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AESTHETIC AND UTILITY VALUES OF ANTHROPOGENIC LANDFORMS: A CASE STUDY OF THE SILESIAN UPLAND, POLAND

ABSTRACT: PELKA-GOSCINIAK J., *Aesthetic and utility values of anthropogenic landforms: a case study of the Silesian Upland, Poland*. (IT ISSN 1724-4757, 2007).

In spite of being generally interpreted as landscape scars, man-made landforms in the urban-industrial areas of Silesia also provide positive benefits to local communities. In case of properly designed and implemented land reclamation can produce attractive aesthetic features and green space for recreation. Another most important function of these anthropogenic landforms is scientific education. They can be studied as positive instances of human transformation of the landscape and sites suitable for the demonstration of present-day geomorphic processes, which sometimes operate at scales unobserved at other locations. The paper cites examples from the Silesian Upland.

KEY WORDS: Man-made landforms, Land reclamation, Landscape evaluation, Silesian Upland (Poland).

INTRODUCTION

Sustainable development requires a harmonious coexistence between society and environment. This can be difficult to achieve in industrial regions, where there may be intensive land degradation and the widespread creation of anthropogenic landforms (e.g. spoil tips and excavations (Modrzejewski, 1987). Landscape aesthetic-scenic values, while their values are difficult to calculate, are important influences on human mental health (Żmuda, 1981). Anthropogenic landscapes, loaded with alien industrial elements, may inhibit psychological regeneration. Recreational land is scarce in many large industrial centres. However, it is often possible to create new recreational zones on former industrial sites which can fulfil a range of important social functions (Dulias & Pelka-Gosciniak, 2005; Dwucet & Wach, 2000; Pelka-Gosciniak, 2006). This paper considers the aesthetic and utility values of some anthropogenic landforms in the Silesian Upland of Poland that are positively perceived by local populations.

STUDY AREA

The Silesian Upland (fig. 1) is one of the most degraded parts of the Poland. Long term extraction of rich natural reserves of black coal, zinc and lead ores, carbonate rocks and sand have fostered large scale industrial development including power plants, metallurgical, machine and electrical engineering industries. Collectively, these activities have transformed the landscape creating numerous accumulational (convex in Polish literature) and excavational (concave) landforms (Żmuda, 1973). Although their number has decreased recently, these remain to be major components of the Silesian landscape.

AESTHETIC VALUES

In the beginning, Silesia's anthropogenic landforms were unpopular with local people, who viewed them as new and alien elements of relief and as analogues to lunar landscapes. However, with time, as a natural vegetation succession proceeded and land reclamation implemented people began to find these excellent sites for walking or jogging and began to recognise the aesthetic and ecological values of these green areas in the city as well.

RECREATIONAL VALUES

Recreational values are especially associated with concave landforms, such as sandpits, particularly if they are water-filled (cf. Dulias, 2004). Examples include the water reservoirs in Nakło - Chechło, Dąbrowa Górnicza - Pogoria III and Sosina in western part of sandpit Szczakowa and a reservoir under preparation (Kuźnica Warężyńska).

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FIG. 1 - Location of study area.

The sandy beaches are ideal for recreational swimming and sailing.

There are also numerous spoil tips left behind by black coal mining. These mounds of variable height are reclaimed for various recreational functions (e.g. in Jaworzno and Chorzów) or to provide scenic viewpoints as in Bieruń (Szczypek, 2003, fig. 2).

The steep slopes of waste tips may also be developed for recreation as artificial ski tracks, as at the dolomite quarry in Bytom (fig. 3). Here, a «Sports Valley» has been created which provides a range of special facilities for skiers, cyclists and others. In some water-filled excavations, centres for divers have been established (e.g. Jaworzno).

FIG. 2 - Spoil tip in Bieruń (photo by J. Pelka-Gosciniak).

FIG. 3 - Artificial ski track built of waste dolomite from a quarry in Bytom (photo by J. Pelka-Gosciniak).

SCIENTIFIC AND EDUCATIONAL VALUES

Many concave anthropogenic landforms in the Silesian Upland have scientific and educational value. The exposed walls of quarries show stratigraphic sequences that clearly reveal the geological history, e.g. in Mikołów, Bytom (Racki & *alii*, 1999; see also Bubík & *alii*, 2004). Unfortunately, often, this type of scientific treasure is not recognised. For example, the extraction of Carboniferous clay slates at Katowice Brynów uncovered a valuable assemblage of calamite trunks, which later were allowed to become buried under rubble and thus lost (Polonius, 2003). In some quarries, it is possible to observe processes of natural plant succession and, sometimes, new and unusual vegetation species may appear (Madowicz, 2000).

Geomorphological processes are often especially active in disturbed landscapes (Kozyreva & *alii*, 2004). They may produce landform assemblages that can be regarded as miniature reflections of large-scale landforms functioning in other climatic conditions. The floors and slopes of sandpits, particularly in Bukowno, eastern Silesian Upland, are affected by aeolian processes and, some years ago; it was possible to observe the formation of minor accumulational and deflational landforms as well as the development of a unique scarp (Szczypek & Wach, 1991, 1993a and b). The observation of such processes can be helpful in geography teaching (Pelka-Gosciniak, 1999).

Other attributes of large sandpits that have educational benefits can include wind-blown sand stratifications, which may be directly observed and used for the recognition of aeolian landforms as well as for the reconstruction of palaeogeographical conditions. Present-day aeolian processes like deflation and accumulation can be linked to the landforms produced, such as deflation pavements, ripple marks, initial dunes, wind shelter sand accumulation features of nebkha type etc. Hence, areas with man-made landforms, like sandpits, can fulfil important educational

and scientific functions, and may be employed as natural laboratories for geomorphological experiments. The sandpit areas in the Silesian Upland may used as models for climatic deserts and other terrain where wind action prevails (Szczypek & Snytko, 1988).

These sites also reveal the initial the stages of soil formation and vegetative natural succession. (Szczypek & Wika, 1985). Indeed, the dolomitic spoil tips of Tarnowskie Góry present such good demonstrations of natural succession that legal protection is proposed (Lamparska-Wieland, 1997). This dump is also very interesting because here natural geomorphological processes are visible (gullies, alluvial fans and landslides, fig. 4). Elsewhere, other pits, especially coal spoil areas, are places where slope processes (rill erosion and sheet wash) are clearly noticeable. Equally, the shorelines of artificial water reservoirs demonstrate, in miniature, natural shore processes and sand spit formation (Rzętala, 2003). Finally, in the light of these processes, it is possible to use the processes of land reclamation intervention to hone the observational skills of learners (Pelka-Gosciniak, 1999).

CONCLUSION

Although anthropogenic elements are still visible in the landscape of the Silesian Upland, people seem more inclined to notice the positive aspects of these special types of landform. Natural regeneration of vegetation and/or properly designed and implemented land reclamation can produce attractive aesthetic features and space for recreation. However, the most important role for these anthropogenic landforms is scientific education. They can be studied as positive instances of human transformation of the landscape and sites suitable for the demonstration of present-day geomorphic processes.

FIG. 4 - Dolomite spoil tip in Tarnowskie Góry with visible erosional and slope processes and vegetation succession (photo by M. Lamparska-Wieland).

REFERENCES

BUBÍK M., KREJČÍ O. & KIRCHNER K. (2004) - *Geologická mulost a přítomnost Fryvdeckomístecka.* Muzeum Beskyd, Fryvdek-Místek, 53 pp. (in Czech).

DULIAS R. (2004) - *Reclamation of the sandpits in Silesian Upland areas.* In: «Ksztaltowanie svrodowiska geograficznego i ochrona przyrody na obszarach uprzemyslowionych i zurbanizowanych (The management of geographical environment and nature protection in industrialized and urbanized areas)», 35. Katowice - Sosnowiec, 13-21. (in Polish).

DULIAS R. & PELKA-GOSCINIAK J. (2005) - *Multisensorial landscapes in suburban zone of Upper Silesian Industrial Region.* In: SZABÓ J. & MORKŪNAITĖ R. (eds.), «Landscapes - nature and man», University of Debrecen, Lithuanian Institute of Geology and Geography, Debrecen, Vilnius, 41-49.

DWUCET K. & WACH J. (2000) - *Influence of land reclamation on natural and landscape attractiveness of the areas transformed by human impact in the Silesian Province.* In: LÓKI J. & SZABÓ J. (eds.), «Anthropogenic aspects of landscape transformations». 1. University of Debrecen, 17-23.

KOZYREVA E.A., MAZAEVA O.A., MOLENDA T., RZĘTALA M.A., RZĘTALA M. & TRZHTSINSKY Y.B. (2004) - *Geomorphological processes in conditions of human impact. Lake Baikal. Southern part of the Angara valley. Silesian Upland*. University of Silesia, Faculty of Earth Sciences, Sosnowiec, 88 pp.

LAMPARSKA-WIELAND M. (1997) - *Dolomitic dump in Tarnowskie Góry Bobrowniki as a potential preservation object.* Geographia. Studia et dissertationes, 21. USv, Katowice, 101-115 (in Polish).

MADOWICZ A. (2000) - *The problem of postindustrial areas cultivation on example of Kijowa Mt. quarry in Będzin*. In: «Ksztaltowanie svrodowiska geograficznego i ochrona przyrody na obszarach uprzemyslowionych i zurbanizowanych (The management of geographical environment and nature protection in industrialized and urbanized areas)», 30. WBiOSv, WNoZ USv, Katowice-Sosnowiec, 19-28.

MODRZEJEWSKI P. (1987) - *Pollution of geographical environment and the problem of health protection in Upper Silesian Region.* In: «Problemy geograficzne górnosvląko-ostrawskiego regionu przemyslowego (Geographical problems of Upper Silesian-Ostrava Industrial Region)». Materials of Polish-Czech Symposium, IDN USv WNoZ Katowice-Sosnowiec: 72-77.

PELKA-GOSCINIAK J. (1999) - *Opyt izuczienia estestvennykh i sopriazennykh procesow na gornych wyrabotkach (na primierie piesczanowo kariera w g. Bukowno - jużnaja Polsza).* Materials of VI Symposium of Belarus Geographical Society, Minsk, 146-147 (in Russian).

PELKA-GOSCINIAK J. (2006) - *Restoring nature in mining areas of the Silesian Upland (Poland).* Earth Surface Processes and Landforms, 31, 1685-1691.

POLONIUS A. (2003) - *Abiotic nature-missed element of nature environmental - on example of Katowice town*. In: Ksztaltowanie svrodowiska geograficznego i ochrona przyrody na obszarach uprzemyslowionych i zurbanizowanych (The management of geographical environment and nature protection in industrialized and urbanized areas), 34. WBiOSv, WNoZ USv, Katowice-Sosnowiec, 33-40 (in Polish).

RACKI G., BARDZINvSKI W. & ZIELINvSKI T. (1999) - *From stony book of primaeval history of Upper Silesia.* Geological guide, USv, Katowice, 168 pp. (in Polish).

RZĘTALA M.A. (2003) - *Littoral processes ands bottom deposits of selected water reservoirs under conditions of diversified human impact (a case study of Silesian Upland and its borders).* USv, Katowice, 149 pp. (in Polish).

SZCZYPEK T. (2003) - *Anthropogenic management of land relief (on the example of Silesian Upland - south Poland).* In: MENTLÍK P. (ed.), «Prvíspěvky z mezinárodního seminárve Geomorfologie'03: Stav geomorfologickyvch vyvzkumů v roce 2003». Západoceská univerzita v Plzni, Katedra geografie, Ceská asociace geomorfologů, Plzeň: 59-64.

SZCZYPEK T. & SNYTKO V.A. (1998) - *Morphological model of "desert relief" in anthropogenically transformed area.* University of Silesia, Sosnowiec, 48 pp. (in Polish).

SZCZYPEK T. & WACH J. (1991) - *Development of the modern dune in the strong human impact conditions.* University of Silesia, Katowice, 79 pp. (in Polish).

SZCZYPEK T. & WACH J. (1993a) - *Anthropogenically forced aeolian processes and landforms in Silesian Upland.* SGP Poznanv, 103 pp. (in Polish).

SZCZYPEK T. & WACH J. (1993b) - *Anthropogenic scarp dune at Bukowno on the Silesian Upland in the period 1989-1993.* University of Silesia, Katowice, 52 pp. (in Polish).

SZCZYPEK T. & WIKA S. (1985) - *Sandpit at Bukowno-interesting educational object*. Wszechsvwiat, 86, 194-198 (in Polish).

ŻMUDA S. (1973) - *Anthropogenic transformation of natural environment of Upper Silesian conurbation.* PWN, ŚIN, Warszawa-Kraków, 209 pp. (in Polish).

ŻMUDA S. (1981) - *Shaping of natural environment and economical development of Katowice agglomeration.* Geographia. Studia et dissertationes, 4, University of Silesia, Katowice: 33-57 (in Polish).

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