

**TRAINING AND RESEARCH CENTER FOR RENEWABLE ENERGY
SOURCES IN OSTOJA NEAR SZCZECIN – NEW FUNCTION
OF A HISTORIC FARM AND PARK COMPLEX**

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Abstract

This paper presents the functioning of the Training and Research Center For Renewable Energy Sources in farm and park complex in Ostoja near Szczecin. The Center is an unit of West Pomeranian University of Technology in Szczecin. A diverse activities (educational, scientific, social and commercial) that provide maintenance and further development of the Center has been described.

Key words: farm and park complex, multifunctionality, maintenance of the historic properties

INTRODUCTION AND OBJECTIVES OF RESEARCH

In the farm manor and park complex in Ostoja (the Municipality of Kołbaskowo), just behind the western border of the city of Szczecin, there is the Training and Research Center for Renewable Energy Sources. It is a unit of the West Pomeranian University of Technology in Szczecin which has been conducting education, training, research and service activities for 10 years.

In the immediate vicinity of the Center there are residential buildings (single and multi-family housing), agricultural land, the facilities and the orchard of the experimental station of the ZUT Gardening Department and the grounds of the new urban cemetery. The location of the Center, away from the hustle and bustle of the city, on the one hand, is a challenge – because of the lack of urban transport and, on the other hand, it is an advantage for the functions of the center (an attractive location for learning, fun and relaxation in a friendly environment).

The aim of this paper is to present the farm manor and park complex in Ostoja and its current functions, following the transformations associated with the founding and operation of the Training and Research Center for Renewable Energy Sources.

STATE OF RESEARCH

The register of monuments in the West Pomeranian Voivodeship includes as many as 700 manor and palace premises with gardens and parks. Most of them were constructed in the 19th and early 20th century; there are less establishments from the earlier 17th-18th centuries (Opęchowski and Stanecka 2002). War damage and post-war negligence resulting from ownership transformations led to the complete disappearance or significant degradation of many of them (Kubus 2008b). Often, however, the acquisition of private property does not guarantee the proper maintenance of a historic building (most often only the area near the building is cared for, often inappropriately, without preserving historical features). Unfortunately, there are known cases of speculative purchases of premises only for the purpose of favorable resale and not taking up or abandoning, after some time, conservation efforts.

Unfortunately, the vast majority of historic manor and palace premises are neglected and require maintenance. Meanwhile they are adaptable to the needs of modern use, and the adaptation is often combined with changes in their original purpose and use (Majdecki 1993).

The best is the condition of the parks near the manor houses and palaces, where hotel, catering, business or scientific research and educational activities (Kubus 2008a) are carried out.

Examples of historical monuments in the West Pomeranian Voivodship functioning as the seat of research, educational, training and integration centers include: the Research and Development Botanical Center, the Palace in Buk, the Training and Research Center for Renewable Energy Sources in Ostoja near Szczecin, the Center for Environmental Education in Małkocin and the Training and Conference Center “European Academy Külz-Kulice Foundation” in Kulice. The owners of the mentioned facilities are: the municipality of Przelewice, Książnica Pomorska, the West Pomeranian University of Technology in Szczecin, the University of Szczecin and the “European Academy Külz-Kulice Foundation”.

The high maintenance costs of historic buildings require the implementation of multifunctionality by conducting parallel activities on the premises. Therefore, in addition to the statutory research and education and training activities mentioned above, the centers also conduct other forms of activities: hotel-catering, service and social.

HISTORY AND REVITALIZATION OF THE FARM MANOR-PARK COMPLEX IN OSTOJA

The history of Ostoja is connected with the history of Gumieńce – a former village and today – a district of Szczecin. In the 13th century, some parts of Gumieńce were handed over to the town by Duke Boguslaw IV, the rest belonged to the church au-

thorities or Szczecin patricians (perpetual leases). In the 16th century, the manor house in Ostoja was privately owned (among others by the Loitz and Glinden families), the areas were gradually redeemed by the town. In the 18th century, there was already an old town's manor farm with colonists and craftsmen; a land estate was also separated within the formerly leased areas of the village. In 1808, a part of the estate was bought by Bask Bettec who called it *Chadeleben* (germ. *Schadeleben*) – the current Ostoja. In 1825-1945 – the manor farm was in the hands of successive tenants (the Schultz and Borchert families). In the first half of the 19th century, a single-storey, neoclassical manor house with a mansard roof was erected and, in the 1960's, it was enlarged by a one-storey neo-gothic wing. The last landlord was Margarete Steffen (family name, Borchert). In 1884, the estate was of an area of 273.84 hectares, while the existing park occupied a smaller area than the present. At the turn of the 19th and 20th century, the park was enlarged and given its naturalistic style (Fig. 1) – Kalita-Skwirzyńska (2006), Kubus and Wójs (2006), Łuczak (2006, 2010).

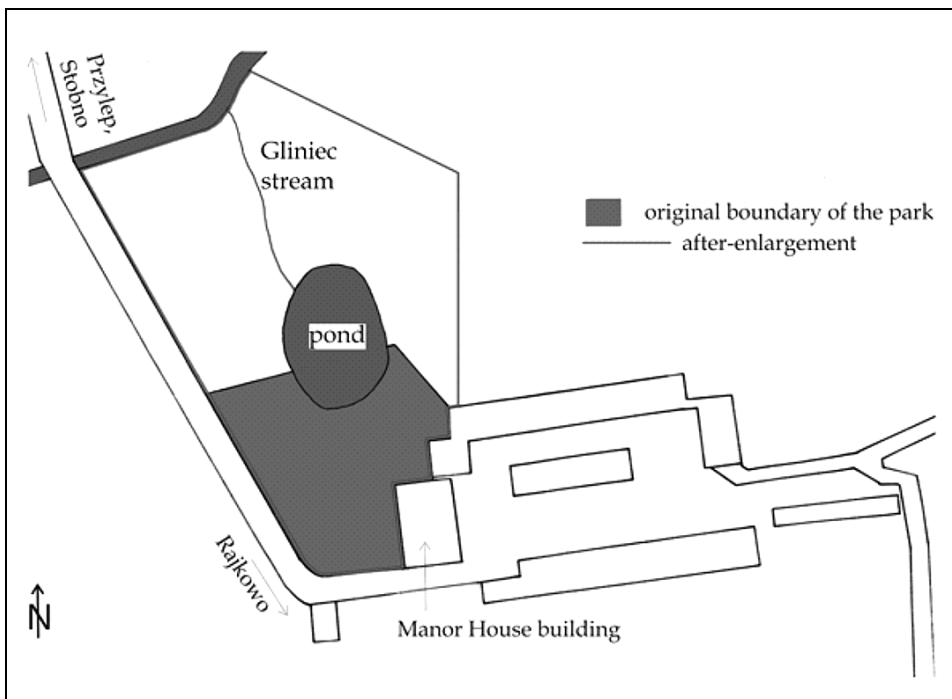


Fig. 1. The Park's area at the beginning of the 19th century (source: Słomiński 1999)

The farm manor-park complex in Ostoja is an example of the most represented spatial structure of the West Pomerania establishments in which the manor is situated between the park and the courtyard, the front of the farm buildings, separated by a representative driveway (Figs 1-3) – Rzeszotarska-Pałka (2008).

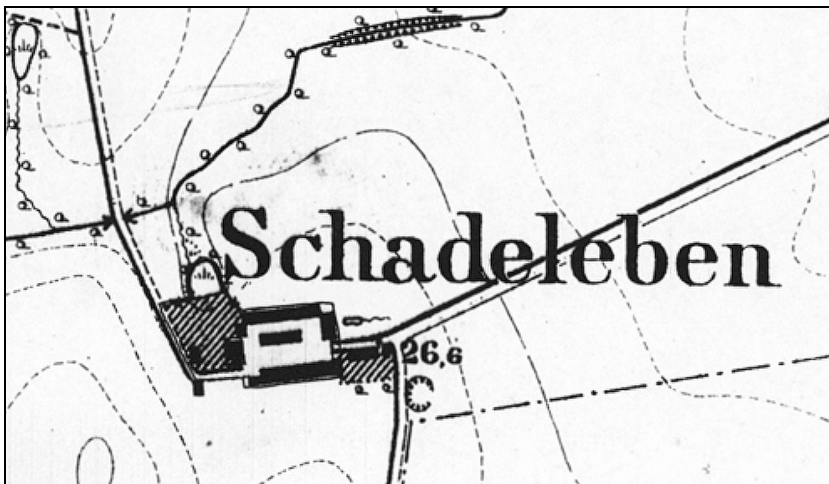


Fig. 2. Ostoja (Schadeleben), Kołbaskowo municipality – reproduction of the map from approx. 1890, in the scale 1:25 000 (Source: the archives of the Provincial Heritage Monuments Protection Office in Szczecin)

After World War II, the farm manor-park complex was put into the hands of the State, and from 1949 there was a State Farm there. In February 1955, the whole was transferred to the university (then it was the Agricultural University of Szczecin) which ran an Agricultural Experimental Department there. From 1993 to 2005, the farm and the area of the Center were leased by “Agrokraj”, a company from Dobiegniew which was involved in the cultivation of the university land. At that stage, a partial renovation of the manor house (1996-1997) was carried out, along with the maintenance of the park (2002).

In 2005, the authorities of the Agricultural University of Szczecin decided to set up the Training and Research Center for Renewable Energy Sources as a place to research and popularize the theoretical and practical knowledge related to the acquisition of energy from unconventional sources, as well as to develop environmental attitudes among the inhabitants of the region. Revitalization works of the facility were taken up in March 2006 and lasted 10 months. Modernization of the farm manor house was carried out under the care of the Conservator of Monuments and included general repairs, taking into account the change of the arrangement of rooms to be adapted to the planned educational and service functions (e.g. study rooms, accommodation rooms), maintaining the historical value of the facility. In addition to the renovation works, the buildings and grounds of the Center were equipped with modern RES equipment such as: solar collectors, PV cells, a heat pump, a biomass boiler, a central heating unit cooperating with all devices and a control system, as well as a biological sewage treatment plant. The total cost of the investment was estimated at PLN 4,832,150, most of the amount was covered by the project “Construction of the Training and Research Center for Renewable Energy Sources in Ostoja” as part of the Integrated Regional Operational Program. There were also targeted donations from the Ministry of Education and Science and from the Provincial Fund for Environmental Protection and Water Management in Szczecin (Klera 2013).

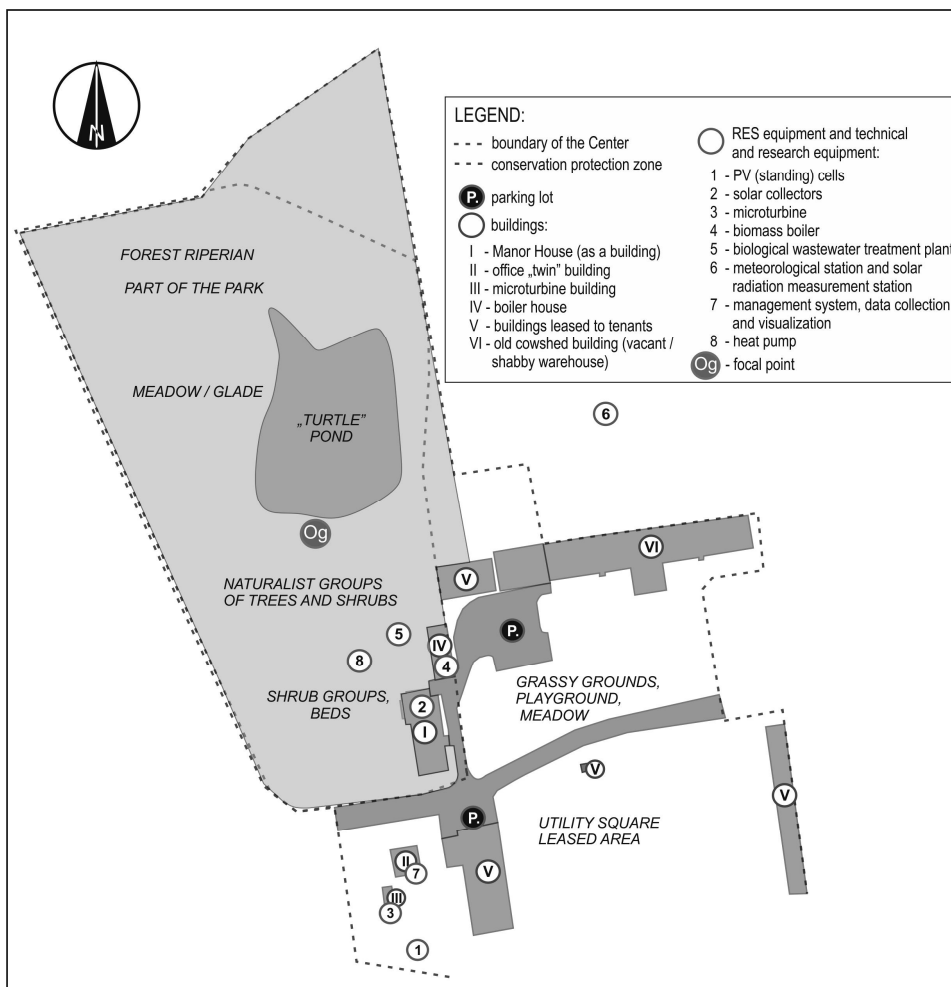


Fig. 3. Map and location of the objects and the RES devices at farm and park complex in Ostoja

The next stage of the works related to the modernization of the Center was implemented in 2007-2008, thanks to the funds obtained under the project “Extension of the Innovative Technical Infrastructure of the Training and Research Center for Renewable Energy Sources in Ostoja” from the INTERREG IIIa program. The works included the comprehensive renovation of the “twin” building in which the Centre’s office is currently seated. In addition, the project also included complementation of the Center’s facilities with a set of PV panels, a meteorological station, a radiation intensity measurement station, and a gas microturbine.

Currently, the Center is an interdepartmental unit of the West Pomeranian University of Technology in Szczecin (the university was created as a result of the 2009 merger of the Academy of Agriculture and the Szczecin University of Technology). The facility conducts a wide spectrum of activities in the field of the popularization of re-

newable energy sources. The main statutory tasks performed in the unit include educational classes and the presentation of equipment and technical solutions used at the Center along with the possibility of conducting research with the use of them. Both the facilities and the grounds of the Center have been adapted for the purpose of creating a place enabling the implementation of educational workshops, operational research, as well as conducting service activities within the training and conference center and the accompanying accommodation facilities. There are various functions within the Center, as described below.

FUNCTIONS IMPLEMENTED IN THE CENTER

1. Scientific-research and service function

The rising energy costs and the gradual depletion of the world's non-renewable resources are the causes of the search for alternative energy sources. Health and environmental aspects (reduction of emissions, greenhouse gases, etc.) can be among the benefits of the green energy along with economic benefits (e.g. reduction of energy imports, creation of new jobs) and political benefits (independence of oil and gas supplies, etc. from abroad). The Center in Ostoja is equipped with the following devices which allow the use of unconventional and non-conventional technologies for energy and heat generation, as well as other environmentally-friendly solutions for the creation of jobs, high-quality education and leisure, respecting the environment and promoting RES technologies (Table 1).

Table 1

Location of the RES devices at farm and park complex in Ostoja

Piece of equipment	Location
Photovoltaic – monocrystalline cells (STP 18OS-24/Ac) and thin-film cells (SCG50-HV)	Free-standing trackers near the office, near the southern boundary of the site
Solar collectors (Vitosol 100F-SH)	Manor building (roof)
Microturbine (Capstone C 30)	Microturbine building
Biomass boiler (Compact 150 HDG)	Farm – boiler room building
Glycol-water heat pump (VITOCAL 300)	Historic park area
Automatic meteorological station and a station for measuring the intensity of solar radiation	Separated area outside the Center, behind the farmhouse (former barn)
System of management, collection and visualization of data: - server collecting data from the RES equipment sensors installed in the Center - system of RES equipment visualization and management	Office building (the so-called “twin”) Manor building, office building (the so-called “twin”)
Biological wastewater treatment plant (BD POLARIS)	Historic park area

2. Educational function

Since the beginning of the Center's existence, the educational activity and popularization of RES are among the main statutory tasks. The unit belongs to the Szczecin Network of Ecological Education Centers which includes both public institutions and non-governmental organizations, such as the Nature Protection League in Szczecin, the West Pomeranian Branch of the Polish Youth Hostel Association and the Szczecin Branch of the Society for the Protection and Care of Animals. Apart from domestic cooperation, the unit is also willing to cooperate with foreign centers of environmental education, including Solarzentrum MV (Wietow, Germany), ZERUM – Zentrum für Erlebnispädagogik und Umweltbildung (Uckermünde, Germany), Zentrum für Erneuerbare Energien (Eberswalde, Germany) and universities (Technische Hochschule Neubrandenburg).

The robust growth of this sphere of activity would not have been possible without employing qualified personnel and systematic supplementation of the didactic base with modern and unique didactic and research aids on a regional scale. For the education of children and teenagers and students, a number of models and teaching sets have been purchased, including experimental sets of wind turbine construction models, photovoltaic and hydrogen fuel cell systems, self-built solar powered car models, a water turbine model and many more. What is more, in recent years, demonstration-training mobile sets (PV cells, solar collectors, heat pump models) have also been purchased along with a biofuel production set and a thermal imaging unit. The acquisition of such a rich educational background was mainly possible thanks to the support obtained from numerous projects submitted to various institutions – especially to the Voivodship Fund for Environmental Protection and Water Management in Szczecin (grants of 75% of the total project costs).

Due to the close proximity to Szczecin, the Center annually attracts around 5,000-6,000 people interested in various aspects related to ecology and the environment protection. The meetings are dominated by children and schoolchildren. The staff of the Center keep records for reporting purposes, which makes it possible to analyze the appropriateness of the actions undertaken and possible adjustments to the forms or topics of the meetings held. The historic manor, with its surrounding park, and the park's focal point at the picturesque pond make it possible to organize a variety of activities (workshops, games and plays) for all age groups. For recreation purposes, there is also a playground vis à vis the entrance to the manor house and a large lawn near the office building.

Many of the workshops are own ideas, using a range of the activation methods available. The most popular form of education is a one-day workshop conducted in the school year, during which the participants themselves perform the assigned works and experiments. Each month a specific theme is implemented, which greatly facilitates the logistics issues related to the preparation of classrooms. Students learn about alternative sources of energy (sun, water, wind, biomass and geothermal energy), the advantages, disadvantages and practical uses thereof. Other topics address climate changes and the related threats, rational management of energy re-

sources, ways to save energy, and segregation of waste and recycling. The content and form of the classes are adjusted individually to the age and number of the group participants and the capacity of the participants. Simultaneously, workshops can be held at the Center for two groups of up to 25 people. The Center offers workshops for groups with integration departments with special educational needs. Depending on the age of the participants, classes take the form of fun, lectures, talks or lectures with presentations. The younger age groups are dominated by learning by play, in the older age group, they gain knowledge based on experiments or analysis of models, devices. The biggest attractions include: solar go-kart rides (for children from 4-12 years old, cars powered with photovoltaic panels), water turbine workshops and testing them on a mountain river model, an ecological wheel of fortune (a game with prizes for children and adults), energy generators (enabling the production of electricity by the power of own muscles) and cooking on solar cookers, using sun energy only, for example, to make popcorn or heat up water. The events during which, in practice, participants paint cotton bags or make their own natural cosmetics are also very popular. In addition to the workshops conducted during the week, the Center's staff also run a series of Saturday workshops at the Children's University "DUTEK", carried out at the units of various faculties of the University.

The park area has also been adapted to the education and leisure needs – near the picturesque pond in the park, there is the focal point where visitors are eager to integrate. In order to diversify the educational offer of the Center, there is an educational path of "Renewable Energy Sources" created which is the diploma dissertation of a high school student in Szczecin – Ms. Justyna Posyniak (supervision of the content of the tables was performed by the Center's staff and the students practicing in the Center). The 10 teaching tables discuss the RES facilities installed along with the illustrations and principles of their operation (in Polish, English and German) and interesting information related to ecological issues, including the turtle pond history. The designed tables also allow you to play an exciting group game during the "Ecological Paper Chase" – an integrated field game that allows you to check the knowledge acquired during the workshops.

The pond located in the park is yet another attraction available to visitors. Being part of the partnership project with the Society for the Protection and Care of Animals, it is a place of residence for the red-eared slider (*Trachemys scripta elegans*) whose former owners cannot continue to look after it for various reasons. The red-eared slider is an invasive species and therefore requires an isolated habitat which is provided by a wooden fence in the Ostoja "turtle pond". The turtles are an attraction for visitors, on sunny days they bathe on the shore, they often also curl up in the direction of children playing around the campfire. The turtles deserved its place in the Center's landscape, therefore, the Center's mascot is a wooden sculpture depicting the turtle. The Center also celebrates such holidays as the Turtle Day and the Biodiversity Day when the theme of the course is to promote knowledge about biodiversity.

The redevelopment and adaptation project of the park developed in 2006 has not yet been fully implemented (Fig. 4).

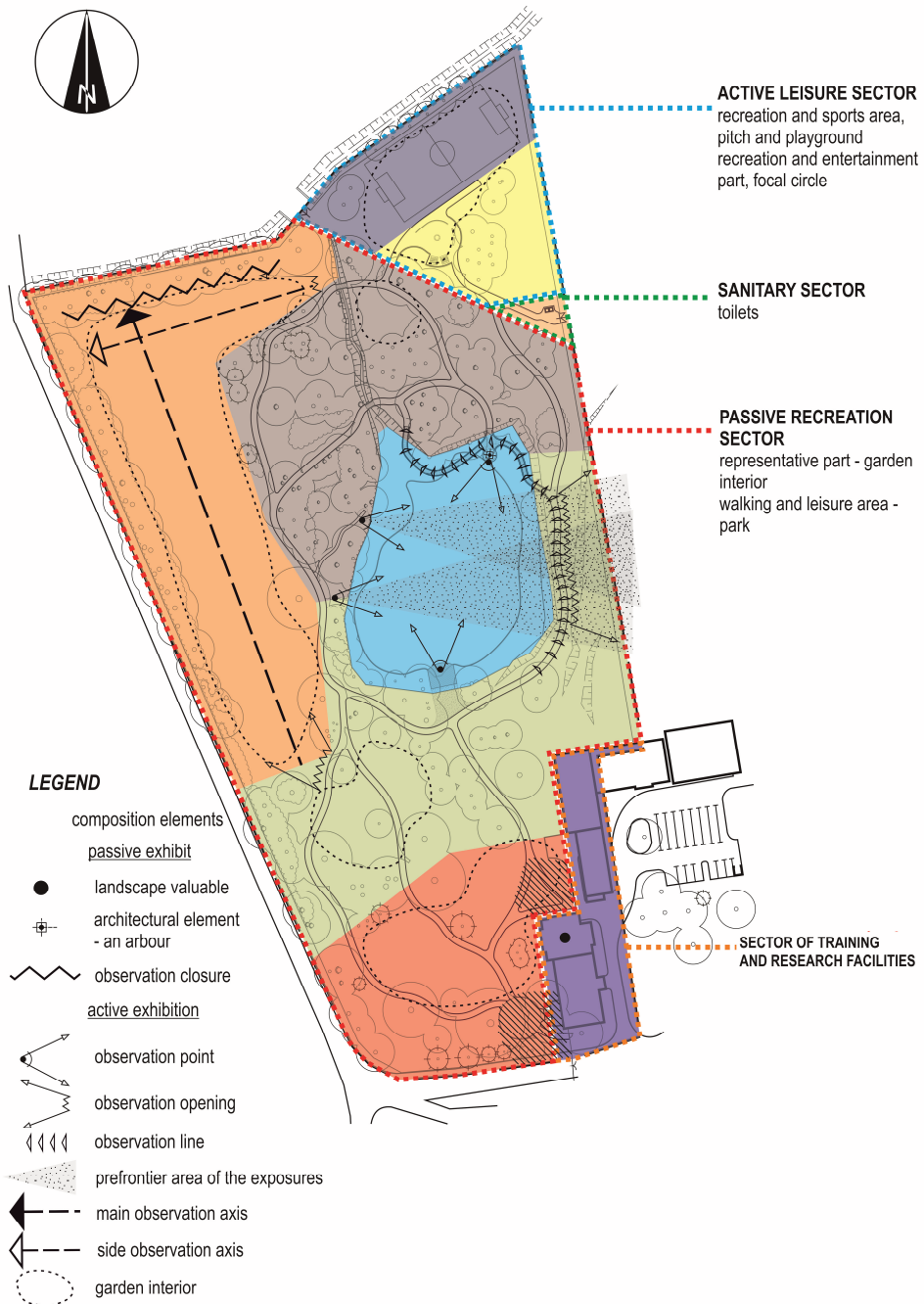


Fig. 4. The functional-spatial structure and composition of the revalorisation project of the park in Ostoja (source: Kubus and Wójs 2006)

In addition to the one-day educational workshops at the Center, green schools and winter and summer day camps are organized. The day camps surely enjoy a growing popularity every year. The success of this form of education is the result of: an attractive program offer regarding ecological and survival themes, low participation costs and field conditions conducive to children's recreation.

The rich offer of the Center also includes the possibility of organizing ecological birthdays during which children participate in RES workshops, they also enjoy the games and plays taking place in the rooms and outdoors. This is an interesting alternative to the other offers on the local market.

The educational program of the unit every year includes also very important meetings and events addressed to a wide audience. During outdoor events, popularizing the theme of RES, the Center's employees conduct ecological workshops for the youngest, as well as games and plays for all age groups. During these events, visitors have the opportunity to take advantage of free consultations concerning the installation of RES equipment (e.g. PV cells or collectors) as well as obtain information about the sources of funding. Every year, the staff of the Center participate in several to a dozen events, most often they are events organized within the Provincial Fund for Environmental Protection and Water Management EROSTREF, accompanying large outdoor events organized in such fields as, for example: Jakubowy Fair, Szczecin Magnolias Festivals, etc. The events aimed at promoting science and green attitudes are also organized at the Center, every year, workshops, meetings, events within the framework of the West Pomeranian Science Festival, European Night of Scientists are held here.

The establishment of the Center was also intended to create a training and conference site for own use or commercially available for companies and external institutions. Many workshops and conferences related to the RES sector have been organized in the Center so far. The issue concerned is addressed to a wide audience: both individuals and public sector representatives, teachers, the unemployed or wanting to expand their professional qualifications. The content includes, depending on the target group – the review of renewable energy sources, their applicability, technical issues, legislative conditions, rules of performing new installations connected to the existing network and the possibilities of obtaining subsidies. One of the most important events organized by us is the Sunny Festival – a promotional campaign in the form of a series of events of international character, involving the acquisition of energy from renewable sources, and in particular from the Sun. So far, various forms of popularization have been taken up within the framework of the Festival, including: organizing the European Solar Forum – an international conference dedicated to RES technologies, presenting legislative solutions and financing systems for RES installations in various European countries. The invited speakers are leading figures on the European political scene; NGOs, the world of science and institutions that fund and implement RES technologies. Politicians, representatives of local governments and administrations as well as entrepreneurs and academic teachers are invited to participate in the forum. The festival is accompanied by other events, such as study trips for students and teachers, as well as participants of the Forum (e.g. trips to the Solarzentrum in Wietow (Germany) or an excursion to the already closed nuclear power plant in Lubmin connected with visiting the Max Planck Institute in

Greifswald, where the construction of a stellator was ongoing – a device capable of producing plasma and performing a controlled thermonuclear reaction).

The Center's activities also include consultation and related activities in obtaining information on renewable energy sources and the associated economic, technical and legal aspects. The staff of the Center provide information on the site as well as during conferences, trainings and outdoor events. In addition, the Center provides information on renewable RES companies in the region and on conferences, trainings and the industry and related events. The information is also provided via the Internet (sending educational offers to schools, running a website, activities in social media). The website of the Center (www.oze.szczecin.pl), since its launch, has recorded nearly 2,000,000 views. The website provides information on the current educational offer, details on the history of the Center, provides a list of RES facilities and the research carried out at the Center, as well as information on upcoming events, competitions and workshops and the past events, together with photo galleries. There are also various attractions for children – such as the possibility of verifying their knowledge of ecology in quizzes and competitions.

3. Service function

In addition to its scientific and educational functions, the Center, through its infrastructure, is able to provide service-oriented functions. The manor house has three rooms (a conference one, a seminar one and a restaurant) which can be rented to third parties and to private persons, among others, for the purposes of organizing trainings, conferences, business meetings as well as meetings and special events (weddings, communions, etc.). The Center also cooperates with the municipality of Kołbaskowo which is superior to it, by renting rooms for the needs of the organization of classes in the community room and meetings of the inhabitants of Ostoja. Guests of the Center also have the opportunity to use hotel services. The Center provides accommodation for 21 persons, the guest rooms are double or triple, with bathrooms. The location is quiet and peaceful, and the opportunity to relax in the adjoining park is an asset of the Center as a leisure location. The Center also offers its guests the opportunity to organize a meeting by the fire or grill.

Some of the buildings (former farm buildings, garages, sheds) and the square within the area belonging to the Center are available for lease to companies and private tenants (the following have been created: a sculpture workshop, a wood trading company, a car workshop, etc.). The property of the Center also includes agricultural land of 34 hectares which are leased. Rental of premises and leasing of land allow for partial balancing of the unit's finances.

4. Social function

Meetings of local communities are organized on the premises of the Center: foundations for the development of the municipality, villages, groups and circles of interests. The Center cooperates in particular with the municipality of Kołbaskowo, being its superior. In the Center, in one of the classrooms, during the school year, community room activities are held three times a week during which children are tutored by

teachers, doing art work, learning and having fun. During the summer and winter holidays, the municipality also organizes day camps for the children who use both the Center's premises and the park grounds. The area of the Center (the park, the playground) is a generally accessible area where both locals and visitors are welcome to spend time in a quiet and peaceful environment. Cooperation with the municipality enables the organization of many interesting undertakings (events, meetings), such as the solemn celebration of the Independence Day in the form of the an evening feast, gathering many inhabitants every year and permanently entering the calendar of municipal events.

CONCLUSION

The adaptation of the original founding in Ostoja to scientific, didactic, social and service purposes has been carried out without changing its original purpose when changing the land use. The functional-spatial structure of the manor farm and park complex has not been affected and its equipment is not excessive.

Although the staff of the Center is not large – it comprises only 3 administrative workers and 4 persons responsible for supervision and housekeeping and maintenance of the facility (1 person). The Center's activities contribute significantly to increasing the ecological awareness of its inhabitants, and its commitment to its activities is an important contribution to the development of healthy ecological attitudes among children, adolescents and adults. A wide range of activities enables the maintenance and development of the historic manor farm and park complex in Ostoja.

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ÓŚRODEK SZKOLENIOWO-BADAWCZY W ZAKRESIE ENERGII ODNAWIALNEJ W OSTOI KOŁO SZCZECINA – NOWA FUNKCJA ZABYTKOWEGO ZESPOŁU FOLWARCZNO-PARKOWEGO

Streszczenie

W artykule przedstawiono funkcjonowanie Ośrodka Szkoleniowo-Badawczego w Zakresie Energii Odnawialnej Zachodniopomorskiego Uniwersytetu Technologicznego w Szczecinie znajdującego się w zespole folwarczno-parkowym w Ostoi koło Szczecina. Scharakteryzowano różnorodną działalność prowadzoną w ośrodku (edukacyjną, naukową, społeczną i komercyjną), której wdrożenie umożliwiwia jego utrzymanie i dalszy rozwój.

