

# **Participatory Approach in Land Consolidation in Poland – Crowdsourcing Application Test Feedback**

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**Key words:** land consolidation, public participation, rural areas development, crowdsourcing

## **SUMMARY**

This paper is based upon research carried out as part of the project entitled "Activation of the local community in rural development projects" co-financed by the European Union under the Rural Development Programme for the years 2014-2020.

The aim of the study was to investigate the possibility of activating rural inhabitants and using endogenic potentials to foster local rural development by applying the crowdsourcing concept at the stage of planning for land consolidation projects. A dedicated mobile Land Consolidation-Crowdsourcing Application (LC-CApp) was created for this purpose which enabled adding detailed information about the area to a digital map, creating a crowdsourced data set which can be relevant for future planning works.

The article presents new ways of engaging in dialogue with the participants of land consolidation at the early stages of consolidation works and the experience of testing the LC-CApp.

# Participatory Approach in Land Consolidation in Poland – Crowdsourcing Application Test Feedback

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## 1. INTRODUCTION

Land consolidation procedure is currently the most important instrument shaping the spatial structure of rural areas in Poland. Modern consolidation projects require taking action to foster creativity among the members of local communities and enable their participation in such projects. Therefore, when undertaking land consolidation, it is important to foresee activities which would enable rural residents to participate in conceptual work on rural development planning.

The aim of the project entitled "Activation of the local community in rural development projects"<sup>1</sup> was to make better use of the local community's potential in the course of rural development projects by obtaining information from rural residents on natural conditions and places of cultural interest in their local area, using innovative solutions.

The article presents the conclusions from the implementation of the above project which included workshops conducted with the participants of several land consolidation processes in Poland. The workshops were organised to enable the participants to share their knowledge about the local area and provide opinions on the solutions proposed in the land consolidation plan. For this purpose, social research was conducted using the Focus Group Interviews method and a dedicated application for mobile devices, based on the idea of crowdsourcing, the Land Consolidation Crowdsourcing Application (LC-CApp), was used. The consolidation project participants used the LC-CApp to add detailed information about their local area to a digital map with view to providing data relevant for the planning works. The app enabled the collection of new geospatial data, not recorded in the existing geodatabases, and the use of such data, in the form of ready-made thematic layers in the GIS environment, to inform the land consolidation plans.

The new data helped to inform the exchange of thoughts and observations between the decision makers, the experts and the residents on the possible development directions for the local area concerned and allowed the participants to propose optimal solutions for preserving and promoting local features of environmental or cultural value.

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<sup>1</sup> The project was implemented as part of the Action Plan of the National Rural Network for the years 2014-2020 (co-financing agreement no. KSOW/4/2020/023), project website: <https://www.gik.pw.edu.pl/zgpinsp/2020-2021-Projekt-KSOW-w-ramach-priorytetu-6-PROW-2014-2020>.

## 2. ACTIVATION OF THE LOCAL COMMUNITY IN RURAL DEVELOPMENT PROJECTS

The ongoing process of transformation of rural areas requires both a new perspective on rural space and the adaptation of rural development tools to current needs. Conducting farming and land management works – including land consolidation – requires a multifaceted approach which takes into account broad economic effects, rather than only the effects on yields and profit obtained by the owners of agricultural and forestry land, as well as social and environmental effects.

The aim of the new Common Agricultural Policy (Ministry of Agriculture and Rural Development, 2020) after 2023 is to foster knowledge, innovation and digitalisation of agriculture and rural areas. As part of these efforts, works should be encouraged on development of innovative tools, methods and procedures that use modern technologies to create inventories of features of natural and cultural value present in the local area and that involve the local community (including farmers) in the process. In Poland, both the literature (Kupidura, 2013; Pijanowski and Zedler, 2015; Pijanowski et al., 2021) and the experts have drawn attention to the fact that processes and activities related to the transformation of rural space require taking actions that enhance creative attitudes among the inhabitants of rural areas and enable them to participate in rural development planning. The results of studies conducted by various scientific centres have indicated that sustainable development of rural areas is not possible without broadly understood public participation (Akkaya Aslan et al., 2007; Hartvigsen, 2014; Lisek et al., 2014). The analysis of trends observed in European policies (such as projects carried out under CAPS, the Collective Awareness Platforms for Sustainability and Social Innovation) has revealed that active involvement of citizens in the decision-making process is both desirable and important.

However, citizens' interest and cooperation in planning local development is generally not a spontaneous phenomenon. Therefore, in order to involve residents in local matters, including consolidation works, it is necessary to (Pawlewicz and Pawlewicz, 2010):

- identify the most important problems faced by the residents of the area selected for consolidation;
- learn about the preferences of the residents of the area under consolidation regarding the methods of solving problems and about their readiness to personally engage in consolidation works;
- identify opinion leaders willing to convince the other residents to cooperate;
- explain to the residents the causes, effects and possible ways of solving the problems of their local area through implementation of the land consolidation project;
- gain the acceptance of the inhabitants for measures adopted to achieve the objectives which are recognized as important in the consolidation process;
- involve the residents in solving specific problems.

The authors' own observations (Krupowicz et al., 2020) indicate that in Polish conditions a high level of public participation is still an exception rather than a rule in rural areas. Therefore, a participatory approach should be promoted as far as possible, in which residents (or their representatives) should be included in field visits, as well as conceptual and planning works. Therefore, the authors decided to explore the possibilities of activating rural inhabitants and

using endogenic potentials to foster local rural development by applying a new approach to acquiring knowledge at the stage of planning land consolidation projects<sup>2</sup>. For this purpose, LC-CApp, a mobile application based on the idea of crowdsourcing, was created to enable local residents to add to a digital map any detailed information on the local area that they think is relevant for the planning works<sup>3</sup>.

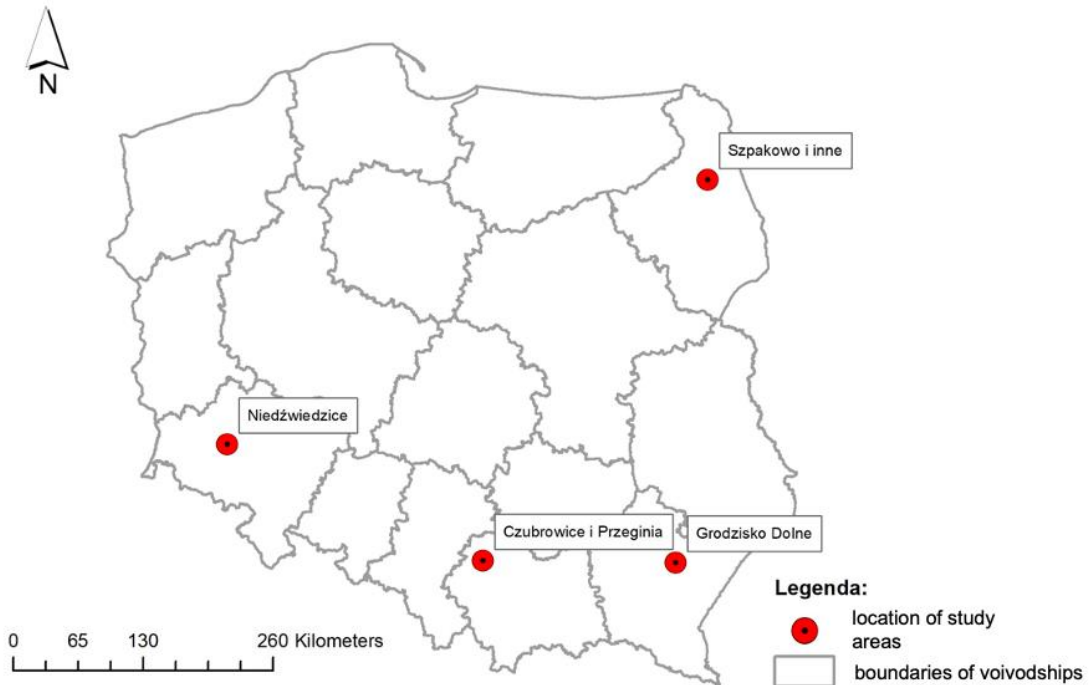
### **3. NEW METHODS OF ENGAGING IN DIALOGUE WITH PARTICIPANTS OF LAND CONSOLIDATION PROJECTS AT THE EARLY STAGES OF CONSOLIDATION WORKS**

As part of the project entitled "Activation of the local community in rural development projects", four workshops were held under the name: „Use of the local community potential in land consolidation”. The aim of the workshops was to familiarize the participants with the idea of sustainable and multifunctional rural development and with methods of involving the local community in shaping the surrounding rural space, and to acquire knowledge from the residents about the studied area. The workshops will be held as part of works on selected areas under consolidation located in four regions: in Podlaskie voivodeship (Szpakowo and other areas), in Podkarpackie voivodeship (Grodzisko Dolne area), Małopolskie voivodeship (Przebinia and Czubrowice areas) and in Dolnośląskie voivodeship (Niedźwiedzice area) in the period from 21 June to 20 July 2021. These voivodships have the largest area of land under consolidation in Poland (based on data from the Department of Land Economy of the Ministry of Agriculture and Rural Development). These regions, due to local conditions, require a multifaceted approach to rural development. The selection of such areas was also dictated by the historical, spatial and landscape conditions of Poland (natural and landscape conditions, the cultural heritage of partitions, the change of national borders after the Second World War, and the resulting agrarian structure).

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<sup>2</sup> The process of drawing up a Land Consolidation Plan is an important stage of conceptual work preceding the step of applying for a decision on initiating the consolidation procedure. The Land Consolidation Plan is a study defining, among others, the boundaries of land under consolidation, including a diagnosis of the existing situation, a description of planned works and a recommendation as to whether an Environmental Impact Assessment should be conducted for the planned consolidation project.

<sup>3</sup> The concept of using the app in the land consolidation procedure in Poland was showcased in the conference paper presented at the FIG Working Week 2019 in Hanoi, Vietnam. The article was appreciated by FIG and received the Article of the Month - February 2020 distinction. The article is available at: [https://www.fig.net/resources/monthly\\_articles/2020/Krupowicz\\_etal\\_February\\_2020.asp](https://www.fig.net/resources/monthly_articles/2020/Krupowicz_etal_February_2020.asp)



**Figure 1. Location of study areas in four regions (voivodships) of Poland representing different types of rural areas**

Source: Czarnecka et al., 2021.

The workshop brought together just over 40 participants, residents of areas where land consolidation is carried out, who are interested in the subject of sustainable rural development (Fig. 2). Guests included also representatives of voivodship (regional) land survey offices, as well as representatives of local authorities.







**Figure 2. Workshop participants during focus group interviews and presentation and field testing of the LC-CApp**

Source: Czarnecka et al., 2021.

During the workshop, the participants shared their knowledge about the area as part of social research conducted using the technique of focus group interviews. It is a relatively fast and inexpensive method which gives accurate and reliable results. Although group interview is classified in social research as a qualitative method, characterized by high accuracy, its results are often consistent with the results of quantitative research (survey research), which is characterized by greater reliability (Kupidura et al., 2011). A group interview should resemble a natural conversation, during which a moderator ensures that each participant has the opportunity to speak, and that no one speaks more than the others. In the interview, the participants of consolidation projects spoke about those aspects of the rural space they live in that are important to them.

In addition, the workshop participants learned how to operate the LC-CApp mobile application, which they used to introduce features, relevant for the implementation of consolidation works, onto a digital map, attaching photographic documentation. This allowed to supplement the existing databases with elements of cultural and natural value, not yet inventoried, which were interesting and relevant for developing the land consolidation plans.

The information collected during the workshops allowed the decision makers, experts and residents to exchange their thoughts and observations on the results of the focus group research and to propose optimal solutions in order to preserve and promote the environmental and cultural values of the study area.

#### **4. EXPERIENCE FROM TESTING LC-CAPP AT THE PREPARATORY STAGE OF CONSOLIDATION WORKS IN POLAND**

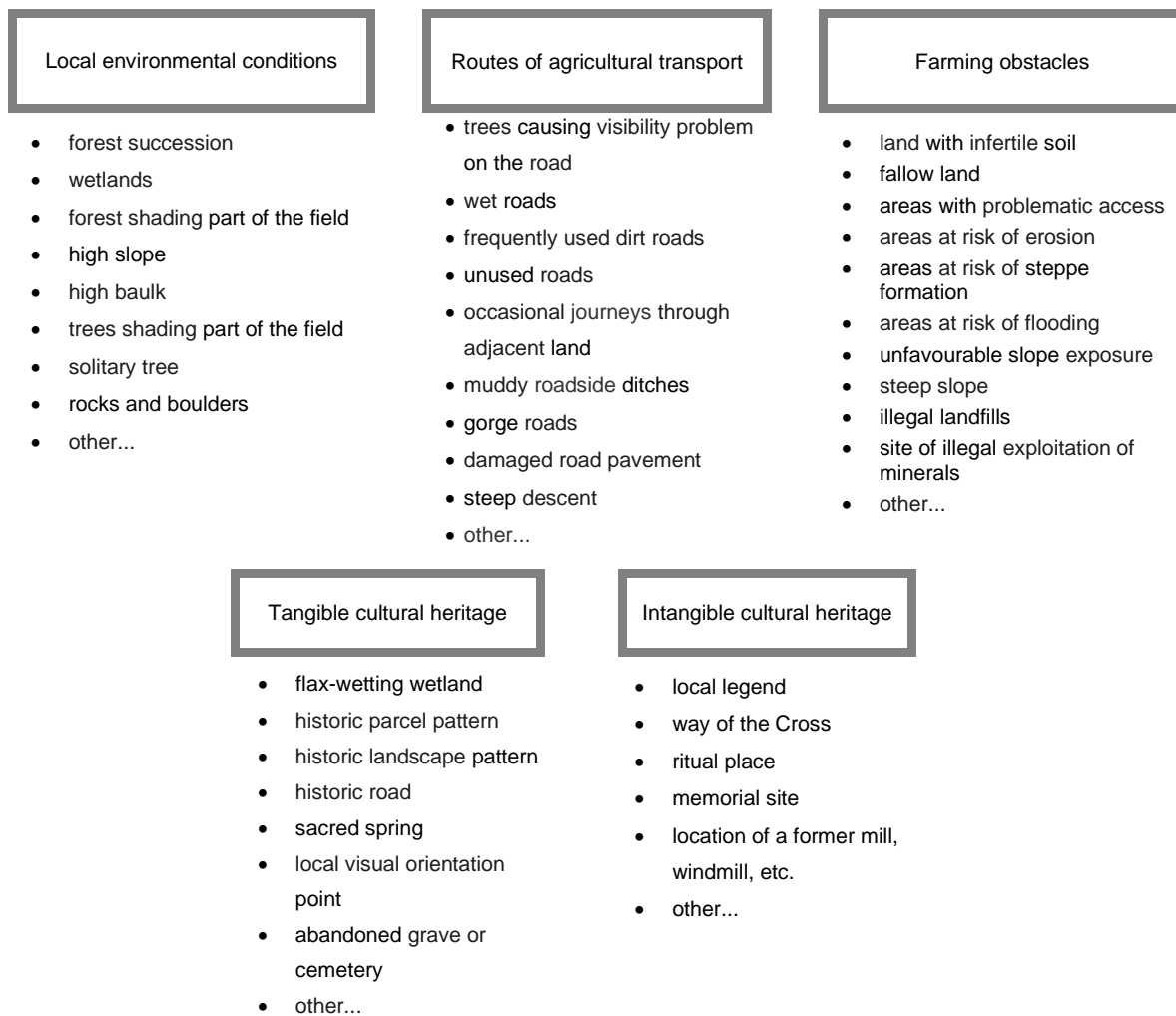
The development of LC-CApp was guided by two ideas:

- a) to involve local residents in deciding which spatial aspects should be taken into account when conducting works aimed at the transformation of the rural space they live in, and
- b) to acquire detailed information about the study area which cannot be found in the existing spatial databases, adding them to a digital map, and then using them when developing the land consolidation plans, in the form of ready-made thematic layers in the GIS environment.

The app was built using Esri's ArcGIS Survey123 software. It is available for iOS, Android, and Windows and is displayed on mobile phones, tablets, and desktops. The app requires access to the Internet to function properly.

The presentation and field testing of the LC-CApp application took place as part of the workshop and consisted of three stages: introduction, practical test and feedback. At the introduction stage, the purpose of the test was explained, the interface and functionality of the application were presented. At the testing stage, the participants were asked to use the app to add detailed information on their local area to a digital map, in particular the information which may be relevant for future land consolidation planning works. The idea behind the application was to enable the collection of spatial data that are not available in the existing databases, in the form of ready-made thematic layers in the GIS environment, and to use such data when developing the land consolidation plans. In the test version of the application, it was possible to introduce features (objects) in five thematic categories (Fig. 3) which are important in planning multifunctional rural development. It is an open data set that can be supplemented, depending on local conditions and the needs of a given project.

**SET OF FEATURES ADDED UNDER DIFFERENT THEMATIC CATEGORIES  
TO LC-CAPP GEOSPATIAL DATABASE**



**Figure 3. Proposal of a set of features entered in the database with the LC-CApp to be used for planning**

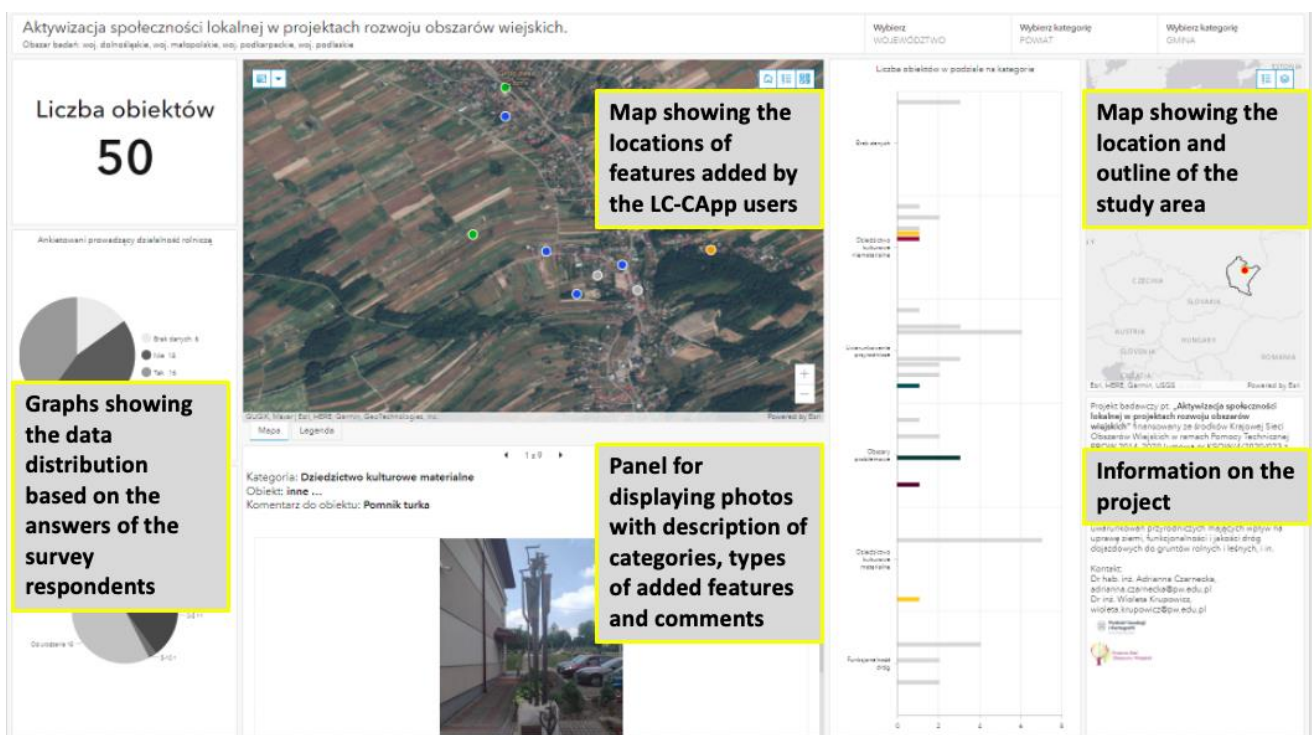
**land consolidation projects**

Participatory Approach in Land Consolidation in Poland – Crowdsourcing Application Test Feedback (11631)  
 Source: Czarnecka, Krupowicz, 2022.  
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The app consists of a Survey 123 software which can be used to collect field data and which runs on a web browser. The survey consists of three basic sections:

- a respondent data section that begins all surveys and is used to identify the respondent
- information on the survey respondent having or not a farming occupation in order to verify if the respondent is a local farmer and how strong their attachment to their local community is, and
- a pane for inserting point features on the map from available suggestions of different thematic categories. Selecting a category separately makes an additional pane appear with features assigned to each category. At this stage, the survey respondents select a category and a feature about which they have knowledge and place it on the map with a possibility of adding a comment and attaching a photo.

Finally, in order to display all the features, the ArcGIS Dashboard application was used to visualize the results and the statistical data. The description of the app structure is shown in Figure 4.



**Figure 4. ArcGIS Dashboard App presenting the aggregate results of the field study**

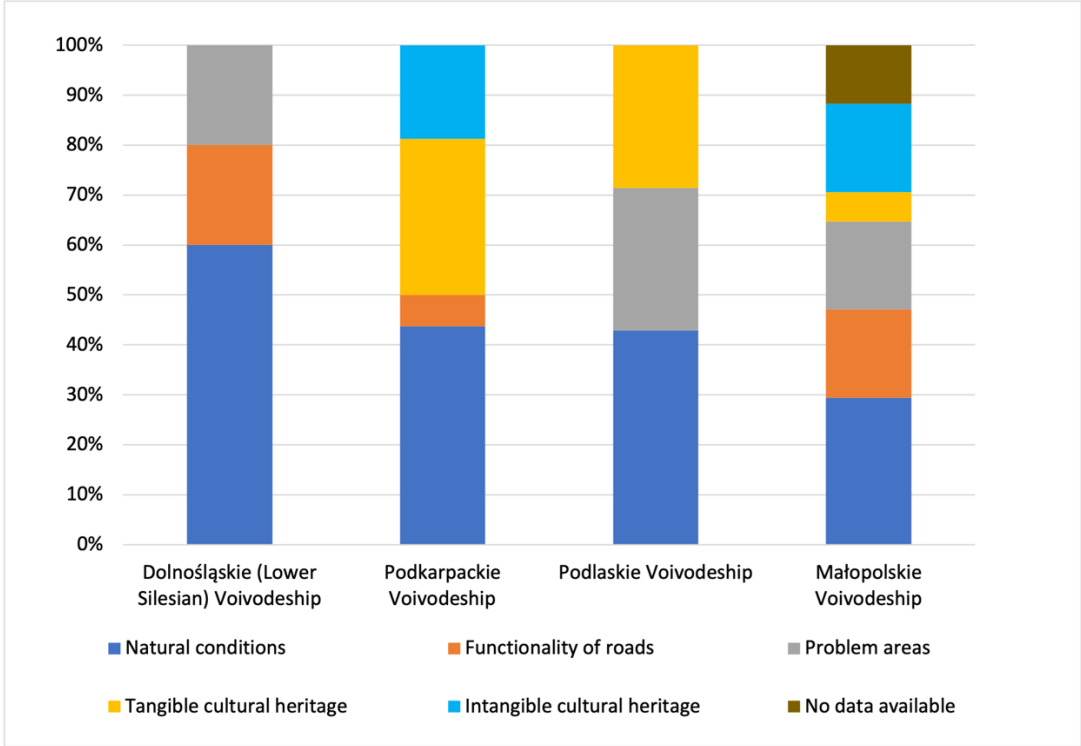
Source: <https://cipw.maps.arcgis.com/apps/dashboards/1f698ac36d0b4077820e8ec49aa6d05c>

Residents of the test areas were keen to provide information about their local area using the mobile app. As a result, the workshop participants added a total of 50 features, 5 of which were unclassified, to a digital map. The discussion with the workshop participants showed that the application was perceived as having a great potential, and the information obtained through the app was considered to be interesting and relevant for the development of the local area, including the information on the identified cultural heritage features that were not included in



the State Register of Historic Monuments. Examples of such features include, among others: 14 stations of the Cross, made of stone and 2 figures in the rock in the village of Czubrowice, and war trenches in the village of Przeginia. Identifying the location of such features before the stage of preparing a land consolidation plan allows a feature to be prequalified as an element of local cultural heritage value, which may contribute to the development of a cultural function of the area, as part of its multifunctional development.

The full distribution of the entered geospatial data is shown using the graph (Fig. 5).



**Figure 5. LC-CApp test results**  
Source: Czarnecka et al., 2021.

During the application test, it was observed that the users needed access to various spatial data available on web portals, e.g. Geoportal (e.g. to the layer of cadastral parcels). The users also

emphasized the need to have the ability to log in to the application, which would facilitate the verification of the quality of the collected data. This confirms the need to further improve the app and add new features.

The application was adopted and positively assessed also by the representatives of voivodeship (provincial) land survey offices involved in the consolidation planning procedure. The land surveyors expressed interest in using the app for developing future land consolidation plans, as well as, in the case of the Lower Silesian Voivodeship, for preparing the land management and farming plans of municipalities.

## 5. SUMMARY AND CONCLUSIONS

The conducted research confirms the thesis that sustainable development of rural areas is not possible without broadly understood public participation. The development and widespread use of the Internet and new digital tools entails a wide range of new opportunities, challenges and perspectives. Crowdsourcing enables communities to be involved in deciding what type of spatial aspects should be taken into account in the implementation of works related to the transformation of rural areas, as well as to obtain detailed information about the study area that is not recorded in the existing spatial databases.

The conducted test of LC-CApp confirmed that the data obtained from the local community allowed for a better and more detailed analysis of the area under consolidation, and thus for a more accurate identification of practical, spatial, natural, cultural and landscape values of the local area for the purpose of drawing up the land consolidation plan. The proposed solution allows to effectively reach the social groups concerned, use their knowledge about the area, obtain their opinions and ideas, and then involve them in the planning works. The proposed solution gives a possibility of supplementing the set of data used in consolidation planning works with a perceptual layer related to the experience, preferences, associations and memories of the local community regarding the rural space they live in. In particular, this applies to data related to the cultural and landscape heritage of rural areas (Kupidura, 2013; Kupidura et al., 2014).

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## **BIOGRAPHICAL NOTES**

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