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Landscape architects perception of their role in the mining industry in England

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Landscape architects have a broad based academic training that prepares them to undertake a variety of different challenges in planning, design, construction and management of land. The purpose of this study was to establish their perception regarding their role in the mineral extraction industry in England. The study involved an online survey of landscape architects practicing in different organisations in England. It was established that they deemed their involvement in the industry as very important. They however have a perception that their involvement is not well appreciated. They also indicated that their representation in the industry is very low. For the mineral extraction industry to fully benefit from the expertise of landscape architects, it has to have a better understanding of what the professionals can offer. More importantly, landscape architects and organisations that represent them should endeavour to showcase and market the profession and expertise.

Key words: Mineral extraction, landscape architecture, quarry reclamation, mineral planning authority.

INTRODUCTION

The landscape architecture profession is relatively new compared to other design professions like engineering and architecture. Just like any other developing profession, landscape architecture has and is still finding itself new niches in planning, design, development and management of land. This new niches are mainly in industries that have typically been dominated by other professions such as the mining industry, history (Historic Landscape Characterisation), archaeology among others. This is possible because landscape architecture training prepares candidates to proficiently deal with specific issues within these industries. The training equips them with understanding of ethics, aesthetics, and socio-ecological issues (Roberts, 1999). It is a multi-disciplinary profession that incorporates horticulture, ecology, botany, applied and fine arts, environmental psychology, physical sciences, geology, and architecture. This background enables landscape architects to be able to marry different aspects of the environment to develop sustainable landscapes. They have the capacity to plan, design, build and manage landscapes of all types, (Buchko and Hitch, 2010).

Mineral extraction is an engineering science dominated industry. Reclamation of mined sites on the other hand requires contribution from experts from a number of professional groups such as engineers, biologists and

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ecologists (Buchko and Hitch, 2010; McKenna, 2002). This domination includes areas within which landscape architects can have profound impact such as mine planning, design and reclamation. This is still the case today because rightfully so, the industry's primary role is to extract minerals from below the earth's surface. This requires specific expertise from engineering specialists. The secondary role of the industry is to ensure that they extract the minerals in an environmentally friendly manner. They also have to ensure that land extracted of minerals is put back to some productive use after the decommissioning of extraction activities. These roles require input from other professions such as ecology, environmental science, biology and landscape architecture, (Berger, 2008). Of the four professions mentioned, only landscape architecture can be seen as not a traditional science profession, (Krutka and Jingfeng, 2015; Kuter, 2013).

"Reclamation offers substantial opportunity to the profession to expand, design and of reoccupation of synthetic space and ecology", (Berger, 2008). The profession applies art and science to develop built environments marrying aesthetics to functions in the landscape. The question is "how would the reclamation process and results differ if those in the design world were a part of the mining process from the beginning"? (Buchko and Hitch, 2010). Within the pure science professions, landscape architects may be looked at as applying subjective principles in an environment that is clouded by objective problem solving, (Arbogast, 2008). Because of this reason, there is potential for the mineral extraction industry to shun and exclude landscape professionals from their teams of expertise, (McKenna, 2002).

In England, landscape architects have been involved at different stages of the mineral extraction process, (Baida, 2012). They serve the industry working for Minerals Planning Authorities (MPA's), mineral operators, private companies that serve the mineral industry, mining and reclamation research organisations and other organisations that provide expertise such as the Royal Society for the Protection of Birds (RSPB), Natural England, the Department for Environment, Department of Food and Rural Affairs, (Defra) and others. They are usually only engaged during the planning stages of a mine either as consultants or at Mineral Planning Authority level. As consultants landscape professionals are usually engaged as part of an Environmental Impact Assessment team. They usually focus on Landscape and Visual Impact Assessment (LVIA) of proposed mining installations. They may also be involved in the development of reclamation scheme which are a pre-requisite for an operator to be awarded planning permission for mineral extraction. They can also provide an interface between mine-site design, engineering and environmental issues (Dempsey et al., 1979). Among other things they can be very helpful in siting and laying out a mineral extraction site taking into consideration the operational requirements and environmental issues including fitting and blending the mine buildings, waste, extraction pit into the natural surrounding slopes concealing them from important views, (Dempsey et al., 1979; Jellicoe, 1980). As MPA's, landscape architects mainly provide technical advice to mineral operators on issues pertaining to their applications for mineral planning permission. It involves assessing impacts statement as well as proposed reclamation schemes. They are also involved in the reclamation of mine sites, especially those that were abandoned after decommissioning.

According to Dempsey et al. (1979), the involvement of the landscape architecture profession as a source of creative thinking and planning has long been active in Europe. In England, a number of different mineral extraction sites have had considerable input in their design from distinguished landscape architects of the past centuries. The Hope Cement Works in Hope, Derbyshire, England, is one of those extra ordinary sites. Sir Geoffrey Jellicoe developed the master plan for the site. His input into the site design was in relation to planning and design of the facility in order for it to blend with the surrounding landscape with minimal negative visual impacts, especially from distant and sensitive viewpoints. Sitting on a rolling landscape of the Derbyshire Peak District, the site had a high potential to be visible from the numerous high points surrounding it. However, Jellicoe designed the site to take advantage of the rolling topography to hide it from certain potential views (Jellicoe, 1980). To date, the mineral operator still uses the Jellicoe master plan to design and develop parts of the site.

Another site that has been influenced by distinguished landscape architects is the Panshanger Park gravel extraction site in Peterborough, Hertfordshire, England. This site was an estate of the Desborough family until 1954. It was opened for sand and gravel extraction in 1998 (Herts and Middlesex Wildlife Trust, 2015). As an estate, the site was first designed by landscape architect Humpfrey Repton. Two other landscape architects, Lancelot "Capability" Brown and John Adey Repton also contributed to the designs of the estate in later years (Herts and Middlesex Wildlife Trust. 2015). Some of the designs by these professionals were never implemented, while those that were implemented have been overshadowed by over growth and lack of management over time. Since the takeover by a mineral extraction operator, parts of the site have been quarried for gravel and some have been reclaimed. The operator uses Lancelot Brown's master plan of the site as a basis for the site's reclamation master plan. Even though the master plan was developed for a different purpose, (residential estate) it still has relevance and more importantly tells a story of the development of the site.

In Cramlington, Northumberland, England, landscape architect Charles Jencks designed the "Lady of Northuberlandia", a park designed in the shape of a nude woman, which was completed in 2012 (Krutka and Jingfeng,

Table 1. A summary of the overall results.

Parameter	Organization	Importance of Landscape Architects in Mining	Perceived level of appreciation	Representation of Landscape Architects in Mining	Role or Input of Landscape Architects in mining
Number valid	20	19	19	19	19
Number missing	0	1	1	1	1
Mean		4.421	3.053	2.579	3.211
Std. Deviation		0.769	0.970	1.121	1.182

2013).

Despite these examples and many others that are not mentioned in this paper, it is still appropriate to ask the question; 'Is the mineral extraction industry in England enjoying the full benefits that the landscape profession could provide?' The purpose of this study was to establish how landscape architects in England perceive their involvement in the mineral extraction industry. The study was also intended to highlight the different roles that landscape architects are playing in the industry.

METHODOLOGY

An internet based questionnaire was developed to solicit responses from landscape architects with roles in the mineral extraction industry in England. Respondents were invited to participate in the survey through unsolicited emails. A Uniform Resource Locator (URL) link to the survey was copied into the emails. Potential respondents were sort from MPA's and private practicing landscape architects with specific interest in the mineral extraction industry in England.

To establish landscape architect's perception of their involvement in the mineral extraction industry the following questions were asked;

1 How important is the role of landscape architects in the mineral extraction industry?
2 What is the level of appreciation for landscape architects in the mineral extraction industry?
3 What is the level of representation for landscape architects in the mineral extraction industry?
4 How much input do landscape architects have in the mineral extraction industry?
5 What roles related to the mineral extraction do landscape architects play in their organisations?

The first question was rated on a scale of 1 to 5, 1 being "not very important" and 5 being very important". Questions 2, 3 and 4 were rated on a scale of 1 to 5, 1 being "very low" and 5 being "very high". The last question was an open ended question intended to establish the different roles related to mining that respondents played in their organizations.

RESULTS AND DISCUSSIONS

A total of twenty responses were gathered. Of the twenty responses, nineteen (95%) were completed in full. Of the nineteen responses, fifteen (79%) were from landscape architects working for MPA's and four (21%) responses were from those working in private practice. Even though this is an unbalanced sample size between MPA and private practicing landscape architects, it was assumed that all respondents were conversant with the constitution, representation and roles of landscape professionals in the mineral extraction industry.

The results show that landscape architects perceive their technical input in the mineral extraction industry as very important with a mean rating of 4.4. They also have a perception that they have an above average role or input in the industry, with a mean rating of 3.2. Despite these high ratings regarding their involvement, they think their representation in the industry is below average with a mean rating of 2.6. The results also show that landscape architects think that the level of appreciation they get from the mineral extraction industry is average with a mean rating of 3.1, (Table 1). This is because "the value of a landscape architect and the contribution and skills they can offer are still a relative unknown within the mining world" (Baida, 2012).

An independent-samples t-test was conducted to compare the perceptions of landscape architects working for MPA's to those working in private practice. There was no significant difference in how they perceive their involvement. The magnitude of the difference between the two groups of landscape architects, represented by Eta squared is very small. The low values of Eta combined with high values of *p* indicate that the difference is insignificant (Table 2). It shows therefore that both groups of landscape architects have the same perception about their involvement in the mineral extraction industry.

Respondents also noted a number of different roles that they play within their organisations which are related to the mineral extraction industry. The roles generally revolve around providing expert advice on landscape planning, design, construction and management related to reclamation and mitigation of landscape and visual impacts caused the mine operations. Another major role involves the actual planning, design, construction and management of sites (Garmony et al., 2007). This is where the landscape architects are doing the job as opposed to providing advice to mineral operators. A summary of these roles as extracted for the results is as follows:

Table 2. Comparison of perception between two groups of landscape architects

Question	Organization	N	Mean	Std. Dev	t	*p*	E_{ta} squared
Importance of landscape architects in mining	Mineral Planning Authority	15	4.40	0.828	-0.225	0.825	0.003
	Private Practice	4	4.50	0.577			
Perceived level of appreciation	Mineral Planning Authority	15	3.27	0.884	2.014	0.060	0.193
	Private Practice	4	2.25	0.957			
Representation of landscape architects in mining	Mineral Planning Authority	15	2.73	1.163	1.174	0.256	0.075
	Private Practice	4	2.00	0.817			
Role or input of landscape architects in mining	Mineral Planning Authority	15	3.13	1.246	-0.540	0.596	0.017
	Private Practice	4	3.50	1.000			

i. Assessment and advice on development planning involving mineral extraction.
ii. Assessment and advice on landscape and visual impacts caused by mineral extraction.
iii. Advice on reclamation and mitigation of landscape and visual impact caused by mineral extraction.
iv. Landscape and Visual Impact Assessment.
v. Mine or quarry reclamation (planning, design, construction and management).
vi. Advice on scoping.
vii. Expert witnesses.
viii. Policy development.

It is evident from these roles that not only can landscape architects provide essential expertise to the mineral extraction industry but they can also do it at different stages of the mineral extraction process, from mineral planning up to closure and reclamation, (Aasen, 2012; Kuter, 2013).

Conclusion

A question that may arise from this study is whether the mineral extraction industry has a holistic understanding of the potential contributions that landscape architects could provide. On the other hand, one can also ask whether landscape professionals have positioned themselves and marketed their expertise wide enough to attract the industry. It is imperative that organisations such as the Landscape Institute (LI) in England, American Society of Landscape Architects (ASLA) in the United States of America, the Canadian Society of Landscape Architects (CSLA) in Canada, and others are at the forefront in promoting the works of landscape architects in the industry.

This study can help individual landscape architects and professional organisations representing them to realise that more effort needs to be focused to integrating them more seamlessly into the mining industry. The study also highlights the different expertise that landscape architects in different organisations are providing to the industry as well as enlighten professionals in the mining industry who may not be aware of the expertise that landscape architects can provide.

Conflict of Interests

The authors have not declared any conflict of interests.

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