

ISSN 2300-1496



UNIVERSITY OF AGRICULTURE
IN KRAKOW

Geomatics, Landmanagement and Landscape

GLL *Geomatics,
Landmanagement
and Landscape*



No. 2 • 2014

Krakow



UNIVERSITY OF AGRICULTURE
IN KRAKOW

Geomatics, Landmanagement and Landscape

Scientific journal founded in 2012 at the University of Agriculture in Krakow



No. 2 • 2014

Krakow

Editor-in-Chief
Prof. dr hab. Józef Bieniek

Scientific Editor
Prof. dr hab. Urszula Litwin

Scientific Board
Urszula Litwin (Krakow, Poland) – chair, Bohdan Cherkas (Lviv, Ukraine),
Ryszard Cymerman (Olsztyn, Poland), Oleksandr Dorozhynskyy (Lviv, Ukraine),
Tadeusz Gargula (Krakow, Poland), Krzysztof Gawroński (Krakow, Poland), Beata Hejmanowska
(Krakow, Poland), Józef Hernik (Krakow, Poland), Volodymyr Hlotov (Lviv, Ukraine),
Jarosław Janus (Krakow, Poland), Thomas Kersten (Hamburg, Germany), Marko Komac (Ljubljana, Slovenia),
Wiesław Kosek (Krakow, Poland), Theo Kötter (Bonn, Germany), Eckart Lange (Sheffield, UK),
Hans-Joachim Linke (Darmstadt, Germany), Pingsheng Leng (Beijing, China), Yun Liu (Beijing, China),
Walter Seher (Wien, Austria), Katarzyna Sobolewska-Mikulska (Warsaw, Poland),
Gernot Stöglehner (Wien, Austria), Karl-Friedrich Thöne (Dresden, Germany),
Zofia Więckowicz (Wrocław, Poland), Franciszek Woch (Puławy, Poland)

Topic Editors
Geomatics: Andrzej Kwinta (University of Agriculture in Krakow)
Landmanagement: Jacek M. Pijanowski (University of Agriculture in Krakow)
Landscape: Julia Gorzelany-Plesińska (University of Agriculture in Krakow)
Language Editor: Raul O. Castro (New York City Housing Authority, Office of the Mayor)
Statistics Editor: Agnieszka Bitner-Fiałkowska (University of Agriculture in Krakow)
Secretary Editor: Halina Stachura

Copy-editing, proof-reading, DTP: Publishing House of the University of Agriculture in Krakow
Supported by the Society for Rural Development
The issue contains peer-reviewed papers

Edition of the publications is financed from the fund of the Rector of the University of Agriculture
and the fund of the statutory activities of the Faculty of Environmental Engineering and Geodesy UR in Krakow

The journal indexed in the databases BazTech, ARIANTA

Copyright © Publishing House of the University of Agriculture in Krakow, Krakow 2014

ISSN 2300-1496



Publishing House of the University of Agriculture in Krakow
31-425 Krakow, al. 29 Listopada 46
Tel.: (+48) 12 662 51 57 or 12 662 51 59
E-mail: wydawnictwo@ur.krakow.pl
www.wydawnictwo.ur.krakow.pl
E-mail: gll@ur.krakow.pl
www.gll.ur.krakow.pl

Editor sheets 5.5. Printing sheets 5.5. Issue 350 copies

CONTENTS

Foreword.....	5
<i>Agnieszka Bitner, Jakub Bysina</i> A study of real estate market in Kraków using the methods of spatial econometrics.....	7
<i>Oleksandr Dorozhynskyy, Lubomyr Dychko</i> Ways of improving the accuracy of digital aerial photography by the railway transport inventory	19
<i>Małgorzata Dudzińska, Katarzyna Kocur-Bera</i> Assessment of land fragmentation for the purpose of land consolidation works as exemplified by the Pasym commune.....	31
<i>Oleksandra Dyda</i> The significance of the Polish architectural heritage in attractiveness of towns in Lviv region	45
<i>Jacek M. Pijanowski</i> Land consolidation development – discussion of a new approach recommended for Poland	53
<i>Beata Szafrńska</i> The analysis of planning possibilities of rural management works as exemplified by the Kozłów commune.....	65
<i>Andrzej Wałęga</i> The importance of the objective functions and flexibility on calibration of parameters of Clark instantaneous unit hydrograph	75

FOREWORD

Rural areas in Poland belong to one of the most specific and complex issues in Europe. The most critical of them are high land fragmentation level, unclear legal status of lands and complicated historical conditions. The adoption of EU directives on changes in spatial structure and landscape development has brought significant results in recent years. We gladly observe that cities and rural areas are more closely related, if only on such planes as farm produce market or suburbanization.

In order to meet emerging challenges, of which the most fundamental is establishing close connections between science and economy, for many years scientific offer of Departments of the University of Agriculture in Krakow has been subject to modifications. Particularly valuable in this respect are the activities undertaken by the Department of Environmental Engineering and Land Surveying. They adhere to the guidelines, which could be called the elements of integrated development policy. We see that students expect from the University not only high level of theoretical knowledge, which we are obviously providing, but also practical skills. And it corresponds with employers' expectations, as we are constantly reported.

The current sixth issue of the scientific journal edited by Prof. Urszula Litwin presents a whole range of innovative research marked by close correlation with practice. Therefore, I am really glad that the Scientific Board of *Geomatics, Landmanagement and Landscape* has been carrying out this mission for more than a year and that the published articles, while being an interesting read, contribute to the exchange of scientific ideas and are the source of valuable research and implementation initiatives. The same applies to the current issue of GLL. Moreover, the subjects examined by authors are related with the requirements included in the European Union operational programmes for 2014–2020.

Let me refer shortly to the subjects of the presented issue. The first article focuses on the real estate market in Krakow while using spatial econometrics methods. The next one examines the vital problem of improvement of accuracy of digital aerial photography. The third paper discusses the issue of demand for land consolidation works as exemplified by the Pasym commune in Warmian-Mazurian Voivodeship. The topic of the forth article is a significance of Polish architectural heritage in the Lviv region. The next paper is a detailed analysis on modern rural management works carried out in an integrated formula, consistent with the EU policy. The same subject is elaborated in the next article, but this time it is presented from the perspective of planning possibilities

of rural management works. The last article focuses on the importance of the objective functions and flexibility on calibration of parameters of Clark instantaneous unit hydrograph. The survey of articles' topics and titles already shows that the authors have undertaken a successful research, not limited to the area of southern Poland, but covering the European reality, and thus they proved the existence of correlation between architectural area and economic and cultural conditions.

As a rector of The University of Agriculture in Krakow I am very happy that the authors of most of the articles are young scholars, who decided to give their attention to these important matters. The University is now faced with the necessity of creating new research personnel – and I am absolutely certain that we will manage this task. Thanks to its high competence level the Journal fully deserves a name of academic publication, and for this reason I am convinced that it in a short time it will be highly ranked.

Prof. dr hab. inż. Włodzimierz Sady
Rector of the University of Agriculture in Krakow