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Forest gardens – new opportunities for urban children to understand and develop relationships with other organisms

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ABSTRACT

This case study explores a learning situation in a forest garden in Sweden. A forest garden is an edible polyculture landscape with different layers of mostly perennial vegetation. The forest garden is designed to maximize the yield of useful plants while minimizing the input of energy and resources, including human labour. Forest gardens may offer learning situations that contextualize interconnectedness and relations between organisms as well as situations that are beneficial for evaluative development (Kellert, 2002), i.e. the development of values, beliefs and moral perspectives in children.

Twenty-seven seven to eight year old primary school children were followed in the first six months of a three year project in which they participated in developing a forest garden. The aim of the study is to investigate how the children reason with respect to different organisms' dependence on and relations to each other, themselves included. Specifically:

How do the children describe their own relationships with other organisms, as well as the relationships between other organisms in the forest garden?

What values of nature are expressed by the children, and in relation to which situations in the forest garden?

Data were collected in the form of field notes, audio and video recordings and photos from the children's visits to the forest garden. The photos were used for stimulated recall in focus group interviews. The data were analysed using a combination of qualitative content analysis (Patton, 2002) and semi-quantitative methods.

The children in the study presented a unidirectional perspective about the relationship between themselves and the organisms, especially the insects, in the forest garden. Rather than asking what these organisms can do for me/us, they pose the question: What can I/we do for the bugs/plants/ bees?

The humanistic values, expressed by the children as a willingness to help other organisms (mostly insects) are in line with the explicit aims of the former curriculum for Biology to "promote care and respect for nature". We should note that these humanistic values are no longer explicitly stated in the current curriculum. It is striking that the anthropocentric ecosystem services perspective (introduced in the current curriculum from grade 4), is so rare in the data. The children seldom mentioned the benefits for humans from insect pollination, even though this relationship is clearly stated by the pedagogues together with humanistic values.

In observations, the children showed a great deal of curiosity for the natural environment (naturalistic value) as well as joy and enthusiasm about participating in the different activities that took place in the forest garden. Aesthetic values were expressed in relation to flowers, cones, berries, a snail's shell etc.

This study shows that forest gardens have the potential to be places where children can connect emotionally and cognitively to other organisms.

1. Introduction

Forest gardens have been established in both urban and rural areas in the temperate world in recent years. Inspired by tropical agroforestry practices, these forest gardens are designed to resemble multi-layered forest edges. The design and orientation aims to

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maximize the inflow of solar energy to the vegetation in order to enhance photosynthesis, producing as many edible and functional plants as possible (Whitefield, 2002; Jacke and Toensmeier, 2005; Crawford, 2010). Forest gardens are also designed to be easy to maintain with little input of resources and energy. While planning and establishing a forest garden there is a need to adapt to specific local conditions. The ground must be prepared in a way that makes best use of the available sunshine and water flowing through the area and the plants should be chosen and located to promote mutual growth. This requires knowledge and careful thought about the relationships between different kinds of plants, but also about the relationships between plants and animals and human activities. Forest gardens thus offer learning situations that contextualize this kind of interconnectedness.

Sustainable development depends on conservation and the development of ecosystem services (Millennium Ecosystem Assessment, 2005). This needs to be understood and acknowledged by the world's decision-makers and citizens when making decisions about land use in urban as well as rural areas. A number of studies discuss the significance of direct encounters with natural environments for children's concern with and understanding of the natural world (Chawla, 1999, 2009) and have pointed to the risks of emotional alienation/estrangement from nature as a consequence of global urbanization (Malone, 2007; Louv, 2008). It has been suggested that the emotional relationship or bonding with nature takes place before the age of 11–12 years old (Kellert, 2002; Sobel 2008). School gardening (Blair, 2009), forest schools (O'Brien and Murray, 2007; Waite et al., 2015) and excursions (Sandell and Öhman, 2010) to more or less wild, rural areas are used in some parts of the world as a means to address these concerns about children's relationship to nature. However, many urban children do not have access to these kind of encounters with nature. Blair (2009) has suggested future research to report on creative means of maintaining school gardens over time and moving the workload away from teachers. The need to travel to green and forested places may cause barriers of transportation cost and travel time (Waite et al., 2015). A forest garden may be more accessible than forest schools/excursions and require less maintenance than a school garden. Thereby it may offer new educational opportunities through its potential to combine aspects of education in the classroom, school gardening and experiences of wilderness/cultivated landscapes.

There is a lack of research into the educational aspects of forest gardens. One reason for this might be that most urban forest gardens, have only been established in recent years. There are reasons to assume that forest gardens in urban areas respond to a variety of emotional, aesthetic, nutritional and recreational needs, for instance through opportunities for citizens to collect and enjoy edible plants. Participation in creating and maintaining forest gardens provides potential opportunities to emotionally and intellectually experience, practice and process knowledge about the interconnectedness and interactions between species, which in turn might increase the children's capabilities to handle complexities; this is important when making decisions about land use, particularly with regard to the conservation and development of ecosystem services. 'Ecosystem services', as a perspective on ecological processes, is highlighted in the Biology curriculum in grades 4–9 in Sweden (Swedish National Agency of Education, 2011), intended to provide students with insights into ecological processes. The ecosystem service approach to nature implies a unidirectional view about the purpose and value of organisms other than humans, insofar as the concept is described as follows:

'Ecosystem services' is a generic term for functions in nature that in different ways are beneficial to humans. Ecosystem services include products such as water, food and raw materials, and processes such as pollination of plants, water purification and circulation of nutrients." (The Swedish National Agency of Education, 2011, p. 21, our translation from Swedish).

Evidence suggesting that experiential contact with nature is necessary for child development has been presented by several authors (Sebba, 1991; Faber Taylor et al., 1998; Basile, 2000). While Faber Taylor and Kuo (2006) saw methodological weaknesses in most of these studies they concluded that "given the pattern of findings pointing in the same direction [. . .] it is more parsimonious to accept the fact that nature can promote healthy child development". Using the biophilia hypothesis (Wilson, 1984), nine types of basic "biocultural" values that people hold about the natural world and which are likely to have been adaptive during human evolution were described by Kellert (1997, 2002, 2009). Kellert's typology, the result of many years of research into people's attitudes and values concerning nature, includes scientific, symbolic, aesthetic, utilitarian, moralistic, humanistic, dominionistic, negativistic and naturalistic values, each describing a particular "affinity" that humans have with nature. The values develop during childhood and represent "the creation of values, beliefs and moral perspectives", referred to as evaluative development (Kellert, 2002, p. 120). This is of interest in our study, as experiential contact with the natural environment, especially for children aged 6–10 years old, has been suggested to be necessary for the development of different values, and consequently for normal maturation during childhood (Kellert, 2009).

Notably for 10–16-year-olds, the ecosystem services-perspective, which reflects the utilitarian values in Kellert's typology, is the only explicit perspective on nature expressed in the curriculum for Biology. For younger students, 6–9-year-olds, the curriculum does not explicitly point out any particular perspectives on nature that should frame learning about and in nature. However, implicitly there is a strong emphasis on what Kellert classified as scientific and symbolic values, such as naming and classifying (The Swedish National Agency of Education, 2011).

The concept of biophilia and Kellert's values of nature has recieved empirical support and form the basis of a considerable body of research (Gullone, 2000). In an investigation of educator's perceptions about the benefits for children of contact with nature, Maller (2009) used biophilia as a basis for a model of how activities involving hands-on-contact with nature influences children's mental, emotional and social health. Davis et al. (2006) applied Kellert's typology to findings in two outdoor learning case studies aimed at children three to 11 years old and found that Kellert's values relate to the pillars of learning formulated in UNESCOs report for learning in the 21st century (Delors, 1996). More recently, Richardson et al. (2015) used Kellert's typology to analyses of results in a study investigating what aspects of urban landscapes can be valued as a route for people to connect to nature. Kahn (2003, p. 131) found "remarkably similar environmental moral reasoning" among children across diverse cultures and concluded that one explanation for this "is that that there are universal and invariant aspects of nature itself that give rise to and bound children's environmental constructions". For a critical discussion the biophilia hypothesis in relation to structural-developmental theory, see Kahn (1997).

1.1. Research aim

This case study follows 27 seven to eight year old school children in the first six months of a three year project in which they participate in developing a forest garden.

The aim of the study is to investigate how the children reason with respect to different organisms' dependence on and relations to each other, themselves included. Specifically we ask: