

Golf courses as a part of urban green infrastructure: social aspects of golf courses and extensively managed turfgrass areas from Nordic perspective

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1. Introduction

Originating in Scotland in the 15th century, the game of golf became very popular first in Europe, later in all English colonies and finally, by the end of the 20th century, around the world. With urbanisation in new urban districts, quite large open areas are designated for golf courses and are considered to be an important part of urban green infrastructure (Zhang 2014). However, the high level of resource input and intensive maintenance and management practice of golf courses is criticised by some ecologists and environmentalists. A paradigm shift is now required towards creating multi-functional sustainable public spaces.

In the Nordic countries managed turfgrass areas and golf facilities have been increasing since the second part of the 20th century. The Nordic golf federations have more than 900,000 members, playing golf on 1071 courses that cover a total area of more than 65,000 ha (Golf around the World 2015). The popularity of golf is partly connected to the growing market economy, increasing incomes and economic stability. There are probably many other factors connected to the modern Western lifestyle, which might explain the popularity of golf (such as health aspects, experience of nature, and social interaction, etc.). Swedish golf courses are seen by many golfers as an arena for meeting, socializing and enjoying nature. Many golf courses are located in or near attractive nature and landscapes such as lakes and forest margins.

We researched golf courses within the interdisciplinary project "Lawn as a cultural and ecological phenomenon" run by scientists from SLU, Sweden and funded by the Swedish Research Council (FORMAS). One of the goals of this project was to study the range of different managed lawns from the most intensively managed urban conventional lawns to the more meadow-like lawns. The parterre lawn, requires the highest management intensity, but parterre lawns are uncommon in Sweden. Instead golf courses were included in our project. Golf courses have a wide range of lawn types and playing surfaces, from very intensively managed greens and tees to fairways with intermediate management practices and roughs with the lowest management intensity. Golf courses in this sense can be seen as a microcosm where all types of planted grass communities (lawns) are presented (fairway, rough and high rough).

During the last decade in Sweden there has been a driving force to develop greater numbers of multifunctional golf courses, which can provide a whole range of ecosystem services such as improving biodiversity (creating habitats for grassland and wetlands), and providing recreational areas, which are accessible for the public. STERF (Scandinavian Turfgrass and Environmental Research Foundation) is one of the main promoters of this movement (Strandberg et al., 2011). An important peculiarity of Swedish golf courses is the use of only small or very small amounts of fungicides, herbicides and fertilizers.

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2. Methodology

Our data collection methods in this research are surveys, interviews, observational studies and document studies. Six golf clubs (GC) were selected in three geographic regions of

Sweden (Gothenburg, Malmo / Lund and Uppsala / Sigtuna): Sigtuna GC, Uppsala GC, Malmö Burlöv GC, Lund University GC, GC Delsjön and Torslanda GC.

A total of 180 golfers and 12 golf course employees are included in the study. Observational studies in the golf environment were aimed at getting an idea of where the visitors went to when they were not playing golf. We have also studied the selected golf clubs' websites and published writings.

3. Results and discussion

The social part of this study has been focused on the golfers' and the golf course managers' perspectives. The main research question was "What is appreciated by golfers in their golf course when it comes to green environment and ecological, cultural and social values?" The interviews indicated that the time spent on the golf course includes much more than just the game itself. For many players visits to the golf course also act as an experience of nature and the beautiful surroundings, as a social context (interaction), a way to stay in shape (fitness), as well as a way to relax (recreation).

The Golf course as a social arena

Golfers indicated that in golf clubs they are able to meet friends and make new social contacts in golf clubs. Players stressed that here they feel included in a social context where all share the same interest - the game of golf. The restaurant as well as shops and other activity arenas on the golf course are important social meeting points. Many golfers also use other golf courses within and outside Sweden. Partly they do this in order to try other golf courses (challenges) and to extend the playing season (which is short in Sweden) by traveling to warmer countries. One of the players said: "*Golf is an important part of my life. This is where I and my wife (sic) meet after work. Here we meet our friends. Here we spend a lot of time, sometimes even the whole day. Then there must be more than just good courses. Periodically, the golf club is our second home during the summer season*".

The Golf course as an experience arena (perception)

Natural values often mentioned by the golf players were: quiet, peaceful environment (silence), sound (hearing of birds), seeing butterflies and small animals as well as the presence of plants. The existence of the "natural environment" is perceived as a very important feature for choosing a specific golf club. For example, one of the golfers said: "*It is so beautiful to have birch trees and flowering meadow as a background for this golf course*". Another player said: "*When I finish playing in this well-kept environment of golf, I want to enjoy being in the surrounding nature. I am so happy to do a little walk in the beautiful surroundings. I have my favorite place where I meet my friend - a hare. The place also has a rich birdlife which I do not notice (sic) as much when playing on the golf fairways*".

Golfers also enjoy the pleasant smells and sounds of nature as well as the presence of water (lake, pond and river).

Vision of biodiversity

The environmental aspect seems to be important for many of golfers. The majority of respondent players said that the golf course was a great environment for biodiversity for animals and plants. For example, 114 from the 180 interviewees said that the golf course was a good environment for biodiversity. Some of the players were skeptical. One of them said: "*No, voles and hares and things like that should not be here. They should stay away from the golf course. The grass must be free from weeds. Greens must be well maintained. I have my garden at home*".

The Golf course as an activity sport's arena

For golfers generally, the game itself, of course, is the primary reason for being at a particular golf course. However, many players noticed that the game is combined with other added values. Many of those interviewed described their vision of a "good" and well-functioning golf course as:

- the golfing environment should be maintained in an environmentally friendly manner
- the golf holes in various parts should be of high quality
- the golf course should be located in a beautiful and quiet environment

- the golf course design should be of good quality in terms of management and playability
- the golf course must be neither too demanding nor too easy.
- the golf course should have necessary features/services that golfers need during a day's stay.

Golfers appreciate some additional features such as good communications, easy access and closeness to home. Many of the golfers also mentioned the importance of cultural aspects.

Lawns and their significance for golfers

A golf course consists of four main parts: tee, fairway, rough and green. The tee is a smooth flat lawn area which is always cut very short. The fairway is an intensively short-cut, elongated lawn area in the direction towards the green that is surrounded by a rough area that consists of higher grass that is cut less frequently. A green is a high-intensity trimmed lawn which is mown daily during peak season. Tees and fairways are not cut as frequently (approximately 3 times per week). The rough is the part of the golf course that is least maintained and cut about once per week or less (interviews with green keepers and managers on golf courses in the Swedish Lawn project, February 2015).

Many of the interviewees valued not only the game, but also the green (both in terms of the quality of playing surface, which sometimes even becomes tanned by the sun or because of the intensive maintenance) but also the 'natural' green areas found in the local environment. In other words, "wild" nature embedding the golf course, is often seen as a valuable additional complement to the professionally designed and well-kept playing surfaces of the golf course.

The manager's vision of golf courses

Interviews with employees were conducted in all six golf courses. All golf course managers have high ambitions when it comes to offering a good quality golf course. The main challenge for all golf courses was to find the balance: how to offer good playing surfaces and well-maintained and attractive golf courses in tight economic conditions. Several golf clubs mentioned the problem of competition between different clubs. Membership fees are not always sufficient for the high ambitions that the clubs want to offer when it comes to course quality and service. The common feature in all studied cases was increasing demands from players in terms of quality of the golf holes (tidy and smooth to play on) and at the same time requirements from municipalities and county councils to address the environmental issues. One of the interviewees said: "*Our players want the best possible quality of the golf course for minimal expenses. A sound principle we try to live up to. Without bragging, I think we can handle it quite well.*"

Two of the golf courses that are included in our study are nature conservation areas. Here the use of pesticides is completely prohibited. It is known that sometimes turf grass suffers from diseases caused by fungus and in this case pesticides are usually used. But in the case of golf courses in nature conservation areas it can be used only occasionally and under strict control. Irrigation and fertilization are also controlled in these areas. Delsjön GC is one of those golf clubs that has been given permission to build a pond to meet irrigation needs. In the second case, Lund University GC, a certain quantity of water is taken from the nearby lake for irrigation purposes. In both cases the golf courses must apply for permission for all major construction jobs, the supply of soil, and tree cutting. The golf courses' business in nature conservation areas is very much driven and controlled by the authorities. One of the employees said; "*In this way we have been forced to become an eco-friendly golf club. Sometimes such policy pays off in the end and our players really appreciate this nature conservation component. We see this as a competitive advantage and believe in this positive trend where more and more of the maintenance of managed turf grass areas and golf courses are controlled by environmental goals.*"

We can also conclude that golf course managers expressed high ambitions when it came to environmental issues. This applies to mowing, watering, and use of pesticides and fertilizers on golf courses. For example, one interviewee said: "*We investigate the situation carefully before we invest in any machines or change our maintenance routines. The aim is to meet the environmental requirements. But this is sometimes difficult to do. Today there*

are, for example, good electric mowers but they devour batteries at a furious pace, and these batteries are very expensive. So it will not be as environmentally friendly in all cases in the end. The hybrid machines available today are certainly good but too expensive so far. So we compromise as much as possible to balance both environmental requirements and our economic reality".

One course manager said: "Previously, we had a strict schedule for the days we would irrigate and run different kinds of management, how often, etc. Now we have introduced the principle – "if and when it is necessary" - which gives both economic and environmental savings. It's about common sense instead of overly strict procedures".

All golf course managers have a desire for creating a "beautiful green natural environment" with flowering plants, shrubs, trees and ideally, with water presence. For example, one of the course managers said: "It would be fun to make the environment a bit more inviting by planting more plants. But we cannot do anything without permission from the County Administrative Board. Plants that do not belong to the natural and original environment are not allowed here since this area is classified as a nature conservation area. But we have many other values for example a beautiful meadow which reaches its peak around midsummer."

When it comes to grass quality the wish list of course managers and green keepers is:

- A long summer season with just enough rain and sun.
- Sustainable and easy maintained grass species and varieties that are tolerant to diseases and can compete with weeds.
- Playing surfaces without diseases caused by fungus and weeds.

When we asked about a "good" golf course design, both players and managers had quite similar answers:

- The golf holes provide good playing quality and are framed by 'natural' scenery with shrubs, trees and, in an ideal case, with some waterbodies.
- The course should be a bit hilly (not only flat).
- Birdlife is also a desirable element in the environment.
- Fairways should provide enough challenging and exciting experiences while walking during the game.

It also appeared that there is sometimes a conflict between green keepers and players' expectations of a golf course. "Here we have players who enjoy the sweet and cute bunnies moving in our course. We as green keepers see them as pests because rabbits definitely will give us troubles. Some players complain if they see a snake. And I am often happy if snakes are here because they help us to keep away mice and voles."

4. Conclusion

Our results show that the golf course environment is often seen as a multidimensional, valuable environment. Most of the interviewees were not only dedicated golfers who enjoy the game itself. They combine golf exercise with a lot of other values. That is why golf courses have great potential to support multiple values: for example, biodiversity and carbon sequestration as well as social wellbeing of people. The green environment of golf courses is often seen as a part of nature and the visit to the golf course as an outdoor activity in nature.

Perception and cognitive processes are an important part of the total experience for golfers. Green spaces and places in golf courses are giving signals of different kinds to the senses. Our impressions from what we are seeing, hearing and smelling impact upon our feelings of well being (Gehl, 2001). Outdoor activities in public places and spaces, like possibilities for pleasant walks and access to places for standing, sitting, meeting, talking and to find a convenient place for relaxation and pleasure after the game, are important according to the golfers we interviewed. Golf courses include large areas of land that are not used for the game of golf. Therefore, there could be potential for better use of the land in many cases in order to provide new opportunities to create an active outdoor life for other groups in addition to golfers. Some of the managers and green keepers mentioned the

possibility of opening and inviting others to the golf courses (not only golfers). In this way golf courses can be valuable green areas for recreation in close proximity to urban areas.

Further work will focus on environmentally-friendly design and management on golf courses that can be part of the bigger urban-green infrastructure picture. This could be an important strategical tool for the future of golf. Golf courses could also have the potential to contribute to supporting wild flora and fauna, particularly in urban and peri-urban settings where they could contribute significantly, for example, to wetland creation (Strandberg 2012; Strandberg 2014) and in preserving “a functioning biotope or ecosystem” which “is of crucial importance in preserving the original vegetation” (Florgård, 2009: p 380).



Fig. 1. A golf player practicing putting March 2015 at Burlöv golf course (in Malmö, Sweden).

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