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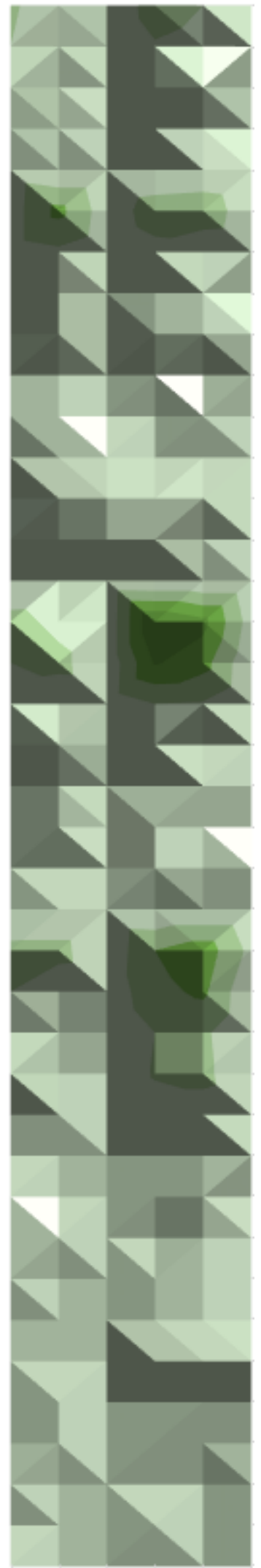
Ecosystem Services as a tool
for Global Citizenship Education
in the context of urban gardening

Master thesis submitted in partial fulfillment
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Master of Science 'Umweltwissenschaften'

by
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Abstract

The degradation of Ecosystem Services (ES) is a global challenge (MEA 2005), that requires people from different parts of the world to work together (Hoffman & Bharucha 2013). To achieve social and ecological sustainability, that allows to reach a balanced state between biophysical limits and social thresholds (O'Neill et al. 2018), cross-cultural exchange is necessary. The concept of ES is part of natural resource management (NRM) (Menzel & Teng 2010). Collaborative natural resource management allows for collective and transformative learning (Armitage et al. 2008). The approach of Global Citizenship Education (GCE) applies transformative learning to enable learners to achieve competencies for cross-cultural exchange (Grobbauer 2018, Davies et al. 2018) and to strengthen the idea of a common humanity by finding peaceful means to achieve global social justice and sustainability (Gosh 2017). Even though the approach of GCE is not explicitly used in NRM, this work gives evidence that the concept ES offers possibilities for cross-cultural learning. In an exploratory study set up, triangulation of literature findings and interview data was used to identify the possibilities of the ES concept for cross-cultural knowledge exchange in the context of urban gardening. Findings were derived by applying the Ecosystem Service Communication Model (ESCM) as an analytical lens to a set of 7 interviews on cross-cultural education in gardens. The ESCM comprises a range of steps which can be used to identify Ecosystem Services. Those include the ecosystem and its components, non-human interactions within the ecosystem, human interactions with the ecosystem, resulting outputs and the value ascribed to them. The results of this work indicate that gardens are places, that enable people from different cultures to exchange, and at the same time to learn about different perceptions of ES. With human interactions in gardens, opportunities for personal exchange on gardening were identified. The aspect of gardening, which was mentioned with the highest frequency and agreement by interview respondents, was growing food. Moreover, associated practices on food waste and the awareness generated by those gardening activities play a key role in learning in gardens. Other aspects of gardening, that had less agreement within the respondents, could be discovered. Those include value ascription to gardening and non-human interactions in gardens. The identified mutuality and differences can metaphorically be seen as a 'tricky landscape'. Within this landscape, points of agreement resemble peaks. Those mountains grow taller when aspects are mentioned more often and by several interview respondents. The peaks are look-outs from which it is possible to find a path through the confusing plain which is populated with little hills, ravines and craters of differences. Differences are considered as a source of learning (cf. Andreotti 2010). Thus, for traveling the 'tricky landscape', diverse kinds of knowledge should be considered equally. This requires taking structural inequalities and power relations into account. It is recommended that the efforts for this kind of collective learning should be enriched and supported by cross-cultural exchange activities, that include wide ranges of societal, governmental and scientific spheres from different countries.

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List of Abbreviations

APCEIU	Asia-Pacific Centre of Education for International Understanding
CEE	Centre for Environment Education
ECM	Ecosystem Cascade Model
ES	Ecosystem Services
ESCM	Ecosystem Service Communication Model
ESD	Education for Sustainable Development
GCE	Global Citizenship Education
IGD	Indo-German Dialogue
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
MDGs	Millennium Development Goals
MEA	Millennium Ecosystem Assessment
NGO	non-governmental organization
NRM	natural resource management
SDGs	Sustainable Development Goals
UN	United Nations
UN DESA	United Nations, Department of Economic and Social Affairs
UNESCO	United Nations Educational, Scientific and Cultural Organization
WBGU	Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen (German Advisory Council on Global Change)

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1. Introduction

"It is not about to see what we agree on, but what we do not agree on. That can be tricky landscape to travel, but that is the interesting part, because then you get new ideas and you get new perspectives […]. A lot of times, […] from my own experiences, I have learned a lot precisely because of the differences with other cultures." - Interview respondent

1.1. Interest and Motivation

Since the middle of the 20th century, humans have changed the world's ecosystems more rapidly and extensively than ever before. One of the direct drivers on ecosystem change is land-cover change caused by the conversion to crop land (MEA 2005). Additionally, urban land-cover is increasing. Today, 55% of the world's population live in urban areas with predictions of an increased share in the future (UN DESA 2018). With the adaption of urban lifestyles in cities, nature experiences are reduced and there is an alienation process between urban population and diverse ecosystems (Barthel et al. 2010, Bendt et al. 2013). With the change of ecosystems there is degradation of more than 60% of Ecosystem Services (ES) (MEA 2005). ES are defined as "the benefits provided by ecosystems" (MEA 2005, p. 39) and "the direct and indirect contributions of ecosystems to human well-being" (TEEB 2010, p. 33). Popular examples of ES are pollination, erosion control and the aesthetics of flowers. The Millennium Ecosystem Assessment (MEA), which was commissioned by the UN, stated in 2005 that the degradation of ES could grow significantly worse during the first half of this century and is a barrier to achieving the Millennium Development Goals (MEA 2005). The Millennium Development Goals (MDGs) were derived from the United Nations Millennium Declaration (UN 2000). They focused mainly on social development and were aimed at countries from the Global South. In 2015, the MDGs were followed by the Sustainable Development Goals (SDGs) which explicitly added economic and ecologic aspects of development. Moreover, global interdependencies were stronger recognized, and the goals were directed at all states, including the Global North (UN 2012). A recent assessment on land degradation and restoration, provided by the 'Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services' emphasizes that avoiding, reducing and reversing land degradation is crucial for reaching the majority of the SDGs (IPBES 2018). The SDGs comprise 17 goals with several sub-targets each. Target 4.7 emphasizes the role of learning in global sustainable development: "By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-

violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development" (UN DESA n.d.). The 'United Nations Educational, Scientific and Cultural Organization' (UNESCO) addresses this target by the programs Education for Sustainable Development (ESD) and Global Citizenship Education (GCE) (UNESCO n.d.). GCE, in a nutshell, wants to strengthen the idea of a common humanity and is about finding peaceful means to achieve global social justice and sustainability (cf. Gosh 2017). Global citizenship can also be understood as planet-wide citizenship. This planetary citizenship gets its fundaments by the concept of 'planetary boundaries' (Misiaszek 2016, Sant et al. 2018). The concept takes into consideration that there is a set of planetwide ecosystem processes (e.g. climate regulation, the freshwater cycle and the nitrogen cycle) which preserve a "safe operating space for humanity" (Rockström et al. 2009). Planetary Boundaries "are scientifically based levels of human perturbation of the (earth system) beyond which earth system functioning may be substantially altered" (Steffen et al. 2015, p. 736). They are also described as "the outer limits of pressure that humanity should place on critical Earth systems in order to protect human well-being" (Leach et al. 2013, p.85). Thus, the concept is also taken up by social scientist. Raworth (2012) realizes that there are also social boundaries which are defined by environmental degradation and resource deprivation.
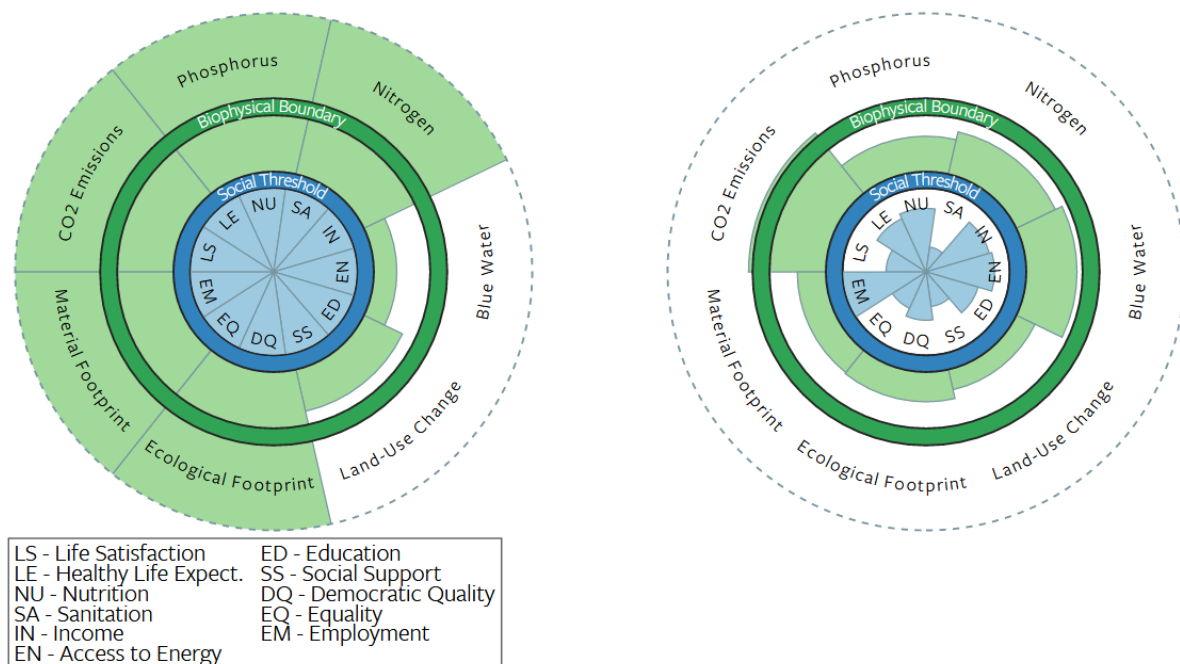
Figure 1: Assessment of the biophysical boundaries and social tresholds of Germany (left) and India (right). Blue wedges show social performance relative to a threshold associated with meeting basic needs (blue circle), green wedges show resource use relative to a biophysical boundary associated with sustainability (green circle), while grey wedges show indicators with missing data. Wedges with a dashed edge extend beyond the chart area. Ideally a country would have blue wedges that reach the social threshold and green wedges within the biophysical boundary. Graphic from goodlife.leeds.ac.uk/countries.

Accordingly, human well-being depends on access to resources that allow each person to meet their human rights, such as nutrition, sanitation, energy, education, employment and equality. Together with other indicators, they form a 'social threshold' (O'Neill et al. 2018). Within a global perspective, different countries are facing different challenges on the boundaries. While Germany exceeds the planetary biophysical boundaries, but meets the social threshold, it is the other way around in India (figure 1). For a globally just world, human activities should stay within the biosphysical limits but also fit the social thresholds. Challenges regarding the well-being of earth's citizens can't be solved on a local, regional or national level alone. For global sustainable development, Global Learning is necessary (Hoffman & Bharucha 2013). Thus, there are calls for a 'Global Education for Sustainability Citizenship' (Huckle & Wals 2015).

1.2. Research Question

Today's conventional agriculture is often seen as not sustainable. To achieve sustainability, urban agdrens should be incorporated (Barthel et al. 2010). More specifically, farming systems need to take the biophysical limits of the planet, social equity and the needs of future generations into account (Dendoncker & Crouzat 2018). Assessments of ES increasingly integrate the objectives of ecological sustainability and social justice into public and private decision-making processes. Those processes acknowledge the complexity of economic, cultural and social values within individuals and groups at multiple geographical scales (Costanza et al. 2017). Especially for urban ecosystems, the importance of stakeholder involvement is highlighted (Luederitz et al. 2015). ES projects can be considered as natural resource management (NRM) (Menzel & Teng 2010). Therefore, the practical application of the ES concept is seen as NRM. In NRM, learning is recognized as a normative goal and process (Armitage et al. 2008). Thus, stakeholders of ES can also be considered as learners. However, the report of the '2nd Indo-German Dialogue on Green Urban Practices' (IGD) states that learning academically is not enough and that instead nature- and place-based learning opportunities like urban gardening are necessary to demonstrate interdependencies. This also involves emotional and social learning as well as thinking about how we connect with and depend on nature (Woiwode & Lay-Kumar 2018). Traditional educational approaches, e.g. schools, reinforce hierarchies of knowledge and devalue other ways of learning (Carvalho da Silva et al. 2012). Thus, learning in NRM (Armitage et al. 2008), and in Global Education (Carvalho da Silva et al. 2012) is seen not only as a matter of issues – what should be content of learning, but also as a matter of methods – how learning should occur. Gardening allows for the generation and reproduction of ecological knowledge (Barthel et al. 2010, Bendt et al. 2013, Camps-Calvet et al. 2015). Personal exchange and conversations based on gardening create shared socio-ecological memory. This memory carries collective, tacit and explicit knowledge and practices

from several persons (Barthel et al 2010). Learning about other cultures is inseparably linked with communication, as the concept of 'culture' receives its relevance by verbal interactions (Nazarkiewicz 2010). Communication on ES is possible with the help of frameworks such as the 'Ecosystem Cascade Model' (ECM) (Haines-Young & Potschin 2016). In this work, cross-cultural knowledge exchange on ES is acknowledged as a learning activity. For this purpose, the natural science-based concept of ES is applied as an analytic lens to the possibilities of learning in gardening context. More specifically, the aim of this work is to identify issues related to the concept of ES that can be addressed in the course of GCE. Further, practices which are suitable for knowledge exchange on gardening will be of interest to this work. With the background of GCE in mind, it will be analyzed how gardening practices and knowledge can contribute to the understanding of ES. In this work the following research question will be analyzed:

What possibilities does the concept of ES offer for cross-cultural knowledge exchange in context of urban gardening?

1.3. Methodology and Perspective

This master thesis builds on qualitative socio-empirical research methods. Interviews taken during the '2nd Indo-German Dialogue on Urban Green Practices' and literature findings are triangulated in an iterative process (cf. Creswell 2012). The intention of this work is exploratory and qualitative content analysis is applied. Interpretation is used to explore the meanings of places, their components and the interactions that happen within those places. This approach is based on the assumption that reality is social constructed (cf. Kruger & Shannon 2000). Following the philosophy of social constructivism, a common reality can be interpreted diversely (Milton 1996), the real world is culturally filtered, and meanings are constructed. Little (1991) suggests that different cultures share a common worldview of ordinary objects and a core set of beliefs about them, but that they may have a distinctive set of general beliefs about the world that are quite different to each other. Interpretation of the ordinary world in his view is possible across cultural differences. Shared reference to real physical objects and properties make communication across conceptual schemes feasible. Menzel & Teng (2010, p. 907) with reference to constructivism state that value results from its beholder, not from the thing itself and that this construct is as valid for ES as it is for other objects. Also, educational approaches are based on constructivist theories (cf. Hofmann & Bharucha 2013). Next to constructivist theory, critical theory can pe applied to educational research. In this work, it is used to identify patterns of oppression that operate on social identity by turning the analytical focus onto systems. The subjectivity of the researcher is recognized as a component in shaping the study (cf. Strunk & Locke 2019). This research

is coming from a local perspective and is written in Freiburg, Germany. However, it is acknowledged that personal experiences and learnings are influencing the work. Especially the author's participation in an exchange program with a Kenyan gardening project and the associated seminars on structural inequalities in the year 2017 affect the research process. Moreover, this work uses theoretical framing in the form of the ECM framework to enable the researcher to better understand socio-environmental issues from globally diverse perspectives (cf. Misiaszek 2016). For this purpose, statements by the interviewees which are considered meta-level, are also included in the discussion.

2. The Concept of Ecosystem Services

The concept of Ecosystem Services offers insights in how humans are connected to the non-human environments. It can be used to raise awareness about how our lives are dependent on natural resources and processes. Ecosystems are communities, which consist of living, biotic organisms, and nonliving, abiotic compartments. They are connected by nutrient cycles and energy flows. The interactions of humans with other parts of ecosystems can be reflected and communicated by the concept of Ecosystem Services (ES). This concept takes into account socio-ecological systems and human-environment interactions.

2.1. Definition and Background

The concept of ES originates from the conservation of biological diversity and landscape planning in the 1970s. In 1983, Ehrlich and Mooney referred to ES in relation to the extinction of species caused by humans. During the 1990s, it was realized, that increasing human impact on the environment brought the need for a concept that describes the connection between human society and ecosystems (Vihervaara et al. 2010). Daily (1997) and Costanza et al. (1997) provided leading publications on the definition and application of ES. Daily (1997, p. 3) defines ES as *"the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fullfil human life"*, while the Millennium Ecosystem Assessment (MEA), which was published by the United Nations in 2005, describes ES as *"the benefits provided by ecosystems"* (MEA 2005, p.39). With the announcement of the MEA, the number of publications on ES has accumulated drastically (Vihervaara et al. 2010). In 2007, the European Comission set ES into an explicit economic frame by launching the study "The Economics of Biodiversity and Ecosystems (TEEB)". The focus was not only on the monetary output, but also to the direct and indirect affects that ES have on the human living, outside of economic markets (TEEB 2010). This is reflected by the "wide consensus on ecosystem goods and services possessing either market or non-market utilitarian value" (Vihervaara et al. 2010, p. 316). However, there has been critique on the predominant economic perspective, which was applied to the concept and on its contribution to the reproduction of the neoclassical economics paradigm in decision making (Gómez-Baggethun et al. 2010, Cornell 2011, Jax et al. 2013, Carmen et al. 2018). This critique goes along with the growing awareness of the connection between current ecological problems and the current economic production methods (Cornell 2011). On the other side, various suggestions for value assignment exist (e.g. Kumar & Kumar 2008, Chan et al. 2012a, Jax et al. 2013), that not only consider economic but also ecologic and socio-cultural values (de Groot et al. 2002). Those three dimensions

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classically represent the three pillars of sustainability, which recently was reflected by Costanza et al. (2017). With the explicit incorporation of sustainability in ES, the focus of valuation approaches shifts to communities and society. On the valuator side different groups and individuals are acknowledged, while the dynamics of ES are examined on multiple scales of geographical and temporal type. Thus, the need for more comprehensive stakeholder involvement was identified. Stakeholders include those who "benefit on the ground" (Jax et al. 2013, p. 264), which are basically each and every one of us. It is recognized that there is less understanding of social and institutional factors that shape decision making processes, environmental practice and change processes related to ES, while the economic and ecologic backgrounds of ES receive a lot of attention (Luederitz et al. 2015). Recently, there are considerations on how the ES scientific community can facilitate the use of the concept beyond the traditional boundaries of science (Carmen et al. 2018). One of the challenges with stakeholder inclusion is illustrated by the finding that the term "Ecosystem Services" is unfamiliar even to persons working in city administrations, forestry commissions, and user organizations, at least in Germany (Riechers et al. 2016). Education might be a way to poluarize the concept. There are only few studies on how ES can be used in education. Wedel (2018) gives an overview on ES as a pedagogical perspective for teaching the importance of biodiversity and Costanza and Kubiszewski (2012) argue that educational models which encourage cooperation will most likely enhance collaboration around ecosystem services. However, little is known about how ES can be used to address cross-cultural knowledge exchange for learning.

2.2.   Classification and Structuring of Ecosystem Services

The concept of ES is highly complex, brings along plurality of possible interpretations and is evolving from contributions of different authors over time. There is a range of classification approaches to bring more clarity and structure into it (e.g. MEA 2005, Wallace 2007, Haines-Young & Potschin 2010). The authors of MEA (2005) classified ES into four broad categories and gave examples for each of them: *(i)* 'supporting services' such as water cycling and biodiversity, *(ii)* 'provisioning services' such as the supply of food and fiber; *(iii)* 'regulating services' such as water purification and the regulation of local and global climate, and *(iv)* 'cultural services' such as social relations and good health. This classification is widely used today because of the popularity of the MEA and its institutional background with the United Nations as an intergovernmental organization. Wallace (2007) proposed a classification linked to human values, considering *(i)* 'adequate resources' that satisfy basic needs and must be in sufficient supply for survival and reproduction; *(ii)* 'protection from predators, disease and parasites'*,* ensuring that the abundance and distribution of harmful organisms is sufficiently low;

(iii) 'benign physical and chemical environment', where a specific range or threshold of e.g., moisture and temperature, is kept; and *(iv)* 'socio-cultural fulfilment', which recognizes that all humans operate within either an explicit or implicit set of beliefs and encompasses ethical positions. A more recently used classification system is the Ecosystem Cascade Model (ECM) by Haines-Young & Potschin (2010) with adaptions from De Groot et al. (2010) that sets ES into the context of the natural environment at the one hand and human society at the other hand by separating it into a "production line" (Potschin & Haines-Young 2016, p.26), consisting of *(i)* 'biophysical structures/processes'; *(ii)* 'functions' that lead to services; *(iii)* specific 'services'; *(iv)* 'benefits' from the services; and *(v)* ascribed 'values'.

While all of the classification approaches are able to explain certain aspects of ES more in detail, probably a combination of them is needed to completely understand the concept. However, they do not always match up straight and ambiguity of terms is realized (e.g. Wallace et al. 2007, Potschin & Haines-Young 2011, Saarikoski et al. 2015). For examples, cultural services are by some considered as benefits (e.g. MEA 2005, Saarikoski et al. 2015) and by others as values (e.g. Riechers et al. 2016). Supporting and regulating services are considered as a synonym for ecological processes (e.g. De Groot et al. 2002, TEEB 2010, Potschin & Haines-Yong 2011); while there is in general great confusion on the distinction of process and function (see chap. 2.4).

This work sets its foundation on the ECM for a number of reasons: a) to avoid confusion because of the conflation of terms; b) because of its use as a communication tool for discussion (Haines-Young and Potschin 2016); and c) because it can be easily adjusted (Potschin-Young et la. 2018; see e.g. Saarikoski et al. 2015).

2.3.   The Ecosystem Cascade Model

As described above, the ECM was initially proposed by Haines-Young & Potschin (2010), though it was modified by De Groot et al. (2010) to separate benefits and values and this adjustment was kept by the creators (see Potschin & Haines-Young 2011, Potschin & Haines-Young 2016). It was introduced with the intention to incorporate the essential elements that have to be considered in any full analysis of an ES and the kinds of relationships that exist between ES (Haines-Young & Potschin, 2011). The ECM (figure 2) describes a pathway "for delivering ecosystem services that goes from ecological structures and processes at one end through to the well-being of people at the other" (Potschin & Haines-Young 2016, p.26). The framework includes the environment at one side and the social and economic system at the other side. Thus, it assigns biophysical structure/process, function and service to the sphere of environment and benefits and values to the social system. The boundary describes the dependence of ES on the social context. Ecosystem processes and the corresponding lead to ES if

a person requires, demands or uses them, either actively or passively (Jax et al. 2013), thus "services exist only in relation to people's needs" (Saarikoski et al. 2105, p. 145).
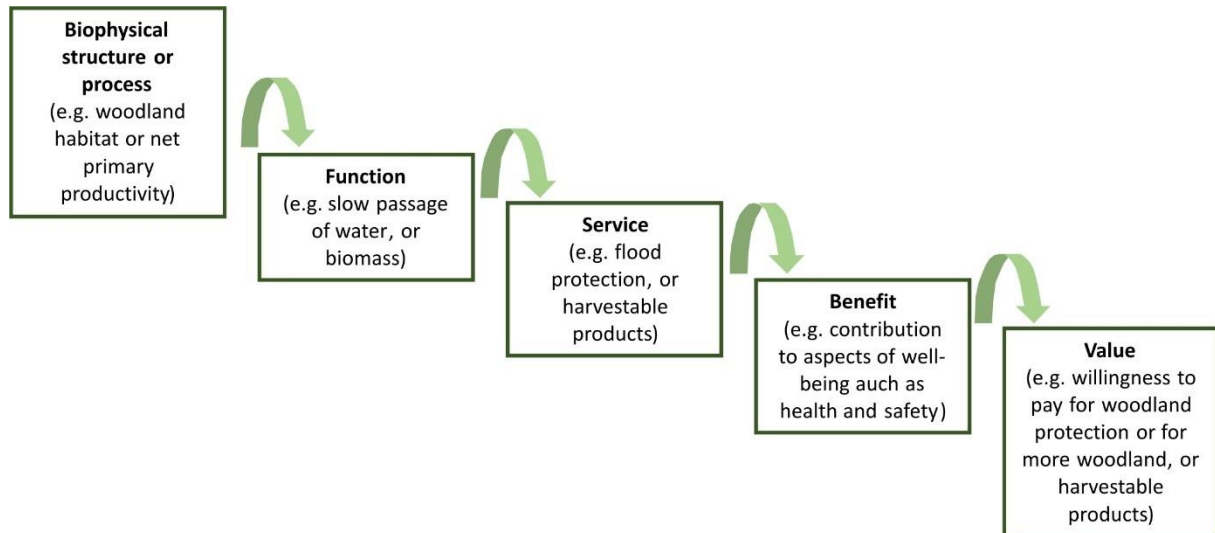
Figure 2: The Ecosystem Cascade Model by Potschin & Haines-Young (2011, simplified).

Because of the relationships between the single steps in the cascade, definitions on them are sometimes imprecise. For this reason, the following paragraph will give definitions on the steps by the creators (Potschin et al. 2016) combined by additional sources for a more comprehensive understanding.

a) Biophysical structure or process

The biophysical structure is defined as "the architecture of an ecosystem that results from the interaction between the abiotic, physical environment and organisms or entire biotic communities" (Potschin et al. 2016, p. 6). It refers to ecological settings and types and abundance of their components (Wallace 2007, Saarikoski et al. 2015, La Notte et al. 2017); the biophysical architecture and composition of species (TEEB 2010); and the collection of species individuals, communities, functional groups or habitat types (Luederitz et al. 2015). Typically, is consists of tangible entities that can be described in terms of amount (Wallace 2007). Following Potschin et al. (2016), an ecological process is "an interaction among organisms, and/or their abiotic environment" (p. 10) while an ecosystem process is "a dynamic ecosystem characteristic that is essential for the ecosystem to operate and develop. Examples of ecosystem processes are fluxes of nutrients and energy (production and decomposition) and characteristics determining population dynamics such as seed dispersal and migration" (p. 12). Interactions include any change or reaction, which occurs within ecosystems, either physical, chemical or biological (TEEB 2010; Saarikoski et al. 2015); the interactions might be complex

and happen between biotic and abiotic components, through the universal driving forces of matter and energy (de Groot et al. 2002; Wallace 2007, Saarikoski et al. 2015). Ecosystem processes exist regardless of whether or not humans benefit from them (Costanza et al. 2017).

b) Function

Ecosystem function is understood as "the subset of the interactions between biophysical structures, and ecosystem processes that underpin the capacity of an ecosystem to provide ecosystem services" (Potschin et al. 2016, p. 11). A little bit simpler, it can be described as interactions between ecosystem structure and processes (TEEB 2010) and as the capacity of natural processes and components to provide goods and services (De Groot et al. 2002; Saarikoski et al. 2015). Like ecosystem processes, functions exist regardless of human benefits (Costanza et al. 2017).

c) Service

ES are "the contributions of ecosystem structure and function – in combination with other inputs – to human well-being" (Potschin et al. 2016, p. 13). They do also include goods (TEEB 2010) and can be considered as the final outputs from ecosystems (Potschin & Haines-Young 2016). ES describe and sometimes quantify appropriated structures or functions (Luederitz et al. 2015). They comprise all components of nature which are directly enjoyed, consumed, or used to yield human well-being (Boyd & Banzhaf 2007); while they need to be required, demanded or used actively or passively by somebody (Jax et al. 2013). Contrary to the positively perceived services, there are 'ecosystem disservices' that affect humans negatively, causing damage and costs (Shapiro & Báldi 2014).

d) Benefit

Benefits are "the direct and indirect outputs from ecosystems that have been turned into goods or experiences that are no longer functionally connected to the systems from which they were derived. Benefits are things that can be valued either in monetary or social terms" (Potschin et al. 2016, p. 5). They can also be described as gains in welfare (Potschin &Haines-Young 2011) and; as outputs from ecosystems that have been turned into products or experiences (Saarikoski et al. 2015). They are positioned at the level at which people can most easily relate ecosystems to themselves (Chan et al. 2012).

e) Value

Value is "the worth, usefulness, importance of something. Thus, value can be measured by the size of the well-being improvement delivered to humans through the provision of good(s). In economics, value is always associated with trade-offs, i.e. something only has (economic) value if we are willing to give up something to get or enjoy it" (Potschin et al. 2016, p.32). Even though De Groot et al. (2010) in

their adaption of the ECM refer explicitly to economic value, the use of the cascade is not limited to it and can also include social values (cf. Petit-Boix & Apul 2018). "People's 'well-being' […] is understood to be things like people's health and security, or their social relations, or the kinds of choices that they can make" (Potschin & Haines-Young 2016, p.27). Values are expressed in several different ways: monetary, moral, aesthetic, and spiritual (Potschin & Haines-Young 2016); or in other words: economic, ecologic and socio-cultural (de Groot et al. 2002). They refer to the importance and meanings of benefits for evaluators (Saarikoski et al. 2015) and can be found in the contribution of an action or object to user-specified goals, objectives or conditions (MEA 2005).

The steps within the cascade are connected with each other: With reference to their values people modify and manage ecosystem structures and any given service depends on a range of interacting and overlapping functions and processes (Potschin & Haines-Young 2011). A benefit is seen as something that can change people's 'well-being'. This change is expressed by values people assign to benefits (Potschin & Haines-Young 2016). However, Costanza et al. (2017) point out that the connection between ecosystem processes and human well-being are complex and that the multiple pathways between them are not well understood. Thus they suggest a pluralistic approach in assessing the connections. Moreover, they conclude that "there is not one right way to assess and value ecosystem services" (p. 3), which opens up a range of possibilities that are made use of in this work. First, the cascade model will be modified with the aim to simplify it further and, second, the use of the simplified ECM as a tool for cross-cultural communication on gardening issues will be analyzed.

2.4.   Adaption of the Ecosystem Cascade Model

Various adaptions of the ECM exist (see Potschin-Young et al. 2018 for an overview), depending on the specific employment of the framework. Here, the aim is to further simplify it to explore the possibilities it brings for cross-cultural communication. To simplify the cascade, it was first checked for adequate discrimination between the steps of the cascade. After that it was simplified in language.

The discrimination check revealed the steps of biophysical structure or process and function as one major issue for clarification. Two difficulties where considered: the distinction between biophysical structure and process, and the entanglement of process and function. Saarikoski et al. (2015) aimed to identify operational ES definitions. In this turn, they argued for the separation of structure and process. According to them, structures are "biotic and abiotic attributes, which constitute the biophysical structure" (ibid., p. 154) while processes are "interactions between these attributes" (ibid., p. 154 – 155). In this adaption of the ECM their approach is followed. The other controversial term in the ECM is function. Since the rather early stages of the ES concept, it was realized that "the term

'ecosystem function' has been subject to various, and sometimes contradictory, interpretations. Sometimes the concept is used to describe the internal functioning of the ecosystem (e.g. maintenance of energy fluxes, nutrient (re)cycling, food-web interactions) and sometimes it relates to the benefits derived by humans" (de Groot et al. 2002, p. 394). It was also realized by Jax (2005) that the term 'function' is used with several different meanings and that it can refer to 'capability' but is often used to describe processes that operate within an ecosystem. Thus, Wallace (2007) suggests to consider functions and processes as the same thing to avoid confusion. The creators of the original ECM do also acknowledge that there are ambiguities that do not serve operational clarity (Potschin & Haines-Young 2011, 2016). Therefore, the suggestion of Wallace (2007) is adopted in this adjustments and 'process' and 'function' are merged to one step.

Simplification of the language, together with the attempt to bring a clear distinction between the steps resulted in the following new definitions, which will be the basis for all further analysis in this work.

> Biophysical structures: This includes 'ecosystems' of all scales, their biotic (organic) and abiotic (inorganic) 'components' and their composition.

> Processes: 'Non-human interactions within ecosystems' that give rise to outputs.

> Ecosystem Services: Material and immaterial 'outputs of ecosystems' from non-human and human interaction that are of use to humans.

> Benefits: (Positive) changes for a specific user or an user group, generated from 'human interactions with ecosystems'.

> Values: All possible kinds of 'values assigned' to the other steps by individuals or groups.
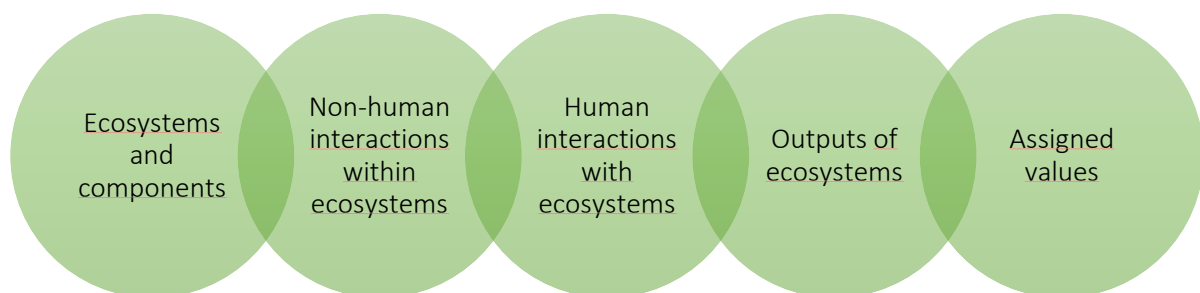
Figure 3: The Ecosystem Service Communication Model, adapted from the Ecosystem Cascade Model.

Note that ES in this context need the definition of the other steps to exist. Their identification is possible either by looking at non-human or human interactions with the environment. Potschin & Haines-Young (2016) describe ES as 'final' because they are still connected to the structures and processes that gave rise to them, and because they contribute directly to some produce (good) or

condition that can be valued by people. Thus, the order of the steps was changed and 'outputs of ecosystems' were set behind 'human-interactions with ecosystems'. As seen in figure 3, the steps in the model are overlapping which illustrates the interrelationship between the steps. Because of its use for analyzing communication, the new model is named Ecosystem Service Communication Model (ESCM).

2.5. Ecosystem Services as a Learning Concept

2.5.1. Ecosystem Services and the Ecosystem Cascade Model as Communication Tools

Looking at recent natural resource challenges, Kruger and Shannon (2000) found that there is a range of social scientist that have called for tools and conceptual frameworks that allow for the assessment of sociocultural meanings of places. Sociocultural meaning refers to the importance or value humans place on an object and the way they communicate about it. This requires common understanding between different stakeholders, users or user groups. Vice versa, the need for a conceptual framework was identified to help frame problems and develop a common understanding in ES stakeholder involvement. For the operationalization of ES there is not only a necessity of common language, but also of clear definitions and simple, transparent tools that can be applied across contexts (Carmen et al. 2018). Detailed reflection and simplified communication on ES are possible with the help of the ECM. Haines-Young and Potschin (2016) describe it as a communication tool for discussion between experts and laypeople. They state that "the ideas represented by the 'boxes' in the model are rather like words in a sentence which we can use to tell the ecosystem service story; each has meaning by virtue of the way we arrange the 'words' (ideas) around them (ibid., p. 26)". Moreover, they see the ECM as "a way of starting the kinds of conversation that people with different perspectives need to have in relation to the idea of ecosystem services (ibid., p. 30)". At the level of general societal discourse, the theoretical concept of ES serve two purposes (Jax et al. 2013): One, the facilitation of multi-directional flow of knowledge between different societal groups (also see Carmen et al. 2018) and, two, ES enhance the awareness about the dependence of society and human well-being on natural systems (also see La Notte et al. 2017). Individual interactions with others and the environment generate processes of learning (Krasny et al. 2013). Consequently, there are several arguments for the involvement of diverse kinds of stakeholders and knowledges into ES assessments and using the ECM in education.

2.5.2. Knowledge Needs in Ecosystem Service Projects

Although Vihervaara et al. (2010) state that the concept of ES translates complex ecological interactions into common language, it is not that simple. The definitions by MEA and TEEB on ES are predominant today but it was realized that instrumental values, in the form of economic values, do not completely capture the ways people assign worth to nature (Jax et al. 2013, p. 262). Focusing exclusively on economic valuation may overlook significant ethical questions as well as questions of justice. Thus, Jax et al. (2013) identified three key ethical questions related to the use of the ES concept: i) who makes the choices regarding use; ii) which values are included or highlighted and which are excluded or obscured; and, iii) who is impacted (positively or negatively) by choices regarding ecosystem service use. Accordingly, decisions and descriptions regarding ES should not be left to scientists and politicians but should be opened to the views and opinions of the different stakeholders of ES. This is reflected by calls for participatory approaches in different steps of definition and application of ES (Chan et al. 2012b, Menzel & Teng 2010). For stakeholder involvement there might be lessons to learn from NRM, as ES projects can be considered as a variant of it (Menzel & Teng 2010). Here, it is recognized that learning can be a group process (Armitage et al. 2008) and social learning is considered as a collaborative process among multiple stakeholders (see Krasny et al. 2013). To strengthen collaborative practices between groups, cultural barriers must be overcome. Stakeholders from different levels of governance, science and practice-based communities should get into dialogue (Carmen et al. 2018).

It is realized, that different types of knowledge exist, which are not mutually exclusive and it therefore is not easy to define knowledge (Carmen et al. 2018). In natural resource and ecosystem management it can be distinguished between scientific knowledge and traditional ecological knowledge (Berkes et al. 2000). While the former is theoretical, empirical, based on research and explicit, the latter is local, accumulated through operational experience and practices from routines and behaviors in social settings and often implicit or tacit (Boiral 2002, Carmen et al. 2018). Another distinction can be made between organized knowledge, which is based on rather formal consensus and unorganized knowledge which aims to find agreement on a certain issue by interactive learning, sharing and framing (Vink et al. 2013). Moreover, it is possible to distinguish between fact-based knowledge claims, that give a description on how the world is or might be and value-based knowledge claims that offer normative input about how things should be (Failing et al. 2007).

2.5.3. Collaborative Learning on Ecosystem Services – Selected Learning Theories

ES describe the connection between human society and ecosystems. In the socio-ecological systems literature and, especially in the context of collaborative resource management, learning has emerged as an important issue (Armitage et al. 2008 and Krasny et al. 2013). In this context, it is referred to three learning theories: Social Learning (Argyris & Schön), Experiential Learning (Kolb, 1984) and Transformative Learning (Mezirow, 2000). Emphasis is put to collaboration and group learning but also to the fact that individuals learn within a social context in a changing environment and that individuals and groups are able to learn from experiences (Armitage et al. 2008). Social theories as well as ecological perspectives describe learning as successful participation in socio-ecological systems, where individuals also interact with the biological and physical environment. Interactions lead to transformation of individuals, the community and the environment (Krasny et al. 2013). Thus, those theories might not be separable in practice and aspects of them might be merged together when applicated into a specific learning setting.

a) Social Learning

Ideas about Social Learning are influenced by behaviorist approaches that focus on learning through imitation, observation and reinforcement through punishment or reward. Social Learning is not seen as a linear process but is based on people's interaction and group learning, which among others, was described by Freire (1970) who looked at learning through dialogue and informal interactions as an empowerment process (Blackmore 2010). Among other definitions, social learning is defined as "a process of iterative reflection that occurs when we share our experiences, ideas and environments with others" (Keen et al. 2005, p.9). Social Learning mechanisms involve the identification of alternative strategies and actions (e.g., harvesting techniques) to resolve specific problems and improve certain outcomes (e.g., improved incomes, higher yields), challenging of existing worldviews and underlying values (such as a shared reconsideration of the goals of a management process), changes in stakeholder behavior, and reflection on norms and protocols (King & Jiggins 2002, Armitage et al. 2008).

b) Experiential Learning

Experiential Learning is a form of active, collaborative learning and in the context of resource and adaptive management it is described as a reflective learning-by-doing process (Armitage et al. 2008). Experiential Learning recognizes learning as a process of creating knowledge through the transformation of experience (Kolb 1984). The idea is to build understanding through experiential knowledge, observation and determining underlying principles. While Kolb (1984) largely modeled

Experiential Learning as an individual learning process, Keen & Mahanty (2006) have taken it up on group processes. In their approach, learning occurs trough interaction between humans and biophysical systems, reflecting on actions, values and beliefs, and trough learning from each other. Thus, interactions between people and between people and their environments are taken into account. According to Keen & Mahanty (2006), dialogues between different stakeholders are necessary to address diverse knowledge, experiences, and values. Both, individuals and groups, should reflect on their learning process and meanings for group behavior. Armitage et al. (2008) add that new opportunities for learning can be generated by building on the experiential knowledge and practices of local groups.

c) Transformative Learning

Transformative Learning theory sets learning as a reflective process that enables an individual's perceptions and consciousness to be altered. According to Mezirow (2000), transformative learning wants to foster liberated, autonomous and socially responsible individuals with the capacity to critical examine their experiences in order to change their behaviors. Transformative Learning involves instrumental learning and communicative learning. Armitage et al. (2008) with reference to Mezirow (1995) characterize them in the following way: "Instrumental learning involves task-oriented, problem-solving actions to improve the performance of current activities, while communicative learning relates to the ability of individuals to examine and reinterpret meanings, intentions and values associated with actions and activities" (p. 88). Thus, exchange with other persons is crucial. Instrumental learning involves actions and activities and can therefore be considered as experiential, while communication needs a counterpart and thus belongs into the sphere of exchange and social learning.

Mezirow's theory helps to understand the learning processes of intercultural competency (Taylor 1994). Most intercultural concepts are based on presumed cultural differences. Cultural characteristics are ascribed to confined groups. Learning targets for intercultural education involve reflection on stereotypes, power relations, interactions with others and the language used (Nazarkiewicz 2010). One approach that brings transformative education and intercultural learning together is Global Citizenship Education (GCE). It puts emphasis on social-ecological transformation and the examination of alternative concepts of sustainable development (Grobbauer 2018) by analysis of the present world situation (Carvalho da Silva et al. 2012).

3. Global Citizenship Education

GCE provides, among other uses, a normative background about why cross-cultural communication can be of advantage. Moreover, it describes conceptions on how that exchange could happen. Participatory decision-making processes, mutual knowledge and collective self-awareness are crucial for GCE (Carvalho da Silva et al. 2012). Next to Education for Sustainable Development (ESD), the United Nations Educational, Scientific and Cultural Organization (UNESCO) uses this approach to address the SDGs (UNESCO n.d.). While ESD traditionally focuses more on Environmental Education, GCE sets the focus on global interconnectedness. GCE is directed at all age groups. In this work, GCE is taken as a reference for cross-cultural exchange. The following chapters give an overview of the educational approach of GCE.

3.1. Definition and Background of Global Citizenship Education

Global Citizenship Education has developed since the 1960s with the rise of civil society movements. Among others, the student movements on civil rights, the anti-apartheid movement and the Nigerian civil war led to a critical approach on the issue of what is called "development" and related educational work (Bridge 47 n.d.). During the mid-1990s, the concept of global citizenship began to appear in NGO and school curriculum materials, mainly in Great Britain and North America (Sant et al. 2018). Today, GCE strongly builds on the idea of the need for a global sustainable transformation. The UK charitable organization Oxfam (2015) describes GCE as "a framework to equip learners for critical and active engagement with the challenges and opportunities of life in a fast-changing and interdependent world. It is transformative, developing the knowledge and understanding, skills, values and attitudes that learners need both to participate fully in a globalized society and economy, and to secure a more just, secure and sustainable world than the one they have inherited" (ibid., p.5). GCE applies to all age groups, as it incorporates a lifelong learning perspective. It can include formal and informal, curricular and extracurricular, as well as conventional and unconventional methods and pathways to participation (UNESCO 2015). The concept is complex and Sant et al. (2018) argue that it cannot be fully defined with complete agreement across all groups and individuals. Thus, further descriptions on entangled educational approaches, the idea of citizenship levels, topics and concepts and, learning outcomes and competencies are important.

3.2. Entanglement of Global Citizenship Education with other Learning Approaches

GCE can be seen as an "umbrella phrase for many different approaches in which efforts are made to help learners understand and take part in current contemporary society and to develop a more socially just world" (Sant et al. 2018, p.7). The concept of GCE is in practice entangled with the approaches of ESD, Global Learning/Education and Ecopedagogy; and clear distinction between the four of them is probably not possible. UNESCO (2015) acknowledges that GCE employs concepts and methodologies from Human Rights Education, Peace Education, ESD and Education for International Understanding, with the aim to advance their common objectives. This is supported in the literature for example by Sant et al. (2018) who add Social Justice Education as central to GCE. The other way around, Huckle and Wals (2015) suggest that GCE should be central to ESD. Finally, Misiaszek (2015) describes critical forms of GCE and Ecopedagogy as linked and interdependent. For more comprehensive overviews and descriptions of those learning approaches, please take into account the cited literature.

3.3. Different Citizenship Levels in Global Citizenship Education

Due to increased globalization and global connections, the citizenship status of individuals beyond their own nation-state is increasingly complex (Misiaszek 2015, 2016). Orientation on national concepts of citizenship might not help, because perspectives on national citizenship vary between countries (UNESCO 2015). Moreover, different organizations promote the concept of a 'global citizen' in various ways, and there is no consensus reached yet (APCEIU 2018). However, it is widely agreed that global citizenship is a sense of belonging to the global community and common humanity rather than a legal status (Pak 2013) and that one's civic responsibility is expanded beyond national borders to the global community. Political, economic, social and cultural interdependency and interconnectedness between the local, the national and the global level are considered (UNESCO 2015). National citizenship is not dismissed or undermined by this understanding (APCEIU 2018). Hence, the Asia-Pacific Centre of Education for International Understanding (APCEIU 2018) defines Global Citizenship in the following way: "Global citizenship is a sense of belonging and responsibility to the global community for a just, peaceful, and sustainable world. It is a way of understanding, acting, and relating oneself to others and the environment, based on universal values, with a respect for diversity" (ibid, p. 25). The UK charitable organization Oxfam (2015) has a similar definition and sees the global citizen as someone who "is aware of the wider world and has a sense of their own role as a world citizen, respects and values diversity, has an understanding of how the world works, is passionately committed to social justice, participates in the community at a range of levels, from the

local to the global, works with others to make the world a more equitable and sustainable place and takes responsibility for their actions" (ibid., p. 5). Misiaszek (2016) clarifies that there is high Western influence of such definitions and acknowledge that there is a number of other definitions out there. Beside local, national and global levels of citizenship, planetary citizenship is an issue, especially in critical versions of GCE, which are influenced by Ecopedagogy (Misiaszek 2016, Sant et al. 2018). Planetary citizenship is based on worldwide society. It expresses a set of principles, values, attitudes and behaviors that brings the perception of Earth as a single community (Gadotti 2011). More specific, planetary citizenship is grounded in the realization of human induced planet-wide changes (e.g. Waters et al. 2016) and planetary boundaries (Rockström et al. 2009) and in two main perceptions: We all live on the same planet which is threatened by unsustainable practices, and the planet and nature on it have rights themselves (earth jurisprudence, see Sant et al. 2018). This perspective is grounded in Ecopedagogy and demands the same citizenships rights for Earth as the rights all human citizens have (e.g. Misiaszek 2016). Within GCE, planetary citizenship acknowledges environmental oppression between people living at opposite ends of the world, that environmental problems do not stop at geo-political borders and that humans are part of nature (Misiaszek 2016). Different levels of citizenship exist next to each other and a person is able to carry several of them at the same time. Larger scale levels carry all the other levels below.

3.4. Topics and Concepts of Global Citizenship Education

There is a wide range of topics and concepts that are incorporated with GCE. 'The Palgrave Handbook of Global Citizenship and Education' (Davies et al. 2018) provides geographically-based overviews on the approach from all over the globe. Topics that are mentioned in GCE literature (Davies et al. 2018, Sant et al. 2018, APCEIU 2018) can be found in table 1. The non-profit organization 'European Educational Exchanges - Youth for Understanding' adds intercultural communication, as well as stereotypes, prejudice, discrimination and inequality to the thematic spectrum, including history, economy, privilege and power relations (Schwartz et al. 2016). Davies et al. (2018) look at those topics from the perspectives of economy and economics, politics, culture, morality, transformative spirituality, race and national exclusion, gender and sexuality, migration, and social class.

A publication by UNESCO (2015), which focuses on the application of GCE, describes three conceptual dimensions that should be incorporated in GCE that build on three domains of learning: *(i)* the cognitive domain, which involves knowledge, understanding and critical thinking about global, regional, national and local issues and the interconnectedness and interdependency of different countries and populations; (ii) the socio-emotional domain, that wants to foster a sense of belonging to a common humanity, sharing values and responsibilities, empathy, solidarity and respect for differences and

diversity; and *(iii)* the behavioral domain, which wants to enable learners to act effectively and responsibly at local, national and global levels for a more peaceful and sustainable world (UNESCO 2015).

Table 1: Key topics in Global Citizenship Education and their sources.

justice/social justice	APCEIU 2018, Davies et al. 2018, Sant et al. 2018
equity and decolonial possibility/decolonial ethic of global citizenship	Davies et al. 2018, Sant et al. 2018
diversity and cultural responsibility	APCEIU 2018, Davies et al. 2018
identity, belonging and diversity/global identities	Davies et al. 2018, Sant et al. 2018
global rights and duties, human rights	APCEIU 2018, Sant et al. 2018
local, national and planetary citizenship	Sant et al. 2018
sustainability/sustainable development	APCEIU 2018, Davies et al. 2018, Sant et al. 2018
conflict and peacebuilding	APCEIU 2018

3.5.   Learning Outcomes and Competencies in Global Citizenship Education

APCEIU (2018) sets, among others, 'real life issues' and the 'own impact on local societies and communities' as learning contents. In doing so, they reflect the subjective turn in social and educational sciences. The focus is not only on accumulated knowledge, but also on individual skills for its application. This process provides learners with competencies (Lang-Wojtasik & Scheunpflug 2005). Competencies can be recognized "as a combination of knowledge, skills, attitudes, and values that drive specific behaviors in people" (Schwartz et al. 2016, p.16). This can be seen in UNESCO's conceptual dimensions on GCE (UNESCO 2015): Cognitive learning outcomes focus on knowledge, socio-emotional learning outcomes are intended to foster attitudes and values, and finally, behavioral learning outcomes involve skills. While knowledge issues are mentioned in the chapter above on key topics and concepts, the following will provide an overview of goals, skills, attitudes and values involved in the conceptualization of GCE.

The concept of GCE has different meanings which are conceptualized in various ways. Thus, underlying goals are different as well (Goren & Yemini 2017). According to Dill (2013) there are two main approaches on GCE with distinct goals: the global competencies approach, that wants to provide students with skills to compete in a global society, which is under economic transformation; and the global consciousness approach, which aims to provide students with empathy and cultural sensitivity

based on humanistic values and assumptions. Veugelers and de Groot (2019) identified three clusters of educational goals, based on interviews with teachers, students and parents: *(i)* discipline, which is about good behavior and following norms; *(ii)* autonomy, which embraces empowerment, the formulation of the own opinion and moral development; and (iii) social involvement which is about developing empathy and social justice-based solidarity.

The two European organizations European Educational Exchanges - Youth for Understanding (Schwartz et al. 2016) and Bridge 47 (n.d.), as well as the international organization UNESCO (2015) provide educators with specific lists and descriptions of characteristics which GCE learners should achieve. Those characteristics can be attributed to the categories of 'attitudes towards learning', 'competencies regarding the self', 'social competencies', 'communication and interaction competencies', 'learning outcomes', 'information competencies', and 'underlying principles'. Central in competencies on GCE is that they want to enable learners to build same rights for all, foster equality and social justice, as well as peace, and get rid of discrimination (APCEIU 2018). A list of the competencies can be found in table 2.

Table 2: Global Citizenship Education competencies and their sources.

attitudes towards learning	
belief that people can bring about change and visionary attitudes	Bridge 47 n.d.
transformation	UNESCO 2015, Bridge 47 n.d.
active engagement in learning	UNESCO 2015
commitment to life-long learning	UNESCO 2015
competencies regarding the self	
self identity and belonging/sense of identity	Bridge 47 n.d., Schwartz et al. 2016
openness to the self/open-mindedness	Bridge 47 n.d., Schwartz et al. 2016
self-efficacy/self-respect and self-confidence	Bridge 47 n.d., Schwartz et al. 2016
self-reflection/learn about own identities	Schwartz et al. 2016, UNESCO 2015
reflect on ethical conflicts	UNESCO 2015
social competencies	
solidarity	Bridge 47 n.d.
tolerance	Bridge 47 n.d.
creativity	Bridge 47 n.d.
optimism	Bridge 47 n.d.
spirituality	Bridge 47 n.d.
curiosity	Schwartz et al. 2016
responsibility/personal and social responsibility	Schwartz et al. 2016, UNESCO 2015
empathy	Bridge 47 n.d., Schwartz et al. 2016
flexibility and adaptability	Schwartz et al. 2016
communication and interaction competencies	
different communication styles	Schwartz et al. 2016
awareness of own interaction styles/awareness	Bridge 47 n.d., Schwartz et al. 2016
understanding of how information is communicated/dialogue	Bridge 47 n.d., UNESCO 2015
participating in the community/proactive community membership	Bridge 47 n.d., UNESCO 2015
active listening skills	Schwartz et al. 2016
co-operation skills/collaboration and teamwork	Bridge 47 n.d., Schwartz et al. 2016
communication skills	Schwartz et al. 2016
conflict resolution skills	Schwartz et al. 2016
learning outcomes	
understanding of identities, relationships and belonging	UNESCO 2015
understanding of own values, other's and shared values, and common humanity	UNESCO 2015
understanding of interconectedness	Bridge 47 n.d.
dealing with complexity	Bridge 47 n.d.
dealing with contradiction	Bridge 47 n.d.
dealing with uncertainty	Bridge 47 n.d.

Table 2 (continued): Global Citizenship competencies and their sources.

information competencies	
ability to inquire into global themes and issues	UNESCO 2015
analytical and critical thinking skills/critical inquiry and analysis	Schwartz et al. 2016, UNESCO 2015
media literacy	UNESCO 2015
planning investigations	UNESCO 2015
analyse data and communicate findings	UNESCO 2015
autonomous learning skills	Schwartz et al. 2016
underlying principles	
human dignity and Human Rights/women's rights, children's rights, labour rights LGBTQI rights, rights of people with disabilities and rights of indigenious people	Bridge 47 n.d., Schwartz et al. 2016
democratic	Bridge 47 n.d.
tolerance to ambiguity	Schwartz et al. 2016
openness to cultural otherness and diversity/open-mindedness	Bridge 47 n.d., Schwartz et al. 2016
cosmopolitanism	Bridge 47 n.d.
pluralism	Bridge 47 n.d.
diversity	Schwartz et al. 2016
caring for others	UNESCO 2015
commited to social justice	Bridge 47 n.d.
integration and inclusion/inclusivity	Bridge 47 n.d., Schwartz et al. 2016
sharing	Bridge 47 n.d.
pay-it-forward	Schwartz et al. 2016
caring for the environment/environmental responsibility and concern for preservation of the planet	Bridge 47 n.d., UNESCO 2015
sustainability	Bridge 47 n.d., Schwartz et al. 2016
equality	Bridge 47 n.d.
non-hierarchical	Bridge 47 n.d.
peaceful	Bridge 47 n.d.
non-violent	Bridge 47 n.d.
non-discrimination	Bridge 47 n.d.
respect/mutual respect and equity/respect for others and human life/appreciation and respect for difference and diversity	Bridge 47 n.d., Schwartz et al. 2016

4. Material and Methods

4.1. Case Description – the 2nd Indo-German Dialogue on Green Urban Practices

This thesis builds on the '2nd Indo-German Dialogue on Green Urban Practices' with the topic of "Education, learning, training and awareness for sustainable development". It took place at the University of Freiburg, Germany from 8th to 11th November 2018. It was organized by the Indo-German Centre for Sustainability (IGCS) which is led by the Indian Institute of Technology Madras and the RWTH Aachen University. The dialogue is part of an annual series which was started in 2017 in Chennai, India, and is planned to be continued in 2019. It is intended to bring together academics, civil society activists, government officials, and entrepreneurs from India and Germany. In 2019, 39 participants took part in the dialogue, with 20 persons coming from India and 19 from Germany. Key objective of the dialogue is to provide a platform of sharing and exchange of experiences of social urban innovative change in Germany and India, in order to leverage action towards new transdisciplinary research and practice projects. The dialogues offer possibilities on collaborative and collective learning on sustainability issues, as well as cross-cultural experiences and knowledge transfer about mutual perspectives. The interaction is viewed as a cultural project to address the challenges of urbanization and sustainability from a broad perspective, which also includes rural-urban linkages. Major themes in the 2nd dialogue were urban gardening/farming as well as education, training and awareness for sustainable development. During the dialogue, four interrelated topics emerged through discussion in a plenary session: *(i)* agro-food-systems and food sovereignty (relating to livelihoods, production and consumption); *(ii)* cross-cultural issues in Indian and German context (including the relevance of various knowledge domains); *(iii)* tools and techniques for participation and governance (facing sustainability transitions); and *(iv)* Indo-German relationships (referring to person-to-person contact). The recent report of the 2nd dialogue states that "social transformation towards sustainable lifestyles will only succeed in practice when people reflect on and learn about the implications of their daily life activities, combined with widely communicating and spreading successful practices, skills, knowledge, values and behaviours" (Woiwode & Lay-Kumar 2018, p. 3). It is acknowledged that transnational exchange is inevitable to generate global awareness and action on sustainability issues. For just and equitable transitions to sustainability, and more specific to identify challenges and opportunities, there is need to share and understand each other's perspectives and situations more in depth. The rationale for the dialogue is based on target 4.7. of the SDGs and the related approach of GCE. Descriptions and further information on the 1st and 2nd dialogue can be derived from the IGCS website (www.igcs-chennai.rwth-aachen.de) and from the report of the 2nd dialogue (Woiwode & Lay-Kumar 2018).

4.2.   The Method of Guided Interviews

The method of guided interviews was chosen after the opportunity for participating in the 2nd IGD evolved. Jenny Lay-Kumar, who was participating in the 1st dialogue and was included in the organization of the 2nd dialogue at the University of Freiburg (Woiwode & Lay-Kumar 2018), reported about the interest and experiences of a range of participants in educational gardening. It became clear that the 2nd dialogue would provide an opportunity to have detailed personal conversation with participants from India and Germany on this issue.

The preliminary literature research for the interview guideline was based on staff advice from 'Eine Welt Forum Freiburg – Freiburg network for global justice' (https://ewf-freiburg.de). This Freiburg based non-governmental organization is focusing on Global Learning and realized that GCE is an emerging approach in this field. Moreover, literature was identified in the library of the NGO. Subsequently, literature by Selby (2003), WBGU (2011), and Singer-Brodowski (2016), as well as the 2017 report on the 1st IGD the 2018 concept paper on the 2nd IGD were used to develop an interview guideline (appendix 1). This guideline is comprised of ten open-ended questions from which three questions are on gardening (Q1, Q2, Q9) and one is on food production (Q4). Those 4 questions were later analyzed together as 'gardening questions'. With reference to Oxfam (2015), a range of GCE related issues was identified. Thus, one question each was formulated on daily life issues (Q3), global justice (Q6) and on mutual understanding (Q5) and personal exchange (Q10). Later, those questions were analyzed as 'GCE issues'. Moreover, two questions (Q7, Q8) on the competencies of learners were included. Because of lack of time those two were excluded from analysis. The interview guideline was developed following the methodical descriptions by Lamnek (2005), Stigler & Reicher (2005) and Lueger (2010).

Stakeholders from different areas (education, science, governance) were chosen for the interviews, based on advice by a participant from the 1st dialogue and the list of participants for the 2nd dialogue, which included remarks on professions; they were contacted and asked for the interview prior to the 2nd dialogue. During the 2nd IGD, between 08.11.2018 and 12.11.2018, seven guided expert interviews were conducted. The interviews were done with participants from India (5; 4 male, 1 female) and Germany (2; 1 male, 1 female). Interviews were done with individual persons, some of them with a break in between. The Interviews started with an introduction that allowed for a narrative entry and ended with a closing question related to the future work of interviewees. Interviewees were given the opportunity to have the results of their interviews anonymized. Along with the interviews, supplementary data (interview number, file name(s), date and time of recording, place of recording, duration of recording, interviewer references, interviewee references, informed consent, annotations) was recorded.

Short summaries (~ 1 page) of the interviews were done shortly after the dialogue, from 15.11.2018 to 18.11.2018. Transcription of the interviews were conducted between 17.03.2019 and 20.03.2019, using the open source computer program 'easytranscript' (version 2.5). Here, interviewees were named 'respondents' (in the following indicated with R1-7). Transcription was oriented on the transcription rules by Fuß & Karbach (2014). Excurses on other topics, repetitions and decorating words (e.g. "okay", "you know") by the respondents were excluded from transcription and indicated by square brackets. The full transcriptions can be found in appendix 2.

4.3. The Method of Literature Research

After the interviews were conducted, it was decided to analyze them with a specific natural-sciences based concept. During a university course on human-environment interactions and socio-ecological systems, the idea of using the concept of ES for analysis evolved. Please note that this was after the interviews were taken.

Literature was derived from university libraries ('Universitätsbibliothek Freiburg', 'Bibliothek Forstwissenschaften' and 'Bibliothek Pädagogische Hochschule Freiburg') journal articles, using 'Google Scholar', and internet research, using the search engine 'Ecosia'. Mostly, English literature was used, but there were also German references taken into account. There was little prior instrumentation in literature research, because the character of the thesis work is exploratory, there is rich context description needed, and there is qualitative content only. Because of the loose initial design of the work, data collection followed a low degree of selectiveness (Miles & Huberman 1994) and there were no prior defined search phrases. Key searches were "Global Citizenship Education" and "Ecosystem Services". Additional searches included "urban social-ecological systems and Ecosystem Services", "social-ecological memory", "Ecosystem Cascade Model", "Ecosystem Services qualitative research", "Ecosystem Services qualitative content analysis", "Ecosystem Services of gardens", "gardening and social cohesion", "gardening and resource management", "gardening and sustainability management", "Transformative Education", and in German "Interkulturelles Lernen" (intercultural learning) and "Urban Gardening und Globales Lernen" (Urban gardening and Global Learning). Please note that this is not an exhaustive list and that its intention is merely to provide insight in the exploratory approach used. Other sources were identified to be useful for the thesis work by following the references in articles and book chapters, making use of the pyramid system.

4.4.   Data Analysis Methods

For data analysis, triangulation of the interview data together with the literature findings was performed in an iterative process (Creswell 2012). After writing up the theoretical chapters on the concept of ES and ES as a learning concept (chap. 2.) and GCE (chap. 3.), the interview data was analyzed. It is therefore acknowledged that literature research had an influence on the coding.

For analysis of the interview transcripts, MAXQDA 11 (version 11.1), a software for qualitative and mixed methods research, was used. First and second level coding methods, following Mayring (2014) and Saldaña (2013) were conducted. First cycle coding made use of initial coding to include several coding methods. All initial coding methods were exploratory. The aim of it was to give an overview of the data and to identify issues that are consistent with the literature findings on ES projects (including NRM) and GCE (including related educational approaches). Second cycle coding used the method of pattern coding to ascribe first cycle codes to the ESCM and was deductive.

Persons and institutions such as schools, countries or religions were recorded from both, the transcripts on the 'gardening questions' (Q1, Q2, Q4, Q9) and questions on 'GCE issues' (Q3, Q5, Q6, Q10). Here, only first level coding was used to identify all the persons and institutions mentioned by the interview respondents and to put them into a list. The identified persons were grouped according to emerging similarities. In the discussion, the findings on persons were compared with ES stakeholders and GCE target groups.

Moreover, the transcriptions on the 'gardening questions' were checked for types of gardens as well as abiotic and biotic components. When they were named in context with gardening, the 'environment' and the spatial conditions 'local' and 'global' were also included in the list of places because those aspects had turned up during literature research. The codes of garden types and components were found within the statements on human and non-human interactions within gardens. To identify human and non-human interactions within gardens, the 'gardening questions' were subjected to the method of process coding during first level coding. With this method, action in the data can be identified. This resulted in a list of activities. Please note that, in contrast to the suggestions by Saldaña (2013), no sequences in the processes were analyzed. Afterwards, the identified activities were sorted by activities that take place in gardens and those which happen outside gardens. Only the ones that happen in gardens were analyzed further. It was assumed that gardening activities stop with the harvesting of products and all other activities that happen, for example in the food chain, take place outside the garden. In the following, the activities in gardens were grouped using the method of pattern coding. For this purpose, meta-codes, e.g. 'growing' and 'watering' were developed. Along the way, codes that involved personal exchange were put into an additional list.

To assess the values, attitudes and belief systems within the transcripts, the 'gardening questions' were analyzed with the method of values coding. This method uses indicative phrases such as "I think" and "it is important" to identify what is valued by respondents. Using second level pattern coding, components of those evaluative statements were ascribed to meta-codes that resemble the ESCM steps 'ecosystems', 'ecosystem components', 'non-human interactions', 'human interactions', 'outputs from ecosystems' and specific types of 'values' named. To identify the outputs, it was checked for phrases such as e.g. "this results in" within the interviewee statements and 'by' within the codes (e.g. 'stress relief' as an output was identified by the code 'stress relief by gardening'). The codes of outputs were also found within the statements on human and non-human interactions within gardens. Next, also the non-valuative statements on gardening activities (human and non-human interactions) where checked for outputs. In the end, also the already coded statements were ascribed by second level coding to their respective ESCM steps. Examples for coding can be found in figure 4.
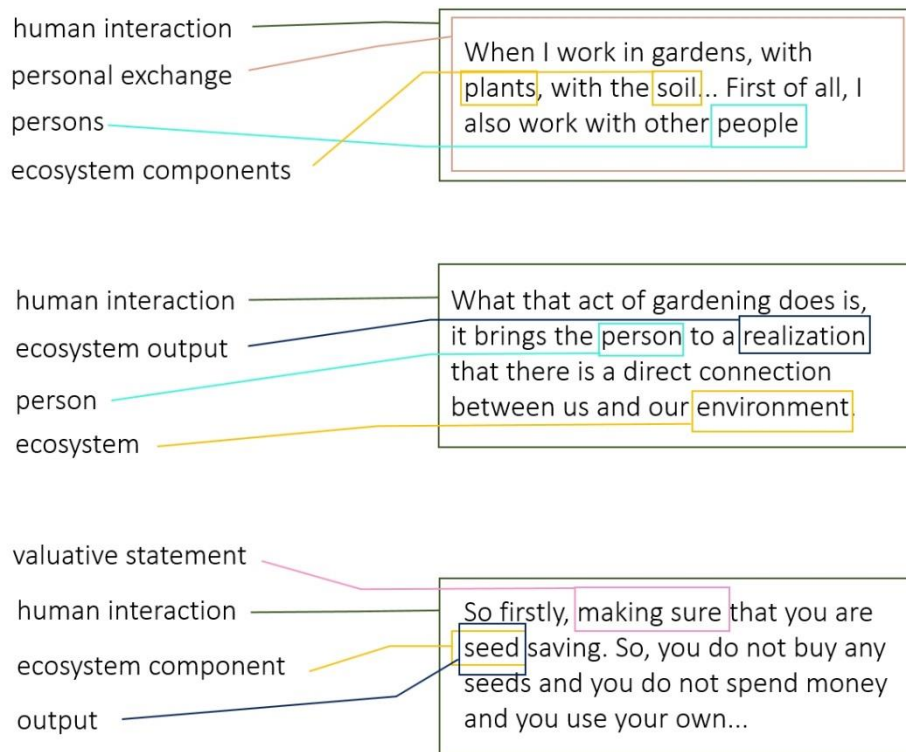
Figure 4: Coding examples.

For visualization, the 'Code Relations Browser' of MAXQDA was used to identify intersections of first and second level coding. To take the statements of respondents into consideration in an equal way, the codes were not analyzed by total frequency but by appearance per respondent (R). The resulting matrix can be found in chapter 5.6. The MAXQDA file can be found in the supplementary CD. To build

the 'tricky landscape' (also see chap. 5.6.), this matrix was visualized with the diagram type 'surface – contour' in the software Microsoft Excel.

The 'GCE issues' questions were first coded to identify themes. For this purpose, statements where summarized into short phrases. The resulting codes were sorted by into meta-level topics (structural coding). Later in analysis, those topics were used to identify quotations that match the findings from the 'gardening questions'.

5. Findings

With this research, 'the possibilities of the ES concept for cross-cultural knowledge exchange in urban gardening' are analyzed. For this purpose, an adapted version of the ECM, the ESCM was developed. The ESCM includes ecosystems, their components, non-human and human interactions happening within this ecosystem, outputs of the ecosystem and the values that people ascribe to all of them. The following findings will first present stakeholders which enliven the ESCM and that can experience knowledge exchange and further will describe the role of each of the ESCM steps. To present the findings, "W-Questions" (Bolay & Reichle 2007, Siebert 2010, Jank & Meyer 2014) are used. Those questions are a method to structure didactical aspects. In a nutshell, W-Questions aim to answer who learns what, why, what for, when, where, how and with what (Siebert 2010). Those questions take into account if, how, when and what type of learning actually occurs in NRM (cf. Armitage et al. 2008) and also they consider that the content, form and context in which the learning process takes place are interrelated in GCE (Carvalho da Silva et al. 2012).

Each of the chapters on the steps first include a section which describes the intersections between learning in NRM and GCE before moving to the interview findings. At the end of each chapter, interviewee statements on the GCE issues 'global justice', 'mutual understanding and exchange', and 'daily life' are presented if applicable.

5.1. Who can be included in cross-cultural knowledge exchange on Ecosystem Services?

When exchanging about ES in the context of urban gardening, it is also necessary to identify the didactic question "who" should or can learn in this process (cf. Bolay & Reichle 2007). The target group can be identified by age, gender, profession or educational level (Siebert 2010). In social audits, persons with specifically required interactional expertise, which can be citizens, stakeholders or scientists, might be involved (KICS 2011). The knowledge of stakeholders engaged in ES management "may not be perceived as equally valid within an implicit hierarchy of knowledge" (Carmen et al. 2017, p. 443) or can be discredited from the process because of dominant and powerful participants. Reflection processes can analyse the influence of different stakeholders in decision-making critically (Keen & Mahanty 2006). In GCE (Misiaszek 2015, APCEIU 2018, Sant et al. 2018) as well as learning in NRM (Keen & Mahanty 2006, Riechers et al. 2016), respect for heterogeneity, other cultures, local knowledge and preferences, different perceptions and interests are central, and also enable learners to get rid of stereotypes (APCEIU 2018).

From the statements of the interview partners a range of stakeholders were identified. These stakeholders were assigned to 17 groups. An overview of the mentioned sub-groups can be found in table 3. Please note that also certain places were included in this analysis because of the assumption that in those places, for example in schools or countries or at markets, there are persons who make that institutions happen.

Table 3: Identified stakeholder groups and subgroups mentioned by interview respondents.

Group name	Mentioned persons, groups and institutions
geographic groups	migrants, refugees, people from different countries, internationals, the West, Global South, developing countries/world, world, economically advanced countries, overseas, US, Cuba, Colombia, Europe, Africa, Kenya, Dakar, Senegal, Kigali, Rwanda, Indians, India, Germans, Germany, other countries, different countries, the same country
gardeners	horticulture department, agriculture department, person obtaining the seeds, person planting the seeds, person that is taking care of the harvest and plagues and all these things, community supported agriculture, people who run the garden, farmer, gardens, agriculture, farms
societal level	people, human beings, humans, society, citizens, residents, public, everybody, everyone, somebody, anybody, each person, we all, mutual
education related groups	education organization, kindergarden, rural/urban/corporation school, university, botany department, teacher, trainer, educators, professor, students, school kids, eco clubs, class six, classes, third and fourth graders, academicians, master's program, biologist, ornithologist, social scientist, research association, research staff
governmental bodies	UN, FAO, state, local/central government, municipality, city manager, corporation, horticulture department, agriculture department, ministry of forestry, chief minister,decision-making domain, parties, political level, policy level, policy makers, regulator, administrator, government agencies, governance mechanism, government bodies
economy related groups	economics, chief officer, business, private sector, people in industry, people that are selling it, farmers/super market, commercial establishment/place, corporations, companies, industries, factories, employing organization, corporate world
cultural groups	muslims, hinduism, vegans, tribal cultures/people, tribes, people who live out in the forest or wetlands or rivers, people from indigenous cultures
age groups	kindergarden pupils, children, everyone under six years old, third and fourth graders, class six, school students/kids, university students, youth, adults, last two generations, this generation, all age groups,
persons with personal relations	family, your child, my child, own children, grandfather, grandmother, parents, father, boss, friends, colleague, neighbor

Table 3 (continued): Identified stakeholder groups and subgroups mentioned by interview respondents.

Group name	Mentioned persons, groups and institutions
other	stakeholder, volunteer, people that are looking for change, practitioners, workers, media, tourists
NGOs	civil society organization, education organization, research association, WWF, WWOOF
food consumers	people consuming, vegans
gender groups	woman, girl, boy
hierarchical groups	power domain, decision-making domain, decision makers, elitist
food producers	people that make that food happen, people that are behind this, people that grow the food, big/smaller producers
health institutions	cancer institute, health fund

GCE issues related to the participating learners can be found in daily life issues, issues on mutual understand and exchange and in issues on global justice. **Daily life issues** referred to by the respondents refer to who has access to gardens, *"for example university botany garden is not open for citizens"* (R5) and to the topic of *"who produced [the food]?"* (R4). **Issues regarding mutual understanding and exchange** also involve food. Especially cultural aspects are of interest to the respondents like the *"strong philosophic or religious background to […] production of food [in India]"* (R7), the *"huge bottom of the pyramid who can only survive by eating non-vegetarian [in Africa or India]"* (R5) and *"different food choices [in different cultures within the same country in India]"* (R4). Moreover, respondents consider the knowledge of persons in certain places *like "indigenous cultures in mountain landscapes"* (R7) because *"mountains […] have a potential for humans to adapt human needs to the landscape"* (R7). *"[Talking] about geography"* (R5) can help to get to know *"why certain plants are doing well and certain plants are not doing well"* (R5). *"When we talk about gardening, everything becomes the same [for different economic backgrounds of people in the same place]"* (R1). Understanding other cultures is possible in the same country *by "integrating, in this case for example, refugees"* (R7) and also when *"people come from different countries […] because people can see from a different perspective"* (R4). Discussions are also possible on gender. *"A girl should get more, or a boy should get more? Of the product. Or within the process. Whose labor should be respected, would still become a question"* (R5). Gender issues are also seen as **global justice issues**, which are not seen to be the same everywhere. When *"collaborating with other countries […], then other aspects, like gender issues, come up"* (R7). Also, power relations play a role with global justice, for example when there is the *interest "to copy the west and become multi-industrial, farmers [are pushed] out"* (R1). Further, socio-economic groups play a role here, when looking at *"the ability that poor people, without resources, have to access to land"* (R7).

5.2.   Where can exchange about Ecosystem Services happen?
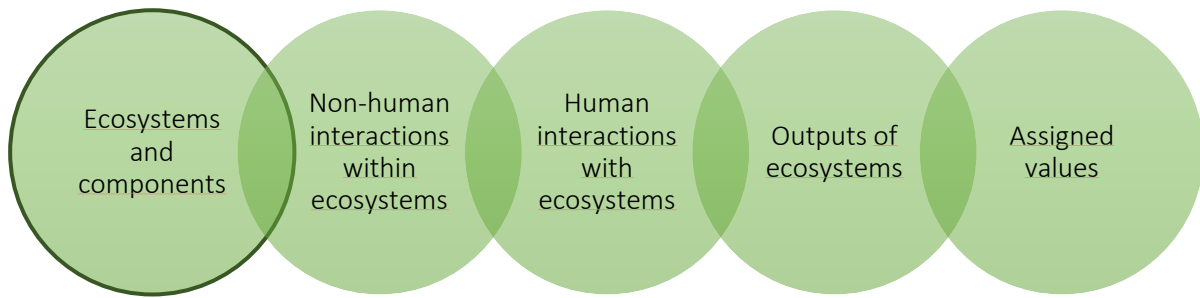
Figure 5: The Ecosystem Service Communication Model with focus on ecosystems, which include ecosystems of all scales.

When looking at places to learn (Siebert 2010), nature opens up a range of chances that can't be toughed in the classroom (Bolay & Reichle 2007). The ECM starts with the identification of environments, because what is realized and described by humans as an ES depends on the context and environment a person refers to (figure 5). Environments can be referred to at different scales, from microscopic to global, and can be related to atmospheric, marine and terrestrial surroundings (cf. Hein et al. 2006). Thus, studies on ES exist on numerous environments, including gardens (e.g.Calvet-Mir et al. 2012, Mohri et al. 2013) as well as urban areas (e.g. Niemela et al. 2010, Gómez-Baggethun & Barton 2013, Luederitz et al. 2015, Riechers et al. 2016) and explicitly, urban gardens (e.g. Cabral et al. 2017). GCE can take place in botanical gardens (Hethke et al. 2010), 'intercultural' gardens (Fleck 2013) and school gardens (Oxfam 2015).

Interviewees mentioned a range of spatial and social agricultural ecosystem types (table 4). The smallest one mentioned is growing plants in a *"pot"* (R4, R6) at home, while the supposedly largest ones are *"urban agriculture"* (R3), *"CSA"* (Community Supported Agriculture, R7), *"projects, involving […] local farming"* (R7), *"crop land"* (R6), *"land"* (R4, R5, R7) *"farm"* (R4) and *"community farm"* (R4). Within the social context the garden types included private and public types of gardens that are either located at *"home"* (R1, R2, R4) or more *"public"* (R6) places like *"school gardens"* (R5), *"community garden"* (R3), *"urban garden"* (R6), *"community supported agriculture"* (R7) and *"community farm"* (R4). For some of the identified garden types, no such ascription is possible. While there are 24 garden types with different attributes named, it is sometimes simply referred to *"space that you can grow in"* (R4), *"where the food is coming from"* (R6, R7), *"where it grew"* (R4) and least specific *"green around*" (R6). In context with gardening, the "global" (R1, R4, R5, R7) as well as the "local" (R1, R2, R3, R4, R5, R7) levels are mentioned, and also "the environment" (R3, R4, R5, R6, R7).

Table 4: Agricultural ecosystem types mentioned by interviewees.

	rather small	**rather big**
rather private	pots of plants, small plot with gardening, small garden, terrace garden, rooftop garden, balcony garden, back yard garden, front yard garden, kitchen garden, gardens around old colonial homes	urban agriculture, crop land, farm, farming project
rather public	public garden, school garden, community garden, urban garden	community supported agriculture, community farm
unspecific	garden, land, green around, space that you can grow in, where it grew, where the food comes from, seed project, tree walk	

Gardens are seen as a spaces for **exchange, where issues** on climate change can be elaborated on, and where personal exchange can happen. *"Gardens can provide you a great laboratory, lab to actually potentially observe what is happening as an impact of climate change in your city. Is the product coming earlier is the product coming later? Usually, this information is available with farmers. But that could be still available within citizens and yourself, as you experiential learning"* (R5). Moreover, exchange can happen *"on forming more community gardens"* (R4) and *"about what are the other problems which are faced [in community gardens]"* (R1). **Mutual understanding** can be based on agreeing on argumentations about specific garden types. *"There were a lot of case studies […] about what is happening in Kigali, Rwanda, or what is happening in Colombia, what is happening in Cuba. And in certain parts of Africa, including Cairo. That kind of mutual understanding really helped us also build a stronger case about rooftop vegetable gardening for our city"* (R3). When looking at place from a **global justice** point of view, *"the ability that poor people, without resources, have to access to land"* (R7) and *"farmland becoming smaller"* (R1) are issues. Moreover, policies play a role, which can be in use in one place but have effects in another place. *"For example, India used to produce all of its own oils until a few years ago. But now it imports most of its oil. Because some other country has huge subsidies on the production of oil"* (R4). **Daily life issues** come up, especially when looking at *"[local] production and consumption cycles"* (R2).

5.3.   For what purpose have cross-cultural exchange about Ecosystem Services?
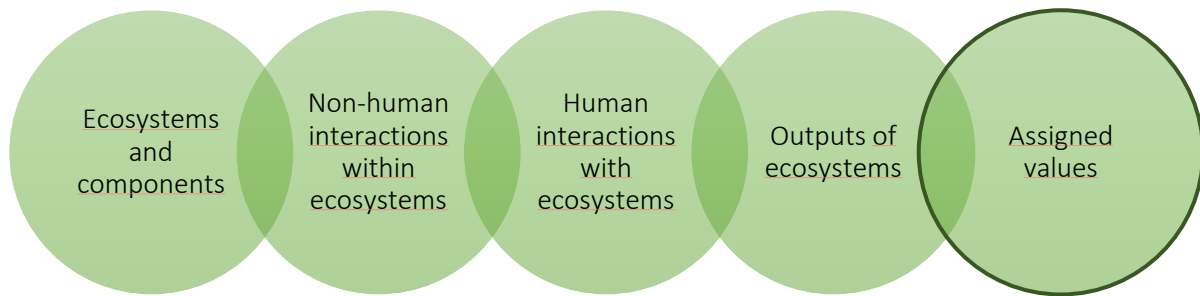
Figure 6: The Ecosystem Service Communication Model with focus on assigned values, which include all possible kinds of values assigned to the other steps by individuals or groups.

There are different situations with different purposes and aims in which learnings are applicable (Siebert 2010). From a practical perspective, environment-based pedagogy is intended to foster global knowledge, job perspective and skills (Bolay & Reichle 2007). Here, it is looked at cross-cultural knowledge exchange and collaboration with a focus on valuation. Valuation on ES includes judgement (Jax et al. 2013) and reference to their importance and meanings (Saarikoski et al. 2015). Values can indicate relative importance, e.g. with monetary valuation or they can represent underlying ideals and emotions like bravery, freedom, happiness or beauty (Brown 1984). In GCE, learners should be able to develop values and reflect on them (APCEIU 2018). Within critical GCE, also alternative notions of what is valuable are considered (Sant et al. 2018). Especially in Ecopedagogy, biocentric perspectives and valuing of nature are included (Misiaszek 2016).

In the context of education in gardens the interviewees made 64 evaluative statements. A list of the statements, including the phrases which indicated value ascription can be found in appendix 3. The statements did not only refer to ES as final outputs of ecosystems but also to the other steps within the ESCM (figure 6, figure 7).
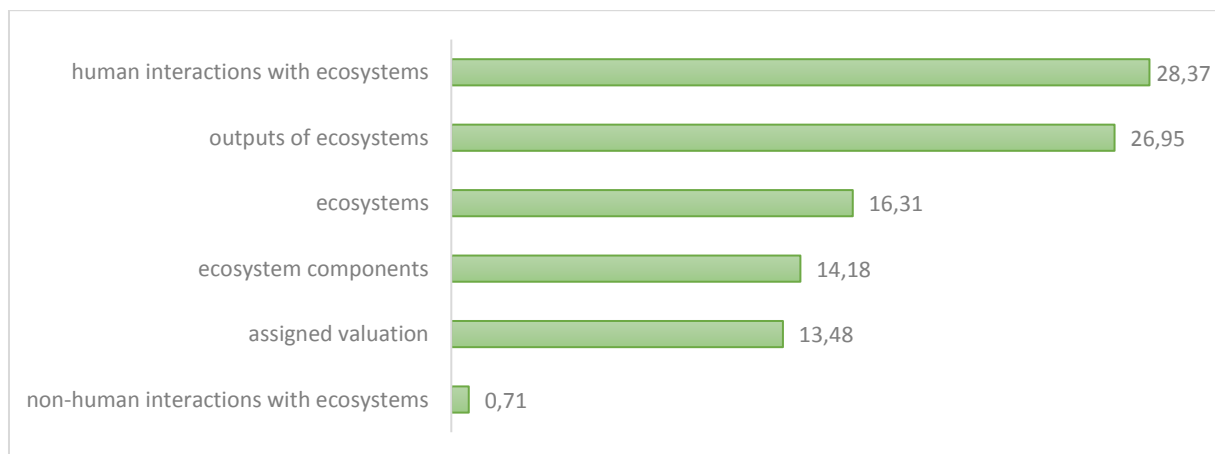
Figure 7: Evaluative statements sorted by assigned Ecosystem Service Communication Model steps. Numbers show the percentage of incidence. When appropriate, statements were assigned to several steps.

Statements with a specific kind of value mentioned where set as "assigned valuation". Those include "sustainability" as a value (R4, R6, R7), 'non-economic' value (R1, R5), "nutritional value" (R4), 'production' value (R6), "culture and heritage value" (R6) and "recreational value" (R5).

Food is the most popular aspect when looking at values of gardening from an educational perspective. For example, it is seen as *"a good insight if you know all the processes that lead to a food product that you eat"* (R2), and it is hoped that *"by doing farming, people will realize what it takes for vegetables, at least greens, to grow"* (R3). At the same time, *"they become to realize how difficult it is for food … to supply the world"* (R6) and *"understand the value, that if you are wasting something, how much time it has really took to produce one tomato or four tomatoes"* (R5). However, it is acknowledged that *"money does not teach you how to value goods. Or natural ecosystem services"* (R5). Gardening is highly valued, too, *"because you do become self-aware of what am I doing and how important this is and what impact it is having"* (R7), it is seen as *"one of the best ways, to effect sustainability"* (R4) and because *"interest in science that develops if children do gardening"* (R3).

One respondent specifically mentioned valuation in context with **exchange** and suggests *"a values clarification and value education lecture" "[where] you can actually have a discussion and debate around […] how the production [from the garden] should be distributed?' and 'what is the social justice here, in terms of distributing production?' […] You can take it from even gender point of view. That, is it: 'A girl should get more, or a boy should get more?' Of the product. Or within the process. Whose labor should be respected, would still become a question. Who did what, also can become question, that: 'Is it only the physically strong boys that do the work, girls who do the work?'"* (R5).

5.4. How to facilitate cross-cultural knowledge on Ecosystem Services in gardens?
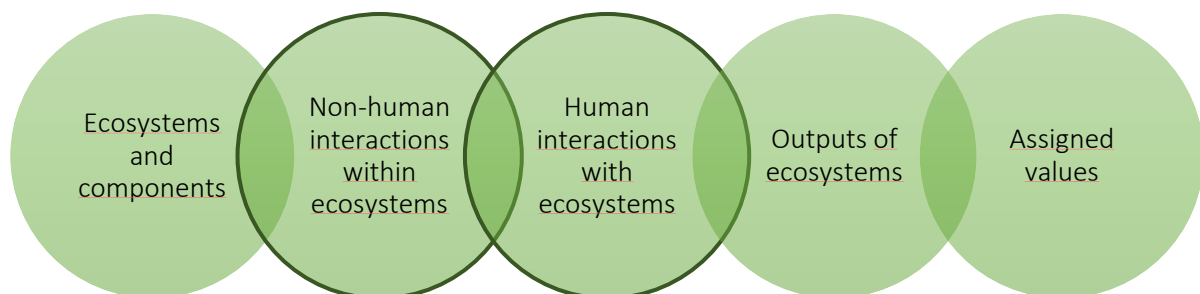
Figure 8: The Ecosystem Service Communication Model with focus on non-human, human and mixed types of interactions.

How learning and knowledge exchange can occur is a matter of learning methods and techniques (Siebert 2010), which can be cooperative and creative, especially in natural learning environments (Bolay & Reichle 2007). Here, it is looked at both, human and non-human interactions as learning

activities (figure 8). In NRM, one requirement is to understand the flows of resources which happen by interactions (Keen & Mahanty 2006). Stakeholders interact and benefit from ES (Potschin & Haines-Young 2011), and they can be involved in the identification of ES (Luederitz et al. 2015). Learning systems are not only made up of individuals interacting with each other, but also of individuals who interact with elements of the biological and physical environment (Krasny et al. 2013). In GCE habits, personal experience and action are learning concerns (Misiaszek 2016, Bridge 47 n.d.) which can happen by behavioral learning (UNESCO 2015) trough enjoyable methods (Bridge 47 n.d.).

Human interactions with gardening ecosystems include "gardening" (R1, R2, R3, R4, R5, R6, R7), "growing" (R1, R2, R3, R4, R6, R7), "watering" (R1, R3, R4, R6), "composting" (R1, R3, R4), "harvesting" (R2, R4, R7), "planting" (R6, R7), "seed breeding" (R5), "plaguing" (R7) and "seed saving" (R1) (figure 9).

Figure 9: Gardening activities mentioned by the interview respondents. Hand icon CC M. Courey.

Non-human interactions in gardens are necessary for those ecosystems to exist. Those can be used as another set of issues for knowledge exchange. The interviewees mentioned issues around the 'nutrient cycle'. *"Nature is all about loops. How do plants feed into the other"* (R4), *"the plant grows, you eat the vegetables, it again goes back to the soil"* (R1). That is why *"if I eat for example a banana, that has grown five hundred kilometers from here, the banana peel was supposed to go back where it grew. [...] There is some sort of a nutrient loss happening in the soil, where it was growing"* (R4). *"The more local the food is, the waste generated from it, also goes back into the same system. The waste generated*

from my kitchen garden in my own house, consumed in the kitchen, whatever is left over, goes back as a composting to my own garden" (R4). Connected to the nutrient cycle is also to *"grow a plant and find that it also sometimes dies"* (R6). Another non-human interaction is evapotranspiration by plants. *"Decrease in the room temperature"* (R3) can be found *"because you are watering the plants up there and it has a cooling effect on the roofs"* (R3). *"Rooftop vegetable gardens also sort of help slowing down during heavy rains, the inflow water into your rainwater harvesting pit"* (R3). As an Ecosystem Disservice, gardens need to be watered *"because there is not enough rain"* (R1) and *"if you do not water your garden when you go for a holiday, it will die"* (R6). On the other hand, there is the non-human interaction of *"rain"* (R3). Furthermore, pollination plays a role in *"using seeds which are open pollinated"* (R1) from the garden. Another non-human interaction that is happening are moving birds that can be seen as indicators for the land use type. *"We had both birds which move through the township, urban birds, and we had birds, which came for the crops"* (R6).

5.5.   With what exchange about Ecosystem Services in gardening context?
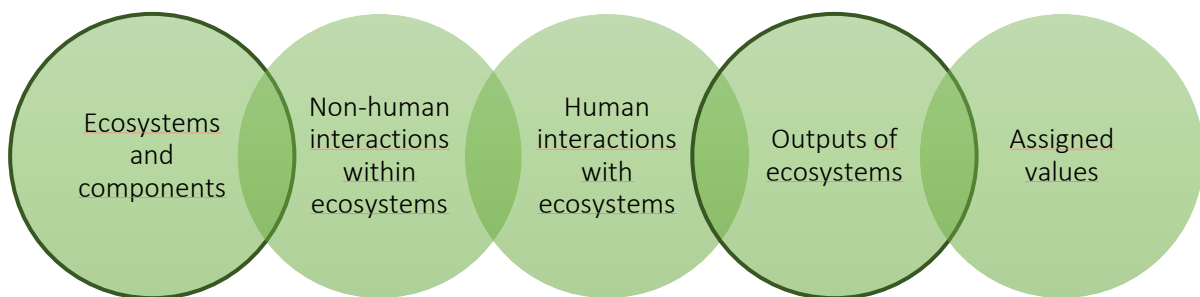
Figure 10: The Ecosystem Service Communication Model with focus on ecosystem components and outputs. Included are ecosystems of all scales, their biotic (organic) and abiotic (inorganic) components and their composition, and outputs of ecosystems, which can be material or immaterial and are derived trough non-human and human interactions with ecosystems.

Different media and resources can be used for learning (Siebert 2010), in nature-based pedagogy natural materials are incorporated (Bolay & Reichle 2007). Garden components as well as outputs of gardening ecosystems are such natural materials (figure 10). In ES assessments, the identification of components should be based on local knowledge (Luederitz et al. 2015), and goods and experiences gained by the ecosystem should be described at a level where people can most easily relate them to themselves (Chan et al. 2012a). Many goods derived from ecosystems can be related to education and culture (Saarikoski et al. 2016) and to issues of distributive justice (Jax. et al. 2013), thus they are of relevance to GCE. In GCE, distributive justice refers to the principle by which resources and goods are allocated within society (Sant et al. 2018) and also to access to resources (Diallo 2018). Moreover,

biological resources and biodiversity are issues related to sustainability within GCE (Menzel 2010, UNESCO 2015, APCEIU 2018).

The abiotic components named by the interviewees with gardening are "water" (R1, R3, R4, R6), "soil" (R1, R4, R7) and "air" (R7). Moreover, 17 biotic components are mentioned by the respondents. The types of fauna mentioned are "pests" (R1) and "birds" (R6), while there was a range of flora types, some less specific called "plants" (R1, R3, R4, R7) and "seeds" (R1, R5, R7), some still vague, "vegetables" (R1, R3, R4, R7) , "trees" (R4, R5, R6), "flowers" (R1, R6), "crops" (R5, R6), "greens" (R3, R4), "edible plants" (R4), "herbs" (R4), "pulses" (R4), "cereals" (R4) and few rather specific "tomatoes" (R4, R5), "rice" ((R4), and "wheat" (R4). "Biodiversity" (R5, R6) was also mentioned. An overview of the components is given in figure 11.
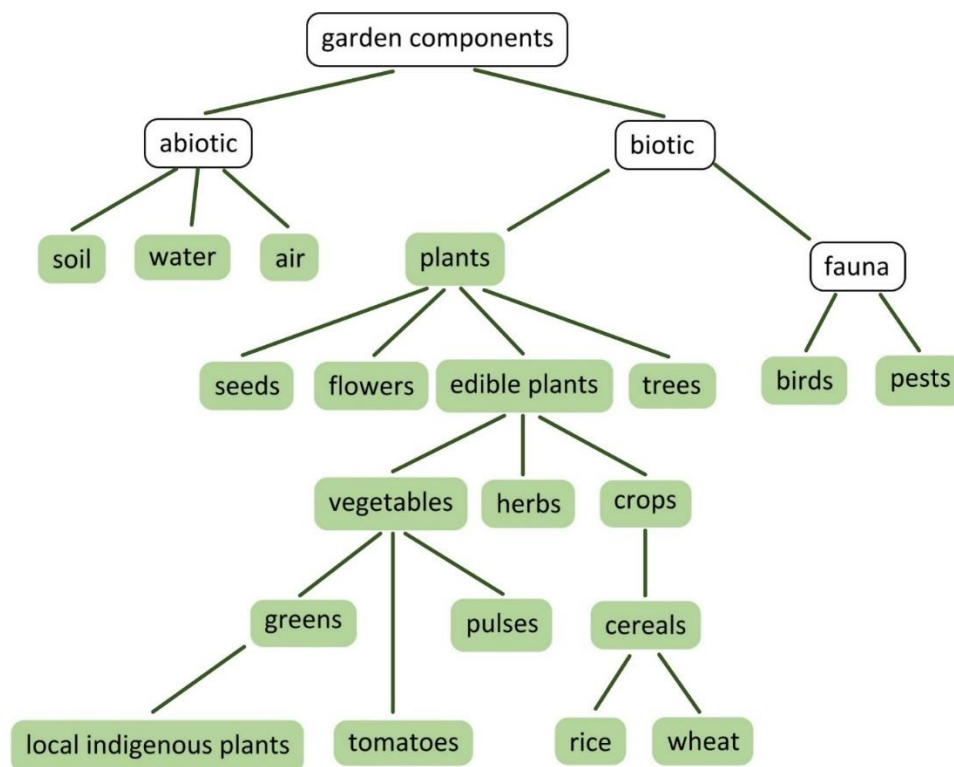
Figure 11: Components of garden ecosystems named by the interview respondents. Green color indicates the components which were directly mentioned.

Material outputs from ecosystems named are "food" (R1, R2, R3, R4, R5, R6, R7) and "products" (R2, R7) and "waste" (R1, R2, R3, R4). The immaterial outputs from gardening ecosystems comprise mainly cultural achievements like "peace of mind" (R7), "sense of attachment" (R5, R7), "stress reliefer" (R5), 'knowledge' (R1, R2, R3, R4, R5, R6), 'awareness' (R1, R3, R4, R5, R6, R7) and 'social skills' (R3, R7). Codings of those outputs can be found in table 5.

Table 5: Immaterial outputs from gardening listed by codings.

Theme or action	Codings
Awareness by…	
composting	realizing about composting
growing	realizing what it takes to grow vegetables
	learning about growing brings interest
	realizing about manure and composting by growing
	realize the burden of growing food on limited amount of land
gardening	mindset change by gardening
	interest in science by gardening
	going through process of self-awareness by gardening
	self-awareness about own actions by gardening
	becoming sensitized to sustainability by gardening
	realizing about composting trough gardening
	realizing about connections to the environment by gardening
	awareness about the environment by gardening
	popularize gardening by working in schools
	beginning an inquiry by gardening
	being conscious about detergents by gardening
planting	changing perspective on planting
food	realize how difficult it is for food to supply the world
	local awareness about food spreading into global awareness
	getting more aware where the food is coming from
	taking into consideration where the food is coming from
	looking at food from a different angle
	reflecting globalization by what you are getting in your plate
Gaining knowledge by…	
gardens	knowing where the water goes in gardens
	learning about setting up gardens
	educating on biodiversity in gardens
	sharing practices in farming
gardening	learning from gardening failure
	learning gardening
	learning from teaching gardening
	learning about the local environment by gardening
	having a learning from a gardening project
growing	learning about growing brings interest
composting	understand waste management by composting
food	know all the processes that lead to a food product
	know where the food comes from
	understanding the entire food chain
	understanding global and local by consumption patterns and economic disparity on food

Table 5 (continued): Immaterial outputs from gardening ecosystems listed by codings.

Theme or action	Codings
Social skills by…	
gardening	social resilience by gardening
	social skills by gardening
	civic and social responsibility by gardening
composting	civic and social conciousness by composting

Ecosystem components and ouputs in gardens provide a wide range of issues on global justice, daily life, exchange and mutual understanding. The components and outputs mentioned with **global justice** comprise climate, weather, water, resources, food and knowledge. When looking at **daily life issues** water, food and waste come up. Climate, weather, food, soil and seeds are seen as suitable for **mutual understanding and exchange**. Table 6 gives an overview of those components and outputs along with interviewee statements. In general, destruction and homogenization of *"cultural traditional knowledge [which] is linked to people who life out in forests or wetlands or rivers and are highly dependent on natural resources around them"* (R6) is mentioned as an issue of **global justice**.

Table 6: Components and outputs, with interviewee statements and the Global Citizenship Education issues in which context they were mentioned.

Component or output	Interviewee statements	issue
climate	Because of subsidies *"it is cheaper to import oil than to produce our own. This impacts everything else […], because food travels a lot more, carbon footprint…"* (R4).	global justice
climate	*"I think, in Germany, maybe Europe, there is more […] studies about climate change"* (R1).	exchange
weather	*"An extreme weather event has impact on […] the base upon which [farmers] earn their money, their livelihood"* (R2).	global justice
weather	In gardens you can talk about *"weather impacts, how your garden survive, what kinds of pests are coming in"* (R5).	exchange
water	*"Our [global justice] issue is very local. It depends on availability of local resources like water"* (R3).	global justice
water	*"The most important thing that we have in life, after breathing. First, you breathe and then you stay alive and after this comes water and food"* (R7).	daily life
soil and seeds	*"From an interdisciplinary point of view of […] soil sciences […], seed breeders and germinations"* (R5) come up.	exchange
food	*"If you take origin of chili as a seed. […] We never talk about the history of seeds"* (R5).	exchange
food	*"Different food choices [from people in different parts of the country]"* (R4).	mutual understanding
food	*"Some schools are […] using what they are growing for the midday meal scheme"* (R3).	daily life

Table 6 (continued): Components and outputs, with interviewee statements and the Global Citizenship issues in which context they were mentioned

Component or output	Interviewee statements	issue
food	*"Everybody cooks food and what do they do with the kitchen waste?" "Then it would be the composting"* (R1).	daily life
waste	*"Composting is a big one, but that is just one aspect of it. We also generate a lot of other waste. Plastic, paper, cardboard. […] When you go to supermarket, do you carry your own bag? Or do you get a plastic bag to carry the stuff? These are the examples, daily examples, which people need to get conscious about."* (R4).	daily life
waste	*"segregating […] the compost, the kitchen waste, paper, your plastic"* (R1).	daily life
waste	*"We are trying […] through the parks, educate our citizens about composting"* (R3).	daily life

5.6. Personal knowledge exchange on Ecosystem Services in Gardens: the 'Tricky Landscape'

According to all of the interviewees, personal exchange can happen in gardens by gardening and growing and also on food as an output of gardening ecosystems. Table 7 gives an overview of the codings on personal interactions.

Cross-cultural exchange, for one interview respondent *"is not about to see what we agree on, but what we do not agree on. That can be tricky landscape to travel, but that is the interesting part, because then you get new ideas and you get new perspectives and... A lot of times, [...] from my own experiences, I have learned a lot precisely because of the differences with other cultures."* (R7). Here, the 'tricky landscape' (figure 12) gives an overview of interviewee statements which were ascribed to the ESCM steps. It comes with a table with corresponding figures. Those figures show with which frequency aspects were mentioned by the respondents. Higher frequencies are represented as elevations within the 'tricky landscape'. Those mountains grow taller when aspects are mentioned more often and by several respondents.

Table 7: Personal exchange in gardens listed by codings.

Theme or action	Codings
garden	working with other people in the garden
	using gardens in schools
	training teachers how to set up gardens
	talking about biodiversity in gardens
	supporting farmers to create seed banks
gardening	interacting with other people through gardening
	involving schools and students in gardening
	shift from elitist behaviour by gardening
	sharing practices in farming
	doing a workshop on how to get started with gardening
	people coming to workshops to start gardening
	asking questions about the environment trough gardening
	asking fopr help with gardening
	asking about garening
	teaching gardening
	discussing with stakeholders on gardening
	working with schools to popularize gardening
	no gardening: disconnecting from people who are planting, plagueing, harvesting, who obtain the seeds and make the food happen
	impacting another person by gardening
growing	talking about growing vegetables
	interacting with children trough growing vegetables
food	knowing people who grow the food
	doing a workshop about edible plants
	asking children what they eat
	talking baout food
	doing national level public consultations on the introduction of genetic modiefied crops

Table 7: Personal exchange in gardens listed by codings.

Findings
- Personal knowledge exchange on Ecosystem Services in Gardens: the 'Tricky Landscape'

	ecosystems	components	non-hum. i.	hum. i.	outputs	valuation
GARDENS	11	6	1	15	10	1
ENVIRONMENT	10	4	0	9	6	4
LOCAL	10	2	0	7	7	1
HOME	7	1	0	4	3	0
GLOBAL	4	0	0	2	3	1
PLANTS	5	23	4	15	16	4
WATER	5	8	2	7	3	2
SOIL	2	5	2	3	3	0
SEEDS	1	4	1	3	3	2
AIR	1	1	0	1	0	1
PESTS	1	1	0	0	1	0
BIRDS	0	1	1	0	0	0
NUTRIENT LOOP	0	5	6	5	4	0
WATER CYCLE	2	4	5	4	1	0
POLLINATION	0	1	1	0	0	0
GARDENING	14	7	2	42	33	5
GROWING	10	13	2	31	24	1
COMPOSTING	4	2	3	10	9	0
WATERING	4	7	2	8	1	1
SEED SAVING	2	3	0	1	2	1
PLANTING	1	2	0	2	1	0
HARVESTING	0	0	0	2	1	1
FOOD WASTING	0	1	1	0	0	0
FOOD	13	13	2	20	26	7
AWARENESS	10	4	3	17	22	1
KNOWLEDGE	6	2	1	10	12	0
WASTE	6	1	0	11	13	0
SOCIAL SKILLS	1	1	0	5	5	2
PRODUCTS	0	0	0	1	2	2
SENSE OF ATTACHMENT	1	0	0	1	2	0
PEST CONTROL	1	1	0	0	1	0
STRESS RELIEF	1	0	0	1	1	0
PEACE OF MIND	0	0	0	1	1	0
SUSTAINABILITY AS VALUE	0	0	0	4	5	5
NON-ECONOMIC VALUE	0	1	0	1	2	2
PRODUCTION VALUE	0	1	0	1	1	1
CULTUR & HERITAGE VALUE	1	0	0	0	0	1
NUTRITIONAL VALUE	0	0	0	1	0	1
RECREATIONAL VALUE	1	0	0	0	0	1
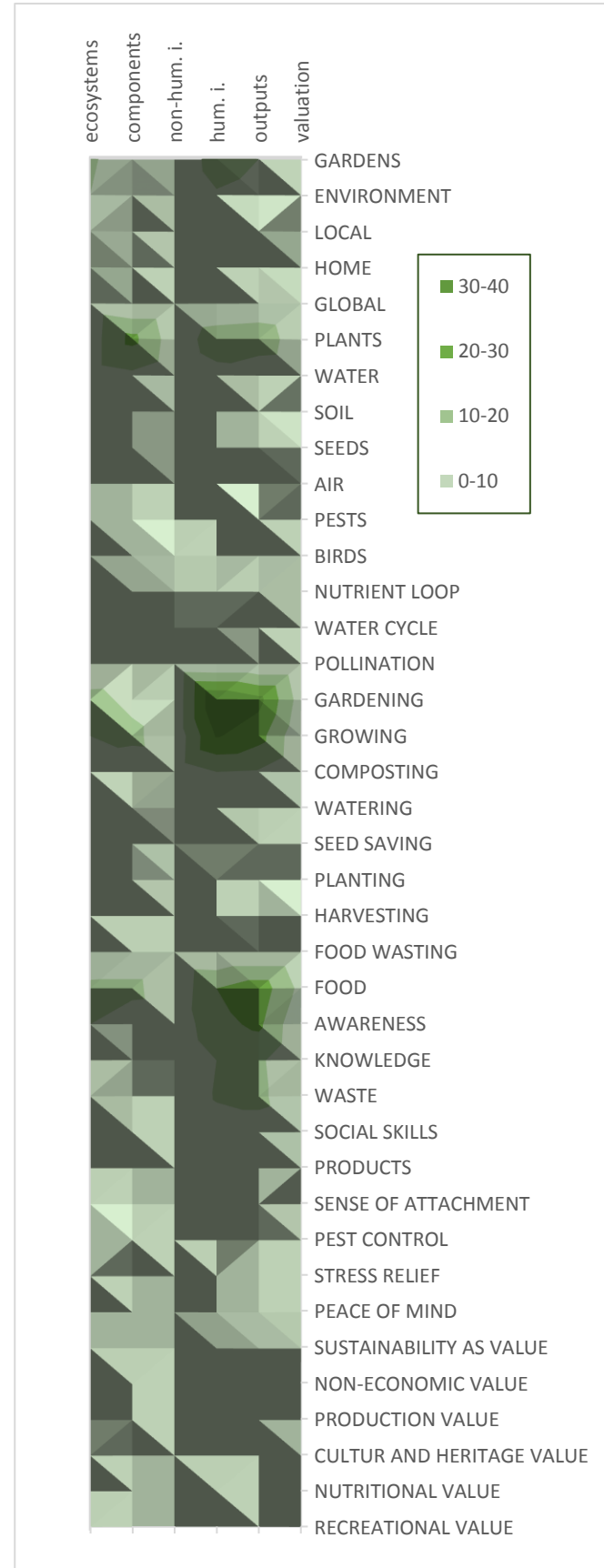
Figure 12: The 'tricky landscape' shows the ascription of Ecosystem Service Communication Model steps to themes mentioned by the interview respondents. Some of the statements include several themes. Colors resemble frequency of the mentioned themes. Abbreviations: 'non-hum. i.' = non-human interactions, 'hum. i.' = human interactions.

6. Limitations and Discussion

In the following paragraphs the identified normative orientation, learners, places, values, methods, materials and contents possible within gardens will be contextualized with the ES concept and GCE. The lens of ES in the form of the ESCM was applied to the interview data after the interviews were taken. This procedure led to the necessity to exclude two question from the guideline (Q7, Q8). Furthermore, the connection of the interview contents with the ESCM had to be compiled with the help of the literature analysis. However, the advantage of this research method might be that statements by the respondents were not biased by presuppositions. By combining the ECSM and the approach of GCE, the 'tricky landscape' was developed. It visualizes certain aspects of cross-cultural knowledge exchange in gardens and the degree of agreement by the respondents on them. Within the landscape, peaks resemble similarities and points in common. Metaphorically, those peaks can be seen as look-outs from which it is possible to find a path through the confusing plain which is populated with little hills, ravines and craters of differences. This idea was the basis for the following discussion. To identify limitation in the findings from more diverse backgrounds, statements by the interviewees, which are considered meta-level by the author, are included in the discussion. Even though interviewee quotes could not be included at an equal amount, it was tried to consider all the mentioned perspectives.

6.1. Sustainability as a Normative Orientation in Ecosystem Service Projects and Global Citizenship Education

As mentioned in the introduction (cf. chap. 1.1.), normative orientation on the purpose of education on sustainability is derived from the Agenda 2030 and the SDGs. However, the issue of sustainability and especially sustainable development should be treated carefully. This was highlighted by one respondent who stated that "*anything which gets qualified as sustainability… also starts becoming an institution in itself. Any institution can be exclusionary in its perspective*" (R5). Moreover, this is supported by the literature. Misiaszek (2016) argues that there should be careful consideration on how and by whom sustainable development is defined and who benefits from it. Sant et al. (2018) criticize that a western-centric perspective is laying behind the idea of sustainable development and suggest that it should rather be a decolonizing process. In a similar vein, Misiaszek (2016) argues that socio-environmental oppressions must be overcome to achieve it. For cross-cultural knowledge exchange this means that power relations need to be realized first to enable learners to do so. At the personal level, self-reflection, which is also an GCE competency (UNESCO 2015, Schwartz et al. 2016) might be helpful for this realization. Although, two questions from the interview guideline would have allowed

a more detailed insight in this topic, they had to be excluded for reasons of practicability of the analysis procedure. The identification of power relations on a personal level is a sensitive issue and it might be more viable to identifying structural power relations, e.g. at an institutional scale.

This work tried to incorporate respondents in an equal way. For this purpose, the unit of analysis in MAXQDA was set at 'per document', and not 'per segment', which means that the program was counting statements within a full interview transcript document and not within the coded parts of it. The idea behind this was to consider interviewee statements independent of their length/how much respondents were talking.

It is an acknowledged limitation of this work that it was not possible to get rid of power relations within the research process. Therefore, it is recommended for future studies to apply more participative methods such as member checking or action research (cf. Creswell 2012).

In general, GCE builds on different normative goals (table 8). To be clearer about the purpose of GCE in gardens, specific ascription to certain conceptions would be needed. It is acknowledged that in this work, not all conceptions are considered equally and that ascription would need further analysis of the data.

Table 8: Typology of Global Citizenship Education and the respective normative goals by Oxley & Morris (2013, in Yemini 2017).

Cosmopolitan global citizenship

political global citizenship	changing relations between states and individuals or other polities
moral global citizenship	human rights and empathy
economic global citizenship	power relations, forms of capital, the work force, and international development
cultural global citizenship	symbols and cultural structures that divide or unite members of different societies

Advocacy global citizenship

social global citizenship	global civil society and advocacy for 'the people`s voice' even when those people are abroad in other parts of the world
critical global citizenship	inequality and oppression, critiquing the role current power relations and economic agendas play in these issues through a post-colonial agenda
environmental global citizenship	environmental sustainability and preservation through striving to change the negative impacts of humanity on the environment
spiritual global citizenship	connections between humans based on spiritual aspects including religion

6.2. Learners in Ecosystem Service Projects and Global Citizenship Education

When different stakeholders work together, collaborative learning takes place by recognizing different subjective perspectives and mutual dependence between different social groups in society (Carmen et al. 2018). Though, it should be considered that persons can carry several identities. This is acknowledged in GCE by Sant et al. (2018) and also in NRM by Armitage et al. (2008). One person can be ascribed to several stakeholder groups. Also, according to one respondent, when talking about differences and mutuality, it is important to define *"who's mutuality we are talking about here. Are we talking about mutuality of academicians, practitioners, the lower strata people, the elite of this country, or that country...?"* (R5). Cultural identity does not only account for differences and similarities, it also influences the values ascribed to ES (Chan et al. 2012a). As a consequence, the ascription of values is a complex process, but on the other hand this allows to address stakeholders within more general groups like 'food consumers'. This way, a wide range of society might be involved in cross-cultural exchange activities. In this work, several groups of stakeholders/learners could be identified (cf. table 3). In the following part of discussion, the relevance of those groups within cross-cultural exchange about ES is described.

In NRM, it is seen as potential strength when groups from different vertical (local, regional, national) **geographic scales** are linked (Armitage et al. 2008). Also, in Ecopedagogy it is acknowledged that socio-environmental issues are transcending physical distances, and this helps to learn about perspectives that are different from our own (Misiaszek 2015). In the interviews, respondents from India and Germany showed different perspectives on the awareness of sustainability in the respective other country. While a respondent from India stated that *"the Indian mindset is still not very sensitized towards sustainability. Usually people who are coming from other countries around the world […] usually it helps to create [more] sensitization of people, because people can see from a different perspective"* (R4), a German respondent was *"really convinced that we, on the German side, can, for example, learn from the Indian practices. And vice versa. […] In [city in India] there is so many initiatives, it seems, that really push forward the SDGs and try to bring it on the policy level and I feel that Germany is lagging behind a lot in that sense"* (R2). This is only one example to show that different perspectives on certain issues exist and further research to identify issues where people from different countries disagree and what is influencing their respective perspectives is needed.

Barthel et al. (2010) see gardens as places where shared knowledge helps to form 'communities-of-practice' that enables participant to manage ES. In NRM, such learning communities are seen as groups of people with a shared interest (Armitag et al. 2008). As mentioned before, sharing of perspectives is crucial to GCE. It is assumed that a shared interest offers an opportunity for such exchange. How this could happen specifically would need practical testing and evaluation. However, **gardeners** are not

specifically mentioned in context with GCE. This might be because it is referred to "learners" more in general (cf. UNESCO 2015, APCEIU 2018) and because it is often used as an approach for school pupils (UNESCO 2015, Oxfam 2015). Therefore, please also consider the results and discussions on gardening as an activity and gardens as places.

The links and feedbacks between **societal level** and nature are essential for the ES concept (Carmen et al. 2018). Within GCE, the idea of society serves two purposes. With planetary citizenship, it relates to the greater society on a shared, planet-wide ecosystem (Misiaszek 2016, APCEIU 2018). Moreover, global justice issues like distributive justice refer to the principle by which resources and goods are distributed within society (Sant et al. 2018). This shows, that everybody might be considered a learner in GCE and that the approach results of this work might be applicable to diverse societal groups.

According to literature references, GCE is directed at **educational groups and age groups** from pre-primary to upper secondary (UNESCO 2015) and also at adults (Davies et al. 2018). For application of cross-cultural knowlede exchange in gardens, all of them can be considered. In NRM and ES assessments, adults are involved traditionally. However, in ES literature, especially children and youth are seen as benefiters from cultural and recreational ES through environmental education, social and motoric development and reengagement with nature (Riechers et al. 2016). Youth can also be included in a more practical way within NRM. Civic ecology practices and youth participation in urban planning are emerging as an important trend in urban environmental education (Krasny et al. 2013). The analysis in this work can be a contribution in offering specific settings and methods for such education.

According to Jax et al. (2013) and Riechers et al. (2016) **governmental bodies** and politics that incorporate the ES concept in management should work together with other stakeholders. Complementary, in GCE, learners should get to know about their political rights (APCEIU 2018) and the possibilities to politically participate are an issue of participatory justice (Sant et al. 2018). In this respect, further research might explore how feasible it is to either incorporate gardeners into urban level policy making on ES and how citizens knowledge about ES can be involved in the planning of gardens.

GCE wants enable learners participate in a globalized economy (Oxfam 2015) and to gain a deeper understanding on economic systems (Misiaszek 2016). Thus, **economy related groups** are important stakeholders to look at. Understanding economics is also necessary for ES valuation (Kumar & Kumar 2008) even though for awareness rising on the concept, there is no need to quantify ES in economic terms (Jax et al. 2013). Still, the influence of economic contents-based education on value ascription of gardening ES could be interesting to look at.

Cultural groups mentioned by the interviewees are religions, tribal people and vegans. For the cultural group of vegans please consider the section on food producers and consumers. Within the conception of ES, it is recognized that different religions attach different spiritual values to ecosystems (Saarikoski

et al. 2016). In GCE, understanding of different religions is part of understanding the global dimensions of citizenship and how beliefs influence people's view about those who are different (UNESCO 2015). Traditional ecological knowledge, e.g. of tribal people, can contribute to the social-ecological memory that enables communities to manage ES (Barthel et al. 2010). The inclusion of traditional ecological and indigenous knowledge in GCE helps to challenge dominant worldviews, to tackle colonialism and to take into account knowledge which is in opposition to western and scientific conceptions of knowledge (Sant et al. 2018). The interview respondents set attention to the reflection of the influence of the cultural background on cross-cultural exchange. *"The Western or European perspective has to be very, very different from"* [the Indian perspective] (R6). Though, *"there is so much of knowledge around the world … that we can only cover up by connecting different cultures, … and learning from each other"* (R4). This requires to *"to be able to understand other cultures, to understand how they see […] problems from their backgrounds and then find common points"* (R7). This idea is reflected in the 'tricky landscape' (cf. chap. 6.8.).

Within GCE **relations to other persons** are resembled in global challenges: For investigating the relationship between local and global level, global issues within close reality, within the family, the neighborhood or the school need to be considered (Carvalho da Silva et al. 2012). Real life issues can come in easily when interacting with family and friends. Later the experiences taken from those interactions provide learning content within GCE (cf. Oxfam 2015, APCEIU 2018). The naming of other persons, with which the respondents have personal relations, supports the assumption that knowledge exchange on ES can happen at a daily basis. Different cultural background is no precondition for it. Still, other findings in this work support the relevance and benefit from cross-cultural exchange. Cultural ES do not only depend on the natural conditions but also on human and social capital which involves the network of family and friends (Costanza et al. 2018).

Next to social capital, economic capital can be a restriction for learning in NRM (Armitage et al. 2018). Thus, attention should be payed to **socio-economic groups**. "*Economic difference, the difference in lifestyles and the difference in language comfort*" (R6) are causing that ESD is treated differently in urban and rural schools in India. In Germany, different socio-economic groups have different levels of awareness on sustainability. To take different perspectives and also demands towards sustainability into account, those groups need to be included in knowledge exchange on ES.

NGOs come in, when stakeholder groups of NRM are linked at horizontal scales. The involvement of local organizations is seen as a potential strength here (Armitage et al. 2008). The whole approach of GCE is strengthened and refined by NGOs and civil society movements (Sant et al. 2018, Bridge 47, n.d.). Thus, they are important stakeholders in application of the ES concept in practical implementation.

One of the central ES mentioned by respondents is food. Thus, **food consumers and producers** play a

crucial role. Here, the whole production chain comes in, and with it respective stakeholders. However, because people do *"not practice gardening [they are disconnected] from the people that make that food happen"* (R7). This illustrates the relevance to connect learners not only to the natural environment of gardens, but also to practitioners that perform agricultural practices. Their ambitions and efforts might be as strange to learners as those of other cultures. Exchanging about those aspirations might enhance cross-cultural understanding. Therefore, further research is necessary on how interactions with food producers influence the valuation of food and the connected ES that are necessary for the food to grow.

Hierarchical and gender groups come in, when looking at power relations. This is an important issue in critical theory in educational research (Strunk & Locke 2019) and also within postcolonial perspectives on GCE which criticize patriarchy (Sant et al. 2018). Consequences from colonialism can be found in context with gardening. *"There was a British tradition of planting gardens around old colonial homes of the upper richer class. This was elitist, and it never triggered down to the lower socioeconomic groups. What we are trying to do today, is to shift that by saying: 'Let us have rooftop gardens or let us have small plots with gardening' and so on"* (R6). However, it seems that consequences of those unequal relations of power are less presented within the research on ES and NRM. Thus, power relations within personal exchange should be taken into consideration for future analysis.

6.3. Places for Ecosystem Service Projects and Global Citizenship Education

When looking at places at which ES projects in combination with GCE can happen, the analysis revealed several aspects that need to be considered. There are limitations as well as possibilities to use gardens as such places. Moreover, the methods applied are restricted to only a few selected analytical aspects. One limitation of the methods is, that the ESCM focuses on the bio-physical environment. However, learning in gardens is an outcome from personal interaction not only with the bio-physical environment, but also with the socio-cultural environment (Krasny et al. 2013). The analysis of this work is limited in this respect and it is acknowledged that further research on cultural systems, in which gardens are embedded, is necessary for more comprehensive insights. Moreover, only places that were mentioned together with gardening activities were considered in the analysis. This decreased the types of places that were mentioned by the respondents considerably. The evaluation of their relevance and meaning, e.g. for ES assessments would be of interest.

No attention was payed to the exact location of the gardens mentioned by the respondents and more specific inquiries would be necessary here. It is obvious that agricultural practices traditionally rather

take place in rural than in urban areas and the flow of knowledge between those places should be analyzed further.

Next to gardens, there are other places, where knowledge exchange about gardening can take place. The socio-ecological memory of persons and groups can be enhanced by external sources like magazines, books or the internet (Barthel et al. 2010). One respondent highlighted the usefulness of a *"report about what is happening in Kigali, Rwanda, or what is happening in Colombia, what is happening in Cuba. And in certain parts of Africa, including Cairo"* (R3) for exchange on gardening practices. In GCE, the internet can be taken advance of, for example when methods of digital storytelling are applied (Truong-White & McLean 2015). Even exchange on school gardens is possible with the help of the internet (Lochner 2016). Thus, the identification of new kinds of media and practices that allow for cross-cultural exchange is desirable.

There are several garden types named by the interview respondents. However, there might be specific gardens which are more suitable to bring people from different cultural backgrounds together and allow for cross-cultural exchange. For example, community and allotments gardens are places where different gardeners interact with each other (Krasny et al. 2013). Even pots of plants offer the possibility to talk about plants. *"For example, you take chili. Chili could be grown […] in a pot. Now, if you take origin of chili as a seed. It is an interesting question to pose [where chil comes from], right from yourself, to your child, to your friends, to your neighbors, to your professors"* (R5). However, identification of other places that allow for exchange on gardening is needed. With respect to NRM, especially possibilities of stakeholder involvement in ES management decisions at e.g. the urban level are of interest. This could provide further insights, as the connection between environment and gardens is acknowledged by the interviewees. Gardens are seen as places within nature. Learning about the natural environment is part of GCE (Selby 2003) and using nature as an educator helps learners to develop a feeling for sustainability (Hoffmann & Bharucha 2013). Accordingly, it is appropriate to see gardens as ecosystems, which qualify for ES assessments and also, as places that enable GCE.

Even more, gardens allow for the consideration of local and global levels. This can be derived from the fact that this thesis' respondents named different spatial levels. Furthermore, local and global levels and their connections are learning content in GCE (Andreotti 2010, Misiaszek 2015, Sant et al. 2018). Local problems are linked with global issues and contents are based at the close reality, at home, in the neighborhood or at school, but also the intermediate reality in the region or the state, and the distant reality in the global world (Carvalho da Silva et al. 2012). The concept of sustainability is an example here. According to this study's interviewees, when looking at *"a global perception of sustainability […] the two worlds are so much apart, that they have fewer commonalities than*

differences" (R6). At the same time, sustainability *"is about awareness of local issues, which then translate into regional and national and global issues"* (R6) and *"global awareness [where] they would have to know about local problems"* (R1). Tracking the same issue across those scales is one of the most important approaches in GCE (Carvalho da Silva et al. 2012). In context with the ESCM, knowledge exchange could happen about the identification and definition of service providing structures within a garden and specification of the respective boundaries (cf. Luederitz et al. 2015). Luederitz et al. (2015) argue that such description should be based on local contextual features. ES differ with varying climatic and socio-economic conditions. Especially for gardening, such conditions are of high relevance and probably lead to different intensity in interaction and different access to resources that are helpful for gardening. Even to understand the issues in a given place, different interests in the associated ES can be relevant (Potschin & Haines-Young 2011). Thus, talking about structures, conditions and interests in context of gardening could bring up cross-cultural differences and mutuality.

It was identified within the interviews, that gardens are often located at home. It is obvious that daily life issues, a GCE topic in context with behavioral learning (Oxfam 2015, APCEIU 2018), happen here. More specific, gardening practices like composting start at home. Thus, the own home has a specific relevance within exchange, as it also provides a reference point for developing the own perspective. However, Armitage et al. (2008) emphasize that learning environments should enable different segments of heterogenous communities the opportunity to participate. To allow for gardening and associated practices and knowledge exchange, there has to be access to gardens first. Moreover, there needs to be a trustworthy and respectful atmosphere for people to express their perspectives. Therefore, the role of safe spaces for cross-cultural knowledge exchange needs to be elaborated.

6.4. Valuation in Ecosystem Service Projects and Global Citizenship Education

Within the interview guideline, there was no direct question on the valuation of ES. The evaluative statements were derived by following a coding method (values coding, see chap. 4.4.) that takes even rather unspecific expressions like "I think" as indicative phrases for identifying what is valued by a person. It is acknowledged, that specific questions about what is valued by the respondents might have resulted in other findings.

When looking at the attributed value ascription from interviewees in context of education in urban gardening, human interaction with ecosystems plays the most crucial role. This might be because education itself is considered a cultural ES (MEA 2005) and several gardening activities which foster learning were identified (cf. chap. 5.4, chap. 5.6.). Outputs from gardening ecosystems are the second most mentioned. However, they are not valued in economic terms by the respondents. One

explanation might be, that in the case study, gardening is contextualized with learning. The plants which are grown are rather not used for self-supply but as an object that provides the experience of growing something to the learner. This is also reflected by the respondents: *"It is a much more conceptual thing than a practical thing of making a garden"* (R6) and *"money does not teach you how to value goods. Or natural ecosystem services"* (R5). The valuation of ecosystems and components shows that biocentric framing seems to be important in gardening projects. Thus, ecosystem components as well as outputs are suitable objects for Ecopedagogy.

In GCE, learners should understand how beliefs and values inform decision-making and how ethical issues can be addressed (UNESCO 2015). Debates about gardening can incorporate values as suggested by one respondent (cf. chap. 5.3.). Such debates can be used for awareness rising on the whole ES concept (Jax et al. 2013). For the conceptualization, measurement and evaluation of ES, normative aspects are of relevance. Choices, which are made, reflect individual values or values of groups within societies (Jax et al. 2013). Thus, values ascribed to ES are dependent on the person who does the ascription (Luederitz et al. 2015). This makes discussions on the values of ES continuous negotiation processes. In such a process, there are several aspects that should be considered: *(i)* different groups may value ES in different ways at different times and in different places (Potschin & Haines-Young et al. 2011); *(ii)* individual and changing preferences, including the personal identification with nature, play an important role in valuation (Kumar & Kumar 2008); *(iii)* valuation (Potschin & Haines-Young 2011) as well as definition (Menzel & Teng 2010) of ES are influenced by power relations (Keen & Mahanty 2006, Armitage et al. 2008). Even though those aspects were not analyzed further, there was some evidence of their importance within the interviews. One respondent pointed out that mutual respect towards different cultures also includes to *"be respectful towards Africa or India, the non-vegetarian food in India for that matter"* (R5). Identification with nature might be influenced by *"working directly with the land [which provides a feeling of] deep connection"* (R7) but also by *"parental influence"* (R6). Valuation of ecosystem outputs like food can be distorted e.g. by subsidies. When *"some other country has huge subsidies on the production of oil. Their cost of oil is lower. Not the intrinsic costs, because it is subsidized. But the cost appearing to people is lower"* (R4). There is more research needed to identify how these aspects affect each other and how legitimacy and equity issues can be considered in discussions on valuation.

6.5.   Activities in Ecosystem Service Projects and Global Citizenship Education

The availability of economic, material and social resources, and time at hand are considered as conditions for learning in NRM (Keen & Mahanty 2006, Armitage et al. 2008). Those conditions are

most likely influencing the possibilities to practice gardening activities. Conditions are also reflected by one interviewee who demands that awareness is needed towards *"the kind of time, energy, maybe expertise"* (R5) available for gardening. The conditions mentioned might be of relevance especially for gardening activities that either need specific knowledge, tools or resources. To identify structural constraints related to those conditions, research on gardening and agricultural practices, e.g. composting or watering techniques, would be insightful.

From information in the literature, gardening as a cross-cultural learning activity is neither very established in GCE nor NRM. However, it is acknowledged that gardening brings people from different cultural backgrounds together. Fleck (2013) describes intercultural gardens specifically as places for Global Learning and social cohesion was found to be promoted for allotment gardeners in Tokyo (Soga et al. 2017), community gardeners in Toronto (Wakefield et al. 2007) and Melbourne (Kingsley & Townsend 2007) as well as for gardeners in Nairobi (Gallaher et al. 2013). According to the interviewees, gardens provide the opportunity to have personal exchange. Knowledge exchange, and with it learning, happens in relation to the experiences from which it arises (Keen & Mahanty 2006). Such experiences might be positive or negative. It is acknowledged that benefits by actions in one place might cause costs in another place. For example, there can be conflicts between different human activities like the use of ES and the protection of biodiversity (Jax et al. 2013). Both, GCE (Misiaszek 2016) and ES stakeholder involvement (Jax et al. 2013) take into consideration who benefits from certain actions and who can be negatively affected. Identification and discussion about such oppositional activities from different global perspectives might be helpful to increase cross-cultural understanding. For a better understanding of the relationships between people and the environment, systems thinking is considered helpful (Keen & Mahanty 2006). Thus, all further research on the thematic constellation should apply a whole system approach.

6.6. Materials for Ecosystem Service Projects and Global Citizenship Education

The questionnaire for the interviews did not include specific questions on the materials that can be used for education in gardening context. All the identified components and outputs were extracted from the interview transcripts with the help of the ESCM and the definition of ecosystem components and outputs (cf. chap. 2.4.). Systematic questions on material for education in gardening would have revealed additional resources. For example, it is assumed, that the availability of gardening tools must play an important role for agricultural practices and exchange on the usage of those tools might be an issue that is enriched by cross-cultural knowledge. Here, further research could follow up.

On the other hand, the output 'food', that was mentioned by respondents, was an explicit element of

one question (Q4) and therefore the high frequency of its appearance might be biased. However, the other components and outputs named were not named within the questionnaire.

It is obvious, that the abiotic components mentioned by respondents, water, soil and air, are preconditions for almost all ecosystems to exist. For example, they are named by Saarikoski et al (2015) for woodland ecosystems. These abiotic components are necessary for the enlivenment of biotic components. Thus, it is clear, that they are suitable for discussions about ES. Analysis of the literature and experiences from the 2nd IDG showed that they are also applicable for GCE. Water quality and scarcity are issues that are directly mentioned within GCE and ESD (UNESCO 2010, UNESCO 2015). Air is not mentioned directly within the literature. Though, air is an important component in the regulation of the climate and climate change as a topic is acknowledged strongly in GCE (UNESCO 2015, APCEIU 2018, Davies et al. 2018). Soil is the only abiotic component which is not mentioned in the cited GCE literature, even though depletion and erosion of soils are acknowledged global challenges. However, the field trip to a community garden during the 2nd IDG in Freiburg provided an example of learning interactions that include soil and compost. Learning activities that include direct interaction with soil are probably rather found in ESD, which was not analyzed into depth in this work. Research within existing literature on the pedagogic implementation of this ecosystem components would probably reveal further insights.

From the 17 mentioned biotic components of gardens, 11 are edible plants. This gives evidence to the relevance of the ES food in knowledge exchange. In GCE, it is taken up in the context of food security (UNESCO 2015). Moreover, in the form of agricultural biodiversity, edible plants are of relevance for the concept of biodiversity. Respondents acknowledge that gardens are places to learn about biodiversity, and the concept is taken up by GCE (UNESCO 2015, APCEIU 2018). Within gardens, also pests contribute to biodiversity. While pests can be considered a disservice in ecosystems, pest control is named as a service (Saarikoski et al. 2016). Learning about those services in context with biodiversity could also involve food webs and the role that e.g. birds are playing. Moreover, biodiversity is a daily life issue that affects every person. Many components of people's homes are provided, regulated or supported by biodiversity. Next to food, those include for example, different types of construction timber, fabrics of different characteristics and medicine. Davies et al. (2018) see biodiversity as an issue with local, national and global relationships which requires future research in context of GCE.

Another important output from garden ecosystems, that was mentioned, is waste. While waste can be a disservice when it is not properly taken care of, food waste allows for gardening activities such as composting and the creation of new, fertile soil. Moreover, the production of waste is part of our daily routines (Davies et al. 2018). This illustrated how ecosystem outputs are interrelated with activities in gardens and the corresponding opportunities.

Next to those material outputs, the act of gardening provides immaterial outputs. The ones identified here can be seen as competencies for cross cultural exchange. Sense of attachment might be a precondition for self-reflection from a local perspective that allows to understand global challenges (cf. chap. 6.3.). Knowledge, awareness and social skills in combination with gardening activities can represent the behavioral, socio-emotional and cognitive domains of learning that are required by UNESCO (2015) for GCE.

6.7.   Contents in Ecosystem Service projects and Global Citizenship Education

Issues mentioned by respondents and ascribed to the ESCM steps are not exhaustive. They represent only fragments from the interview transcripts and should be rather seen as examples here. The questions on gardening and food production (Q1, Q2, Q4, Q9) revealed that next to the production of food in gardens, the subsequent food chain, including transporting, trading, purchasing and eating the food is of relevance for all the interviewees. Those aspects were not included with the analysis because of the assumption that the food products leave the garden ecosystem with the act of harvesting. However, further analysis would probably reveal connections between both, GCE and ES management.

Moreover, except for one respondent, all other interviewees mentioned aspects of either local or global governance in context with the questions on 'GCE issues' (Q3, Q5, Q6, Q10, cf. chap. 4.2.) that also play a role with education in gardens. The aspects came up with all the issues 'daily life', 'global justice', as well as 'mutual understanding' and 'exchange'. Statements relate to the institutional conditions for gardening and food production. While understanding political issues is one learning goal in GCE (APCEIU 2018, Sant et al. 2018) and ES stakeholder involvement includes the political level (Carmen et al. 2018), those statements where not analyzed. More in-depth research on the political dimension is recommended.

7. Recommendations and conclusion

Learning in NRM, and with it in ES projects (Armitage et al. 2008), as well as GCE (Grobbauer 2018) take advantage of transformative learning (Mezirow 2000). This is possible by interactions with the environment (experiential learning, cf. Keen & Mahanty 2006, chap. 5.4.) in combination with personal exchange (social learning, cf. Keen et al. 2005, chap. 5.6.), based on garden ecosystem components and outputs (chap 5.5.). The ESCM, which was developed from the ECM (Potschin & Haines-Young 2016), was a helpful tool to achieve detailed insights about those interactions, the ecosystems of gardens, related components and outputs, the ascribed values and associated personal exchange in gardens. Themes and activities for personal exchange and stakeholder involvement were identified.

The aspect of gardening which was mentioned with the highest frequency and agreement by interview respondents was growing food. Moreover, associated practices on food waste and the awareness generated by those gardening activities play a key role in education in gardens. Other aspects of gardening with less agreement could be discovered, those include value ascription and non-human interactions in gardens. This research could prove that ES offer learning content and that gardens are suitable places and references for cross-cultural exchange. For this purpose, the underlying principles on competencies in GCE (cf. table 2) are seen as principles for cross-cultural communication on ES. The idea behind this is, that personal exchange allows for the identification of different worldviews, values and associated practices. Those differences again are considered as a source of learning (cf. Andreotti 2010). Accordingly, ES stakeholders can be considered as learners within a 'tricky landscape' of differences and mutuality (chap. 5.6.). For traveling the tricky landscape, it is recommended that learners take certain issues of power into consideration. On the one hand, the ECM provides the opportunity to incorporate informal knowledge based on intuition and informal approaches (Carmen et al. 2018). On the other hand, learners and stakeholders have different levels of access to, and sources of, power (cf. Armitage et al. 2008). While in theory, traditional, local ecological and experiential knowledge play a role in ES assessments and management (Berkes et al. 2000, Berkes & Folke 2002), it is questionable to what extend it is included. In ES research, those researchers who are considered most productive come from only 24 countries (Costanza & Kubiszewski 2012), while there can be 193 countries found in the world. More specifically, Luederitz et al. (2015) point out, that in their research, which included 201 studies, there is a clear bias towards the northern hemisphere. For GCE, it is obvious that the concept is coming from English speaking countries and that they mayorly influenced its creation. The cultural background of the authors in this field is probably very similar and a greater range of more diverse sources should be considered. (cf. Huckle & Wals 2015). Sant et al. (2018) go even further and recommend that ethical spaces for unlearning coloniality should be

established for the purpose of taking periphery knowledge into account. Accordingly, the worldviews of non-dominant people should be considered. Awareness should be put to the hierarchies of knowledge not only in further research but also in personal reflections, practical applications and their analysis.

Examples of the incidence of power relations were identified by separate analysis of the single ESCM steps. Gardens were identified as appropriate places for cross-cultural knowledge exchange, although experiences of such exchange must not be limited to gardens alone. Knowledge on gardening is based on agricultural knowledge which is traditionally rather found in rural than in urban areas. The flow of knowledge between those 'places' should be analyzed and encouraged. However, for all kinds of personal exchange, there is need for spaces that provide a respectful, trustworthy atmosphere and enable learners to express themselves without the fear of being judged or overlooked. This is especially true for communication on the valuation on ES, as very personal orientations and perspectives can be expressed here. The cultural backgrounds of single persons and groups, changing preferences, and issues of power play a role in value ascription. Accordingly, equity issues in valuation process should be identified by research and recognized in practical implementation. Within gardens, collective activities are possible, which allow for personal exchange and increase the social cohesion between gardeners. Social skills, awareness and knowledge are created. Together with gardening activities, these interactions allow for the socio-emotional, the behavioral and the cognitive domain of learning within GCE. Further, sharing practices creates common socio-ecological knowledge which is related to the capacity to manage ES. However, structural constraints for the ability to conduct gardening and produce food need to be identified. Research that applies systems thinking might be ideal to identify practices that are in opposition to each other and affect gardening. Components and outputs from gardening ecosystems turned out to be interrelated with the activities within gardens. Thus, they are preconditions for any exchange on gardening. In context with education, components and outputs were not valued in monetary terms. However, especially the output 'food' offers opportunities for further insights. Analyzation of the adjacent food chain, which comes after the production and harvesting process in agricultural systems, would probably reveal other types of value ascription and further connections between ES and GCE. While it was not possible to analyze the political dimension on cross-cultural knowledge exchange in gardens, there was evidence found that it plays an important role and thus research on the political dimension is recommended.

However, with the exploratory character of this work, it is acknowledged, that there is only the presentation of selected possibilities viable in this work and that for all the analyzed aspects further research is necessary. To confirm the findings, the ESCM needs to be applied directly within research and interview questions. With inclusion of participative methods, like member checking or action

research (cf. Creswell 2012), this research itself would be a learning process that acknowledges different perspectives.

The learning approach of GCE, and with it, cross-cultural knowledge exchange is not strongly established yet, despite increasing globalization, the need for sustainable transition and political shifts to the right that can be observed. In preparatory conversations which were held with interview partners, it turned out that most of the interviewees were not familiar with the term 'Global Citizenship Education' but showed more recognition for 'Global Learning'. On the other hand, Transformative Learning is currently taken up by both, Germany and India. In Germany, the 'German Advisory Council on Global Change' (Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen, WBGU), an independent, scientific advisory body to the German Federal Government sees transformative education as essential practices for global sustainable change (WBGU 2011). According to their recommendation, Transformative Education should generate understanding of problems, action paths and possible solutions. Communication between science and society on the current research state is part of this as well as theme-specific educational programs. In India, the idea of the "handprint" can be considered as a Transformative Learning approach (Hayward 2013). It was launched in 2007 by the Centre for Environment Education (CEE), a center of excellence supported by the Ministry of Environment and Forests. The handprint is conceptualized as an opposite to the ecological footprint. While the ecological footprint is a "measure of the 'load' imposed by a given population on nature" (Wackernagel & Rees 1996, p.5) and represents the damage that is caused by humans within a certain area, "the Handprint represents the belief that we can make a difference through individual and collective actions to solve the environmental problems"(CEE n.d.). Thus, the Handprint is a measure of individual action that is directed to decrease the footprint and to care and work together towards a sustainable future.

In respect of global challenges that require humanity to achieve a balanced state between biophysical limits and social thresholds, it is recommended that Germany and India, as well as other states, apply an attitude of a common humanity and shared global citizenship. The efforts for collective learning should be enriched and supported by exchange activities that include wide ranges of societal, governmental and scientific spheres. Global challenges should be tackled together - *"There is so much of knowledge around the world. Solutions for problems that we have in one place already exist in some other place"* (R4).

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Appendix 1: The Interview Guideline.
Please note that questions 7 and 8 where later excluded from analysis.

	Notes	Questions
1	Narrative Introduction First time: gardening	*I am especially interested in how gardens are used for knowledge transfer.* When was the first time you came across gardening in terms of education/research and in which context was this?
2	Associations	Please give some associations on how gardens support sustainability.
3	Transformative Education Daily life issues	*Transformative Education wants to create understanding for sustainable actions and approaches. Pointing out options in everyday life is part of this.* Which daily life issues do you refer to in your educational approach/research?
4	Global & local Sustainable food	*Global and local issues are more and more intertwined.* Which connections do you see regarding sustainable food?
5	SDGs Global awareness Mutual understanding	*With the Sustainable Development Goals the UN wants to raise global awareness on sustainability issues.* Which roles does mutual understanding of other cultures play in your work?
6	Global justice	Which issues of global justice are you facing in your work/research?
7	Knowledge vs. action Relation	*In Germany, despite widespread knowledge of sustainability problems there is little sustainable action in society.* In which relation do you see the provisioning of information on the one hand and of practices on the other hand?
8	Competences & tools of change	What competences and tools of change would you like to share with learners?
9	Empowerment of gardens	How can gardens empower learners to act sustainable in everyday life?
10	Future connections	*In Global Citizenship Education relations between topics and places are a key point.* When you imagine the future of your work/research, which actors would you like to exchange with?

Appendix 2: The Interview Transcripts.

Interview #1

Project	Master thesis: "Ecosystem Services as a communication tool for Global Citizenship Education"
Interview number	01
File name(s)	gced_respondent1_1.mp3; gced_respondent1_2.mp3
Date and time of recording	08.11.2018; 5.35 pm – 6.14 pm
Place of recording	University office
Duration of recording	29:45 min (03:29 min; 26:16 min)
Data collection	Guided interview, personal
Interviewer	Lisa Schneider
Interviewee	Respondent 1 (R1)
Gender	Female
Occupational area	Gardening Education, Practitioner, NGO, Urban Gardening
Informed consent	Oral agreement from 08.11.2018
Anonymization	By explanations in brackets, e.g. [name of a dialogue participant], [city in India/Germany]
Date of transcription	17.03.2019
Transcribing person	Lisa Schneider
Annotation	The interview was done spontaneously during an unexpected gap in the dialogue's timetable; the interview data consists of two parts which are both included in this transcription and marked as "gced_respondent1_1.mp3" and "gced_respondent1_2.mp3"

gced_respondent1_1.mp3

#00:00:00-0# Interviewer: […] I am especially interested in how gardens are used for knowledge transfer. And the first question is: When was the first time you came across gardening in terms of education? #00:00:22-4#

#00:00:22-4# Respondent 1: The first time, it would have been probably (...) 2013. Is when I came across

as... when I could teach. Because to see how... That is when we started teaching also. #00:00:40-3#

 #00:00:40-3# Interviewer: Okay, so the context was... teaching? #00:00:45-7#

 #00:00:45-7# Respondent 1: The context was teaching but I could say that I use gardens to teach my children but not other's children. My own children if you say. From the time... they were little... so from the late 1990s. That is when I show them the flowers, show them the plants and tell them how it is. How things grow. But I started teaching people from 2014 maybe. #00:01:18-6#

 #00:01:18-6# Interviewer: Okay and which location was (Respondent 1: All this is in [city in India]) this? Okay but you started to teach...? #00:01:26-5#

 #00:01:26-5# Respondent 1: When I was teaching my own children, it was from home. When it was in the other place, first it started off from the (idea?) ... there was a cancer institute. We were growing vegetables for the pediatric work. It was interactive with children. And then we went on to teaching in schools. After a year or so. #00:01:50-4#

 #00:01:50-4# Interviewer: [...] to #00:02:05-4# Please give some associations on how gardens support sustainability. #00:02:14-1#

 #00:02:14-1# Respondent 1: Your question is: How do gardens and sustainability work together? #00:02:21-8#

 #00:02:21-8# Interviewer: Yes. What comes first to your mind when you think about sustainability regarding to gardens. #00:02:30-9#

 #00:02:30-9# Respondent 1: The first thing is using (..) waste. Waste in inverted commas. Because what we use is things that normally people throw out. In [city in India], I can give you an example from [city in India]. We drink coconut water, so we use that in our gardens. Then we have sugar cane, then we have... When you grow your own vegetables, it is actually like a cycle. You are composting, you use the compost for growing, you are using seeds which are open pollinated, which you are not buying from the market, you have seed saved, using that. The plant grows, you eat the vegetables, it again goes back to the soil. It is a complete cycle. That is what I would say (?) sustainable. [...] #00:03:28-4#

gced_respondent1_2.mp3

#00:00:00-0# Interviewer: […] Transformative education, in very short, wants to create understanding for sustainable action and approaches by pointing out options in everyday life. This is part of this. […] Which daily life issues do you refer to in your educational approach? #00:00:38-8#

#00:00:38-8# Respondent 1: [...] When we are teaching or in our personal life? #00:00:47-8#

#00:00:47-8# Interviewer: When you are teaching. #00:00:49-3#

#00:00:49-3# Respondent 1: Then it would be the composting firstly. Because everybody cooks food and what do they do with the kitchen waste? So that was my every day. And second is segregation. I would say those two would be my first. #00:01:13-5#

#00:01:13-5# Interviewer: Okay. That is how I meant the question. What do you mean by segregation? #00:01:21-9#

#00:01:21-9# Respondent 1: Segregation is segregating meaning the compost, the kitchen waste, paper, your plastic, ... because it is not done. It is not done in the way it is done in Germany it is not done so much where I come from. So, we are teaching people how important it is that you should not mix plastic and kitchen waste. Or you should keep your plastic separate, your paper separate, your... (??). Second thing would be, I would say, is to try to not keep buying things, because if you buy something you have to throw out something else. If you buy to many clothes, for example, or you buy... Or your phone is... They tell you that you need to buy a new phone because the next model has come out. So, what happens to the phone which you throw out then? I would say reduce (to?) your wants, also. #00:02:35-5#

#00:02:35-5# Interviewer: This is also something you tackle in your […] garden project? #00:02:45-5#

#00:02:45-5# Respondent 1: [...] Yes, it all becomes a life pattern. Because if you say that you are going to grow your own vegetables, you try to save on everything. #00:03:06-6#

#00:03:06-6# Interviewer: Global and local issues are more and more intertwined. Which connections do you see regarding sustainable food? #00:03:20-1#

#00:03:20-1# Respondent 1: Local. Local connections, because... You start off local and then you go on

to global. [...] You try to eat food which is local. (5) #00:03:47-4#

#00:03:47-4# Interviewer: This is like your... (...) idea or your...? #00:03:58-9#

#00:03:58-9# Respondent 1: Idea, which you get from global. Like how I can learn from you, you can learn from me, I can learn from [name of a dialogue participant], I can learn from (some?) people. But in the end, for it to be very sustainable, I cannot take back what you do here... [...] some of the education part of it. Maybe I can take that. For it to be completely... for sustainability it has to be local. #00:04:26-2#

#00:04:26-2# Interviewer: (9) [...] With the sustainable development goals, the UN wants to raise awareness, global awareness, on sustainability issues. (A person comes in and interrupts.) #00:04:51-0# to #00:05:03-3# And which role does mutual understanding of other cultures play in your work? #00:05:14-5#

#00:05:14-5# Respondent 1: [...] to #00:05:50-3# In our work it is more of... our culture which we give when we teach children. It is more of your culture. And we do try (?) to grow vegetables which then some other country child can eat then, too. But we (would prefer to get it?) local. For it to be sustainable. [...] Actually they have to know what we do locally. And we try to explain to them how important it is. Since they live in that area, in our area. [...] For relation to teaching gardening, it will have to be local. So, we do not... The global awareness, probably, they would have to know about local problems. [...] #00:07:09-8#

#00:07:09-8# Interviewer: [...] to #00:08:14-7# Here, it is maybe not easy to understand how people in other places of the world life. And maybe it is about the lifestyle in other places, this question. #00:08:33-4#

#00:08:33-4# Respondent 1: [...] Actually, it does happen. Let me not just put it as two different countries. Even if I say, two different economic backgrounds of people in my own place. They life differently. A person with a more higher economic background lives differently from a person with a lower income background. But when we talk about gardening, everything becomes the same. #00:09:05-7#

#00:09:05-7# Interviewer: (6) So I think the next question is kind of related to that. (Respondent 1 reads: Which issues of global justice are you facing in...) ... in your work? [...] #00:09:28-6#

#00:09:28-6# Respondent 1: I think we face the biggest issues that the farmland becoming smaller, there is more urbanization, there is more... the government wants to take over more and more agricultural land because they want to develop industries. They don't seem to understand that we need food to... [...] They want to copy the west and become (multi-industrial?) and have more industries. So, they are pushing the farmers out. They want to build factories on farmland. Or they want to build amusements parks, make it more tourist friendly, like the other person was saying that they build this huge statue. And in India there is another place where they took over forest land and they made it into a commercial place. For me that is a big problem, that is a political problem. #00:10:53-0#

#00:10:53-0# Interviewer: At least in Germany, despite kind of widespread knowledge of sustainability problems, there is little sustainable action in society. And the question is: In which relation do you see the provisioning of information on the one hand of practices on the other hand? #00:11:22-8#

#00:11:22-8# Respondent 1: [...] I would say in Germany, actually, there is more sustainable action compared to India. #00:11:38-1#

#00:11:38-1# Interviewer: [...] So what do you think about the importance of information and of the importance of (Respondent 1: practice?)? #00:12:31-0#

#00:12:31-0# Respondent 1: [...] You cannot have practices without information. It has to be a change from within yourself to actually be sustainable. Because, I might know so much and I might say "I do not care". Unless it impacts me. #00:12:50-1#

#00:12:50-1# Interviewer: And do you think information are necessary? #00:12:58-5#

#00:12:58-5# Respondent 1: I definitely think yes, information is necessary. But unless... you have information of so many things, but so many things, we do not take it and we do not take it to heart. Unless we change from within our self. If we do not do this, what is going to happen to our children or what is going to happen to the next generation and the next generation. Unless you feel that. You got to feel that. For the information to go into you and then to change. And only then, when you change, will you practice and you will say: "Okay, I will be sustainable. I will do this." #00:13:32-7#

#00:13:32-7# Interviewer: But how can you get to feel that? #00:13:37-3#

#00:13:37-3# Respondent 1: [...] With information and information has to be very impactful. It has to shake you and say that (?) "No, you cannot be like this anymore, you have to change". #00:13:50-7#

#00:13:50-7# Interviewer: How can information be impactful? #00:13:54-3#

#00:13:54-3# Respondent 1: [...] It will have to be (?). [...] It has to be powerful. It has to be something which makes shakes you up, makes you scared. Makes you think that if you do not do this, what is going to happen next. (8) Either through visuals, either through photographs or movie or... It has to be only visual. It has to be either by advertisement, either by movies. Only those two will help. #00:14:46-3#

#00:14:46-3# Interviewer: [...] What competencies and tools of change would you like to share with learners? In the gardening project. #00:15:17-1#

#00:15:17-1# Respondent 1: [...] I would like them to learn (?) love for the soil. Love for nature. And how it is that the earth... [...] it needs nurturing. That is what I would like to give to people that come to learn from me. To handle earth with a lot of love. And to take care of soil. (...) [...] You need to do these two things. #00:16:16-4#

#00:16:16-4# Interviewer: What I understand is that you would like to pass on practices that have to do with preparing the soil...? #00:16:34-6#

#00:16:34-6# Respondent 1: Preparing the soil and making sure that the soil is healthy, and you take care of it. How do you take care of it? You go back to not throwing plastic. Be aware of what you are doing. #00:16:53-5#

#00:16:53-5# Interviewer: [...] How can gardens empower learners to act sustainable in everyday life? #00:17:11-4#

#00:17:11-4# Respondent 1: [...] (interruption: people coming into the room, a person asking something) #00:17:15-8# to #00:17:56-1# I can tell you only in context with gardening. So firstly, making sure that you are seed saving. So, you do not buy any seeds and you do not spend money and you use your own... again, back to composting. You create your own soil. You use things that are locally available to build soil. [...] If you have pests in your garden, you use what is locally available and what is natural. That is what we (are doing?) at home. Things which we can even use to wash your hair, we use the same thing to spray for the pests. Not shampoo, but it is local. Local things, local fruits. [...]. #00:19:12-1#

#00:19:12-1# Interviewer: [...] to #00:20:08-6# How can sustainable actions be transferred from gardening to everyday life? #00:20:18-5#

#00:20:18-5# Respondent 1: What I do is... What has happened at home is, when we (??) fruits and we take out the juice, let us say of oranges, then we dry the orange peel at home and then we make that into a dish washer. Dish washing powder. [...] And then we are conscious about what kind of detergent we use for our clothes, even the shampoo, and even the bathing. Because when you know where that water goes, you know what is going to happen. If you want to use the water again, you are trying to save water, using the water for the garden, you want to use things that are good for the garden. So, for the bathing I use a (?), I make something with the flowers from my garden, I dry them, powder them and then I add some lentils and then I use that as a scrub. [...] You cannot use the water from your washing machine into the gardens because you do not know what soap you are using but if you are using natural products, you can use that water. It becomes like one after the other. Slowly more and more things... Because it started a garden and then you want to do more for a garden and then you say "Ok, I want to use the water which is in my house and I want to use that for my garden because there is not enough rain. How do I do it?" It becomes like a ripple effect. The small thing, it becomes more and more (?). Everybody at home, you use natural products. That the water does not get contaminated. That is what I mean by sustainable, it just becomes more and more things. Then it becomes even the clothes that you wear, then you want to get your underwear organic (or?) you do not want to wear synthetic. That is how it has been processed in my life. #00:22:40-8#

#00:22:40-8# Interviewer: [...] In Global Citizenship Education, relations between topics and also between places are a key point. When you imagine the future of your work, which actors would you like to exchange with? [...] Actors from another area, area in the sense of another topic or discipline; and also, in the sense of another place? [...] #00:23:54-4#

#00:23:54-4# Respondent 1: [...] I would like to know more about what impacts plastic have with the environment, I want to know more, I know a little bit. [...] I found that the problems which I face, even here, people face the same things, from the presentation which I saw today. So the challenges, which you have here, too, in your gardening, in community gardens. We have the same problems. If I had to [...] learn more, I would like to know more about what are the other problems which are faced here. Then I would like to know, especially here, I think, in Germany, maybe Europe, there is more awareness or there is more studies about climate change, I think than in any other place. [...] #00:26:16-0#

Interview #2

Project	Master thesis: "Ecosystem Services as a communication tool for Global Citizenship Education"
Interview number	02
File name(s)	gced_respondent2_1.mp3; gced_respondent2_2.mp3
Date and time of recording	09.11.2018; 8.15 am – 8.45 am
Place of recording	University, seminar room
Duration of recording	20:43 min (2:25 min; 17:51 min)
Data collection	Guided interview, personal
Interviewer	Lisa Schneider
Interviewee	Respondent 2 (R2)
Gender	Female
Occupational area	Academic, Agriculture, Urban Gardening, Social movements
Informed consent	Oral agreement from 09.11.2018
Anonymization	By explanations in brackets, e.g. [name of a dialogue participant], [city in India/Germany]
Date of transcription	18.03.2019
Transcribing person	Lisa Schneider
Annotation	The interview data consists of two parts which are both included in this transcription and marked as "gced_respondent2_1.mp3" and "gced_respondent2_2.mp3"

gced_respondent2_1.mp3

#00:00:00-0# Interviewer: [...] I am especially interested in how gardens are used for knowledge transfer. [...] When was the first time you came across gardening in the terms of education or research and in which context was this? #00:00:41-9#

 #00:00:41-9# Respondent 2: [...] Do you know 'WWOOFing'? I did WWOOfing myself, sometimes in gardens. And I thought it had an educational aspect. Learning, again, practices from people across the globe, basically. Not only from the people who run the garden but also the other internationals who come, so everyone shares their practices in gardening. [...] That was fifteen years ago, roughly. #00:01:22-8#

 #00:01:22-8# Interviewer: [...] Please give some associations on how gardens support sustainability. [...]

#00:01:38-7#

#00:01:38-7# Respondent 2: I think for... On a household level if you produce your own food, you do not need to, obviously, buy it on the market. And very often... I mean people do not shop at the markets, the farmer's market. They go to supermarket. And then you have to buy the quantities that they sell, and they mostly wrapped in plastic or any kind of thing. So, you can actually only harvest what you need, that (?) avoid food waste. And at the same time, you grow it locally at your place. So, you do not need... no one needs to bring it to you. So, there is less transportation and less, let us say, food waste and food wrapping, plastic. (5) And if you want to do it organically, obviously you do not put any agrochemicals, which is sustainable because agrochemicals base on oil. [...] #00:02:52-0#

gced_respondent2_2.mp3

#00:00:00-0# Interviewer: [...] Transformative Education wants to create understanding for sustainable actions and approaches. Pointing out options in everyday life is part of this. Which daily life issues do you refer to in your research? #00:00:27-0#

#00:00:27-0# Respondent 2: [...] I focus more on farming and urban gardening. It is probably the same reasons that I mentioned before. [...] Producing locally (?) and the cycles, production and consumption cycles be very small. And reducing waste, non-recyclable waste. Waste and transportation again. #00:01:10-8#

#00:01:10-8# Interviewer: [...] Global and local issues are more and more intertwined. Which connections do you see regarding sustainable food? #00:01:32-5#

#00:01:32-5# Respondent 2: [...] I think the same again, gardening and producing locally. So, having... Keeping all on a smaller scale, to avoid long (?) between basic need production and consumption phases. [...] #00:02:18-8#

#00:02:18-8# Interviewer: Which issues of global justice are you facing in your work or research? #00:02:25-3#

#00:02:25-3# Respondent 2: [...] I do face injustice towards farmers. It seems like especially small-scale farmers are always at the lower end of (...) justice. I mean so much... The work of farmers is so important to society, but society does not really value this work and the production of food. And then there are

the corporations who intervene and want to deliver their chemicals to farmers and want to bind them into contracts. And then there is the policy level, as well. Which does not really help the farmers to do what they can do best. Which is producing food for society. Which should be one of the... I mean the pillar of the society, actually. So, I feel injustice in this. #00:03:31-2#

#00:03:31-2# Interviewer: So, it is injustice regarding the economic system or...? #00:03:42-4#

#00:03:42-4# Respondent 2: It is all. It is economy, also ecology. Because then also... (Interruption: two persons coming into the room and one person saying something) #00:03:49-8# to #00:04:03-4#. Also, an ecological level, because, we saw yesterday, when are farmers the most affected when it comes to climate related vagaries like droughts and (?) for example. This affects farmers often a lot more than for example urban people, who sit in their apartments and whose livelihood does not depend on this ecological event, if you want. So, it is economic and ecological injustice and social of course. #00:04:41-2#

#00:04:41-2# Interviewer: Social, in which way? #00:04:44-7#

#00:04:44-7# Respondent 2: Social because... it all has impact. Let us say, an extreme weather event has impact on the livelihood. So, the base upon which they earn their money, their livelihood. #00:05:04-3#

#00:05:04-3# Interviewer: [...] With the Sustainable Development Goals the UN wants to raise global awareness on sustainability issues. Which role does mutual understanding of other cultures play in your work? #00:05:26-4#

#00:05:26-4# Respondent 2: In my work, in my research it does, actually. I am really trying. Especially by being here. [...]. I was just talking to a colleague this morning and I am really convinced that we, on the German side, can, for example, learn from the Indian practices. And vice versa. Especially... I do not know. In [city in India] there is so many initiatives, it seems, that really push forward the SDGs and try to bring it on the policy level and I feel that Germany is lagging behind a lot in that sense. I wish we could learn from their approach. How to approach the political level, political agenda, for example. So, I think it is really, really important because society, or state, let us say this entity, tends to kind of rest on this thinking of having achieved sustainability already. And then they are not pushing further. So, I feel we in Germany, we are in this state at the moment. Where really not enough is done. So yes, mutual learning is, I think, one of the most important aspects. #00:07:02-1#

#00:07:02-1# Interviewer: [...] In Germany we have this kind of wide spread knowledge on sustainability problems but there is little sustainable action in society. [...] And I think you already started to explain, why. The question here is: In which relation do you see the provisioning of information on the one hand and of practices on the other hand? #00:07:48-4#

#00:07:48-4# Respondent 2: [...] Yes, there is much more information. Well I think, I mean, [name of a dialogue participant] was talking about programs in schools, for example. There is... So, information is (?) and yes, you got the media attention as well. I think both, radio and television, whatever medium. Yes, but the action just seems to be there on the paper. And there is small initiatives, which is good. But I feel that in Germany then the grassroots have not enough power, or they are not determined enough to push things. So, there is both (..) the civil society, not acting accordingly, and also somehow the policies, that discourage sustainable action. #00:08:45-6#

#00:08:45-6# Interviewer: What do you think, how should it be, or how could it be better? #00:08:51-5#

#00:08:51-5# Respondent 2: Good question. I do not know if there should be sanctions for unsustainable behavior or should we try to... I do not know. I think this... Well, when I read about sustainability concerning Germany. I always feel that it is theoretical, the message is not, probably, transferred into a practical thing. It does not feel... I do not feel concerned when I read some... or when I listen to a television contribution or podcast or something on sustainable issues. It does not make me feel concerned so much, although, I am concerned already. I think the message should be more conveyed, in more pressing way. Also, the unsustainable behavior should be, I mean, discouraged and look at the cars. I mean there is a lot of... I know so many people who do not possess a private car and use bicycle and use public transportation and at the same time you have got the car lobbyist and the highways in Germany. You can go up to the speed of, I do not know, 300, if your car is powerful enough. All this works parallel. And that does not make sense. There cannot be policies, on the one hand, that support car industry and this highspeed stupid highways and, on the other hand, the sustainable, rather small scale, action which is "use your bicycle, walk", whatever. This is not very coherent, I think, the policies. There is too much support for unsustainable industries. #00:10:53-1#

#00:10:53-1# Interviewer: [...] What competencies and tools of change would you like to share with learners. #00:11:24-1#

#00:11:24-1# Respondent 2: [...] Not only gardening, composting, waste recycling, spreading the message, gathering people, maybe start some movement, something, some civil action. [...] #00:11:56-7#

#00:11:56-7# Interviewer: And to start a movement and civil action, what kind of competences, more specific...? [...] #00:12:08-7# to #00:12:42-4#

#00:12:42-4# Respondent 2: I think it is on (dissimilation?), probably. Gathering people. Go to university, start a group. (4s) Look for practitioners, who can join, look for researchers, who can join and then may address the higher levels. For the seed. #00:13:06-8#

#00:13:06-8# Interviewer: [...] How can gardens empower learners to act sustainable in everyday life? #00:13:34-0#

#00:13:34-0# Respondent 2: Probably a lot of it is the appreciation of what you can produce and what you need, maybe. Maybe this relation between your needs, and (...) needs and capacity to produce. And I think it is a good insight if you know all the processes that lead to a food product that you eat. Then, this is a first step. Like this understanding. Personal living of the entire food chain. I think this knowledge is (pretty? /really?) momentous. #00:14:28-9#

#00:14:28-9# Interviewer: [...] In Global Citizenship Education relations between different topics and also different places are a key point. When you imagine the future of your work or your research, which actors would you like to exchange with? [...] #00:15:25-0#

#00:15:25-0# In terms of places... all places! [...] I think we can all learn from each other. I mean in terms of farming it makes probably sense to move in these similar geographic conditions or something. I mean, similar soil... No! It actually does not make sense. I think anywhere, the scope can be (...) anywhere. [...] I definitely want to talk to policy makers, somehow. They should be involved. And different actors. I focus more on farming and resource use. I guess I will... (..) And maybe schools, as well. For... Because they also work on nutrition and health. (Interruption: Person taking something out of the room) #00:16:55-4# to #00:17:01-0# Schools are important, I think. (6) Or at (ministry?) level, probably education and health. Health funds or something. [...] Health funds or health ministry, educational ministry... maybe even approach the parties. (...) For example, the green party. Although, I do not believe so much in parties, political parties. #00:17:44-1#

Interview #3

Project	Master thesis: "Ecosystem Services as a communication tool for Global Citizenship Education"
Interview number	03
File name(s)	gced_respondent3_1.mp3; gced_respondent3_2.mp3
Date and time of recording	09.11.2018; 12.45 am – 1.05 am; 10.11.2018; 8.30 am – 9.00 am
Place of recording	University office; hotel lobby
Duration of recording	38:14 min (15:40 min; 22:34 min)
Data collection	Guided interview, personal
Interviewer	Lisa Schneider
Interviewee	Respondent 3 (R3)
Gender	Male
Occupational area	Urban Gardening, Governance, quasi-governmental
Informed consent	Oral agreement from 09.11.2018
Anonymization	By explanations in brackets, e.g. [name of a dialogue participant], [city in India/Germany]
Date of transcription	19.03.2019
Transcribing person	Lisa Schneider
Annotation	The interview was started during lunch break at 09.11.2018 but was interrupted and continued the next morning, 10.11.2018; note that in the morning there was just limited time available and clarifying questions were not possible because of that; the interview data consists of two parts which are both included in this transcription and marked as "gced_respondent3_1.mp3" and "gced_respondent3_2.mp3"

gced_respondent3_1.mp3

#00:00:00-0# Interviewer: [...] I am especially interested in how gardens are can be used or are used for knowledge transfer. When was the first time you came across gardening in terms of education or research or with your work. And in which context was this? #00:00:37-7#

#00:00:37-7# Respondent 3: [...] From my personal experience, I think we were exposed to gardening at very young age in my school. You probably heard [name of a dialogue participant] talk about Rishi Valley (explanatory note: Rishi Valley Institute for Educational Resources) and Jiddu Krishnamurti, a philosopher in India, who is no more. I actually had the privilege to study in one of his schools. From kindergarden to class six, grade six. There, they pushed us to learn gardening and go for nature walks. And also, there was a program called (?) where you would clean the... they would serve us lunch at the school, and we would sit on mats and the tables would obviously get dirty with food. Students were required to clean the plates, sweep the floors, every week. Different classes had the responsibility to do that. We were exposed to nature and gardens and civic responsibility at a very young age. In that particular school. Professionally speaking: I started this job in January, with [name of employing organization]. [...] Prior to joining here, [...], I was research staff. There was a community garden project, which they were very interested in doing. And still, I think, remains in a proposal stage. But it was a very holistic project, I had some learnings from there. At [name of employing organization], my chief [...] officer was my boss. He had this vision that, [...] we have roof tops in [name of a city in India], they are laying empty, there is scope to embrace rooftop vegetable gardening, terrace gardening for residents in [name of a city in India]. Why not popularize it? Why not... how do we make it more practical? I, through extensive stakeholder consultations and discussions, brought in the idea of working with Corporation Schools, which are public schools that are Greater [name of a city in India] Corporation controlled and managed. Greater [name of a city in India] Corporation is a local government. They went to had an announcement that they would like to do rooftop vegetable gardening for hundred schools and get students involved who (take? /are?) part in eco clubs. We recommend that third and fourth graders are involved, the exposure will help them. From an education point of few, what we hope to accomplish are a few things. One, explain to them the civic responsibilities that come up with gardening, that are related to gardening. For example, waste management is an (educational?) component. [...] Composting is one integral part of it. [...] Some schools in [name of a city in India] were already doing some (formal?) vegetable gardening. And we are using these vegetables and products to supplement the midday meal scheme. [...] Some schools were doing that. So, we brought in the attention of local government and they seemed interested in that. What we are trying to push for, is growing greens, because there are fewer pests related to growing greens, it is easier. But in terms of waste management, there is, of course, a very strong (?) composting. We hope that by doing farming, people will realize what it takes for vegetables, at least greens, to grow. The farm to table concept we (incumbent?) on students. Hopefully... through studies have shown that there is a lot of focus on science, an interest in science that develops if children do gardening. We sort of highlight these aspects in our work. #00:05:29-0#

#00:05:29-0# Interviewer: [...] Please give some associations on how gardens support sustainability. #00:06:02-1#

#00:06:02-1# Respondent 3: The first thing is, of course, waste management. You are reducing what goes into your landfill by using the right waste. That is one very strong linkage that is. Hopefully, if you have rooftop vegetable gardens, then some studies have shown that there is a decrease in the room temperature. Because you are watering the plants up there and it has a cooling effect on the roofs. I know this has happen in Cairo. [...] These are two that I can immediately think of. Of course, there is the education component, there is an environmental governance component. You could have municipalities having agriculture departments that could be integrated in master planning of certain... Urban agriculture could be incorporated in master plans. There is many different sustainability components. You also, sort of, if you look at rooftops, we are trying to push for water conservation, using efficient water technologies. Rooftop vegetable gardens also sort of help slowing down the... during heavy rains, the inflow water into your rainwater harvesting pit or your (?) or whatever it is. Mainly the rainwater harvesting because that is what is really happening in India. In [name of city in India] at least. There is a strong push, right from the early twothausand, under our chief minister (??) on rain water harvesting. It supplements that. And then if you (divide?) in with maybe solar, somehow. Some part of the roof is for solar, part of the roof is for gardening. Of course, Indians also dry clothes, because there is enough sunlight. We do not have dryers. So, there is that... energy saving there. That is not (?) to gardening. #00:08:21-7#

#00:08:21-7# Interviewer: [...] Transformative education wants to create understanding for sustainable actions and approaches. Pointing out options in everyday life is part of this. [...] (Respondent 3 reading: Which daily life issues do you refer into your educational approach or research?) [...] #00:09:13-3# to #00:10:04-8#

#00:10:04-8# Respondent 3: [...] I will respond from a program point of view. What we are trying to push... not push, although we are trying to encourage, is learning by doing. So at least for children... for them to be involved in gardening we will (tell? /help?) them learning by doing. It is like a... It sensitized at many issues. I think that is what are (schools are?) ready, to holistic learning and those aspects. [...] #00:10:44-1# to #00:12:33-6# What we are trying to do is, in our program that we have. We are following three components. One is to (?) in resident welfare associations to encourage them to adopt rooftop vegetable gardening. [...] How do they develop the rooftop vegetable gardening? That is something we have not really done but we face some issues there on how the produce can be distributed, those kinds of issues. Number one. Number two, with schools. While some schools are already doing what I described to you, using what they are growing for the midday meal scheme, we brought to their attention that it is easier to grow greens because there are fewer pests, there are

fewer... Greens grow easily, they require it... To me it requires less maintenance also, you can just water them and keep them simple. You know, there is not too much work that goes into maintaining greens. If even one or two leaves are eaten by pests the rest remain okay. There is still a lot of scope for that. To be highlight that to them, the third way we are approaching residents is by (edge?). Since there are new solid waste management bylaws that have come in after the solid waste management rules issued by the central government in twothousandsixteen. The new bylaws are still in draft phase and they have gone to the government for approval, for the municipality. For our local government. They... that pushes composting in legal terms as far as possible for gated communities, for resident welfare associations and also for industries and restaurants and other commercial establishments. What that does is sort of encouraging them to compost but it has not yet incentivized. What we are trying to do is, through communities' holds, that the local government owns, also through the parks, educate our citizens about composting. So, we are trying to highlight the different policy linkages also, in addition to trying to realize practically a vision for this rooftop vegetable gardens. [...] #00:15:21-3#

#00:15:21-3# Interviewer: [...] Global and local issues are more and more intertwined and which connection do you see regarding sustainable food? (Interruption: Person asking if they can store something in the room) [Explanatory note: It turned out that it was better to continue the interview later; the rest of the interview was recorded in the morning of the following day.] #00:15:35-2#

gced_respondent3_2.mp3

#00:00:00-0# Interviewer: [...] Global and local issues are more and more intertwined. Which connections do you see regarding sustainable food? #00:00:14-5#

#00:00:14-5# Respondent 3: Quite obviously, in the SDGs, you got a goal on sustainable agriculture which does a direct linkage. Then waste is... Sustainable waste management is also highlighted in the SDGs. So, the global SDGs provide a good framework to view local issues also and to address local issues. So, I see them intertwined in that way. #00:00:37-4#

#00:00:37-4# Interviewer: [...] So you see a lot of connections between the SDGs? #00:00:53-4#

#00:00:53-4# Respondent 3: Yes, local priorities. After all, the SDGs are a reflection of local and national priorities. #00:00:59-9#

#00:00:59-9# Interviewer: [...] The UN wants to rise global awareness on those issues. What do you think: Which role does mutual understanding of other cultures play in your work? #00:01:22-4#

#00:01:22-4# Respondent 3: [...] I think that that report which I was highlighting to you "Growing green gardens", the FAO reports, have been very useful in helping us articulate the benefits of vegetable gardening, rooftop vegetable gardening. There were a lot of case studies in that particular report about what is happening in Kigali, Rwanda, or what is happening in Colombia, what is happening in Cuba. And in certain parts of Africa, including Cairo. That kind of mutual understanding really helped us also build a stronger case about rooftop vegetable gardening for our city. And articulating which evidence, what is happening elsewhere. #00:02:10-9#

#00:02:10-9# Interviewer: Because of what? Because they are handling the same issues, or you can learn from them or...? #00:02:25-5#

#00:02:25-5# Respondent 3: Both, they are handling the same issues and we can learn from them. It is evidence based. So then, because they have done it in practice, in Dakar, Senegal, or wherever... It helps us also build a stronger case for our city to look at urban agriculture from a more serious point of view. #00:02:47-9#

#00:02:47-9# Interviewer: [...] In your work, do issues of global justice... do you face them in your work? [...] #00:03:19-4#

#00:03:19-4# Respondent 3: Not really. [...] Can you give me an exampel of what somebody else might have described? #00:03:27-9#

#00:03:27-9# Interviewer: (...) The description I gave to [name of a dialogue participant] was equity in your use of resources. But actually, it is not... You can also think of it in a wider way. [...] #00:04:00-5#

#00:04:00-5# Respondent 3: If you (?) from a global perspective, I do not think there is any issue that we face. It is not like climate change where the developed world has just polluted its way to development. And wants a card, a free card, that there are (no?/now?) responsible deals and obligations (underdeveloped?). In the case of... them imposing... developmental constraints in developing countries... This is not like climate change, our issue is very local, really. It depends on availability of local resources like water... being mayor constraint and challenge that we face. But then that is not... Because... I mean there might be some influence of global climate change on availability of water. But I would not blame climate change specifically. #00:04:49-9#

#00:04:49-9# Interviewer: You do not have the impression that climate change is influencing or...? #00:04:58-6#

#00:04:58-6# Respondent 3: It is influencing. #00:04:59-7#

#00:04:59-7# Interviewer: [...] It might be something you are facing in your work, if it is influencing? #00:05:08-2#

#00:05:08-2# Respondent 3: Yes, but we face floods and droughts, we face periods of... But that is not just because of climate change. It is also because of how water is managed in our city. So, we need to look at it from a more practical perspective. We do not have twenty-four by seven running water. That the government provides to us. But they are trying, infrastructure improvements, there are two desalination plants in [name of a city in India]... They are supplying water to the city which really help us during droughts. But is it the right way to obtain water with the energy cost associated? I do not know. I can just say that we face certain (?) related to water challenges. #00:05:57-1#

#00:05:57-1# Interviewer: [...] In Germany, here, there is widespread knowledge on sustainability problems, for example it is also in the media, in the news. But in spite of this knowledge there is little sustainable action. This made me think: "Why is it like that?" In which relation is the provisioning of information on the one hand and of practices on the other hand? #00:06:33-9#

#00:06:33-9# Respondent 3: [...] I think, generally speaking, it has been in our culture to turn of lights, to turn off fans, turn off... basically electrical appliances because we do not have enough electricity for the long period of time. We were... There was a shortfall of energy in our country and in our state. I think there is already a mindset build in for conservation. And that is on energy. But in terms of water, also. We try to conserve as much as possible. Try not to waste water. I think that is very much in tune with our... Because of lack of water we try to save the last drop, even. With consumer preferences and attitudes changing there is sometimes wastage of water, of course. People might not fix their leaky tabs, those kinds of issues, too exist. I think there is slow... Maybe because we are a poorer country, in some ways, we do value what we have, in some ways. Like water and electricity for that matter. That are two that come to my mind, that jump directly... (...) #00:08:09-3#

#00:08:09-3# Interviewer: [...] What competencies and tools of change would you like to share with learners? #00:08:19-6#

#00:08:19-6# Respondent 3: The... I think there has to be a (..) desire to bring about real change that comes from within. A desire to lead, a desire to take ownership of issues. [...] Which, I think, is what we see with some citizen leaders who are leading a few environmental initiatives or... social issues. In [name of a city in India], at least, of course they are passionate, they care very much about what they are working on. Some NGOs have succeeded very well on bringing attention by using digital media. To issues like water bodies, restoration... And that really helps. In [name of a city in India] (?) the 2015 floods that happened, they were quite devastating. […] Something that we had never seen. And it affected not just low-income people but even the rich. So there has been a general interest in restoring our water bodies

among all sections of our society. And of protecting our water bodies across all sections of our society. There is change happening at that level. Of course,... competency would be leadership, I would say, citizen leadership. And tools... I think definitely social medias play an important role. [...] #00:10:09-5# to #00:11:26-6#

#00:11:26-6# Interviewer: How can gardens empower learners to act sustainable in everyday life? #00:11:30-9#

#00:11:30-9# Respondent 3: I think that is the kind of change we are trying to bring with gardening. By exposing children at a young age to gardening, what we are hoping to do is built in them a civic and social responsibility and resilience. They will start caring about plants, they will start caring about the food they eat. Like [name of a dialogue participant] was saying yesterday, or I forgot who was saying it: When children grow their own vegetables, they might do not eat them. But they see some change. Like (?) or something, they would usually eggplants. That is something that we are hoping to accomplish. Second, by encouraging children to even expose them to composting, then they will understand waste management in some ways. We are hoping to see some incidental benefits that they will stop littering on the street, start caring about how the waste is taken care of. In our case, we hope that this kind of positive environmental thing will help them respect the environment much more and build civic and social consciousness (early?) and then, as adults... [...] Whether it is respect for waterbodies... just the major thing is to not litter. [...] I think gardens can... Learning gardening can help you connect with nature. #00:13:13-1#

#00:13:13-1# Interviewer: (...)[...] In Global Citizenship Education relations between [...] topics and disciplines on the one hand, and of places on the other hand. They are a key point. How are different topics related and how are different places related. I am interested in: When you imagine the future of your work... [...] You are already connected with a lot of people, are there any actors you would like to include in that network? [...] #00:14:53-1#

#00:14:53-1# Respondent 3: [...] For our work of course we are engaging [name of an organization] which is a civil society organization, we engage different government agencies, like the horticulture department which is part of the state governmental corporation with the local government. And [name of a region in India] Corporation for developing the women. Because they are doing... They created a model vegetable garden on the rooftop of their terrace in the building. They are encouraging citizens also to grow rooftop vegetable gardens. We invited the relevant government bodies. We work with stakeholders, civil society, like (??). There is some other we work with in [name of a city in India]. Called [...] [name of a company]. They have a demonstration space that they developed in their own private property which they showcase to people. [...] #00:16:07-5#

#00:16:07-5# Interviewer: When you think about how to move forward [...] which connections would you like to make up? [...] Maybe you can even talk about money but then it is: Which institutions or persons could provide that? #00:16:43-1#

#00:16:43-1# Respondent 3: Yes, we look for CSR funds, from different companies. [...] Private sectors... One company and (??) support our work. Then, of course, Greater [name of a city in India] Corporation has to provide the permission to use the schools. That is something that we are trying to do. Try to get the relevant (??) schools we can work with. That is something very key on our agenda. So that is the local government. We are engaging [name of an organization] [...] for their help on project support and project management, if they can play a role sort of. [...] Ideally, I would love for that to be deeper connections even with the different FAO cities, so there is continuous learning. To be part of the FAO network. Obviously, Indo-German Dialogue on Green Urban Practices network is also very strong. These are the actors I would like to continue engaging with. But the [name of a city in India] connections I already have the relationships, with the Germans, I need to strengthen them. [...] #00:18:10-8# to #00:22:34-5#

Interview #4

Project	Master thesis: "Ecosystem Services as a communication tool for Global Citizenship Education"
Interview number	04
File name(s)	gced_respondent4_1.mp3; gced_respondent4_2.mp3
Date and time of recording	10.11.2018; 8.00 am – 8.30 am
Place of recording	Hotel lobby
Duration of recording	29:34 min (03:29 min; 26:16 min)
Data collection	Guided interview, personal
Interviewer	Lisa Schneider
Interviewee	Respondent 4 (R4)
Gender	Male
Occupational area	Gardening Education, Urban Gardening, Practitioner, NGO
Informed consent	Oral agreement from 10.11.2018
Anonymization	By explanations in brackets, e.g. [name of a dialogue participant], [city in India/Germany]
Date of transcription	20.03.2019
Transcribing person	Lisa Schneider
Annotation	The interview data consists of two parts which are both included in this transcription and marked as "gced_respondent4_1.mp3" and "gced_respondent4_2.mp3"

gced_respondent4_1.mp3

#00:00:00-0# Interviewer: [...] I am especially interested in how gardens are used for knowledge transfer. [...] When was the first time you came across gardening in terms of education and which context was this? #00:00:31-9#

#00:00:31-9# Respondent 4: [...] to #00:01:02-5# I began my work in farming about ten years ago, eleven years ago. When I came back from corporate world, from US to India. After about five, six years of farming; people, local people started asking me to help them with gardening. Doing edible plants in their homes. That is when I began my own research, learn about it first. Then I did one first workshop in 2013, in my home town. [...] #00:01:46-5#

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#00:01:46-5# Interviewer: How did it come that they did approach you? Did they already know you are somehow related to the topic or...? #00:01:55-3#

#00:01:55-3# Respondent 4: I was only farming for five, six years by the time. Some friends and family, they just suggested to me that: "Oh, I have some space in the balcony, can I grow some herbs?" Or: "I have some backyard; can I grow some vegetables?" It began like that. Initially, I was not very keen on it, but then when I started learning about it, I got very interested. At one point, when I felt, I had enough understanding of it, that is when I did one workshop to teach people how to get started with gardening in their own houses. [...] #00:02:30-3#

gced_respondent4_2.mp3

#00:00:00-0# Interviewer: [...] Please give some associations on how gardens support sustainability. What comes first to your mind? #00:00:13-9#

#00:00:13-9# Respondent 4: I think... When I began gardening, I did not realize this, but as I started doing it, this... It came about to me, that through gardening, it is one of the best ways, to effect sustainability. In many, many different ways. One of the things that happens is, you talk to people everywhere around, and we see all the issues with the current development in our spaces, in our cities. We all say: "We need to do this, we need to do that". Or: "We need to save trees, or we need to work on climate change and this and that...". But people do not make it personal. They do not realize what it means to actually work on climate change, or to actually work on sustainable (?). What happens is, when you start growing that first plant, or five plants, or five pots in your balcony or your terrace or your backyard. When you start gardening, what happens is, when you begin that act of growing, the plants start communicating to you. The plants will tell you that something is very hot today, something is very cold today. What that act of gardening does is, it brings the person to a realization that there is a direct connection between us and our environment. And that is when the person starts getting sensitized and aware: "That is something around us, makes a difference." What happens is, people just come to us to start with gardening. But then when they start gardening, they start realizing: "I need to give manure to my plants. Can I start composting?" This way, the journey begins, where they go from... And then they soon (realize?): "I want to give water to my plants. Can I safe water in some way? Am I using water in the most efficient way or not?". By [...] the act of gardening, it begins an inquiry in each person to start asking these questions about our environment. That is how they become sensitized to sustainability. That is one angle to look at it. The other way to look at it is... Of course, we realize the burden of growing food on the limited amount of land that we have available, and less and less of it is available, because of urbanization and more and more land getting (?) into cities. Things like that. What urban corporation

can do, at least we are (?) in [city in India] or (?), most cities in India. There is so much space that you can grow in. And while you cannot grow everything that you eat, but you can still grow substantial amounts that can make an impact. In that sense it directly affects sustainability in many different dimensions. For example, again, one is of course, you are doing local food production, which means that you are burning less fuel for the food to be transported to you. Less packaging, less carbon footprint. All of these are effects of growing your own food. And you are doing gardening because now the food has to travel less. It has many impacts to it. It does not have to be packaged, it does not have to travel. This is one sort of very obvious impact. Other than that, of course if you start composting, like... I do not know about [city in Germany] but in [city in India], waste is a huge issue. [City in India] produces eight million kilos of waste every day. Of which sixty percent is compostable, biodegradable. [...] Which is five million kilos every day, can be composted. But it does not get composted right now. It goes to the landfill. #00:04:11-6#

#00:04:11-6# Interviewer: Now it is allowed to compost it in your home place? #00:04:17-3#

#00:04:17-3# Respondent 4: It was always allowed. [...] People were not very open to it because of various issues like smell and whether it is clean or not... Since people have (dismiss?) about composting, they were not very open to it. But again, when you [...] begin gardening, you soon realize the plants need nutrients. And where are those gonna come from? And then you realize: "I have my kitchen, where I generate so much of waste that can be composted, and that can be given to my plants." And that forms a loop. Everything... Sustainability is all about loops. Nature is all about loops. How do plants feed into the other. The moment you start growing, you start realizing that (?) manure. You start composting. You are making an impact on the... waste impact on the landfill. [...] This act of gardening has... affects all the dimensions of sustainability, not just one. It is also at a spiritual level, at a personal level it makes a difference. The person starts changing, the person starts becoming more aware and starts realizing they have a responsibility towards their environment. #00:05:26-6# [Explanatory note: The answer already provided aspects of question number nine. Because of that and because of time issues, question nine was later left out.] #00:05:34-0#

#00:05:34-0# Interviewer: [...] Transformative Education [...] wants to create understanding for sustainable actions and approaches. In this concept, pointing out options in everyday life is a thing... is part of this concept. [...] Which daily life issues do you refer to in your work? It is composting, from what I heard... #00:06:16-0#

#00:06:16-0# Respondent 4: Composting is a big one, but that is just one aspect of it. We also generate a lot of other waste. Plastic, paper, cardboard. What has happened to our planet and the people in the last two, three, four decades, is what is called as 'consumerism'. We buy things that we do not need.

Because of the media and marketing and advertising we generate a need for things that we do not really need. Because of this, people... The amount of things that we buy... We are not conscious about that. Or what we buy. We are not conscious about that. Even if I buy... Let us say that I buy a chips package from the supermarket: I only think about the chips that I am gonna eat. I do not think about the package, the way it is packed in. What examples I give is, that are... Are we only responsible for just making sure that we eat the chips that are healthy for us? Or are we just thinking about the food itself that we are gonna... we are eating? Or also: How it came to you? How it is packaged? Who produced it? How it was produced? Where it was produced? Are these questions also important to us? That is sort of the examples I take. That we have a responsibility towards every action that we take. Which is consumerism. Which... If I buy anything, if it is a shirt or a t-shirt, or a cycle, or a car... or anything that I buy, has an impact on this planet. We need to get conscious about that when we choose. When you go to supermarket, do you carry your own bag? Or do you get a plastic bag to carry the stuff? These are the examples, daily examples, which people need to get conscious about. In terms of realizing what the impact of it is on the environment. #00:08:15-1#

#00:08:15-1# Interviewer: [...] Of course, global and local issues, they are more and more intertwined. Which connection do you see regarding sustainable food? #00:08:32-4#

#00:08:32-4# Respondent 4: (6) At least the way I see it, food is meant to be local. As much as possible. While there can be trade, there can be movement of food around. But it can be only a very small percentage. I think, as of now, the way I understand, the average distance that food travels in India is eight hundred kilometers. [...] What has happened, again over the last three, four, five decades, is that transportation has become much easier. As compared to earlier times. Because of which food can be transported to various distances. Because of which also, there is a higher carbon footprint, there is more pollution, there is many various things. Not only that, but if you look at it from a different angle... Food... This is... Again, this is something I learned when I began the gardening and teaching gardening and all of that... Any fresh produce loses... Starts losing it's nutritional value the moment it is harvested. In about twenty-four hours, the nutritional value becomes half. So, if I have hundred milligrams of calcium in my spinach right now, the same spinach, a day later, will only have 50 milligrams left. If my food is traveling eight hundred kilometers on average... That means nothing reaches to me in less than twenty-four hours. From the time it was harvested to my mouth. If it has been two days, then practically what we are eating is empty calories. There is no nutrition left in it. What this means is, that food is meant to be local, as close to you as possible. The fresher it is supposed to be eaten, the more closer it is supposed to be to you. If you are eating greens and herbs they should be probably growing in your balcony or your terrace or your backyard or your front yard. If it is a few vegetables that take more space to grow they could be on a farm nearby your house. Or a community farm near you. Or some space around you like

that. Of course, all the greens and cereals and pulses and oils that we use should be local again. What belongs to your region. We are very fascinated by various different kinds of... This is part of consumerism... Of products that grow all around the world. And we think that: "It is coming from there, they should be better..." Again, local indigenous plants, greens tradition, is where, I think, the strength in food lays. Sustainability and local food are very interconnected. The more local the food is, the waste generated from it, also goes back into the same system. The waste generated from my kitchen garden in my own house, consumed in the kitchen, whatever is left over, goes back as a composting to my own garden. The loop closes right there. If I am buying wheat or rice from a neighboring farmer, nearby farmer, then whatever... straw that comes out of that in the process of making the wheat ready to eat, is again (?) back to the farm right there. If it is traveling long distances, then the waste generated through that process, does not go back where it started from. #00:11:55-4#

#00:11:55-4# Interviewer: The circle is disconnected. #00:11:58-2#

#00:11:58-2# Respondent 4: [...] What that results in, is the depletion of soil. We do not realize this. But if my food grown here, travels a thousand kilometers, the waste that that food was generating as part of its process, should have gone back into the soil where it grew. [...] If I eat for example a banana, that has grown five hundred kilometers from here, the banana peel was supposed to go back where it grew. [...] There is some sort of a nutrient loss happening in the soil, the (way? /where?) it was growing. Again, that is where the local food systems come into play. The closer it is to you, the more likely that it is going back to the same area. And return and the loop will get closed out. [...] #00:13:03-3#

#00:13:03-3# Interviewer: [...] With Sustainable Development Goals the UN wants to rise global awareness on sustainability issues. [...] #00:13:16-2# to #00:14:30-4# Which role does mutual understanding of other cultures play in your work? #00:14:36-2#

#00:14:36-2# Respondent 4: I think, one that is very obvious, is food choices. In India, there is so many different cultures within the same country. People from different parts of the country have different cultures, which correspond with different food choices. If I am living in [city in India]. Now [city in India] has a certain whether and a climate for things to grow. But if I am originally from southern part of India, then my food choices will be different. Then, what would be typically growing there. I think, it generally works out to create a more diverse holistic system, because then there is sort of more knowledge exchange happening in terms of different food cultures or different cultures in general. #00:15:25-5#

#00:15:25-5# Interviewer: And in terms of understanding other cultures from other countries? #00:15:35-0#

#00:15:35-0# Respondent 4: In our workshops a lot of people come from different countries. Through that I get a perspective on how... [...] The Indian mindset is still not very sensitized towards sustainability.

Usually people who are coming from other countries around the world, and they are part of our workshops or whatever education that we are doing... Usually it helps to create a more... sensitized... Sensitization of people, because people can see from a different perspective. [...] In India would typically, until at least a few years ago, would not even think about plastic bags or things like that. Or about their waste. But because of cultural exchange, people coming from other parts of the world and sort of expressing their thought around what (enact?) means... It also helps... [...] To get a global understanding of things. That there is a certain impact of what we are doing, and I think (??) exchange that can happen (?). [...] I am not understanding this word 'global justice'.   [Explanatory note: Respondent read the question] #00:16:52-7#

 #00:16:52-7# Interviewer: There is different global justice issues, for example equality in the access to different resources. #00:17:08-8#

 #00:17:08-8# Respondent 4: [...] There are a few things that bother me, for example. One is... You know a lot of people, or a lot of farmers, who are growing and who are growing well... The best quality of their produce is usually chosen for export. They are very keen to export. And of course, they are, because they get better prices over there. There is some injustice there, because then the good quality produce, you are sending to other parts of the world, while your own people do not get the best produce. [...] There is some sort of discrepancy there, in terms of how economics makes it imbalanced of where that output goes. [...] A lot of issues around... Subsidies... How global prices of various things affect. [...] For example, India used to produce all of its own oils until a few years ago. But now it imports most of its oil. Because some other country has huge subsidies on the production of oil. Their cost of oil is lower. Not the intrinsic costs, because it is subsidized. But the cost appearing to people is lower. Then, it is cheaper to import oil than to produce our own. This impacts everything else we discussed up to now, because food travels a lot more, carbon footprint... Also, there is an injustice to it because now the local farmers, what they produce, has no value. Or has... Is not demanded, because somebody else can produce for cheaper, because they are subsidized in their country. [...] This sort of effects... If US has a subsidy on... say palm oil, or whatever, that they grow over there, than... It is still cheaper to export that oil from US to India, as compared to producing our own oil. Edible oils. I think, that sort of creates injustices. Also, subsidies around various fertilizers and things. One of the things around sustainable food production is... To not use chemicals, I would suppose. In our food, in growing our food. Pesticides and chemical fertilizers. Again, a lot of these things are subsidized in the cost, because of which the real cost of food is distorted. That causes imbalances in trying to move to a sustainable food production. For example, if I approach a farmer, and I tell that farmer: "Why do you not use chemicals and grow food this way because it is more sustainable?" But it does not make sense for that farmer, because the fertilizers are subsidized, and he finds that cheaper. As compared to this. [...] These activities are not

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subsidized here. The right actions need to be encouraged to policies... So, the Sustainable Development Goals become an important aspect of... Which is not the case right now. We want sustainability. But by the policies that we have in place currently, we are not actually encouraging sustainability. [...] #00:20:38-4#

#00:20:38-4# Interviewer: [...] to #00:21:01-4# In Germany, despite of widespread knowledge on sustainability problems, there is little sustainable action. [...] #00:21:08-3# to #00:21:35-8# In which relation do you see the provisioning of information on the one hand and of practices on the other hand? #00:21:44-7#

#00:21:44-7# Respondent 4: [...] to #00:22:16-0# The way I understand this is, that there is a gap between... the information passed to people around sustainability and actual action that people take towards sustainability. I think, it very much related to gardening and how gardens support sustainability. What we discussed earlier. That, when you start gardening, besides the direct impact, it has... There is a transformation that starts happening at an individual personal level. Where you are now more sensitized (towards?) actions. Because of being sensitized to that actions, then you start bring it into practice. Because now, you will be conscious of your choices. Not just about what you are buying, where you are buying, how you are buying, who you are buying from, how it is packaged, how did it travel, what do you buy, do you need to buy it or not... All these questions start popping up, as you start getting sensitized. As the awareness increases. The action only comes about, when you feel the direct impact of your actions. And that... One of the easiest (ways?) to do it, is to start gardening. When you start gardening, you suddenly start realizing many different things that you typically would not. I might be walking by from here and I might see some waste laying around and I might think: "This is not nice." But when I actually go to the shop, I still buy the same thing and I will throw it somewhere. How does that transformation happen in my choice? It is because, at some point, I have to realize that there is an impact of this package being purchased or being produced or being thrown away. I think, that only comes about once you begin an inquiry into it and you start taking some action towards... I think gardening is one of the easiest ways to go about it. #00:23:58-7#

#00:23:58-7# Interviewer: [...] In Global Citizenship Education relations between topics and also between places are a key point. When you imagine the future of your work, which actors, in terms of topics or disciplines, and in issues of where they come from; would you like to exchange with? #00:24:39-8#

#00:24:39-8# Respondent 4: I see our planet becoming more and more global. I think there is so much of knowledge around the world. Solutions for problems that we have in one place already exist in some other place. I do see an exchange... Like this event, that we are having right now, the conference on...

the IGCS conference on sustainability and the dialogue. This is one such place. I hope to see more of this. In our work... I think, there is so much need for people to act, as we discussed in the previous question, towards sustainability, understanding it, making them sensitized, taking action towards it. [...] There is so much of knowledge, there is so much of wisdom, that is around us, and that we can only cover up by connecting different cultures, forming more and more networks and learning from each other. #00:25:38-4#

 #00:25:38-4# Interviewer: [...] to #00:26:14-5# Did you meet anybody here who you now want to keep in touch with and which topics do they work on? #00:26:23-2#

 #00:26:23-2# Respondent 4: For example, [name of a participant] is over here, who I would like to connect with on forming more community gardens. How do (?) create communities around food? That is one exchange, that I can see very directly. Also, around... How to bring about gardening in our school curriculum. There are two or three people in the group, who are do working on this. [...] #00:26:49-7#

 #00:26:49-7# Interviewer: Those people, they are from India? #00:26:52-6#

 #00:26:52-6# Respondent 4: I think both. [...] #00:26

Interview #5

Project	Master thesis: "Ecosystem Services as a communication tool for Global Citizenship Education"
Interview number	05
File name(s)	gced_respondent5_1.mp3; gced_respondent5_2.mp3
Date and time of recording	10.11.2018; 1.45 pm – 2.30 pm; 10.11.2018; 5.10 pm – 5.40 pm
Place of recording	Urban community garden; Hotel lobby
Duration of recording	69:22 min (41:25 min; 27:57 min)
Data collection	Guided interview, personal
Interviewer	Lisa Schneider
Interviewee	Respondent 5 (R5)
Gender	Male
Occupational area	Environmental Education, Education for Sustainable Development, Coordination, NGO
Informed consent	Oral agreement from 10.11.2018
Anonymization	By explanations in brackets, e.g. [name of a dialogue participant], [city in India/Germany]
Date of transcription	21.03.2019
Transcribing person	Lisa Schneider
Annotation	The interview with this person was not planned in prior, the possibility for it evolved from an informal conversation; the interview was started spontaneously during lunch break; the interview data consists of two parts which are both included in this transcription and marked as "gced_respondent5_1.mp3" and "gced_respondent5_2.mp3"

gced_respondent5_1.mp3

#00:00:00-0# Interviewer: [...] to #00:03:44-8# When was the first time you came across gardening in terms of education and in which setting was that? #00:03:53-4#

 #00:03:53-4# Respondent 5: This came in for me very later in my life, when I started working with the [educational organization]. We had a teacher training program, and in the teacher training program one

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of the ideas [...] was talking about biodiversity. What you could do as your local action. That is the first time we... I personally came up from this idea, that how gardens can also potentially used by teachers in school setting. In order to talk about... In the teacher training we had to learn a little bit about different ways in which you can set up gardens. That was the first time. Through the professional requirement, I started to looking at garden. #00:04:39-4#

#00:04:39-4# Interviewer: They were looking for how they could implement subjects like, let's say, biology, into the garden, or...? #00:04:53-4#

#00:04:53-4# Respondent 5: No. Biodiversity. [...] Typically, India have (??) integrated subject in botany. It is up to you to decide how... #00:05:11-5#

#00:05:11-5# Interviewer: [...] to #00:05:38-6# Please give some associations on how gardens support sustainability. #00:05:46-0#

#00:05:46-0# Respondent 5: You typically look at the framework of what you call the Ecosystem Services... Now, gardens turn out to be definitely recreational space for you. They are also important part of the land-use planning. In formal science of land-use planning. In urban context. I do believe that they do provide those kind of spaces, where citizens do care for gardens. All age groups as well as all kind of classes require that kind of a space, which is low on the noise levels. Because if you look at the noise levels on the street and you look at the noise level of the garden, you would definitely feel a qualitative difference on some, because of maybe (?). It also depends on where it is located. What kind of a stage garden has. So, recreational value, defiantly yes, that is a great value to look for. And other, culture and heritage value. Gardens are also indicator for me, of lack of planning or presence of planning. The more garden you have... maybe your (respect?) and your planning process is more robust. The lesser gardens you have, that is in (contradiction?) context. Which means, your priorities are not open spaces, but only commercial (dressed?) or simply lack of space. We recommend on encroachment on public good, potentially. One can look at it with that (trait?) as well. In India there are guidelines, called 'urban planning guidelines'. There are (certain?) rules that for X number of population, X number of square feet of land should be there for open space. [...] #00:07:40-1# to #00:08:23-3#

#00:08:23-3# Interviewer: [...] Transformative Education wants to create understanding for sustainable actions. [...] #00:08:43-4# to #00:09:46-2# Which daily life issues do you refer to in your educational approach? #00:09:52-6#

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#00:09:52-6# Respondent 5: I typically belief, that... Then we have to deviate a little bit, because we can look at gardening as self-realization process. Then the answers would be definite. For example, it becomes a sustainability action with a lot of... maybe, social awareness. That I can still do gardening at my home. Start from home, typically, or your rooftop, or somewhere. Which is really the harvest, your interest, and something else. First of all, you do not have the kind of time, energy, maybe expertise, sometimes, to do this. Conditionalities under which can do maybe gardening. That is one limitation, I would say. Second level (page?), I would definitely say, that, in Indian context at least, it has never... It has been a very used and a very limited (?). For example, you look at, typically only the botanical gardens as... The botany department, as learning spaces. For botany students. Not for (even?) citizens. For example, university botany garden is not open for citizens. [...] #00:11:05-3# to #00:11:24-7# Areas like university of Pune has a tree walk. Done for purpose of education. Where people should understand what kind of trees are around. [...] #00:11:34-7# to #00:11:54-4# Your tree is... Tree in itself is an ecosystem. How it really supports other life forms. Maybe you can get the starting point to getting awareness about... [...] #00:12:07-3# to #00:12:28-3#. Transformative Education, maybe you agree, it would also depend from the context to context. Because then, it becomes a little more personal than a social value. That you go to gardening, you transform your view of sustainability. Maybe you are far away from that reality. [...] #00:12:47-8# to #00:22:05-9#

#00:22:05-9# Interviewer: Which... Global and local issues are intertwined, and which connections do you see regarding sustainable food? #00:22:19-4#

#00:22:19-4# Respondent 5: [...] One reflection of globalization is actually, what you are getting in your plate. And what you get in your plate... And it is also links with, somehow, modernity. (Interruption: We receive desert by two friendly persons that hands it over to us.) #00:22:40-6# to #00:23:02-9# One (key?) is, what is there in your plate, and it has been changing. [...] A colleague of mine who is focusing on biodiversity education, they have been doing a very interesting research project. That... They work with three hundred schools in (?) and they have done a activity called 'What is in my plate?'. There is a blanc paper plate on which they ask children: "Write down, what all you eat. You eat. And you write down what you eat." Then they give them a second plate and say: "Now ask your father, what he used to eat." And then they give one more plate and say that: "Ask your grandfather or grandmother, what she used to eat." And then they compare these three tings. You see that the diversity is reducing, generation after generations. It becoming more monoculture. The (odor?) is, the local varieties are gone, and the hybrid varieties are there, in food, in your plate. That is a comment on the... What to say... The global impact of the processes, where globally... (Interruption: Desert issues.) #00:24:12-3# to #00:24:18-2# Definitely one context, I would say, that matters on the local level. Last two generations

never had pizza or cheese. But this generation, they are aspiring for that, for burger, for that matter. That is the (?) to it. The other global impact, that I potentially see is the (5) entrance of the GM food. The genetically modified food, in (?), but typically in India. Because our organization was responsible for doing national level public consultation, whether the GM (?), the eggplant, should be taken up for consumption or not. The responsibility was with us, even by the ministry of (inland?) and forestry. We did several consultations, seven consultations at India level. It was decided, that it will not be used for consumption. However, with the change of government, it may come to consumption, not to eggplant, but to mustard. They have already started the mustard seed (?) project. We do not even know the gene... germplasm and genes... How to say... pollution has already taken place. That has been a battle, which we have already kind of lost, because in the mean of conserving... or reducing the losses, the crop losses. We are actually losing our (own?) sovereignty of farmers to breed the local variety seed. (?) supporting a lot of farmers and ensures to create local seed banks, and also help them do evaluations. #00:26:12-6#

#00:26:12-6# Interviewer: [...] Is India... agrobiodiversity... #00:26:23-8#

#00:26:23-8# Respondent 5: They are reducing. [...] Because it has never been mapped, also. We do not even know, what we have lost. There is no baseline. #00:26:33-6#

#00:26:33-6# Interviewer: The Sustainable Development Goals by the UN. They want to rise global awareness on... [...] Which role does mutual understanding with other cultures play with this, or in your work? #00:27:16-9#

#00:27:16-9# Respondent 5: [...] to #00:28:11-7# Yes and no. Because two things. One is: One has to also look at, that this kind of dialogues or processes are important, and they do have that educational value. But they may not be very effective in policy decisions. The power is not in dialogues. The power is where it is. (Interruption: Person that was listening during the interview adds: "But I learned so much within the last days.") #00:28:35-8#. That is the thing. [...] That remains in the civil society domain. It is not the power domain or the decision-making domain, and unless this dialogue become effective, it is not able to inform the policies. The policies needs to be sensitive towards biodiversity, to tribes... For example, if you take urban farming. And urban farming is good or vegan food is good. Then slowly, slowly, it may become a value. And now it becomes a value, and somebody wants to say that I... I have bought some (??). How vegans should react to that? That is where cultural or mutual understanding comes in. Because anything which gets qualified as (sustainability?) like farming or vegan food or organic food... It also starts becoming an institution in itself. Any institution can be exclusionary in its

perspective. That, we have to be very careful about. When you are saying, mutual respect towards different cultures, then we will have also be respectful towards Africa or India, the non-vegetarian food in India for that matter. Indians do not only eat vegetarian food. There is a huge bottom of the pyramid who can only survive by eating non-vegetarian. That is, where they will get their proteins from. (??) slaughtered is an issue of discussion. It is not just about killing or non-killing, it is also about where the woman who are into physical work in the city, would get their proteins from. They are not... They can get the cheap protein only from eating cow meat and not the chicken. Because chicken is far more expensive than the cow meat for that matter. Muslims in India have actually (to got?) business. The Muslim, who eat more of cow... of (mull?) meat, as by their culture, their cultural practice. That was a political decision, taken in India two years ago, that they will ban the slaughter. That they will stop all the slaughtering activity which means the livelihood of one particular community, which is Muslims, will be completely wiped out. It will also impact the leather industry, because it was just not about the meat, it is also about the leather. If the leather becomes expensive, naturally it is not the local, which will get benefit, but the global companies will get more benefit. You will have the leather prices going so up, that the local business of shoe making with the local leather will go on complete toss. One has to understand that, from a system's thinking and a completely system's point of view, not a linear thinking that: "Here is a problem and here is a solution." It does not work that way. It might end up creating a few more, newer problems. Which you cannot leave there, because they are not under your control. That is why thinking it trough as a complete system and understanding the politically economy of any decision, is in my view, most critical aspect in the mutual understanding. The mutual would also depend, that who's mutuality we are talking about here. Are we talking about mutuality of academicians, practitioners, the lower strata people, the elite of this country, or that country... Or: Are you talking about a value? I am very scared of sustainability becoming a value. If sustainability becomes a value, it will become a religion in few years, and that is a great threat. Because the processes are for liberation and not for creation of newer SUPs of living life. That is definitely a value in itself, but people become so fanatic about that value, that anybody then eating non-vegetarian is looked upon as non-sensitive person, do you think that is a good idea? There is a great danger of happening that. One has to be very... extra cautious about this, is what I feel. If people in India, let's say, coming up only from upper casts. [...] Those who (?) do not eat non-vegetarian. They will be generally be find promoting vegetarian or vegan food. Participants coming from the lower strata of Indian society, which is not the case in most of the dialogues... Then naturally there is a challenge in (?) with them. #00:33:05-5#

#00:33:05-5# Interviewer: I think it is kind of the same in Germany. #00:33:07-8#

#00:33:07-8# Respondent 5: Everywhere I would say. (??) #00:33:11-6#

#00:33:11-6# Interviewer: [...] Which issues of global justice are you facing in your work? [...] #00:33:27-8# to #00:34:34-7#

#00:34:34-7# Respondent 5: (??) [...] Resource scarcity equates to inequalities. [...] That is, where governments become most important. Because then, we need a state, regulator, of people's behavior. Can actually put in policies which would be equal, fair, and just. With that understanding, I would say, that the biggest challenge we are facing, is the identity crisis of the governance mechanism. What I mean by that is: Our notion of welfare state is weathering away. (Interruption: Applause and goodbye to the food caterer.) #00:35:29-7# to #00:35:43-2# When we talk to the policy makers nowadays. Like administrators, city managers. When we say, that you have to do this... They are completely in their orientation... Is becoming neoliberal. They do not belief, that is anymore their responsibility to work for urban poor. To work for migrants. To do policies, which will be useful to the lowest strata. Which is most vulnerable. That is, where I would say, the first inequality challenges comes, that market and market process cannot really take care of welfare functions. Because they work for business and it does not work... Public transport is never going to give you profit. Water supply will never going to give you profit. Unless you privatize it. If you privatize it, then the private (person?) is never going to do charity. They will do business. That is the really first thing, I believe that one has to look at a little more carefully. From a global justice point of view, I will definitely belief, that the whole dialogue on climate change and fixing of the responsibilities and... Not only money transfer, but that transfer of technology, or goal seventeen, which is 'resources for implementing SDGs'... I think that entire discussion has gone on toss in the last two years. After particularly UN dynamics has changed. I think, it has severely changed the whole dialogue around how you are negotiating climate change. In my view, that was the only platform, where there was... The discussion had clearly come after Kyoto Protocol to a level where there was actually some hope of some fair trade between Global South and North. I think those discussions have kind of really moved into green economy, type of softer neoliberal agendas. [...] #00:37:44-3# to #00:39:05-8# Transfer of technology as well as transfer of resources to co-create knowledge for mutual interest is in the threat, as one can say. From a global justice point of view. #00:39:17-2#

#00:39:17-2# Interviewer: [...] Do you think, that the topic of climate justice, which is more going up... Or let us say not climate justice, but climate change, is reducing the international solidarity? #00:39:44-4#

#00:39:44-4# Respondent 5: Not reducing. It is reducing its scope. It is reducing its... what to say... cooperation. It is reducing more and more discussion on climate change. There was a phase when Global

South could claim certain spaces for negotiations, but now that phase is on the downside of it. [...] #00:40:11-6# to #00:40:37-3#

#00:40:37-3# Interviewer: So, the center of attention is shifting somewhere else? #00:40:41-4#

#00:40:41-4# Respondent 5: It usually shifts, yes. And that is the challenge, I would say. [...] #00:40:43-8# to #00:41:25-1#

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#00:00:00-0# Interviewer: [...] In Germany, despite widespread knowledge of sustainability problems, there is little sustainable action. In which relation do you see the provisioning of information on the one hand, and of practices on the other hand? #00:00:41-5# to #00:02:12-9#

#00:02:12-9# Respondent 5: [...] It is always a structural or systemic issue. For example, when you look at where are the scientist for knowledge creation. We typically look at school, colleges, universities, as kind of so called 'formal structures of knowledge creation' as well as knowledge transfer. [...] School, college or university makes it mandatory to have certain environmental conservation actions. They are not mandated through your textbook curriculums, they are not part of your compulsory courses. They are usually still considered as extracurricular activities. If you develop a garden in your school, because you are motivated. I do not know, whether you (?), whether you can do a little garden. If you are creating global citizens in school that should be... the action should be an indicator of how you are doing things. How kind of green skills you are building. At school level, which is just practice. Maybe at university, college and university level, it is also the knowledge skill and practice. Should be assessed. I do not see in India or in the global context the actions of people, skills of people, for sustainability, or the ability and capacity to contribute to sustainability actions, is not measured. It is left in the personal domain of individuals. If you would like to go by cycle or (??). People may talk about (?), but their lifestyles could be very carbon intensive. That hypocrisy in the structural way in the school and university systems, is a big challenge [...]. There, I think, what we have eroded over (?) of time, both in India as well as in other parts of the world, that you do not respect labor. Physical labor. Physical labor is considered to be a low class, low caste (analogy?). Because you are physically doing it. If you are doing mental exercises, then you are expert. But if you are physically doing something, that expertise is not considered as equivalent to maybe... A resource rich person. For example, today we went and saw that lady from Brazil doing interesting stuff. Now, what she must might getting payed is very less as compared to maybe college or university teacher or professor would get paid for. That is a clear distinction between how much we respect certain sustainability actions. Then you left it to the domain of people to decide. People usually

decide respect people who get paid more, because that is the way we perceive power. That has been a challenge. We do not recognize very tacit knowledge of people who are doing, let us say, gardening for centuries together, or as their profession. In Indian context thought there are castes, which are known as 'Mali' which is basically gardener's community. Which constitutes fifteen percent of (?) population. Their profession (are not?) respected anymore. With the urbanization to it (??), their aspiration also became than urban and they are into white collar jobs. Their knowledge skills maybe died down, or people may not consider that is a more fashionable thing. [...] One has to look at the knowledge and the action from a frame that... What frame are (??). A gandhian frame of respecting all forms of labor and work? If yes, then they should be also well paid off. Or should not be paid off as high as one should really pay, let's say, teachers or university professors' salaries in India. [...] #00:06:25-3#

#00:06:25-3# Interviewer: [...] What competencies and tools of change would you like to share with learners? [...] In your work. #00:06:41-7#

#00:06:41-7# Respondent 5: [...] There are two competencies. Which are different competencies. One is the competencies for sustainable development action. They are called 'ESD competencies'. And ESD competencies are... [...] There are three, four different frameworks for looking at ESD competencies. [...] First is critical thinking. Second ability to [...] systems thinking. [...] Ability to act ecologically sensitively. [...] #00:07:28-3# to #00:07:54-7# That is the third competency. I would say, fourth competency potentially comes from the ability to cooperate and collaborate. As a competency. For me, maybe these four becomes most critical. The ESD competencies are little different. Because ESD competencies are something to (?) maybe persons, individuals. Because an individual should be able to think critically, should be able to think systematic... System thinking-wise, ecologic sensitive-wise and should have the ability to collaborate. However, ESD competencies is, in my view, a little bit more technical. There are competencies which are teacher or educator needs to have in order to build ESD competencies in individuals. Of all age group. We are not just talk about school or college education, we are also talking about talking to senior citizens, who may have a unsustainable practice, on motivating them to joining in sustainability action. Because (just me?) come from self-realization, may not come from self-realization. Because they had been doing that for centuries together. For example, when my mother does solid waste management, she puts everything together, because something called 'plastic' was not introduced thirty years ago, when she started, all the waste together. Now, newer things, which is non-degradable plastic, started coming in last twenty years into our lives. We have never had a discussion about how to segregate now. Into recyclable and non-recyclable. This... Now, she is sixty-five years old, now, how do I have that conversation? It is critical. It is not her fault, because new material came in, but we will have to have those conversations as well. That is, where the ESD competencies becomes more important. [...] #00:10:05-4#

#00:10:05-4# Interviewer: [...] How can gardens empower learners to act sustainable in everyday life? #00:10:14-7#

 #00:10:14-7# Respondent 5: In urban context, I would say, gardens can provide an excellent stress (buffer?), stress reliefer. You release your stress by doing gardening, because it is a very enlightening exercise. That you... You are actually looking at plants, you are feeling them, you are actually communicating with them. (?) them and finding out... Actually, learning about your local environment, (for that matter?). It can be complete stress reliefer in one hand. It also gives you sense of attachment to your surrounding. [...] #00:10:52-9# to #00:11:17-8# My sense of creation. Like you almost become... You can understand what a mother feels, what a mother feels after delivering a child. When you actually produce something. The sense of production. Which is non-alienation. Urban areas are known for alienation practices. In the classical Marxian sense, that cities... You cannot say that this product is mine. Because, I work in a company. But I just do assembly. I would say, that I work in Samsung company but the whole process is not mine. You get assemble somewhere. That he calls 'alienation'. Now, urban areas are known for, let us say, alienation. Because people lose connection with the place. Now this potentially brings... May bring back the alienation to maybe some connection with your area and bring in more ownership about the place. Because now you are rooted. Maybe toward (what is?) garden, but you are still rooted with nature, potentially. That... I do definitely feel, that has impact on your everyday life, and I think then you are... This is like a trigger for me, which initiates the whole dialogue around food and wastage. You also understand the value, that if you are wasting something, how much time it has really took to produce one tomato or four tomatoes. The crop might have failed. The kind of care you have given to it. You actually start do valuing, which you have got only trough money. Money does not teach you how to value goods. Or natural ecosystem services. I think, it is a great potential in that sense, to really start valuing what you get. And the pay in production, of small, small stuff. [...] #00:13:11-2#

 #00:13:11-2# Interviewer: [...] In Global Citizenship Education, relations between topics [...] and between places are key points. When you imagine the future of your work, which actors would you like to exchange with? [...] #00:13:53-2#

 #00:13:53-2# Respondent 5: [...] to #00:14:31-6# We need to aspire for bringing urban local bodies... bringing them to do better policies. Where possibilities of shaping global citizenship becomes much more easier. If it completely remains within the civil society domain, or individual personal behavior domain... I have problems with that. Because I feel usually human behavior issue by the structures around them. The rules and regulations around them. If there are more (?) or welcoming attitude, which should come from policies, then there is a potential for more people joining in there. [...] City needs to do it a little more thoughtfully. That what is their global citizenship kind of a role, the city, trough it's

policy would like to communicate. Like: What is [city in Germany] policy on urban gardening? What are the learnings civil society has to offer to [city in Germany]? [...] #00:15:34-7# to #00:16:19-6# If you take such a huge potential for learning in here. For example, you take chili. Chili could be grown actually anywhere. Technically. You can do it at home, you can do it in a pot. It can happen in Germany, it can happen in India, most of the parts. Now, if you take origin of chili as a seed. It is an interesting question to pose, right from yourself, to your child, to your friends, to your neighbors, to your professors. That... Where is... Let us make a quick map of where chili comes from. You can actually build an entire global, so to say, a poster. For example, as an communication. That, what kind of chilis are there in different shapes, sizes, colors available (cutting?) across the world. [...] You can actually create so much information about how chili transport from one location to another. Like chili, you can do it for each and every product [...]. That is the way, I think, the interesting learning can happen. [...] #00:17:35-5# to #00:18:45-2# There is a huge potential of redefining several aspects Global Learning... and learning is actually possible through your garden. Trough notions of the weather impacts, how your garden survive, what kinds of pests are coming in. Surely there is great learning which can evolve... co-create. I mean your garden can provide you a great laboratory, lab to actually potentially observe what is happening as an impact of climate change in your city. Is the product coming earlier is the product coming later? Usually, this information is available with farmers. But that could be still available within citizens and yourself, as you experiential learning. Two, three colleagues of [environmental education organization] in [city in India] office are actually trying out gardening by sawing different types of seeds, observing pest. We are actually writing a module, teacher training module, on gardening. Before we do that, we thought of actually going to (adopt?) it, so we understand what kind of instructions we are giving there. [...] #00:19:58-1# to #00:20:45-3# I am saying here, that I would like to exchange more with city administration. [...] #00:20:50-3# to #00:22:02-8#

 #00:22:02-8# Interviewer: If you just look at gardening, maybe. I am also interested in which topics in the sense of... [...] #00:22:16-0# to #00:22:41-4# ...in the sense disciplines, you would like to exchange with? #00:22:49-5#

 #00:22:49-5# Respondent 5: [...] Surely, I could definitely look at it from an interdisciplinarity point of view of... Soil sciences [...], we typically look at forestry, we typically look at seed breeders and germinations and [...] #00:23:08-3# to #00:23:32-8# You can actually link with mathematics, you can actually see with mathematically calculation, that (?) area square feet you can actually build on to. [...] You can actually do link it to biology [...], like process documentation and research questions. If you are just documenting it every day, the happenings which are there... There are some plants which are used by butterflies and you can actually do the entire life cycle analysis of butterflies. [...] The world is fancy. That does great learning exercise and that is surely possible in schools. There has been great talk going

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on about increasing the nutritional value. The great nutritional value... If children do this gardening, the urban gardening, in their school. And then, if they cook it and use it in their own... In India, there is a scheme called 'midday meal'. [...] #00:24:52-2# to #00:25:12-6# You can actually talk about chemistry. What kind of fertilizers... organic, (??). Which you study actually in science, but we never use it. [...] At the same time, you can actually talk about equality and social justice, you can actually talk about political science and sociology... #00:25:37-0#

#00:25:37-0# Interviewer: You can talk about anything. #00:25:38-8#

#00:25:38-8# Respondent 5: Anything! For example, this much production is now done. How the production should be distributed? And what is the social justice here, in terms of distributing production? It is a topic; a social scientist can actually take from a garden. [...] You can actually have a discussion and debate around it. You can take it from even gender point of view. That, is it: A girl should get more, or a boy should get more? Of the product. Or within the process. Who's labor should be respected, would still become a question. Who did what, also can become question, that: Is it only the physically strong boys that do the work, girls who do the work? That is why they later on claim that: "We should get more, because we engaged more!" Could still become a values clarification and value education lecture, for that matter. It completely depends on how creative and how innovative you would like to be. As educators, in that particular scenario. That is why I think teachers are in best position to take that decision and do it. These are some possibilities, where... (??) possibilities which will come. You can actually talk about geography. Why certain plants are doing well, and certain plants are not doing well. [...] The concept of native and non-native is also very relevant. [...] We never talk about the history of seeds. [...] #00:27:57-7#.

Interview #6

Project	Master thesis: "Ecosystem Services as a communication tool for Global Citizenship Education"
Interview number	06
File name(s)	gced_respondent6_1.mp3; gced_respondent6_2.mp3; gced_respondent6_3.mp3
Date and time of recording	11.11.2018; 1.30 pm – 3.00 pm;
Place of recording	Urban park; coffeehouse
Duration of recording	51:12 min (10:06 min; 25:21 min; 15:45 min)
Data collection	Guided interview, personal
Interviewer	Lisa Schneider
Interviewee	Respondent 6 (R6)
Gender	Male
Occupational area	Academic, Practitioner, Education for Sustainable Development, Environmental Education
Informed consent	Oral agreement from 11.11.2018
Anonymization	By explanations in brackets, e.g. [name of a dialogue participant], [city in India/Germany]
Date of transcription	26.03.2019
Transcribing person	Lisa Schneider
Annotation	The interview with this person was done one day after the dialogue; the interview data consists of three parts which are all included in this transcription and marked as "gced_respondent6_1.mp3", "gced_respondent6_2.mp3" and "gced_respondent6_3.mp3"

gced_respondent6_1.mp3

#00:00:04-0# Interviewer: I am especially interested in how gardens are used for knowledge transfer. When was the first time you came across gardening in terms of education or research, and in which context was this? #00:00:20-5#

#00:00:20-5# Respondent 6: [...] I lived in a township that was still growing. But all through my childhood and into college days we had a garden. But it was already in a phase of transition. Our garden

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was pretty wild. Next to my garden, we had still a growing crop land of [...] the two local semiarid land millets. [...] #00:01:01-2# to #00:01:37-3# We had both birds which move through the township, urban birds, and we had birds, which came for the crops. I, very early, during my school days, got... Made friends with one of India's greatest conservation biologists. His name was Dr. Salim Ali. [...] He is primary an ornithologist. [...] He used to take me out for (motor?) cycle rides, but in the process, I learned bird watching. [...] Much of my birdwatching was done from the terrace of my house. Because at that time, [city in India] was still not so urbanized, which meant that you still got birds in surrounding forests coming in there. #00:02:42-2#

#00:02:42-2# Interviewer: So, they came to your garden? #00:02:45-2#

#00:02:45-2# Respondent 6: They came to the garden and to the trees around it, around the garden. It was a very, sort of, uncultured garden. There was no lawn. It was just tree cover and a few pots of (?) plants... In my college days, I got interested in growing bonsai. The Japanese technique of growing plants, trees, in a small pot. Many people asked me why I would want to do that. I guess it was... To me, it was the closest art to nature. Forming these little trees was a very beautiful thing. [...] Actually, this was all link to my parental influence from my parents. And we have always been very close to nature. More than close, more enamored by nature. I grew up loving nature. And loving wildlife. [...] #00:03:56-9# to #00:04:21-7# When I went to medical college, I started going to National Parks and sanctuaries, taking photographs. [...] #00:04:28-9# to #00:06:35-9# Garden for me, is an urban nature area, actual area. Over the years I... though I was a surgeon, I kept this interest up, and eventually, I had done three books on wildlife and conservation. [...] #00:06:54-2# to #00:07:57-9# I then started doing school programs for the WWF. I was for a long-time sort of a volunteer, running..., sort of assisting the nature part of their camps for school kids. [...] That was the education thing, and that is where it came from. [...] #00:08:24-8# to #00:08:52-7# I was used as... for all these training of trainer's camps to talk to them about ecology. [...] #00:09:00-7# to #00:10:06-6#

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#00:00:00-0# Interviewer: Please give some associations on how gardens support sustainability. #00:00:08-8#

#00:00:08-8# Respondent 6: [...] to #00:00:36-4# I think, if you want to link this. It is really a question of changing people's mindsets. And it is this mindset thing, that happens with urban gardening. They may do it actively or they may just appreciate the fact that there is green around them. I think that is the key to this whole thing. It is not having a garden and planting plants. [...] It is about changing people's perspective on this. You, in Germany and also whole of Europe, UK very specially, have always had traditions of private small gardens. India did not have that. India had public gardens. [...] This is, where

the disparity lies. When you came back there, to say, what about your urban gardens? There was a British tradition of planting gardens around old colonial homes of the upper richer class. This was elitist, and it never triggered down to the lower socioeconomic groups. What we are trying to do today, is to shift that by saying: "Let us have rooftop gardens or let us have small plots with gardening" and so on. It has never been looked at as a food source [...]. That people can harvest food from there. It does seem to be catching on now. And people say: "I like to grow my own tomatoes" [...]. It is happening. But that is a very, very, very small sector of human... of urban people. Gardening has always been linked to farming, rather than a small garden producing your own food. That is the difference. [...] I do not think that gardens in India will directly support food security. That is something much, much larger. It is a nice thing for especially children to know that... where does their food come from. If they grow a plant and find that it also sometimes dies. They become to realize how difficult it is for food to be... food to supply the world. I think that is an important concept. But it is a much more conceptual thing than a practical thing of making a garden. #00:03:37-3#

#00:03:37-3# Interviewer: [...] Transformative Educations wants to create understanding for sustainable actions and approaches. Pointing out actions in everyday life is part of this. Which daily life issues do you refer to in your educational approach? #00:04:02-8#

#00:04:02-8# Respondent 6: [...] I think sustainability has become an important component of this today. [...] It is really linked to environmental..., and to be much more importantly, to conservation. Conservation of nature. That is... I think, that is where it comes from. And the connections are... Really understanding, deeper understanding of what we refer to at the 'three pillars'. Three pillars of sustainability. It is really the interlinkages between the three pillars, it is important. And there, I think, my personal perspective is, that the Western or European perspective has to be very, very different from ours. There are (?) apart. Trying to match them does not work. It is a question of... That is why when they say: "Can we have a global perception of sustainability?"; the two worlds are so much apart, that they have fewer commonalities than differences. [...] #00:05:26-4# to #00:06:49-7# One of the things, that I am doing currently, is translating SDGs, which I believe, are written for governments to do, into what school teachers can do in their class room. [...] #00:07:02-1# to #00:07:47-2#

#00:07:47-2# Interviewer: [...] Global and local issues are more and more intertwined [...]. Which connections do you see regarding sustainable food? #00:08:02-3#

#00:08:02-3# Respondent 6: [...] I see consumption patterns as the major linkage. When you say consumption patterns... The disparity between economic groups, that I have observed in, let us say Germany, is not so wide. But if you look at the disparity in India, that is enormous. From extreme poverty to extremely affluent. And a growing middle economic sector. This is the key thing to the whole thing

of understanding global versus local issues. That the local issues in India are much, much, much more diverse. That makes it very difficult for us to adjust to the thinkings of the west. After a while, Indians are not every day shocked by poverty. Becomes part of life. [...] When you are living in it every day, you sometimes do not even... people do not even see it. But to you, it would be very, very shocking. The global issues are very distant for some of the people we are talking about. Some stakeholders. They will say: "If I cannot get my full meal today, what I am looking for in the globe?" [...] #00:09:57-6#

#00:09:57-6# Interviewer: Also, regarding the everyday life. If lifestyles are so different, I guess, it is also difficult to connect [...] sustainable actions to everyday life, if everyday life is so different... #00:10:23-9#

#00:10:23-9# Respondent 6: Yes #00:10:25-6#

#00:10:25-6# Interviewer: With the SDGs, the UN wants to rise global awareness on sustainability issues... #00:10:36-8#

#00:10:36-8# Respondent 6: [...] I would start with local issues. [...] You can build on those local issues. If you only look at global issues, you cannot break them down into local issues. [...] #00:10:55-6# to #00:11:36-5# SDGs are not written for individuals, they are written for what the country is supposed to do. We want, at school level, for children to understand this at a very local level, at their own household level. How to save (?) water, how to... It is ridiculous sometimes. We say how to save water, but there are places in India, where there is no water. We say, eliminate poverty, is the first SDG. How does a local school kid eliminate poverty? It is a wrong perception. He has to understand, that within the country, there is huge disparity in economics. Among people, family, his own friends. How to be sensitive to that. Not that he has to do something about it. He cannot. He may want to very much, but there is no (excess?) for him to do that. Would you expect the child therefor, to...? If he is given pocket money, in a middle-class home, to go back and say: "I will give my fifty percent of my pocket money to poor kids on the street"? Is that, what you are looking for? It does not happen. That is not the way to look at it. It is to look at sensitivity to that sector of society which I have (not?). #00:13:06-2#

#00:13:06-2# Interviewer: I think this refers to, let's say, [...], kind of cultures within the same country. [...] #00:13:24-7# to #00:13:47-7# Which role does mutual understanding of other cultures play in your work? #00:13:55-4#

#00:13:55-4# Respondent 6: Lots. [...] You look at the difference in the way we threat environment education and ESD in our rural and urban schools. They are very different. Because, we are catering to a different audience, completely. The various are this economic difference, the difference in lifestyles and the difference in language comfort. [...] We are in a very transient phase of awareness issues. That

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is, one of the things that one needs to deal with in ESD, that it is not only about education. It is about awareness of local issues, which then translate into regional and national and global issues. A classic example of where that has to work, is on conservation of biodiversity. It is very, very different. #00:15:19-0#

#00:15:19-0# Interviewer: [...] Which issues of global justice are you facing in your work? #00:15:29-9#

#00:15:29-9# Respondent 6: (6) I do not think (..) the west, or the north, or whatever you want to call it, the economically advanced countries. Really have a deep understanding of the cultural issues of developing or emerging nations. I think, that is where the (bloc?) lies. For me, looking at other cultures is very important. But that is a very personal thing, it does not necessarily translate into... I look at tribal cultures. That has been part of my work for last five or six years. I realize, how rapidly their cultures are being destroyed by homogenization and the way we teach things in formal school. It is a very big concern. Much of this cultural traditional knowledge is linked to people who life out in forests or wetlands or rivers and are highly dependent on natural resources around them. That knowledge and that culture is being actually wiped out by formal education. #00:16:50-6#

#00:16:50-6# Interviewer: [...] In Germany, despite widespread knowledge of sustainability problems, there is little sustainable action in society. #00:17:07-1#

#00:17:07-1# Respondent 6: [...] It is more prominent than in India. [...] The general awareness in the population, of what is sustainable development, is not understood. [...] #00:17:33-3# to #00:18:05-4#

#00:18:05-4# Interviewer: [...] In which relation do you see the provisioning of information on the one hand, and of practices on the other hand? #00:18:22-6#

#00:18:22-6# Respondent 6: [...] I think academics, I do not know about Germany, academics in India, are very (?); they can keep talking to themselves for the next (several centuries?) I think. But they will not reach the common people, the people who really need this kind of information and understanding. Both, in the upper socioeconomic class as well as in the very deprived people. We do not reach them. The understanding of this becomes very poor. #00:19:02-6#

#00:19:02-6# Interviewer: [...] So This would be the provisioning of information. [...] And what about the provisioning of practices? #00:19:14-6#

#00:19:14-6# Respondent 6: No. If there is no information, there won't be practice. I believe, it leads from information into an awareness of your own environmental issues and from awareness develops a certain concern and that concern has to develop into action. [...] #00:19:33-5# to #00:22:21-9#

#00:22:21-9# Interviewer: [...] What competencies and tools of change would you like to share with learner? [...] Regarding sustainable food production. #00:22:50-8#

#00:22:50-8# Respondent 6: The government systems in agriculture push high yielding crop varieties. They are even in some states supporting GM crops. Which, to me, is very bad. A very key thing, that I would like to see support for, trough educational processes for agriculture especially, is about the importance of conserving our local crop and livestock varieties. Crop varieties, indigenous crop varieties and indigenous cattle, (?), goats. I think, this is very important for India in future. If we allow this on farm conservation of genetics to disappear, which is what is happening because of government schemes. Government schemes push high growing, high yielding crops. And yes, that was at one point in time very important, to be able to feed millions of people in India. Today, that particular strategy of the Green Revolution is finishing off all our local cultivars. At one point in time, India used to have thirty to fifty thousand varieties of rice alone. Today we grow ten, twelve, twenty, mainly as food crops for the whole country, and very small bits of the individual cultivars remains. Especially, with tribal farmers. I want support for those. I think that is very crucial. For long term genetic management of crops, for long term conservation of genes. Just like you want to support the conservation of ecosystems and conservation of landscapes like this, conservation of species, it is also equally important to conserve this kind of genetic variability. #00:24:50-5#

#00:24:50-5# Interviewer: Why do you say it is important? #00:24:52-6#

#00:24:52-6# Respondent 6: In future, that is where the resource is for producing... Suppose you get one disease in rice today, you may have to go back to that gene, in a specific tribal gene, which is resistant to that disease. It has already happened in the case of rice. I think it is very important for long-term sustainability. [...] #00:25:17-7# to #00:25:21-5#

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#00:00:00-0# Interviewer: [...] to #00:00:26-9# How can gardens empower learners to act sustainable in everyday life? #00:00:33-1#

#00:00:33-1# Respondent 6: (One?) would have to do that quite consciously. It would be interesting, to bring it into formal educational processes. For example, we have pushed, even in urban, but much more in rural schools, the concept of a small garden, where they plant whatever they want. It is not necessarily flowers. It is vegetable gardening or whatever, whatever. That is something that we have been doing, but in many schools now, that is also being translated into: "Lets grow a flowery garden." Which I do not mind, I think it is a good idea. It is just that growing something makes it internalized. You begin to feel for that plant. I think that is the important part of it. That you feel for nature. That you also

realize, that if you do not water your garden when you go for a holiday, it will die. [...] Even the failure of a gardening episode in a school, to me, is a very important learning exercise. You did not water your garden, you did not water... (5). #00:01:43-3#

#00:01:43-3# Interviewer: [...] to #00:06:09-2# In Global Citizenship Education, relations between different topics, and also between different places are key points. When you imagine the future of your work, which actors would you like to exchange with? #00:06:29-0#

#00:06:29-0# Respondent 6: [...] to #00:07:02-3# What are you asking is: "What are the points of connection, which you feel, or which I feel, are most important for people to understand? #00:07:11-8#

#00:07:11-8# Interviewer: Yes. #00:07:13-3#

#00:07:13-3# Respondent 6: [...] I think it is about processes of nature. It is all... A deeper understanding, things like the cycles in nature. The changes in climate, that we are seeing. The importance of, let us just say as examples, pollinators or seed dispersers as being (?) to human life. It is understanding of ecological processes, which I think, then can be expanded into what is happening in your town or village, in your state or in country and (?) into the world at large. I think this is something that is inherent in Indian philosophy and Indian thought, especially in Hinduism. [...] We are not different from nature. We are part of a much larger, using a Christian word, 'creation'. [...] There is a need to teach it though, because those traditional things are disappearing. It is different in different communities, it is different in different religions. It is different in different cultures. The most fascinating ones are the linkages to nature, which are there at tribal people of India. Seventeen percent of India is tribal. They are very inherently close to nature. They depend on the... nature's resources. And they life very sustainable lives. We do not look at their knowledge as being hugely useful, but it is the future. It is the knowledge that we need for the future. [...] #00:09:46-2# to #00:14:27-5#

#00:14:27-5# Interviewer: With which actors from another place or another culture would you like to exchange with? #00:14:41-6#

#00:14:41-6# Respondent 6: Youth. [...] The youth as being part of future culture. Is very important to me. [...] I would like to interact more or less with your generation. At a much more informal set up. Than what happened in those two days at our discourse. Which was not bad, but... This kind of thing only come through one to one interactions with people and so on. I think it is important to understand cultures that way. [...] #00:15:38-1# to #00:15:45-5#

Interview #7

Project	Master thesis: "Ecosystem Services as a communication tool for Global Citizenship Education"
Interview number	07
File name(s)	gced_respondent7_1.mp3;
Date and time of recording	12.11.2018; 1.00 pm – 1.50 pm;
Place of recording	University office
Duration of recording	32:48 min
Data collection	Guided interview, personal
Interviewer	Lisa Schneider
Interviewee	Respondent 7 (R7)
Gender	Male
Occupational area	Academic, Agriculture, Indigenous knowledge, Sustainable Development
Informed consent	Oral agreement from 12.11.2018
Anonymization	By explanations in brackets, e.g. [name of a dialogue participant], [city in India/Germany]
Date of transcription	22.03.2019
Transcribing person	Lisa Schneider
Annotation	The interview with this person was done two days after the dialogue

gced_respondent7_1.mp3

#00:00:00-0# Interviewer: [...] I am especially interested in how gardens are used for knowledge transfer. [...] When was the first time, you came across gardening in terms of education or research? And in which context was this? #00:00:20-4#

#00:00:20-4# Respondent 7: Okay, the first time was here in Germany. When... I think it was in 2013, no, 2012. That is when I started connecting with [sustainable food research association]. I was not part of [sustainable food research association] then and [member of the sustainable food research association] offered a tour for the master's program, I was taking part of. He took us to different... not all of them were gardens. [...] Projects, involving either seeds or local farming or CSAs. It was trough that tour, that I got familiar with the concept. #00:01:14-8#

#00:01:14-8# Interviewer: [...] Before that, had you have any... any experiences with gardening? #00:01:33-3#

#00:01:33-3# Respondent 7: No, not really. #00:01:35-7#

#00:01:35-7# Interviewer: [...] Please give some associations on how gardens support sustainability. #00:01:46-1#

#00:01:46-1# Respondent 7: [...] The first thing that comes to my mind is, that when I think about sustainability is the... (4) The ability, that a person, or a group of people, have to create or get items... in this case food, in ways that have (..) the less impact available on the environment. In terms of gardening. Sustainability in this context, I think, makes reference to the idea of being able to... First of all, obtain food in the... In a way that you make sure, that it is not being transported so far. And that you are using... The inputs that you put into the food are... (..) [...] friendly with the environment... Or that... Or that you can make sure, that the environment, in this case the soil and the air, are not affected as much as they are trough different methods of obtaining food. That is, in terms of the food, but I think also sustainability is (..) impacting the way that people behave. If you are disconnected from your food, I think that also creates a disconnection with people. I think, trough gardening you engage in a sustainable way of obtaining your food, but also you develop social skills. Trough interacting with other people. For me, that is important to sustain society. In my view, sustainability is also involving human beings very strongly. #00:04:04-5#

#00:04:04-5# Interviewer: [...] How, in this sense, people are disconnected? From people? #00:04:19-3#

#00:04:19-3# Respondent 7: [...] In the sense that... If you... If you do not practice gardening, in my point of view, you are... You are obviously disconnected from the food. But also, from the people that make that food happen. Not just from the person that is obtaining the seeds, but also from the person that is planting the seeds, and the person that is taking care of the harvest and plagues and all these things. For me, it is not important who brings the food to my plate so much, in terms of transportation, I do not put too much importance into that. But it definitely disconnects you from the people that grow the food. Because if... If you do not even know the food that you are eating, then how are you supposed to know the people that are behind this? [...] #00:05:30-3#

#00:05:30-3# Interviewer: [...] Transformative Education wants to create understanding for sustainable actions and approaches. Pointing out options in everyday life is part of this. Which daily life issues do you refer to in your educational approach or in your research? #00:05:57-8#

#00:05:57-8# Respondent 7: [...] to #00:06:32-5# We are very concerned with... [...] the lack of knowledge that people have. Regarding the most important thing that we have in life, after breathing. First, you breathe and then you stay alive and after this comes water and food. [...] We try to put together programs, educational programs, that can address very... Everyday life situations for people. So that, when they go to the kitchen, for example, or when they go to the street, they can think about these things, that ultimately take you to food. [...] We are very concerned how people think, when they go out shopping. Because most people go to the market, and just by the fact by going to the market, that already puts your mind into a frame, where you are looking for specific shape of a carrot or a certain package, or a certain amount of food. #00:08:03-9#

#00:08:03-9# Interviewer: You are talking about the supermarket and not the...? #00:08:07-1#

#00:08:07-1# Respondent 7: [...] ...not the farmer's market. Like Edekas, Rewe. That is... That is a life issue. When you take the decision to go shopping for food. What are you thinking about? Is it a supermarket like Edeka, or like Kaufland, which is even... Probably worse. Or is it the farmer's market? Or is it your local farmer that lives around the corner? [...] That is one of the things we want to address. Start from the very beginning of the... How people think about their food. #00:08:41-7#

#00:08:41-7# Interviewer: [...] Global and local issues are more and more intertwined. Which connections do you see regarding sustainable food? #00:08:57-8#

#00:08:57-8# Respondent 7: (4) [...] One connection I see, the most obvious one for me, is that normally we... Or in general, people do not take into consideration, where the food is coming from. Where, on earth, it is produced. Sometimes it is local, or something is in the same country. Many times, it is coming from different countries. At least where I come from, people do not really put much attention into that. We just go, buy food, regardless of where it is grown. Lately, I have seen that in different countries, I go back home, and I compare with Germany... And I already see that back home, we are already getting more aware of where this food is coming from. [...] The more people realize where the food is produced, this is going to create more awareness and hopefully this can help create local awareness, that can spread into global awareness. (4) #00:10:37-3#

#00:10:37-3# Interviewer: Why do you think it is important to have... Or why would you like to... that the local awareness goes to global awareness? #00:10:49-5#

#00:10:49-5# Respondent 7: If I am getting an avocado from Kenia. And I start worrying where Kenia is actually located on the map, then that is going to change my mindset. On the other hand, a person from Kenia... I am pretty sure, that they would prefer the avocado sustain in Kenia. The awareness is going to come in different... In different facets. For the people consuming, is something, and for the people that

are selling it, is a completely different thing. It is different problems for the two places, but the awareness that you get, that will bring you to the same kind of thinking. [...] #00:11:40-5# to #00:13:05-7# The more obvious connection that I see between this, is the role that the producers are playing. The more the big food producers are growing, the more options they have to sell their food overseas or in other countries. I see that there is a tendency worldwide, that the smaller producers are tending to disappear, and the bigger producers are getting stronger. (5) In general, big producers are not very sustainable in the way they are producing the food. I see a big problem there. Regarding producers [...] and the transportation part of this. #00:13:57-1#

 #00:13:57-1# Interviewer: [...] With the Sustainable Development Goals, the UN wants to raise global awareness on sustainability issues. [...] Which role does mutual understanding of other cultures play in your work? [...] #00:14:30-3# to #00:16:50-1#

 #00:16:50-1# Respondent 7: It plays a huge, huge role. We are very inclined to create projects, where we are integrating, in this case for example, refugees. That is a very local thing. But we also connect with organizations across Europe and India and what not... That is because one of our main objectives, is precisely, to be able to understand other cultures, to understand how they see these problems from their backgrounds and then find common points. Find these common themes. That even though there are different religions and we eat different food and we life in different climate, there is points in which we all agree regarding sustainability. [...] That is one of the principal things that we have in [sustainable food research association], That we... (..) We like to know how we think, and we have our own ideas, but we want to enrich them through the eyes of other peoples and other cultures. We think that it is very important, that these relationships exist. Then again, we can just find a mega list of points in common and then we can start working on them, together. #00:18:08-3#

 #00:18:08-3# Interviewer: What about the differences, do you... [...] Do they also play a role? #00:18:13-4#

 #00:18:13-4# Respondent 7: Yes, of course. [...] I think, that is the most interesting part of it, because then you get to see things different. So, it is not about to see what we agree on, but what we do not agree on. That can be tricky... tricky landscape to travel, but that is the interesting part, because then you get new ideas and you get new perspectives and... A lot of times, [...] from my own experiences, I have learned a lot precisely because of the differences with other cultures. The case of India, they have a strong philosophic or religious background to many of their practices. Regarding production of food. That is just mind-blowing for me, and that is just one country. Like the cow, the role that the cow plays, for example. [...] #00:19:18-2#

 #00:19:18-2# Interviewer: Which issues of global justice are you facing in your work? #00:19:26-0#

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#00:19:26-0# Respondent 7: [...] One of the important ones is the access... The access to land. The ability that poor people, without resources, have to access to land. Or the lack of it, in this case. [...] Being able to own a piece of earth. For the sake of feeding yourself. [...] A secondary aspect would be the access to water and services. Basic infrastructure for health and water treatment and housing. [...] Access to land, to feed yourself, and also to be able to have a place where to protect yourself from the weather. Rise a family and be happy. When we start collaborating with other countries, then we start to see other (reasons?) coming up, that... I mean, we are based in [city in Germany], in Germany, and we have very different social issues. When we... As we extend our cooperation with other countries, then other aspects, like gender issues, come up. For us, also gender issues are very, very important. We try to integrate them into our projects as much as possible. (...) #00:21:13-4#

#00:21:13-4# Interviewer: [...] In Germany, despite widespread knowledge of sustainability problems, there is little sustainable action in society. In which relation do you see the provisioning of information on the one hand, and of practices on the other hand? #00:21:41-9#

#00:21:41-9# Respondent 7: I think there is a lot of work to be done, still. For the provisioning of information. From the government. From the municipal, local, state level. There is a lot of work that they should be doing, and they are not doing. On the other hand, it is also a personal responsibility to educate yourself. Especially in Germany. We have a lot of resources available, we have libraries and internet. I think it is not fair to just expect the authorities to do something for us. I would put a fifty-fifty percent responsibility there, between authorities and the public in general to educate yourself on information regarding sustainable actions. Regarding the practices... It is a direct consequence. I do not think there is enough awareness, I do not think there is enough provisioning of information. It could be improved a lot and because there is not enough, then these practices are just not seen in everyday life. In [city in Germany], for example, you have all this recycling and all this, which is great, but in my personal opinion, we should have already moved much further from that. I think, we tend to feel very comfortable. When we do something sustainable, we... We just feel comfy and we stay there, and we stagnate. I think, it is important to keep the ball rolling... At a personal level, first of all. But also, authorities would need to do more work in this sense. #00:23:35-8#

#00:23:35-8# Interviewer: [...] to #00:24:02-3# What competencies and tools of change would you like to share with learners? #00:24:08-3#

#00:24:08-3# Respondent 7: [...] I cannot mention tools in specific, because I am not very knowledgeable on tools used to... Used in education per se. That is not my field. [...] If it was my decision to take, I would invest time resources on developing [...] self-awareness. I think, it is very important to get to know ourselves. In many aspects in life of course, but this is also impacting the way that we act

in the... In life. Especially now in food. Self-awareness, the study of the self, which is of course very philosophical but... I think we need to go there, if we want to get the sensibility in order to understand all the things that we take for granted. #00:25:43-9#

#00:25:43-9# Interviewer: [...] How can gardens empower learners to act sustainable in everyday life? #00:25:56-8#

#00:25:56-8# Respondent 7: [...] My very personal perspective: When I work in gardens, with plants, with the soil... First of all, ... I also work with other people, with... When I am working directly with the land, it really brings me a lot of peace of mind. I guess, it is the same thing that people, some people, get when they are having pets for example, or... [...] I just feel a very strong connection, a deep, deep connection. Because of that, I start questioning (other/all?) things around me. Which do not feel very natural like plants or like worms. In my experience, that is how just the act of gardening can empower you. Because you do become self-aware of what am I doing and how important this is and what impact it is having. Then you have another person next to you and then you see: How are the things that I am doing impacting this other person? Who hopefully is going through the same process of self-awareness. [...] That is how it happens for me. #00:27:31-3#

#00:27:31-3# Interviewer: [...] In Global Citizenship Education relations between topics, in the sense of disciplines, and also relations between places like... (Respondent 7: Geographically?) [...] Are key points. When you imagine the future of your work, which actors would you like to exchange with? #00:28:09-0#

#00:28:09-0# Respondent 7: Teachers. But if it is a future that I can imagine as I want, I would not want to work with teachers as we understand teachers right now. I think teachers should be teached... deeply first. I think, we need a new educational framework first. To... provide teachers with the knowledge that they should have. The teacher should go through this self-awareness process first of all. To be able to become a teacher. In my... In my perspective. And children. Everyone under six years old. From zero to six years old, I think that is... Educating that age range is the best thing that we can do. Of course, the rest of people are playing a very important role, but we have good teachers and we can give children this information through these teachers that... That is going to build up a new culture. It is going to take years but that is not the question. In third place, I guess, I would put decision makers. In general. Not just authorities but decision makers. People in industry, people... Private sector. [...] People that want to... Are looking for change. [...] #00:30:01-2#

#00:30:01-2# Interviewer: And in terms of places? [...] #00:30:04-7# to #00:30:54-5#

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#00:30:54-5# Respondent 7: Regarding geography. I am very interested in indigenous cultures. I would really like to be able to exchange... to work with people from indigenous cultures. In this case, from all over the world but that is very big. So, I would like to start with people in the mountains, actually. Indigenous cultures in mountain landscapes. And also, around river beds. [...] Mountains because there is... [...] challenges everywhere. I think mountains have a very special potential. I think they are... (...) They have a potential for humans to adapt human needs to the landscape. You can play around with mountains and landscapes a lot. And rivers because that is where... since we are humans... That is where humans are gathering. Close to water. From the beginning when humans were approaching water they started killing animals and polluting water and I am very interested to see how these dynamics can change. That we can still do our human thing and not... without the bad things about it. [...] #00:32:48-8#

Appendix 3: Valuative Statements within the 'Gardening Questions.'
Statements within the 'gardening questions' (Q1, Q2, Q4, Q9) by the interviewees with reference to the indicating phrases.

Code	Indicative Phrases
CULTURE AND HERITAGE VALUE	"value..."
RECREATIONAL VALUE	"value..."
AWARENESS WHERE THE FOOD IS COMING FROM	"hopefully..."
CARE ABOUT FOOD	"we are hoping...."
CARE ABOUT PLANTS	"we are hoping..."
CIVIC RESPONSIBILITY	"the privilege...", "we hope..."
CLOSEST ART TO NATURE	"want to do that..."
CONNECT WITH NATURE	"I think..."
CREATE SOIL FROM WHAT IS AVAILABLE LOCAL	"making sure..."
EASY GROWING	"push for..."
EFFECT SUSTAINABILITY	"I think [...] one of the best..."
ENVIRONMENTALLY FRIENDLY	"Sustainability [...], I think...", "make sure..."
FEEL FOR NATURE	"I think that is the important part..."
FOOD	"the value..."
GARDENS AS PART OF LAND-USE PLANNING	"important..."
GREEN AROUND	"appreciate..."
GROW OWN TOMATOES	"I like to..."
GROWING AT HOME AND NEARBY	"they should be..."
GROWING FLOWERS	"I think it is a good idea..."
INTERACTING WITH OTHER PEOPLE	"for me, that is important..."
INTEREST IN SCIENCE	"hopefully..."
INVOLVING HUMANS	"in my view..."
INVOLVING SCHOOLS AND STUDENTS IN GARDENING	"would like..."
KNOW PEOPLE THAT GROW THE FOOD	"it is not important [...] but..."
KNOW THE PROCESSES THAT LEAD TO A FOOD PRODUCT	"I think [...] good insight..."
KNOW WHERE THE FOOD COMES FROM	"it is a nice thing..."
LEARNING FROM FAILURE	"very important..."
LOCAL AWARENESS SPREADING INTO GLOBAL AWARENESS	"hopefully this can help..."
LOVING NATURE	"loving..."
LOW NOISE LEVELS	"require..."
MINDSET CHANGE/ PERSPECTIVE CHANGE	"I think..."
NO FAR TRANSPORTATION	"Sustainability [...], I think..."
NO GM CROPS FOR CONSUMPTION	"seven public consultations", "it was decided"
NON MONETARY VALUATION	"how to value..."
NOT ELITIST	"we are trying..." to shift that..."
OBTAINING FOOD	"I think..."

References - Appendix 3: Valuative Statements within the 'Gardening Questions.'
Statements within the 'gardening questions' (Q1, Q2, Q4, Q9) by the interviewees with reference to the indicating phrases.

Code	Indicative Phrases
OPEN SPACE	"there are rules..."
PEST CONTROL: LOCAL AND NATURAL	"making sure..."
GARDENING IN SCHOOL	"we have pushed..."
PUBLIC GOOD	"we recommend..."
REALIZE WHAT IT TAKES TO GROW	"we hope..."
RECREATIONAL VALUE	"great value..."
RESILIENCE	"we are hoping...."
RESPECT FOR WATERBODIES	"respect..."
RESPECT THE ENVIRONMENT	"we hope..."
SEED SAVING	"making sure..."
SELF AWARENESS ABOUT OWN ACTIONS	"how important this is..."
SELF-AWARENESS	"who is hopefully..."
SOCIAL RESPONSIBILITY	"we are hoping..."
SOCIAL SKILLS	"I think..."
STOP LITTERING ON THE STREET	"we are hoping..."
STRESS RELIEF	"excellent..."
SUSTAIN SOCIETY	"it is important..."
UNDERSTANDING THE ENTIRE FOOD CHAIN	"I think...", "momentous..."
USE WATER EFFICIENTLY	"I want..."
USING LOCAL (AND) INDIGENOUS PRODUCTS	"should be [...] I think, ..."
VALUING ES	"value..."
VALUING GOODS	"value..."
VALUING PRODUCTION OF SMALL, SMALL STUFF	"I think [...] great potential..."
WASTE GOING BACK TO WHERE IT GREW	"should have..."
WASTE MANAGEMENT	"by encouraging..."
WATER CONSERVATION	"we are trying to push for..."
WHAT YOU CAN PRODUCE	"appreciation..."
WHAT YOU NEED	"appreciation..."

Eidesstattliche Erklärung

Hiermit versichere ich, die vorliegende Arbeit selbständig verfasst zu haben. Ich habe keine anderen als die angegebenen Quellen und Hilfsmittel benutzt und alle wörtlich oder sinngemäß aus anderen Werken übernommenen Inhalte als solche kenntlich gemacht. Die eingereichte Masterarbeit war oder ist weder vollständig noch in wesentlichen Teilen Gegenstand eines anderen Prüfungsverfahrens. Die elektronische Version der eingereichten Masterarbeit stimmt in Inhalt und Formatierung mit den auf Papier ausgedruckten Exemplaren überein.

Freiburg i.Br., 04.10.2019