

1. Introduction

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Political changes initiated in Poland in the 1980s and 1990s resulted in intense structural and functional transformations of the rural areas. They were based primarily on economical and social grounds. Decreased cost-effectiveness of agricultural production brought about massive collapsing of state farms, and discontinued cultivation of some private farmlands. Considerable areas of abandoned lands appeared in the agricultural landscape. Issues related to land abandonment have been presented in the nation-wide (Bański 1998, 2006, 2007; Harasimiuk 2013), regional and local scales (e.g. Łowicki 2008; Jaros, Woch 2010; Krysiak 2010, 2011, 2012; Majchrowska 2013, 2014). Arable land abandonment in Poland has been compared with other countries (Orłowski, Nowak 2004), where similar changes are occurring in the rural landscape (e.g. Molinillo et al. 1997; Strijker 2005; Navarro, Pereira 2012; Prishchepov et al. 2013; Terres et al. 2013). Positive and negative ecological consequences of land abandonment, in particular those concerning the landscape, have been presented in numerous publications (Höchtel et al. 2005; Bowen et al. 2007; Rey Benayas et al. 2007; Navarro, Pereira 2012).

Studies into transformations of landscapes which are located outside the suburban zones of the Łódź Voivodeship revealed some regularities in the spatial distribution of abandoned lands. Geocomplexes and natural landscape types with a rather low potential for biotic productivity were characterised by a considerable share of such lands. In agricultural landscapes, opposite directions of transformation were observed. On lands characterised by high agricultural suitability, there was an increase in the intensity of cultivation, expressed by enlargement of fields and simplification of landscape structure. In less fertile areas, significant acreages of abandoned

lands appeared, representing various degrees of secondary plant succession (Krysiak 2006a, 2008a, 2008b). In the suburban zone of Łódź, around smaller cities, and on their outskirts, land abandonment is a common phenomenon. It takes place not only on poor soils but also on soils of medium quality. Presumably, some of these areas will be built-up or used for transport infrastructure. In such cases, abandonment may be only a transitory period before principal changes in the usage type (Krysiak 2014). Large amounts of abandoned lands around urbanised areas is a regularity observed in many regions of Poland where, before a farmland area can be built-up, it is usually excluded from cultivation for several years (Matuszyńska 2001; Orłowski 2003; Warczewska 2003; Łowicki, Mizgajski 2005; Łowicki 2008).

The scale of abandonment in regional studies has mostly been evaluated on the basis of standard statistical analyses or data from General Agricultural Censuses. Information from these sources only illustrates the scale of abandonment in administrative units – communes, districts or voivodeships, without providing any information on the distribution of this phenomenon within the boundaries of the units and its habitat conditioning (Łowicki 2008; Harasimiuk 2013).

There is no universally accepted, uniform notion of abandoned land. Generally, abandoned lands are considered to be post-cultivation areas, left without human interference for many years. In the traditional meaning, the term “abandoned lands” refers only to uncultivated arable lands. In land records they are also treated as arable lands (Rozporządzenie Ministra Administracji i Cyfryzacji... 2015). In this work, abandoned lands also include idle meadows and pastures. There are three reasons for expanding the meaning of the term “abandoned land” to encompass

unused grassland. Firstly, unmowed meadows and pastures where grazing no longer takes place are areas of progressing overgrowing, similarly to arable lands left without interference from farmers. Regardless of the original usage type, there is a similarity between ecological processes, expressed in spontaneous regeneration and plant succession. Secondly, in the functional dimension, the energy subvention directed by people during previous usage has disappeared. Thirdly, from the formal point of view, the overgrowing meadows and pastures can also be called abandoned lands because the dictionary definition states that to be abandoned means “to be set-aside, not used, neglected” (Uniwersalny Słownik Języka Polskiego 2003). The presented perspective refers to the landscape ecological definition of the process of land abandonment (Pointereau et al. 2008), for which the basis is the evaluation of vegetation land cover.

Abandonment of considerable areas makes it possible to observe the course and rate of spontaneous plant succession and regeneration. In these areas, vegetation “emancipated” from long-term anthropopressure appears; vegetation which develops as a result of autonomous activity of ecological processes (Faliński 2001). Many times, as years pass, the idle lands become more and more floristically diverse, often with the occurrence of rare and protected plants (Kurus, Podstawka-Chmielewska 2006). On the other hand, abandoned lands which have not been afforested or used in another way are in danger of overgrowing with

weeds, and becoming occupied by the so called invasive species of plants, which often colonise abandoned lands. This poses a great threat to the nearby natural ecosystems, as the invasive species, particularly those of non-native origin, such as *Solidago canadensis*, *Impatiens glandulifera*, *Padus serotina*, or *Acer negundo*, grow even under unfavourable habitat conditions and spread quickly to large distances (e.g. Tokarska-Guzik 2005; Tokarska-Guzik et al. 2012; Woziwoda 2012).

Despite a large amount of research, not all processes occurring in abandoned lands during secondary succession and factors which influence the succession have been recognised. Besides, it has not been established how important abandoned lands can be for the functioning of the neighbouring ecosystems, especially in protected areas.

The scale of transformation of contemporary agricultural landscapes in Central Poland has resulted in the emergence of a large amount of abandoned lands. For the authors of this work, it is the reason for undertaking research into the spatial distribution and ecological role of abandoned lands in the buffer zones around landscape parks of the Łódź Voivodeship. In this respect, filling gaps in forest cover and correcting the field-forest boundary by the spread of abandoned lands is the most important, along with an increase in landscape heterogeneity, formation of ecological microcorridors, and improvement of food supply for a number of animal species (Jermaczek 2007).