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## Bibliometric analysis in the evaluation of journals published by the Forest Research Institute: *Forest Research Papers* and *Folia Forestalia Polonica Series A – Forestry*

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**Abstract.** In recent years, there has been a significant increase in interest in publishing articles in journals recorded by global databases, in particular the Web of Science™ Core Collection, which indexes journals found in the Journal Citation Reports. The publication of results in these journals has a significant impact on the assessment of the achievements of researchers and scientific institutions.

Our study focused on the bibliometric analysis of two journals published by the Forest Research Institute: *Forest Research Papers* (*Leśne Prace Badawcze*) and *Folia Forestalia Polonica Series A – Forestry*. The results of these analyses were used to develop theoretical indices for the editorial boards of these journals in terms of requirements for including both periodicals in the Journal Citation Reports.

The analysis covered the volumes published in 2000–2015 and the publication activity of the journals was evaluated on the basis of the numbers of articles, references, authors and journal citations. Bibliometric indicators such as the predicted Impact Factor, the Hirsch index, the Scimago Journal Rank and the Index Copernicus Value were used to evaluate the rank of the journals within the databases.

In the examined period, 65 volumes of *Forest Research Papers* were published, with an average of 31 articles per year containing about 14,000 references and almost 900 contributing authors. During the same time frame, 30 volumes of *Folia Forestalia Polonica Series A – Forestry* were published, with an average of 14 articles per year. These articles included approximately 5,000 references and 600 authors. An increase in the bibliometric indicators for both journals was observed with the Impact Factor predicted to rise to 0.192 (*Forest Research Papers*) and 0.178 (*Folia Forestalia Polonica Series A – Forestry*).

In order for the two examined journals to be included in the Journal Citation Reports the following requirements need to be met: (1) an increased number of articles published by authors with significant international authority in their field, (2) a greater number of researchers, especially from developed countries, in advisory boards, (3) more articles published in individual volumes to reach higher citation numbers in databases, and (4) promotion of the most cited articles.

**Keywords:** bibliometrics, journal evaluation, citations, Journal Citation Reports, Impact Factor

### 1. Introduction

Printed publications by the Forest Research Institute (IBL) date back to 1932, when the article on fungal diseases and their control (*‘Osutka i jej zwalczanie’*) by Wanda Konopacka was first published (Głowacka 2000, Szewczykiewicz 2016). After 1933, four publishing series were launched, that is, the series A – ‘Dissertations and Reports’ including original scientific papers, B – supplementary publications, C – textbooks and E – materials on nature conservation. The broad subject matter

of these series concerned practically all the aspects of forestry, including wood technology. In the early 1950s, the series A developed into a periodical, which after several modifications of the title, has been published since 2004 under the name: *Leśne Prace Badawcze* (*Forest Research Papers*). The journal was published intermittently until 1999, and since 2000, it has been printed regularly as a quarterly in the Polish language. Since 2013, it has also been published online, both in Polish and English. The area covered in *Forest Research Papers* comprises all forestry disciplines, including economics as well as political

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and social aspects.

The second scientific journal published by IBL is *Folia Forestalia Polonica Series A – Forestry*. The origin of this journal dates back to 1957, when the Polish Academy of Sciences (PAN) decided to establish a new publication: *Folia Forestalia Polonica*, as an organ of the Forest Science Committee. The publication was intended to consolidate and communicate the achievements of Polish science in the field of forestry and wood industry to all interested, both in Poland and abroad. The journal has been published in English and presents the results of studies devoted to natural sciences, and in particular, those related to the concepts of ‘environment’, ‘forestry’ and ‘agroforestry’.

Since 199, *Folia Forestalia Polonica Series A – Forestry* has been issued by IBL in cooperation with the Forest Science Committee of the Polish Academy of Sciences. Initially, the journal was published once a year, then every 6 months, and since 2012 the number of issues has increased to 4 per year. Since 2007, it has been published in printed and online versions. Until the year 2014, there was also published the journal *Folia Forestalia Polonica Series B – Wood Technology* (in the English language) by the Wood Technology Committee of the Polish Academy of Sciences.

Both *Forest Research Papers* and *Folia Forestalia Polonica Series A – Forestry* are now issued in accordance with the current world standards and include original works, reviews, methodological reports, short articles, reports and commentaries. Each article published in these journals is peer-reviewed by two academic experts from various scientific units. Presently, the journals are published by De Gruyter Open, who publishes open access scientific articles and monographs.

In Poland, there has recently been observed a growing pressure for article publication in leading international journals, covered in the world's largest databases. In order to establish their prestige and influence on world science, scientific journals all over the world are evaluated and positioned in rankings. The rankings of scientific journals along with the citation databases and the use of these for evaluation of scientific institutions have been increasingly a topic of analyses carried out in Poland (Drabek 2001, Klineciewicz 2007, Osiewalska 2008a). This approach also has a practical dimension, as parametric assessments of scientific units and the achievements of individual researchers refer to the rankings and citation rates.

There is an ongoing discussion about the most appropriate methods for assessing the achievements of contemporary science and pertinent literature, as well as those of individual scientists. The quantitative analyses of the processes taking place in science are carried out in the field of scientometrics, which was developed in the 1960s, when the need to undertake research on the status and development of science was recognized (Nalimov, Mul'chenko 1969). One of the most important measures in science evaluations is citation analysis, a common-

ly used bibliometric method, which examines scientific work along with the quality and quantity of references (including journals) with the use of statistics (Garfield 1972; Nowak 2003; Osiewalska 2008b). Bibliometric methods are also applied to monitor scientific progress, observe research trends and to evaluate progress of new multidisciplinary sciences and technologies (Skalska-Zlat 1993; Frączek 2004; Sapa 2009; Drabek 2012). The popularity of bibliometric analyses has been steadily increasing with the development of new scientific tools, including citation databases that enable searching, analysing and comparing the academic achievements of individuals, institutions or countries (Drabek 2012). Based on the results obtained by the means of bibliometric methods, the most influential scientific journals in a given field can be distinguished, the most inspiring ones can be recognized as well as new specific issues presented in the journals can be defined (Śleszyński 2013).

One of the most prestigious databases used to analyse scientific journals is the annual publication by Clarivate Analytics – the Journal Citation Reports (JCR). Citation analysis and search for bibliographic records from journals, books and all kind of materials with reference to exact and social sciences are here examined with the use of citation indexes available at the Web of Science Core™ Collection (WoS<sup>CC</sup>). In the JCR database, the Impact Factor (IF) for the humanities is not calculated. Being included in WoS<sup>CC</sup> and having IF are perceived as the measure of publication success. Therefore, in the present study, we performed bibliometric analyses of the two journals published by IBL, in an attempt to develop theoretical recommendations for the editorial offices of *Forest Research Papers* and *Folia Forestalia Polonica Series A – Forestry*, which may be useful during the process of incorporating these journals into the JCR database.

## 2. Methods

On account of the dynamics of changes in bibliometric sources and tools, as well as the fact that the results of the last evaluation of journals based on the Web of Science™ Core Collection were published in 2015, the authors of this paper presented the results of the bibliometric analyses for *Forest Research Papers* and *Folia Forestalia Polonica Series A – Forestry* issued in the years 2000–2015.

During the first stage of bibliometric analyses carried out, the number of articles published in the examined journals, the average numbers of references included in the articles, as well as the number of national and foreign authors of the papers published were compared. Next, citations of the articles under the study in the Web of Science™ Core Collection, as well as Scopus and Google Scholar databases were checked. Comparisons were also carried out of the rankings of journals included in the ICI Journals Master List (Index Copernicus

catalogue) and in the Part B of the list prepared by Poland's Ministry of Science and Higher Education (MNiSW), which is published as the notification of the Minister of Science and Higher Education. Journal scores were analysed starting from data for the year 2008, when the unified lists of ranked scientific journals were prepared for the first time by the Ministry of Science and Higher Education. The following bibliometric tools were used in the study:

Hirsch index (index h) – derived from the number of publications of a given author or scientific institution and the number of citations of their works in scientific literature; indicates papers with the greatest response in the scientific community (Wróblewski 2013);

SCImago Journal Rank (SJR) – contains information about Scopus indexed journals; referred to as the citation index; calculated on the basis of complex algorithms; available at the SCImago Journal and Country Rank Scopus Resource System, which allows a comparison in terms of citations and the number of articles published (González-Pereira et al. 2010);

Index Copernicus Value (ICV) – a measure of the effects of quality and impact of scientific journals, including publishing quality, data digitization and international focus; enables defining activities and provides information in the form of a report on strengths and weaknesses of a given journal; calculated with the use of data from the Index Copernicus database.

In the present study, the Hirsch index was calculated using the Google Scholar database and the Publish or Perish (PoP) software that retrieves and analyses academic citations, and at the same time, constitutes the source of information on citations of scientists and journals (Osiewalska 2008b; Kulczycki 2012). Furthermore, for both the examined journals, their so called predicted Impact Factors were calculated, that is, the hypothetical values that would be reached if the journals were included in the JRC database. This index was calculated in line with the IF methodology, based on the number of citations of articles in the Web of Science database (Garfield 2006). De Gruyter's statistics on access to *Forest Research Papers* and *Folia Forestalia Polonica Series A – Forestry* web pages in the years 2012–2014.

The results of the carried out bibliometric analyses constituted the basis for considerations with regard to upgrading the international position of the two journals analysed and elaborating recommendations that could be applied during the process of inclusion of *Forest Research Papers* and *Folia Forestalia Polonica Series A – Forestry* into the Journal Citation Reports.

### 3. Results

#### 3.1. Bibliometric analysis of *Forest Research Papers*

In the years 2000–2015, 65 issues of *Forest Research Papers* were published, and these included in total 504 articles (Table

1). At that time, on an average, 31 articles were published annually, and most of them were published in the years 2005 and 2009. The published articles contained a total of 13892 reference items. The studies were published by 896 authors (on average 56 authors/year), and in this group, foreign authors accounted for nearly 7%. The majority of the articles reported the results of multi-authorial works (usually 2–5 authors).

In 2015, the journal was indexed by 32 databases and research services, among others: CABI (Agroforestry Abstracts), Forestry Abstracts, the Directory of Open Access Journals (DOAJ), Forest Science Database, Google Scholar, Index Copernicus, Zoological Record – Thomson Reuters, Wildlife Review & Fisheries Review.

The results of the analysis of Web of Science™ Core Collection resources showed that 185 articles – published in *Forest Research Papers* in the years 2000–2015 – were cited 288 times. The journal was cited mainly in Polish periodicals (81%), with the highest number of citations (85) in 2015. During Google Scholar's cited reference search, a given journal title and its abbreviation were entered. The results of the analysis of Google Scholar resources by means of the Publish or Perish software showed that 569 articles published in 2000–2015 in *Forest Research Papers*, were cited 905 times. The average of citations per one article was 1.59, and the Hirsch index reached the value of 11. In the latter case, the search was performed using the ISSN code of the journal.

The highest value of the predicted IF of the journal examined was obtained for the year 2015 (Figure 1). This value was lower than the lowest value of this index in the category: forestry (0.235), which was obtained in 2015 by the Croatian journal *Sumarski List*.

Since 2001, *Forest Research Papers* has also been continuously indexed in the Index Copernicus database. The Index Copernicus value showed a steady upward trend from 4.05 in 2001 to 96.04 in 2014, when the most recent evaluation of the journals based on the resources of this database was carried out. Such a significant increase in the Index Copernicus Value was, among others, due to a change in the method of calculating scores that was introduced in 2014. Then each journal indexed achieved almost tenfold increase of the index value. In the years 2007–2009, Poland's Ministry of Science and Higher Education granted *Forest Research Papers* the score of 6 points, and in the following years the score increased up to 13 points (achieved in 2015).

#### 3.2. Bibliometric analysis of *Folia Forestalia Polonica Series A – Forestry*

In the analysed 15-year period, 218 articles were published in 30 issues of *Folia Forestalia Polonica Series A – Forestry* (Table 2). As a reference, 104 papers were all in all published in the years 1990–1999. On average, 15 articles/year were

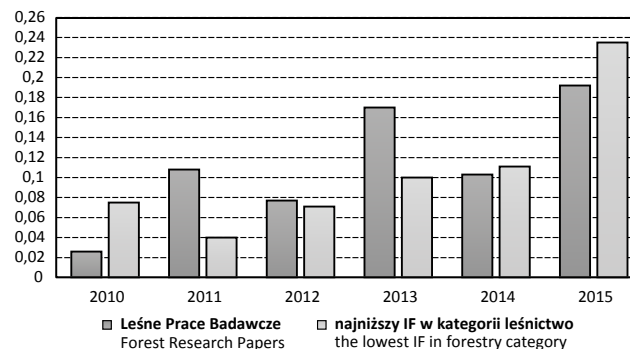
**Table 1.** Number of articles and references and number of authors publishing in *Forest Research Papers* in 2000–2015

Year	No. of articles	Mean no. of references	No. of authors	
			domestic	foreign
2000	18	38	32	0
2001	20	23	31	0
2002	28	19	32	0
2003	18	31	20	5
2004	30	24	43	4
2005	42	25	34	8
2006	24	33	43	3
2007	22	28	36	4
2008	36	17	56	1
2009	42	22	72	5
2010	41	29	69	1
2011	37	33	69	5
2012	34	28	56	8
2013	34	22	68	5
2014	39	37	88	0
2015	39	34	88	10

published in the journal in the analysed period (2000–2015). The largest number of articles was published in 2012. In most cases, the authors referred to the journals published in English. Since 2012, a marked increase was observed in the number of authors publishing articles in *Folia Forestalia Polonica Series A – Forestry*, and the share of foreign authors also increased – from 15.4% in 2000 to 32.2% in 2015. In 2000–2015, altogether 600 authors published articles in this journal, on average 40 authors/year, including 34% of authors from other than Poland countries. Similar to *Leśne Prace Badawcze*, one paper was prepared on an average by 3 authors. In general, most of the papers were multi-authorial works (2–5 authors).

*Folia Forestalia Polonica Series A – Forestry* is indexed by 28 databases and scientific services, among others: The Zoological Record – Thomson Reuters, Scopus-Elsevier, Index Copernicus, Google Scholar, CABI-CAB Abstracts, CABI-Forest Science Database, CABI-Forestry Abstracts, DOAJ, Polish Scientific Journals Database and SCImago Journal & Country Rank.

The analysis of the Web Collection of Science™ Core Collection resources showed that 186 articles published in the years 2000–2015 in *Folia Forestalia Polonica Series*



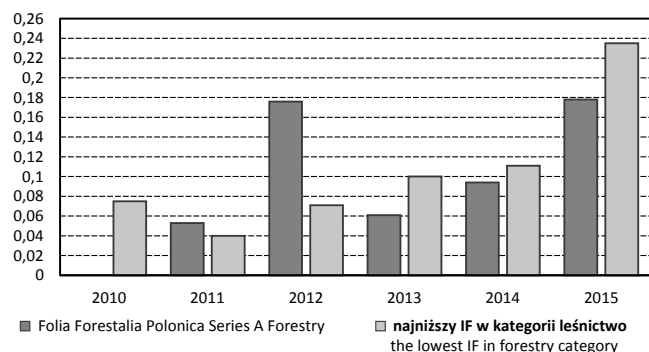
**Figure 1.** Predicted for *Forest Research Papers* and the lowest Impact Factor in category forestry in 2010–2015 (source: author calculations based on Web of Science™ Core Collection)

*A – Forestry* were cited 319 times, of which 195 in Polish publications, which constituted 61% of citations. It is worth noting that the journal was cited 19 times (about 6%) in periodicals published in the USA. The highest number of articles (51) was cited in 2015, and this year also the journal achieved the highest value of the predicted IF (Figure 2). The Impact

**Table 2.** Number of articles and references and number of authors publishing in *Folia Forestalia Polonica Series – A Forestry* in 2000–2015

Year	No. of articles	Mean no. of references	No. of authors	
			domestic	foreign
2000	8	20	11	2
2001	9	24	18	1
2002	9	23	15	0
2003	6	18	11	0
2004	7	21	17	0
2005	7	25	12	2
2006	7	23	18	5
2007	7	11	13	0
2008	.*	-	-	-
2009	22	19	30	21
2010	16	19	17	18
2011	18	26	15	28
2012	31	27	55	47
2013	22	26	51	24
2014	23	19	54	25
2015	26	28	61	29

\* in 2008 there was a publishing break



**Figure 2.** Predicted for *Folia Forestalia Polonica Series A – Forestry* and the lowest Impact Factor in category forestry in 2010–2015 (source: author calculations based on Web of Science™ Core Collection)

Factor calculated for the journal was lower than the lowest (0.235) listed in the JCR 2015 in the category forestry.

The bibliometric analysis of *Folia Forestalia Polonica Series A – Forestry* – carried out with the use of the Scopus

database – showed that in the period 2002–2015, 205 articles were cited 138 times, with the highest number of citations (26.4%) in 2015. The steady increase in the number of cited articles from 1 citation in 2002 to 38 in 2015 contributed to an increase in the SJR index from 0.100 to 0.212. By way of comparison, the highest value of  $SJR_{2015} = 2.288$  in the category forestry was reached by the American Journal of Geophysical Research. The Hirsch index for these articles was 7.

In 2013, 115 titles of journals were assigned to the category forestry in the Scopus database. In the ranking of journals with regard to the SJR index value, *Folia Forestalia Polonica Series A – Forestry* ranked 102 (quartile 4). In the next year (2014), the ranking included 150 journals in the category forestry, and then the journal ranked 108 (quartile 3). In 2015, the Scopus database comprised 144 titles of forestry journals, and *Folia Forestalia Polonica Series A – Forestry* ranked 91 (quartile 3).

The analysis carried out on Google Scholar resources – by means of the Publish or Perish tool – showed that 119 articles published in the years 2000–2015 were cited 219

times. At the same time, the Hirsch index was 7. For the articles published in 2000–2015, the average number of citations per 1 bibliographic item indexed by Google Scholar amounted to 1.84.

Since 2010, *Folia Forestalia Polonica Series A – Forestry* has also been indexed in the Index Copernicus database. The Index Copernicus Value showed a steady upward trend – up to 114.89 points achieved in 2014. In the years 2008–2010, Poland’s Ministry of Science and Higher Education granted this journal the score of 2 points. In subsequent years, the score was systematically increased – up to 14 points achieved in 2015. By that time, *Folia Forestalia Polonica Series A – Forestry* scored 1 point lesser than another Polish journal focused on forestry issues – *Sylvan*, which is listed in the Part A of the ranking of journals announced by the Ministry of Science and Higher Education.

### 3.3. Analysis of the process of incorporating *Forest Research Papers* and *Folia Forestalia Polonica Series A – Forestry* into the Journal Citation Reports database

The publishers and editorial offices of both journals examined to see the importance of developing the strategy of improvement of these publications and making the articles available online. Also, they recognize the meaning of applying appropriate review procedures and ethical principles. Much attention is paid to the promotion of the journals as well as the accomplishment of adequate numbers of citations at the same time, as the number of self-references is limited. In 2015, both journals implemented the Editorial Manager – an electronic editorial system that enables altering the features of scientific journals, from review and production manage-

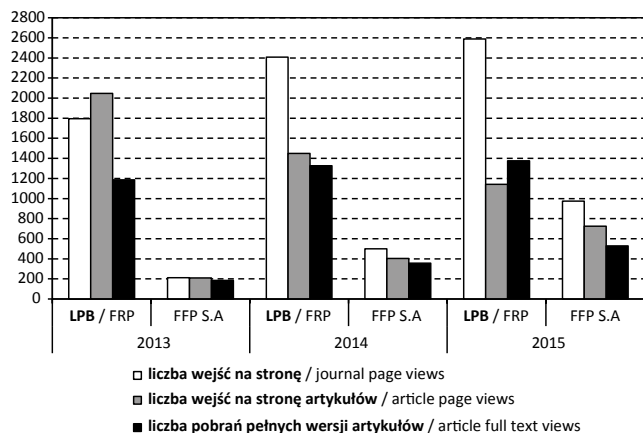
ment to marketing. Both journals use modern technology that streamlines the processes of manuscript submission and evaluation, preparation of online versions, integration with abstract and index databases as well as the promotion of the journals via the Internet.

Both *Forest Research Papers* and *Folia Forestalia Polonica Series A – Forestry* established advanced websites containing information about the journal, including the title, ISSN, the list of advisory and editorial board members, information for authors and information on current publishing procedures, as well as on the indexing databases. The publishing process takes place in the electronic document flow system from/to the author, reviewer and publisher, who have the assigned roles and competences, and all these factors enable full control over the publishing process.

The journals’ websites are subject to dynamic changes in line with the requirements for IF journals, and accordingly – towards accomplishing the placement in the Part A of the List of ranked journals prepared by Poland’s Ministry of Science and Higher Education. As soon as the articles are published in print, they are released online free of charge, hence both journals can be included in the group of Open Access periodicals. Figure 3 shows the statistics concerning the visits on the websites of both journals in the years 2013–2015.

Figure 3 shows that in the analysed years, the Internet users visited the website of *Forest Research Papers* about 10 times more frequently as compared to that of *Folia Forestalia Polonica Series A – Forestry*. It seems that the publication of articles in the Polish language contributes to the popularity of *Forest Research Papers* among numerous forest practitioners in Poland, who are more and more eager to make use of subject literature not only concerning the forestry industry, but also forestry science. In the case of the latter journal, a steady increase in the number of visits to the website was observed – from almost 1800 in 2012 to 2600 in 2014 (an increase of activity by 30%). Concurrently, the amount of accesses to the title pages of articles decreased from 2050 to 1150 (by 45%). At the same time, the number of downloads of the articles’ full versions increased from 1190 to 1370 (by 14%).

In the case of *Folia Forestalia Polonica Series A – Forestry*, a considerable growth rate of all analysed statistics was observed (a few hundred percent every year), however, it was not significant when judged in absolute figures. For example, in 2012, the website of this journal was visited 210 times, whereas in 2014 – 970 times, thus the observed increase was 460%. A slightly less dynamic jump was observed in the number of accesses in terms of the article titles: from 210 to 720 visits (an increase by 340%). Every year, full versions of articles were browsed to a greater extent, which



**Figure 3.** Statistics of *Forest Research Papers* (FRP) and *Folia Forestalia Polonica Series A – Forestry* (FFP S.A) website views in 2013–2015 (source: De Gruyter, 2013–2015 Annual review reports)

was indicated by the observed increase by 280% (from 190 to 530 visits).

Further works by both editorial offices should continue upholding the Open Access and improving the international focus, among others, by engaging more authors from outside the country. In 2015, the contribution of foreign authors in *Forest Research Papers* did not exceed 9%, whereas it was 32.2% in *Folia Forestalia Polonica Series A – Forestry*. Since both journals are aimed at the international audience, it would be much advisable to have at least 50% participation of the authors from developed countries such as the USA, Canada, Western Europe countries, Israel, Japan, South Korea, Taiwan, Hong-Kong, Singapore, Australia and New Zealand. According to the publishing platform De Gruyter Open, the contribution of authors from Poland should not exceed 30%, and that of authors from Central and Eastern Europe should be at a level of no more than 20%. On the other hand, such a proportion restricts the participation of publications of native authors and may adversely affect the promotion of Polish research.

One of the weaknesses of the journals examined is that they have extremely low citations of the members of editorial boards and the authors of the published papers, apart from a few exceptions. The Web of Science Core Collection database is more willing to accept the periodicals that invite the scientists with significant, internationally recognized achievements (as reflected in their citations) to their editorial and advisory boards, or publish their works. It should be noted that the JCR promotes the titles with very low self-citation levels, and negatively evaluates the so-called cooperatives of journal citation.

Developments on improving the position of journals examined on the international fora should aim at increasing the number of researchers in their advisory boards to 20–25 persons, counting 80% members from developed countries. Currently, that is, in 2017, the Advisory Board of *Leśne Prace Badawcze* comprises 11 researchers, including 8 (73%) foreign scientists, 4 (36%) of whom come from the developed countries (USA and Finland). Also, *Folia Forestalia Polonica Series A – Forestry* should make an effort to increase the number of its Advisory Board members, that now comprises 17 scientists, 12 (70%) of whom are foreign researchers, and 8 (47%) of whom are from the developed countries (the USA, Austria, Spain, Japan, United Kingdom, Italy). Naturally, it should be kept in mind that the quality of the journals is also influenced by: activities related to acquiring more articles, assurance that the articles are of a high standard, as well as the promotion and accomplishment of best and active citations.

Considering that not only the content but also the form, design and release regularity are taken into account in the Impact Factor assessments, it can be assumed that the rate of development of both journals examined delivers the expected outcome. In the case of *Leśne Prace Badawcze*, the progression has been

observed for many years, whereas in the case of *Folia Forestalia Polonica Series A – Forestry*, the process of strengthening the prestige of the journal has been particularly intensive since 2009. This journal has been ever since transformed into an improved graphic and editorial form, followed by the improvement of the published papers' scientific quality along the lines of current and international trends in the publishing market. In addition, the number of journal printed issues was increased to 4 per year. In 2010, as a result of editorial efforts, *Folia Forestalia Polonica Series A – Forestry* received the positive opinion from Thomson Reuters, and it was also included in the Zoological Record. Bibliometric analysis showed an ever-increasing recognition of the journal by the scientific community along with a greater than before, wide-ranging interest in the publications included in this periodical.

More and more, one may come across the opinion that the Scopus database provides the greatest prospects for rewarding the best journals related to humanistic, social, technical and other sciences, whereas the list of journals based on the Journal Citation Reports, used by Poland's Ministry of Science and Higher Education to prepare the Part A listing of journals, does not include many good quality periodicals. Therefore, the editorial office of *Forest Research Papers* should strive to place the journal in the Scopus database, also because of the possibility to accomplish additional indication to "demonstrate" the journal and to obtain an even better score by the Ministry of Science and Higher Education.

Both journals examined in the present study adhere to the discipline of regular publication and dissemination of subsequent issues to subscribers. *Forest Research Papers* and *Folia Forestalia Polonica Series A – Forestry* meet the criteria of Clarivate Analytics (previously the Intellectual Property and Science business of Thomson Reuters), such as: timely publication, clear peer review and international editorial standards, and these constitute a prerequisite for indexing any journal in the Web of Science and open the way to apply to the Emerging Sources Citation Index that reviews journal titles before placing them in the basic citation indexes in the Web of Science Core Collection.

The new rules of scientific journal evaluation, which have been in use for the last several years, have positively influenced the quality of many periodicals, and it is reflected in the increase in scores announced by Poland's Ministry of Science and Higher Education. It should be noted that publication in the journals included in the lists prepared by this Ministry consolidates the model of scientific communication, which comes down to the dissemination of research results first and foremost to the scientific community. On the other hand, however, the model as such does not meet social expectations and challenges aiming at online accessibility of all the results of scientific works, including raw data. At



the time when interconnected and all-embracing Internet has become the main source of information, easy, open and full access to scientific works should be ensured.

#### 4. Conclusions

In the case of the journals published by the Forest Research Institute (IBL), the application process for inclusion in the Web of Science, and consequently – in the Journal Citation Reports database – should primarily encompass:

- increasing the share of articles by the authors with well recognized scientific achievements in the international arena
- inviting more scientists (especially foreign) to the advisory boards
- publishing more articles per each issue
- improving publication marketing, including the promotion of the best articles, monitoring of progress, as well as taking steps proactively to increase citation rates of the journals

#### Conflicts of interest

The authors declare no potential conflicts.

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#### Authors' contributions

J.Sz. – (30%) concept, analysis of the results, literature review; I.S. – (40%) concept, performance analysis, manuscript writing; K.M. – (30%) concept, literature review, editing.

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