integrating marginal groups, • Promoting unending education, • Encouraging unity through respect for differences, • Fostering cultural expression.	**Economic Dimension:** • Keeping the money in the community, • Circulating it through as many hands as possible, • Earning it, spending it, and investing it in member-owned retail and service businesses, • Saving it in homegrown financial institutions.
Cultural Dimension: • Shared creativity, artistic expression, cultural activities, rituals and celebrations, • Sense of community unity and mutual support, • Respect and support for spirituality manifesting in many ways, • Shared vision and agreements that express commitments, cultural heritage and the uniqueness of each community, • Flexibility and successful responsiveness to difficulties that arise, • Understanding of the interconnectedness and interdependence of all the elements of life on Earth and the community's place in and relation to the whole, • Creation of a peaceful, loving, sustainable world.	**Ecologic Dimension:** • Growing food as much as possible within the community bioregion supporting organic food production, • Creating homes out of locally adapted materials, • Using village-based integrated renewable energy systems, • Protecting biodiversity, • Fostering ecological business principles, • Assessing the life cycle of all products used in the ecovillage from a social and spiritual as well as an ecological point of view, • Preserving clean soil, water and air through proper energy and waste management, • Protecting nature and safeguarding wilderness areas.

Source: GEN 2015a

Ecovillages share their knowledge through different channels such as workshops, seminars, visitation days and weeks. Furthermore, specific "Ecovillage Design Education Courses" were developed in 2005 at the GEN 10th Anniversary Conference and has since then offered more than 180 face-to-face, online and project-based programmes worldwide (GAIAEDUCATION 2015). The Findhorn Foundation in Scotland – the largest education-professionalised ecovillage - consults the United Nation as well as a number of international corporations. Findhorn further trains around 9.000 people per year from over 50 countries in aspects of alternative ecological life (FINDHORN.ORG 2014, LITFIN 2014).

4.1 Overview of the German Ecovillage Movement

Germany developed an alternative left-oriented scene 1968/69 with new political movements for, among others, environmental protection, gender equality and alternative energy. The first rural communes formed around that time and formulated their general principles with a

holistic socio-ecological approach[10]. Since then, these civil bottom-up initiatives have formalised in the international Global Ecovillage Network. In September 2014, the national association GEN-Germany was found by nine socio-ecological communities that understand themselves as places of research and training as well as models for society. As part of the founding preamble, they state: „We stand up for a change of the legal framework conditions so that they support the exploration and experimentation of sustainable lifestyles" (translated, OTTMAR 2014). The national network aims to strengthen their mutual support, political influence and knowledge building. The German sub-division further helps better local coordination of activities and voicing of interests. Apart from ecovillages, it encompasses other types of socio-ecological communities that are pro sustainability.

In Germany, Austria and Switzerland, 129 socio-ecological communities were identified in 2014 with three types being most dominant: left-leaning alternative commune representing 21,7%, eco-alternative community representing 20,9% and eco-spirituel self-awareness-oriented community representing 20,9% (LAMBING 2014: 58). The two year research project on socio-ecological communities defines ecovillages as only those communities that are rather large and proactively communicate their model character (LAMBING 2014: 10).

4.2 Identifying Seven Established German Ecovillages

Researching the GEN databank according to the selection criteria (see Chapter 3.2) led to seven established ecovillages in Germany. The overview presented in Table 4 tries to cluster some of their activities by seeing repetitive structures and mechanisms in their diverse activities (see Table 8 in the Appendix for a more detailed overview). The seven established ecovillages in Germany range from 40-120 inhabitants, four have above 100 inhabitants. Most of them have been established for more than 10 years - the oldest is 29, the youngest five years old. The youngest and with 115 inhabitants one of the largest ecovillage, Schloss Tempelhof, has a special advantage in that a large group of these pioneers learned from the older ecovillages through a community building process (EE1). Six out of the seven presented ecovillages are located in the northern central part of Germany and four are located in the former GDR. Four are eco-alternative type of villages, two have a major left-wing

[10] For more background details see LAMBING 2014.

orientation and one is spiritually oriented[11]. Most of the investigated ecovillages have transformed sites with a special history such as work camps or castles.

[11] Own classification according to ecovillages website statements and typology (LAMBING 2014: 58)

Table 4: Overview of the explorative research of seven established ecovillages in Germany

Categories	**Characteristics**	Ökodorf Sieben Linden	ZEGG gGmbH	Lebenstraum Jahnishausen	Schloss Tempelhof	Schloss Tonndorf	gASTWERKe e.V.	Lebensgarten Steyerberg e.V.
Age as of 2015	**Age (founded)**	18 (1997)	24 (1991)	14 (2001)	5 (2010)	10 (2005)	8 (2007)	29 (1986)
Inhabitants	**Number**	120	100	43	115	60	40	100
Formality	**GEN-member**	x	x	x	x	x	x	x
Orientation	**Assumed type of socio-ecologic community**	Eco-alternative community	Eco-spiritual self-awareness-oriented community	Left-leaning alternative commune	Eco-alternative community	Eco-alternative community	Left-leaning alternative commune	Eco-alternative community
Region	**Federal state**	Saxony-Anhalt	Brandenburg	Saxony	Baden-Wuerttemberg	Thuringia	Hesse	Lower Saxony
Location	**Rural-urban**	Rural area	Periphery to a small city	Periphery to a large city	Rural area	Periphery to a small city	Periphery to a large city	Periphery to a small city
Historical heritage	**Original use, * former GDR**	Old farm*	Nazi-youth & Stasi training centre*	Feudal estate*	Castle	Castle*	?	Armaments industry work camp
Form of organisation	**Legal entities**	Settlement and housing cooperation, educational association	Limited registered company	Settlement cooperative	Foundation (land), Cooperative (business), association (social projects)	Cooperative (land owner), association (for public events)	Association	Association
Decision making structure	**Non-hierarchical model**	Decentral, consent-based model	Sociocracy	Consent model, optional workgroup	Six-stage consent culture	Consent model	Consent model	Consent model

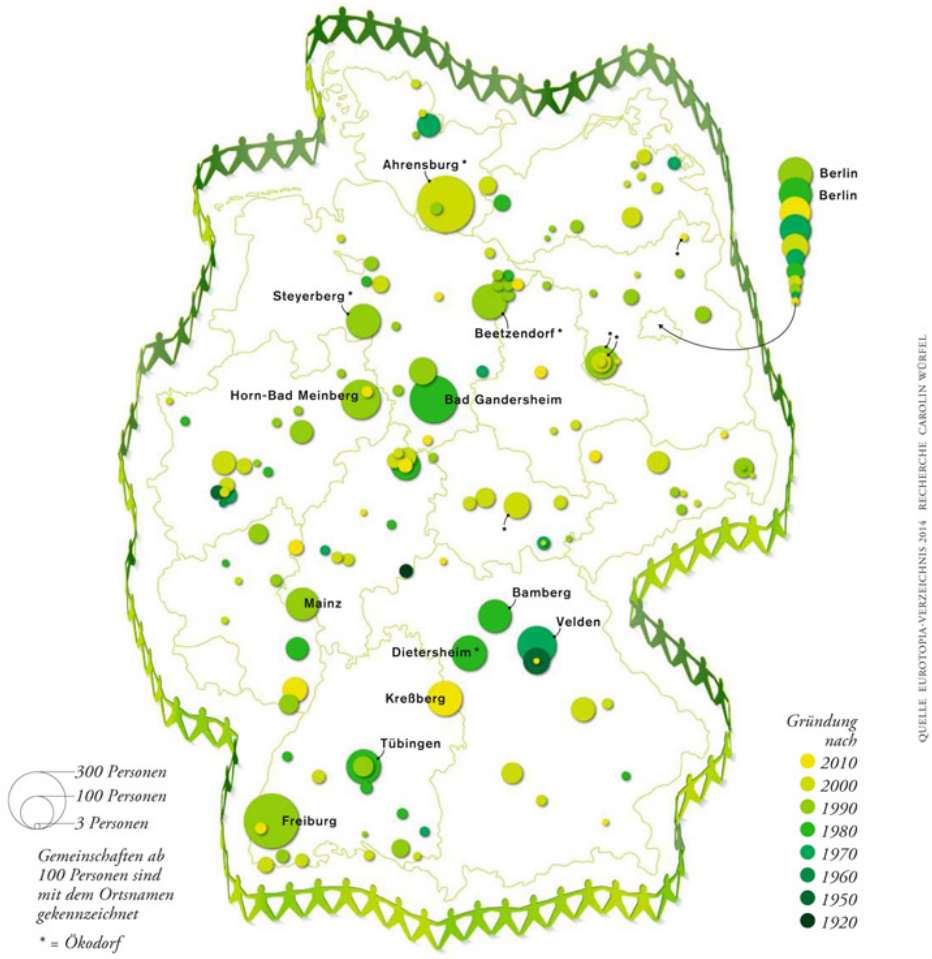
Source: data from their websites: SIEBEN LINDEN 2015, ZEGG 2015, JAHNISHAUSEN 2015, TEMPELHOF 2015, TONNDORF 2015, GASTWERKE 2015, STEYERBERG 2015

City classification: Small (< 20.000 inhabitants), middle-size (20-100.000 inhabitants), large (> 100.000 inhabitants). The question mark indicates that no data was found on the website.

Another established intentional community matching most of the criteria is Kommune Niederkauffungen. It is one of the three cases visited for the participatory observation. The left-leaning alternative commune has however no GEN membership and does not state the intention of being a role model on their website (NIEDERKAUFFUNGEN 2015). Lebenstraum Jahnishausen does not communicate the role model intention on their own website but does so by being a GEN-Germany founding member and is therefore included in the selection (OTTMAR 2014, JAHNISHAUSEN 2015).

The term ecovillage is used broadly and the proposed selection criteria for established ecovillages can be discussed. This is illustrated by a DIE ZEIT article that maps alternative communities and uses the term ecovillage for two communities that were not found in the GEN database: a Camphill community of 120 people with mentally or multiply handicapped inhabitants near Dietersheim in Bavaria (www.hausenhof.de) and a socio-ecological village project in Ahrensburg near Hamburg (www.allmende-wulfsdorf.de) (see Figure 9).

Figure 9: Alternative communities in Germany summarised as co-housing



Source: Stolz 2014; ecovillage indicated with a star (*) next to the village name

The article defines alternative communities as co-housing (sharing living space across houses) with a diversity of practices in them: “Some sharing income, some being spiritual. Most cultivating organic vegetables, some being vegan, a few cigarette- or mobile phone-free, a minority practicing free love” (translated, STOLZ 2014). This diversity in practice and “some few calling themselves ecovillage” is interpreted as an aversion of the inhabitants to be classified (ibid.). Another article states that some ecological settlements call themselves ecovillages although their main focus is on ecological building and less on the more defining community aspects (MEYER 2007). The interviewee further suggests that unlike other villages with one church, ecovillage would have one meditation room for several religions reflecting the GEN principle of respect and support for spirituality manifesting in many ways.

4.3 Common Practices and Institutions in the Seven Ecovillages

Although there are diverse approaches of ecovillages towards sustainability, many of their everyday practices and principles (reflected in their institutions) are similar. Table 5 summarises more detailed research (see Table 8 in the Appendix) of common practices by the seven established ecovillages with examples clustered by their main sector. Common practices and source of monetary or food income are the agricultural and horticultural activities found in all of them. All presented ecovillages further offer seminars and have guest accommodation available at different scales. Many seminars are related to self-sufficient practices in agriculture, gardening or construction. Practices around sharing economy are also common allowing for resource efficiency.

Table 5: Summary of common socio-ecological practices and institutions in the seven established ecovillages by sector

Sector, dimension	Common socio-ecological practices
Food industry & culture	Solidary gardening in a Community Supported Agriculture (CSA) scheme; Permaculture gardening, shared food/communal cooking.
Economy	Using co-working spaces; working in the food, handcraft or education sector; doing voluntary community work; sharing economy (sharing goods such as tools or household machines and sharing a household budget or all income); providing wages solidary. Running a gift store or box.
Policy (Institutions)	Structures for shared ownership and participation: Land is owned by an association or cooperative, flat hierarchies exist and decisions are made in consensus.
Technology	Using: renewable energy, ecological insulation, alternative ecological techniques (e.g. only compost toilets, plant sewage system, straw bale insulation). Experimenting. Banning WiFi. Sharing cars, train tickets & e-bikes.
Social	Sharing common spaces; living with multiple generations; offering seminars & education; running alternative kindergartens; intergenerational learning; re-skilling. Communicating non-violently; doing social experiments.

Cultural	Using the communication technique Forum; sharing & gifting culture; neighborhood support; hub of cultural activity in the region; preserving nature-oriented traditional knowledge. Offering dance, yoga, alternative therapy. Sharing a studio e.g. for pottery, painting.

Many ecovillage activities are related to immaterial aspects such as knowledge and skill enhancement, or nature and communal experiences. Through the lens of Social Practice Theory, common 'meanings' or aspirations of many practices are self-sufficiency, individuality, communality, solidarity, integration, non-violence and living within ecological boundaries. The 'material' elements of their practices often share characteristics of a local and nature-based origin with low-tech easy access. A diversity of social and technical 'skills' – especially the ability to self-organise - seem necessary for the broad range of practices. The seminars offered by all ecovillages lead to an abstraction of the information necessary for many of their practices which eases the reversal in a new location.

Through the lens of Institutional Economics, the practices are stabilised by common institutions ensuring shared ownership and participation. Three of the seven ecovillages have organised land ownership through a settlement cooperative, two through an association, one through a nonprofit business and one through a foundation. Three have furthermore organised their social, educational and public activities through an association. At all of the ecovillages, decisions are made transparently and participative through consensus-based models where decisions are made through an unanimous or a 2/3 majority agreement.

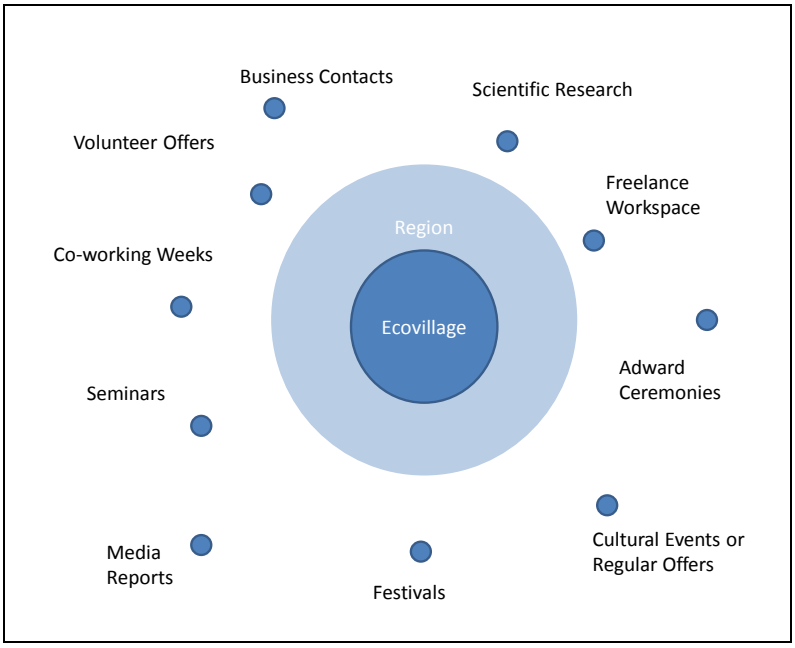
4.4 Interaction Points of the Change Agent with other Participants

The seven established ecovillages show mayor 'points of interactions' with the wider society presented in Figure 10. These interaction points could be analysed as the 'arena of change' of the conceptual framework where change agents interact with other participants and can have a direct impact on changing practices or institutions. The 'points of interaction' include communication channels like mass media as suggested by ROGERS (1965) but have a focus on the often more interpersonal and everyday interactions.

One area of interaction is regionally concentrated in order to create transparency and gain acceptance in the surrounding area which is done through public days and events. The other is more specialised where they share their knowledge with culturally like-minded people through alternative seminars or co-working experiences. A small but regular point of interaction is created through the working spaces and opportunities for freelance lecturers, craftsmen or business managers that live nearby ecovillages. They are not members of the

ecovillage association or cooperative but have a special guest status. Young people can further experience the ecovillage through a Voluntary Ecological Service Year. Living in an ecovillage as an inhabitant would create most interactions with the model. A further, however one-sided, immaterial and non-interactive point of interaction is created by the media reporting on or documenting the activities in ecovillages either by print or online articles or through documentary TV shows. Scientists and political advisors are further interacting in 'reality labs' or other forms of research in ecovillages.

Figure 10: Points of interactions of the change agent with other participants



Source: Participatory observations, website analysis and literature review

5 Indicators to Assess a Change Agent's Transformative Impact

The change agent's transformative impact potential is assessed in the context of its material conditions, attributes of its community and its institutions and practices (micro level variables, see Chapter 6.1) as well as the regime and landscape conditions and trends (see Chapter 6.4). Firstly, the innovativeness of the change agent practices and institutions is assessed (see Chapter 6.2). Then its transformative impact potential is assessed by looking at the interactions (I1) and outcomes (O1) in the arena of change. Here, especially processes related to the diffusion management of a change agent's socio-ecological practices and institutions is analysed (Chapter 6.3). These are assumed to be crucial for a transformative impact. Strategic

Niche Management presented in Chapter 2.4.3 is used for the operationalisation of diffusion processes with qualitative indicators (see Table 6).

Table 6: Indicators for analysing the diffusion process of the change agent's innovative socio-ecological practices

Indicator	Description	Data needed from different sources
Interaction (I)		
(I1a) Expectation Management	Managing and articulating expectations and visions of the change agent when interacting with others.	**Observation:** Surprises and expectations expressed by co-working participants. **Online Media**: Amount and type of posts by ecovillage inhabitants. **Print Media**: Quotes of ecovillage inhabitants on the ecovillage practices and institutions. **Expert Interview**: Assessment by ecovillage experts.
(I1b) Social networking	External networking: The number, variety and degree of interactions with other initiatives or relevant stakeholders such as scientists or politicians. (Broad or deep network) Bridging social capital: The creation of new relationships between people who did not previously know each other.	**Observation, Print Media:** Amount and type of collaborations with other initiatives or relevant stakeholders mentioned, points of interaction mentioned/observed. **Online Media**: Amount and type of social media user reporting on the ecovillage. Amount and type of points of interaction mentioned. **Survey**: Open-ended question for ecovillage seminar guests on new relationships created during their visit (bridging social capital) and their knowledge of other ecovillages (deep network). **Expert Interview**: Assessment by ecovillage experts.
(I1c) Learning processes	First order learning: New material and especially ideas and skills around cultural techniques such as communication, awareness, community building. Second order learning/questioning: Routines are questioned, change of perspectives if offered, triggering questions or visions on personal or societal development.	**Observation, Online & Print Media**: Amount and type of first and second order learning processes as well as interaction points mentioned/observed. **Expert Interview**: Assessment by an ecovillage expert. **Survey**: Open-ended question on what new skill, material or idea the seminar participant learned.
Outcome (O)		
(O1a) Translation	Mis/understanding of practices and institutions by visitors.	**Online & Print Media**: Amount and type of practices and institutions reported on. **Survey**: Amount and type of pre-defined practices and institutions that were noticed by and/or explained to survey sample guests.
(O1b) Replication	The modified replication of practices or institutions by participants reported to be inspired by the ecovillage.	**Online & Print Media**: Amount and type of social media posts/articles related to the imitation of practices and institutions. **Survey**: Open-ended question on the new materials, skills or ideas learned that were adopted or replicated in a modified way.
(O1c) Growth in scale	Decrease or increase of ecovillage members or their immediate surroundings as well as their practices and institutions.	**Online & Print Media**: Amount and type of social media posts/articles; content related to growth of the ecovillage, their practices and institutions. **Expert Interview**: Self-assessment by an ecovillage expert.

Further indicators derived from research on the impact of community-based initiatives on different sectors (CELATA et al. 2015) could help to enrich the analysis on the change agent's influence on the regime:

- Social indicator: Enrolment, social inclusion, bonding social capital, empowerment, human capital externalities (skills passed on through e.g. seminars and workshops),
- Political indicator: Networking, political mobilisation,
- Economic indicator: Financial sustainability, economic benefits, job creation,
- Technological indicator: Technical complexity, innovativeness.

Table 9 in the Appendix is an extension of Table 6 detailing these indicators and necessary data. All indicators were discussed in the expert interviews.

The discussion with the experts showed a unity in the emphasis on social indicators. Discord existed for the indicator on 'learning processes' (I1c) if it only analyses the change agent's promotion of complex skills during the interaction with other participants (EPE1, EPE3). The change agents' specialty is less about the new practice learned but more about showing new perspectives, triggering personal life questions or questions on societal development such as everyday equality and participation (EPE3). In the indicator, this is summarised as **second-order questioning potential** of the change agent and included under 'learning processes'. Along with SPT, where the 'idea' is an element of the practice, analysing the new ideas of the change agent that could change others' perspective and trigger such questioning processes can reveal more about the change agent's transformative impact potential. Another expert stated the importance of looking at the change agents innovative techniques for social interaction and community building - especially in its impact on guests (EPE2). These **cultural techniques** of ecovillages have an impact but are difficult to assess (EE1). They are included in the indicator on first-order 'learning processes'.

Interesting to experts are further the scope or enrolment and networking capacity (EPE3, EPE1) which are included under 'growth' and 'social networking'. The view on 'replication' as an outcome indicator differed with one expert stating that replicating the structure is not the main point (EPE3) and others seeing potential there (EPE1, EPE2).

Includable but not so interesting for all experts were the indicators political mobilisation and technological innovativeness. The classical impact indicators employment numbers or job creation was seen skeptical by all experts but provoked the idea of an indicator for the provision of new social security structures (EPE3). A further suggested indicator is the reasons for people going to the ecovillage and not elsewhere (EPE1) which was added to the

survey questions. Other developments that could be integrated are their scientific contributions to knowledge building or interaction with foundations (EPE3).

The assessment of the change agent's impact needs a certain openness which could be provided by looking at their four dimensions of society, culture, economy and ecology (EPE3). Indicators could be structured by internal and external ones (EPE1) and the assessment could be organised through a self-assessment questionnaire (EPE2). Besides looking at the practices it is recommended to look at the guidelines (EPE2) and principals (EPE3) of ecovillages which was done by looking at their institutions and the ideas or meaning behind their practices. Further of importance are the components of time patterns, the idea, the processes, the context and resistances: "Is it the right time, […] does it fit into the landscape right now?" (translated, EPE1). Finally, recommendations to decision makers and the change agent on further action should be given and the feedback from the change agent on the research should lead to an adaptation and the next step in a post-thesis action research design (EPE1). In general, they should not be seen as separate from society as they are part of it (EPE3).

In the following chapter, the empirical data on Ökodorf Sieben Linden is analysed with the indicators presented in Table 6. The indicators are used as coding categories for the qualitative analysis of the media content, participatory observation, online survey and expert interviews.

6 Analysing the Case of Ökodorf Sieben Linden

Forthcoming, the conceptual framework is applied to the case of Ökodorf Sieben Linden to see if the framework can show patterns in the empirical data that can be used for an assessment of the transformative impact of the ecovillage. The assessment consists of an assessment of the change agent's innovative socio-ecological practices and institutions and an analysis of their interaction with other participants and its outcomes. Furthermore, the barriers and opportunities of the regime or landscape relevant for the change agent are presented. In the summary, the analysed interactions and outcomes are discussed within the context of the regime and landscape. From this, the transformative impact potential of the change agent could be derived. Table 10 in the Appendix summarises the data in the developed framework. Following the analysis, Chapter 7 discusses the results and its implications for the framework.

6.1 Micro Level Context: Material Conditions, Attributes of the Community & Institutions

Ökodorf Sieben Linden is located in the rural area of Saxony-Anhalt between Hamburg and Berlin. The property of 21ha consists of a forest, acreage and 8ha for construction land for up to 300 inhabitants (SIEBEN LINDEN 2015). Eight out of the ten two-storey houses are self-constructed with the main **material** being local wood, clay and straw bale (ALBRECHT 2015). Experiments with material, architecture and eco-technology but also different user-planer groups lead to multiple designs versions. The first houses on site where two delivered pre-constructed eco-houses in 1999 as the self-constructed versions took too long (finishing in 2001) (WÜRFEL 2014). Further people live in around 50 construction wagons. Central is the communal 'Regiohaus' with a large kitchen and dining rooms, seminar and guest space, food storage and sale, a library, bar and dance room. Other mainly self-made constructions onsite include a work space, a kindergarten, a private area for young inhabitants, a camping area, a house of silence which is under construction, an amphitheatre and a sauna. The gardens are divided in private parcels and a larger horticultural business for self-sufficient production of food (ratio of 70%). Eco-friendly technology consist of a compost toilet system, a plant sewage system, a solar energy and wood heating system. Distinctive signs at the entrance of Ökodorf Sieben Linden indicate the beginning of the ecovillage terrain, some important rules (e.g. no phone, no cars) and a map gives orientation on private and public areas for guests (ALBRECHT 2015).

The Ökodorf Sieben Linden understands itself as a trendsetting **community** project implementing sustainable lifestyles (SIEBEN LINDEN 2015). It aims at social, economic and ecologic justice that it approaches as an experimental quest with open, honest and aware communication, self-sufficiency and appreciation of diversity. The ecovillage understands itself as a place of personal development but also as a model for a sustainable society (ibid.). The internal motto is: "Unity in Diversity" (translated, SIEBEN LINDEN 2015) referring to the diversity of approaches to sustainability. In 2015, the community consisted of 120 inhabitants including 40 children (SIEBEN LINDEN 2015). Around 6.000 guests are visiting the ecovillage per year (EE1). The ecovillage's self-presentation is that of heterogeneous social backgrounds (ibid., WÜRFEL 2014)[12]. Teenagers and young adults were reported to leave the ecovillage for better education in urban areas or for travel experiences (ALBRECHT

[12] A two year study assumes ecovillage inhabitants to be part of the socio-ecological or liberal-intellectual milieu (LAMBING 2014: 26).

2015, EE1). Ecovillage inhabitants were observed to be very busy and involved in a multitude of tasks from food production to construction, active and aware communication and organisation. The diversity of skills is based on many 'trial and error' experiments in the past, however, the experiment-friendly culture reduced as long-time inhabitants counter that they have tried it already. From the beginning in 1997, the settlement group had different approaches towards sustainability and split into neighborhoods. Some have a theme relating to their inhabitants or construction technology, however, a distinguished neighborhood profile did not develop (ALBRECHT 2015).

Institutions at Ökodorf Sieben Linden were observed to mainly play a role for property, internal decision making and organisation of everyday life. External communication and onsite seminars are organised by an association. Land in Ökodorf Sieben Linden is owned by a settlement cooperative and a housing cooperative organises the living spaces. By contract each inhabitant pays a minimum share of 10.000 EUR into the cooperative when entering the ecovillage and more regularly a fee for wood, electricity and food as well as a monthly rent when living in a house. Other important associations are the Global Ecovillage Network where Ökodorf Sieben Linden is an active actor and a founding member of GEN-Germany.

Operational rules organising daily life include e.g. showering before bathing in the local lake as well as a ban of wireless internet, mobile phones and cars onsite. Strong norms relate to the participation in the community through volunteer and community work as well as participating in communication and conflict resolution processes (ALBRECHT 2015).

Decision making takes place in an altered consensus decision model. In working groups on specific topics, solutions are developed and decisions are passed with a 2/3 majority. The decision making process is recorded in protocols, however, a set of all rules is not collected as they constantly develop (WÜRFEL 2014). A brochure for new inhabitants lists 37 important rules (WAGNER 2013: 115), a flyer for new guests lists 19 rules from requesting guests to announce their arrival and respect the mobile-free space to the aware and eco-friendly use of compost toilets, showers and other goods and areas onsite.

The change agent's policy and vision paper state values of honesty in communication, awareness, self-responsibility, interest for others, appreciation, trust in oneself and others, allowing creative tension and persuing inner growth. Further observed values and aspirations include long-term thinking, closing cycles, efficiency, resource conservation, biodiversity, supporting culture and art, securing the established community, neighborhood help,

(individual financial) independence, self-determination, a sense of responsibility, self-discovery and integration (ALBRECHT 2015).

These values and aspirations are reflected in their everyday practices. The co-working week, mainly focused on gardening, however many other **practices** where observed and the first three participated in:

Table 7: Practices observed during one week of co-working at Ökodorf Sieben Linden

Sector-Bundle	Practice
Food, Agriculture, Consumption, Care	**Gardening together** once a year in a co-working week reducing the level of weeds especially to maintain the clay and wood constructions, showing participants the ecovillage.
	Communal eating up to three times per day including an opening circle for lunch and dinner to present who cooked, what was cooked and to thank the cook.
	Communal servicing in the kitchen for 30min each day helping to clean up as a co-worker, for inhabitant the communal service in the kitchen or garden depends on the level of use.
	Cooking mainly regional and seasonal food.
	Socio-ecological gardening in smaller individual garden parcels and professionally by a gardener in a Community Supported Agriculture (CSA) scheme,
	Communal cooking of lunch and dinner, breakfast is also prepared. Rotating community service depending on use of service. (Other option: Cooking from community food storage.)
Housing , Infrastructure, Construction, Energy	**Maintaining the compost toilet** includes replacing full buckets and a ~weekly wheelbarrow trip to the larger compost to empty the buckets. (After 1-2 years this is valuable compost to afforest the local nutrient-poor woods).
	Living together in small self-organised groups in houses owned by the cooperative with 16qm space/person and communal areas (kitchen, library, sauna, work space).
	Building houses ecologically with local or recycled material, financed through the cooperative.
	Heating and generating own electricity with renewable sources (wood, biomass, solar).
Consumption	**Gifting unused** items in a gifting area that is maintained by a volunteer.
	Sharing goods such as cars and tools in a small-scale self-organised way.
Others	**Celebrating nature** events like summer solstice (yearly rituals).

The change agent's practices and institutions represent common practices and institutions identified in the seven established ecovillages in Germany (see Chapter 4.3). A shared income structure, practiced by other established ecovillages, is not implemented at Ökodorf Sieben Linden.

6.2 Innovativeness: Assessing the Change Agent's Practices & Institutions

In a first assessment, the innovativeness of the change agent's socio-ecological practices and institutions is explored in expert interviews and scientific literature. Most of these presented practices observed Ökodorf Sieben Linden at are not an **absolute novelty** except for maybe the building of houses with straw bale insulation, with the first such a house registered in Germany (EE1), the everyday use of communication and conflict resolution tools as well as

managing a compost toilet system for 120 people. Novel is also the integration and combination of several practices and processes to a complex socio-ecological system (EPE1, EPE2, EPE3). As a community, they act self-sufficiently across sectors and consider the whole life cycle of a product or service. They practice an alternative societal und living-together model (EPE2, EPE3). Most practices and institutions are **relative novelties** especially in the context of the rural area. Ecovillage inhabitants see themselves in the global context (EPE3, EE1) and their life is seen as extremely contrasting mainstream societies life (EPE3). They further network better compared to past communities (EPE1). Relatively novel are the institutions that allow participation in the immediate design of the change agent's environment, the communal ownership as well as the norms requesting voluntary work. The practices and institutions presented are not just idea but have been **implemented** and proven to work in this particular context. A study on the greenhouse gas emissions of Ökodorf Sieben Linden revealed significantly lower emissions even when compared to the emissions of the average ecologically mindful German (SIMON 2004). The housing system with a practice of living in small rooms (16qm per person is the rule) and using a diverse but compact communal infrastructure is more **effective** than the private use of such resources (EE1, SIMON 2004). The food system of the ecovillage seems more effective in regards to sustainability than the conventional system: It consists of practices and institutions of socio-ecological gardening and catering producing ~70% of the ecovillage food, it ensures a regional, seasonal and often communal diet and increases the resilience of the community being independent of market prices. Besides the local processing and consumption of the food, it engages the community and provides a service of three daily meals. Sharing goods and gifting unused item is further more effective in regards to resource use (LEISMANN et al. 2012). Using local material such as wood, clay and straw for construction, also would also reduce the CO_2-balance compared to the transport and mining of conventional construction material. The permanent negotiation and communication processes could be seen as effective as otherwise the community would be instable (EPE3). On the other side a high fluctuation exists (EE1, EPE3) and an overload of practices in the daily life of inhabitants (EPE3, EE1) could be considered ineffective.

The social (EPE3, EPE2), communal (EE1, EPE3) and participatory (EPE3) aspects of the ecovillage practices and institutions are qualities that could **meet a social need**. A quote by an inhabitant illustrates this: "In Sieben Linden, I finally live a meaningful life because I am part of it" (translated, MATTHEIS 2008: 34). Participants of the co-working week expressed valuation of the food-related and social practices of the change agent: high quality of life

through healthy and fresh food, a socially interactive life and security in age/pension. Good food on open Sundays was also the element attracting initially more skeptical locals (EE1). The ecovillage expert values Ökodorf Sieben Linden for it sharing goods but also for its social aspects of support, personal development and room for deeper conversation. Furthermore, at the ecovillage one can live a political statement and a more self-determined life as it empowers to change the immediate context (EPE3, EE1). In community, one can also live more ecologically (EE1). Further valued are the communal catering and eating (EE1, survey). Ecovillages, however, do not provide solutions for every problem or milieu in society (EPE3). Yet, the ideas of community and autonomy behind many of their practice are essential human needs according to Maslow's 'hierarchy of needs'.

A wider application the change agent's practices and institutions could **enhance society's capacity to act:** a) Ökodorf Sieben Linden uses underused resources and assets in the form of recycled material for construction and developed an underused rural area. b) Many products and services are self-made or co-created. c) Internally ecovillage inhabitants hold multiple roles. Relationships are intense and fostered through community building and personal development techniques. d) The change agent is empowered by its participatory institutions allowing the design of their immediate context. e) Within the ecovillage, a collaborative and open lifestyle is aimed at and fostered through yearly intense times to discuss needs and conflicts. The ecovillage lifestyle is, however, exclusive to the inhabitants and, to some extend and time, open to guests. f) Reciprocity is partly institutionalised through the rules on community service and the norms around volunteer work. g) The presented practices could be seen as future-oriented in regards to climate change as they aim to increase the community's resilience or protect the environment.

6.3 The Diffusion Process: Interactions & Outcomes

Applying the framework, the empirical data was analysed for the interactions and outcomes on the micro level in the arena of change where the change agent interacts with other participants. The impact of its practices and institutions on guests is analysed in the following chapters. Particularly the diffusion processes of the change agent's socio-ecological practices and institutions is analysed. Empirical data consists of participatory observations, a content analysis of online and print media, an online survey and expert interviews.

6.3.1 Managing Expectations

The content analysis showed a low interaction of Ökodorf Sieben Linden with the selected online and print media. Within one month, 19 tweets around the general German term ‘Ökodorf’ were posted on Twitter compared to 586 tweets on the English term ‘ecovillage’ (Aug 2015, TOPSY 2015). The more specific social media analysis on Ökodorf Sieben Linden showed 99 posts within 20 months from Twitter, Facebook, Youtube, blogs and Google Plus (Jan 2014 to Aug 2015, TOPSY 'SIEBEN LINDEN' 2015). About half of them were not analysed as they were posted by international social media users. Four posts by ecovillage inhabitants or lecturers, announcing seminars or camps, indicate that social media is not much used by the ecovillage to manage expectations. The search for “Ökodorf Sieben Linden” in the weekly newspaper DIE ZEIT archive delivered two articles (2011, 2014). The daily newspaper Süddeutsche Zeitung archive search delivered 19 articles mainly from the regional section (2002–2015). In two print newspaper articles, ecovillage inhabitants are cited putting the ecovillage life in perspective: They distance themselves from some of their “hard-core ecos” that only want to use 10% of CO_2 of the average German footprint (translated, MATTHEIS 2008) and one long-term inhabitant states “we are not an island of happiness”, “not everything is like a dream here but for me it is a good life” and “here we also have problems with the work-life-balance but in the village we can alter the structure” (translated, BLAWAT 2009).

In the survey questionnaire, no question was asked about expectations being met, however, the overall tone on the ecovillage experiences of the sample was positive. Some critical answers included one person being surprised by the “relatively bourgeois attitude for an ecovillage” (translated, 2014). Observations from the co-working week revealed that the four other participants’ expectations of getting to know the community and picking or relating ideas to themselves were mostly fulfilled. However, their expectations of an ecovillage lifestyle differed from reality regarding the cost of living in the ecovillage. Co-workers had expected much lower costs e.g. for building or food. They were further surprised about the large amount of rules they perceived onsite. An anecdote about some short-term guests illustrates the difficulties in translating the ecovillage lifestyle: the guests were put off by the compost toilet, did not want to deal with their faeces and left immediately (ibid.).A discussion with two ecovillage inhabitants further indicated that the GEN principles and vision do not represent all GEN members but that each ecovillage is rather unique.

The interview with the two ecovillage experts revealed potential reasons why managing expectations about ecovillages is difficult. Experience in Ökodorf Sieben Linden shows, even three weeks of community course is not enough to prepare for life in an ecovillage (EE1). The one year trial time and "godfathers" for newcomers are good in theory but are difficult in practice as social and cultural aspects are complex (translated, ibid.). Managing expectations could overstrain the inhabitants. The daily life in an ecovillage requires much from individuals ranging from social to financial investments (EE1, EPE3). Further attention is required by larger changes such as demographic developments and employment models. Overall the self-management seems to be off higher priority than managing the external impact (EPE3). From outside, ecovillages are seen as an experiment when they also want to live a normal life and not be constantly overstrained e.g. by demands from science and policy (ibid.).

6.3.2 Building Social Networks

The ecovillage build a **deep network** with eco-alternative projects and others interested in their lifestyle. The German social media postings on Ökodorf Sieben Linden are diverse and consist mainly of users with shared values and aspirations. These are e.g. the social business magazine Enorm, the left-wing politician Andreas Höpfner but also a lifestyle blog (TOPSY 'SIEBEN LINDEN' 2015). A deep network was also observed during the co-working week with several conversations around exchanges with the ecovillage Tamera in Portugal and other eco-alternative projects. Locally, the ecovillage initiated a citizen initiative mainly with other newcomers to the area that lead to an energy cooperative and an alternative school (EE1). Furthermore, around 60% of the survey samples visitors are in contact with like-minded people and more than 50% know other ecovillages either by visit or reading about them. The majority of co-working guests were singles, around 45 years old of diverse socio-economic backgrounds (unemployed, student, nurse, political EU administration) with an interest to move into or start a community project. An international network is indicated by the social media posts on Ökodorf Sieben Linden as about half of were not in German but in Italian, English, French, Chinese, Greek, Latvian, Dutch and French. The international organisation GEN further support deep networking e.g. with increasing cooperation of their national delegates (EE1).

Broadening network activities are indicated by an increasing interest and interaction of the science and policy community with ecovillages (EE1, EPE3) and Ökodorf Sieben Linden has recently formed a science working group (EE1). A researcher from Leuphana University

Lüneburg was met by chance during the co-working week as she moved to the ecovillage. She holds seminars on “Transdisciplinary Reality Labs for Experimental Societal Design” and develops research concepts with students that are in line with the interest of ecovillages (LEUPHANA UNIVERSITY LÜNEBURG 2015) and plans to start a research unit in Ökodorf Sieben Linden. Observations at the final conference of the research project ‘Models of Lived Sustainability’ organised by GEN and funded by the German Environment Agency further mark the interest and interaction of ecovillages with science and policy (ALBRECHT 2014). A need for temporary meeting rooms in the city to increase internal as well as external networking was expressed (EE1).

The co-working hosts explained that their social network is growing in the region as some became members of the fire brigade and politically active in the municipal and county council. Broader local networks are important for Ökodorf Sieben Linden inhabitants but were difficult to build in the rural area (EE1). Acceptance with the neighbours towards the new “academic [...] city people” increased over the last 18 years - their choir now sings in the local church around Christmas and they were asked to contribute to the 650 year celebrations of the nearby village (EE1). Furthermore, “we do not aim at a full autarky. Economic relationships embed us into the surrounding environment” (translated, MATTHEIS 2008).

Several social media posts mentioned **points of interaction** such as the summer camp (3), visits (3), a report on the Ökodorf Sieben Linden experience at a regulars’ table of the German Ecologic-Democratic party (2) and “two exciting and computer-free weeks” (TOPSY 'SIEBEN LINDEN' 2015). Furthermore, posts included links to YouTube videos, online articles and pictures. The co-working week itself was a ‘point of interaction’ creating new relationships and exchange between people with heterogeneous background and experienced as an was intense way of getting to know the village and some of its inhabitants by working together, talking much in breaks, receiving a tour and having a diverse evening program (movie on the ecovillage, sauna, bar, yoga). Points of interaction onsite could be the bar, sauna, smoking area, kitchen and dining room. Depending on the seminar content, guests might more or less interaction with ecovillage inhabitants. The tour can be the main point of awareness for some of the specialties onsite (EE1). It was further observed that the public streets of the ecovillage were rather quiet and locals seem to stay much in their private areas or were busy with work.

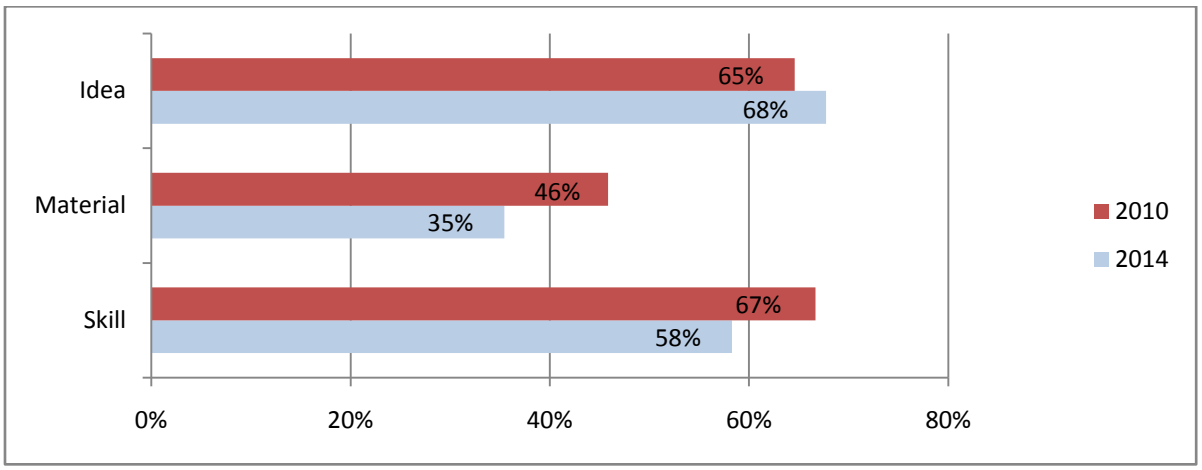
A **bridging social capital function** of the ecovillage was indicated by around 20% of the survey sample making longer-lasting contacts during their visit - some are still in intense

contact, one meet her partner in the ecovillage, others lost all contact or have not met anyone. The main reasons given for lost contact was the distance as participants are coming from all over Germany.

6.3.3 Learning Processes

The function of the ecovillage as a place for learning is confirmed by the survey sample where 80% (2010) to 86% (2014) indicated that they had learned a new skill, material and/or idea in Ökodorf Sieben Linden.

Figure 11: New ideas, material and skills learned by the survey sample during their visit at the change agent community



Survey sample: 48 answers (2010), 127 answers (2014).

The main materials learned about in both years were straw and clay for construction (2010: 35%, 2014: 13%). Wood for construction, compost toilets and vegan food were new 'materials' for some guests in both years. The overall skills and ideas learned are very diverse. In both years, the main skills learned were social skills (~30%) with most being related to personal growth. In 2014, new social skills were further about community and non-violent communication. Other common skills in both years were Permaculture and singing, planting trees, straw bale building and handcrafting as well as preserving and processing fruits and vegetables. In both years, new ideas especially on community life and community building (~20%) such as the awareness for diversity in community or the desire to life in community were acquired. Ideas on personal growth such as self-liberation, allowing closeness or other personal insights were especially gained by 2014 guests (19%). Other ideas were on Permaculture and deep ecology, building with straw and clay and meat-free diets. Furthermore, during 2014 visits, new ideas on sociocracy and ecovillage organisation were acquired and during 2010 visits, ideas on communal working emerged.

Both first and second order learning processes are taking place at the ecovillage. First order learning takes especially place in seminars. The seminars are addressed in two social media post (on “leadership culture” and “ecovillage 2.0” (TOPSY 'SIEBEN LINDEN' 2015)) and two print articles (on straw bale building (NEUMAIER 2011, GRASBERGER 2011)). One expert stated that learning processes should be less about implementing new ecovillages e.g. in the city but more about what can be learned from their principles, mission statement and social dynamics (EPE3). The seminars are helpful to preserve the cultural and social resources but less for the integration of guests and might even be a disturbance for the community (ibid.).

Social media posts related to ‘second-order learning’ processes are that Ökodorf Sieben Linden is a place for dropouts, an example for crisis precaution and is associated via hash tag with post-growth, degrowth and communal justice in the monetary system (TOPSY 'SIEBEN LINDEN' 2015). One interviewee that had visited the ecovillage learned that civilisation is built on “thin pillars” and that a simple life is physically tougher but possible and healthier (translated, EHRMANN 2011). Second order learning or “a pedagogic approach” is less practiced as most seminar guests that come for several days are already sensitised for global problems (translated, EE1). Hence, it is more about showing solutions and positive messages (ibid.). The ecovillage aims at positive learning experiences and inhabitants “do not want to missionise but to inspire” (translated, MATTHEIS 2008). The ecovillage does inspire for the possibility of a different life which several guests from the survey sample stated as newly learned ideas. During the co-working week, participants learned much on the ecovillage way of organising and its diversity but also commonality in the expression of a sustainable lifestyle. Several inhabitants explained their view and experiences during the breaks or while working together. Besides explaining e.g. the material for construction of houses, the architecture, the building phases and points of social conflict, inhabitants also explained the underlying reasons for their action which could foster ‘second-order learning’ (ALBRECHT 2015). For example, a scythes is used for mowing the lawn – it was explained how to use it but also the underlying reasons of value for wild flowers and communal disapproval of lawnmower noise.

6.3.4 Translation

The Google Trend report reveals that there is a chance of confusion or misunderstanding of the concept of ecovillages. In Germany, the most searched terms related to ‘ökodorf’ (ecovillage) on Google is ‘ökodorf brodowin’ and ‘brodowin’ (100 popularity points) (over

time 2004 - 2014, GOOGLE TREND 2015). Ökodorf Brodowin is foremost an ecological farming company and not an intentional community. The term 'sieben linden ökodorf' (80) ranks third on Google search terms[13]. The ecovillage expert stated that the misunderstandings with Ökodorf Brodowin were only noticed when interacting outside of Ökodorf Sieben Linden (EE1). This misunderstanding is not regarded as problematic by experts as it is not about the term 'ecovillage' but more about certain characteristics, social practices or principals (EE1, EE3).

The model character of Ökodorf Sieben Linden for society and its organisational setup stand out in the print articles analysed. The ecovillage is described as a: (translated and sorted by date):

- "building owner association […] settlement" (SCHNEIDER 2002),
- "the only holistic ecovillage" (MEYER 2007),
- "model settlement" (SZ 2008a), "societal draft, based on cooperative property" (SZ 2008b),
- "societal long-time experiment" (translated, BLAWAT 2009), "self-sufficient commune" (SZ 2009b), "future-oriented draft of society" (SZ 2009c) , "a Berlin eco-village", "enclave" and "model settlement" (BLÖCHL 2009),
- "drop-out model" (EHRMANN 2011), "ecological-social model project" (GRASBERGER 2011) ,
- "a kind of land commune" (SZ 2014a).

These associations match the self-stated aims of being a trendsetting self-sufficient model for a sustainable society but lack the aim of economic and ecologic justice, open and aware communication, appreciation of diversity and personal development. The titles of articles suggests associations with a "strong sense of community" (translated, SCHNEIDER 2002), "the good life" (translated, BLÖCHL 2009) (translated, BLAWAT 2009) and "classical world-saving" (translated, MATTHEIS 2008). Its inhabitants are described with skepticism as

[13] Additional insights: The interest on the search term 'ökodorf' on Google is highest in Berlin (100), followed by Vienna (43) and Hamburg (29). Google Trend shows online news articles that indicate why a search term might have spiked in popularity. These including an article on a visit of the German Federal President at Ökodorf Brodowin (DIE WELT 2013), an interview of the author and film maker Michael Würfel on his life at Ökodorf Sieben Linden (SPIEGEL ONLINE 2012) and a three month self-experiment of an economic editor living with people on "the edges of society", among others in Sieben Linden (translated, SPIEGEL ONLINE 2011).

"herb-communards" (translated, MEYER 2007), "idealists", "seekers of new life concepts", "strange friends of nature" (translated, BLAWAT 2009) and "dropouts" (translated, BLÖCHL 2009). One of the 19 articles is critical with the interviewee understanding Ökodorf Sieben Linden, amongst others, as a dropout model and not a future vision drawing a dramatic picture: "To live like in the mid ages is a regression. 90% of people would not survive that" (translated, EHRMANN 2011). Especially the communities exhibited complacency: "feeling as something better, as elite, as avant-garde. Not just dropping out for themselves. They want to demonstrate a future model of a sustainable life" (ibid.). Social media posts related much to the communal and ecological aspects understanding Ökodorf Sieben Linden as a good and social place of "living and working [well] with friends" and where people see "community as a chance" (translated, TOPSY 'SIEBEN LINDEN' 2015). It is seen as maybe the most well known ecovillage in Germany, as an exclusive place where "ecos are amongst themselves" and "not a village like any other" (translated, ibid.).

Most reported on practices in the newspaper articles were material practices related to food, housing, construction and ecology:

- Growing staple food self-sufficiently (SCHNEIDER 2002, MEYER 2007, MATTHEIS 2008, SZ 2009a, NEUMAIER 2011, BLÖCHL 2009),
- Using compost toilets (SCHNEIDER 2002, MEYER 2007, MATTHEIS 2008, BLAWAT 2009, NEUMAIER 2011),
- Building with straw bales as insulation material (SZ 2008a, GRASBERGER 2011, ARNTZ 2008),
- Living in construction wagons (MATTHEIS 2008, BLAWAT 2009),
- Farming with horses and carriage (ARNTZ 2008, MATTHEIS 2008),
- Uusing solar energy (ARNTZ 2008, NEUMAIER 2011).

In the print articles, few of the common practices of ecovillages identified in Chapter 4.3 around solidarity, community and culture were reported on. For gardening, the focus was more on self-sufficiency than on the solidarity or Permaculture aspects. Eating together was reported on once (SCHNEIDER 2002) and communal cooking was not mentioned – both practices observed as of high value by co-working participants. Communal practices reported on are living together to save energy and look after the children (MEYER 2007) and reserving time for important relationships (BLAWAT 2009). Little attention is given to the economic dimension (earning money through seminars, applying for federal state education funding)

(NEUMAIER 2011) or the sharing aspects of their practices around food, communal rooms or other goods. The cultural techniques used and diversity of cultural activities offered, the alternative health practices, nature-oriented celebrations or running the alternative kindergarten are not mentioned in print. While the use of compost toilet is reported on, the maintenance is not. Self-sufficiency is a common topic in relation to inhabitants self-constructing their houses, developing regenerative energy and water supply (BLÖCHL 2009) and sorting their letters into the postboxes themselves (BLAWAT 2009). Multi-generational living is the topic of one article (MATTHEIS 2008). In social media posts, the ecological and community building practices of using the community technique 'Forum', producing 70% of their energy needed, cleaning water naturally, building with straw bales and heating with ecological sources are mentioned. The overall tone of the posts is positive – from two positive ratings of YouTube videos on Ökodorf Sieben Linden to people being impressed[14] and in love[15].

In the survey questionnaire, two matrixes listed practices and institutions of the change agent community to find out more about their understanding. Guests were asked if they had noticed these and if they were explained to them (see Figure 14 and Figure 15 in the Appendix). While the rate of noticed practices was only slightly higher in 2014, the rate of explanations was found to be much higher in 2014 (multiple answers possible: 2010: 263%, 2014: 398%). In both years, the food related practice of eating together (2010: 60%, 2014: 48%) and cooking for the community (~47%) were the most noticed by the sample. Least noticed were solidary gardening and gifting of unused items. The most explained practices to ~43% of the survey sample were ecological building and letting plants clean the waste water. Maintaining the compost toilet was explained to many of the 2014 sample and servicing the community to many of the 2010 sample. Organic gardening was explained to few of the 2010 and many of the 2014 sample (2010: 10%; 2014: 38%). An open-ended option comments gave room for additional practices that were noticed:

- In both years: Using the communication technique Forum,
- In 2010: Nursing community, collecting wild herbs, building a house, using geomancy,

[14] Tweet 2014: *Jörg Kästl @jkaestl: 70% Energieautarkie, natürliche Wasserklärung und Strohballenbauweise des Ökodorfes "Sieben Linden" beeindruckte... fb.me/1bMT4GVZZ (TOPSY 'SIEBEN LINDEN' 2015*).
[15] Tweet 2015: *CASPER3 @casperfan23 jetzt.sueddeutsche.de/texte/anzeigen… ich liebe die sieben linden (TOPSY 'SIEBEN LINDEN' 2015*).

- In 2014: Practices to handle conflict and support social processes, creating circles to talk, tuning into meetings e.g. with silence, meeting people with similar needs and interests, meditating together, helping neighbours, celebrating festivals, storing and sharing food trustfully.

In the 2014 sample, it was further commented that the everyday-solidarity and awareness for another, the edible forests and a place that combines gardening with spirituality and art were noticed. Other commentators wrote that they do not remember what was explained or would need more time to reflect before answering (2010) or that they were not part of the community and hence did not notice much (2014). Further comments related to the organisation and decision making which was covered by the next question.

Mayor institutions are well covered by print media. **Rules** on ecological issues are mentioned such as no environmentally harming construction material (SCHNEIDER 2002), a car-free zone and no street light in order to see the stars (ARNTZ 2008). Others are on organisational issues such as that long-term inhabitant must be part of the settlement cooperative, new members are on a one-year trial (SCHNEIDER 2002), long-term guest must apply for this status and inhabitants decide collectively on new members (MATTHEIS 2008). The decision making process is mentioned by three articles – one explaining that ecology-related decisions are easier compared to more social ones such as eating meat (MEYER 2007) and another describing the process of the ecovillage moving from a consensus decision making model to a 2/3 majority direct democracy due to practicability (MATTHEIS 2008). A third sums it up as co-determination (SZ 2009a). From a list of 12 rules and norms (institutions), the most noticed by survey sample guests are operational rules and norms: Cars park outside of the Ökodorf Sieben Linden terrain, the moments of silence and mobile phones are not allowed onsite (2010: ~70-80%; 2014: ~40%). 57% of 2010 and 42% of 2014 guest indicated that they understood the rules and norms of the community. Least noticed was the collective-choice rule that rules can be changed by a 2/3 majority (2010: 44%; 2014: 17%). Further sparsely noticed are rules relating to solidarity and ecology: certain costs for children like food are covered by the community and one should shower before swimming in the lake. Most explained is the ban of mobile phones (2010: 69%; 2014: 46%).

Norms mentioned are a daily-routine-ecology (MEYER 2007), friendly caring communication, flexibility in work time, communal vegan meals (MATTHEIS 2008) and a high willingness-to-pay for eco-friendly solutions (SZ 2008a, MATTHEIS 2008). Most explained is the norm that honorary work is expected by the community inhabitants (2010:

67%; 2014: 35%). Least explained but much noticed are the moments of silence before eating or meeting (2010: ~75%; 2014: ~40%).

As **forms of organisation,** the housing and settlement cooperative (SCHNEIDER 2002, GRASBERGER 2011) are mentioned as well as sub-groups called neighborhoods organising new constructions (SCHNEIDER 2002) or representing different life concepts (MATTHEIS 2008). Two articles name that property is owned by a cooperative (SZ 2009a, SZ 2008b) and another that production is cooperatively organised (NEUMAIER 2011). Another article states that Ökodorf Sieben Linden is "strictly hierarchical" (translated, EHRMANN 2011) which could be meant in comparison to other dropouts or regarding guest-inhabitant status. More so, special rooms on the material side of institutions are mentioned: the administration rooms of the cooperatives and the communal house (SCHNEIDER 2002). In social media posts only the settlement cooperative is mentioned as a form of organisation. Explained to many of the survey sample guests of Ökodorf Sieben Linden was that land and houses are common property (2010: 65%; 2014: 48%).

Inhabitants are said to try to avoid rules but **values** such as diversity, tolerance (MEYER 2007) and self-sufficiency (SCHNEIDER 2002) are important. Much freedom (SCHNEIDER 2002) and an experiment-friendly culture regarding relationship models (MATTHEIS 2008), political theories and rules is reported on (BLAWAT 2009). One expert without ecovillage experience understands that freedom of individuality once fought for is partly given up (EPE2). Further reported on values are related to the independence of machines and thinking in whole life cycles of a products need for resource and energy which lead to the practice of using straw as a building material (SZ 2008a, GRASBERGER 2011). More recent social media posts value the internet-free time ({Topsy 'Sieben Linden', 2015 #449}).

While material and ecologic aspects are easy to explain and understand, the immaterial, social and organisational aspects are very difficult as they are virtual and only explained by words (EE1). To create transparency and more understanding for the project, the ecovillage invites monthly for open Sundays with coffee and cake which attracts many local neighbors. A tour helps understanding the material aspects and a weekend can create an intuitive awareness that something is different but for the whole complexity of the project it takes a few months (EE1). One expert without personal ecovillage experience understands that ecovillages need high levels of reflection and are conflict intense (EPE2). An expert with ecovillage experience understands that they highly contrast mainstream life and seem to develop to a combination of a lived practice and a political movement (EPE3).

Early ecovillages were accused of being sects, had low public acceptance and difficulties in finding land (EE1). There was initially and might still be a cultural divide between the rural inhabitants and the new rather urban ecovillage people (EE1). Ökodorf Sieben Linden founders were all academics with no idea about rural life. The ecovillage has a "low threshold offer that was meant for this [translation of the project to outsiders], a regional centre or house that includes a public library that is however not used by the locals as the terrain feels too private" (translated, EE1). Prejudices (e.g. everyone runs around naked) and envy (e.g. everything is financed by subsidies) still exist and lead to avoidance of contact (ibid.).

6.3.5 Modified Replications

Two social media posts could indicate a desire for future replications of what was experienced at the ecovillage: One inspired visitor gained "new food for the medium-term life planning" and another expressed the vision that "Ökodorf Sieben Linden is not enough. It needs an experiment in the size of 3-10.000 people" (translated,TOPSY 'SIEBEN LINDEN' 2015). A failed replication of an ecovillage is the content of two print articles on the former city council of a municipality near Munich who handed in 11 applications before resigning from her office. One of them was the construction of an ecovillage with Ökodorf Sieben Linden as a role model arguing that this will be an attraction. The two articles deliver a skeptical view on this "rather utopian request" (translated, SZ 2014a) and a role model "on whose webpage still horses and carriages till and pigs roam freely between the houses"[16] (translated, SZ 2014b).

According to two experts, a pure replication of ecovillages from a blueprint is not possible (EPE3, EPE2). One print article declares that ecovillage experiments are not generalisable comparing them to the experiments of a biologist on cells which cannot completely replicated on the whole human system (BLAWAT 2009). It is more about the ecovillage potential to change perspective and to trigger questions on what alternatives could look like (EPE3).

However, younger projects like ecovillage Tempelhof could be seen as an adapted replication learning much and faster from older ecovillages such as Ökodorf Sieben Linden (EE1). From the beginning, they did very successful public relations and attracted many that would have not moved into such a project 10-20 years ago (EE1).

[16] The later cannot be confirmed: www.siebenlinden.de. Furthermore, no animals except horses are allowed on the property (WÜRFEL 2014).

Most guests report that they gained something for their personal development or integrated more sustainability in their daily life (EE1). As an outcome of the seminars, 65% of the 2010 survey sample and 56% of the 2014 sample indicate that they maintained or replicated variations of the new skills, materials and ideas learned at the ecovillage. Around 13 % of the sample from both years indicated that they did not maintain them. The rest did not answer or answered vaguely. Many guests from both years stated that they have integrated what they learned at the ecovillage in their work or private life, are talking about it to others (one does so in the US) or have applied it. Concrete modified replications were a co-found community project, a self-sufficient horse riding farm or shopping mainly organic food since taking the decision in an Ökodorf Sieben Linden summer camp (2010 sample). The 2014 sample indicated replications are across a wide range with e.g. building ecological sanitation, building with straw, installing a rain water collector, founding of a (later failed) Transition Town initiative, buying more regional products, designing a school garden and shop with self-made products, meditating daily now and writing over 100 songs in one year. Further, more awareness on the use of resources, sustainability, vegan food, 'temporary communities' such as bands, the "important driving force of communal action for positive change" and the intensity of life was reported by 2014 guests (translated). The 2014 sample reported on six evolving community projects and the choice to live polyamorous as major life inspirations by the stay in Ökodorf Sieben Linden. Furthermore, decision making tools learned in the ecovillage lead one couple to take in an unaccompanied minor refugee (guided by the orientation to "serve life" (translated, 2014)). Since the technique of straw bale building that was used for the first time officially in Ökodorf Sieben Linden (EE1) and its trade association Fachverband Strohballenbau Deutschland e.V. was formed in the ecovillage, the around 150 buildings[17] in Germany (GRASBERGER 2011) could be seen as a more concrete adapted replication.

Opportunities for replication might be in the highly shared norms of expecting respectful (2010: 96%; 2014: 57%) and transparent (2010: 77%; 2014: 44%) communication as well as willingness to communicate and solve conflict (2010: 94%; 2014: 49%) indicated by the survey sample. Further potential is in their "willingness-to-do" solidary cost coverage for children (~ 46%), communal land ownership (~41%) and norms on communal service (2010:

[17] Around 250 registered in 2014 (FACHVERBAND STROHBALLENBAU DEUTSCHLAND E.V. 2015)

69%; 2014: 50%). Practices with low potential for reproduction that ~17% of the sample would do themselves could be ‘living together with communal rooms and 16qm per person’.

6.3.6 Growth

Google queries on ‘ökodorf’ and ‘ecovillage’ show a slight decrease in relative popularity compared to other search terms since 2004 (GOOGLE TREND 2015). Growth of ecovillages is not seen by a print article (MEYER 2007). Ökodorf Sieben Linden’s “export success” of straw bale building (translated, EE1) is still a niche: Although it is officially recognised as construction material since 2006 (SZ 2008a) and the seminars in the ecovillage are “nearly always booked out”, the trade association has not reached its targets of 500 buildings by 2012 (translated, GRASBERGER 2011, FACHVERBAND STROHBALLENBAU DEUTSCHLAND E.V. 2015).

The demand for educational offers in ecovillages shows a seeking for alternative lifestyles (EPE3). It was observed that the co-working weeks in Ökodorf Sieben Linden were booked out much in advance. Comparing the 2010 and 2014 survey sample, there is an increasing desire and realisation of socio-ecologic projects which could be seen as a growth of the ecovillage practices and institutions.

Opportunities for reproduction might be in the highly shared norms of expecting respectful (2010: 96%; 2014: 57%) and transparent (2010: 77%; 2014: 44%) communication as well as willingness to communicate and solve conflict (2010: 94%; 2014: 49%) indicated by the survey sample. Further potential is in the desired solidary cost coverage for children (~ 46%), communal land ownership (~41%) and norms on communal service (2010: 69%; 2014: 50%). Around 60% of the survey sample of both years indicated that they are in contact with like-minded practitioners which could help stabilise their practices.

The survey sample did encounter resistances on implementing the alternatives learned from the change agent (2010: 17%; 2014: 46%; the rest did not answer). Most stated resistances were inner conflicts e.g. lack of persistence, wishing to be more radical and experiencing fears. Other common resistances were lack of money, time and understanding of the family. The own or other peoples ego and individuality as well the lack of like-minded people were further stated as barriers to the reproduction of alternatives. Practices with low potential for reproduction that ~17% of the sample would do themselves could be ‘living together with communal rooms and 16qm per person’.

The following chapter shows further trends that might hinder or support the change agent's growth.

6.4 Barriers and Opportunities for the Change Agent

The landscape and regime constitute the wider context of the change agent with increasingly more actors and stability of systems as well as decreasing influence of the change agent towards the landscape level. Barriers and opportunities depend much on the sector and adapting the new idea to local conditions with local participation can help overcoming barriers (EPE1). "Every barrier is also an opportunity [...] when one has the courage to address it" (EPE2). Barriers are not bad intentions but express other needs or interests (EPE1).

The print media analysis and expert interviews illustrate the landscape and regime trends relating to ecovillages and potential barriers and opportunities for the diffusion of their practices and institutions. As experts are mainly from the field of environmental policy advisory, the policy dimension is especially pictured. Table 8 summarizes prominent barriers and opportunities.

6.4.1 Landscape Level Implications

The landscape shows megatrends on the global and national level that the change agent cannot affect but that can create 'windows of opportunities' for change or 'lock-ins' of established systems. These are e.g. the dynamics of globalisation and the investment effects of international capital leading to the global financial and **economic** crisis as well as local crisis e.g. by price increases for staple food (WBGU 2011, EPE3). A 'window of opportunity' for the change agent from these trends could be a search for more resilient systems. The constraints of capitalism, competition and lacking social recognition for unpaid work could be lock-ins in the economic system. This is further stabilised by the human biological instinct to collect for hard times which leads to high consumption but use is low which results in dissatisfaction in richer countries (BLAWAT 2009). The economic system is seen as very stable and changing the income or profit structure or increasing economic insecurity would create large scale resistance (EPE2).

Rule acceptance can be high when the rule is not imposed from outside but constitutes an own value (EE1) or is accompanied by supportive measures (EPE2). General **policy** trends in Germany are the withdrawal of the state and social security as well as outdated policy making as "the institutional solutions do not fit the social reality anymore" (translated, EPE3). The topic of migration might open up a new dimension (EPE2).

An opportunity for community and the environment might be that they are important German values among "moral, harmony, welfare, personal development, community and connection to nature" (translated, BLAWAT 2009: 74). And that self-reflection is part of human life and best done in a relationship with others (ibid.). Further **social** and economic trends can be seen in a globally improved democratisation, increasing energy demand and use of non-renewable sources, trends towards urbanisation and increasing land use competition between food, bioenergy and forest (WBGU 2011).

Ecological megatrends are the changing climate, rising CO_2 emission, biodiversity loss, desertification, water pollution and scarcity of resources (WBGU 2011). Furthermore, these ecosystem trends reinforce each other.

Insecure times, crisis and pressure creates a higher willingness to look at alternatives (EPE3) and hence a 'window of opportunity' for pioneer actors. On the other side, 'lock-ins' are created by cemented institutional and power structures (EPE2), the given infrastructure and production system and other framework conditions (EPE1).

6.4.2 Trends on the Regime Level

The established regime trends relate more directly to the change agent and are less stable than the landscape. With a system of internally established practices and institutions, the ecovillage is also a meso level actor on the regime level. Challenges for ecovillage development on the regime level are **economically** underdeveloped regions (EE1). Land in the rural area and especially in East Germany is cheaper but the rural and inaccessible character puts people off to move there (EE1) and fosters that the main source of monetary income for ecovillages comes from seminars (EPE3). Inhabitants often live precarious but the model could also be seen as a new social security structure (EPE3). An economic opportunity for ecovillages that would strengthen collective action could be funded community courses for civil society and the business sector. This is especially relevant in light of many new initiatives shying away from the cost but counselling by experienced community members highly increases their success (EE1). Further helpful would be better accessibility of land e.g. by giving communal projects priority over the highest bid (EE1). An opportunity might also be that especially for business ideas, funds exist (EPE1).

A **socio-economic** opportunity might derive from the increasing desire to work self-determined. Sociologists see a "longing for alternatives" to the full employment (translated, BLAWAT 2009: 83). No decision making power or transparency and the "feeling of

insufficiency" to live the liberties fought for lead to depression and other illnesses (translated, BLAWAT 2009: 82). A further opportunity might derive from the economic benefits of collective action. This is e.g. indicated by the trends of building communally where difficult legal questions and conflicts arise that demand new skills (SCHNEIDER 2002). The change agent's model of a sharing economy is however seen as conflicting with expensive desires of individuals (EPE2).

The mainstream **society** is not homogenous but consists of different social classes, groups or milieus and a good life or what is acceptable can be very different for people (EPE2, EPE3). Hence, focusing just on ecovillages is not enough as they do not represent the broad range of society and correspondingly necessary solutions (EPE3). Social interaction has much changed through internet and communication technology (EPE2) and through this channel, civil society is funding many ecovillage related things e.g. by crowd funding (EPE1). Ecovillages address the desire of a past social construct of large families (EPE2) and the demand for more participation in decision making as can be seen e.g. at Stuttgart 21 or Tempelhofer Feld (EPE3). Other observed trends are that communal rooms and catering are increasingly more attractive in various versions as well as cooking or at least cooking books (EPE1). Furthermore, collective construction projects exits in large scales also amongst conventional builders (SCHNEIDER 2002) and co-housing is becoming more popular (STOLZ 2014). Communication and permanent negotiation processes are key for communities' stabilisation and although ecovillages are good at it, a high fluctuation exists (EPE3). Difficult is finding the balance between community and individuality (EPE2, EPE3) which needs much reflection, communication, guidelines and routines (EPE2). Rather than looking at practices, the principals lived by in ecovillages could be useful for societal development inspiring for questions on e.g. interaction with children, freedom and tolerance towards others, equality, everyday participation, social security structures or decision making (EPE3).

The survey sample encountered resistances on implementing the alternatives learned from the change agent (2010: 17%; 2014: 46%). Most stated resistances were inner conflicts such as lack of persistence, wishing to be more radical and experiencing fears. Other common resistances were lack of money, time and understanding of the family. The own or other peoples ego and individuality as well the lack of like-minded people were further stated as barriers to the reproduction of alternatives.

A **culture** of change or innovation is restricted by legal barriers, cost-intensive tests and time intensive knowledge building as the case of straw bale building shows (GRASBERGER

2011). Besides technical barriers, a strong barrier to a change in culture might be that one third of Germans is "existential indifferent" and alienated as psychology research indicates, executing demands and not interested in other delights (translated, BLAWAT 2009: 74). On the other side, a niche actor culture of complete independence can also hinder cooperation or support (EPE1). An opportunity might arise from a new generation that demands a more experimental culture, participation and a debate on democracy (EPE1). To design change, the change agent and other participants need a positive attitude towards resistances (EPE1). Other aspects like the location e.g. that ecovillages developed their culture relatively freely in rural areas can also play an important role for their cultural development as especially in the city it is rather difficult to design the immediate context (EPE3). However, cultural self-sufficiency in a rural area is not easy and sometimes more than the "ecovillage family" is needed (translated, EE1). The close proximity to a city like Berlin probably attracted many to move to ecovillage ZEGG (EE1). The infrastructure of larger nearby settlements is an incentive for ecovillage growth and an alternative school attracted many people to move to or close to the preceding Ökodorf Sieben Linden project, however, the lack of a secondary school lead to others moving away (EE1).

Table 8: Barriers and Opportunities for the Change Agent

	Windows of Opportunity: High insecurity with pressure on the economic system and persistent environmental problems calling for alternatives & resilient systems; Migration; Globalization (also of alternative projects); German values of moral, harmony, welfare, personal development, community and connection to nature.	**Lock-ins**: Outdated slow policy making (e.g. responsibilities in single policy area); Firm power and institutional structures; Sunk investments in infrastructure and production system; Collection instinct fostering increasing consumption; Non-reflected routines; Lacking social recognition for unpaid work; High resistances on economic changes; Dominance of capitalism and the investment effects of international capital; Strong resistances to profit or income structure changes.
	Opportunities on the regime level	**Barriers on the regime level**
Technology	Internet and communication technology changed social interaction & support for alternative solutions; Straw bale building passed the official tests on fire resistance.	Special equipment and knowledge for straw bale building necessary, no financial benefits; Cost-intensive experiments.
Society	Communal living and building as well as communal cooking and catering trends; Self-determined work trends; Increased diversity in lifestyles and good life definitions; Ecovillage replacing past large family structures.	Ecovillages addressing only certain milieus' need (stabile niches?); Socio-economic challenges of start-up communities (critical mass, conflicts); Balance between community and individuality.
Economy	Self-determined work trend; Diversity of funds for business ideas; Demand for group conflict resolution and knowledge on community building; Model for alternative social security structures; Economic benefits of collective action.	Income generation in rural areas; Conflicts on shared income and personal desires; Precarious ecovillage lifestyles; Difficult reutilization of industrial space due to contamination and limited gardening space.
Culture	Broad ecovillage principals as model principles for societal development; Ecovillage cultural techniques: communication, awareness and community building; New generation demanding more participation, contextual design & democracy debates; Using resistances	Culture of change restricted by legal barriers and time intensive knowledge building; Highly developed urban areas not allowing contextual design; Socio-cultural self-sufficiency in rural areas; (Culture of existential indifference).

	as solution indicators.	
Policy	Going the official path of policy making and not undermining social and environmental standards; New rule design including an adjustment phase; Ecovillage function for broader society as experimental space; GEN associations' formalisation and reorganisation also allowing funding options; Ecovillages influence in developing regional institutions.	Legal insecurities in communal building; Sanctioning rather than enabling German law with a lack of support for the enactment of the ecovillage function as an experimental model.
Science	Transition of science self-understanding towards a more designing and recommending function; Policy-oriented research explores citizen science and reality labs; Need for a new social theory and courageous sociologists; Science could support ecovillages; Self-organised research in community (RIC).	Overstraining the change agent.

Generally, an opening up and more appreciation for the topic of societal transformation can be observed on higher **political** levels due to the need for new solutions (EPE3). However "at the moment, we are just identifying movements and areas of change" (EPE3). Policy making can create conditions to increase opportunity for change but this should go the established way of politics of investigating and reflecting on new phenomena and voting in parliament for or against (EPE2). Top down and hurried change mechanisms like the Dutch Crisis and Recovery Act where selected change agents can change the law upon success are seen critical (EPE2, EPE1). Experiments are important but policy making has to be careful that social and environmental standards are not undermined (EPE1). In several areas there is freedom to experiment as rule compliance is not monitored (EPE1). Official room for experiments (EPE2) and a general opening up to institutions (EPE3) is possible in Germany when it is relevant for and has a function for the broader society. For this, a diversity of social and physical spaces for experiments are necessary with different levels of integration, size or perquisites of participants (EPE3). Ecovillages could be one such type of experimental space. As they act across diverse areas of life, single aspects that match socio-political agendas could be used for policy making as well as societal development (EPE3). They are an intended political statement (EPE3, EE1) by being a model of sustainable, grandchildren-suitable lifestyle, seeing global responsibility and intending to contribute to a change in the world (EE1). Ecovillages' role for society as experimental spaces is accepted in the ministry but their role is not taken serious enough nor is this function supported (EPE3). Several publically funded programs support the internal GEN networking and learning process (EE1). However, Germany has a sanctioning rather than enabling law and there is no political effort for ecovillage replication and no support e.g. of relieving structures so they can concentrate on the essentials of experimenting rather than translating to a broader society (EPE3).

Institutional support of pioneers and maybe allowing some anarchy is necessary but very difficult due to diverging interests and power structures (EPE3). Also politics across areas is complex and time-intensive as the political structure is organised by responsibility for a single area (EPE2). Flexibility in policy making can be designed by including a reflection and adjustment phase (EPE2).

The institutional settings of GEN Europe and Germany provide a formal and international networking platform (EE1) and the association structure provides several funding opportunities (EPE1) for their mainly volunteer work. A little exercised opportunity so far is helping the cultural change in the area of organisation (EE1).

As neo-liberalism is in a crisis and state socialism failed, communitarianism based on community and shared norms fills a gap and could contribute to a new social theory (BLAWAT 2009). For such a theory to emerge, social **scientists** need to speak more in public however intimidating the dimensions (ibid.). A scientific transition is currently discussed in the science community (see Chapter 2.1): Science is descriptive but also has a designing part, even if just temporarily (EPE1). Action research exists for at least 20 year but has not been politically relevant (EPE1). Now, especially citizen science and reality labs are off interest to policy-oriented research and ecovillages are an interesting format for this (EPE3). Research in community (RIC) is the effort of communities to contribute to knowledge building in society (EPE3). Integrating science in an ecovillage is time-intensive when it is meant to be a communal process (EE1) but science could also disburden ecovillages (EPE3).

Barriers to the **technology** of the change agent might be prejudices, the wider technological infrastructure and the German law. Although scientific and public authority fires tests and approvements show that building with straw bale is no problem (SZ 2008a) (GRASBERGER 2011), it might still be rejected because of the image that straw burns quickly, is instable and prone to pests and moisture. Pressing straw also needs more pressure than used in agriculture and the construction has no financial benefit compared to conventional constructions. Building permits might also depend on the responsible agency (SZ 2008a) especially for weight carrying houses (GRASBERGER 2011). Often the German construction law inhibits growth of ecovillages (EE1). The reutilisation of former industrial sites suitable for communal projects is often limited by space and prohibitions due to contamination of sites (SZ 2014a).

6.5 Summary of the Analysis

As an introduction, the micro level context of the arena of change - the observed 'attributes of the community', 'institutions and practices' as well as 'material conditions' - were presented. Afterwards, the change agent's practices and institutions were assessed. They showed an extensive **socio-ecological innovativeness** being 'absolutely novel' in their combinations e.g. of solidary organic gardening and norms and rules on communal cooking creating a socio-ecological food system. Absolutely novel are further the socio-cultural techniques such as the routine use of community building, communication and conflict resolution tools. The change agent 'empowers' e.g. through participatory design processes of their immediate context and creating deep relations but also showing its visitors communication and conflict resolution tools in seminars. The change agent is limited in its 'openness' to guests as the character of the ecovillage life is private and time-intense. For society's empowerment, several ecovillage practices and institutions or systems of these could be of interest as they show potential valued qualities that could meet a social need relating to ideas and skills on personal development, independence, community, food and empowerment. However, these might not be a need of every social class or milieu.

Following the first assessment, the socio-ecological practice and institutions of the change agent were analysed regarding the diffusion processes in the arena of change.

In the diffusion management process, **managing expectations** is seen as a challenge due to the underestimated intense self-management within and complexity of the ecovillage. Ökodorf Sieben Linden did build a deep (inter)national **social network** with seminar guests and other eco-alternative initiatives that could be supportive. The network is also broad in the region and widened more recently with policy-makers and scientists. The survey across Ökodorf Sieben Linden seminar guests indicates a bridging and education function of the ecovillage. A majority of the survey sample **learned** new skills, material and ideas (83%) across all except the policy dimension. The focus was on 'first-order learning' with positive solutions of eco-technology and housing material; communication, community building and personal development techniques and new ideas about communication and community. Also 'second-order questioning' processes on possible alternatives for their own lives where expressed by the sample.

As outcomes of the diffusion management, a modified **replication** of the practices and institutions of the change agent was indicated by ~60% of the survey sample. The media

analysis showed low media coverage and a potential mis**understanding** of the ecovillage concept with the agricultural business Ökodorf Brodowin. Many print articles describe the ecovillage and help the translation of what Ökodorf Sieben Linden is and does. They are mainly on eco-technology and housing related practices but institutions such as rules, norms and the form of organisation are much covered. The survey sample noticed mainly food related practices (eating together, cooking for the community) and operational rules and norms (car- and mobile phone-free terrain, moments of silence before eating or meeting) but also added diverse cultural practices. Least noticed is the collective-choice rule (rules can be changed by a 2/3 majority) that empowers the change agent to design its context in a participatory way. The experts share the understanding that communication plays a major role and that the model contrasts mainstream society. The monthly open Sunday with good cake and coffee helped bridging the rural-urban cultural divide and translation of the project. Spending a weekend in the ecovillage gives an intuitive impression but for a real understanding it takes a minimum of several months depending on the personality. A **growth** within the niche is indicated by their increasing seminar activity and the high replication rate indicated by the survey sample. The growth of straw bale houses remains under the reported expectations. The trends on the micro and regime level indicate opportunities for growth especially of the communal aspects.

Ideas on community for building and housing projects are increasingly popular demanding skills on conflict resolution and communication. Further **opportunities** are in the institutions and practices on participation which is a demand of the young generation as well as integrated ecological solutions which is a pressing global need. The transition in science working with change agents and increased understanding in the policy area could help the highly developed niche. Due to the change agent's broad setup, it can provide solutions on many dimensions from e.g. new social security structures to environmentally friendly constructions. Potential for fostering of the change agent's values (institutionalisation) was indicated by the survey samples' high interest in the institutions around shared norms of respectful transparent communication and conflict resolution and the desired norms and rules on communal service, solidary cost coverage for children and communal land ownership. Relationships with like-minded practitioners of ~60% of the survey sample underline a reproduction potential on the micro level.

Barriers to a transformation on a policy dimension might be the sanctioning rather than enabling German law as well as the firm power and institutional structures. The function of

ecovillages as experimental spaces for societal development has entered the policy level, however, it lacks seriousness and support. To fulfil its function and time-intense self-management it needs support in managing outside expectations and understanding. Socio-economic barriers might be the difficulties in balancing of community and individuality, diverging interests and lock-ins through capitalism. Micro level resistances to reproduction are especially inner conflicts but also lack of money, time and understanding of the family.

6.6 Assessment of the Transformative Impact

The change agent's practices and institutions show an extensive socio-ecological innovativeness. The diffusion analysis on the micro level showed that its interactions with other participants had an impact on their personal, socio-cultural and ecological skill and idea development. While this change agent might not be their only inspiration, a majority of the survey sample ascribed concrete inspirations from their visit and may become change agents themselves.

It can be summarised that the ecovillage has an impact empowering individuals and that a diffusion process is taking place in small specific circles across several dimensions. The empirical data did not indicate a transformative impact on society. Especially the low media coverage showed little attention or awareness of the existence of ecovillages.

Looking at regime and landscape trends, there is potential of a transformative impact especially through multipliers in science and policy. Ecovillages developed strength in networking and the debate on transformation can be an opportunity for niche change agents' acknowledgement and support. The extensive socio-ecological innovativeness of their practices and institutions addresses multiple social and political agendas. Especially the socio-cultural techniques and routines around community and autonomy were considered a valuable skill. The multi-dimensional activities could be a barrier producing time-intense internal management processes. They could also be an opportunity influencing more radical changes as trends can be matched on every dimension, as their implemented ideas show the possibility of alternative socio-ecological systems and as they can trigger a general change of perspective. Furthermore, the high fluctuation in ecovillages might reflect their experimental character and a certain tension between autonomy and community but also gives a chance to a larger amount of people to live this experiment. As ecosystem trends reinforce each other and globalisation dynamics add to higher uncertainties and potential crises, their model can enter diverse 'windows of opportunity'.

The transition pathway for ecovillages might be that of a ‘reconfiguration’ as the niche is already developed and landscape pressure from ecosystem and globalisation trend exists. Ökovillage Sieben Linden’s holistic setup and abstracted knowledge through seminars can demonstrate diverse implemented and adoptable sustainability solutions in times of global crises. With aggregations within the niche and subsequent adjustments, the regime’s basic architecture can be reconfigured.

7 Discussion of the Results

The following chapters discuss the results of the analysis on Ökodorf Sieben Linden regarding the explanatory potential of the framework developed in this thesis as well as the methods used for analysis and their results and evaluation. Furthermore, recommendations for political action and scientific research are given.

7.1 Discussion of the Framework

The transition pathway of a ‘reconfiguration’ altering the regime by aggregation (GEELS 2011a) was identified for the change agent. This is in line with the image of ecovillage impact as a “silent revolution” that emerges from the bottom up and creates small-scale places of resilience (KUNZE 2015).

The developed framework encompasses the relevance of practices happening on a daily basis (SHOVE et al. 2012), multiple levels of stability when analysing transformations (GEELS 2011a) and hence the importance of institutions representing stable valued practices (WILLIAMSON 1989, GOODIN 1998). The complexity of multiple levels helped classify the qualitative data and enriched the picture of the change agent’s impact.

The empirical analysis with the help of the variables from the framework developed in the first part of this thesis, showed a potential transformative impact of the change agent. The identification of the micro level context of the change agent provided a base of knowledge on the relevant characteristics of the change agent. However, the criteria of the socio-ecological innovativeness of the change agent’s practices and institutions would need further development as the criteria of ‘meeting a social need’ hold the risk of a normative subjective assessment. This could be improved through a comparative analysis on which needs of social milieus the change agent could address or through an INGLEHART (1977) oriented approach distinguishing between different value orientations such as materialist and post-materialist and the respective social needs. The assessment criteria could further be enhanced by the

‘wheel of sustainability’ which summarises the dimensions of human needs such as autonomy, subsistence and participation and the dimension of their implementation e.g. through technology, arts, norms or the social structure (WAGNER 2013). Furthermore, the ecological criteria and which practices and institutions are ‘more effective than existing solutions’ could be further developed to allow ease of assessment for everyday practices.

The diffusion variables could explain processes of interactions of the change agent with others and outcomes of these which could influence their wider adoption:

- Managing expectations: The variable shows a potential barrier to the diffusion of the change agent’s practices and institutions. Expectations are not widely shared and partly not realistic, self-management is too time-intense and needs to be prioritised by the inhabitants. The complexity of the change agent and its many immaterial aspects take time and personal experiences to understand and evaluate.

- Social networking: The variable shows a deep social network and increasingly broader social network which indicates more supporters for the change agent and seems especially relevant for the potential transformative impact. Furthermore, a function of the change agent ‘creating new relationships’ could be shown which adds to the ‘empowerment’ of its guests (‘bridging social capital’).

- Learning processes: The variable shows how and what knowledge is transferred to other participants. The view of practices-as-entities enriched the analysis on what was learned and, hence, can be replicated in a modified way. The ecovillage has ‘abstracted’ its knowledge which helps the modified replication or migration in a new arena of change. Learning processes take place at multiple regime dimensions on technical aspects of ecological building and even more on socio-cultural ideas and techniques. The change agent’s potential to trigger questions on the possibility of a different life was confirmed. Learning processes are not only an interaction variable but also shows learning outcomes.

- Translation: The variable was the most extensively analysed variable. It showed that the immaterial ideas of the ecovillage are difficult to translate and that a real understanding can only be achieved through longer interactions onsite. The variable further showed the diverse perceptions of the change agent’s practices and that, in comparison, mayor institutions were easier to analyse. For comparison of what should be translated, the framework was extended by the change agent’s aim or intention. To

increase reliability, the results should be discussed with the change agent to see if the translation matches the reality. A related variable to ‘translation’ could be that of ‘wider awareness’ as the media content analysis showed a lack of this.

- Replication: The variable should be used in the sense of adapted or modified replications. The concept of practices-as-entities was helpful to show such patterns where the elements of the change agent’s practice were replicated through many new initiatives that, even when created within the niche, can aggregate and lead to a reconfiguration of the regime. Similar to replication is the reproduction which could be indicated by the relationships and resistances of the new practicioners.

- Growth: The variable showed increasing popularity within the niche. However, as the change agent is more about the quality of a good life, the quantification in form of scaling might not be an appropriate indicator. Ecovillages might have already transformed the established regime by being a meso level actor with complex sets of established socio-ecological institutions and practices within an international network of actors.

The low level of ‘managing expectation’ and ‘translation’ to a wider society show barriers to the diffusion. The empirical analysis indicates that these tasks should not only be fulfilled by the change agent as they are overstrained by expectations of an experimental function while at the same time being intense to self-manage. Furthermore, only looking at the diffusion management would be one-sided. The context of the regime and landscape revealed barriers, such as the sanctioning national law, and opportunities, such as the transition in science, of a potential transformative impact of the change agent.

The developed framework did only indicate why the technique of straw bale building has not entered the regime. The low numbers of straw bale houses show little adoption although the practice was standardised and formalised through an association. Its material aspects are comparably easy to translate and accessible. It might be explained with the image of straw being prone to fire and mould, a lack of financial benefits and cognitive routines or strong lobbying activities in the established regime.

The framework could be especially helpful in systematically analysing systems of practices and institutions of the change agent that can address the needs of the wider society. For example the ecovillage food system is based on solidary ecological structures and its ‘materials’ of fresh, regional-seasonal and home-cooked food and its ‘image’ of pleasure or

abundance were found to address heterogeneous actors. This shows that the change agent is a model for the attractiveness of a sustainable life.

Splitting the practices of the change agent in its elements of material, skill and idea allowed more openness to the data of this complex change agent. It proved useful in showing 'modified replications' and 'learning outcomes' and could help fostering opportunities and overcoming barriers to change. The institutional economics view that stable valued practices form institutions could help understanding and supporting long-term change processes.

7.2 Discussions of the Methods

The mixed-method approach delivered a diversity of qualitative data and helped the explorative research with a rich picture on the complex change agent to increase reliability of the conceptual framework which was deducted from theory. Although a minimum of three empirical data sources was used to analyse each diffusion indicators, some were more dominant in providing data on the relevant indicator.

The participatory observation was initially used to distinguish intentional communities and define ecovillages for this thesis. It was further helpful to illustrate the contextual variables of the change agent, added to the understanding of 'learning processes' around the elements of a practice as well as valued qualities and mismatched expectations of the co-working guests. The content analysis provided much data for the 'translation' variable on how journalists understand the ecovillage and translate it to a wider society. It further showed that the change agent is not widely known and potentially misunderstood. It showed as one of the main indicators against a transformative impact in the form of no 'wider awareness'. The social media analysis however showed a deep network of the change agent. The print media analysis showed many 'institutions' while these were of little awareness to many of the survey sample guests. The online survey was particularly helpful to analyse the diverse learning processes and replications within the deep network of the change agent. The exert interviews provided a diverse picture on the barriers and opportunities of the change agent especially on the political dimension. They further confirmed many findings from the other sources and helped with a better understanding of reasons for these.

A first explorative research on the common practices and institutions of established ecovillages in Germany increased help for a more general framework that could work for other ecovillages. The common characteristics of the other six established ecovillages were found to match the practices and institutions of the ecovillage analysed. The content analysis

of the website of the seven established ecovillages was an efficient way to explore their characteristics as little to no research literature exists on them. However, this needs adaptation by further research in the form of e.g. participatory observation and media content analysis.

7.3 Recommendations for Political Action & Scientific Research

Sociology is rather descriptive than explanatory or recommending. Still, knowing a system, **policy** making can derive measures to provide better conditions or decrease barriers e.g. for sustainable lifestyles by aassisting change agents that provide innovative climate-friendly solutions. The developed framework suggests looking at the barriers and opportunities of a change agent in light of its practices and institutions. The uncertainty and emergent dynamic of practices implicates that policy cannot control the outcome of practices.

Looking at valued stable practices within a socio-ecological system, institutions to foster their reproduction can be derived. Policy making is a process with 'trial and error learning'. It can intervene "within and as part of the ongoing dynamics of practice. They do not work as abstract measures but as historically specific moves within a landscape of possibilities that is, in any case, always in transition" (SHOVE et al. 2012: 145). The suggested framework helps to understand the frame of action and its historical implication for present or future action thinking in processes and path-dependencies. If further suggests specific variables that have shown to influence interactions or outcomes of a change agent with other actors.

Actors, including policy makers, have several options to influence transition by influencing a) the range of elements in circulation like the idea of communal action being socially, economically, ecologically and culturally sustainable, b) the ways in which practices relate to each other like solidary gardening and communal cooking that when combined can bring a change to the food system, c) the careers and trajectories of practices and those who carry them which are much influenced by past interactions but also institutions, and d) the circuits of reproduction which policy makers can influence by connecting pioneers with scientists, policy-makers and market actors in order to reconfigure practices (SHOVE et al. 2012: 146-62).

Further recommendation for policy and science is to not overstrain change agents but provide enabling structure to support their socio-ecological innovations. This can be as simple as providing part-time meetings rooms in the city for rural ecovillage actors, enabling spaces for socio-ecological experiments or supporting community building programs. There is further need to help translating the immaterial aspects of the change agent such as the cultural

techniques around community and autonomy. Furthermore, in national statistics, there is a lack of data on alternative institutions and their distribution in society. Science and policy could add to their acknowledgment and provide data e.g. on collective land ownership by communal housing cooperatives, solidary cost coverage models for children or participatory rule design through consensus decision making models.

A **scientific** research focusing more on ecovillage institutions and their transformative impact is recommended. As they are more stable, they might provide more reliable impact assessment results. Further research could analyse how the elements of common sustainable practices and institutions compare to non-sustainable ones in terms of an ecologic footprint, economic sustainability and fulfilling socio-cultural needs. This could provide heuristics for everyday decision making e.g. on materials to use but also support political decision making on which initiatives to support.

A milieu study across the change agent's interaction points could further help to identify into which milieus the ecovillage practices and institutions are already diffusing into. Comparing the different milieus' needs with the needs the ecovillage can fulfill could reveal more about their potential transformative impact. This could be supported by a comparative research on the elements of practices of different social milieus and barriers and opportunities for their diffusion. Furthermore, a research project on former ecovillage inhabitants and their post-ecovillage projects could add to the ecovillage's impact assessment. Research on change agents should be conducted in a participatory action research format presenting results to the change agent and adapting further research steps according to their feedback. Reality labs and citizen science could also be interesting but might demand too many time resources from the change agent.

Assessing ecovillages' impact could shed light on areas of internal improvement, socio-political or economic cooperation or barriers and opportunities of the change agent. It could further assist stakeholders' decision making. The thesis could be the foundation of an empirical study at several ecovillages in Germany as case studies modifying the conceptual framework. This could e.g. demonstrate innovative practices and institutions or sets of these, with a potential of diffusing into and transforming society.

8 Conclusion

This thesis proposes a framework for the assessment of a transformative impact potential of change agents and diagnosis of its potential barriers and opportunities. The change agents analysed were ecovillages as they aim to be models of sustainability across all dimensions from ecological building to participatory decision making.

Influential concepts on complex socio-ecological systems (OSTROM 2006, POTEETE et al. 2010), multiple levels in transitions of systems (GEELS 2011b), change in practices (SHOVE et al. 2012) and institutions (WILLIAMSON 1989) as well as the diffusion of socio-ecological innovations (SCHOT et al. 2008, CAULIER-GRICE et al. 2012) provided variables for the framework. Further research on established ecovillages, expert interviews and participatory observations gave an impression of the common characteristics of German ecovillages. In a mixed-method approach using further a media content analysis and a survey among its seminar guests, the case of Ökodorf Sieben Linden was analysed with the framework to see if it can help diagnose patterns in the observed phenomena.

The developed framework is built around the change agent interacting with other actors such as its visitors or neighbours. The main units of analysis are practices (SHOVE et al. 2012) – defined as elements of the materials, skills and ideas involved - and institutions – rules, norms, forms of organisation - which represent a higher level of stability and can be altered or created by stable valued practices (GOODIN 1998). The transformative impact depends on (1) the change agent's innovative socio-ecological practices and institutions (2) and their diffusion into the mainstream 'regime' which together with more stable 'landscape' trends can pose (3) barriers or opportunities to change.

In the case of Ökodorf Sieben Linden, (1) the socio-ecological innovativeness of its practices and institutions was assessed as '*relatively new*' in the rural context and '*absolutely new*' in its combinations e.g. producing local, organic food through a kind of community-supported-agriculture scheme, cooking for the community with rules on use-dependent service and appreciating this through moments of silence before eating. They '*empower*' its 120 inhabitants through participatory design of their immediate context and also its yearly ~6,000 guests showing them e.g. the use of communication techniques and self-sufficient gardening.

(2) The diffusion analysis showed that especially '*managing expectations*' of visitors and '*translation*' of the model is a challenge as the ecovillage life is time-intense, complex and its many immaterial aspects need experiences for understanding. Its '*social network*' with

potential supporters is deep in the eco-alternative scene and increasingly broad in its region and in the scientific- and policy-advising community interested in societal experiments. A survey among seminar guests showed mainly processes of '*first-order learning'* on the change agent's ecological '*material*' as well as socio-cultural *'skills'* and '*ideas*' about community and personal development. As *'modified replications',* these elements were integrated in many new initiatives of the survey sample such as the founding of community projects, building with straw bales and buying consistently organic or regional products. Further processes of *'second-order-questioning'* were identified where guests were stimulated on the reflection about their constituents of a "good life".

The empirical analysis indicates a potential transformative impact of the ecovillage through an aggregation of new initiatives within the niche especially from *'learning processes'* and *'social networking'* activities. (3) Barriers that were found might be the sanctioning rather than enabling German law and a lack of appreciation among national political institutions that create *'lock-ins'* or take time to overcome. Societal trends of self-organised community and wider participation-demands hold *'windows of opportunities'* for the change agent's solution. The assessed transformation pathway of a '*reconfiguration'* of the regime by an accumulation within the niche (GEELS 2011b) confirms the image of a "silent revolution" of ecovillage impact creating small-scale places of resilience (KUNZE 2015).

The developed framework helps to understand sustainable solutions of complex change agents and allowed a systematic analysis of barriers and opportunities to their transformative impact. Especially the concepts on diffusion and practices-as-entities, helped to identify patterns and interrelated elements.

With this tool, ecovillages can align their public relations towards change processes and policy-makers can craft relieving policies and support sustainable practices and institutions. A comparative analysis on the potential of ecovillage solutions to address needs of different social milieus and the difference in transformative impact variables between other ecovillages could be a next research step.

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10 Appendix

Figure 12: Questionnaire for the semi-structured expert interviews

Im Rahmen meiner Masterarbeit beschäftige ich mich mit der Frage, wie die Wirkung von Nischen- oder Graswurzelakteuren auf die Gesellschaft im Sinne einer Transformation in Richtung Nachhaltigkeit untersucht werden kann. Als Untersuchungsobjekt habe ich dafür Ökodörfer ausgewählt. Dabei schaue ich mir ihre Praktiken, Institutionen (Regeln, Organisationsformen) und Schnittstellen nach außen an um mögliche Variablen und Indikatoren für ihre Ausstrahlungskraft zu identifizieren.

- *EÖ: Expert/in Ökodorf P: Politikberater/in*

Ich betrachte Sie in diesem Interview als Expert/in für _____.

1. *Persönliche Angaben.*
   a. *Name b. Rolle, Aufgaben*

2. *Ökodörfer Verständnis*
   1. *Bei welchen Praktiken und Organisationsformen von Ökodörfern sehen Sie einen Mehrwehrt für die Gesellschaft? Was sind ihre Qualitäten?*
   2. *Würden Sie sagen es herrscht ein Verständnis von Außenstehenden, für das was in Ökodorfer passiert? Gibt es Missverständnisse (Brodowin)?*

3. *Chancen & Barrieren, Übertragbarkeit, Transformationspfade*
   1. *In welchen Bereichen sehen Sie im Kontext der nachhaltigen Entwicklung in Deutschland eine Relevanz für diese Akteure? Wo sehen Sie **Hebelmöglichkeiten,***
   2. ***wo Barrieren**?*

4. *Indikatoren*
   1. *Ich habe acht Indikatoren mitgebracht, mit denen man eventuell den transformativen Einfluss von Ökodörfern für den gesellschaftlichen Wandel untersuchen kann. Wie schätzen Sie diese Indikatoren ein? [Vorlage der Indikatoren]*

      a. *Messung ihrer Reichweite z.B. # Teilnehmer an Seminaren,*
      b. *Untersuchung ihrer Netzwerke:*
         i. *Bonding social capital: intern z.B. Art und # Begegnungsmöglichkeiten,*
         ii. *Bridging social capital: Öffentlichkeitsarbeit z.B. Tag der offenen Tür,*
         iii. *Externes Netzwerken z.B. Resultate von Treffen mit ähnlichen Initiativen oder wichtigen Stakeholdern.*
      c. *Fähigkeit zur politischen Mobilisierung,*
      d. *Schaffung von Arbeitsplätzen,*
      e. *Förderung von komplexen Fähigkeiten (3 höchsten Fähigkeiten im Ökodorf, # fähiger Personen, # Kurse & Teilnehmer, # Jahre die es für die Fähigkeit braucht),*
      f. *Innovativität (Entwicklungs/Testlabor, Schaffung neuer Märkte, registrierte Patente, Kooperationen),*
      g. *Replikation ihrer Projekte oder einzelner Praktiken (# Replikationen durch Gäste).*

5. Ökodorf Experte: Inwiefern entsprechen die Erwartungen von Außenstehenden dem was in Sieben Linden passiert? Gibt es besondere Initiativen mit denen Sieben Linden in der Region vernetzt ist?

Figure 13: Questionnaire for the online survey on the case of Ökodorf Sieben Linden

Eindrücke und Erfahrungen im Ökodorf Sieben Linden

Hat deine Zeit im Ökodorf Sieben Linden dich inspiriert oder langfristig etwas in deinem Leben verändert?

Wir würden gerne mehr darüber wissen. Wir, das sind der Freundeskreis Ökodorf e.V., Eva Stützel, Gemeinschaftsberatung Sieben Linden und Stefanie Albrecht, Masterstudentin an der Humboldt-Universität zu Berlin. Eva gibt Seminare für Gemeinschaftsinteressierte, Stefanie schreibt ihre Masterarbeit zur Ausstrahlungskraft von Ökodörfern. Die Ergebnisse dieser Umfrage fließen anonymisiert in diese Masterarbeit ein.

13 Fragen (10min) - wir freuen uns über deine Teilnahme!

1. *Was hat dir besonders gut im Ökodorf Sieben Linden gefallen (der Ort, die Idee, die Projekte, die Infrastruktur, das Seminar, das Miteinander)?* [Open-ended answer]

2. *Hast du dort eine neue Fähigkeit, ein neues Material oder eine neue Idee kennen gelernt?`* *Fähigkeit:* [Open-ended answer];*Material:* [Open-ended answer]*; Idee:* [Open-ended answer]

3. *Hast du diese beibehalten oder verändert weiter geführt?* [Open-ended answer]

4. *Welche der folgenden Praktiken hast du <u>wahrgenommen</u>, <u>erklärt bekommen</u>, würdest du <u>selbst gerne umsetzten</u> und/oder <u>setzt du bereits um</u>?* [dimension or sector]
   - *Kochen für die Gemeinschaft* [food, culture]
   - *Gemeinsames Essen* [culture, food]
   - *Kochen mit regionalen und saisonalen Lebensmitteln* [food, ecology]
   - *Ökologisch Gärtnern* [food, ecology]
   - *Solidarisch Gärtnern (ein Bauer versorgt die Gemeinschaft bei Abnahmegarantie der Lebensmittel)* [culture, food]
   - *Gemeinschaftsdienste leisten* [economy, culture]
   - *Zusammen wohnen mit Gemeinschaftsräumen und 16qm pro Person* [housing, ecology]
   - *Die Komposttoilette pflegen* [housing, ecology]
   - *Ökologisches Bauen mit Stroh, Holz & Lehm* [construction, ecology]
   - *Pflanzen das Abwasser reinigen lassen* [housing, ecology]
   - *Mit Holz heizen* [energy, ecology]
   - *Ungenutzte Artikel verschenken* [economy, culture]
   - *Güter wie Autos oder Werkzeuge teilen* [economy, culture]

5. *Kommentar zum Wert, zur (Nicht-)Umsetzung oder weitere wahrgenommen Praktiken möglich:* [Open-ended answer]

6. *Welche der folgenden Regeln, Normen und Institutionen innerhalb der Gemeinschaft hast du wahrgenommen, erklärt bekommen, verstanden, würdest du selbst gern umsetzten und/oder setzt du bereits um?* [dimension or sector]
   - *Land und Häuser sind nicht Privateigentum, sondern werden gemeinschaftlich durch zwei Genossenschaften verwaltet* [housing, social]
   - *Lebensmittel und Nebenkosten der Kinder werden finanziell von der Gemeinschaft getragen* [social, food]
   - *Ehrenamtliches Arbeiten für die Gemeinschaft wird von den Bewohner/innen erwartet* [economy, culture]
   - *Bereitschaft zu Kommunikation und Konfliktlösung wird von den Bewohner/innen erwartet* [social, culture]
   - *Respektvolle Kommunikation wird erwartet* [social, culture]
   - *Transparente Kommunikation wird erwartet* [social, culture]
   - *Momente des Innehaltens (vor dem Essen, zu Beginn von Treffen)* [culture]
   - *Mobiltelefone dürfen auf dem Gelände nicht genutzt werden* [technology, social]
   - *Wlan ist nicht erlaubt* [technology, health]
   - *Autos parken außerhalb des Geländes (Ausnahme Ein- und Ausladen großer Mengen)* [technology, health]
   - *Vor dem Baden im See soll geduscht werden* [ecology]
   - *Regeln können neu gestaltet oder abgeschafft werden, wenn 2/3 der Bewohner/innen zustimmen.* [collective-choice, social]

7. *Was hat dich in Sieben Linden nachhaltig inspiriert? (z.B. ein eigenes Projekt, Lebenswandel, Wertewandel, andere Gäste)* [Open-ended answer]
   a. *Bist du bei der Umsetzung auf Widerstände gestoßen?* [Open-ended answer]
   b. *Bist du generell im Austausch mit gleichgesinnten 'Praktizierenden'? Hast du davon welche in Sieben Linden kennen gelernt?* [Open-ended answer]

Und für die Statistik:

8. *Kennst du andere Ökodörfer? Wenn ja, welche?* [Open-ended answer]
9. *Wie alt bist du?*
   - *unter 18 Jahre, 18-25 Jahre, 26-35 Jahre, 36-45 Jahre, 56-65 Jahre oder über 66 Jahre*
10. *Wie hoch ist ungefähr dein Nettomonatseinkommen?*
    - *unter 1300€, 1300-2600€, 2600-3600€, 3600-5000€ oder über 5000*

Table 9: Overview of the research on the practices and institutions of seven established ecovillages in Germany

Categories	**Characteristics**	Ökodorf Sieben Linden	ZEGG gGmbH	Lebenstraum Jahnishausen	Schloss Tempelhof	Schloss Tonndorf	gASTWERKe e.V.	Lebensgarten Steyerberg e.V.
Age as of 2015	**Age (founded)**	18 (1997)	24 (1991)	14 (2001)	5 (2010)	10 (2005)	8 (2007)	29 (1986)
Inhabitants[1]	**Number**	120	100	43	115	60	40	100
Formality	**GEN-member**	x	x	x	x	x	x	x
Orientation	**Assumed type of socio-ecologic community**[2]	Eco-alternative community	Eco-spiritual self-awareness-oriented community	Left-leaning alternative commune	Eco-alternative community	Eco-alternative community	Left-leaning alternative commune	Eco-alternative community
Region	**Federal state**	Saxony-Anhalt	Brandenburg	Saxony	Baden-Wuerttemberg	Thuringia	Hesse	Lower Saxony
Location	**Rural-urban**[3]	Rural area	Periphery to a small city	Periphery to a large city	Rural area	Periphery to a small city	Periphery to a large city	Periphery to a small city
Historical heritage	**Original use & * former GDR**	Old farm*	Nazi-youth & Stasi training centre*	Feudal estate*	Castle	Castle*	?	Armaments industry work camp
Form of organisation	**Legal entities**	Settlement and housing cooperation, educational association	Limited registered company	Settlement cooperative	Foundation (land), Cooperative (business), association (social projects)	Cooperative (land owner), association (for public events)	Association	Association
Decision making structure	**Non-hierarchical model**	Decentral, consent-based model[4]	Sociocracy[5]	Consent model, optional workgroup	Six-stage consent culture	Consent model	Consent model	Consent model
Examples of activities according to sector	**Food**	Ecological farming (8ha), communal cooking, joint food chamber, Permaculture	Communal cooking, edible landscape/Perma-culture	Organic gardening, natural food delivery service	Ecological farming (26ha land + animals), internal CSA	Aquaponic, CSA, Permaculture, food sub-scription box, catering service, beekeeping	Ecological gardening (5ha), external CSA, communal cooking	Involved in neighbouring Permaculture park (8ha)
	Exemplary other consumption goods	(Kids) Cloth sharing store	Shared tools, library, gift table	Shared washing machine	Multipurpose hall	?	?	?

Categories	Characteristics	Ökodorf Sieben Linden	ZEGG gGmbH	Lebenstraum Jahnishausen	Schloss Tempelhof	Schloss Tonndorf	gASTWERKe e.V.	Lebensgarten Steyerberg e.V.
	Energy & Heat	(Passive) solar energy, insulation, wood burning & gasification	Wood chips heating system, 200m² photo-voltaic plant, 200m² solar thermal system	Wood chips heating system, solar power	Ecological renovation of the castle	Ecological renovation of the castle	High eco-construction standards, PV, renewable energy	?
	Technology & Construction	Strawbale Building, no WiFi, compost toilets	Wetland for sewage treatment	Plant sewage system	Repair shops, Mobile living manufactory, no WiFi	?	Ecological garden and landscape design, Software sales & training	Shop for eco construction and solar technique
	Living	Multi-generational, families of choice	Hub of alternative projects in the region	Senior community	Collaborative commitment for the community	Diverse group to renovate and revive the castle	Small group living and working together	Larger settlement with cultural activities
	Mobility	Self-organised car sharing	Self-organised car sharing	Self-organised car sharing	?	Self-organised car sharing	e-bike & car sharing	?
	Education & Research	Seminar centre, forest kindergarten, research institute forming	Seminar centre	Offers seminars	Offers seminars, private primary and secondary school	"Academy of Grandmas", integrative day care, nature education	Permaculture seminars, day care, display garden, shows educational movies	Seminars centre, alternative currency research, Permaculture park, private school
	Working[6]	Several businesses onsite [7]	Large seminar centre, Freelancers	Freelancers (no internal jobs)	Partly onsite for the CSA & workshops	Office space & workshops onsite	Collective work & external workers	Some businesses on heath & seminars
	Finance & Economy	Household budget for food, aiming for internal value adding	Acts as a business, aims at developing regional economy	Focus settlement cooperative	Needs-based income, co-working spaces	Focus settlement cooperative, co-working spaces	Shared Economy	Focus settlement cooperative
	Health	Dance classes		Naturopath, dance classes	Jin Shin Jyutsu (naturopath method for self-healing empowerment)	Therapy, midwifery, yoga	Homeopathy practice	Ergo- & psychotherapy, naturopath, education therapy, yoga school
	Art	Jeweller	Shared atelier (painting, photography, sculpturing)	Jeweller	?	Wild wood furniture	?	Pottery, painting, felting, photography

Categories	Characteristics	Ökodorf Sieben Linden	ZEGG gGmbH	Lebenstraum Jahnishausen	Schloss Tempelhof	Schloss Tonndorf	gASTWERKe e.V.	Lebensgarten Steyerberg e.V.
	Cultural Sector	Practice for creative life design, deep ecology workshops	Quest for new forms of love and sexuality	Theatre and other events for the region	Wild herb tours, creativity camps	Wish tree, kid theatre/stilts/music, fire shows, nature experiences	Permaculture principles	Regional cultural centre & support, Zen-Buddhism group
	Communication (tools)	Fish-pool discussion, non-violent communication, Forum	Forum[8]	Forum, Community building by Scott Peck	Community building by Scott Peck, non-violent communication	Non-violent communication	?	Mediation, non-violent communication
Points of interaction	**Communication channels & encounterment points**	Open Sundays, co-working, trail weeks & weekends, seminars (also in French)	Open Sundays, seminars, info weekends, working space, festival, co-working weeks	Open Saturdays, info weekends, seminars, MDR docu soap	Info café & weekends, co-working, info weekends, seminar, festival	Open Sundays, info weeks & weekends, seminars, MDR docu show	Co-working weeks, info café, thematic open days, trial weekend	Seminars, Sunday tours, guest status, trial weeks, co-working weeks

1: Number of inhabitants: Small (below 50 inhabitants), medium (50 - 99 inhabitants), large (100 and more inhabitants).

2: Assumed type of socio-ecologic community: Own classification according to ecovillages website statements and typology (LAMBING 2014: 58).

3: Rural-urban location: Small city (< 20.000 inhabitants), middle-size city (20-100.000 inhabitants), large city (> 100.000 inhabitants).

4: Decentral, consent-based decision making model: Decentral through yearly elected specialised councils on different topics e.g. economy, settlement; transparency through written protocols.

5: Sociocracy: Governance system of consent-based decision making (when no objections) with an organisational structure in semi-autonomous circles with individuals linking the circles and shared decision-making.

6: Working: Not all state it but voluntary work for the community is assumed take place to e.g. clean common spaces. All ecovillages give seminars, some as larger seminar centres, other with few offers. All offer guest accommodation.

7: Several businesses onsite such as a publisher, food coop/organic shop, herb & raw food delivery service, wood workshop, community consulting, Permaculture seminars, dancing workshops, jewellery, coaching & counseling.

8: Forum: Group process with up to 50 participants to create transparency and group cohesion developed by ZEGG and practiced in other communities.

Source: SIEBEN LINDEN 2015, ZEGG 2015, JAHNISHAUSEN 2015, TEMPELHOF 2015, TONNDORF 2015, GASTWERKE 2015, STEYERBERG 2015; a question mark indicates that no data was found on the website.

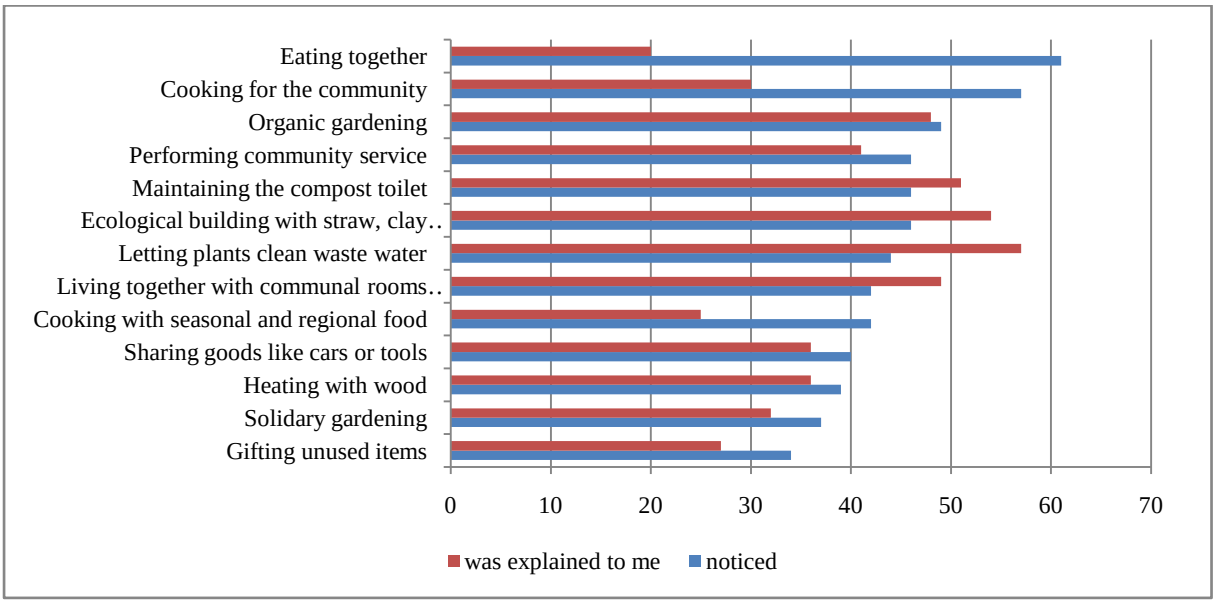
Table 10: Selected micro level and regime indicators to assess the transformative impact of a change agent

Indicators	Description	Sub-Indicator	Data needed
Interaction (I)			
(I1a) Expectation Management			
(I1a) Expectation management	Managing and articulating expectations and visions.	(i) Outside communication analysis	1. Communication of vision and goals on website, flyers, guest/participant info etc. (micro level). 2. Content Analysis of vision - shows a route/direction for learning processes, is clear/specific, realistic/achievable and can attract attention
(I1b) Building Social Networks			
Bridging social capital	Creating new relationships between people who did not previously know each other.	(i) Internal Bridging (ii) External Bridging	Information about new relationships between people who attended face-to-face opportunities or other activities by the change agent such as seminars. Type and amount of points of interaction (e.g. communal spaces, library, kitchen).
Bonding social capital	Strengthening networks and social interaction.	Face-to-face interaction opportunities index	1. Type, amount and frequency of face-to-face opportunities or activities organised by change agent per year. 2. Target of these activities (e.g. policy makers, scientists, guests). 3. Average # of participants. 4. Type and # of points of interaction (e.g. communal spaces, library, kitchen, bar).
External networking	The number, variety and degree of interaction/collaboration with other change agents or relevant stakeholders.	(iii) Social Network Analysis (Betweenness, Closeness, Degree, etc.)	Information about interactions that have occurred in the last 12 months, with similar initiatives or relevant stakeholders). 1. Name and description of the similar initiative or political actor 2. Type and frequency of interaction/s - relevant outcomes/impacts 3. 'Strategic vision' about possible alliances
(I1c) Learning processes			
Learning processes	Spreading of the change agents skills (1st order learning) but also the underlying reasons behind (2nd order learning).	(iiii) 1st order learning (1 & 2) (iiii) 2nd order learning (2d)	1. Internally the most common skills applied. # of people . # of years of education , # of years of experience to obtain that skill. 2. Face-to-face opportunities for interaction: a. Learning/educational/training activities held b. Frequency. c. Average # of attendants. d. Communication of the reasons for action

Empowerment (related to 2nd order learning)	Enhancement of the participants' self – and social awareness.	(i) Participation in decision making (iii) Interaction opportunities	1. Structure of the organisation (hierarchical or not); 2. Participation in decision-making ("full" to "no participation") 3. Participation in organisational activities /experiencing a new role; 4. Number and type of face-to-face interaction opportunities (especially internal meetings).
Outcome (O)			
(O1a) **Translation**	Mis/understanding of vision, aims and underlying values.	(j) Outside perception of vision, expectation	1. Media analysis (online, print, radio, TV, etc.), observations and/or survey on expectations 2. Comparison of communicated vision and outside expectations.
(O1b) **Replication**	The replication of practices or institutions by participants.	(jj) Replication rate	Amount and type of replication/imitation by participants.
(O1c) **Growth /Enrolment**	The ability to involve people, openness towards new members and scope of people reached.	(jjj) Enrolment/Scope (jjjj) Growth / decrease	1. # members and volunteers 2. # guests Historical information (5 years ago*) about the above and # likeminded projects in the neighborhood.
Job creation	New jobs created.	Jobs created	# of jobs that would have not existed without the change agent.
Political mobilisation	The ability to influence the political agenda, build alliances and coalitions.	Political activity	The type and amount of political activities or campaigns the change agent was engaged with in the past 12 months and the most relevant outcome.
Innovative ness	Creates, improves or diffuses new products, services, practices or institutions.		E.g. experimental spaces testing innovation, patents registered, new markets created, see socio-ecological innovation in the developed framework.

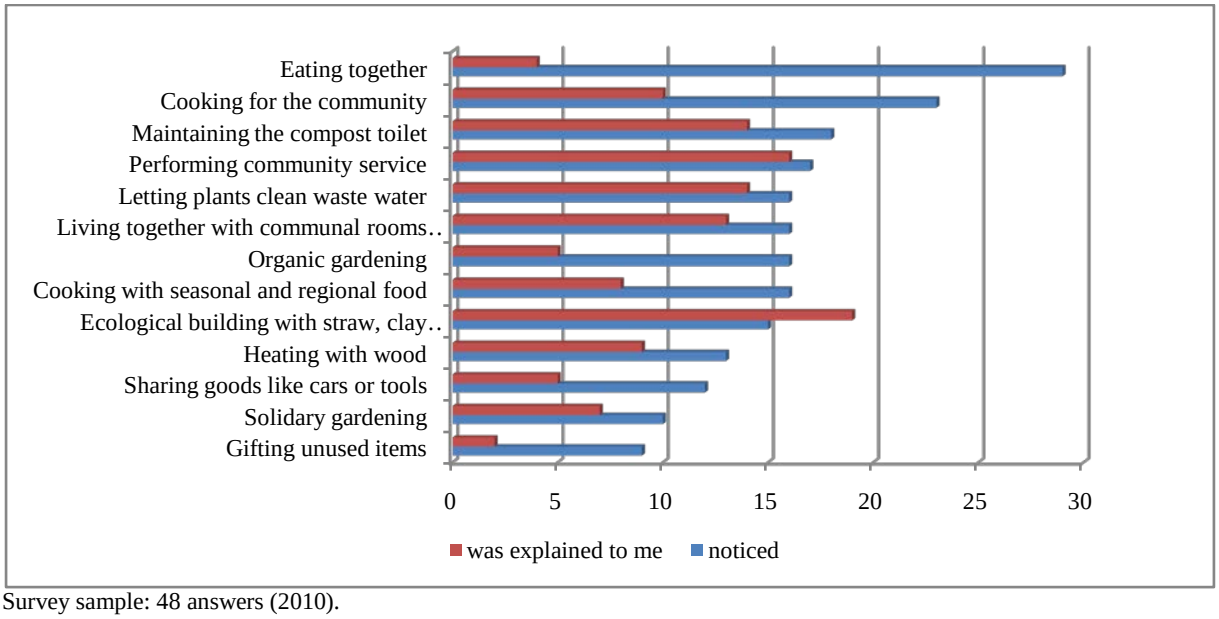
Source: adapted from CELATA et al. 2015 and SEYFANG et al. 2012: 38

Figure 14: Practices of Ökodorf Sieben Linden noticed by/explained to 2014 survey sample



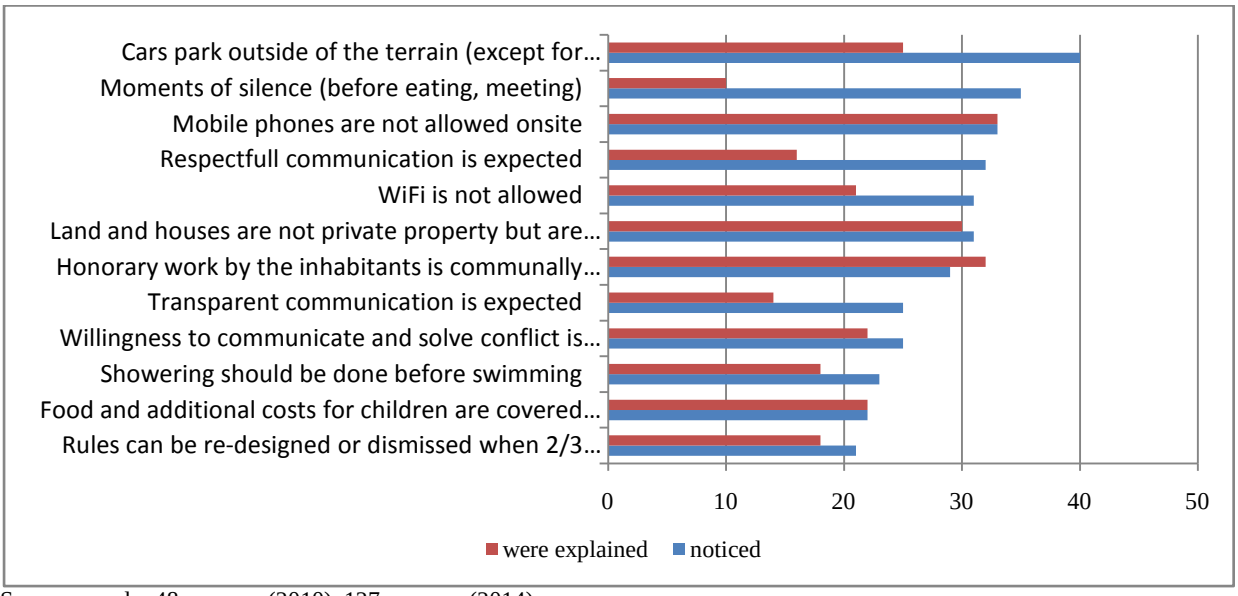
Survey sample: 127 answers (2014).

Figure 15: Practices of Ökodorf Sieben Linden noticed by/explained to 2010 survey sample



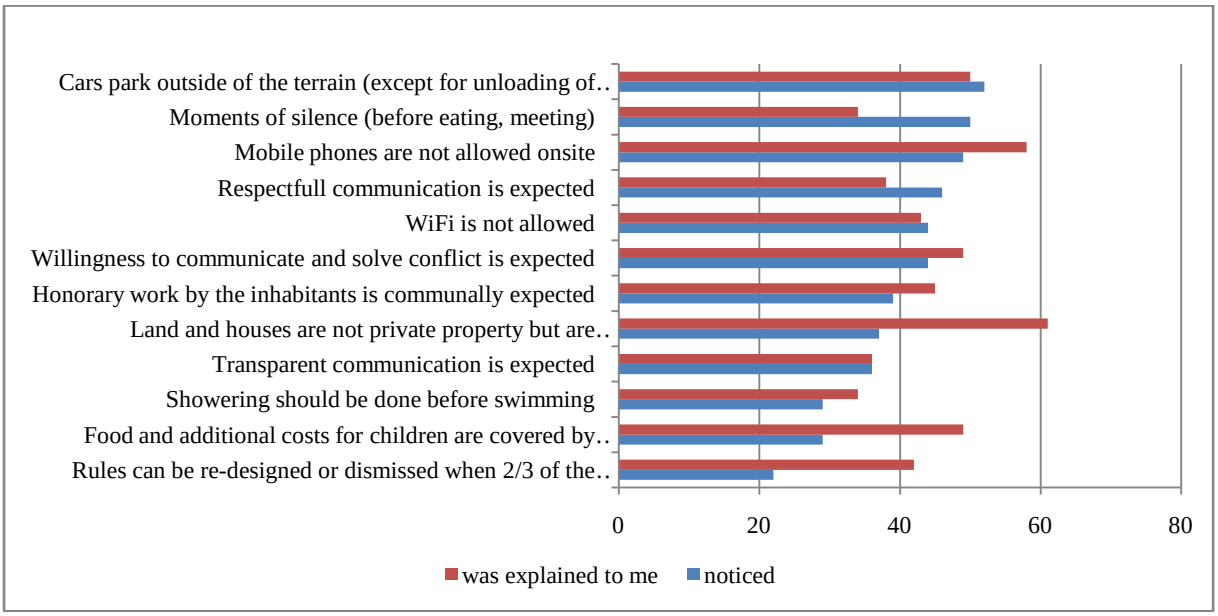
Survey sample: 48 answers (2010).

Figure 16: Rules and norms of Ökodorf Sieben Linden noticed by/explained to 2010 survey sample



Survey sample: 48 answers (2010), 127 answers (2014).

Figure 17: Rules and norms of Ökodorf Sieben Linden noticed by/explained to 2014 survey sample



Survey sample: 127 answers (2014).

Table 11: Framework diagnosis of the transformative impact of Ökodorf Sieben Linden

Material and Biophysical Conditions (MC)	**Institutions and Practices (IP)**
Located in a rural area near Poppau in Saxony-Anhalt, Germany, 3h from Berlin & Hamburg. **Size**: 21ha property with 8ha construction land for up to 300 inhabitants, forest & acreage. **Physical entities:** 10 larger buildings mainly from clay, straw and wood; central communal house with kitchen & dining rooms, seminar & guest space, food storage & sale, a library, bar & dance room; 50 construction wagons, camping space, work space, sauna, kindergarten, gardens. **Technology**: Solar energy, wood burning & gasification, compost toilets, plant sewage system. **Distinctive markings**: Signs e.g. car & phone-free zone & map with larger footpath for guests, smaller ones private. **History**: Former farm; initiating core created a settlement cooperative and bought the property in 1997, constructions since 1999 mainly self-made & from local material; two pre-constructed delivered eco-houses. **Level of stability:** Contractual security for land and vision through settlement cooperative.	**Practices**: socio-ecological gardening, cooking, living, constructing and consuming. **Operational Rules**: Communal work rules, eco-protection rules, car- and WiFi-free zone. **Collective Choice Rules**: Equal votes, topic-specific working groups, 2/3 majority decision making, protocols for transparency.**Norms:** Volunteer work norm, openness to communication and conflict solution. **Values, images & aspirations:** Personal development e.g. confidence, self-responsibility, -discovery, -determination; integration, awareness, security, self-sufficiency, long-term thinking, closing material & energy cycles, short routes & manageable structures, resource conservation, biodiversity, culture & art, individual financial independence, neighborhood help. **NGO**: Association "Freundeskreis Ökodorf e.V. for education & public relation; Global Ecovillage Network (Germany). **Property-rights systems:** Each inhabitant holds a share in the settlement cooperative. A housing cooperative coordinates living spaces.
Assessment criteria (AC): socio-ecologic innovations	**Attributes of the Community (C)**
Absolute Novelty: Building straw bale houses; maintaining a compost toilet system; routine use of communication & conflict resolving techniques; complex socio-ecological system combining practices & institutions self-sufficiently across sectors, alternative societal & living-together model. **Relative Novelty:** unconventional practices & institutions; lived responsibility/global consideration; improved networking. **Implemented ideas:** Living sustainability. Comparably more **effective & resource efficient** than existing solutions: Participatory, integrated & communal solutions for equality. Low greenhouse gas emissions by shared goods & resources; socio-ecological food & construction system. Negotiation & communication processes stabilise community vs. high fluctuation. Ineffective: overstrained inhabitants. **Valued qualities:** community, personal development, deeper conversations & support, integration, participation, self-determination, empowerment, living a political statement, communal catering & eating, higher ecological impact. But not solutions for every milieu in society. **Empowers by** a) Use of un- or underused resources such as recycled & local materials; rural area development. b) Co-design of products such as houses & self-sufficient services around food, culture, educational activities. c) Creation of multiple roles & deep relationships. d) Developed empowering skills through participatory organisation & contextual design, e) Open and collaborative character: Collaborative but rather exclusive to inhabitants, somewhat open to guests. f) Reciprocity norms & rules on community service and volunteer work. g) Future-oriented ideas & solutions on resilience & environmental protection.	**Ecovillage** (eco-alternative community settlement). **Aim**: implementing sustainable lifestyles; trendsetting model for a sustainable society; economic and ecologic justice; open, honest and aware communication; self-sufficiency; appreciation of diversity; personal development. **Number of participants:** 120 inhabitants, ~6,000 guests/ year. **Skills**: Eco-construction; self- and group organisation; community building, communication and conflict solution techniques; subsistence gardening (70%). **Mental models**: Shared vision of a sustainable lifestyle but different ways of implementing. Motto: Unity in diversity. **Conflict hearing & solution finding procedures**: Working groups for particular topics; closed for the public once a year for intensive community weeks. **History**: 1989: First ideas for project; 1991 founded association "Freundeskreis Ökodorf e.V." for everyone interested in ecovillage; 1997 project official start with foundation of settlement cooperative and property purchase; 1999 foundation of housing cooperative to organise building and living. **Socioeconomic attributes**: Heterogeneous or mid-age to older socio-ecological milieu? **Points of interaction**: communal rooms onsite accessible to guests: bar, sauna, smoking area, kitchen and dining room; interaction level with inhabitants depends on seminar; quiet public streets; Open Sunday with tour; co-working week, festivals and other public events. **Time resources:** Low - diverse tasks, interactions & demands.
Interactions on the micro-situational level	**Outcome on the micro-situational level**
I0- De-/attachment of elements (reconfiguration & circulation) d) Association, de- and reclassification processes, e) Access to or use of new material, f) Abstraction of information & reversal in a new location.	O0- New practice e.g. d) New or added meaning, e) New material, f) Migrated new skill.
Interactions on the micro level	**Outcome on the micro level**
I1- Diffusion Management a) Managing and articulating expectations & visions: Underestimated individual & social investments, experiment vs. normal life, prioritised time-intense community-management; no social media account. Print interview statements: e.g. "not everything is like a dream here but for me it is a good life"; fulfilled co-workers' expectations of getting to know the community & picking or relating ideas to themselves but surprises about the amount of rules & cost of	O1- Diffusion outcome a) Translation: Often food related. Rural-urban cultural divide; prejudices & envy still exist - avoidance of contact; low threshold offer of regional house is not used by neighbours - terrain feels too private; easy understanding of ecology & material e.g. at Sunday tour, more difficult are immaterial, social & organisational aspects, a weekend can give an impression, deeper understanding needs several month; model perceived as

living; surprised short-term guests by eco- standards; over-expectations by science & policy

b) Building social networks: Lengthy process of local acceptance & networks due to rural vs. urban culture (now: fire brigade, municipal and county council, yearly cultural event, Christmas choir, 650 village anniversary). Economic networks in the region, professional networks for straw bale building. Bridging social capital function: 20% of survey sample made new friends during visit. **Deep** network: with eco-alternative projects and other ecovillages, initiating local energy cooperative with like-minded neighbours, (inter) national seminar guests, ~50% of survey sample know other ecovillages, social media users mainly from the alternative scene; **Broad** network: with scientific community and policy consultants. Points of interaction: summer camp, (stories on) visits, youtube videos, online articles & pictures. Need for temporary meeting rooms e.g. the city.

c) Learning processes: Offering seminars on alternative construction & cultural techniques. Seminars help preserve cultural & social resources but do not fully integrate guest & might disturb the community. Should maybe be more about their principles, mission statement & social dynamics; Mainly **1st order learning** showing solutions: 83% of the survey sample learned a new skill, material and/or idea. Diversity in skills and ideas: **New skills** (~ 62%): mainly social skills/personal growth (~30%), community and non-violent communication, Permaculture, singing, planting trees, straw bale building, handcrafting, preserving & processing food. **New ideas** (~ 67%) mainly on community life & building (~20%), Permaculture, deep ecology, building with straw & clay, meat-free diets. 2014: personal growth, sociocracy, ecovillage organisation. 2010: communal working. **New materials** (2010: 46%; 2014: 35%) mainly straw & clay for construction (2010: 35%, 2014: 13%). **2nd order learning**: place for dropouts, example for crisis precaution, postgrowth, degrowth, monetary justice; explanations by inhabitants to co-workers on the underlying reasons for their action.

change perspective & trigger second-order questions on personal or societal development

I2- Reproduction of practice

a) Resistances Especially 2014 survey sample: inner conflicts e.g. lack of persistence, wishing to be more radical, experiencing fears; lack of money, time, like-minded people & understanding of the family; egos & individuality.

b) Standardisation/Institutionalisation: Shared expectations on respectful transparent communication & on willingness to communicate & solve conflict and desired norms on communal service; solidary cost coverage for children; communal land ownership by survey sample. The change agent established a. o. a regional energy cooperative and alternative school. Formalisation of straw bale building in Sieben Linden.

c) Relationships in community of practitioners: ~ 60% of the survey sample indicated that they are in contact with like-minded practitioners.

reflection & conflict intense & restrictive of individuality; contrast to mainstream life; lived practice & political statement; misunderstandings with agri-business Ökodorf Brodowin. ~50% of the survey sample indicate understanding the rules and norms of the ecovillage. **Practices**: Most print reported practices were related to food, housing, construction and ecology with focus on self-sufficiency and eco-friendliness. Less focus on communal, cultural and solidary aspects. Social media was communal and ecology oriented. Most noticed by the survey sample were the food related practice of eating together & cooking for the community, most explained were eco-technology related practices. Comments on other noticed practices related to communication, community and conflict resolution techniques, rituals, solidarity and sharing. Mayor **Institutions:** are well covered by the print media, especially operational eco-technology rules and organisational **rules**. The survey sample noticed mostly technology rules, least noticed were rules related to internal decision making, solidarity & ecology especially the phone-ban was explained to them. Print-reported **norms** on communication, food & money. The survey sample most noticed cultural norms which were least explained. Print-reported **values**: Openness for diversity, tolerance, self-sufficiency, freedom, experiment-friendly culture, independence of machines, holistic decision making. **Form of organisation**: Print-reported on housing, settlement & production cooperative - common property, also most explained to survey sample; 'neighborhoods' for organising new constructions/representing different life concepts.

b) Replication/Imitation: A pure replication of ecovillages is not possible; failed planned replication by a Bavarian city council; around 250 straw bale houses as of 2014. Modified replications by 60% of survey sample maintained or replicated variations of the newly learned skills, materials and ideas. 13% did not. Resulting initiatives 2010: a co-found community project, a self-sufficient horse riding farm, shopping consequently organic food. 2014: Six evolving community projects, the choice to live polyamorous, use of decision making tools, building ecological sanitation, building with straw, installing a rain water collector, founding of a (later failed) Transition Town initiative, buying more regional products, designing a school garden & shop with self-made products, meditating daily, writing songs; More awareness on resource use, sustainability, vegan routine, the power of communal action, intensity of life & "temporal communities".

d) Growth: Increase in straw bale building. Desire for and increase in socio-ecologic projects comparing 2010 and 2014. Decreasing Google search interest. *Disincentive*: Limited by land size or price, cost of community counselling; German construction law; rural location is inaccessible and lacks diversity in culture; *Incentives*: alternative school, close proximity to a city, counselling new communities highly increases their success.

Source: Survey sample, expert interviews, participatory observations, online and print media content analysis. Red: additional insights

Hiermit erkläre ich, die vorliegende Masterarbeit selbstständig verfasst und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt zu haben.

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Datum Unterschrift