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THE ROLE AND SCOPE OF FIELD STUDIES IN ENVIRONMENTAL IMPACT ASSESSMENTS AND ENVIRONMENTAL DOCUMENTATION

ROLA I ZAKRES BADAŃ TERENOWYCH W OCENACH ODDZIAŁYWANIA NA ŚRODOWISKO I DOKUMENTACJI ŚRODOWISKOWEJ

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Streszczenie. Badania terenowe stały się trwałym elementem systemu dokumentacji środowiskowej, która z kolei stała się standardowym elementem procesu inwestycyjnego. Zakres prowadzonych badań i obserwacji terenowych, prowadzonych w ramach procedur ocen oddziaływania na środowisko, jest bardzo zróżnicowany i zależy zarówno od rodzaju inwestycji, jak i od wymagań zawartych w postanowieniach wydawanych przez właściwe organy prowadzące postępowanie środowiskowe. W artykule przedstawiono analizę wybranych przykładów dokumentacji środowiskowej dotyczącej badań terenowych oraz wpływu ich wyników na uzyskanie decyzji o środowiskowych uwarunkowaniach zgody na realizację przedsięwzięcia. W analizie uwzględniono również potrzeby badań terenowych, które powinny być dostosowane do poziomu oraz rodzaju inwestycji, której wpływ na środowisko podlega ocenie.

Key words: environmental impact assessments, environmental documentation, field studies.

Słowa kluczowe: oceny oddziaływania na środowisko, dokumentacja środowiskowa, badania terenowe.

INTRODUCTION

Procedures for environmental impact assessment (EIA) are a standard part of location proceedings regarding projects with the highest potential negative impact on the natural environment, as defined in law (EIA Act 2008; EIA Regulation 2010). They also include plans, studies, programs and strategies for which strategic EIA are conducted. Since a majority of such procedures involves various impacts regarding spatial transformation and interference in the functioning of the environment, they require field research to be conducted, ranging from a simple site inspection and the most commonly-used forms of inventory and valuation, to medium- and long-term monitoring studies. In certain atypical or complex cases, specialist, scientific expert opinions are a necessity, which go beyond the standard formal and legal

requirements. Field studies have become an integral part of the documentation related to the investment process and are frequently a crucial element in the acquisition of subsequent permits (e.g. a building permit). The constitutional principle of sustainable development often finds its sole expression in the preparation of an EIA report on the grounds of which a decision is made on the environmental conditions pertaining to the project. Therefore, the report's reliability is a prerequisite for putting the principle into effect (Wiśniewska and Babicz 2006; Kula et al. 2008). On the other hand, the basis of a reliable EIA report is the appropriate scope and depth of field research.

The basic scope of subject matter and the content layout for the environmental impact assessment report, a fundamental document for an EIA, are stipulated in the 2008 Act on Access to Information on the Environment and its Protection, Public Participation in Environmental Protection and Environmental Impact Assessment Reports (hereinafter referred to as the EIA Act). The 20 points of article 66 give an overview of the mandatory content of the report, with some of this directly related to the conduct of field research. The provisions of Section 2 are of particular importance, since they describe the natural features of the environment covered by the scope of the planned investment's expected impact on the environment, including those elements of the environment that are subject to protection (Strulak-Wójcikiewicz and Łatuszyńska 2014). Their fulfillment is often detailed via arrangements with the competent environment protection authority. However, while the wording may be brief, a wide range of specific issues are covered. The most frequently conducted studies aim to:

- describe current uses of both the land to be taken up by the project and that of its surroundings;
- identify the people living in the area to be covered by the project or using the area;
- describe the soils along with the manner of their use, erosion processes, topography and geological conditions;
- describe the manner of agricultural use, quality of land, intensity of cultivation;
- describe and locate (on scale maps) the fauna, flora and habitats in the location and the vicinity of the project;
- describe the most important parameters of the plant and animal populations and their habitats which may be affected by the project;
- indicate protected species, habitats and areas, and map their ranges;
- describe the water environment, including stagnant surface and flowing waters, groundwater, estuaries, coastal and marine waters and underground and surface runoff;
- hydrological data, data on water quality, the use of water resources (including water supply to population centres and industry, fishing, angling, bathing, recreation, navigation, sewage disposal);
- describe the local climate and meteorological conditions as well as air quality;
- recognise current noise levels;
- describe the existing light and thermal conditions along with electromagnetic fields (Kistowski 2002; Wiśniewska and Babicz 2006).

The detailed scope of work required for each EIA report is typically included in the decision on a particular investment, resulting from the initial impact assessment (screening). Its contents often determine not only the scope of the report itself, but also the methodology of

any field studies as well as their timing. It may contain suggestions concerning the duration, scope, methods used and expected results of such work. Beyond classifying a given project type for an EIA report, the decision stage is crucial to its quality, contents and the degree of detail (Wilżak 2011; Grudziński and Zarzecka 2011; Nowak 2015).

This paper presents an analysis of selected examples of investments along with their environmental documentation in terms of the required scope of field research as well as the impact of its results on the granting and form of environmental decision.

MATERIAL AND METHODS

The research material for comparing the scope of field research in environmental documentation was comprised of documents submitted over the years 2012–2015 to the Regional Directorates for Environmental Protection (RDOŚ) and documents available on the Internet. A total of 177 examples of environmental documentation were analysed, which comprised five basic document types: project information sheet (50), EIA report (small investments – 50), EIA report (large investments, 31), environmental impact forecast (17), and environmental screening (pre-investment, 29). The study involved documentation from the Regional Directorates for Environmental Protection in Szczecin, Poznań, Łódź, Gdańsk, Kraków and Lublin. The form and scope of field research in these documents were defined. The number of documents analysed depended chiefly on the availability of the individual documentation types. The authors tried to include a variety of investment projects in the analysis in order to widen the basis of the field work used for their preparation. EIA reports were divided into a group concerning small investments, featuring a standard scope of issues included in the documentation (service outlets, small production plants, local road investments, redevelopments) and a group of large investments, requiring an extended scope of studies. The legal status referred to in this article was that in force in 2015. The analyses given in the article do not refer to changes to be introduced into the Environmental Impact Assessment Act that are to enter into force on 1 January 2017.

RESULTS AND DISCUSSION

Environment management is an area that is subject to the constant, intense pressure of public opinion. A series of investments, particularly those conducted near large cities and on naturally valuable terrains, rouse substantial public interest and often lead to conflict. Environmental procedure entails various forms of communication and social participation, with its documentation frequently the principal source of information on the resources of a given area. Therefore, the environmental documentation, in addition to a detailed description of the investment, ought to include the complete, comprehensible characteristics of the environmental values (Kistowski 2008; Kula et al. 2008; Strulak-Wójcikiewicz and Latuszyńska 2014).

Current legal regulations, contained chiefly in the EIA Act, do not include a detailed standard for field studies used in the drawing up of various types of environmental documentation. The studies are used in the scope regulated by contractors' practice and experience along with detailed guidelines stipulated in the Decision issued by the environment protection authority,

typically in this regard agreed upon with the Regional Directorate of Environmental Protection. The scope of field work depends above all on the degree of detail in the document and on its nature, since sometimes the scope of study may be imposed along with detailed guidelines, e.g. in case of wind power plants, guidelines are issued regarding the study of birds and bats. However, the authors rarely encountered well planned, detailed field studies in the documents they analysed. On the whole, these studies had a practical objective (a list of facilities, protected plant stations, etc.) and a limited scale, particularly a limited time scale. It is rare to find extended study cycles or even the requirement for multiple verifications of results in the field. The set of environmental documents analysed contained many forms of field work, which are shown in Table 1.

Table 1. Forms of field work in environmental documents analysed
Tabela 1. Typy badań terenowych wykorzystywane w badanej dokumentacji

Forms of field work Typy badań terenowych	Description of works Opis działań
Site inspection Wizja terenowa	overall familiarisation with the investment terrain, photographic documentation, drawing up of terrain description and characteristics ogólne zapoznanie się z terenem inwestycji, dokumentacja fotograficzna, przygotowanie opisu i charakterystyki terenu
Pedological or geological surveys Badania gleboznawcze lub geologiczne	characteristics of geological and hydrological conditions, of substrate mechanical property analyses, soil fertility analyses charakterystyka uwarunkowań geologicznych oraz hydrologicznych, analiza właściwości mechanicznych podłoża oraz żyzności gleb
Physicochemical analyses Analizy fizykochemiczne	examination of water quality, biological pollution load, microbiological analyses badanie jakości wód, obciążenia zanieczyszczeniami biologicznymi, analizy mikrobiologiczne
Inventory of flora and fauna Inwentaryzacja florystyczna i faunistyczna	inventory of flora, compilation of phytosociological relevés, inventory of protected plant and animal sites, dendrological inventory, schedules of trees and bushes designated for removal, inventory of fauna (chiefly avifauna) spisy flory, zestawienia zdjęć fitosocjologicznych, inwentaryzacje stanowisk roślin i zwierząt chronionych, inwentaryzacje dendrologiczne, zestawienia drzew i krzewów przeznaczonych do usunięcia, inwentaryzacja fauny (głównie ornitofauny)
Valuation Waloryzacja	qualitative and quantitative valuations of flora and fauna, the environment, infrastructure, urban valuations waloryzacje jakościowe i ilościowe dotyczące flory i fauny, stanu środowiska, stanu infrastruktury, waloryzacje urbanistyczne
Environmental supervision Nadzór środowiskowy	series of field visits aimed at verifying the recommendations of the environmental protection authority during construction of the investment and at the post-investment stage cykle wizyt w terenie mające na celu sprawdzanie zaleceń organu ochrony środowiska w trakcie realizacji inwestycji oraz w okresie poinwestycyjnym

The essence of an EIA is to assess the impact of the investment on the environment with respect to measurable and unmeasurable environmental effects (Strulak-Wójcikiewicz and Łatuszyńska 2014). Several authors have undertaken research on various types of environmental dossiers, but mainly in terms of their number in a given municipality, or the number issued via

administrative decisions based on the environmental conditions of approval for the implementation of individual projects (Nowak 2015, Kistowski and Grzybowski 2013). Often ignored is the quality of the environmental document, which is largely due to the type and quality of the research field.

As investment size and the degree of complexity in the required documents has increased, so has the scope and amount of field work required. In the case of small-scale projects the dominant form of field work has been various forms of inventory-taking of natural and cultural objects. However, the documentation of investments of larger areas and greater volume has seen the appearance of valuation studies, long-term monitoring studies or monitoring repeated several times as well as the testing of various environmental components (surface and underground waters, soils, substrate properties, etc.). The extent of field work often also depends on the type of project and on the public perception of it (e.g. wind farms will always be subject to more scrutiny than the location of summer houses along a lake shoreline).

The results of analyses of various types of environment documents are presented below:

Project Information Sheet. The somewhat general character of project information sheets typically allows field work to be limited to a general site inspection and the collecting of photographic documentation (Fig. 1).

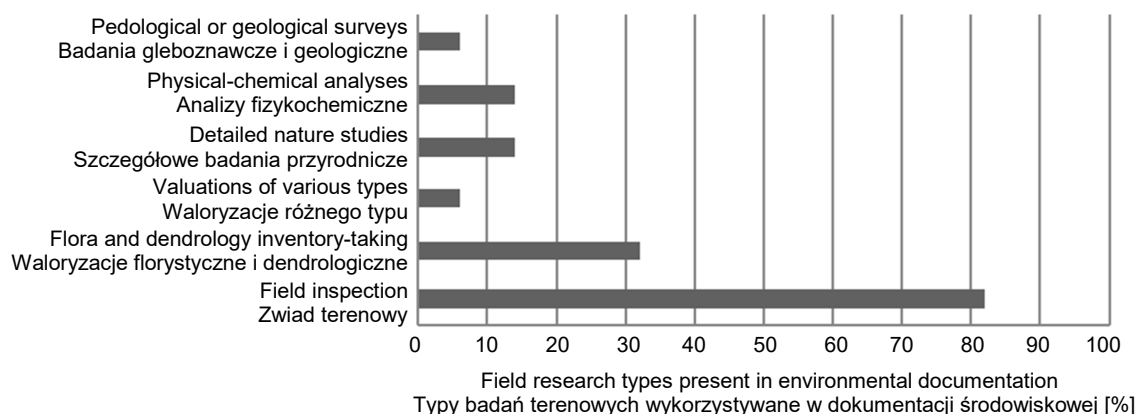


Fig. 1 Characteristics of field research types used in project information sheets

Ryc. 1. Charakterystyka badań terenowych w kartach informacji o przedsięwzięciu

The document aims to provide a brief description of the project in order to facilitate the decision of the environmental protection authority in terms of its appropriate classification or determining the extent of the report. What must not be forgotten, however, is that it is often the case that a detailed, high-quality project information sheet may dispel any doubts regarding the environmental impact of a planned investment and may result in the abandonment of the requirement to prepare an EIA report (for group II projects as per the regulations). In special cases involving e.g. the need to cut down trees or the investment's impact on urban green spaces, this stage features flora and dendrology inventory-taking or compiling a list of trees designated for clearance in combination with a project for natural compensation. Such inventories are often of a simplified nature and take the form of a list of trees designated for clearance. The procedure is thus shorter and the investor has the chance that the procedure will be shorter and simpler. Detailed nature studies (e.g. habitat identification and inventory-taking) are rarely performed in the case of project information sheets. Such research is only

undertaken when faced with spatially expansive investments interfering with landscape and usually at the explicit instruction of the competent authority. In documents of this type physicochemical analyses were very seldom found. These were usually only singular test results, chiefly concerning water quality.

EIA report. These documents are the most frequently-encountered type of environmental documentation and a common element of EIA procedure. In the majority of cases, the scope of the report's field work is stipulated in the decision issued by the authority conducting the EIA procedure. The most common types of field work are various kinds of lists and inventory-taking of natural resources occurring in the investment area and in the area of its impact. Occasionally they assume the form of valuation, aiming to define natural or cultural value. Often such valuations are carried out in works relating to organized greenery such as parks, greens, etc. Where there are large investments, the extent of field research may comprise a very wide spectrum of investigations. The best examples are studies conducted with regard to e.g. wind power engineering, comprising, inter alia, ornithological monitoring lasting 7–18 months on average, a complete nature study, meteorological examination as well as flora and fauna inventory-taking (Fig. 2, 3).

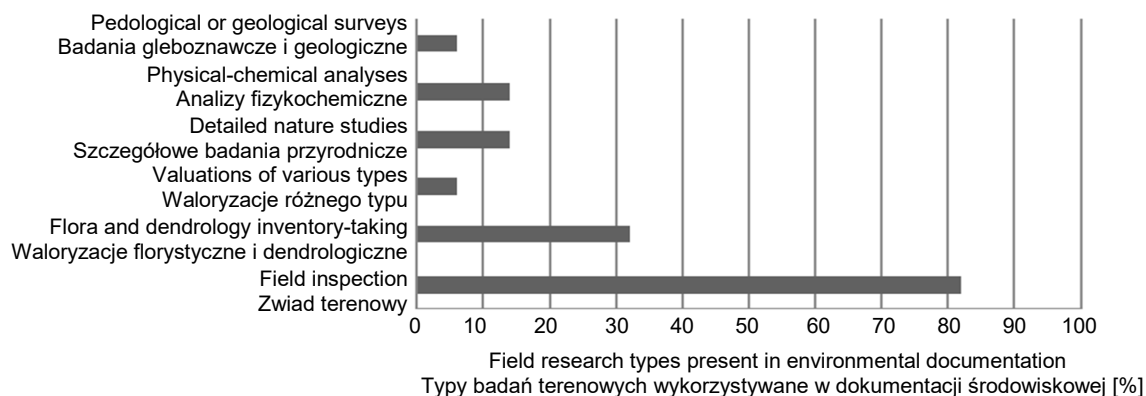


Fig. 2 Characteristics of field research types used in EIA reports for small projects

Ryc. 2. Charakterystyka badań terenowych w raportach oddziaływania na środowisko w przypadku małych inwestycji

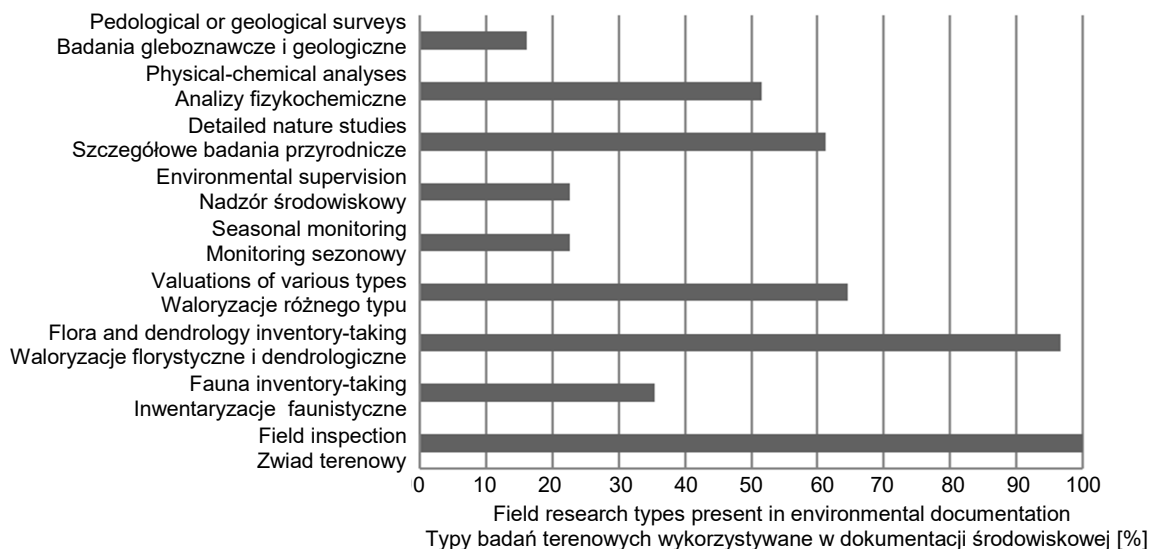


Fig. 3 Characteristics of field research types used in EIA reports for large projects

Ryc. 3. Charakterystyka badań terenowych w raportach oddziaływania na środowisko w przypadku dużych inwestycji

The aim of EIA reports is chiefly to evaluate different kinds of impact constituting the subject of the project both during its construction stage and its operation, and sometimes also its liquidation. Hence, the scope of field research is more extensive and it should be exhaustive, presented in such a manner so as to leave the competent authority conducting the EIA with no doubts regarding the types of impact identified (both long- and short-term and above all accumulated impacts).

Forecast of the environmental impact of drafts plans, strategies, etc. In documents of this type, field research has limited application because the subject of the EIA typically concerns provisions included in strategic urban planning documents. Therefore, any field work usually takes the form of a brief site visit to the area where the actions stipulated in such a document are planned, in order to verify the documentation provisions and to become familiar with the nature of the individual project. The documentation created as part of a strategic EIA demonstrate the need to conduct landscape science research, because they often concern projects which take up a large area, which are of linear nature or of multi-factor impact. Field work in these types of activities also involves verifying cartographic data and making them more detailed for the purpose of analyses using GIS tools, e.g. with the use of methods involving multi-factor analyses in the drawing up of thematic maps (Fig. 4).

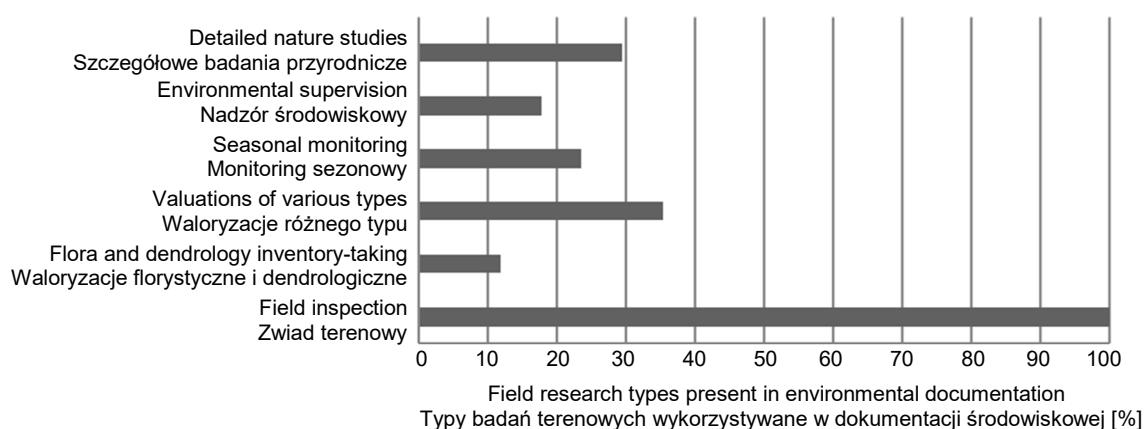


Fig. 4. Characteristics of field research types used in strategic EIAs

Ryc. 4. Charakterystyka badań terenowych w strategicznych ocenach oddziaływania na środowisko

Environmental screening conducted at the pre-investment stage constitutes a specific type of documentation. Frequently an activity preceding the EIA procedure, conducted at the instruction of the Investor, it aims to supply the preliminary natural characteristics of the investment terrain and to exclude any sites where there is a danger of extensive damage to the natural environment. The nature of such studies makes it a de-facto report of multi-directional field research carried out at the site of an investment. The scope of research is strictly related to the nature of the investment. The objective of screening is resource recognition, and it always comprises basic inventory work, determining the existing hydrological situation, some natural and landscape analyses; monitoring studies, however, are conducted only rarely (Fig. 5). Typically, documentation created as part of pre-investment screening is of a general nature and is based on several, rather cursory site visits, comprising chiefly of abbreviated flora and dendrology inventory-taking.

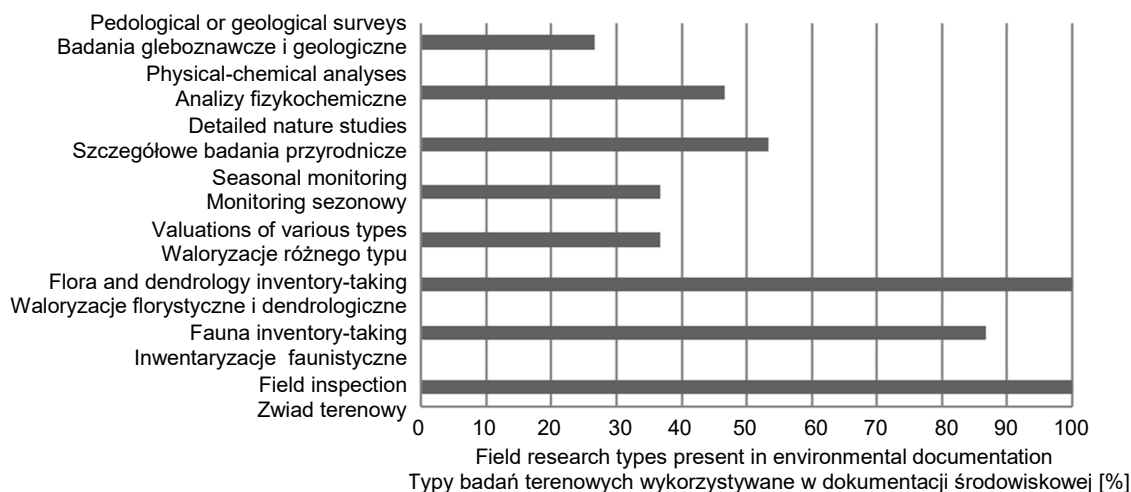


Fig. 5. Characteristics of field research types types used in environmental screening
Ryc. 5. Charakterystyka badań terenowych w przedinwestycyjnym screeningu środowiskowym

Table 2. Elements of landscape field work in the EIA of an investment
Tabela 2. Elementy badań krajobrazowych w dokumentacji środowiskowej inwestycji

Documentation types Typy dokumentacji	Characteristics of fieldwork forms Charakterystyka form badań terenowych
Project Information Sheet Karta informacyjna przedsięwzięcia	inventory-taking and specification of habitats; analysis of the conditions defined in article 63 of the EIA Act, including distance from protected areas or from areas of historical, cultural or archaeological value inwentaryzacja i charakterystyka siedlisk; analiza uwarunkowań określonych w art. 63 Ustawy o ocenach oddziaływania na środowisko, w tym odległości od obszarów objętych ochroną i obszarów mających znaczenie historyczne, kulturowe lub archeologiczne
EIA report (small investments) Raport oddziaływania na środowisko (małe inwestycje)	inventory-taking and specification of habitats; inventory-taking of cultural buildings; landscape valuation; distance from protected areas or from areas of historical, cultural or archaeological value inwentaryzacja i charakterystyka siedlisk, inwentaryzacja obiektów kulturowych; waloryzacja krajobrazowa; odległość od obszarów objętych ochroną i obszarów mających znaczenie historyczne, kulturowe lub archeologiczne
EIA report (large investments) Raport oddziaływania na środowisko (duże inwestycje)	inventory-taking and specification of habitats; identification of individual protected species and habitats (if found); inventory-taking of cultural buildings; landscape valuation; landscape unit delimitation; specification of cultural landscape; identification of threats to landscape inwentaryzacja i charakterystyka siedlisk, identyfikacja poszczególnych gatunków i siedlisk objętych ochroną (jeśli takie stwierdzono); waloryzacja krajobrazowa, delimitacja jednostek krajobrazowych, opracowanie charakterystyki krajobrazu kulturowego, identyfikacja zagrożeń dla krajobrazu
Forecast Prognoza	depends on the type of documentation analysed; specification of cultural landscape; distance from protected areas or from areas of historical, cultural or archaeological value zależy od rodzaju analizowanej dokumentacji; opracowanie charakterystyki krajobrazu kulturowego, odległość od obszarów objętych ochroną i obszarów mających znaczenie historyczne, kulturowe lub archeologiczne
Environmental screening (pre-investment) Screening środowiskowy (przedinwestycyjny)	inventory-taking and specification of habitats; inventory-taking of cultural buildings; distance from protected areas or from areas of historical, cultural or archaeological value inwentaryzacja i charakterystyka siedlisk, inwentaryzacja obiektów kulturowych, odległość od obszarów objętych ochroną i obszarów mających znaczenie historyczne, kulturowe lub archeologiczne

In the examples of documentation analysed, the aspect of landscape studies, in the authors' opinion, occurred extremely rarely, which could result in a deterioration of the quality of the documents. This most often concerned EIA reports, with landscape studies reduced to a description and identification of natural habitats in the area under study. The methods of landscape studies were more widely represented in strategic EIAs where projects of a planning nature were analysed, in which case various forms of landscape unit delimitation were performed along with landscape transformation analyses, etc. However, these were based on fieldwork only to a very limited degree. They were typically studies that used cartographic resources and GIS procedures, e.g. with the application of methods involving multi-factor analyses in the preparation of thematic maps (Table 2).

CONCLUSIONS

Field research is a commonly-applied tool in the drawing up of environmental documentation; however, its scope, methodology and the manner in which its results are given are not regulated by any formal documentation requirements. The substantive value of the results, therefore, differs and is dependent on the professionalism and technical capabilities of the contractors as well as on the scope suggested in the decisions of the environmental protection authority. A broad scope combined with a lack of detailed guidelines fails to ensure the desired quality and depth of research. In addition, a clear drawback to the documentation is the lack of a broader research plan: research is typically ad-hoc and one-off, limited to a single cycle of activities, so it is difficult to apply it to more complex environmental processes. More complicated projects require a well thought-out plan, at least in terms of adapting the scope of field work to the phenological cycle, water condition, social and economic conditions, etc. On the other hand, there is a lack of wider access to the resulting documentation, scattered as it is over a wide number of reports, which prevents any practical and scientific use of this highly extensive database of results. This in turn raises the costs of preparing reports and crosschecking information from a similar area or subject. A database of case studies would result in a significant improvement to the quality and scope of further documentation and give rise to the possibility of wide-scale assessments on the real impact of completed investments. The situation can be significantly improved if amendments to the EIA Act are adopted, to which the following solutions are proposed:

- the creation of an EIA database including the results of field research used in the documentation;
- legislation to create a nature inventory bank to comply with the INSPIRE Directive;
- a definition of nature inventory-taking;
- an extension of the mandatory scope of environmental reports by the inclusion of the results of nature inventories, along with a description of the methodology used, which aims to standardise and raise the standard of data collected in the course of field work.

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Abstract. Field studies have become a permanent feature of the environmental documentation system, which in turn has become a standard part of the investment process. The scope and depth of environmental impact assessment field studies is highly diverse and depends both on the type of investment and the provisions required by the relevant authorities. The paper presents an analysis of selected examples of investments in the scope of the field research conducted, along with the impact of their results on obtaining a positive environmental assessment decision. The analysis also takes into account the needs of field research, which should be tailored to the level and type of investment which is subject to environmental impact assessment.