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An assessment of quality, trustworthiness and usability of Indonesian agricultural science journals: stated preference versus revealed preference study

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Abstract Scientific journals published in non-English languages may be less accessible to researchers worldwide. Most of them are not covered in international indexing and abstracting databases such as the *Web of Science* and *Scopus*, which can influence their impact. Scientific journals published by the Indonesian Agency for Agricultural Research and Development are a case in point, and their impact cannot be ascertained due to the non-existence of a tool that can assist in assessing the performance of the journals. To address this concern, this study aims to (a) assess the quality of Indonesian agricultural science journals; (b) determine how Indonesia-based agricultural science researchers assign and calibrate trust to the journals they use; (c) determine how Indonesia-based agricultural science researchers assess the usability of the journals they read; and (d) produce an internal ranking of Indonesian agricultural journals. The study has been designed as a combination of two approaches, namely revealed preference and stated preference study. The revealed preference study involves citation analysis of the nine journals sampled. The stated preference study gauges the trustworthiness and usability of these journals from the perspectives of the researchers who use them. The revealed preference provides the Journal Quality Index whereas the stated preference study provides the Journal Trust and Journal Usability Index. The study also provides internal ranking and comparison between indicators resulted from the revealed preference and stated preference study. It is also observed that Quality and Trust indices are well correlated and indicate a good model fit with the Overall Index. On the other hand, Usability Index is negatively correlated and shows very less model fit with the Overall Index.

Keywords Journal quality · Trustworthiness · Usability · Revealed preference study · Stated preference study · Agricultural science journals · Indonesia

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Introduction

Researchers are both consumers and contributors to scholarly communication. They read and publish in scholarly journals that serve their community, and cite articles in a refereed journal which are believed as more prestigious than those published in conference proceedings and monographs (Abrizah et al. 2015; Jamali et al. 2014; Nicholas et al. 2015). Scientific journals play a central role in the dissemination of research results; at the same time the importance of scientific publication in advancing the careers of research scientists, has encouraged them to publish in top international journals. Unquestionably, the quality and reliability of the journals are the most important characteristic of scholarly communication and their use.

Most of the world's scholarly research communication is concentrated in a few scientifically and technologically advanced countries, where spending on research and development is the highest. The scientific world is divided into centers and peripheries, a demarcation that is typically seen as corresponding to the divide between the affluent, industrialized states of the northern hemisphere and the less well-off and technologically less advanced nations of the south. The quality of journals originating from these core countries can be assessed by citation analysis, peer analysis, circulation and coverage in global indexing or abstracting services and many of them are indexed by international indexing databases such as the *Web of Science* (WoS) and *Scopus*. Nonetheless, for a variety of structural and cultural reasons, the 'newly industrialized' countries such as India, Iran and China, are on the periphery of world science, too. These countries have their homegrown abstracts and citation database, with multidisciplinary objective knowledge contents from their many top scholarly journals, such as the *Indian Citation Index*, *Islamic World Science Citation* database and *Chinese Science and Social Science Citation* database.

A country would find that it is useful to know and control information about scholarly publications that it produces in order to gauge research performance and identify strengths and gaps. The onus of keeping such information must surely fall upon the shoulder of an agency in a country. This is because an international agency or database would not be able to or may be less interested in such information. International indexing databases such as the WoS (owned by Thomson Reuters) and *Scopus* (owned by Elsevier) control information on scholarly publications and citations, however, their focus is on scholarly publications that are published in selective journals deemed to be of international quality measured by their own derived indices.

Clearly then, scholarly communication in peripheral countries such as those in the Southeast Asia merit investigation—this means we shall not only be able to determine how scholars from the periphery characteristically behave in regard to assessing quality and reliability of journals, but also to determine whether they act differently with regards to journals that originate from these countries. Thailand and Malaysian governments clearly stated the importance of building up a scientific and fair evaluation system of national scholarly journals. The urgency to speed up the development of a citation index system initiated the establishment of the *Thai Citation Index* (TCI) (Sombatsompop et al. 2012) and *Malaysian Citation Index* (MyCite) (Abrizah et al. 2013). With both systems in place and running, authors and researchers in these two countries are able to ascertain the quality and reliability of their national journals that are not indexed in the WoS and *Scopus*-based on citation data, since authors tend to consider firstly the reputation of the journal by using the impact factor, followed by international reach and coverage by abstracting and

indexing services (Swan 1999; Salager-Meyer 2014). In Indonesia (a semi-periphery country), a conference paper describes the development of an *Indonesian Electronic Citation System* (Sari and Kurniawan 2010) however unlike Thailand and Malaysia, the citation database has not been implemented.

However, the question asked of "How can I tell if Indonesian journals are of good scholarly worth and what is their impact"—cannot be ascertained due to a non-existence tool that can assist in identifying the impact score for Indonesian-based journals, according to the citations that are received. The number of journals published in Indonesia which was indexed by *Scopus* was low, and none is indexed in the WoS. Based on SCImago Journal and Country Rank 2014, the number of Indonesian journals indexed in *Scopus* is only 16 journals. However, many articles in Indonesian agricultural science journals have been cited internationally. A search on Google Scholar revealed that the *Indonesian Journal for Agricultural Science* has been cited 59 times, and 14 times in Scopus. Another journal, *Jurnal Ilmu Ternak dan Veteriner* has been cited 395 times in Google Scholar, and 28 times in *Scopus*.

Assessing the impact of Indonesian journals is a challenge due to the non-indexation status of these journals in global citation databases, because these journals are not easily available and most of them are published in the national language. The only indexing service is provided by Directorate General of Higher Education, Indonesian Ministry of Education. This service does not include agricultural science journals into their list of indexed journals. Even if there is an availability of journal assessment for Indonesian journals, one should bear in mind that no single metric can address all relevant quality and reliability indicators. Moreover, while a particular metric might be useful for one subject matter, it might be quite inappropriate for another. This fact is true especially in the context of journals from a specific discipline. such as agricultural science, published by a government agency in Indonesia. To address the concerns about the indicators for assessing journals, we aim to fill the gap with this study. Although our method is only applied to agricultural science journals, it is general enough to evaluate the quality and reliability of journals in other disciplines.

Literature review

There are various definitions of scientific publication quality depending on the perspectives and fields of the scholars. Even with different fields, it still can be concluded that scientific publication quality includes term fulfillment of certain requirements of information and user's satisfaction of provided information. In short, scientific publication quality is a requirement that must be fulfilled by a certain journal to achieve user's satisfaction. Implications of journal quality cannot be ignored. Low journal quality can damage trust of an institution which had been built for a long period. To prevent the risks of low journal quality, an organization should evaluate their journal regularly. It is important not only to understand their journal quality status compared to other organizations, but also to assure its improvement (Yang et al. 2002; Katerattanakul and Han 2003). There are other reasons for assessing journal quality which includes: (a) limitation of libraries to subscribe to all journals and need to determine core journals to be purchased; (b) scholars need to know which journals are best suited to their researches when they are deciding which journals to submit articles to; and (c) the need to evaluate and measure the quality and impact of

faculty member/staff for promotion and tenure decisions (Auburn University Libraries 2012).

Journal evaluation can be varied depending on the perspective and field of the evaluator. Any tools can be used as there are no perfect tools that can be used to measure journal quality. However, the tools should be combined to achieve the valid measurement. Garfield (1998) pointed that citation data and analysis should always be used in combination with other indicators. Auburn University Libraries (2012) named seven methodologies to assess journal quality, namely, citation analysis, impact factor, prestige and reputation of journal, in-depth knowledge of the field and journals in the field, acceptance/rejection rate of the journal, indexing services covering the journal, and total circulation of the journal. Ali et al. (1996) proposed citation analysis, peer analysis, circulation and coverage in indexing/abstracting services for assessing the quality of the publication. Morris et al. (2009) on the other hand proposed individual citation, institutional lists, peer surveys, citation studies, and derived lists of most significant publications. Rafols et al. (2012) used the mean score of the Association of Business Schools' (ABS) journal rankings and mean number of citations per publication to evaluate journal performance. Meanwhile, Cherkowski, Currie and Hilton (2012) classified methodology on assessing journal quality into two classes, (a) human assessment includes expert panels, peer reviews, and peer assessment and (b) objective measure includes citation indices, acceptance rates, and downloads from websites or libraries. Chan et al. (2013) stated that journal ranking can be assessed using survey-based and citation-based methods approaches. Leung et al. (2014) proposed peer review for journal manuscript. While Tsai (2014) emphasized on the implementation of using surveys, impact factor, and h-index approaches to rank journals.

In assessing journal quality using citation analysis, Journal Impact Factor (JIF) has been predominantly used. Bar-Ilan (2010) and Nixon (2014) used JIF for determining rankings of information and library science journals, whereas Polit and Northam (2011) investigated impact factors of nursing journals. The critics on utilization of citation analysis increased the number of researchers who are in favour of utilizing this methodology. Garfield (2006) stated that the use of impact factor as a measure of quality is widespread because it fits well with the opinion of many scholars of the best journals in their respective fields, although JIF is not a perfect tool to measure the quality or journal articles.

Experts opinion have also been used to rank and identify influential journals. Nisonger and Davis (2005) used this approach which they termed as "perception study" to capture the collective opinion of deans of ALA-accredited library schools and the Association of Research Libraries (ARL) Library directors on the prestige of 71 Library and Information Science (LIS) journals, by ranking the journals on an ordinal scale of 1–5. Nixon (2014) also used this approach which she termed as "expert opinion survey" to create a tiered list of 217 LIS journal titles from Ulrich's Web to guide librarians who wish to make a serious contribution in scholarly publishing.

Tahai and Meyer (1999) categorized two means by which journals are evaluated: through revealed preference studies and stated preference studies. Revealed preference studies, which Tahai and Meyer (1999) used in their study of management journals' influence and described as "more objective measure of a journal's quality and impact," rely upon citation analysis. A stated preference involves surveying members of a particular academic community in ranking journal by their own expert judgment. Abrizah, Noorhidawati and Zainab's (2015) study is a case in point, where they used stated preference study to approach the issue on sub-categorization of the information science–library science (IS–LS) journals surveying active authors/editors publishing in this field. The current

research has been designed as a combination of two studies: stated preference and revealed preference.

Objectives and method

The objectives of the research are to:

(a) assess the quality of Indonesian agricultural journals based on bibliometrics approach;
(b) determine how Indonesia-based agricultural science researchers assign and calibrate trust to the journals they use;
(c) how Indonesia-based agricultural science researchers assess the usability of the journals they read;
(d) produce an internal ranking of the Indonesian agricultural journals based on (a), (b) and (c).

A total of nine agricultural science journal titles published by the Indonesian Agency for Agricultural Research and Development (IAARD) are sampled in this study. IAARD is appointed by the government of the Republic of Indonesia to be responsible for the country's agricultural research and development. Scientific and popular serials are the primary publication channels for disseminating research findings within IAARD institutions and researchers (Indonesian Agricultural Research and Development 2009). Therefore, this study gauged IAARD journal quality through revealed preference study, involving bibliometrics and citation analysis of the nine journals sampled; and stated preference study which observes journal trust and usability study took place in some empirical phases.

The stated preference study

The phases in the stated preference study, or experts opinion involved (a) reviewing the literature, (b) developing a list of potential trust and usability indicators from the literature, (c) sending the list of potential indicators to a panel of experts for validation, (d) developing a list of trust and usability statements; (e) developing a survey questionnaire, (f) distributing the questionnaire to three journal editors cum authors for face validity, (g) conducting pilot test for reliability, and finally (h) administering the actual survey instrument. The research population for the stated preference study comprised all researchers affiliated to IAARD who specify two eligibility criteria: (a) their names are listed in the IAARD website, in their capacity as a researcher and author; and (b) they have published at least one article from any of the nine IAARD journals. When selecting samples for the study, the research considered two aspects: representativeness for the study and generalizability for the survey. Systematic random sampling was applied for selecting the sample researchers. With this exercise, a total of 539 researchers from IAARD centers and institutes and agricultural related faculties of *Universitas Gadjah Mada* (in Yogyakarta, Indonesia) were sampled. A total of 229 (50.59 percent) usable questionnaires were returned. The survey instrument consisted of item statements on respondents' perceived trust and usability of the sampled journals. Respondents respond to the following attributes regarding journal trust where they need to give a score to each statement using a five-point scale: Very Poor, Poor, Fair, Good, and Excellent. The trust attributes consist of 18

parameters namely impartial review, recognition of authors, confidence, accuracy, correctness, objectivity, clarity, conciseness, ease of understanding, clarity of measurement, currency, relevance, presence of all elements in paper, comprehensiveness, adequacy, coverage, reliability, and overall level of satisfaction. Respondents also respond to four attributes regarding journal usability i.e. time needed for getting the journal after it has been published, the estimated number of articles read, the frequency of journals read, and journal reading style and purpose.

The revealed preference study

The data source for the revealed preference study using bibliometric approach is nine IAARD agricultural science journals published by IAARD. These journals were selected based on their characteristics as primary scientific journal that played important roles as the main scholarly communication platform for researchers within and outside IAARD. The content of IAARD journal articles is mainly on agricultural innovations and these journals became input for agricultural development in Indonesia. These journals are also used as scientific reference sources by other researchers in the Southeast Asian region. Consistent with Milat et al. (2011) and Yu-Wei and Mu-Hsuan (2012) journal studies using bibliometrics approach, systematic random sampling was also used for selecting the articles published in these journals. First, all available volumes and issues of journals these journal titles from 1995 to 2010 were collected with a total of 2958 articles. Then the number of articles that need to be sampled for each journal was determined. A total number of 674 articles were finally available. Table 1 presents the journals and the number of articles sampled in this study.

For each journal article, the following citation information were extracted from the reference lists and recorded in a computer spreadsheet to facilitate further analysis:

Table 1 IAARD journals and the number of articles sampled in the revealed preference study

No.	IAARD journal titles	Total number of articles (2006–2010)	Articles sampled (2006–2010)	Articles available (2006–2010)
1	*Jurnal Tanah dan Iklim* (JTI)	135	88	84
2	Indonesian Journal of Agricultural Science (JAS)	129	115	103
3	*Jurnal Ilmu Ternak dan Veteriner* (JITV)	595	68	67
4	*Jurnal Penelitian dan Pengembangan Pertanian* (JPPP)	308	63	60
5	*Jurnal Hortikultura* (HOR)	740	92	91
6	*Jurnal Engineering Pertanian* (JEP)	108	80	77
7	*Jurnal Agro Ekonomi* (JAE)	140	70	68
8	*Jurnal Penelitian Tanaman Industri* (JPTI)	414	69	63
9	*Jurnal Penelitian Pertanian Tanaman Pangan* (JPPTP)	389	65	61
	Total	2958	710	674

authors' name of the cited articles; year of publication of the cited articles; title of cited articles; and the source type (e.g. journal titles, monographic series, conference proceedings). The characteristics are associated with year of publication (Sutardji 2011; Ezema and Eze 2012), type of cited publication (Sutardji 2011; Kumar and Kumar 2011), self-citation (Shahbodaghi and Sajjadi 2010; Kurmis and Kurmis 2010), and Journal Impact Factor (Thomson Reuters 2012a, b; Sutardji 2011; Lokker et al. 2012).

Data analysis

Descriptive statistics were computed to facilitate understanding of attributes of journal quality, trust and usability. The lists of journal quality, trust and usability attributes use the mean value of each item statement (variable). The index value which is counted as the weighted mean value of journal attributes of the journals determined journal quality, trust, and usability. The weighted mean value of each IAARD journal attribute is counted using the weighted mean formula indicated below:

$$\bar{x}_\omega = \sum\nolimits_{i=1}^{n} (\omega_i x_i) \Big/ \sum\nolimits_{i=1}^{n} (\omega_i)$$

where as $\bar{x}_\omega$ is the weighted mean variable, ω_i is the allocated weighted value and x_i is the observed values.

The average indices value of the journal based on bibliometrics approach in the revealed preference study determines the quality of the journals. The journal that is highly ranked

Table 2 Quality of IAARD journals ranked based on citation attributes

Rank	Journal title	Index value based on				Journal Quality Index
		Year published of the cited article	Self-citation	Type of cited publication	5-year impact factor	
1	*Jurnal Hortikultura* (HOR)	1.77	4.30	4.34	1.23	2.91
2	*Jurnal Agro Ekonomi* (JAE)	1.99	4.43	3.67	0.53	2.66
3	Indonesian Journal of Agricultural Science (JAS)	2.03	4.05	4.18	0.10	2.59
4	*Jurnal Ilmu Ternak dan Veteriner* (JITV)	1.77	3.78	4.25	0.51	2.58
5	*Jurnal Tanah dan Iklim* (JTI)	1.82	4.29	3.85	0.31	2.57
6	*Jurnal Penelitian dan Pengembangan Pertanian* (JPPP)	1.90	3.92	3.66	0.78	2.57
7	*Jurnal Penelitian Pertanian Tanaman Pangan* (JPPTP)	1.75	4.13	3.96	0.38	2.56
8	*Jurnal Penelitian Tanaman Industri* (JPTI)	1.88	3.90	3.97	0.17	2.48
9	*Jurnal Enjiniring Pertanian* (JEP)	2.21	3.75	3.47	0.11	2.39
	Overall	1.90	4.06	3.93	0.46	2.59

denotes its quality. The ranking and rank change resulted from revealed preference and stated preference study is compared for Quality and Trust indices, quality and usability indices, and trust and usability indices. The rank change between each pair of indices shows high similarity if the value is low.

Findings

Journal quality based on revealed preference study

Table 2 presents the Quality Index of IAARD journals calculated based on four citation attributes, namely the year published of the cited articles, self-citations, type of cited publications, and 5-year impact factor. The overall Journal Quality Index reached 2.59. In detail, Quality Index of the IAARD journals range from 2.59 to 2.91. HOR, JAE, and JAS are the top three journals based on quality. HOR ranked first on its Quality Index due to its

Table 3 Trust Index of IAARD journals based on users survey

No.	Parameters	Journal Trust Index									
		JAS	JPPP	JPTI	JPPTP	JITV	HOR	JAE	JEP	JTI	Overall
1	Impartial review	1.92	1.89	1.77	1.76	1.71	1.7	1.78	1.67	1.76	1.77
2	Recognition of authors	1.87	2.04	2.19	2.33	2.16	2.06	2.06	1.76	2.18	2.07
3	Confidence	2.54	2.65	2.6	2.65	2.47	2.56	2.63	2.45	2.6	2.57
4	Accuracy	3.88	3.71	3.77	3.81	3.77	3.49	3.76	3.48	3.57	3.69
5	Correctness	4.02	3.77	2.89	3.84	3.77	3.64	3.7	3.38	3.68	3.63
6	Objectives	3.9	3.72	3.65	3.73	3.71	3.61	3.68	3.33	3.63	3.66
7	Clarity	3.8	3.81	3.72	3.84	3.7	3.61	3.77	3.29	3.66	3.69
8	Conciseness	3.64	3.55	3.56	3.55	3.41	3.49	3.48	2.95	3.41	3.45
9	Ease of understanding	3.59	3.86	3.54	3.93	3.57	3.71	3.48	3.00	3.63	3.26
10	Clarity of measurement unit	3.62	3.68	3.68	3.74	3.53	3.54	3.51	3.15	3.58	3.56
11	Currency	3.69	3.54	3.75	3.54	3.34	3.34	3.76	3.00	3.32	3.14
12	Relevancy	3.85	3.8	3.68	3.81	3.79	3.7	3.57	3.43	3.73	3.71
13	Presence of all elements in paper[a]	3.55	3.61	3.71	3.66	3.5	3.42	3.57	3.24	3.49	3.53
14	Comprehensiveness	3.22	3.31	3.23	3.42	3.25	3.29	3.24	2.91	3.26	3.24
15	Adequacy	3.3	3.36	3.26	3.46	3.19	3.28	3.45	2.91	3.24	3.27
16	Coverage (bread and depth)	3.29	3.28	3.38	3.36	3.17	3.24	3.44	3.05	3.15	3.26
17	Reliability	3.93	3.76	3.75	3.83	3.62	3.69	3.69	3.38	3.63	3.70
18	Overall level of satisfaction	3.54	3.6	3.57	3.68	3.43	3.43	3.61	3.14	3.45	3.49
	Journal Trust Index	3.40	3.39	3.32	3.44	3.28	3.27	3.34	2.97	3.28	3.26

[a] These elements include presence of title and running title, author, affiliation, abstract, research background, literature review, methodology, result and discussion, conclusion and recommendation, references, appendix, and acknowledgment

high level of 3 indices value of the journals compared to other journals. The indices included self-citation (4.30), type of information sources (4.34), and impact factor (1.23).

Moreover, the type of information sources was also ranked the highest value amongst the IAARD journals. JAE had the highest value index on self-citation (this is somehow a negative indicator as well) (4.43). Other index values were also high which reflected on their high journal quality. As for JAS, all its Quality indices were high, except for its impact factor.

Journal trust and usability based on stated preference study

A total of 229 respondents contributed in this survey, consisted of 158 (69 percent) male respondents, 65 (28.4 percent) females, and six respondents who did not state their gender. The respondents came from the IAARD (207 respondents) and the University (22 respondents).

Journal assessment based on trust

Eighteen attributes of trust were selected to assess IAARD journals. The selected attributes include impartial preview, recognition of author, confidence, accuracy, correctness, objectives, clarity, conciseness, ease of understanding, clarity of measurement unit, currency, relevance, presence of all elements, comprehensiveness, adequacy, coverage, reliability, and overall level of satisfaction. Table 3 reveals the assessment of the IAARD journals based on Journal Trust Index. Analysis of the index values on the IAARD journals showed that the trust of the journals was at a mean of 3.26. Overall, the Trust Index value revealed that the IAARD journals were perceived to be trustworthy (in between fair to good) among the respondents.

Table 3 also presents each of the IAARD Journal Trust Index, which varied from 2.97 to 3.44. These values showed that the entire journals were of fair to good trust level. JPPTP achieved the highest trust among all IAARD journals with an index of 3.44 followed by JAS (3.40), and JPPP (3.39). JEP received the lowest trust with an index value of 2.97. HOR also received a low index of 3.27, whereas JTI and JITV received an index value of 3.28 respectively.

Journal assessment based on usability

The ISO (1994) views usability as the way in which a system can be used by target users to accomplish specific tasks and achieve a degree of effectiveness, efficiency and satisfaction.

Table 4 Usability Index of IAARD journals based on users survey

No.	Parameters	JAS	JPPP	JPTI	JPPTP	JI TV	HOR	JAE	JEP	JTI	Overall
1	Obtaining time	2.22	2.13	2.02	2.02	1.88	2.06	1.64	2.14	2.04	2.02
2	Estimated number of articles read	1.39	1.68	1.65	1.8	1.73	1.86	1.62	1.83	1.71	1.70
3	Reading frequency	1.58	1.27	1.76	1.53	1.71	1.63	1.71	1.91	1.68	1.64
4	Reading preferences[a]	2.72	1.91	2.67	2.31	2.59	2.27	2.57	2.87	2.46	2.49
	Usability Index	1.98	1.75	2.03	1.92	1.98	1.96	1.89	2.19	1.97	1.96

[a] Reading preferences refer to the reasons and habit for reading journal articles (e.g. to support research, to expand knowledge; reading whole journals, reading selected articles etc.)

A few studies on journal usability took place that looked into the average number of articles and hours scholars spent on reading scholarly articles (King et al. 2009); and scholars' purpose and preferences of reading journals (Jamali et al. 2014; King et al. 2009; Tenopir and King 2001). While Nielsen (2012) defined usability as how easy and pleasant the feature was to be used, in a journal context, the definition should be how easy and pleasant the journals' features are to be used. Therefore, usability in the context of IAARD journals means that the reader can use the journals easily and pleasantly, and usability attributes used in this study are obtaining time, the number of articles read, the journals read, and reading preferences.

The mean of the Usability Index of the IAARD journals is 1.96. Table 4 indicates the Usability Index for each of the journals. JEP is the journal with the highest Usability Index (2.19), followed by JPTI with the Usability Index of 2.03. JAS and JITV have similar the Usability Index of 1.98. In contrast, JPPP has the lowest Usability Index (1.75) followed by HOR and JTI at 1.96 and 1.97.

Overall journal indices and internal ranking of Indonesian agricultural journals

Table 5 presents the ranking and the Overall Index of IAARD journals based on three assessment attributes, namely usability, trust, and quality. These journal assessment attributes were cumulative of the weighted mean value on the IAARD journals. The maximum Overall Index value of the IAARD journals that may be achieved is 4.33. Journals with Overall Index values between 0 and 0.86 were categorized as very poor. Meanwhile, other journals were categorized poor (0.87–1.73), fair (1.74–2.54), good (2.55–3.54) and excellent (3.55–4.33).

The overall indices varied from 2.52 to 2.71 with a mean of 2.62, indicating that the IAARD journals fall into the category fair to good. HOR achieved the highest index among the IAARD journals with a value of 2.71. JAS is ranked second with an index value of 2.66, and JPPTP and JTI are ranked third with an index of 2.64. In contrast, JEP, JPTI and JITV had the lowest index values of 2.52, 2.58, and 2.61 respectively.

Table 5 The overall ranking of the IAARD journals based on usability, Trusts and Quality indices

Rank	Journal title	Indices			Overall Index	Rank
		Usability	Trust	Quality		
1	*Jurnal Hortikultura* (HOR)	1.96	3.27	2.91	2.71	1
2	Indonesian Journal of Agricultural Science (JAS)	1.98	3.40	2.59	2.66	2
3	*Jurnal Penelitian Pertanian Tanaman Pangan* (JPPTP)	1.92	3.44	2.56	2.64	3
4	*Jurnal Agro Ekonomi* (JAE)	1.89	3.34	2.66	2.63	4
5	*Jurnal Tanah dan Iklim* (JTI)	2.03	3.32	2.57	2.64	3
6	*Jurnal Penelitian dan Pengembangan Pertanian* (JPPP)	1.75	3.39	2.57	2.57	5
7	*Jurnal IlmuTernak dan Veteriner* (JITV)	1.98	3.28	2.58	2.61	6
8	*Jurnal Penelitian Tanaman Industri* (JPTI)	1.97	3.28	2.48	2.58	7
9	*Jurnal Enjineering Pertanian* (JEP)	2.19	2.97	2.39	2.52	8

Results of this journal assessment show similarity to that of the Indonesian Institute of Sciences (*Lembaga Ilmu Pengetahuan Indonesia* - LIPI) accreditations for scientific journals. LIPI (2012) conducted accreditations of scientific journals based on peer review, and defined an accredited journal as a journal which received a passing grade of the accreditation process. The passing grade to be accredited is 70 and journals with scores less than 70 are identified as non-accredited. The maximum accreditation score was 100. The accredited journals were classified into two categories: (a) journals with accreditation scores varied from 70 to 85 were categorized as B predicate journals, (b) journals with accreditation scores more than 85 were categorized as A predicate journals. LIPI had included IAARD journals in its 2012 accreditation and all nine journals sampled in this study received a passing grade in the accreditation process. As such, the current journal assessment based stated preference and revealed preference study confirms the accreditation of these nine journals based on peer-review process by a scientific agency.

Comparison of the internal ranking based on quality, trust and usability indices

Comparison of the internal ranking based on quality, trust and usability indices was further conducted using Gap Analysis. Table 6 shows the comparison of the internal ranking of the IAARD journals based these three indices. The gap analysis showed that there was no gap difference in the journal assessment index for JAS and JPPTP based on quality versus usability, as well as quality versus trust attributes. They also received a low gap of 1 and 2 respectively based on trust versus usability attributes. The low gap reflected that these two journals had no difference when compared based on these three attributes. On the other hand, JAE and JEP showed a big gap when compared between all three attributes. Other

Table 6 Comparison of the internal rankings of the IAARD journals based on Trust, Usability and Quality indices

	Journal title	Quality rank	Trust rank	Usability rank	Quality-trust rank change	Quality-usability rank change	Trust-usability rank change
1	Indonesian Journal of Agricultural Science (JAS)	3	2	3	0	0	1
2	*Jurnal Penelitian Pertanian Tanaman Pangan* (JPPTP)	6	8	6	0	0	2
3	*Jurnal Ilmu Ternak dan Veteriner* (JTV)	4	6	3	1	1	2
4	*Jurnal Tanah dan Iklim* (JTI)	5	7	2	1	3	2
5	*Jurnal Penelitian dan Pengembangan Pertanian* (JPPP)	5	5	8	2	3	3
6	Jurnal Penelitian Tanaman Industri (JPTI)	7	4	4	2	3	4
7	*Jurnal Hortikultura* (HOR)	1	1	5	2	4	6
8	*Jurnal Agro Ekonomi* (JAE)	2	3	7	5	5	6
9	*Jurnal Enjiniring Pertanian* (JEP)	8	9	1	6	7	8

Table 7 Correlation analysis and model fit of indices and overall Index

	Usability	Trust	Quality	Overall Index
Usability	1			
Trust	−0.78346	1		
Quality	−0.36329	0.354644	1	
Overall Index	−0.23721	0.563609	0.85482	1

journals (JITV, JTI, JPPP) received a low gap between 1 and 3 when compared among all three attributes.

Therefore, to examine the relationship among studied indices and their model fit with the Overall Index, we employed correlation and regression analysis as given in Table 7 and illustrated in Figs. 1, 2 and 3. The results of correlation analysis (Table 7) described that Quality and Trust indices showed a good correlation. Quality Index has a strong relationship (>0.85) and Trust Index depicted a moderate correlation (>0.56) with the Overall Index. However, Usability is negatively related (>−0.23).

The regression analysis trends (Figs. 1, 2, 3) indicated that Quality Index (>0.63) is followed by Trust Index (>0.58) and showed a good model fit with Overall Index. On the other hand, Usability Index has very less or no model fit (>0.07).

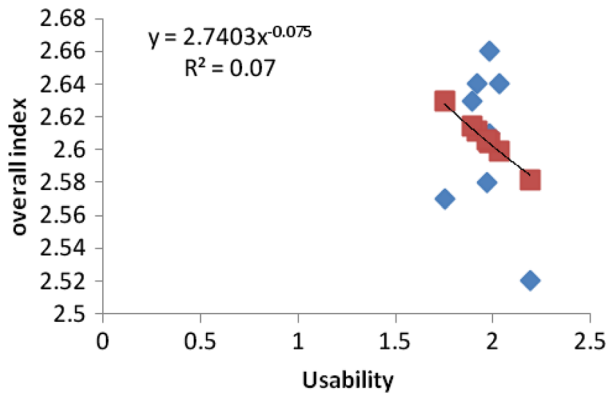**Fig. 1** Overall Index versus usability

$y = 2.7403x^{-0.075}$
$R^2 = 0.07$

Fig. 2 Overall Index versus trust

$y = 4.779x^{-0.55}$
$R^2 = 0.5846$
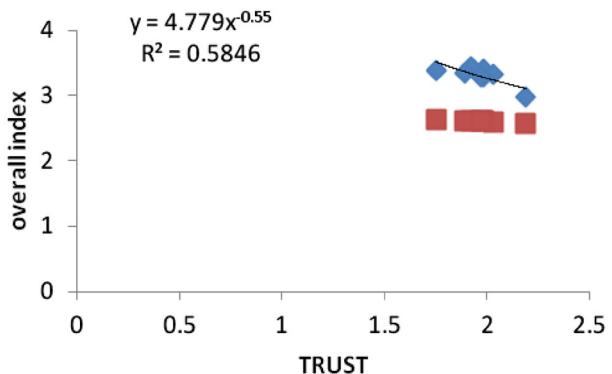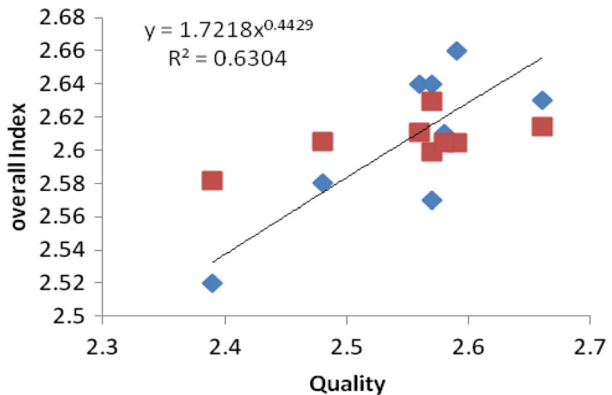
Fig. 3 Overall Index versus quality

$$y = 1.7218x^{0.4429}$$
$$R^2 = 0.6304$$

Conclusion

The visibility and impact of national journals from the periphery, as well as semi-periphery (like Indonesia), are viewed in terms of their indexation status and citations in universal citation databases. However, the numbers of Indonesian journals which have gained indexation in Elsevier's *Scopus* are small and non-existence in Thomson-Reuters's *Web of Science* (*WoS*). Since global citation databases offer limited coverage of Indonesian journals, it is not clear whether the visibility and impact of these journals can be assessed with indexation status in *Scopus* and/or WoS and the citations they received. Hence, if a periphery country wants to gauge the quality of their national journals, another approach is needed. This paper has demonstrated an assessment of IAARD journal influence as a combination of two studies: stated preference and revealed preference. Therefore, the journal quality study is the revealed preference study, involving bibliometrics analysis of nine IAARD journals sampled. The trust and usability study which is the stated preference study, involves an end user survey of similar journals. Based on the findings, the following conclusions are made.

(a) The revealed preference study that gauge the quality of IAARD journals through bibliometrics approach indicated that IAARD journals are characterized by Impact Factor, Cited Publication Type, Year Cited and Self-Citation. Journal Quality Index of IAARD journals reached 2.59. HOR, JAE, and JAS are the top three journals with the highest Journal Quality Index.

(b) The stated preference study that gauge the trust of IAARD journals through user survey indicated that IAARD journals in general have been identified as journals that have good level of accuracy, correctness, objectiveness, currency, clarity, conciseness, ease of understanding, clarity of measurement units, relevancy, reliability, and overall trust. The journals also have fair level of bread and depth of information, all necessarily values, comprehensiveness, and adequacy. IAARD journals have no impartial review, are recognized by less than 50 percent of the respondents, and are trusted for the entire journal content. Trust Index of IAARD journals was 3.26. JPPTP achieved the highest trust of IAARD journals with the index value reached 3.44 followed by JAS (3.40), and JPPP (3.39).

(c) The stated preference study that gauges the usability of IAARD journals through user survey indicated that most respondents obtained the journals more than

3 months after the journals are published, they read less than 50 percent of the total articles, and they read the entire articles compared to only articles that interest them. There are two main purposes why respondents read the journals: to expand their knowledge and to support their research. Usability Index of IAARD journal is 1.96. JEP is the journal with the highest Usability Index (2.19), followed by JTI with the Usability Index of 2.03, meanwhile, JAS and JITV have similar Usability Index of 1.98.

(d) Indices of IAARD journals quality varied from 2.52 to 2.71. HOR (2.71) is ranked first among IAARD journals, followed by JAS (2.66), JPPTP and JTI (2.64), JAE (2.63), JPPP (2.57), JITV (2.61), JPTI (2.58), and JEP (2.52). JPPTP and JTI have similar indices and ranking. The comparison between indicators resulted from revealed preference and stated preference using gap analysis indicated that quality and trust, and quality and usability, are not much different, and the ranking of the journals is almost similar.

(e) However, when correlation and applied regression analysis to examine the relationships among these indices and Overall Index were applied, it was observed that Quality Index followed by Trust Index are well correlated. In the same vein, power regression trends pointed out good regress with Quality and Trust indices. The Usability Index is negatively correlated and found a very low model fit with Overall Index.

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