



**Utrecht University**

# Eco-villages: a contested concept for climate resilient communities

Assessing how community members of eco-village projects engage  
with community resilience to climate change

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## Participating eco-villages:

Global Tribe Biodynamic Ecovillage, Almonte  
Los Serpos, Valdelamusa  
Rincon Malillo, Valdelamusa  
El Calabacino, Alájar

The four participating eco-villages are all located in the province of Huelva in the region Andalusia, Spain.

## Abstract

This thesis researches how community members of the eco-village projects of Global Tribe, Los Serpos, Rincon Malillo and Andalusia in Spain engage with community resilience to climate change. Academic attention is paid mostly to absorbing short-term shocks rather than on the long-term resilience of communities. As the concept of eco-villages has been cited by several players as a model for creating sustainable and resilient communities, this thesis sets out to assess how this concept could serve as solution for community resilience to climate change.

How community members engage with community resilience to climate change was analysed through the research methods of interviews, observations and secondary data. The theories of Alternative Food Networks, the resilience theory and Sustainable Development was used as the theoretical foundation of the analysis. The findings from the data show that there are clear factors that contribute to community resilience while there are also factors that temper it. Moreover, the thesis has shown how it is a contested process as not all community members want to engage with community resilience. Nevertheless, the research can still inform about 1. best practices in low-tech climate change adaptation and mitigation strategies next to well-defined technical systems; 2. strategies to reduce dependency within the dimension of 'food'; 3. strategies for agency in eco-villages; and 4. how to use intergenerational knowledge and practices as an approach for community resilience.

The main proposal for future research is to do longitude research and use the framework of the Sustainable Livelihood Approach (SLA) to position community members as agents of change and to look further into their capabilities and vulnerabilities in creating community resilience to climate change.

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No te decimos adios sino hasta luego, we don't say goodbye but see you.

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# Table of contents

<b>Abstract</b> .....	3
<b>List of tables and figures</b> .....	1
<b>Abbreviation list</b> .....	2
<b>Chapter 1 Introduction</b> .....	3
1.1 Problem context .....	4
1.2 Scientific relevance and international development studies .....	5
<b>Chapter 2 Theoretical framework</b> .....	7
2.1 Eco-villages .....	7
2.1.1 The concept of eco-villages .....	7
2.1.2 Food systems .....	8
2.1.3 Food regimes: the corporate food regime .....	9
2.1.4 Post-development and Buen Vivir.....	9
2.1.5 Alternative Food Networks .....	10
2.1.6 Eco-villages and permaculture .....	11
2.2 Community resilience .....	13
2.2.1 Community .....	13
2.2.2 Resilience theory .....	14
2.2.3 Community resilience.....	15
2.3 Climate change .....	16
2.3.1 Sustainable Development .....	16
2.3.2 Eco-villages as concept for Sustainable Development? .....	17
2.3.3 Eco-village adaptation and mitigation strategies.....	18
<b>Chapter 3 Regional thematic framework</b> .....	21
3.1 Spain .....	21
3.1.1 Climate change .....	22
3.1.2 Policy .....	23
3.1.3 Sustainable development.....	24
3.1.3 Asociacion Red Iberica de Ecoaldeas.....	24
3.2 Andalusia .....	25
3.2.1 Economic sectors.....	26
3.2.2 Land use and agri-food export .....	27
3.2.3 Desertification .....	28
3.2.4 Sustainable development.....	29
<b>Chapter 4 Methodology</b> .....	30
4.1 Research design.....	30

4.1.1 Operationalization.....	31
4.1.2 Methods.....	33
4.1.3 Data collection.....	35
4.1.4 Data analysis.....	38
4.3 Positionality of the researcher .....	40
Chapter 5 Eco-village: main characteristics .....	41
5.1 Demographics.....	41
5.2 Similarities with the concept.....	42
<b>Chapter 6 Strategies for Sustainable Development .....</b>	<b>44</b>
6.1 Effects of climate change .....	44
6.1.1 Environmental dangers .....	45
6.2 Adaptation and mitigation strategies.....	46
6.2.1 SHS and grids as EVD solution .....	46
6.2.2 Organic farming, gardening and composting.....	46
6.2.3 Low-tech solutions .....	48
6.2.4 Lifestyle.....	49
<b>Chapter 7 Self-sufficiency through generation and autonomy.....</b>	<b>51</b>
7.1 Vulnerabilities to self-sufficiency .....	51
7.2 External products and services.....	52
7.2.1 Food.....	52
7.2 Autonomy.....	54
7.2.1 Territorial autonomy – land ownership .....	54
7.2.2 Material autonomy - alternative to the market.....	55
7.2.3 Social autonomy - freeganism.....	56
<b>Chapter 8 Shaping the eco-village design process.....</b>	<b>57</b>
8.1 (Permaculture) design .....	57
8.2 Agency of the community members .....	57
8.2.1 Sense of belonging .....	58
8.3 Power relations .....	59
<b>Chapter 9 Intergenerational knowledge and practices .....</b>	<b>61</b>
9.1 External social networks.....	61
9.1.1 Structure.....	62
9.2 Intergenerational knowledge and practices.....	63
<b>Chapter 10 Discussion: towards a solution for climate resilient communities? .....</b>	<b>66</b>
10.1 Climate change adaptation and mitigation strategies .....	66
10.2 Self-sufficiency.....	67

10.3 Agency in design process.....	69
10.4 Intergenerational knowledge and practices .....	70
10.5 Conclusion .....	72
<b>Chapter 11 Conclusion and recommendations.....</b>	<b>73</b>
11.1 Implications for academic debate .....	73
11.2 Implications for policy .....	74
11.3 Implications for practice within eco-villages.....	76
11.4 Limitations of research.....	76
11.5 Conclusion .....	77
<b>References .....</b>	<b>79</b>
<b>Appendices.....</b>	<b>84</b>
Appendix A Informed consent.....	84
Appendix B Interview guide .....	86
Appendix C Passive and moderate (participant) observation.....	89
Appendix D Codebook.....	91

## List of tables and figures

**Figure 1:** Resilience as process and outcome (2018)

**Figure 2:** Production of agricultural crops (1998)

**Figure 3:** Production of agricultural crops (2021)

**Figure 4:** Hügelkultur in eco-village of Global Tribe

**Figure 5:** Created water ponds in eco-village of Los Serpos

**Figure 6:** Experimenting with native seeds in eco-village of Los Serpos

**Figure 7:** Alternative to the market in the eco-village of El Calabacino

**Figure 8:** External social networks of the four EVIs

**Figure 9:** Traditional basketmaking in the eco-village of Los Serpos

**Table 1:** Six EVD solutions

**Table 2:** Operationalization of the theoretical framework

**Table 3:** Overview participants

**Table 4:** Characteristics of the four participating eco-villages



## Abbreviation list

<b>AFNs</b>	Alternative food networks
<b>BV</b>	Buen Vivir
<b>EGD</b>	European Green Deal
<b>EVD</b>	Eco-village development
<b>EVIs</b>	Eco-villages
<b>GEN</b>	Global Eco-village Network
<b>GHG</b>	Greenhouse gas
<b>HBP</b>	Household biogas plants
<b>ICS</b>	Improved cookstove
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>RIE</b>	Asociacion Red Iberica de Ecoldeas, Iberian Ecovillages Network
<b>SHS</b>	Solar home system
<b>SSI</b>	Semi-structured interview
<b>WCED</b>	World Commission on Environment and Development
<b>WTO</b>	World Trade Organization

## Chapter 1 Introduction

Both of the Washington Post (2022) and Catalan News (2015) make promising statements about the sustainability of eco-villages as a model against climate change and as an alternative way of life. As the article in Washington Post of 15<sup>th</sup> of April 2022 displays, climate awareness plays a role in the re-evaluation of the countryside by means of reviving abandoned places into eco-villages (EVIs). The article goes on to say it does not only arise from an ecological point of view through striving for a sustainable future but above all arises from wanting to create an alternative to the “urban lifestyle emphasizing individuality”. Alfonso Alquer of La Base eco-village in Girona, Spain, cites a quote in the article of Catalan News on the 19<sup>th</sup> of June 2015 and describes this as the following: “La Ciutat és un crim; cal que lluitem contra ella”, of which the translation is that ‘the city is a crime; and we need to fight against it’. Alquer reports how Spain has had a century of rural flight that has made cities dirty and overcrowded. In both articles a reverse movement is shown whereby an increasingly large group with especially young people see rural areas as spaces for sustainable development against climate change. Therefore, the concept of eco-villages could offer a new and green model for an ‘alternative way of life’ leading to the creation of so-called ‘intentional communities’ (Catalan News, 2015). Furthermore, this concept is in line with the philosophy of the Buen Vivir (BV) movement and post-development and could be a “radical reimagination on an ontological, spiritual as well as ecological, social and politico-economical level.”(Escobar, 2015, p. 3). In this way, eco-villages as a concept could inherently contribute to the resilience of communities (Ujuaje & Chang, 2020).

Community resilience can be defined as “not only referring to the capacity of a group of people united by common interest to exercise agency in responding to change locally. It also considers their ability to instigate and contribute to transformation in the wider systems in which they are nested.”(Henfrey, 2018, p. 2). Within academic literature, the concept of community resilience to climate change has been predominantly used to initiate immediate bounce-back instead of the long-term resilience of systems. Therefore, this work sets out to analyse how EVIs could be a solution for climate resilient communities by considering the following research question: **How do participants of the eco-village projects of ‘Global Tribe Biodynamic Ecovillage (Global Tribe)’, ‘Los Serpos’, ‘Rincon Malillo’ and ‘El Calabacino’ in Spain engage with community resilience to climate change?**

- 
1. *To what extent do the communities implement climate change adaptation and mitigation strategies?*
  2. *How do the communities strive to succeed in their self-sufficiency?*
  3. *How do different actors within the community shape the design process in the eco-village projects?*
  4. *To what extent are intergenerational knowledge and practices involved within the eco-village projects?*
- 

In order to answer this main question further division into four sub-questions has been made. The first sub-question looks at to what extent the communities implement strategies for climate change adaptation and mitigation. The second sub-question deals with how the communities strive to be self-sufficient and thus are able to provide for themselves when change occurs. The third sub-question looks at the agency that different actors exercise in the eco-village design and consequently their contribution to strategies for community resilience. Lastly, the fourth sub-question explores the involvement of intergenerational knowledge and practices for climate resilience. The theoretical framework will further substantiate the sub-questions.

### 1.1 Problem context

Climate change and desertification require an urgent 'alternative way of life' through creating a green model. Last year's 'Climate Change 2021: The Physical Science Basis' report of the Intergovernmental Panel on Climate Change (IPCC) shows that in the worst-case scenario an average of 4.4 degrees Celsius surface level temperature difference is to be expected for 2080-2100 compared to 1850-1900. A surface level temperature rise that for 95%, according to the IPCC (2021), is due to the effects of human action of which the corporate food regime has had a major influence. The corporate regime is the third global food regime that has been operating from 1980 and is leading to a way of farming that is increasingly at odds with ecological processes. A contemporary sound in the discourse is therefore "(...) that food systems are failing us." (Béné et al., 2019, p. 118). Therefore, the research also assesses how eco-villages could be used as an alternative to the corporate food regime. In the bargain, Spain is a country designated with one of the highest risks to climate change in all of Europe: in 2018, 40 percent of its landscape was assigned medium to high risk of desertification by the European Court of Auditors. Commercialization of agriculture as result of over-exploitation of the native olive tree, tourism and uncoordinated

have contributes to this. This brings the scientific relevance of this work for development studies into view, which will be further elaborated.

### 1.2 Scientific relevance and international development studies

Several studies have been done on eco-villages, but the focus has mainly been on: rural development aspects (Kuruoğlu et al., 2021; Escribano, 2020; Paniagua, 2020; McIntyre-Mills, 2019), policy aspects (Forde, 2020; Bányai, 2018), cultural aspects (Farkas, 2021; Alonso González & Parga Dans, 2019) including gender (Pajumets & Hearn, 2021; Lindström, 2020), economic aspects (Kaefer, 2022; Balaguer Rasillo, 2021) and sustainability (Antonopoulos et al., 2019; Van de Sanden, 2018) although only one study focuses on the resiliency in sustainability aspects (Atutxa et al., 2020). Although this research is similar in its focus on rural development and economic, cultural and sustainability aspects, it differs by considering resilience at a community level by combining several of these aspects. In addition, some studies have been conducted into EVIs in Spain, although the concept of eco-villages is hardly the main point of focus in these studies (Kaefer, 2022; Balaguer Rasillo, 2021; Escribano, 2020; Atutxa et al., 2020; Alonso González, 2019). This research thus contributes to this knowledge gap for EVIs in Spain.

Moreover, within academic literature, the focal point mostly lies on the short-term ability to buffer, adjust, and continue in response to external forces or shocks (Kais & Islam, 2016; Twigger-Ross et al., 2015). This is especially true for climate resilience. For this reason, there is a need to make the distinction between reduction of short-term vulnerability on the one hand and long-term resilience on the other hand within development (Xie et al., 2015). Additionally, policy documents show that the combination of ‘climate change’ and ‘community resilience’ is hardly used as point of focus (Kais & Islam, 2016; Twigger-Ross et al., 2015). Therefore, this work advances the academic debate on long-term community resilience in development studies.

Another aim is to analyse how eco-village projects could potentially serve as a concept for sustainable food systems. This research thus progresses the development studies on food systems. As aforementioned, the corporate food regime has put efficiency and high profits first that is increasingly at odds with ecological processes. On the contrary, sustainable food systems are characterized as: “food systems that prioritize environmental, social, and economic health, through connecting producers and consumers, reducing harmful external inputs and promoting affordability and accessibility throughout the food

chain.” (Ulug et al., 2021, p. 1042). Additionally, sustainable food systems are characterized by being place-based and relational (ibid.). It is precisely these characteristics that seem to be strongly integrated within the concept of eco-villages, whereby the values of sustainability and self-sufficiency are translated into concrete food practices (Roux-Rosier, Azambuja & Islam, 2018).

Overall, the themes of ‘community resilience’ and ‘sustainable food systems’ together with the underlying problem context of climate change match the overarching theory of Sustainable Development in development studies. Therefore, this work can be placed in line with SDGs in the field of Sustainable Development. The defined and relevant SDGS for the concept of EVIs (Fiebrig & Van de Wiel, 2021), being: food (2), water (6), responsible consumption and production (12), climate action (13) and life on land (15). The European Green Deal (EGD) is also a crucial part of the EU’s plan to achieve the 2030 Agenda for Sustainable Development and includes objectives of preserving and restoring ecosystems and creating sustainable food systems (Fetting, 2020). The research therefore aims to contribute to international development by means of the following: 1. bringing more academic attention to long-term community resilience; 2. contributing to Sustainable Development; and 3. stimulating agency within the Global North.

The structure of the thesis is as follows. The consecutive chapter will focus on the theoretical framework of the research where the three central ‘legs’ of the thesis are discussed: the concept of eco-villages, community resilience and climate change, respectively. Chapter 3 will explore the regional thematic framework of Spain and Andalusia, giving insight in the context to which the research is carried out. Chapter 4 proposes the methodology to answer the research question, sub-questions and the substantiation of the research methods. Subsequently, Chapter 5 gives a general description of the eco-villages, whereas Chapter 6, 7, 8 and 9 resolve around the result chapters of the thesis. Moreover, Chapter 10 discusses the findings and compares it with the theoretical framework. Lastly, Chapter 11 draws a conclusion on the research. All in all, the main question of how community members of the four eco-villages engage with community resilience to climate change is answered.

Throughout the thesis, the term ‘eco-villages’ is used interchangeably with the abbreviation of EVIs.

## Chapter 2 Theoretical framework

In the theoretical framework, the concepts that are of importance to assess how community members engage with community resilience to climate change are discussed. This is done through highlighting the three central 'legs' of the research. The first concept is the concept of EVIs as an 'alternative to life' and potential sustainable food system. The second concept is that of community resilience, giving insight into the resilience theory as approach. As final concept, strategies for climate change adaptation and mitigation are explored and aligned with the theory of Sustainable Development. Overall, giving insight into the three main concepts of the research.

### 2.1 Eco-villages

To clarify the concept of eco-villages, the theory on EVIs will be elaborated. First, the definition is highlighted. Subsequently, the food system theory and the corporate food regime will be explored. This, in turn, will place the concept of eco-villages in the theory of Alternative Food Network (AFNs).

#### 2.1.1 The concept of eco-villages

EVIs can be both rural and urban and are a form of local action against climate change by pursuing sustainability at a social, economic and environmental level (Magnusson, 2018). A global network of eco-villages exist,

the Global Eco-village Network (GEN), which consists of 500 eco-villages worldwide. The EVI-movement knows different phases.

#### Definition eco-village

"Human-scale, healthy and sustainable development, full-featured settlement and the harmless integration of human activities in the natural world." (Çohadar & Dostoğlu, 2020, p.13).

Where the first EVIs were mainly founded in the 1970s and 1980s as a countermovement that aspired an alternative to society with communal living as a niche, it has now gained popularity through cooperation with civil organizations and construction companies. Especially in the most recent phase there is more attention on this aspect of networking in addition to increased focus on small-scale agriculture through permaculture (ibid.).

The definition of eco-villages is: "Human-scale, healthy and sustainable development, full-features settlement and the harmless integration of human activities in the natural world." (Çohandar & Dostoğlu, 2020, p.13). However, how this looks like in practice is different for each EVI. Nevertheless, five general characteristics can be drawn up: 1. EVIs are grassroots

initiatives. This means EVIs are not initiated by government or companies; 2. EVIs are based on communal living; 3. EVIs strive for self-sufficiency with regard to basic needs; 4. EVIs often have a spiritual nature with shared values; 5. EVIs are breeding grounds for innovation and often offer educational programs (ibid.). Comprehensive studies on the concept of eco-villages are scarce. Many of the studies conducted on EVIs have focused primarily on its organization and everyday life and challenges. Key challenges identified in the meta-analysis of Magnusson (2018) are: a lack of financial support and attention on an institutional level. Nevertheless, expanding the eco-village community seems to be the biggest challenge over time because the sense of connection is different from that between the pioneers. Additionally, it can cause a shift in values that conflict with the initial vision and may create disputes among members (ibid). The first solution to these challenges points to the presence of pioneers in enthusiasm, commitment and having the necessary knowledge of technical systems. The second solution is the involvement of other members in the design process as it has a major influence on their feeling of responsibility. Interestingly, the meta-analysis shows that the intergenerational and social experience of connectedness to the community and the natural environment is the determining factor in the degree of sustainability and length of stay (ibid.).

The next section will look at the theory on food systems, the corporate food regime and how EVIs can be placed in the theory on Alternative Food Networks and permaculture.

#### 2.1.2 Food systems

The concept of 'food systems' is often described as a whole set of actions, ranging from the food production, processing and distribution to the consumption of food (Ericksen, 2008). A more elaborate exposition of this concept is by including both the activity and the outcomes of these activities such as food security, social welfare and the interaction with the environment. Currently, there is a reappraisal of the (food) systems theory due to the globalization of food systems and the challenges these systems pose to the environment, to power relations and to health. Because it is through globalization that what happens in one place has a direct bearing on another. To clarify this, the definition of the system theory is: "a system is a unified collection of consistent and mutually dependent parts that are either artificial or natural. Each system is defined by its temporal and spatial boundaries, bordered and affected by its surroundings (...)" (Muzerengi et al., 2021, p. 3). The systems theory thus

analyses the dependency of separate parts of food systems to assesses certain outcomes of (food) activities, including its ecological footprint. The following section will look more deeply into this.

#### 2.1.3 Food regimes: the corporate food regime

The theory on 'food regimes' has emerged in the 1980s is used as an analytical framework to distinguish different phases of agricultural production and consumption within the recent history of capitalism (Muzerengi et al., 2021; Potter et al., 2018). As aforementioned in the introduction of this work, the corporate food regime has led to a way of farming that is at odds with ecological processes through its large-scale, industrial and over-exploitative agricultural practices. The corporate food regime is the latest food regime and has been operating from the 1980s. This regime is strongly linked with neoliberalism by which a retreat is seen in governmental market regulation; the so-called 'rolling back the state' which has given free rein to corporates and multinationals. In particular, global agricultural value chains of supply and demand have been given preference over smallholder-based and local production. On the one hand, the corporate food regime can thus be characterized by land dispossession. On the other hand, there has been a shift to market institutionalization through transnational regulations such as by the World Trade Organization (WTO) (Muzerengi et al., 2021, McMichael, 2012). All in all, the corporate food regime has led to widespread water and soil depletion, deforestation and biodiversity loss through over-exploitative use of monocultures and harmful pesticides. A contemporary sound in the discourse is therefore "(...) that food systems are failing us." (Béné et al., 2019, p. 118).

The next section shows how important principles of BV and post-development go against the corporate food regime and what place the concept of eco-villages has in both of these two development theories.

#### 2.1.4 Post-development and Buen Vivir

In response to the political, socio-economic and environmental consequences of developments such as the corporate food regime, post-development arose in the 1980s. It formulated alternatives for development among which the BV 'the Good Life' movement and its Rights of Nature (Escobar, 2015). In essence it is based on 'holism' that is described by Leonard Boff as: "The Buen Vivir points to an ethic of that which is enough for the whole community, not just for the individual (...) an integrating holistic vision of the human being



immersed in the great earthly community, that includes (...) with Pachamama (Our Mother Earth)” (Acosta, 2012, p. 196). In particular, the BV movement has emerged from Latin America, where the struggle of indigenous people against the conception of modernity was highly prevalent (Escobar, 2015). Through its reappraisal of indigenous knowledge and practices, the belief is that de-economization and de-colonization must take place although appropriate technological advancements do not have to be pushed aside (Kiely, 1999; Edelman, 1999).

To see how the ideas surrounding the BV movement are practically implemented in alternative food systems, the next section will look at Alternative Food Networks (AFNs).

#### 2.1.5 Alternative Food Networks

The character of food is often discussed in the development discourse as the dichotomy of conventional versus alternative. Where the conventional aspect symbolizes the aforesaid corporate food regime, the alternative aspect embodies all the ways in which the food system is revised, also known as AFNs. Within AFNs studies, the elaboration of autonomy seems to be important. Through autonomy, AFNs could potentially contribute to political and social transformation of food systems: “Self sufficiency and autonomy are now political demands, well rooted in the experience of millions of Indians, campesinos, ‘urban marginals’ (...). Rerooting and regenerating themselves in their own spaces, they are creating effective responses to “the global forces” trying to displace them.”(Wilson, 2013, p. 727-728). Furthermore, three aspects of autonomy can be distinguished: 1. the territorial; 2. the material; 3. the social. These aspects will be further elaborated.

Firstly, the territorial autonomy can be defined as the physical place that is temporary and shifting in nature whereby different arrangements can be made to be able to consume and produce food and to maintain social relationships. Secondly, the material autonomy can be described as the ability to create an alternative economy that respects the interests of the community by means of farmers’ markets or the decoupling of food as a commodity. Thirdly, the social autonomy can be defined as the revising of social relations within food systems. New individual and collective identities are thus set up by which owner, consumer and producer are given another meaning. An example of this could be food reclaiming through freeganism whereby only remnants of food, clothing and furniture are used (ibid.).

Positive qualities of AFNs are the relocalization of food systems, sustainability ideals and the acknowledgement of the political and social nature of food. However, there are also points of criticism involved through keeping in place the apparent dichotomy between 'conventional' and 'alternative', giving the appearance that one is bad and the other is good. Moreover, AFNs are not homogeneous. Therefore, values such as power (re)distribution and sustainability appear differently in practice (ibid.). As the position in the market functions specifically at the niche level, it turns out that AFNs are mostly accessible to middle class white consumers. This raises questions around the extent to which race, class and privilege are at the forefront of the movement. Consequently, distinctive attention must be paid to the three aspects of participation, inclusion and decision-making within AFNs (Wilson, 2013; Guthman, 2008; Slocum, 2007).

Nevertheless, AFNs are used to create alternative social, spatial and ecological urban (food) spaces. As the current AFNs discourse highlights, these networks could be a potential solution to overpopulation in cities and establish quality of life through creating urban green spaces. As there is strong emphasis on this in the current AFNs discourse, it could point to the societal trend and perhaps, necessity (Kropp & Da Ros, 2020; Galt et al., 2014).

The following section will elaborate on permaculture by which the concept of eco-villages contributes to AFNs.

#### 2.1.6 Eco-villages and permaculture

Permaculture is an alternative conception of humanity's relationship with nature. It is based on regenerative principles where indigenous knowledge is coupled with scientific insights that come together in a framework to shape land and communities. The concept of permaculture is aligned with the BV movement through its three central principles: care for the earth, care for people and sharing of resources (Caraway, 2020; Brain et al., 2017). As permaculture is a shift to farmer-led initiatives, there is decentralized control over the food production by farmers which amounts to their 'food sovereignty' and creates sociodiversity within food systems (Liebrand et al., 2021).

The permaculture design process consists of twelve principles that can be summarized as: observing and attuning to nature, interfering as little possible in the environment, using sustainable and renewable self-regulating techniques whereby long-term yields are preceded over short-term profits. The main aim of the principles is to

create: “consciously designed landscapes which mimic the patterns and relationships found in nature (...)”(Holmgren, 2020, p.3). Therefore, a successful permaculture design can be summarised as arranging the environment in such a way that it corresponds to patterns in nature and buildings, agroecosystems and communities are shaped (Caraway, 2020). Moreover, extensive mapping is done by means of observation of the seasons, depth of frost and prevailing winds. The techniques that are used are determined by these conditions at hand. For this reason, not one permaculture system is the same (Fiebrig & Van de Wiel, 2021; Holmgren, 2020). Furthermore, these twelve design principles are classified through five zones. Firstly, zone ‘00’ is the ‘self-care’ zone where there is room for well-being and social life. Secondly, zone ‘01’ is the ‘intense use space’ that is closest to home and generates water and energy. Thirdly, zone ‘02’ concerns all things that require care at least once a day such as chickens, perennial vegetables and vermicultures. Fourthly, zone ‘03’ contains fruit trees and cattle, sheep and horses while zone ‘04’ is organized around woodlots and pastures. Lastly, zone ‘05’ is made out of wilderness (ibid.).

Nevertheless, several challenges can be highlighted around the concept as well. As the study from Roux-Rosier et al. (2018) shows there could be a distance between theory and practice (ibid.). Miller (2014) also indicates that permaculture would pursue a rather isolationist position with limited cooperation with other institutions. The reason for this would partly be due to a lack of external recognition of value whereas only scholarly science is seen as legitimate. This would also detract that it can be innovative next to using traditional and intergenerational knowledge. Instead, permaculture is criticized as pseudoscience and not rigorous enough (ibid.). Moreover, due to the dispersed nature of the movement, permaculture ‘elders’ would have the most decision-making ability as they are seen as most skilled (ibid.). Therefore, questions on power-relations, agency and inclusiveness can be raised.

Section 2.1 has provided an outline of the definition of the concept of eco-villages and has placed the concept within the food system theory. Now, the concept of community resilience will be looked at further to provide insight into the driving theory behind the research: the resilience theory.

## 2.2 Community resilience

To clarify the term 'community resilience', the definitions for community and resilience will be elaborated, respectively before the resilience theory as an over-arching theory will be brought into view.

### 2.2.1 Community

Defining the term 'community' is difficult because it is a social construct that varies per case. However, the interpretation of 'community' can be summarized in three categories: 1. compositional: community defined as shared personal characteristics; 2. contextual: community defined through shared territory; and 3. functional: the community defined as shared functions (Kais & Islam, 2016). Taking notice of these categories, communities are placed on a geographical scale at the intersection between the level of households and the regional context. Additionally, 'community' is described as: community members who interact on somewhat a daily basis, without intervention of the state and where common beliefs are prevalent. This definition is relevant to use as determination researching in what way there is a 'community' in the four participating EVIs (ibid.).

Next to these categories, there is also the feeling that people have of a community, the so-called 'sense of community'. The definition often given is: "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together." (Francis et al., 2012, p. 401). What is striking here is that it is mainly about the feeling of belonging and the trust to meet each other's need (ibid.).

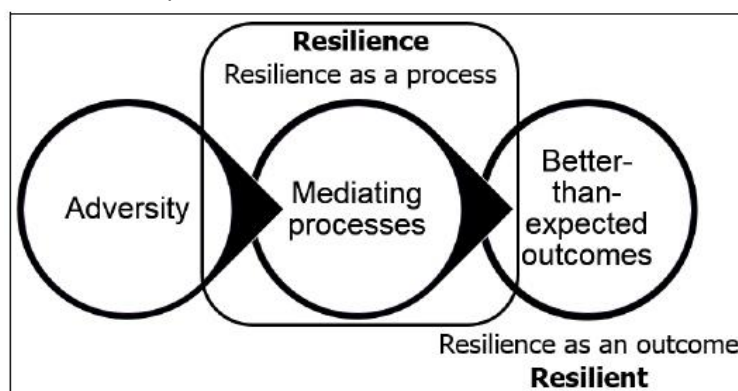
The following section on resilience theory will elaborate the concept of 'resilience' and the various components of the theory.

### 2.2.2 Resilience theory

The term resilience is referred to in the general resilience theory as: “the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function (...)” (Henfrey, 2018, p. 1). Various components of resilience can be deduced from this, to which the academic literature adheres its interpretation as resistance or adaptation to vulnerability, resulting in an unexpected better than expected outcome. Therefore, ‘resilience’ deals with the factors that allow positive outcomes to occur despite adversity as Figure 1 shows.

**Figure 1**

*Resilience as process and outcome*



*Note.* Extracted from Van Breda (2018).

What is striking from academic literature is that most attention is given to resilience-contributing factors at an individual level. These factors include personal character traits and habits such as the degree of intelligence and problem-solving ability (Van Breda, 2018). Nevertheless, this interpretation of resilience is getting increasingly criticized as being in line with neo-liberal politics through placing the responsibility for well-being and systemic issues (i.e., poverty and racism) with individuals. Instead, studies have been focusing more on the social component of resilience by considering individual expressions as result of relational experiences. Therefore, better-than-expected outcomes could be determined by social relations. In that way, interdependence and interconnectedness are important factors to analyse in resilience (ibid.). Considering that attention is paid to social relations as factors for resilience, the question then is how resilience can exist on a community level.

### 2.2.3 Community resilience

Part of the definition of community resilience is the extent to which a community is able to bring about change as the quote by Henfrey (2018, p.1) shows. Aforementioned in the introduction, the place that community resilience takes in policy

#### Definition community resilience

“Community resilience does not only refer to the capacity of a group of people united by common interest to exercise agency in responding to change locally. It also considers their ability to instigate and contribute to transformation in the wider systems in which they are nested.” (Henfrey, 2018, p. 1).

underpins the relevance of the research: studies show that the concept of ‘community resilience’ in combination with climate change is hardly used (Kais & Islam, 2016; Twigger-Ross et al., 2015). In fact, particular emphasis is placed on safeguarding against direct shocks instead of long-term resilience (Xie et al., 2015). When community resilience is discussed, it is often done under the heading of ‘self-sufficiency’ and ‘sustainability’ while the vulnerabilities and capabilities of communities or the role of stakeholders might be as important to include (ibid.). Therefore, one of the applications of community resilience could be the use of indigenous knowledge. Because it is grounded in local cultural practices, rituals and values that are fundamentally based on sustainable practices for future generations, it could strengthen the capabilities of communities (Chowdhoree, 2019).

All in all, reframing community resilience at a policy level is necessary especially since development approaches are shifting towards strategies on a community level as these strategies are seen as positive, proactive and inclusive (Kais & Islam, 2016; Twigger-Ross et al., 2015). Despite long-term community resilience not being the core driver on matters as climate change, it is thus gaining momentum as such. Of the academic literature on eco-villages as concept for community resilience only one case study can be found. It is the case study of the L’Aquila eco-village in Italy (Fois & Ferino, 2014). The concept proved to be able to give a renewed input to the local village and turned out to be a driving force for rural revitalization. The case study shows that the solutions to challenges as financial lack, proved to be social networks and community resilience by means of using six c’s (ibid.).

These six c’s can be defined as: 1. communication; 2. cooperation; 3. cohesion; 4. coping; 5. credibility; and 6. credo. The first c of ‘communication’, is defined as clear communication on challenges and the services that the eco-village needs. The second c of ‘cooperation’, would be the responsibility the eco-village takes rather than depending on

external forces. The third c of 'cohesion', is described as the degree of connectedness within the EVI through sensitivity to needs, with particular attention for the most vulnerable in the community. The fourth c of 'coping', is defined as the action that is taken to be able to deal with negative effects. The fifth c of 'credibility', is referred to as new ways of organization implemented by the EVI. Finally, there is the c of 'creed', which is specified as the vision the eco-village has for the future (ibid.). These six c's are used in the operationalization of the theoretical framework although components have not been named as such.

Section 2.2 has provided insight into the driving theory behind the research: the resilience theory. Community resilience has now been defined whereby various of its components have been elaborated. The next section looks at climate change as motive of the research, giving rise to strategies implemented for adaptation and mitigation in the larger context of Sustainable Development.

### 2.3 Climate change

Climate change is elaborated in this last section of the theoretical framework. As such, it portrays the problem situation of the research at hand and positions strategies on Sustainable Development.

#### 2.3.1 Sustainable Development

As described in the introduction, humans have had an overwhelming influence on climate change for as much as 95% (IPCC, 2021). The past twenty years (2001-2021) were the warmest years in record as result of the amount of GHG emissions. Consequences are warming of the atmosphere, ocean and land which will cause widespread climate extremes around the world, putting ecological and social systems under unprecedented pressure. Therefore, climate change is problematized on three dimensions: high complexity, high degree of uncertainty and requires a high level of decision-making (IPCC, 2021; Kais & Islam, 2016). Here comes the theory of Sustainable Development into play. The definition of Sustainable Development that the World Commission on Environment and Development (WCED)(1983) has drawn up: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Within this framework various strategies have been formulated on planetary boundaries, needs of humanity, environmental limitations and adaptation and mitigation. In 2015, the UN gave shape to the SDGs as indicators of these strategies. 17 goals were set for

2030 and are evaluated by means of 230 indicators (Hope, 2020). At the end of December 2019, the European Green Deal (EGD) was presented by the European Commission. The EGD main objective is, being: “the EU’s new growth strategy, which aims to transform the EU into a fair and prosperous society with (...) a competitive economy. It is also a crucial part of the EU’s plan to achieve the 2030 Agenda for Sustainable Development.”(Fetting, 2020, p. 5). No less than 37% of the recovery plan for the consequences of the COVID-19 outbreak are reserved for green expenditures. This includes the objectives of preserving and restoring ecosystems and creating sustainable food systems (ibid.). The research thus ties in with the set objectives for Sustainable Development highlighted through the EGD.

However, there are two important critiques on the framework of Sustainable Development that need to be taken into consideration. Firstly, the framework would be too undefined and vague, which gives room for it to be politically malleable and used by those that don’t pursue environmental sustainability. Secondly, the core of the SDGs may well be growth-led development and even have neo-extractivist motives, by continuing partnership with the private sector and transnational extractive capital (ibid.).

To narrow the scope of the research the focus of the thesis lies on adaptation and mitigation strategies in addition to analyse the social, cultural, ecological and economical sustainability of EVIs which will be elaborated in the next section. Mitigation can be described as the intervention in the sources of gas emissions, while focusing on more sustainable forms of energy such as solar photovoltaics while adaptation is the process of adapting to the expected or actual effects of climate change (Liebrand, 2021; Rockström et al., 2009). Adaptation and mitigation strategies are further elaborated in section 2.3.3, following the case study on the concept of eco-villages for Sustainable Development.

#### 2.3.2 Eco-villages as concept for Sustainable Development?

The study by Shrestha & Singh (2019) in the eco-village of Lele, Nepal, specifically evaluates how the concept can be used for Sustainable Development through looking at the social, cultural, ecological and economical sustainability. Firstly, social sustainability is defined as the sense of belonging through community-building, transparent and inclusive decision-making, encouraging participation and leadership and conflict resolution. Secondly, cultural sustainability is described as the involvement of diverse cultural traditions through rituals, celebrations and festivals that aim to protect and respect communities and nature. Thirdly, environmental sustainability is characterized by the respect for the cycles of nature in food,



shelter, water and energy practices. At last, the economical sustainability is defined by means of circular economies with economic activities using organic agricultural production and ecotourism (ibid.).

In the following section, the implemented techniques for climate change adaptation and mitigation strategies in EVIs will be explored.

2.3.3 Eco-village adaptation and mitigation strategies

Six high-impact solutions for climate adaptation and mitigation can be found in the field of eco-village development (EVD)(Olesen, 2018). These six EVD solutions are included in Table 1 whereby their impact on mitigation and adaptation is shown, respectively.

**Table 1**  
*Six EVD solutions*

EVD solution	Mitigation impact	Adaptation impact
<b>1. Improved cookstove (ICS)</b>	GHG and black-carbon emissions are reduced by 1-3 tons per family per year.	Not assessed (n.a.).
<b>2. Household biogas plants (HBP)</b>	GHG and black-carbon emissions from cooking and agriculture are reduced by 1-4 tons per family per year.	Soil improvement.
<b>3. Solar home system (SHS)</b>	GHG from kerosene and other non-solar light sources are reduced by 0.34 tons per family per year.	Provides light during climate extremes.
<b>4. Solar or hydro-, micro- and mini grids</b>	GHG from electricity and/or diesel engines are reduced by 0.7 tons per family per year.	n.a.
<b>5. Solar dryers</b>	GHG from electric or fossil-fuelled dryers are reduced by 1.4-3 tons per family per year.	Preservation of food through weather fluctuations.
<b>6. Organic farming, gardening, composting</b>	Replace GHG producing fertilizers and increase soil carbon, which reduces GHG emissions from agriculture; difficult to quantify in reductions.	Improve soil moisture retention and crop rotation for stable yield.

*Note.* Adapted from Olesen, 2018.

Of the six EVD solutions, the transition to more sustainable cooking methods appears to have the greatest reduction in GHG. The use of renewable energy shows the second-greatest

impact, especially through the implementation of SHS (ibid.). ICS is a cooking appliance technique using a chimney construction that allows little heat to escape, while HBP is a technique in which manure is stored and converted into biogas for cooking and agricultural fertilizers. Using the HBP composted manure as organic fertilizer helps soil to retain water, making it more resistant to droughts and thus helps to adapt to the effects of climate change. However, to what extent the HBP is able to reduce GHG emission depends on the size of the plant and how much gas leaks out in the process.

Furthermore, SHS and hydro-, micro- and mini grids replace equipment run by fossil fuel generators, as well as other forms of heating or powering homes such as gas. SHS could create economic opportunities through its ability to become micro distributor of energy, while micro and mini-grids make use of multiple renewable energy forms, such as solar, biogas, hydro and wind installations. As a result, this could make EVIs less dependent on power outages, which amounts to their resilience against external shocks. Although there are high costs involved investments of SHS and micro- and mini- grids, these costs could be met through subsidies. Moreover, solar drying is a method in which fruits, vegetables and herbs are dried for preservation. This method is affordable, can generate income and is more sustainable than commercial methods. In extension, because of the decreased dependency on food through preservation it can reduce the EVIs' vulnerability to food volatility on the market, induced by (climate) disasters and external shocks.

Finally, organic farming has both climate mitigation and adaptation outcomes. Firstly, the soil fertility is enhanced, inducing higher crop yields. Secondly, the water retention and drainage is improved, demanding less from irrigation systems and creates better resistance to extreme weather. Thirdly, through using crop diversification and local varieties, self-sufficiency is stimulated which also reduces vulnerability to external shocks (ibid.). However, an important note here is that these climate change adaptation and mitigation techniques in eco-villages should not be used as 'technical fixes' because these techniques often lack equity, legitimacy and efficiency (Lala, 2020; Rojas-Downing et al., 2017).

Section 2.3 has provided insight into problem situation of the research at hand: climate change. Moreover, the theory of Sustainable Development has been brought into view, highlighting strategies for climate change adaptation and mitigation as well as looking at EVIs as concept for Sustainable Development. The next chapter will elaborate on the national and

regional context of Spain and Andalusia, respectively. All in all, clarifying the background of the four participating eco-villages.

## Chapter 3 Regional thematic framework

This chapter sets out the national and regional context of this work. First, a general description of Spain is provided. Next, the effects of climate change are discussed and an overview of the national structure of EVIs is given. At last, the situation in Andalusia is brought into view.

### 3.1 Spain

Spain can be characterized by two varieties of climate. On the one hand, areas in the North have a more oceanic climate, which is colder and has more rainfall. On the other hand, in the South there is a semi-arid climate. Spain has a total population of 47.4 million people and an annual population growth of 0.5%. This is in line with other countries of the Global North: the share of population under the fifteen years-of-age is 14.4%, while the population over sixty-five years-of-age is 19.7%. This is partly compensated by the number of immigrants in the country. In 2020, there were 5.4 million foreign residents, 11.4% of the total population (Instituto Nacional de Estadística, 2022). Moreover, the share of urbanization remains stable and high over the past twenty years. Where in 2010, 78.4% of the population lived in cities, this number has grown to 80.8% in 2020 (Statista, 2022).

One of Spain's challenges is the major youth unemployment that has been ongoing since the financial crisis of 2008-2009, reaching a rate of 35% in 2018. The reasons given for this unemployment rate are a large informal economy and a poor education system. Therefore, the actual numbers of unemployment are lower than indicated because of employment through the informal market.

To recover from the financial crisis, Spain has mainly focused on reducing imports while increasing exports. Investments were made in four areas: 1. renewable energy commercialization; 2. automotive and transportation industry; 3. tourism; and 4. agriculture. In 2019, Spain gained first place for the third time worldwide in the Travel & Tourism Competitiveness Index conducted by the World Economic Forum. This index measures the degree of 'attractiveness' for tourists, indicating the global competitiveness and the economic opportunities a country has. In agriculture, most notable was making the desertified area of Almeria accessible for export of fruits and vegetables. As a result, a GDP growth rate of 3.2% was observed 2015-2016, with Spain growing twice as much as the average in the eurozone and having the highest increase in exports worldwide (Cinco Días,

2016). This trend in import and export shares can still be seen even today although nowadays most export takes place in the automotive industry and raw materials. Spain has a GDP per capita of 41.346 US\$, with a projected growth rate of 3.8% and has 7.416.00 thousand hectares of agricultural land in total (OECD, 2022). Nevertheless, it seems this growth in exports have not resulted in increased youth employment. Instead, the main focal point in employment-strategies have been on attracting migrants.

To see how economic sectors and rural-urban demographics have contributed to climate change in Spain, this will be further elaborated in the following section.

3.1.1 Climate change

Two factors play a role in Spain being at high risk to the effects of climate change. First, a shift has taken place away from traditional agricultural techniques to over-exploitative monocultures which has left the countryside degraded and less able to deal with the effects of climate change (Curfs & Imeson, 2013). Subsequently, there has been a main focus on crop intensification with the use of pesticides and irrigation systems. An example is the intensification of the olive-tree, which is a traditional crop in the Mediterranean area: with a strong increase in its cultivation, the only oasis in Europe is turning into semi-desert. This is the oasis of Tabernas-Sorbas Basin in Almeria, Spain (Martínez-Valderrama et al., 2020).

Secondly, uncoordinated urbanization is the most active agent of desertification in Spain through an overuse of water and soil. Moreover, it accounts to the surge of land fragmentation, leading to loss of half a million ha of formerly used agricultural land. In the Mediterranean area, 25% of all hotels in the world can be found. In Spain, there is thus a definite push on the population from the tourist sector (Benassi et al., 2020).

Where land degradation means the loss of fertility of the soil, desertification is defined by the European Court of Auditors as: “Land degradation in arid, semi-arid and dry sub-humid areas resulting

**Definition desertification**

“Land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities.” (European Court of Auditors, 2018, p.7).

from various factors, including climatic variations and human activities.” (2018, p. 7). Spain is said to rise two Celsius by the end of the century with 40% of its landscape associated with medium to high risk to desertification. The situation is particularly concerning in Murcia and

the Canary Islands (ibid.). A national surveillance system to monitor and measure land degradation could strengthen preventive interventions (Martínez-Valderrama et al., 2016).

The next section will focus on the climate policy promoted by the European Union and the Spanish government through, among other things, the Common Agricultural Policy (CAP).

### 3.1.2 Policy

For every Member State of the European Union a revised CAP for the period of 2023-2030 has been drawn up. By means of the CAP every Member State is obliged to draw up a National Strategic Plan, stating actions, where funding is allocated and how the targets are evaluated. The National Strategic Plan must consider regional variations of farming systems and must be environmentally and socially sustainable (Díaz et al., 2021). Of all European countries, Spain has the highest amount of biodiversity within agricultural environments. Therefore, the European Commission has given specific priority to their preservation. Three national strategies have been drawn up to ensure this: 1. the National Strategy for the Conservation of Pollinators; 2. the National Strategy for Green Infrastructure and Ecological Restoration; and 3. the National Strategy for the Conservation of Wild Relatives of Crops and Wild Plants. Hence, agricultural landscape management is the core of Spain's Strategic Plan (ibid.).

Nevertheless, the Spanish government has not yet clearly stated these objectives in its external communication. Moreover, the formulated objectives seem to be solely aimed at creating: 1. a national plan for the control of the food chain; 2. the integration of policy with Spain's regions; 3. an approach for the consumption of fruit, vegetables and milk in schools; 4. a strategy to support organic production of which 39% is produced in Andalusia (Ministry of Agriculture, 2013). The regional objectives for the Andalusia region seem to be missing within the policy documents as is the funding that is made available for ecological production. This is in line with what Díaz et al. (2021) highlight around the absence of regional objectives. Subsequently, funding options are solely available for farmers and organizations affiliated with the national agricultural association. Furthermore, there is no national governmental attention for permaculture, leading to a dispersed movement of permaculture initiatives (Ministry of Agriculture, 2013; Red Ibérica de Ecoaldeas, n.d.).

The next section will look at the general context of Sustainable Development in Spain. The relevant SDGs for the concept of eco-villages that have been described in the introduction of this work, will be used as general indicators for this.

### 3.1.3 Sustainable development

The SDGs of food (2), water (6), responsible consumption and production (12), climate action (13) and life on land (15) will be elaborated specifically (Fiebrig & Van de Wiel, 2021): within SDG 2, the share of ecological agriculture has increased from 6.3% in 2009 to 9.3% in 2019. The protection of local varieties is also part of this, which has increased to 2.7% in 2021 as opposed to 0.5% in 2009. Moreover, for SDG 12, the amount of recycled waste has remained the same in past years, around 1.3 kilograms per person per day. However, more companies are publishing sustainability reports which makes it possible to assess the sustainability of production and consumption patterns. Subsequently within SDG 13, when comparing 2009 to 2020, the GHG has dropped from 9.13 to 5.80 tons per person. Finally, it is notable that for SDG 15 on life on land, many indicators have been drawn up and assessed. Outcomes of these indicators are sustainable forest management for 5.167.697 hectares of forest which is 18.5% of all national forest, a number that has been growing since 2015. Moreover, the share of degraded land seems stable, 18.2% of the total land mass (Instituto Nacional de Estadística, 2022). For SDG 6, results on protecting and restoring water-related ecosystems are not available.

In the next section a description will be given into the structure of eco-villages in Spain through the Iberian Ecovillages Network (RIE). In this way, insight is gained into the context of the EVI projects that the research focuses on.

### 3.1.3 Asociacion Red Iberica de Ecoaldeas

The RIE consists of 45 members on the Iberian Peninsula, Spain and Portugal. The legal foundation of the RIE dates back to 2008 although its informal network is over 35 years old. In this way, it is one of the oldest networks for EVIs in Europe. The RIE is an association that aims to connect the various initiatives and people that strive to live with respect to the planet and each other (Red Ibérica de Ecoaldeas, n.d.; European Youth Portal, n.d.). The basic objectives of the RIE are: 1. a free exchange of resources between its members and other groups; 2. the diffusion of the concept of eco-villages; 3. to facilitate people that would want to try an alternative way of living. An important role within these objectives is (adult)

education. For this, the association has made educational materials and training available around topics such as permaculture, appropriate use of technologies, community building and social economy. It has a close collaboration with the Global Ecovillage Network (GEN) and other partners such as the Erasmus+ Programme of the European Union and NextGEN Europe, where there is specific attention for ecovillage youth (ibid.). The RIE is also specifically committed to creating an outcome for rural abandonment (Flaquer, 2019). In total there are 89 eco-villages in Spain, of which at least eleven are located in the region of Andalusia (The Global Ecovillage Network, 2021).

Next the regional context of the four participating EVIs will be brought into view. First, a general description of this region will be given, followed by an overview of the economic sectors, land use and agri-food exports that each play a role in the effects of climate change in this region.

### 3.2 Andalusia

Andalusia is located in the south of Spain and is the second largest and most populous region as it contains 8.4 million inhabitants. The region has a varied landscape, it includes UNESCO protected tidal marches as well as the Tabernas desert. Moreover, half of the region is mountainous, of which 1/3 are above 600 meters. When looking at the ratio rural-urban, the majority of Andalusia consists of rural areas. 637 of the 770 municipalities have a population of less than 10.000 inhabitants. Nevertheless, roughly 1.8 million people live in rural areas in Andalusia, which is 23% of the total population (OECD, 2010)

The three main social and economic problems in Andalusia are unemployment, increasing aging population and social exclusion. During the financial crisis the region had an unemployment rate of 27.7% which was eight percent above the national average and has not yet returned to what it was before the crisis. Moreover, Andalusia achieves only 80% of the average European GDP per capita and has remained in 15<sup>th</sup> place in GDP of the 17 autonomous regions in Spain. Additionally, the percentage of social exclusion remains high of which 27.4% in 2020. Social exclusion occurs in one or more of the following cases: at risk of poverty or severely below the usual standard of living, in case of unemployment or if only 20% of the total labour capacity is reached. The population pyramid of the region shows there is an increasing aging population in contrast to the number of births although this is



partly compensated by immigrants that mainly work in agriculture in Almeria (Instituto de Estadística y Cartografía de Andalucía, n.d.).

This section has touched upon the three main social and economic problems in the region. In the following section, the economic sectors of Andalusia will be discussed.

### 3.2.1 Economic sectors

The construction, industry- and energy sector are the largest sectors in Andalusia and amount to around 20% of the Gross Value Added (GVA) in 2021. The share of agriculture in GVA has climbed back to 7.1% in the recent years due to reappraisal of organic farming as asset (Instituto de Estadística y Cartografía de Andalucía, n.d.; OECD, 2021; OECD, 2010). Additionally, the region is an important player for the mining industry: it produces 38.6% of the national mining-industry and is part of the Iberian Pyrite Belt (IPB). Through its multi-cultural heritage, the service sector, including tourism, accounts for 74.6% of the GVA with 20.050.000 tourists every year (ibid.).

In the absence of more recent data on these economic sectors, growth and decline are expected to be in line with societal trends. The IPB is described by the OECD as a global asset when it comes to metallic minerals. The report 'Mining Regions and Cities Case of Andalusia, Spain' (OECD, 2021) argues that Andalusia's mining value chain can help the EU achieve its 2050 climate goals while addressing unemployment in the region. Moreover, in the field of agriculture, the following is said: "The region represents a sizeable share of national production, strong climatic assets and know-how and has capacity to develop new niche markets such as organic agriculture with the help of university research and innovation." (OECD, 2010, p. 52-53). Moreover, the technology industry is a sector that is growing rapidly in areas such as aerospace, ICT and biotech. In this way, Andalusia is able to distinguish itself internationally to attract foreign direct investment and high-qualified migrants. According to OECD the region can thus position itself as a 'green region', 'leisure region', 'vibrant region' or even a 'hi-tech region' (ibid.).

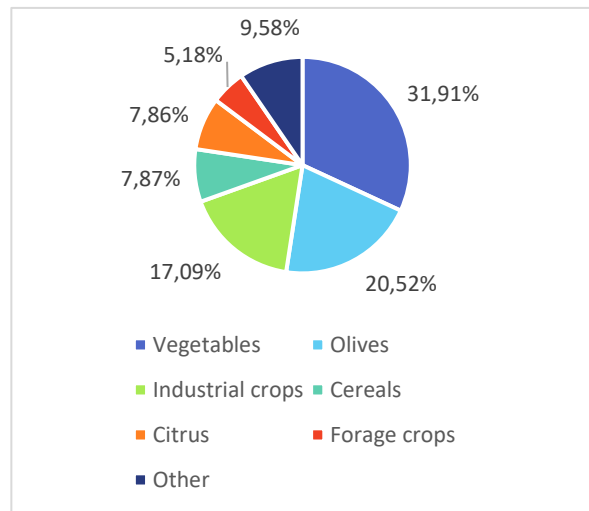
To elaborate how the region amounts to being a 'green and vibrant region' through agricultural practices, the next section will look at the land use and agri-food exports.

### 3.2.2 Land use and agri-food export

The trade in agri-food products plays an important role in the regional economy, representing 21.3% of the national total (52.804 million). The value of agri-food exports has risen sharply since 1990, reaching 11.255 EUR million in 2020. In terms of exports, the largest export sector is that of fruit and vegetables. Moreover, Andalusia constitutes as major exporter for the European and global market of olive oil, of which it's the world's capital of olive oil production (Hortidaily, 2021; Martinez & Blanco, 2019; Butler, 2011): olive trees are

the largest irrigated crop and comprise 46% of the irrigated land, followed by cereals (14%), vegetables (12%), industrial crops (9%), citrus (8%), fruit trees (5%) and forage crops (2%). A further picture of the land use in Andalusia is seen in Figure 2 and 3. The OECD (2007) indicates that there is an increasing demand for organic products within consumer behaviours. The Agri-food International Campus of Excellence in Cordoba appears to play a key role in the collaboration of organic farming in Andalusia.

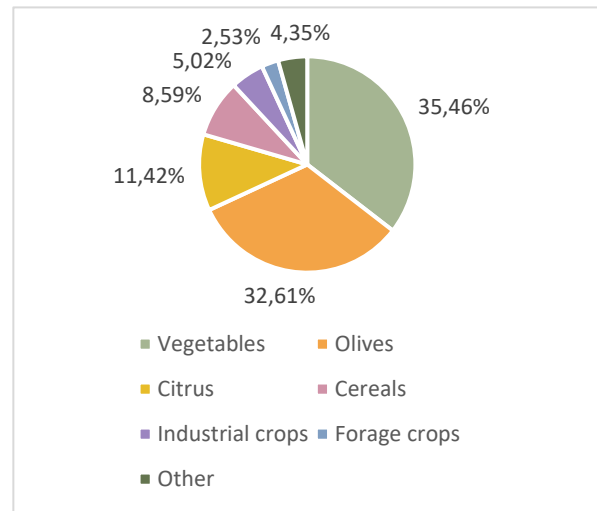
**Figure 2**  
*Production of agricultural crops (1998)*



*Note.* Adapted from Instituto de Estadística y Cartografía de Andalucía, n.d.

Overall, the amount of production has increased since 1998. The total share of vegetables has increased from 4.535.539 to 7.353.756, the share of olives from 2.915.820 to 6.762.658, citrus from 1.116.500 to 2.368.460 and cereals from 1.117.847 to 1.782.424. This shows a shift to more intensified production of certain crops, while cultivation of others have been reduced (Instituto de Estadística y Cartografía de Andalucía, n.d.).

**Figure 3**  
*Production of agricultural crops (1998)*



*Note.* Adapted from Instituto de Estadística y Cartografía de Andalucía, n.d.

This commercialization of monocultures and over-exploitative agricultural practices are leading to desertification, which will be described in the next section.

### 3.2.3 Desertification

Through the Desertification Indicator System for Mediterranean Europe (DIS4ME)(n.d.) several indicators have been set out to gain insight into the state of desertification. Two of these indicators are the Aridity index and Soil Loss Index (USLE). On the Aridity index, a study in the province of Huelva, part of the Andalusia region, shows an aridity of 0.55. This falls within the established framework for arid areas where desertification occurs (0.5-0.65) (Curfs & Imeson, 2013; DIS4ME). The accretion of olive groves and orange plantations have had a major influence on soil erosion. Julie Butler reports in *Olive Oil Times* (2011): “80 tons of soil per hectare were being lost each year due to the erosion in Andalusia (...) equivalent to about four truckloads of soil for every 100 olive trees.” Also of influence are irrigation systems and the use of chemical fertilizers. Within the water-energy-food nexus in the region, 80% of the water resources are absorbed by the crops that have a high need in irrigation. Andalusia has, through all these reasons, a high risk of erosion (Rodríguez Sousa et al., 2019; Anaya-Romero et al., 2015; Curfs & Imeson, 2013; DIS4ME).

Section 3.2.4 will give specific attention to how the SDGs are met in Andalusia, giving further insight into the regional context of the research.

### 3.2.4 Sustainable development

On SDG 2 (food), the proportion of agricultural area in which sustainable agriculture is practiced, is a total of 22%. This is in stark contrast to the national average, with 9.5%. Nevertheless, when looking at SDG 6 (water) the percentage of soil erosion by water is high, namely 23.9% in contrast to the national average of 9%. For SDG 12 and 13 it appears that the recycling of waste has a rough percentage of 30.4%. Interestingly is the GHG compared to 1990. Despite that this percentage has fallen to 21.8% in 2019 the share lags behind the national share of 8.5%. Nevertheless, a positive trend can be noted in relation to SDG 15 (life on land). The percentage of forest in relation to the total remains the same (33.4%) and even more forest is being added to the landscape. The amount of sustainable forest management has also been increasing to 29.5% in 2019, which is above the national average of 19.8% (Instituto de Estadística y Cartografía de Andalucía, n.d.).

All in all, there are challenges and opportunities in the region of Andalusia. On the one hand, a path is being made toward organic production within the agriculture sector. On the other hand, the question remains to what extent this is done through commercialization. In the area of climate change, by looking at the SDGs, something can be said both for and against current developments. As aforementioned, reason for this may be that objectives are not clearly formulated on a regional level. Nevertheless, a way is being paved towards climate goals in Spain although the question is if it is merely for the contribution to global competitiveness and economic growth.

## Chapter 4 Methodology

This part will describe the methodology of the research. First, it will deal with the research design, including the research questions. Secondly, the operationalization of the theoretical framework is formulated which makes the research practically feasible. Finally, the research methods and method of data analysis are explained, with specific attention given to the positionality statement of the researcher and the weaknesses of the research methods.

### 4.1 Research design

There is a growing interest for qualitative research through increasing attention for people's perspectives within policy. The distinct feature of qualitative research is that it analyses issues through mapping the perspectives and interpretations of participants (Hennink & Hutter, 2020). Because qualitative research formulates new theories through considering the meaning that is addressed to certain objects and events, it is less structured than quantitative research. For that reason, qualitative research is interpretative and inductive in nature (Mohajan, 2018). A quote that summarizes this is that it: "involves an interpretative, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them." (Denzin & Lincoln, 2008, p.3).

The theoretical framework has clarified the three 'legs' of the research, namely community resilience, eco-villages and climate change. This work analyses how community members of eco-village projects engage with community resilience to climate change. Because 'engage' is about the perspectives, interpretations and meaning that community members address to community resilience, qualitative research is the most appropriate and has been set out through the research question: **How do participants of the eco-village projects of 'Global Tribe', 'Los Serpos', 'Rincon Malillo' and 'El Calabacino' engage with community resilience to climate change?** The research question is answered by means of the following sub-questions:

- 1) To what extent do the communities implement climate change adaptation and mitigation strategies?
- 2) How do the communities strive to succeed in their self-sufficiency?
- 3) How do different actors within the community shape the design process in the eco-village projects?

4) To what extent are intergenerational knowledge and practices involved within the eco-village projects?

#### 4.1.1 Operationalization

To answer the research question, the concepts of the theoretical framework are elaborated and operationalized. The operationalization was also used to develop the research methods, which are further elaborated in section 4.1.2 and can be found in Appendix B-C. As can be seen in Table 2, three dimensions have been established.

First, the definition of eco-villages as defined in the theoretical framework is: “Human-scale, healthy and sustainable development, full-featured settlement and the harmless integration of human activities in the natural world.” (Çohadar & Dostoğlu, 2020, p.13). Secondly, the definition of community resilience has been determined through clarifying what ‘community’ and ‘resilience’ is, respectively. Community is defined through the three categories of: 1. compositional: community defined as shared personal characteristics; 2. contextual: community defined through shared territory; and 3. functional: the community defined as shared functions (Kais & Islam, 2016). This definition is relevant to use as determination researching in what way there is a ‘community’ in the four participating EVIs (ibid.). Additionally, resilience is explicated as “the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function (...)” (Henfrey, 2018, p. 1) or to amount to better-than-expected outcomes (Van Breda, 2018).

**Table 2**  
*Operationalization of the theoretical framework*

Dimension	Sub-question	Concept	Indicator
<b>Eco-village</b>	How is self-sufficiency strived for	<u>Self-sufficiency</u> : Degree of dependency and <u>generation</u> : cultivation for own consumption	<ul style="list-style-type: none"> <li>To what extent is the eco-village dependent on external products and services?</li> <li>How is generation in food, shelter, water and energy practices provided for?</li> <li>In what way does the eco-villages use crop diversification and local varieties?</li> <li>Does the eco-village use methods for preservation?</li> </ul>

		Autonomy (territorial, material, social)	<ul style="list-style-type: none"> <li>How is the physical space provided for in the eco-village?</li> <li>How are alternative markets or an alternative to the market created?</li> <li>To what extent are former social relations (ownership) within the food system revised?</li> </ul>
<b>Community resilience</b>	Intergenerational knowledge and practices	<u>Cultural heritage</u> : involvement and preservation of (local) cultural traditions, rituals and values	<ul style="list-style-type: none"> <li>How are cultural traditions involved in the eco-village's rituals, celebrations and festivals?</li> <li>How reconnected are the eco-village's knowledge and practices?</li> <li>What place do cultural traditions have in local entrepreneurship?</li> <li>What place do the values of interdependence and interconnectedness have?</li> </ul>
	Actor's agency in design process community resilience	<u>Agency</u> : taking initiative, be flexible and capable to adapt	<ul style="list-style-type: none"> <li>In what way do actors have the ability to shape the (permaculture) design process and principles of the eco-village?</li> </ul>
		<u>Power relations</u> : 1) The different levels of power over decision-making 2) The different levels of power and authority between actors	<ul style="list-style-type: none"> <li>How transparent and inclusive is the decision-making?</li> <li>How is participation and leadership encouraged?</li> </ul>
<b>Climate change</b>	Adaptation and mitigation strategies	<u>Sustainable development</u> : “(…) development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”	<ul style="list-style-type: none"> <li>How does the eco-village strive to succeed in the obtaining the SDGs indicators?</li> <li>How are the cycles of nature (regeneration) in food, shelter, water and energy practices provided for?</li> </ul>
		<u>Adaptation and mitigation strategies</u> : the intervention in the sources of gas emissions, while focusing on more sustainable forms of energy. The process of adapting to the expected or actual effects of climate change.	<ul style="list-style-type: none"> <li>How does the eco-village make use of the six EVD solution for climate change adaptation and mitigation?</li> <li>What place do other mitigation and adaptation strategies as hydraulic ram pumps, rainwater harvesting, and micro irrigation have?</li> </ul>

On the basis of the theoretical framework, components have been distinguished in the three dimensions. In the dimension of 'eco-village', both self-sufficiency and autonomy appear to

be important in the functioning of the eco-village as AFNs (Wilson, 2013) and are described in Table 2. Moreover, elements of self-sufficiency in EVD solutions such as preservation and crop diversification are used as indicators (Olesen, 2018). In the dimension of ‘community resilience’, distinction is made between cultural heritage and agency. These both components have shown to play a role in creating social and cultural sustainability in EVIs (Shrestha & Singh, 2019; Chowdhoree, 2019; Magnusson, 2018; Fois & Ferino, 2014) while critiques on permaculture initiatives are the differences in decision-making ability, pointing to a necessity to explore power relations (Miller, 2014). For the dimension of ‘climate change’, there is looked at the framework of Sustainable Development on the one hand and climate change adaptation and mitigation strategies on the other hand. In regard to Sustainable Development, the SDGs and findings on environmental sustainability are used (Fiebrig & Van de Wiel, 2021; Shrestha & Singh, 2019). For the indicators on climate change adaptation and mitigation strategies, the framework of the six eco-village development (EVD) solutions is used (Olesen, 2018). Now that the operationalization of the theoretical framework has been elaborated, the substantiation of the research methods is described.

#### 4.1.2 Methods

To gain insight into how community members engage with community resilience to climate change, the main methods of research are that of in-depth interviews and observations. Through in-depth interviewing and observations, the perspective of the study participants is looked at, which corresponds to the premise of qualitative research also known as the emic perspective (Hennink & Hutter, 2020; McIntosh & Morse, 2015). Additionally, these two methods have been supplemented with the secondary data analysis method to provide a complete set of findings on the operationalized dimensions.

The substantiation of the three research methods is set out whereby positive qualities as well as limitations are elaborated.

##### 4.1.2.1 In-depth interviews

To create a space for discussing sensitive topics such as agency and power relations in the EVI, the method of in-depth interviewing was chosen over the use of focus-group discussions. Therefore, opinions of the community as a whole have not been included in the research. Nevertheless, this method of in-depth interviewing also lends itself to investigate values such as interdependence and inclusiveness in practice although this also requires



building rapport with the participants, which is a limitation of the method. The extent to which the interviewer succeeds in this, largely determines the richness of the data obtained from this research method. To provide a certain 'free flow of information' to occur regarding these sensitive topics, the interviews were semi-structured (SSI)(Hennink & Hutter, 2020).

Because the interviews were designed through a partially structured interview guide, questions were determined in advance while there was also freedom to discuss other topics and taking the time to answer the open-ended questions. In this way the SSI interviews were more like conversations for the interviewees. However, flexibility is required to switch within the interview guide or to even deviate from it. On the one hand, the SSI have been deliberately chosen as method for inductive inference. On the other hand, this means that the researcher must remain vigilant to ensure that the desired data is retrieved while new data is obtained. With each interview more detailed probes were made. This is called 'inductive inference', which Hennink & Hutter (2020, p. 482) describe as: "A process used during qualitative data collection, whereby initial data collected guides further data collection (...)". The interviews have taken place in a short succession of time. For this reason, there was no time to transcribe after each interview. Therefore, the researcher has kept notes to allow adjusting of the research method. Through this inductive interference there can be a greater attunement to the participants' contexts, making the data collection 'richer' and 'thicker' (ibid.).

Another type of interviewing has taken place; the interviewing method of 'walk through the spaces.' In three of the four EVIs these were carried out by which the researcher was guided through the setting by a participant. This allowed the researcher to see through the eyes of the participant and in turn, gave more insight on the contextual background at hand.

The second research method used is the method of observations. The substantiation of this method is discussed in the following section.

#### 4.1.2.2 Observations

The method of observations is used to understand the unspoken social norms and values because it helps to bring into view the social protocol of how different actors use space and behave towards each other, including their power relations (Hennink & Hutter, 2020; Ciesielska et al., 2018). Through this method the researcher adapts to the context at hand

and tries to influence the setting as little as possible which is a first limitation of this method as it is characterized by less control from the researcher over the field of study. Therefore, it also asks to avoid subjective and personal interpretation into what is observed by the researcher. Initial guiding points for observations has been drawn up on the basis of the operationalization of the theoretical framework. Field notes were used during the observations to ensure that minimal information was lost.

Through observations, the three dimensions operationalized and described in section 4.1.1, have been mapped: 1. eco-village; 2. community resilience; and 3. climate change. With use of inductive inferences, the researcher was reflective on the setting at hand, allowing for aspects outside of the observation guiding points. All in all, contributing to retrieving in-depth information and the cyclical nature of qualitative research. Moreover, observations alternated between passive and moderate (participant) observation, either remaining an outsider from a nearby vantage point or participating in activities (ibid.).

However, because of the language barrier, not all interactions have been interpretable, putting extra emphasis on observing body language and non-verbal communication. Therefore, the method of observation was strengthened through using the complementary research methods of interviewing and secondary data analysis, which will be discussed in the following section.

#### 4.1.2.3 Secondary data analysis

The secondary data analysis has been conducted through the use of a variety of social media posts, newspaper articles and information from the websites of the EVIs. All in all, supplementing the research methods of interviews and observations. This method proved to be decisive in gathering an overview into the context of the four participating EVIs as it highlighted issues not mentioned during the interviews or observed during observations.

The next section will describe how the data has been collected using the aforementioned research methods.

#### 4.1.3 Data collection

In total eighteen interviews were carried out. For the data collection of the in-depth SSI interviews, the interview guide in Appendix B was used. Because some of the participants were not comfortable being recorded, the content of two interviews was recorded by the researcher directly afterwards. The rest of the interviews were recorded using mobile phone or computer. The participants were asked for permission in advance, explaining what the

recordings would be used for. A fill-in informed consent form was used for every participant (Appendix A). Among other things, the informed consent ensured confidentiality of the participants that the recordings would solely be used for transcribing, whereby only the researcher and supervisors would have access to the recordings. Moreover, anonymity was guaranteed through excluding any compromising information around identity (Hennink & Hutter, 2020).

The number of observations were one per EVI. The observations have been carried out with use of an observation guide (Appendix C). The observation guide was supplemented through writing notes and making photos that helped in writing out the guiding questions afterwards (ibid.).

#### 4.1.3.1 Selection of eco-villages and participants

A total of four EVIs in Spain have participated in the research: the eco-villages of Global Tribe, Los Serpos, Rincon Malillo and El Calabacino. The data collection has taken place from the 27<sup>th</sup> of April to the 11<sup>th</sup> of May. The researcher has spend one-and-a-half weeks in the eco-village Global Tribe in Almonte and half a week in the eco-village of Los Serpos near Valdelamusa. From these EVIs the other two eco-villages of Rincon Malillo (Valdelamusa) and El Calabacino (Alájar) were visited in the province of Huelva in the region of Andalusia, in Spain. The selection process of the eco-villages has taken place through the following: first of all, the theoretical framework had made it clear that there is a high degree of desertification in Andalusia of which the presence of commercial agriculture plays a major role. Therefore, it was decided to select eco-villages in this region. Using the website of the Global Ecovillage Network (GEN)(2021) and Google, EVIs were searched in Andalusia. A total of eleven eco-villages were approached. There was confirmation of participation with Global Tribe Biodynamic and Los Serpos. However, it proved to be difficult to get in touch with other EVIs. As a result, the two other eco-villages of Rincon Malillo and El Calabacino were visited via snowball-sampling through a gatekeeper (Hennink & Hutter, 2020). Nevertheless, this reduced the quality of the data collection of the research as it resulted in having less time to conduct the research in both of these snowball-sampled EVIs. Nevertheless, in all eco-villages there was coordination and informed consent (Appendix A) about the research beforehand. A further overview on participants is shown in Table 3.

**Table 3**

*Overview participants*

Interview #	Participant, in order of date	Eco-village	Date	
1.	Jerry	Global Tribe	29-04-2022	
2.	Gaia	Global Tribe	30-04-2022	
3.	Liza	Global Tribe	01-05-2022	
4.	Christopher	Global Tribe – ‘walk through the spaces’	01-05-2022	
5.	Cobie	Los Serpos – ‘walk through the spaces’	02-05-2022	
6.	Wasim	Los Serpos	02-05-2022	
7.	Julien	Rincon Malillo	03-05-2022	
8.	Maja	Rincon Malillo	03-05-2022	
9.	Fintan	Rincon Malillo	03-05-2022	
10.	Cobie	Los Serpos	04-05-2022	
11.	Mahdi	Los Serpos	04-05-2022	
12.	Rome	Los Serpos	04-05-2022	
13.	Frank	Global Tribe	05-05-2022	
14.	Louise	El Calabacino ‘walk through the spaces’	06-05-2022	
15.	Mateo	El Calabacino	06-05-2022	
16.	Luna	El Calabacino	06-05-2022	
17.	Jon-Paul	El Calabacino	06-05-2022	
18.	Alisa	Global Tribe	10-05-2022	
Passive and moderate observation #		Eco-village	Date	
1.		Global Tribe	30-04-2022	
2.		Los Serpos	02-05-2022	
3.		Rincon Malillo	03-05-2022	
4.		El Calabacino	07-05-2022	
Secondary data #	Article	Type	Eco-village	Date
1.	Our story	Website	Global Tribe	n.d.
2.	About	Website	Global Tribe	n.d.
3.	Transition festival	Social media	Global Tribe	28-04-2022
4.	Women’s circle	Social media	Global Tribe	12-06-2022
5.	Digital nomads	News article	Global Tribe	10-10-2021
6.	Building materials	Website	Los Serpos	n.d.
7.	Pool	Website	Los Serpos	n.d.
8.	Recruiting help	Social media	Los Serpos	11-10-2021
9.	History	Social media	Los Serpos	03-11-2019

10.	Restoration nature	Social media	Los Serpos	21-02-2019
11.	Info	Social media	El Calabacino	n.d.
12.	Judicial process	Social media	El Calabacino	n.d.
13.	Resilience Circle sociocracy	Social media	El Calabacino	29-03-2022
14.	CO2 zoning	News article	El Calabacino	31-10-2021
15.	Andalusian parliament	News article	El Calabacino	02-02-2018

As seen in Table 3, more interviews took place in Global Tribe and Los Serpos than in the other EVIs. This was because of the pre-determined selection of both of the eco-villages. Moreover, the table shows the data collection in the snow-ball sampled EVIs have taken place in one day, respectively giving a tilt to more in-depth data collected in Global Tribe and Los Serpos.

Additionally, as there was no knowledge about the demographics of the EVIs beforehand including age, gender and permanence of residency, the recruitment of participants had to be done on the spot. In some cases, the researcher broke into the daily activities of the community members, with no control over which members were present. Moreover, in one eco-village it was decided by one member which other community members were the 'most-suitable' for interviewing. Subsequently, Google Translate was often used as an extra translation tool with several participants and the researcher alternated several times between English, German and Spanish in addition to the frequent help from Cobie as a guide. Some interviews lasted longer than an hour, others only lasted around half an hour. All in all, contributing to limitations of the research, which will be discussed in the final chapter.

The next section describes the steps that are taken in the data analysis of the research methods.

#### 4.1.4 Data analysis

Due to the interpretative nature of qualitative research, the replication of this work would be difficult if not impossible compared to quantitative research. As a result, in the theory on qualitative research, alternatives are often sought for the validity, reliability, objectivity and generalizability that is strived for in quantitative research. Nevertheless, this could stem from a positivist paradigm, assuming objective truth in qualitative research. Replication

studies are a novel approach to this: “A replication is a (novel) qualitative study conducted by independent researchers replicating one or more aspects (such as study design, research questions, context, methods and participants of an earlier qualitative study and embedding within its findings an interpretative comparison (...)” (TalkadSukumar & Metoyer, 2019, p. 2).

As transparency plays an important role in these novel replication studies in qualitative research, the data analysis is described in-depth. Overall, the method for data analysis was done through Thematic Analysis (TA) of the data. All research methods were coded with the use of NVivo 20 following the six defined steps of TA (Terry et al., 2017): firstly, familiarisation with the data took place. Secondly, codes were generated, seeing similarities and patterns across the data. Thirdly, themes were constructed although these remained open to change. Fourthly, potential themes were reviewed. Fifthly, themes were defined and in the final phase the definite codebook was made. All in all, contributing to the iterative process of data analysis (ibid.).

For the method of the semi-structured interviews, this concerns the following:

1. Each interview was recorded separately. A telephone or computer was used to process the recording. Every recording was saved on several platforms afterwards to ensure their safety.
2. Each interview was transcribed into a separate document, using Google docs' built-in transcribing feature or writing them out personally. Every transcript was checked for spelling and rewritten where necessary.
3. NVivo 20 was used to code the transcript using the aforementioned TA and iterative process.
4. A codebook was drawn up (Appendix D).

The data collection of the research method of observations have taken place through:

1. First of all, the field notes and photos taken as supplement to the observation guide were digitized and saved on various platforms, ensuring their safety.
2. The observation guide was made directly after the eco-village was visited to ensure the direct retrieval of observations.
3. NVivo 20 was used to code the observation guide using the aforementioned TA and iterative process.

4. A codebook was drawn up (Appendix D).

The process of secondary data analysis has taken a similar course through putting the various social media posts, newspaper articles as well as information on the website of the EVIs in a Word-file and integrating those in the iterative process of coding within NVivo 20.

To provide insight how the positioning of the researcher has influenced the data collection process, the relation to the four participating EVIs is shown in the next section. The overall limitations of this process and the research in general will be described in the last chapter of the thesis.

#### 4.3 Positionality of the researcher

For the reflexivity of the research, it is important to reflect on the positionality of the researcher. Conducting the research, the researcher was aware of herself being a young, Dutch woman. Therefore, safety was ensured approaching the EVIs where she had availability of her car rental when staying at both the eco-villages of Global Tribe and Los Serpos and could leave at any time. Moreover, she had mostly a base for stay at the Global Tribe eco-village where she was surrounded with tourists.

Subsequently, the researcher was aware of the possible distance that exists between her and different community members or the community as a whole because she only has been minimally involved with alternative lifestyles. The researcher thus placed extra emphasis on finding the similarities and presented herself with an open attitude. Moreover, because there was a language barrier and possible differences in socio-cultural values and habits, the researcher asked questions to make sure interpretations of observed interactions and activities corresponded to what was expressed.

Throughout the interviews difficulties arose. First, there was difficulty in translating whereby Google Translate was used as an interpreter. Secondly, three of the recordings were difficult to transcribe or had to be cut short because the researcher broke into daily activities of community members. Nevertheless, participants seemed to be especially willing to talk about their personal life stories although the richness of data could have been better. Possible solutions to this would have been an in-person interpreter, a quieter surrounding in some of the cases and longitude research. More limitations of the research are elaborated in the final chapter of the thesis.

## Chapter 5 Eco-village: main characteristics

To gain insight into the main characteristics of the participating EVIs, Chapter 5 will start out with a description of these four cases. First, a general overview of the demographics of the four participating EVIs will be shown. Secondly, the size and settlement type of the eco-villages is described. Thirdly, the similarities with the concept of EVIs will be examined. Altogether, Chapter 5 thus provides a description of the main characteristics of the four EVIs.

### 5.1 Demographics

In order to get a clear picture of the general demographics, Table 4 has been outlined.

**Table 4**  
*Characteristics of the four participating eco-villages*

Eco-village	Size	Demographics	Residency type	Size	Location
Global Tribe	<ul style="list-style-type: none"> <li>• 12 community members</li> <li>• Tourists</li> </ul>	<ul style="list-style-type: none"> <li>• Mostly young (20-30 years old)</li> <li>• Male/female</li> </ul>	Short term	100 by 300 metres	Near town of Almonte
Los Serpos	<ul style="list-style-type: none"> <li>• Between 6 and 12 community members</li> </ul>	<ul style="list-style-type: none"> <li>• Mostly middle-aged (40-50 years old)</li> <li>• Male</li> </ul>	Permanent, semi-permanent	<1 hectare	Off-grid
Rincon Malillo	<ul style="list-style-type: none"> <li>• 5+ families with children</li> </ul>	<ul style="list-style-type: none"> <li>• Between 30 and 40 years old</li> <li>• Male/female</li> </ul>	Permanent	< 1 hectare	Off-grid
El Calabacino	<ul style="list-style-type: none"> <li>• 120 community members</li> <li>• Families and three generation of children</li> <li>• Tourists</li> </ul>	<ul style="list-style-type: none"> <li>• 120 community members</li> <li>• Tourists</li> <li>• Male/female</li> </ul>	Permanent, semi-permanent and short term	<ul style="list-style-type: none"> <li>-Over 100 by 300 metres</li> <li>-Exact size unknown/spread across mountainous areaa</li> </ul>	Near town of Alájar

What stands out is that Global Tribe is set apart from the other EVIs through its short-term residency type. This is due to the contracts that the community members volunteer for a period of three months. The type of residency that occurs in the other EVIs is mostly semi-permanent or permanent. In the case of Los Serpos and El Calabacino there are community members and tourists visiting for a shorter period of time. Additionally, while Global Tribe has a young population of community members, the EVI of Los Serpos can be characterized as middle-aged male population. Moreover, Global Tribe has a small in-crowd of twelve



community members and a constant influx of tourists that can triple the amount of people within the eco-village while El Calabacino has a large in-crowd that contains 120 community members. All in all, the four cases are of a variety of demographics and contain various sizes. The similarities with the concept of EVIs will be explored next.

## 5.2 Similarities with the concept

When looking at the similarities of the four cases with the concept of eco-villages, a number of things stand out. First of all, the interviews and observations<sup>1</sup> revealed that three of the four EVIs have doubts about whether they are an actual eco-village. In Global Tribe this was expressed because it generates its own revenue through a goji berry farm and tourism. On top of that, the community members usually are in short-term residency and there are no families part of the EVI. In case of Los Serpos, participant Wasim explained that the EVI does not form a community through collaboration or through being self-sufficient:

*“You know because even we work in the conventional buildings, we are not auto sufficient we are not for sure, we are ecologists all of us we don't like to destroy the nature.”*  
Participant Wasim (Los Serpos, male, 42)<sup>2</sup>

In Rincon Malillo participant Julien points to a lack of a clear definition of what an eco-village is. Additionally, he might not want to put a label on their way of living as there are costs assumed by identifying as an eco-village, possibly pointing to process of implementing various strategies:

*“We don't think, like you, that it is an eco-village. Because it is a lot of money, you have to live with what you have. And there are lot of visions. Many ideas about what is really an eco-village. If a person who live in a real eco-village they come to here or come to Serpos and no I don't want to do an eco-village I only want to be more responsible with the environment and not put a name on that.”*  
Participant Julien (Rincon Malillo, male, 42)<sup>3</sup>

Of the four cases, El Calabacino seems to be the most similar to the definition of the concept, which is drawn up by a community member herself in the news article of Lavodelsur.es on October 31st, 2021<sup>4</sup>:

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<sup>1</sup> Table 3

<sup>2</sup> Table 3: interview #6

<sup>3</sup> Table 3: interview #7

<sup>4</sup> Table 3: secondary data #14

*“But what is an ecovillage? Darma Folqués answers: ‘It is a concept of a way of living that takes into account the relationships of people with the territory and of people with each other. It has four legs: the economic one, because there is a group of people who have a common economy; the ecological, of relationship with the environment; the commitment to do social work to generate harmony, knowledge and growth; and global consciousness, having an idea of what we want humanity to be like.’”*

As can be seen from this secondary data, the participant from the eco-village of El Calabacino has a clear idea of what an eco-village is, which indicates identifying as an eco-village. Nevertheless, the other three participating EVIs have doubts about the similarities with the concept, this might point to a general lack of a clear definition for the concept of eco-villages. Moreover, there could be hesitance to identifying as such because of the cost of certification and implementing techniques. Altogether, this can prevent eco-villages from being involved with professional actors that could lead to financial support or attention from local, regional and national politics. In turn, this reduces their ability to exercise agency in responding to change locally and thus lessen their overall community resilience.

The next thematic chapters set out the findings of the sub-questions of the research, whereby Chapter 6 focuses on adaptation and mitigation strategies, Chapter 7 deals with the eco-villages’ self-sufficiency, Chapter 8 describes the agency of community members and Chapter 9 shows the involvement of intergenerational knowledge and practices in the EVIs.

## Chapter 6 Strategies for Sustainable Development

Chapter 6 handles the first sub-question and looks at the strategies used for climate change adaptation and mitigation in the four eco-villages. Foremost, the experiences on the effects of climate change are outlined. Subsequently, the eco-village development (EVD) solutions and complementary strategies for climate change adaptation and mitigation are described. In this way, Chapter 6 places the strategies used in the larger context of Sustainable Development.

### 6.1 Effects of climate change

Each participant was asked about their experience with the effects of climate change in the EVI. The interviews showed that the greatest effects are perceived when the EVI has a collective garden. For example, in Global Tribe there is great pressure on the yields of the vegetable gardens and goji berry farm through it being its main revenue:

*“We did thankfully get some rain in March and in April, but it hasn't been enough for an entire year of dryness. So, it has definitely affected crops the ecovillage. It's being necessary to water by hand you know every day not to lose our veggies and they have produced less. We noticed there's less vegetables this year, which raised a lot of concerns (...). Certain couple times we realized we're running out, so we had to plant some more and it's being a big planning action to grow more crops because it's not being enough. It's not being enough.”*

Participant Liza (Global Tribe, female, 42)<sup>5</sup>

The statement of participant Liza shows that the community members experience less yields than last year. It shows how a year of drought has direct effect on how the eco-village is able to sustain itself. This aspect of self-sufficiency will be further analysed in Chapter 7.

Nevertheless, across all EVI's rising temperatures are noticed:

*“Years ago, there were at least five days a year of thick ice on my rainwater harvesting barrel. Now there is only one day a year where there is a film layer of ice on the barrel. Previously there were also persistent thunderstorms with a lot of rain or periods where it rained for one month continuously. This is now no longer the case.”*

Jon-Paul (El Calabacino, male, elderly man)<sup>6</sup>

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<sup>5</sup> Table 3: interview #3

<sup>6</sup> Table 3: interview #17

Participant Jon-Paul describes how the usual periods of rain and cold are becoming less. As a result, other environmental conditions are attributed such as a lack of water and the danger of forest fires. Section 6.1.1 will cover these environmental dangers.

#### 6.1.1 Environmental dangers

In all four EVIs the main environmental challenge is the general lack of water. To solve this problem, each eco-village is implementing several strategies. However, not all eco-villages are able to do this all year-round:

*And I don't see Calabacino as an example for climate resilient communities because there are certain months of water scarcity that cause high tensions and community members fighting each other over water."*

Participant Jon-Paul (El Calabacino, male, elderly man)<sup>7</sup>

As participant Jon-Paul shows, scarcity of water can directly impact the cohesion amongst community members and influence their ability to withstand difficulties, affecting their overall community resilience to climate change. Moreover, forest fires are a serious threat to two of the four EVIs and can be linked to unsustainable land management due to the overexploitation of eucalypt:

*"Eucalypt fires with anything. You make it like that and foem. Really dangerous. And the fires the specialists call it a top fire so it jumps very far and it's impossible to stop it. Here there is a transition place so this is a vegetation that is used to have fire. When you see the skin of the tree, it's prepared for that. When it pass the fire, everything regrows again. But the factor of the thousands of hectares of eucalypt has effected a lot."*

Participant Cobie (Los Serpos, male, 52)<sup>8</sup>

In addition to these two direct dangers from increasing drought, environmental factors can play a role that have to do with the location of the eco-village. In the case of Los Serpos, with its rural location, there is an active threat for planting trees as these are eaten by deer. Because community resilience indicates the ability of a group of people to exercise agency in responding to change locally, the next section will look at how the EVIs deal with climate change and other environmental threats.

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<sup>7</sup> Table 3: interview #17

<sup>8</sup> Table 3: interview #10

## 6.2 Adaptation and mitigation strategies

Climate change adaptation and mitigation strategies have been summarized as the intervention in the sources of gas, emission, while focusing on more sustainable forms of energy. It is the process of adapting to the expected or actual effects of climate change. Of the six EVD solutions as adaptation and mitigation strategies, mainly solution 3. SHS; 4. solar or hydro-, micro- and mini-grids; and 6. organic farming, gardening and composting are used. Conversations with participants have shown that both the improved cookstove (ICS) and household biogas plant (HBP) technologies are not suitable for cooking because of the heat, creating danger and discomfort. Subsequently, gas is cheap in Spain, resulting in the EVIs not partaking both of these EVD solutions.

Therefore, in the following sections exclusively the findings on the three EVD solutions of SHS, hydro-, micro- and mini-grids and organic farming will be described.

### 6.2.1 SHS and grids as EVD solution

Of all the EVD solutions, SHS show the best adoption as each of the participating eco-villages has this system implemented. The Spanish government seems to play a major role in this, as participant Mateo indicates.

*“But now it’s cheapest and you can buy for not a lot of money an installation for normal use. And I think this is good because the government also start to think about it and now in Spain the law is if you put solar panels in every place you can sell the electricity to the electric company and it’s a discount in your inbox every month.”*

Participant Mateo (El Calabacino, young male)<sup>9</sup>

The statement of participant Mateo shows how has made SHS into solar grids by giving users the ability to sell their energy for cost reduction. Moreover, it stimulates the communities’ agency through increasing their ability to use energy as a means to provide for themselves and their communities. Throughout the four participating cases energy is provided with use of SHS, although its grid function is solely visible in El Calabacino.

### 6.2.2 Organic farming, gardening and composting

In each of the participating EVIs there is an ecological way of gardening or farming. However, sometimes this means using a clearly-defined theory such as (biodynamic) permaculture, while for others it is mainly working with the traditional methods of agriculture. In all cases,

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<sup>9</sup> Table 3: interview #15

pesticides are excluded in farming. In Global Tribe biodynamic principles of Rudolf Steiner are used. Various techniques were observed in Global Tribe<sup>10</sup>, including the Hügelskultur technique. In Figure 4 the Hügelskultur in Global Tribe is pictured, showing the raised beds that have been created using organic material such as mulch, straw and compost to create a water efficient and nutritious soil environment.

**Figure 4**  
*Hügelskultur in eco-village of Global Tribe*



Other techniques used in Global Tribe are vermicultures, adjusting the planting of crops to moon phases and making herbal teas such as nettle tea to water and fertilize crops. Moreover, with the innovation of the Lactobacillus and worms in a dry-separated toilet, compost is created. One the one hand, pee is used for watering the plants. One the other hand, the poop is processed by the Lactobacillus and will be used as compost after three years. Although a comment here as two participants from both El Calabacino and Los Serpos point out that permaculture is a hip word, sometimes coming across as an intellectual theory more than practical knowledge. Therefore, some participants especially work with the traditional methods of farming, gardening and composting whereby traditional seeds are seen as best able to withstand the effects of climate change:

*“In the end it has been the seed that has planted for hundred years and it’s the seeds that are going resist more adapted to the place, no? Maybe some of them will not work on the future, we don’t know. But we have to try everything that’s the only way.”*

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<sup>10</sup> Table 3: Passive and moderate observation #1

The statement shows participant Cobie's perception that traditional seeds may be better adapted through their evolution over time. Additionally, he explains how he makes trees resilient to the effects of climate change by not overwatering them: as the trees must search for water deep in the ground, they develop strong roots and are better adapted to the local (dry) climate. This is more in line with the low-tech strategies which will be elaborated next.

### 6.2.3 Low-tech solutions

For the four participating EVIs, low-tech solutions may be chosen over well-defined technical systems such as the Lactobacillus dry-separating toilets. Consequently, in the four EVIs mostly low-tech solutions are used for climate change adaptation and mitigation as well as for counteracting environmental dangers. Through it being impossible to list all techniques used in the various eco-villages, an overall picture is given.

In Los Serpos, a system was observed<sup>12</sup> pumping the water from a nearby well and through collecting rainwater. This is then stored in a pool which is transported throughout the eco-village with tubes. Various water ponds have been created through this system as is displayed in the photo in Figure 5. Through these water ponds, several microclimates are made possible until the heat leaves the ponds to dry out. It was observed that the water ponds stimulate biodiversity through attracting birds, frogs and insects.

**Figure 5**  
*Created water ponds in eco-village of Los Serpos*



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<sup>11</sup> Table 3: interview #10

<sup>12</sup> Table 3: passive and moderate observation #2

This technique of a pool, also known as 'alberca' is also used in El Calabacino. Moreover, in Los Serpos, bird feeders are used to spread traditional seeds across the countryside. In Global Tribe low-tech solutions are using left-over vegetables from the supermarket and transporting their produced goji berries in trucks already going to the place of destination.

Furthermore, most of the houses of Los Serpos and El Calabacino are made through low-tech and sustainable building methods. In this way, natural materials such as soil, straw and lime are used together with recycled materials like glass and metal. A caveat here is that some houses seem makeshift. An interview had to be actively postponed due to major leakage during a rain shower. Therefore, the question is how resistant these houses are to absorb external environmental factors and lead to resilience against extreme weather. Another important aspect of climate change adaptation and mitigation strategies is lifestyle, which will be explored in the following section.

#### 6.2.4 Lifestyle

In all four EVIs reflectivity of human-nature relations occurs. This shows that community members actively reflect on their own behavior and their degree of adaptability to the feedback cycles in nature. To counteract the danger of forest fires and to lower the general temperature, in Los Serpos and Rincon Malillo human intervention in the landscape is contemplated:

*“And before summer, we cut all the grass. Now we let it stay because all the bees are eating on that but when it going to be dry and yellow, we start cutting because it’s a danger. But we try to conserve to manage the soil, no? Because all that grass is stopping it, it is getting lower temperature. So, we try reserve until the end until we have no more time.”*

Participant Cobie (Los Serpos, male, 52)<sup>13</sup>

*“And we thought the other day we can take it off and then to plant lavender or rosemary. And then we thought ‘OK, it’s fine there. It’s been there all life and it’s green even in summer. Why we have to take it off? Leave it there.”*

Participant Maja (Rincon Malillo, female, 43)<sup>14</sup>

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<sup>13</sup> Table 3: interview #5

<sup>14</sup> Table 3: interview #8



These statements from participant Cobie and participant Maja show how it is not a measure of aesthetics but looking for a synergistic relationship with nature and to only to intervene when it forms a direct danger to the EVI. Using feedback loops in nature is not only used to prevent forest fires and reduce temperatures but also to be able to withstand other environmental hazards such as the danger of deer for the cultivation of trees:

*“That one for example this seed needs to be eaten by a dear and with the shit when it pass with the stomach is when the seed is ready to be planted. So on the end, with the fight that we have for the deer I’m trying not to plant anymore. To throw it away, deers eat it and they will make the shit over there they are spreading the seeds.”*  
Participant Cobie (Los Serpos, male, 52)<sup>15</sup>

However, it is not only through this practical awareness of human-nature relations that behaviors are adjusted. It can become a general vision for the way of farming, gardening and composting. Through interviews with participant Cobie, it became clear that that his view is to always give back more than to take from it and that he assumes a greater purpose in nature. In other words, a strategy does not always have the expected outcome but will always indirectly effect nature’s needs: sometimes a seed will be food for insects or birds, other times an actual tree will grow out of it. Another interpretation of this philosophy is the lifestyle that Global Tribe adopts by implementing a vegan or vegetarian diet.

In conclusion, Chapter 6 has shown how climate change adaptation and mitigation techniques are not only implemented through well-developed technical systems but can also take place through low-tech solutions and lifestyle changes. Moreover, the chapter has presented how the participating EVIs contribute to SDG 6, 12 and 15 in their strategies for water, energy, sustainable building methods and reflectivity on landscape management. Nevertheless, it remains to be seen how the EVIs are able to manage other factors regarding Sustainable Development, which will be described in the following chapter.

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<sup>15</sup> Table 3: interview #5

## Chapter 7 Self-sufficiency through generation and autonomy

Chapter 7 looks at the self-sufficiency of the participating EVIs by seeing to what extent they depend on external good and services. It does so through outlining vulnerabilities to self-sufficiency before moving onto two distinguished sides to dependency: 1. generation of food, water, shelter and energy; and 2. autonomy. The last category can be divided into the degree of territorial, material and social autonomy, each of which will be analysed separately. Taken together, this gives an overview into how the eco-villages strive to succeed in their self-sufficiency. In turn, this contributes to seeing the ability of the community to react to change locally, assessing their overall community resilience to climate change.

### 7.1 Vulnerabilities to self-sufficiency

Conversations with participants show that there are great vulnerabilities involved in an eco-village's ability to be self-sufficient. This is in line with a general problem in Spain, namely: rural (landscape) abandonment which is especially the case in Los Serpos. Participant Cobie says the following about this:

*“What I would like is that the people and it's very important is that the women and the child's come back to the countryside. When it has no women or child's, only men's it has no future. We came here with forty years, now we are almost fifty all of us and if there is not a new generation this place will die so we need the young people. But at the moment everybody is in the city, it's more comfortable and they don't want to do real effort.”*

Participant Cobie (Los Serpos, male, 52)<sup>16</sup>

The participant draws the explanation for this to the degree of comfortability in the countryside. Since much of the eco-village consists of self-constructed technical systems and building methods, this could indicate an overall barrier for young people and women to live here. Moreover, participants mention that due its off-grid location, education and work opportunities are limited, which plays a significant role in the problem of rural abandonment. Furthermore, governmental policy can also lay pressure on the eco-villages' ability to sustain themselves:

*“No, those people have chickens. They could not sell the eggs to their neighbours, or they could, they would get such a big fine. That that it will break them for the winter. It's illegal because the eggs are not certified by the health department that regulates the health guidelines. If a family has a pig and decides to make sausages eventually out of the pig. Not only you cannot sell them to your neighbours or give them to your neighbours, you cannot*

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<sup>16</sup> Table 3: interview #10

*even eat them yourself. The family is illegal in that they eat their own pig because it's not certified.”*  
Participant Liza (Global Tribe, female, 42)<sup>17</sup>

The quote highlights how through the process of certification, farmers and small-producers are tempered in their ability to produce and consume their own products. All in all, reducing their community resilience. The next section will further elaborate the self-sufficiency of the EVIs on food.

## 7.2 External products and services

The extent to which the EVIs are dependent on external products and services differs greatly between and even within the eco-villages. Because Chapter 6 explored the dimensions of water, energy and shelter, this chapter will therefore focus on the remaining dimension for self-sufficiency: food.

### 7.2.1 Food

In the eco-village of Los Serpos, as described in Chapter 6, various strategies are being applied to create more opportunities for gardening in the coming years. As was observed in the garden of participant Cobie<sup>18</sup>, he is actively experimenting with native seeds. Figure 6 shows a photo of a native bean crop in the participant's garden. This crop is cultivated and brings a sustained harvest.

**Figure 6**  
*Experimenting with native seeds in eco-village of Los Serpos*



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<sup>17</sup> Table 3: interview #3

<sup>18</sup> Table 3: passive and moderate observation #2

Nevertheless, each community member self-determines if they plant crops. Therefore, there is a difference found in the presence of gardens for individual member although the gardens that are there are minimally cultivated. As a result, each community members goes to the supermarket to do weekly groceries and no large-scale projects are yet undertaken to change this. Although there is a common garden, it has been overgrown with wilderness. The conversations with the participants show that a lack of communal decision-making, impermanent residency and rural abandonment are instrumental in this. The eco-village of El Calabacino is of a similar order although here it is more specifically related to the lack of communal decision-making. Moreover, there is a large difference found in the degree of products being purchased from the supermarket as the statement of participant Louise highlights:

*“No, only people have to put to it themselves. All the people have the garden to eat but some people buy everything in market some people buy nothing. It's very depends.”*  
Participant Louise (El Calabacino, male, middle-aged)<sup>19</sup>

For Rincon Malillo there is presence of a communal garden. Furthermore, what emerged from the conversations with community members in Rincon Malillo is that there is a prevalent vision throughout the community to become as little dependent as possible. To do this, several future projects are planned as the statement of participant Maja shows:

*“OK, we go to the supermarket. The big supermarket. We buy the for example the milk and the oil, the cooking oil. We know we can in the future get our own oil. But for the moment we have the trees but we have no time and we have no energy to prepare these old trees.”*  
Participant Maja (Rincon Malillo, female, 43)<sup>20</sup>

As described in Chapter 6, food supply is an important part of the revenue of Global Tribe, which means that self-sufficiency in this area is high and undertaken as shared collective responsibility. Therefore, Global Tribe only buys processed foods that are incorporated in the dishes they serve for tourists and community members, such as pasta and rice.

Moreover, of the four cases, two eco-villages use crop diversification, while Los Serpos mainly uses local varieties which is one of the indicators of self-sufficiency defined in the operationalization of the theoretical framework. Rincon Malillo currently mostly uses the

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<sup>19</sup> Table 3: interview #14

<sup>20</sup> Table 3: interview #8

already well-functioning crops, such as tomatoes, and is actively working towards local intergenerational methods to preserve these which will be elaborated in Chapter 9.

## 7.2 Autonomy

To gain an overview of the three dimensions of autonomy, the territorial autonomy as result of land ownership is discussed first. Secondly, the material autonomy is elaborated through the way in which alternative markets or alternative to the markets are created by the EVIs. Thirdly, the social autonomy is explored through looking at how the eco-villages revise food relationships.

### 7.2.1 Territorial autonomy – land ownership

Territorial autonomy seems to form a large vulnerability context for two of the four EVIs. Two of the EVIs, Global Tribe and Rincon Malillo, own the land they inhabit. However, for Los Serpos and El Calabacino there are difficulties around land ownership and building permits. In both cases this is a direct consequence of the earlier rural abandonment of the houses. Foremost in Los Serpos, the current inhabitants have rebuild their houses from the ruins left behind by the previous residents. As a result, the community members are in a squatting position regarding their houses:

*“But I know most part of our houses we know the owners and I have to be sincere with you, I don't put too much interest on that like I'm there, I don't think nobody going push me out of there (...). But I know these people everybody knows with which one is his house and no problem, you know, no problem at all. The only problem can happen here is the minery or something they find gold down here. It's going to be another song you know if the owner comes and I have a fancy house all finished.”*  
Participant Wasim (Los Serpos, male, 42)<sup>21</sup>

As the statement of participant Wasim shows there is a general squatting position although every community member is set to know the owner(s) of their house. Moreover, participant Cobie explained during the interview how he has given the owner of his house thousand euros as a means of good-will. Taken together, this could leave the eco-village vulnerable and never able to fully shift out of their makeshift-housing.

In the case of El Calabacino, it is a legal process with the Andalusian Parliament around twenty-two houses that are deemed to be breaking the law. This concerns the zoning plan within the Aracena Natural Park where El Calabacino is located and includes

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<sup>21</sup> Table 3: interview #6

building regulations. Raíces de El Calabacino neighbourhood association have entered the legal process and are requesting crowdfunding for this online.<sup>22</sup>

### 7.2.2 Material autonomy - alternative to the market

Alternatives to the market have been created in three of the four participating eco-villages which largely relates to the vision of the eco-village and its overall revenue. In Global Tribe and El Calabacino in particular, the alternative to the market provides an economic boost. Global Tribe does so through its revenue as goji berry farm and tourism while El Calabacino focuses on activities within the eco-village.

**Figure 7**

*Alternative to the market in the eco-village of El Calabacino*



The activities that were observed<sup>23</sup> include setting up a pizzeria as the photo in Figure 7 displays and a creperie that are also part of the sociocracy circle for economy. Community members and guests can then eat a pizza or a pancake for three euros, money from which the eco-village creates opportunities for repairing, organizing or purchasing. As it plays a major role in the agency of community members of El Calabacino, the alternative to the market, will be discussed further in Chapter 8. For Rincon Malillo this is currently less practically implemented although it forms a strong part of its vision:

*“For me it’s very important that one ecovillage makes a circular economy project in relation with the administration, politics, the peasants, enterprises and commerce. That it’s a*

<sup>22</sup> Table 3: secondary data #14-15

<sup>23</sup> Table 3: passive and moderate observation #4

*common impulse for everyone. To change the world, you have to connect with the area, society and reality in the local environment. There are many eco-villages that have a wall.”*  
Participant Julien (Rincon Malillo, male, 42)<sup>24</sup>

The statement of participant Julien shows how the vision for a circular economy sparks ideas of how an eco-village can form an impulse for its surroundings. It does this through incorporating products from local artisans and interacting locally to exchange knowledge and practices. It also highlights a potential negative trait of EVIs through, what participant Julien calls, creating a wall around themselves.

### 7.2.3 Social autonomy - freeganism

Of all four cases, Global Tribe shows the most overhaul of social food relations. As aforementioned, freeganism is living off remnants of food, clothing and furniture. In terms of objects present in the eco-village, almost everything is donated or collected for free. Moreover, there are specific designated areas for freeganism. In these areas there are bookcases and bins to leave or take objects freely such as clothing and books. Global Tribe might be able to do this through its continuous influx of new community members and guests.

In summary, there are major pitfalls and opportunities associated with the self-sufficiency of the four participating EVIs. Throughout the eco-villages, there is a dependency on food and external goods, while it differs greatly between and even within the eco-villages to what degree this is the case. Moreover, for two out of the four EVIs there is a large vulnerability found in their material and territorial autonomy because of a lack of land ownership and makeshift housing. This directly influences their prospects to sustain their function as eco-village and thus directly impacts their community resilience although strides are made through forming alternatives to the market. Chapter 8 will explore how the eco-villages are shaped through a (permaculture) design and agency of community members.

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<sup>24</sup> Table 3: interview #7

## Chapter 8 Shaping the eco-village design process

Chapter 8 deals with the third sub-question around how different community members shape the eco-village. On the one hand, this chapter does so by examining the agency of community members. On the other hand, power relations between different actors are examined and brought into view. Looking at agency can inform about the different ways in which community resilience takes shape and forms a contested process.

### 8.1 (Permaculture) design

The permaculture design seems to be largely related to the organization of public and private domains, the (environmental) possibilities of the terrain and the physical changes over time although there might be general tendency to separate from permaculture principles by some community members as aforementioned in Chapter 6. In the case of Global Tribe there are only a few private domains on the entire site while in Rincon Malillo there are private houses where the families live. Both have communal gardens and reflect a large-scale interpretation of permaculture. However, only Global Tribe seems to have a specific permaculture design. Overall, this could point to the lack of practical applications of permaculture design in zones.

### 8.2 Agency of the community members

Because an actual permaculture design is less present in three of the four eco-villages, this section will focus more on the capacity for initiative of activities by different actors in the community. In three of the four EVIs there are meetings related to the organisation of activities. These meetings relate to either long-term goals for strengthening the eco-village, its vulnerability context or daily tasks that need to be done. The frequency of meetings and the content thereof, seems to correspond with the size of the eco-village as well as the vision and permanence of residency. In Global Tribe, there is a work schedule for daily activities to provide for the tourists staying at the eco-village. A meeting is organised everyday at 10:00 AM, in which tasks are subdivided for the short-term staying volunteers. Each community member has the room to discuss their tasks

*“We're meeting at 10:00 o'clock every day and in this meeting we have a big whiteboard, and then we're writing on the whiteboard things that we've identified that need to happen. So, it can be anything from restocking the spices in the kitchen, to making signs to some collective weeding in the gardens and whatever comes up in your moment, really.”*



Participant Frank has a coordinating function, is oldest of age and longest-staying volunteer present in the eco-village and has a higher degree of decision-making ability. These power relations will be explored further on in this section. Instead, in the other two EVIs of Rincon Malillo and El Calabacino, the meetings are about long-term projects:

*In the beginning the process was very strict and we have two meetings a week one of the for the economy and one for the work that needs to happen in the place 'we have to do that'. And now we communicate to all the people when there is anything important.*

Participant Julien (Rincon Malillo, male, 42)<sup>26</sup>

This statement of participant Julien shows how the organizational structure of the eco-village can shift over the years. This is in line with findings from other interviews throughout the eco-village where it seems the community realized that there should be a gradual process of implementing strategies: when there is too much pressure on the immediate start-up of projects, this results in the cancellation of projects or less satisfaction of residency. In El Calabacino meetings have been arranged through the organizational method of sociocracy as it was expressed in interviews to be impossible to decide together with a total of 120 community members. Rather, projects are done in smaller circles that have thematic focus including the economy and infrastructure of the eco-village. This sociocracy structure generates theme-specific outcomes. In conversations with community members, it was expressed that the eco-village can do repairs out of the financial revenue and alternatives to the market that have been created, as described in Chapter 7. Nevertheless, not all the community members are participating in these sociocracy circles, directly affecting their ability to exercise agency. Moreover, the statement of participant Jon-Paul in Chapter 6 highlighted that the organizational method of sociocracy may not reduce vulnerability contexts such as the scarcity of water.

### 8.2.1 Sense of belonging

Several participants indicated that the degree of agency is related to the degree to which community members feel a sense of belonging. The sense of belonging would influence the

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<sup>25</sup> Table 3: interview #13

<sup>26</sup> Table 3: interview #7

sense of ownership and in turn the feeling of responsibility for the eco-village. A great sense of belonging is perceived in the four eco-villages. However, due to the character of the EVIs and the residency of community members, the sense of belonging is experienced differently. There are three categories found in 'belonging': 1. to the place; 2. to nature; and 3. to the community. The first category was most strongly felt within El Calabacino and seems related to the experience of having different generations of history in the eco-village:

*"It's because in the begin people come from outside and they don't know how long they will stay here but now with the years people have the children here. And when it's like that your connection with the place is different because people now are not from outside, people are from here, living here. Have the roots growing and growing. Deepest, no? Deeper and deeper. (...) I'm from here, it's my place. And I think this an important step to want to care of the place."*

Participant Mateo (El Calabacino, young male)<sup>27</sup>

The second category of belonging seems related to working directly with nature itself through gardening although it is also induced by a general feeling of interconnectedness, which will be explored in Chapter 9. Moreover, the third category seems largely shaped by the perception of uniformity and the space created for socio-emotional support amongst the community members. This is the case in Global Tribe and Rincon Malillo where there are collective sharing circles and open spaces to talk about socio-emotional issues.

### 8.3 Power relations

When looking at power relations, a few things stand out: first of all, the perceived hierarchy is mainly related to the founders of the eco-village as they are perceived as having the most knowledge. In Global Tribe and Rincon Malillo, the founders are the longest staying community members. It was observed that they often are the only members that have insight about the practicalities of the eco-village such as fixing a water leak. In both cases, the founders are the ones to instigate projects although interviews show that other community members experience openness to share their input. Furthermore, these forms of hierarchy might as well be seen as necessary:

*"To guide us on if something is being done wrong, they're correct as well, you know, so it's not that they are above anyone, it's just that they've been given that role, which is really necessary. We appreciate that as well so. I mean, it would be ideal if everyone knew exactly what to do and how to do it right, and no one ever went outside guidelines, you know, but in a perfect world."*

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<sup>27</sup> Table 3: interview #15

Participant Liza (Global Tribe, female, 42)<sup>28</sup>

Participant Liza mentions that not only the founders but also the coordinator specifically is seen as necessary to create structure in Global Tribe. During an interview, the coordinator also interrupted the conversation because the participant was doing the interview during his work shift. Nevertheless, problems can arise when there are differing views on self-determination and a difference found in the overall uniformity within the eco-village:

*“That's why I just say to you everything still going good here because nobody expects anything from anybody. It's a little bit individualist anarchism.”*

Participant Wasim (Los Serpos, male, 42)<sup>29</sup>

Participant Wasim highlights how he experienced critique for reusing motor oil as lubricant for wood to prevent insects during his previous residency in El Calabacino. Moreover, observations and interviews in El Calabacino show that some community members now enter the ecovillage with cars, while this was previously done with the use of donkeys. All in all, these differences in views can lead to conflict and lack of cohesion within the community.

Taken together, the way in which different actors shape the eco-village is different per EVI. Several organizational structures are implemented within the four EVIs. Overall, the degree of agency exercised is related to the sense of belonging that is experienced while a lack of uniformity in decision-making can be a starting ground for conflict. Moreover, not all community members want to engage with community resilience to climate change. Taken together, it shows how agency is a contested process.

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<sup>28</sup> Table 3: interview #3

<sup>29</sup> Table 3: interview #6

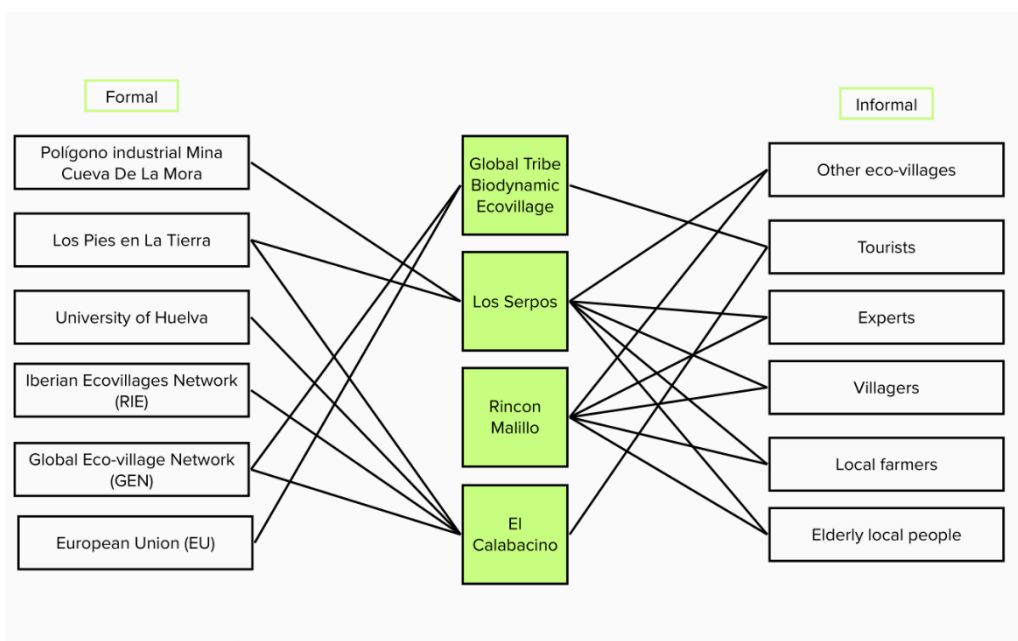
## Chapter 9 Intergenerational knowledge and practices

Chapter 9 centres around the fourth sub-question of intergenerational knowledge and practices. First of all, the relationship of the eco-village with external parties will be described before the involvement of cultural heritage is brought into view. This shows how the EVIs are embedded within their social networks and what role cultural heritage plays in strategies undertaken for community resilience to climate change.

### 9.1 External social networks

The relationships EVIs have with external parties seem to be primarily related to the meaning the community members address to those. Moreover, the eco-villages that are larger of size or less dependent on external services are significantly less likely to have relationships with (informal) external parties. These relationships are shown in figure 8.

**Figure 8**  
*External social networks of the four EVIs*



*Note.* Retrieved through mapping relationships of the four EVIs by combining data from interviews, observations and secondary data.

The figure shows how some EVIs have more formal external relationships while others have more informal ones. The nature of these relationships is also shown. What stands out is that only two eco-villages are linked with formal eco-village institutions, namely the RIE and GEN. This possibly points to a lack of wanting to label as an eco-village, as explored in Chapter 5.

Of the four participating EVIs Los Serpos has the most formal and informal connections. The formal connections of this eco-village can be characterized as relationships with various civic associations such as a minery organization (Polígono industrial Mina Cueva De La Mora) and an organization on the importance of nature (Los Pies en La Tierra). Where Global Tribe and El Calabacino have a revenue from tourists, Los Serpos and Rincon Malillo are depended on various informal contacts for their self-sufficiency. In turn, it contributes to their overall vision of the value of intergenerational knowledge and practices which will be further described in section 9.2.

In the case of El Calabacino, outsiders are unable to visit the eco-village without connections inside the eco-village as the 'Info' section of the Facebook page shows (n.d.)<sup>30</sup>:

*"El Calabacino is an ecovillage, a member of Iberian Network of Ecovillages (RIE), and the Global Ecovillages Network (GEN). We are not a community therefore we do not receive visitors only in a personal capacity."*

As can be read in this secondary data, it is difficult for outsiders to visit El Calabacino. This is in contrast to the inclusion of the eco-village in both the formal networks of the RIE and the GEN. Therefore, a figurative wall is places around the eco-village towards informal networks. In the next section the relation of the EVIs to the structure is explored.

#### 9.1.1 Structure

In addition to these formal and informal social networks, a number of things stand out from the interviews, observations and secondary data when looking at the relationship the EVIs have with worldwide (food) systems. Throughout the eco-villages there is an over-arching sense of opposition to these systems which was especially observed in Global Tribe and Los Serpos. In Global Tribe the system is often called 'Babylon' while in Los Serpos this is more strongly expressed through being against the dependency of the system in paying mortgage or taxes. However, in all eco-villages the city is experienced as symbol for what they oppose. The city is described by the participants as dirty, densely populated and epitome of consumerism:

*"We disagree with the kind of life you can have in a city. We were living before in a city, Huelva, 100 kilometers from here. We thought that it was a very hard life. No, we were not*

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<sup>30</sup> Table 3: secondary data #11

*comfortable with that kind of life. You know pollution. If you go to the road, you have the windows that are telling you, you have to buy, you have to buy, all the time.”*  
Participant Maja (Rincon Malillo, female, 43)<sup>31</sup>

This statement by participant Maja shows the general opinion throughout the EVIs about life in the city.

## 9.2 Intergenerational knowledge and practices

Intergenerational knowledge and practices have been defined in the operationalization of the theoretical framework as the traditional and local cultural practices, rituals and values that are used to strengthen the eco-village. Therefore, it can also be seen as the involvement and preservations of cultural heritage. It also works with indigenous and reconnection forms of relating, crafting and working with the land which holds the values of interdependence and interconnectedness in high regard. These values are expressed in the EVIs by means of three different categories:

1. A commonly expressed connection with nature with nature nominated as Mother Nature and Pachamama. In this case, special rituals and celebrations are organized during the new and full moon.
2. A local interdependence and interconnectedness. Here a special emphasis is placed on the knowledge and practices that older generations have acquired. In this case, older generations are seen as the key for cultivating the land.
3. An appreciation of previous generations within the eco-village with celebrations specifically surrounding its own existence.

Category 1 is particularly present in Global Tribe:

*“So, the few rituals that we do is the new moon ritual, which we're going to do tonight hopefully. A new moon is actually very tied into nature and planting. So, with the new moon, it's time to plant seed. Now the full moon is time to reap harvest. And it's also very personal, within ourselves, we have to plant seeds within ourselves to start something new, which is what we'll be doing tonight maybe some self-reflecting and wanting to start new things.”*

Participant Jerry (Global Tribe, male, 22)<sup>32</sup>

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<sup>31</sup> Table 3: interview #8

<sup>32</sup> Table 3: interview #1

Participant Jerry describes how he perceives the cycles of the moon of influence on humans. Therefore, it is a direct reflection of the perception of interconnectedness with nature. For Los Serpos and Rincon Malillo this is more locally and practically oriented which coincides with the second category described in the beginning of the section. Both see the older generation as the keepers of the traditional knowledge and practices. Moreover, local traditional methods are perceived to be working best in the local environment specifically. Both Los Serpos and Rincon Malillo attribute much of the problem of unsustainability to disrespect for the older generations. As a result, intergenerational knowledge and practices is one of the themes that recur in almost all conversations as being of great importance for their capability to sustain themselves. Moreover, category 3 is especially present in El Calabacino, where every year there is a celebration of the existence of the eco-village that now inhabits several generations of continuous residents. Nevertheless, for all the EVIs traditional craftsmanship was observed<sup>33</sup> to be incorporated for self-sufficiency and as sustainable substitutions for regular products. In the case of Global Tribe this is done through making organic soap that does not pollute the recycled water. In Los Serpos this

**Figure 9**  
*Traditional basketmaking in the eco-village of Los Serpos*



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<sup>33</sup> Table 3: passive and moderate observation #2

making traditional baskets as the photo shows in Figure 9 and indicates how traditional practices can be a means to provide through (local) entrepreneurship. In the case of participant Wasim the traditional baskets allows him an extra income.

In conclusion, for all EVIs intergenerational knowledge and practices seem to be implemented for community resilience although the interpretation thereof differs per eco-village. This interpretation depends largely on the eco-villages' relationship to the outside world. When there is a larger size of the eco-village and less dependency on external goods and services, there are less informal relationships formed. Therefore, the meaning contributed to intergenerational knowledge and practices are either experienced more generally and globally (Pachamama) or more bound to the eco-village itself through celebration of its existence.



## Chapter 10 Discussion: towards a solution for climate resilient communities?

This chapter sets out to combine the findings from the observations, interviews and secondary data in combination with the literature background described in Chapters 2 and 3. In this way, the outcome of the research is discussed. It does so by means of following the outline of the sub-questions of the thesis. All in all, this chapter provides insight into how community members of the four participating EVIs engage with community resilience to climate change which forms the main question of this research.

### 10.1 Climate change adaptation and mitigation strategies

This sub-question analyses to what extent the eco-village communities implement climate change adaptation and mitigation strategies. The findings of the interviews show that low-tech strategies for adaptation and mitigation of climate resilient communities are more extensively implemented while the implementation of other climate strategies as the defined EVD solutions operationalized in the theoretical framework remains limited.

On the one hand, this general lack of implementation of EVD strategies possibly points to the presence of low-tech solutions that can be used as a lower-cost alternative to well-defined technical systems. Nevertheless, policy could play a decisive role to counteract this through subsidization as is the case with SHS. As seen in the operationalization of the theoretical framework, climate change adaptation and mitigation strategies can be described as the intervention in the sources of gas emissions. In that way, it forms the process of adapting to the expected or actual effects of climate change. Six EVD solutions were elaborated as a means to do this. Recollecting these solutions established by Olesen (2018): 1. ICS technologies; 2. household biogas plants; 3. SHS; 4. solar or hydro micro and mini grids; 5. solar dryers; 6. organic farming, gardening and composting, this work shows that mostly solutions three, four and six are used. The absence of both ICS technologies and household biogas plants seems either interlinked to the discomfort when cooking with fire or the difficulty of implementation. Subsequently, gas in Spain is cheap which gives it an advantage over the other two strategies. However, policy can create opportunities for the adoption of climate change adaptation and mitigation strategies. An example of this is the adoption of SHS (EVD solution three and four) through the policy mapped out by the Spanish

government: through tax reduction when implementing SHS, an advantage is created over the cost of initial purchase.

On the other hand, the findings of the interviews and observations show that low-tech solutions and reflectivity of human-nature relations are at the heart of eco-villages' climate change adaptation and mitigation strategies. Throughout the four eco-villages there is a general vision to farm, garden and compost organically (EVD solution six) while there is a preference to do this low-tech and through reflectivity on human-nature relations. These include exchanging and cultivating native seeds, land management to retain soil condition and biodiversity and using vermicultures as plant fertilizers. Moreover, materials are recycled as building method and lifestyle choices, i.e., making dietary options as eating vegan or vegetarian and asking self-reflective questions on habits around consumerism have shown to be important low-tech and traditional strategies for climate change adaptation and mitigation. Yet, the degree of implementation depends on the collective decision-making and the design of the EVIs in private and public domains such as the availability of communal gardens, which in turn creates dependency on food and consumption patterns.

All in all, when looking at the framework of Sustainable Development, serious strides can be observed within the EVIs for sustainability through the defined SDGs of food (2), water (6), responsible consumption and production (12), climate action (13) and life on land (15) although on some SDGs both positive and negative results can be seen. As aforementioned, well-defined technical systems such as SHS coexist with low-tech and traditional solutions in the field of water, energy and shelter, creating sustainable (re)generation cycles within the EVIs. Nevertheless, a varying dependency on food is observed (2) which makes consumption and production patterns less to not sustainable (12), directly effecting the EVIs ability to absorb and allow reorganisation to environmental hazards. When looking at the definition established by Henfrey (2018) for resilience: "the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function (...)" (Henfrey, 2018, p. 1), the ability of EVIs to provide in food forms a large vulnerability context and will be explored next.

## 10.2 Self-sufficiency

This sub-question analyses how the eco-village communities strive to succeed in their self-sufficiency. The findings shown in Chapter 7, point to difficulty in the attempt for

community resilience through self-sufficiency and autonomy. The self-sufficiency of the EVIs will be analysed before it is placed in the theory of AFNs. Recalling the definition made by Xie et al. (2015), self-sufficiency is zero consumption of an external product or service. Whilst dependency is not completely feasible or desirable because of the interdependence with (local) social networks, which will be discussed later, it does reflect a degree of resilience with regard to external circumstances.

Difficulties can be found in how the EVIs sustain themselves through their self-sufficiency. Although there (re)generation of energy and shelter by means of SHS and sustainable building materials through recycling, the vulnerabilities lie in the dependency on food and water the EVIs have. As aforementioned, in consequence of the layout of the eco-village design in public and private domains as well as the self-determination of community members to decide for themselves over their degree of gardening, there are varying degrees of dependency on food between and even within the eco-villages. Moreover, even though the four EVIs have water management strategies, water scarcity can still be the case and even lead to conflicts.

When looking at the autonomy, clear strengths and weaknesses can be defined when placing the participating eco-villages in the theory of AFNs. Recollecting the definition construed by Roux-Rosier, Azambuja & Islam (2018) AFNs are: “food systems that prioritize environmental, social, and economic health, through connecting producers and consumers, reducing harmful external inputs and promoting affordability and accessibility throughout the food chain.” As defined in the theoretical framework, AFNs know three dimensions of autonomy: 1. territorial; 2. material; and 3. social. Of the three aspects of autonomy, territorial and material autonomy seems to be the most hindered. This is largely due to issues around land ownership. For two eco-villages there is a position of squatting whereby rural abandoned houses have been rebuild. In the case of El Calabacino this is leading to legal proceedings with (local) governments regarding building regulations. All in all, this has a direct effect on the community resilience of the eco-villages in question: due to a lack of territorial autonomy, the eco-village’s ability to maintain the same function and to exercise agency is reduced and even amounts to makeshift housing. In turn, creating vulnerability for community members. Moreover, for two out of four EVIs material autonomy has been created by instigating alternatives to the market which is largely made possible through novel (academic) views on the design of economic and industrial systems such as the circular

economy or sociocracy. Nevertheless, it continues to be seen how this could contribute to the EVIs sustaining themselves within the domain of food and water. As a result of social autonomy, social relations around the food system are revised in the sense of ownership and consumer-producer relations. This includes using and giving products or services freely, buying second hand, elongating the lifecycle of products through reparation and a general viewpoint of sharing. Nonetheless, the positioning of the four EVIs within the food chain remains limited through their dependency on food and difficulty in material and territorial autonomy. Therefore, the eco-villages can not be seen as alternatives to the corporate food regime.

### 10.3 Agency in design process

This sub-question examines how different actors within the community shape the design process in the eco-village projects. Looking at the agency in the eco-villages shows how community resilience is a contested process. The findings shown in Chapter 8 indicate a field of tension is present between individual agency and agency at the community level. As seen in the operationalization of the theoretical framework agency is taking initiative, being flexible and having the capability to adapt. A first point needs to be made regarding the eco-village communities and the framework of the research as such. The EVIs communities can not be seen as homogenous. Not all community members make the (conscious) choice to be involved in strategies for community resilience. Therefore, not all community members are interested in exercising agency to shape the design process to begin with.

Subsequently, not all eco-villages operate as a community through their lack of decision-making at a community-level. Instead, self-determination is placed above shaping the design of the eco-village as a community. Moreover, the eco-villages where the most hierarchy is found in decision-making ability of different actors, more decisions are made for the community as a whole. Although this seems like an apparent contradiction, it actually gives space to appoint managers or coordinators who oversee the needs of the community and communal projects. This is the case with Global Tribe, which makes other revenues such as goji berry farming and tourism possible.

The agency of community members is also largely related to size of the eco-village and the uniformity throughout its community. Above a certain number of members, decision-making ability is tempered and the eco-village will have to look for other forms of

organization such as sociocracy. However, uniformity appears to be decisive for the degree of cohesion or friction in relation to previously developed values. There seem to be certain preconditions for participating in the community. If these preconditions are not met through misalignment of principles or a shift in principles over time, this leads to pressure on the community members and a potential disintegration. This is in line with the challenge Magnusson (2018) has identified in that new members may cause a shift in values that conflict with the initial vision of the EVI and may cause disputes. Nevertheless, the findings from the research point to methods to overcome these challenges which is through a sense of belonging to 1. place; and 2. others. The first category of 'place' deals with the ability the community members have to become rooted in the eco-village. As these 'roots' are expressed to become deeper over time and with successive generations, this is less practically applicable to the EVIs that are dealing with rural abandonment. Nevertheless, the degree of comfortability to build houses, the presence of infrastructure and the availability of work- and educational opportunities could prevent the issue of rural abandonment of community members. Moreover, celebrations and activities that mark the existence of the EVI also contribute to the community members' sense of belonging to 'place'. The second category of connection to 'others' is done through implementing activities that offer socio-emotional support. All in all, the experience of belonging to place and others leads to community members feeling more responsibility with regard to the eco-village, resulting in more agency exercised in shaping its design.

#### 10.4 Intergenerational knowledge and practices

The final sub-question looks at to what extent intergenerational knowledge and practices are involved within the eco-village projects. On the one hand, the data of the research shows that intergenerational knowledge and practices are highly implemented in the EVIs for community resilience to climate change. On the other hand, it shows how the interpretation of the values of interdependence and interconnectedness operationalized in the theoretical framework differs greatly with only two EVIs interacting with their local social networks resembling these values.

Intergenerational knowledge and practices have been defined in the operationalization as the traditional and local cultural practices, rituals and values that are used to strengthen the eco-village. Throughout the four participating EVIs, various

intergenerational knowledge and practices are implemented although for two these practices lie at the foundation of all strategies used. This means that in these EVIs strategies are determined through the help from local elderly villagers. These elderlies are asked which native plants grow best there specifically, whereby traditional seeds are exchanged and traditional methods of cultivation and preservation are passed on. Besides this embeddedness in local social networks, findings show that intergenerational knowledge and practices assist in efficiency in working with the countryside through knowing, as the participants describe, “what works best there specifically” in methods of cultivation. However, despite this difference in interpretation that will be elaborated further, traditional craftsmanship can be found throughout the four EVIs varying from traditional soapmaking and traditional basketmaking to drying herb although some EVIs use techniques from indigenous cultures worldwide.

For the remaining two EVIs this is either a more generalized or internalized interpretation of the values of interconnectedness and interdependence. In this case, generalized means a global instead of a local interpretation and leads to the nomination of nature as Mother Nature by which the connection with others takes places on a general layer of unity worldwide through forming an ‘Earth tribe’. Within this generalized interpretation, practices are implemented reflecting the interconnectedness through using the moon phases as a guide stone for planting, gardening and harvesting or for aligning festivities. The internalized interpretation takes place in the confines of the eco-village. In this case, internalized means an intern instead of a local interpretation and leads activities and festivities aimed to celebrate the existence of the eco-village specifically. Taken together, both the generalized and internalized interpretation of the values of interconnectedness and interdependence can be characterized as having distance towards local social networks. This is largely influenced by the size and degree of self-sufficiency as a result of which they are less depended on these local social networks and make less use of them in return even though these networks could be instrumental in incorporating strategies for climate resilience and efficacy in working with the countryside.

This section has shown how the four EVIs highly implement intergenerational knowledge and practices although the interpretation and origins of the practices differ. As a result, the insights of the research on intergenerational dynamics contribute to the current literature on EVIs as the few comprehensive studies on the concept have focused primarily

on its everyday life and planning. Therefore, these new insights on intergenerational dynamics contribute to the academic debate beyond the scope of the concept thus far.

### 10.5 Conclusion

Taken together, the findings on the four sub-questions have shown the varying degree of implementation of strategies for community resilience to climate change and in turn display how community resilience is a contested process. On the one hand, community members engage through implementing various low-tech, well-defined and intergenerational strategies for community resilience to climate change. On the other hand, difficulties in dependency on food and water through a lack of communal decision-making, land ownership and makeshift housing (material and territorial autonomy) are factors that impede community resilience and even create vulnerabilities. All in all, amounting to the four EVIs not being a sustainable alternative to the corporate food regime. Moreover, not all community members engage with community resilience to begin with, which forms one of the limitations of the research and will be elaborated in the final and concluding chapter of the thesis.

## Chapter 11 Conclusion and recommendations

This research has aimed to answer how community members of the eco-villages of Global Tribe, Los Serpos, Rincon Malillo and El Calabacino engage with community resilience to climate change. Using the theory of Alternative Food Networks (AFNs), the resilience theory and Sustainable Development, the findings from the interviews, observations and secondary data discussed in Chapter 10 have shown how community resilience is a contested process. Through these findings implications can be made for academic debate, policy and practice within eco-villages before moving on to the limitations of the research.

### 11.1 Implications for academic debate

Firstly, the thesis contributes to the academic debate on long-term community resilience to climate change. As the theoretical framework highlighted, the focus has been on immediate short-term buffering, adjusting and continuing in response to external forces instead of looking at the long-term resilience of systems (Kais & Islam, 2016; Twigger-Ross et al., 2015). Moreover, community resilience is often pursued under the terms of ‘sustainability’ and ‘self-sufficiency’ while the capabilities and vulnerabilities of communities might be as important to include (Xie et al., 2015). Therefore, this thesis is an impetus for future research into climate resilient communities, as it provides insights into the capabilities of communities and in particular the place of intergenerational knowledge and practices for long-term resilience. This is one of the main findings of the research and contributes to the Buen Vivir (BV) framework within theories of development. The research shows the importance of using low-tech and traditional practices for climate resilience next to implementation of well-defined technical systems. This will be elaborated further in the implications for practice within eco-villages.

Secondly, the research advances the academic debate around Sustainable Development. As the theoretical framework has elaborated the critique on the framework of Sustainable Development is that it would be too undefined and vague, which gives room for it to be politically malleable and used by those that don’t pursue environmental sustainability (Hope, 2020). Moreover, the core of the SDGs may well be growth-led development and even have neo-extractivist motives, through continuing partnership with the private sector and transnational extractive capital (ibid.). By interpreting Sustainable Development through both the SDGs and the aforementioned four dimensions of



sustainability (social, cultural, ecological and economical) defined by Shrestha & Singh (2019), the research contributes to the academic debate on best practices within this framework although these best practices are not mutually inclusive for all four EVIs. Additionally, the thesis shows how the framework of Sustainable Development can be implemented through horizontal networks that eco-villages form as well instead of it being used by political and private sectors.

Thirdly, the research stimulates the academic debate on AFNs. Within AFNs studies, the elaboration of autonomy appears to be important. In this way, it could contribute to political and social transformation of food systems: “Self sufficiency and autonomy are now political demands (...)” (Wilson, 2013, p. 727). The research shows that all our participating EVIs can be, at the moment, not be seen as sustainable alternative to the corporate food regime because of difficulties in material and territorial autonomy. Nevertheless, policy could play into reducing these difficulties which will be explored next while the opportunities of EVIs in creating alternatives to the market and social autonomy could be strengthened. Moreover, the findings of the research can be in insights on the functioning alternative social, spatial and ecological urban (food) spaces in the current AFNs discourse (Kropp & Da Ros, 2020; Galt et al., 2014). Nevertheless, future research could look into the market functioning of EVIs as one of the criticisms is surrounding its functioning at a niche level making it mostly accessible to middle class white consumers as this has not been covered through this thesis (Wilson, 2013; Guthman, 2008; Slocum, 2007).

The following section will look into the implications for policy as the research shows policy can play a role in strengthening or limiting community resilience.

## 11.2 Implications for policy

Since the focal point in policy hardly focuses on community resilience to climate change (Kais & Islam, 2016; Twigger-Ross et al., 2015), this research highly encourages to do so as policy plays an important role in improving or hindering the possibilities for community resilience of EVIs.

On the one hand, the research shows policy can strengthen opportunities for community resilience. The findings indicate that due to the policy of the government of Spain, SHS are adopted by all of the four participating EVIs. The policy therein is making solar panels available at a low cost and providing tax reduction. This not only ensures a cost

effective and sustainable energy supply strategy but also gives communities self-sufficiency in this regard. In turn, this provides the ability to buffer direct shocks in energy-supply such as blackouts and gives EVIs the opportunity to provide energy within their networks. Therefore, the first recommendation would be to use policy for the adoption of other climate change adaptation and mitigation strategies such as transitioning out of gas as main cooking-method. Due to the cheap supply of gas, all EVIs put the cooking-method of gas above that of fire or other options. In comparison to fire, it is the most comfortable for high temperatures and safest against the danger of (forest) fires. Nevertheless, the successful adoption of SHS would reduce the transition necessary towards an electric cooking-method as the energy is already generated sustainably through SHS. As this is not the case in the four EVIs, the second recommendation for policy is to look at ways it could make the transition towards electric cooking-methods possible. This would ensure transitioning to less GHG emissions while becoming less dependent on gas sources in general, leading to strengthening the overall community resilience.

On the other hand, the data indicates that policy can limit opportunities for community resilience. In the four EVIs this is especially the case through policy in the areas of certification and rural abandonment. The policy on certification makes it difficult for EVIs to produce, consume or sell their own food and products. There is thus a constraint placed on the functioning of EVIs as AFNs. Therefore, the third recommendation for policy is to ease difficulty of certification for small-farmers and producers and to look at strategies for subsidization. This would make it easier for EVIs to generate their own revenues, which stimulates self-sufficiency and strengthens their community resilience to instigate change in the wide food systems in which they are nested. All in all, this can create windows of opportunities for EVIs to be able to propose an alternative to the corporate food regime. Secondly, as rural abandonment is a general issue in Spain, two of the four EVIs are actively reviving the abandoned places through rebuilding ruins and other functionalities. For that reason, the fourth recommendation is to highlight EVIs as potential outcome against rural abandonment and to give EVIs political, institutional and material support.

In the next section implications for practice within eco-villages are outlined through looking at best practices and challenges within the four participating EVIs.

### 11.3 Implications for practice within eco-villages

The core of this research forms the analysis of the capabilities and vulnerabilities of EVIs. In this way it was assessed how community members engage with community resilience to climate change. Because it includes an analysis of four EVIs, various contributing and tempering factors for community resilience can be specified. The theoretical framework highlighted that where the EVIs were mainly founded from the 1970s as niche countermovement against urbanization through communal living, it has now gained popularity through cooperation with civil organizations and networking in addition to increased focus on small-scale agriculture through permaculture (Magnusson, 2018). The findings indicate that permaculture as a theory often does not fit in with practice or is seen as a new name for something that exists traditionally. Therefore, the research contributes to the academic debate on EVIs to be in line with the practice within eco-villages at hand.

Moreover, comprehensive studies on the concept of eco-villages are scarce and on have been focused primarily on its organization through its planning, with an emphasis on everyday life challenges. Through the analysis of long-term community resilience to climate change, durable and strong qualities as well as vulnerabilities of EVIs have been highlighted.

At last, several limitations of the research can be seen which will be elaborated next. This following section will also provide recommendations for future research before proceeding to the concluding note.

### 11.4 Limitations of research

To reflect on the research question: How do community members of the four participating eco-village projects engage with community resilience to climate change? Well, some community members don't. Therefore, this also the first limitation of the research. When drafting the research and sub-questions, a more homogeneous community was assumed. As a result, some community members have no interest in exercising agency or in being involved in implementing strategies for resilience at a community level. This ties in with another limitation of the research. The study mainly looked at capabilities and vulnerabilities of EVI communities as a whole. On the one hand, this means that capabilities and vulnerabilities on an individual level are not sufficiently highlighted while on the other hand, additional research is needed to analyse the role of stakeholders and structures. Moreover, the research was conducted in a short timeframe resulting in the inability to assess in-depth

the long-term resilience of the eco-village communities. For this reason, one proposal would be to do future longitudinal research through the framework of the Sustainable Livelihood Approach (SLA), position the community members as individual actors and agents of change. This would also resolve the issues found in data collection:

As there was no knowledge about the demographics of the EVIs beforehand, the recruitment of participants had to be done on the spot. In some cases, the researcher broke into the daily activities of the community members. Because of this, there was less control in some of the EVIs over which members were present or how long data collection could take place. For that reason, building rapport with EVIs over a longer time period is recommended. In this way several sensitive topics can be reviewed again to get more in-depth information and to assess long-term resilience.

At last, as a researcher there is a preference for BV and bottom-up development and thus with traditional and indigenous knowledge and practices. Therefore, it is possible that the findings of the research are influenced by this because potential emphasis was placed during the data collection. Nevertheless, the research can still inform about 1. best practices in low-tech and traditional climate change adaptation and mitigation strategies next to well-defined technical systems; 2. strategies to reduce dependency within the dimension of 'food'; 3. strategies for agency in EVIs; and 4. how to use intergenerational knowledge and practices as approach for community resilience to climate change. Moreover, clear recommendations for future research and policy are made. At last, final concluding words can be outlined.

### 11.5 Conclusion

As final concluding words it is good to look back on the title of the thesis: "Eco-villages: a contested concept for climate resilient communities". On the one hand, there is clear and decisive complexity found in the concept of eco-villages for community resilience to climate change. On the other hand, the research also shows best practices. Moreover, not all community members are interested in engaging with community resilience to climate change. Nevertheless, if we look at the findings of this work in light of the context described in the introduction, the concept of EVIs could propose an alternative to the "urban lifestyle emphasizing individuality." It does so through its strides towards ecological and communal

living although future research and development should show whether it could become a less contested process.

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## Appendices

### Appendix A Informed consent

## Eco-villages, a solution for climate resilient communities?

Assessing how community members of eco-village projects engage with community resilience to climate change

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### **Consent to take part in research**

I .....(NAME) voluntarily agree to participate in this research study.

- I understand that I can withdraw at any time after or during my participation.
  - I understand that I can refuse to answer any question for any reason I have.
  - I have been promised by the researcher that my data will be used mostly confidentially and anonymously, meaning that compromising data around identity will not be included and data will only be shared and published for (future) research purposes.
  - I understand that I am free to contact any of the people involved in the research to seek further clarification and information.
  - I understand that I can withdraw permission to use data from my interview within two weeks after the interview, in which case the material will be deleted.
  - I have had the purpose and nature of the study explained to me both in writing and in-person and I have had the opportunity to ask questions about the study.
  - I understand that the data of the study will be stored as long as necessary for the purpose of the study.
  - I agree to my (mobile) interview being audio recorded.
  - I understand that disguised extracts from my interview may be quoted.
  - I understand that I have freedom of information and that I therefore at any time have access to the data I have provided. The researcher will, when the thesis is completed, send the study to the participant.
- 

### **Contact information**

Researcher: Lacey Bartels, lacey.bartels@hotmail.com, +31611162385

The supervisor: Dr. Sara Brouwer, s.f.brouwer@uu.nl

Signature of research participant:

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Date:

As a researcher I believe that the participant is giving informed consent to participate in this study

Signature of the researcher:

-----  
Date:

Appendix B Interview guide

Date:

Starting time:

End time:

No. of interview:

### **Introduction for participant**

This research is being conducted for the master's thesis on community resilience to climate change. The questions are around the climate change adaptation and mitigation strategies, self-sufficiency of the eco-village and the role of intergenerational knowledge in that.

The information will solely be shared for research purposes. Compromising information around identity will not be included within the master's thesis. If during or after the interview there is a desire to withdraw, you can let me know at all times. Feel free to ask questions.

First, do I have your permission to record this interview?

### **Opening questions:**

#### **Theme 1: personal characteristics**

*Build rapport: short introduction of researcher.*

1. Can you tell me something about the eco-village?

Probe: meaning of the name of the ecovillage, vision/ideology, members, large/small

2. How long have you been living/volunteering in the ecovillage?

Probe: trajectory of becoming member, vision/ideology, former experiences

3. How would you describe your role within the eco-village?

Probe: farming/gardening, organizing activities/workshops, crafting, cooking

#### **Theme 2: Eco-village**

*Guiding questions:*

*How is that? Can you motivate your answers? Why/why not? How do you feel about that?*

4. Can you tell me how the eco-village is designed?

Probe: twelve permaculture principles/five zones, self-regulating and renewable techniques, livestock, sustainable agriculture/building material, crop diversification

5. In what way is there self-sufficiency in basic needs?

Probe: dependency of external forces/services in food, water, clothing, sleep and shelter

6. How is the physical space for the eco-village provided for?

Probe: shifting nature of physical space, arrangements, subsidies institutions/crowdfunding

7. Do you create an alternative to the market, for example farmers markets or are you involved in alternative markets as bartering/collective sharing?

Probe: initiating farmers market, decoupling of food as commodity, collective sharing/bartering, circular economy, local currencies, ecotourism

8. How are the social relationships around food revised within the ecovillage?

Probe: consumer/producer, food reclaiming; dumpster diving or freeganism; remnants of food, clothing, furniture's

9. In what way do different members have the shape the (permaculture) design process and principles of the eco-village?

Probe: inclusive decision-making, open communication, sociocracy, more/less knowledgeable, older community members?

### **Theme 3: community resilience**

*Guiding questions:*

*How is that? Can you motivate your answers? Why/why not? How do you feel about that?*

10. How are cultural rituals, celebrations and festivals around community resilience to climate change involved in the eco-village?

Probe: cultural heritage Andalusia, intergenerational/indigenous traditions, reconnective practices with nature

11. In what way do cultural traditions play a role in the eco-village's community resilience to climate change?

Probe: local entrepreneurship through traditional ways of crafting, herbology, workshops, knowledge/practices for adaptation and mitigation?

12. What place do the values of interdependence and interconnectedness?

Probe: care for the earth, providing for each other, support, care for vulnerable/older and younger members

### **Theme 4: climate change**

*Guiding questions:*

*How is that? Can you motivate your answers? Why/why not? How do you feel about*

13. To what extent does climate change affect the eco-village?

Probe: erosion, desertification, soil degradation, loss of biodiversity, more extreme weather

14. What adaptation and mitigation strategies for climate change do you use within the eco-village?

Probe: improved cookstove, household biogas plants, solar home system, solar or hydro micro grids, solar dryers, organic farming/composting

15. To what extent do you assess the SDGs within the eco-village?

Probe: sustainable agriculture, erosion through water, recycling of waste, GHG emissions, sustainable forest management

16. How are the regenerative cycles of nature in food, shelter water and energy practices maintained in the eco-village?

Probe: solar photovoltaics, bio-gas, grey water separation, solid waste management, composting, sustainable building techniques, re-using materials

### **Theme 5: closing questions**

*Guiding questions:*

*Why do you feel that?*

17. To what extent do you feel a sense of belonging within the community?

Probe: power of the place, cultural background, connectedness to the other members and the natural environment, new members/expanding eco-village

18. How old are you?

19. Is there anything else we need to cover?

## Appendix C Passive and moderate (participant) observation

### **Theme 1: Eco-village**

1. How big or how small is the physical space of the eco-village?

- The total size of the eco-village
- The amount of houses
- The use or design of the physical space



2. What is the (permaculture) design of the eco-village?

- Zone 00 'self-care': mental, physical, spiritual and socio-emotional created space
- Zone 01 'intense use zone', amount of EVD solutions that are implemented in this zone
- How zone 02 is shaped through gardens, livestock and vermicultures
- Zone 03 for large fruit trees and cattle
- Zone 04 for woodlots and pastures
- How the Zone 05 is shaped through wilderness
- Other noticeable design(s) of the eco-village

3. Who makes decisions regarding time and supervises the mitigation and adaptation activities?

- The interaction around time and space management for these activities
- The general meetings around tasks

4. How is self-sufficiency managed within the eco-village?

- The size of the garden, the amount of crop diversification
- The noticeable signs of provision of food, shelter, water and energy
- Alternative markets or alternatives to the market that are visible within the eco-village

5. Are there visible signs of alternative relations within the food system?

- The availability of free products and clothing in the eco-village
- The noticeable signs of the usage of free products, such as worn-out furniture

**Theme 2: Community resilience**

6. How are community members with different ages and genders interacting around or during mitigation and adaptation activities?

- The observable differences between genders and ages within these activities
- What corresponds between genders and ages around the mitigation and adaptation activities
- 

7. Is there a diversity or homogeneity visible in appearances and behaviours of community members?

- The homogeneity that is visible in the way community members express themselves around sustainability
- What appearances do the community members show around sustainability
- Other habits that are uniformly prevalent in the eco-village

**Theme 3: Climate change**

8. What are visible effects of climate change within the eco-village?

- The soil condition within the eco-village
- The amount of water prevalent
- What the environmental characteristics surrounding the eco-village are

9. What adaptation and mitigation strategies are done throughout the day?
- The prevalence of the six EVD solutions: 1. Improved cookstove (ICS) technologies; 2. household biogas plants; 3. solar lighting; 4. solar or hydro micro and mini grids; 5. solar dryers; 6. organic farming, gardening and composting
  - Other noticeable innovations around adaptation and mitigation strategies
10. What kind of routines therein can be observed?
- Which community members take care of the garden
  - Which community members manage other (EVD) tasks
  - The various routines that are done throughout the day to amount to the adaptation and mitigation strategies of the eco-village (recycling)

Appendix D Codebook

Name	Description
1. Activities	This code contains activities varying from daily routines to workshops and celebrations, aiming to bring into view the habits of the eco-village.
<ul style="list-style-type: none"> <li>• Celebrations</li> </ul>	The celebrations that the eco-village takes part in and/or organizes

• Cultural traditions	The various cultural traditions and craftsmanship that plays a role within the eco-village such as traditional soap making, farming, preservation methods and craftsmanship as basketmaking
• Rituals	The code of rituals covers the ceremonial aspect within the eco-village around, for example, moon phases.
• Routines	The routines that the community members of the eco-village take part in and/or organize, such as cleaning, cooking and feeding animals. When relevant for the implementation and impact of adaptation and mitigation strategies, the code is put up in that category (gardening or method of cooking).
• Workshops	The workshops the eco-village takes part in and/or organizes
2. Adaptation and mitigation strategies	The strategies that the eco-village uses for climate change adaptation and mitigation
• Agriculture	The ways in which agriculture is used as a means for climate change adaptation and mitigation, such as permaculture (design), micro-irrigation, using compost and treat biodiversity
- Permaculture	The use of permaculture as a sustainable agriculture process, including design and techniques
• Impact	The perceived impact the community members express the eco-village has on climate change
• Improved cookstove	Other methods of cooking such as improved cookstoves or ovens
• Lifestyle	The ways in which the eco-village uses lifestyle as a strategy for climate change adaptation and mitigation strategies, such as the use of natural products, eating vegan or vegetarian or reflect on their behaviours
• Recycling, re-use	The methods that are used to recycle and re-use waste and water
- Waste	The recycling and re-use of waste through waste separation, building materials
- Water	The methods that are used to collect and re-use water, such as rainwater harvesting
• Solar system	The adoption of solar panels as a strategy
3. Characteristics	The general, historical, physical, demographic and environmental characteristics, of the eco-village on the one hand and demographic information and role within the eco-village of the community members on the other hand are covered in this code.
• Eco-village	The general, historical, physical, demographic and environmental characteristics of the eco-village
- Demographics	The demographics of men-women, age, families with children and pets within the eco-village.
○ Families and children	The amount of families and children the eco-village has
○ Pets	The general condition of pets within the eco-village
○ Sex	The demographics of male-female sexes within the eco-village
- Environmental	The environmental characteristics the eco-village has including the condition of the soil, the surrounding natural resources and the flora and fauna.
○ Fauna	The natural fauna that inhabit the surroundings of the eco-village
○ Flora	The natural flora that grow in the surroundings of the eco-village

○ Soil condition	The condition the soil is in, in the eco-village, when it is not associated with climate change.
- History	The history that the eco-village has of residency and shifts in material, territorial and social aspects
○ Age of eco-village	The length of residency within the eco-village
○ Changes over time	How the eco-village has shifted over time on a material, territorial or social level
- Negative traits	This code deals with the negative traits of eco-villages mentioned by participants, vraying from doubts over the definition to other aspects
- Territorial	The physical size of the eco-village and the type of residency
○ Design	The design of the eco-village
○ Physical size	The total physical size of the eco-village in land area and the amount of houses
○ Residency	The type(s) of residency that the eco-village has
• Participants	The demographic information and role of the community members within the eco-village individually.
- Demographics	The demographics of the participants individually in the eco-village
○ Age	The age of the participant
○ Experience	The experience the participant has had in other eco-villages.
○ Job, study	The job or study of the participant
○ Reason of stay	The reason of stay the participant has
- Role	The role the participant individually has within the eco-village
○ Interest, vision	The vision and interest the participant has
○ Length of stay	The length of stay of the participant within the eco-village
○ Tasks	The tasks the participant does within the eco-village
4. Crises	This code relates to mentions of various crises such as the economic crisis of 2007-2008 or the Coronavirus pandemic that started in 2020
• Coronavirus pandemic	The Coronavirus pandemic that started in 2020
• Economic crisis 2007-2008	The 2007-2008 Financial Crisis.
5. Relationship	The relationships the community members have inside or outside the eco-village
• Inside	The various relationships the community members have inside the eco-village, including with the felt connection and satisfaction as well as the cultural aspects
- Connection	To connection that the community members express to have with others, the local nature or the eco-village as a place
- Culture	The cultural aspects of the eco-village, such as the sharing that takes place, the agency, meetings and overall uniformity (for example of clothing)
○ Agency	The degree of agency in decision-making the community members have and how is dealt with the aspect of ownership

○ Meetings	The meetings that take place in the eco-village, for example sharing circles, work shifts discussions or sociocracy meetings
○ Sharing	The sharing that takes place within the eco-village, such as emotional and material support as well as bartering and how common and private spaces are shaped
○ Uniformity	The uniformity that is observed or expressed in vision, behaviours and expressions such as clothing
- Satisfaction	The satisfaction the community members express to have as being part of the eco-village (in being content, relaxed, or other aspects)
• Outside	The relationship the eco-village has with the outside among which individual (neighbours, local farmers, intergenerational and experts), the interconnectedness it expresses to have with Mother Nature or humanity as a whole and the way it relates to structures (urban or "system"-wise)
- Individuals	The relationship it has with outside individuals such as neighbours, local farmers, intergenerational, experts and tourists
- Interconnectedness	The interconnectedness the eco-village expresses to have with Mother Nature or humanity as a whole.
- Intergenerational	Which role intergenerational relations play
- Other EVIs	
- Structure	The ways in which the eco-village relates to external structures such as urban and city live and the (capitalist) system with its consumerism, mentality and companies
<b>6. Self-sufficiency</b>	
• Autonomy	The degree of autonomy the eco-village has on a territorial (physical space), material (alternative markets or alternative to the market) and social level, through the revised relationships within the (food) system.
- Alternative market	The ways in which the eco-village has created an alternative market (or alternative to the market). This category deals with the economy of the eco-village.
- Freeganism	The ways in which the eco-village shares products freely such as clothes, books and also makes use of free products.
- Land ownership	The ownership the eco-village has over the land that it inhabits
• Dependency	The degree of dependency of the eco-village divided in the categories of food, water, energy, shelter, transport and work.
- Energy	The degree of dependency the eco-village has within the category of energy
- Food	The degree of dependency the eco-village has within the category of food
- Shelter	The degree of dependency the eco-village has within the category of shelter
- Transport	The degree of dependency the eco-village has within the category of transport
- Water	The degree of dependency the eco-village has within the category of water
- Work	The degree of dependency the eco-village has within the category of work
<b>7. Vulnerability context</b>	The various difficulties the community members express to experience

• Companies	The ways in which companies, such as minery companies, provide difficulties for the eco-village
• Environment	The ways in which environmental aspects provide difficulties for the eco-village, such as forest fires, surrounding fauna or climate change
- Climate change	The effects of climate change that the community members express to experience for the eco-village
- Other	The various environmental aspects that provide difficulty for the eco-village, such as forest fires and surrounding fauna
• Governance	The ways in which governance provides difficulties for the eco-village
• Lack	The ways in which material, territorial or social lack amounts to difficulties for the eco-village, among which size, technology or other aspects
• Rural abandonment	The ways in which rural abandonment provide difficulties for the eco-village