CHAPTER IV

ANALYSIS AND FINDINGS

This chapter presents the results of the study and discusses the findings. The results presented in this chapter include bibliometric and quality, trust, and usability of the IAARD journals. This chapter also presents the IAARD journals' rankings and comparison of the rankings.

4. 1.   Evaluative Bibliometrics of the Indonesian Agricultural Journals and their Quality

The bibliometric parameters of a journal include authorships, agricultural commodities, fields of knowledge, languages, fifteen years impact factor, types of publication cited, cited journals, cited literatures, years published of cited articles, and self-citation. This part also reveals the IAARD journal quality based on bibliographic analysis.

4. 1. 1.   Bibliographic Analysis of IAARDJournals

Bibliographic Analysis of the IAARD journals presentsthe research findings and discussions on authorships of the journals' articles, agricultural commodities, fields of knowledge, and languages.

4.1.1.1.   Authorship

Table 4.1 shows the number of authors per article of the IAARD journals over the period of 1995 to 2010. Details of the journals are presented in Appendix C.

Table 4.1. The number of authors per article of the IAARD journals (1995 to 2010)

Number Of Authors Per Article	No. Articles	Percentage
1	142	21.07
2	166	24.63
3	181	26.85
4	124	18.40
5	39	5.79
6	18	2.67
7	1	0.15
8	1	0.15
9	2	0.30
Total	674	100

As can be seen from the table above, the number of authors per article varied from one to nine. The highest frequency was for a journal written by three authors, followed by articles with one and two authors. The table also showed that almost 80% of the articles were written by two or more authors, suggesting joint authorships and collaborations. On the other hand, single author articles represented only by about 21%. This higher percentage of collaboration can be reflected on a better quality of articles with quality inputs that had been discussed during planning, conducting and reporting.

The number Of authors per article of the IAARD journals differed from the researches conducted by several researchers, such as Tiew (2006), Swarna, Kalyane, and Kumar (2008), Biswas, Roy, and Sen (2007), Al-Qallaf (2009), Winarko and Sormin (2010), and Sitienei and Ocholla (2010). The said researchers studied on the number of authors per article and generally they found that most of the articles were written by a single author. However, most of the IAARD journals were written by two or three authors.

In contrast, the findings of multiple authors in this research showed similarity with researches conducted by Arya (2012) who worked on veterinary medicine and Ram (2011) who worked on *Artemisia annua*. Other researchers such as Hadimani, and

Rajgoli (2010) who worked on agriculture engineering, Dixit and Katare (2007) who worked on cotton improvement, and Kumar and Kumar (2008) who worked on oil seed, also had similar findings.

The IAARD journals published articles were not only written by Indonesian authors. The geographic distribution of the authors is shown in Table 4.2, and please also refer Appendix D.

Table 4.2. Geographic distribution of the IAARD journals' authors (1995 to 2010)

NO.	COUNTRY/REGION	NO. ARTICLES	PERCENTAGE
1	**ASIA**	**1797**	**97.50**
1.1	Indonesia	1706	92.57
1.2	Malaysia	35	1.90
1.3	Japan	26	1.41
1.4	Philippines	16	0.87
1.5	Thailand	6	0.33
1.6	India	3	0.16
1.7	Bangladesh	2	0.11
1.8	Pakistan	2	0.11
1.9	Sri Lanka	1	0.05
2	**EUROPE**	**22**	**1.19**
2.1	Netherlands	15	0.81
2.2	United Kingdom	3	0.16
2.3	Belgium	3	0.16
2.4	Germany	1	0.05
2.5	France	0	0.00
3	**AUSTRALIA**	**13**	**0.71**
4	**UNITED STATES OF AMERICA**	**6**	**0.33**
5	**AFRICA**	**1**	**0.05**
5.1.	Kenya	1	0.05
6	NA	4	0.22
		1843	100

* NA = Not Available

The table shows that the authors originated from 5 continents and 16 countries. Asia shows the highest distribution of the authors comparing to the other four continents. The highest geographic distribution in Asia was due to the contribution of authors from Indonesia. Its contribution reflected 92.57% which equal to 1,706 authors. The

international contributions in the IAARD journals are relatively low as it was only represented by 137 authors (7.43%).

The low number of international contributions on the IAARD journals showed that the journals have yet to be accepted at the international journal level. This is due to the fact that the journals are mostly written in Bahasa Indonesia, the language that is dominant in Indonesia. The language constraint is possibly a factor that the international authors are not interested to cite and to publish articles in the journals. The other reason is because the number of exemplar and the distribution of the journal were limited to the national level. Eventhough two of them are distributed internationally, namely (*Indonesian Journal of Agricultural Science*) JAS, which was used for publication exchange with international organization and NAK (*Jurnal Ilmu Ternakdan Veteriner*) which was registered on the Directory of Open Access Journals (DOAJ), most of the journals are still only locally distributed. The good news is recently, the entire journals are available on digital format and published on the internet through their affiliations of websites and *Repositori Publikasi Badan Litbang Pertanian* (http://digilib.litbang.deptan.go.id/repository/index.php/repository).

As for the geographic distribution of the authors, findings of this research showed a similarity to the research conducted by Bakri and Willet (2008). The researchers found that geographic distribution of authors in the Malaysian Journal of Library and Information Science dominated by the Malaysian authors. In addition to the findings, authors from India, Bangladesh, Africa, Australia, and Sri Lanka did contribute in the journals. Similarly, Dixit and Katare (2007) reported that a low number of international contribution in the Journal of Indian Society for Cotton Improvement. Only three foreign institutes contributed in the journal.

As for the Dates publications, the authors came from 59 countries that include USA, France, India and Egypt and had the largest international contributions on the publications (Anwar, 2006). Kademani et al. (2006) reported that most authors of the India's nuclear papers also came from the international authors. Authors from the United States contributed most papers followed by Italy, Germany, France, Japan, United Kingdom and Canada. Authors in the Journal of the American Society for Information and Science were also originated from various countries. Similarly, the research on algae and bio-fuel showed that the United States and the European Union were the two countries with the highest contributions (Konur, 2011). Research activities in Biochemistry, Genetics and Molecular Biology (Bala and Gupta, 2010), research in agricultural engineering (Hadimani, 2010), and food composition database for biodiversity (Charrondière et. al., 2012) found that United States was the highest contributor in the researches. Bartol (2010) noted that the authors from eight neighbouring countries contributed in the journals. Poland's authors contributed the most in the particular journals.

The research identifies 161 affiliated bodies of 1,843 authors' appearances on the IAARD journals. The journals show that the mean of the affiliation body appearances varied between 4.58 to 10.96 times (See Appendix E).

Table 4.3. Classification of authors affiliation based on institution types
and appearances (1995 to2010)

No.	Type Of Affiliation	No. Articles	Percentage (%)	Ranking
1	IAARD	1,332	72.27	1
2	University	410	22.25	2
3	Research Institute	62	3.36	3
4	Company	20	1.09	4
5	Governmental Body	15	0.81	5
6	NA	4	0.22	6
	Total	1,843	100	

Table 4.3 presented two groupsthat dominated affiliation of the authors, namely the IAARD and the university. IAARD ranked first on the list. This group comprises all centers (*pusat* and *balai besar*), research institutes (*balai penelitian*), assessment institutes (*balai pengkajian*), and other research supporting institutes such as local, research installation, and experimental garden under the IAARD. The second group, university, includes national (private and states universities) as well as foreign universities. Companies (state and private companies) and governmental bodies ranked the last of the author affiliations that contributed in the journals.

Grouping of the affiliation bodies in Table 4.3 was also conducted by other researchers. Zainab et al. (2012) reported that almost similar affiliation body grouping on scholarly journals in Malaysia that include: a) Government agencies that are similar to IAARD in this research, b) Societies and Associations similar to Research Institute, c) Universities and colleges, and d) Private companies similar to Company. They reported different findings to this research. University was the highest contributor in their research, which reflected 55.5% of the total contribution, followed by Government agencies and Societies/Associations, with almost similar percentage i.e. 20.4 and 22.6 respectively. The difference was due to publishers of these two researches were naturally of different backgrounds. Zainab et al. (2012) work in a university while this researcher works in a governmental institution.

Koehler (2000) also reported almost similar grouping of author's affiliations in the Journal of the American Society of Information Science. He reported that the grouping consisted of academic, corporate, government, and others. Meanwhile, Sprott and Miyazaki (2002) grouped author's affiliations in the Journal of Public Policy and

Management into academic, corporate, non-profit, and government affiliation contribution.

Table 4.4 shows the top ten prolific affiliation bodies of the IAARD journals. The table also shows that the entire affiliation bodies of the IAARD journal are the institutes under IAARD, except for Bogor Agricultural University. These institutes contributed 51 to 209 articles from the year 1995 to 2010. IPB (Bogor Agricultural University) was ranked first in the list with the appearance of 209 times within that period. Next in the ranking were Indonesian Center for Agricultural Land Resources Research and Development, and the Indonesian Center for Agricultural Machinery Research and Development with the appearance of 184 and 122 times respectively.

Table 4.4. The top ten most prolific affiliation bodies within the IAARD journals
(1995 to 2010, n=161)

NO.	AFFILIATION	NO. ARTICLES	PERCENTAGE
1	Bogor Agricultural University	209	11.34
2	Indonesian Center for Agricultural Land Resources Research and Development	184	9.98
3	Indonesian Center for Agricultural Engineering Research and Development	122	6.62
4	Indonesian Spice and Medicinal Crops Research Institute	110	5.97
5	Indonesian Research Institute for Animal Production	100	5.43
6	Indonesian Center for Agriculture Socio Economic and Policy Studies	95	5.15
7	Indonesian Vegetables Research Institute	79	4.29
8	Indonesian Ornamental Crops Research Institute	70	3.80
9	Indonesian Center for Rice Research	63	3.42
10	Indonesian Tobacco and Fiber Crops Research Institute	51	2.77

IAARD institutions dominated the top ten prolific affiliation bodies of the IAARD journals. The possible reason of this fact was that at the beginning the IAARD journals were dedicated for bridging scientific communications among the researchers in IAARD. The researchers used these journals as communication media to disseminate their research findings. In its development, the journals also disseminated to other

institutions out of the IAARD as its social responsibility. At present, the IAARD journals have extended its reader distributions with author contributions from institutions other than IAARD.

The most affiliation bodies came from Indonesia, of which it shows a similar pattern to previous researches. According to Tiew (2006), *Perpustakaan Negara Malaysia* (PNM), the publisher of the *Sekitar Perpustakaan* contributed the most in the journal. The contribution reached 70.76 % of the total appearance comparing to the second contributor (university) that only contributed 23.47%. Similarly, Azevedo (2010) stated that affiliation bodies of Brazilian freshwater ichthyology's authors came from 94 Brazilian institutes out of 145 institutions that contributed.

Sutardji (2003) also reported that most affiliation bodies of the *Jurnal Penelitian Tanaman Pangan* were research institutes under the Indonesian Center for Food Crops Research and Development which was also the publisher of the journal (384 articles). The other affiliation bodies were from the Indonesian Research Center for Genetics and Biodiversity (contributed 26 articles), the Indonesian Center for Rice Research (24 articles), the Indonesian Center for Agricultural Land, Resources and Climate (2 articles) and the University (2 articles). Affiliation bodies of IPTAN database had similar pattern (Winarko and Sormin, 2010). The highest contribution of affiliation bodies of the database were the IAARD (770 articles) and the universities (132 articles). Meanwhile, Koganuramah, Angadi and Kademani (2002) mentioned that the Unit for Rural Studies of Tata Institute of Social Sciences (TISS) was the highest contributor, which contributed 62 papers in TISS papers. Bala and Gupta (2010) also found similar research findings on Biochemistry, Genetics and Molecular Biology research.

As for the IAARD articles published in the *Sinartani*, Mansjur, Suryantini, and Mulyandari (2007), it was reported that the Indonesian Center for Agricultural Socio Economic and Policy Studies was the institution with the highest number of contributions. The center contributed 175 articles. The other institutions with high contributions to the *Sinartani* were the IAARD secretariat and the Indonesian Center for Estate Crops Research and Development (89 articles each) and the Indonesian Center for Food Crops Research and Development (66 articles). The contribution pattern of the affiliation bodies was almost similar.

However, Konur (2011) and Ram (2010) reported differently on the distribution of the affiliation bodies on the research of algae and bio-energy and the research on *Artemisia annua*. The highest numbers of the distribution affiliation bodies were bythe Chinese Academy of Sciences and Lanzhou University. Affiliation bodies of the two researchers were more widely distributed compared to this research.

Total number of authors' appearances in the IAARD journals were 1,843 times, which came from 1,113 unique authors (See Appendix F). Table 4.5 shows the contribution of authors in the IAARD journals.

Table 4.5. The contribution of authors in the IAARD journals (1995 to 2010)

No. Contribution	No. Articles	Percentage
1	950	74.45
2	200	15.67
3	71	5.56
4	25	1.96
5	13	1.02
6	10	0.78
7	3	0.24
8	2	0.16
9	2	0.16
Total	1,276	100

Authors of the IAARD journals contributed one to nine articles in general. Most authors (74.45%) contributed one article each in the journals. The next two highest contributions were from authors with two and three articles respectively. In contrast, only a small number of authors contributed between seven to nine articles to the journals. Only three authors contributed seven articles in the journals. Two authors contributed eight articles and two more authors contributed nine articles.

The number of authors who contributed only one article in the IAARD journals was the highest. This showed that productivity of the IAARD researchers were relatively low. Within that fifteen year period, 950 researchers had only written one article each. Even if this number is true; we have to consider that the IAARD researchers also published their articles in other publications or other types of publications such as monograph, proceeding and others. The opportunity to publish their articles in the IAARD journals is also limited. Compared to the number of the articles in the IAARD journals and the number of the IAARD researchers, it might be an acceptable reason why only 950 researchers had written one article each. (Indonesian Journal of Agricultural Science) JAS is a good example for this limitation. JAS is a journal which publishes one volume with two issues in a year. The number of articles is limited to five for each issue. Therefore, for a 15 year period, the number of articles published in JAS is average at 150 articles only. With the number of the IAARD researchers that reached up to 2,700, the percentage of articles published in JAS as compared to the IAARD researchers was 0.019. In addition to that, high percentage of rejection of the articles that will be published in the journals somehow declined the opportunities.

In the previous research, Ram (2011) reported that articles contribution by the authors in the *Artemisia annua* research was varied from 1 to 13. However, the pattern of articles' contribution was similar, where authors who had one article each was the highest contributors. The higher number of the articles reflected on the lower number of the authors.

Table 4.6 provided 13 most prolific authors who had published their articles in the IAARD journals. These authors were classified into four cohorts, whom had contributed 8 to 15 articles in the journals. B. H. Prasetyo contributed 15 articles and ranked first, followed by Hikmatullah on second. The next cohort belongs to four authors who had contributed nine articles each. The authors were Kasno, A.; Sabiham, S.; Thahir, R.; and Triwahyudi, S. These authors had written nine articles each in the IAARD journals. Seven authors contributed eight articles, namely, Adiningsih, J. S.; Gultom, R. Y.; Paramawati, R.; Sinurat, A. P.; Subagyo, H.; Sukarman; and Widodo, P. were classified in the fourth cohort.

Table 4.6. The top 13 prolific authors of the IAARD journals (1995 to 2010)

No.	Authors	No. Articles	Percentage
1	Prasetyo, B. H.	15	0.81
2	Hikmatullah	10	0.54
3	Kasno, A.	9	0.49
4	Sabiham, S	9	0.49
5	Thahir , R	9	0.49
6	Triwahyudi, S	9	0.49
7	Adiningsih, J. S.	8	0.43
8	Gultom, R. Y.	8	0.43
9	Paramawati, R.	8	0.43
10	Sinurat, A. P.	8	0.43
11	Subagyo, H.	8	0.43
12	Sukarman	8	0.43
13	Widodo, P.	8	0.43

Compared to the previous researches, the most prolific authors of the IAARD journals have higher contributions as opposed to the *Sekitar Perpustakaan* journals' prolific

authors. Prasetyo BH, the most active author of the IAARD journals wrote 15 articles compared to Choo Ming Ding who wrote only nine articles in the *Sekitar Perpustakaan* (Tiew, 2006) while Muswazi and Pienaar, contributed 11 articles each (Sitienei and Ocholla, 2010). On the other hand, Bala and Gupta (2010), Konur (2011) and Koganuramah, Angadi, and Kademani (2002) found in their researches, much higher contribution with 231, 15 and 38 articles accordingly.

4.1.1.2. Commodities, Field of Knowledge, and Languages of the IAARD Journals

Table 4.7 presents groups of agricultural commodities in the IAARD journals based on five agricultural sectors, namely food crops, horticulture, estate crops, animal husbandry, and fisheries. Food crops, horticulture, and estate crops ranked first to third with commodities appearances above 103. Meanwhile, animal husbandry and fisheries placed on the last two ranks with the appearances of 64 and 14 respectively. Food crops and horticultural became the highest group of commodities due to the importance of these groups in agriculture. Food crops provided staple food items that needed for living. Meanwhile, horticulture compliments staple food items with vegetables and fruits. These two groups are necessary for daily needs. Detail of each appearance in the IAARD journals presented in Appendix G.

Table 4.7. The commodity group appearances in the IAARD journals based on agricultural sectors (1995 to 2010)

No.	Commodity Groups	No. Articles	Percentage
1	Food Crops	181	37.87
2	Horticulture	116	24.27
3	Estate Crops	103	21.55
4	Animal Husbandry	64	13.39
5	Fisheries	14	2.93
	Total	478	100

Table 4.8 shows the top ten agricultural commodities in the IAARD journals, which grouped into eight cohorts. Rice was the most popular agricultural commodity which was studied within the years of 1995 to 2010 with the total appearances of 69 articles. Corn and Soybean were ranked second and third respectively with the appearances of 33 and 28 articles each. While sheep, pepper, and cow are agricultural commodities ranked the fourth to seventh on the list. The remaining four commodities on the list had similar number of appearances (two appearances for each cohort) i.e. *Chrysanthemum* and chicken on the seventh place, and tobacco and onion on eighth place. The detailed agricultural commodity appearances are presented in Appendix H. Mean of agricultural commodities in the IAARD journals varied from 1.79 to 5.75 for JPP and JTP respectively.

Table 4.8. The top ten agricultural commodities in the IAARD journals 1995 to 2010 (n=478)

No.	Agricultural Commodities	No. Articles	Percentage
1	Rice	89	18.62
2	Corn	33	6.90
3	Soybean	28	5.86
4	Sheep	21	4.39
5	Pepper	17	3.56
6	Cow	11	2.30
7	Chrysanthemum	10	2.09
8	Chicken	10	2.09
9	Tobacco	9	1.88
10	Onion	9	1.88

Rice and corn were grouped into food crops became the highest number of articles found in the journals. These two commodities are staple food for Indonesians. It was no doubt that these two commodities become important and attract the attention of researchers and decision makers to highlight the commodities. The remaining commodities compliment the daily necessities of the Indonesians. Soybean, sheep,

chicken, and cow are protein sources, while pepper and onion are ingredients of cooking. Again, these commodities are the daily necessities.

Eventhough the agricultural commodities are not mentioned in detail, Mansjur, Suryantini, and Mulyandari (2007) indicated the presence of agricultural commodities such as food crops, horticulture, industrial crops, and animal husbandry in the *Sinartani*. The highest number of agricultural commodities was food crops followed by three other commodities, namely industrial crops, horticulture, and animal husbandry in that order. Food crops commodity ranked first in the two mentioned researches. Food crops contributed 207 articles, while, horticulture and estate crops commodities were ranked second and third with 119 and 114 articles respectively.

Sundari and Rufaidah (2009) included rice, corn, and soybean as food crops commodities in their articles in the CARIS database. Orange, orchids, onion, and banana were the horticulture commodities, while coconut, medicinal plants, cocoa, clove, rubber, sugar cane, palm oil were the industrial plant commodities. The other commodities were cow, goat, sheep, and poultry were included in the animal commodities.

Table 4.9 presents the fields of knowledge in the IAARD journals based on the main AGRIS/CARIS categorization scheme (See also Appendix I for detail descriptions of each journal).

Table 4.9. Major fields of knowledge in the IAARD journals (1995 to 2010)

No.	Field Of Knowledge	No. Articles	Percentage
1	Plant Science And Production	206	28.93
2	Natural Resources And Environment	113	15.87
3	Economics, Development And Rural Sociology	91	12.78
4	Animal Science, Production And Protection	71	9.97
5	Plant Protection	72	10.11
6	Agricultural Machinery And Engineering	61	8.57
7	Processing Of Agricultural Products	39	5.48
8	Agriculture In General	25	3.51
9	Postharvest Technology	14	1.97
10	Fisheries And Aquaculture	7	0.98
11	Education, Extension And Information	5	0.70
12	Pollution	5	0.70
13	Methodology	3	0.42
	Total	**712**	**100**

The table shows that only 13 out of 17 AGRIS/CARIS major categories found in the research. The remaining four categories, namely Geography and History; Administration and Legislation; Forestry; and Human Nutrition were not shown in the list. The table also shows that Plant Science and Production were the highest number of articles in the said journals. The next two highest numbers of articles were in the fields of: a) Natural Resources and Environment, and b) Economics, Development and Rural Sociology. In contrast, articles in the fields of Education, Extension, and Information; Pollution; and Methodology were the least number found.

Table 4.10 presents the top ten minor fields of knowledge in the IAARD journals. Plant Genetics and Breeding ranked the highest (7.44%) of the total minor field of knowledge. It is followed by Soil Chemistry and Physics, and Crop Husbandry in the second and third places with 7.16% and 6.18% of appearances respectively. Plant Diseases; Pests of Plants; Agricultural Economics and Policies; And Agricultural Machinery and Equipment placed fourth to seventh places. These fields achieved 5.34% to 4.21% appearances. The last three fields of knowledge belong to: a) Agriculture -

General Aspects, B) Fertilizing, and C) Agricultural Structures with similar achievements, i.e. 25 (3.51%) appearances.

Table 4.10. The top ten minor fields of knowledge in the IAARD journals (1995 to 2010)

No.	Field Of Knowledge	No. Articles	Percentage
1	Plant genetics and breeding	53	7.44
2	Soil chemistry and physics	51	7.16
3	Crop husbandry	44	6.18
4	Plant diseases	38	5.34
5	Pests of plants	34	4.78
6	Agricultural economics and policies	33	4.63
7	Agricultural machinery and equipment	30	4.21
8	Agriculture - General aspects	25	3.51
9	Fertilizing	25	3.51
10	Agricultural structures	25	3.51

Plant science and production was the most important aspect of agriculture (See Table 4.9). This aspect reflects staple foods, vegetables, fruits, and other plant products for our daily necessities. With this important aspect, it has obliged the researchers and decision makers to pay utmost attention into it. The importance of plant science and production was also supported by detailed results of the top ten fields of knowledge in Table 4.10. Three of the ten fields of knowledge, namely, Plant Genetics and Breeding, Crop Husbandry, and Fertilizing were minor fields of knowledge under plant science and production. Hence, this indicated that plant science and production is an important aspect of agriculture.

Fields of knowledge in this research findings were almost similar to the research on *Pheonix dactylifera* L conducted by Anwar (2005). Plant Diseases, Genetics, Soil Fertility, and Engineering and Technology were discussed in both researches. Even the two researches applied different classifications of fields of knowledge, several fields of knowledge of the two researches were found almost similar. AGRIS/CARIS

categorization scheme proposed a wider area compared to the classification of *Pheonix dactylifera L.* For instance, Plant Science and Production in this research can accommodate several fields of knowledge, namely, genetics, plant physiology, plant biochemistry, and plant sciences presented in the *Pheonix dactylifera* L article. Meanwhile, Products Processing of Agricultural Products accommodates Agricultural Products, Food, and Feed Chemistry presented in the *Pheonix dactylifera* L article. Similarly, research on tobacco conducted by Cohen, Chaiton, and Planinac (2010) found 11 studies focused on the research. Two of them focused namely on the economics and methodology which were almost similar to the fields of knowledge in this particular research (Economics, Development and Rural Sociology and Methodology).

Mansjur, Suryantini, and Mulyandari (2007) reported that Soil Science; Plant Cultivation; Genetic and Breeding; Agriculture Machinery; Pest and Diseases; Post-Harvest Management; Socio-Economic; Communication, Library, and Documentation were the fields of study presented in the IAARD articles in the *Sinartani*. The occurrences of economic development and rural society; and plant science and production were the highest among the other fields of knowledge with 200 and 146 articles respectively. Similarly, Winarko and Sormin (2010) also reported that both fields of study were the highest among others. Economic Development and Rural Society represented 61.62 % of the total articles in the IPTAN database while, plant science and production made up of 14.72%.

As in the field of knowledge study on maize, Makkasau and Mansjur (2006) reported that Plant Science and Production with 30 articles was also the highest appearances compared to others. The next fields of study were Pest and Diseases with 28 articles and Genetic and Breeding with 24 articles.

Zainabet. al. (2012) reported similarities on the basic element of the fields of study on their research, particularly in Sciences, Technology and Medicine part. They reported on the occurrences of Agriculture, Forestry, and Veterinary fields of study, which were more broader/general fields of the said research. Similarly, Azevedo (2010) reported that the research area of Brazilian freshwater ichthyology also showed similarity with Animal Science, Production and Protection; and Fisheries and Aquaculture.

The study exposed that Bahasa Indonesia and English as official languages of the IAARD journals (see Table 4.11 and Appendix J). The IAARD journals are published using Bahasa Indonesia and English, except for JAS and HOR that use English and Bahasa Indonesia for their entire articles respectively. The study had also shown that the IAARD journals published more articles in Bahasa Indonesia (77.56% of the total IAARD articles) compared to English.

Table 4.11. Languages of articles in the IAARD journals (1995 to 2010)

No.	Languages Of Articles	No. Articles	Percentage
1	Bahasa Indonesia	522	77.56
2	English language	152	22.59
	TOTAL	674	100

The use of Bahasa Indonesia as the official language in most of the IAARD journals proved that language is important for scientific communication within the IAARD and other agricultural related researchers. Most of the IAARD journals were national level journals. These journals were also dedicated particularly to bridge scientific communication among the IAARD authors. If the journal is disseminated to the national readers only, it can be understood and there is no necessity to publish it in English. The other possibility of using Bahasa Indonesia as the official language is related to the low English proficiency of most Indonesians. Education First (nd) reported that Indonesia

has a low English proficiency with 53.31 English Proficiency Index (EF EPI). The low EF EPI may be the constraint to the IAARD authors to disseminate their research findings in English.

The official language of the IAARD journals has similar pattern with the language used in the *Sekitar Perpustakaan.* The journals use more national language in their articles compared to others. According to Tiew (2006), the *Sekitar Perpustakaa*n articles used predominantly Bahasa Malaysia in their articles. Similarly, most of the IAARD journals articles use Bahasa Indonesia.

Konur (2011) and Ram (2011) on the other hand reported that English was the most used language in algae and bio-energy articles and in *Artemia annua* articles with the percentage of 97.6% and 89.22% respectively. Kademani et al. (2006) also reported a similar research finding. They stated that English was the language chosen by authors of nuclear science and technology research papers in India with a percentage of 99.63%. Meanwhile, Hindi language used by author represented only 0.05% of the papers. Similarly, Bartol (2010) found that English language followed by Polish were predominant languages in the Journal of Central European Agriculture.

Salager-Meyer (2014) stated that to increase the visibility of peripheral journals published in languages other than English can be conducted with upgradingthem from local to a global status. The solutions are to reduce the number of journals and encourage authors to publish in them.

4.1.1.3. Origin of cited articles: IAARD vs. Non IAARD

The origin of cited articles of IAARD journals have comes from IAARD journals itself and other publications. Table 4.12 shows the origin of article cited on IAARD journals.

Table 4.12. Origin of the cited articles of IAARD journals (1995 to 2010)

No	Origin Of Cited Articles	No. Articles	Percentage
1	IAARD	2,284	19.31
2	Non - IAARD	9,546	80.69
	Total	11,830	100

The origin of cited articles of IAARD journals comes from IAARD journals itself and other publications. Table 4.12 showed that authors cited small number of articles published in IAARD journals. Authors of IAARD journals cite only 19.31 percent of total number of 11,830. The table also showed that IAARD author's citation pattern is more on non IAARD publications comparing to IAARD.

The highest number of non-IAARD citation can be explained by the easy access of IAARD researchers to information resources. Internet application development, including digital library and electronic journal benefited to the researchers to access information related their research topics. Previously, when scientific journal were subscribed as printed journal, the number of subscribed journal are limited. This limitation was due to budget availability of ICALTD who provided scientific journal for IAARD researchers. With the easy access of internet and availability of electronic journals/databases, the number of subscribed journals increased. This will enable the IAARD researchers to download big number of articles for supporting their research. The internet access on electronic journals will also open the opportunities to access information without geographical boundaries. This will enable IAARD author to get more articles from various journals and origin.

Comparing to the previous researches, Bakri and Willet (2008) found similar research finding. They reported low citation numbers of the *Malaysian Journal Library and Information Science*. They stated that about 86% articles on the journal do not cited. In the opposite, Hutchison and White (2003) reported the high citation of articles. Their research resulted 314 citations were made from 308 articles of The *Journal of The American Taxation*.

4.1.1.4. Authors of IAARD Journals' cited articles

The numbers of authors cited on IAARD journals were 15,832 with 27,186 citations. Table 4.13 presented top ten authors cited on IAARD journals (see also appendix K for detail of top 500 cited author on IAARD journals). The tables showed that there were three types' authors of cited articles on IAARD journals, namely, anonymous, institutional, personal authors. Articles with no author (anonymous) reached the highest number of citation (0.005%). *Badan Pusat Statistik* and *Balai Besar Sumber Daya Lahan Pertanian* were the national institutional authors on the second and fourth ranking with 111 and 75 numbers of citations respectively. Meanwhile, Soil Survey Staff and Food and Agriculture Organization (FAO) were the international institutional authors on the fifth and the sixth ranking with 53 and 43 citations respectively. Personal authors consisted of Adiningsih, J. S on the third ranking with 80 citations followed by Subagjo, H.; Simatupang , P.; Sinurat, A. P; and Widjaja Adhi, I. P. G. on the sixth to tenth ranking with 40 citations for Subagjo, H. and 39 citations for each remaining authors.

Table 4.13 Authors of the cited articles on IAARD journals (1995 to 2010)

No	Authors Of Cited Articles	No. Articles	Percentage
1	Anonymous	137	0.005
2	*Badan Pusat Statistik*	111	0.004
3	Adiningsih, J. S	80	0.003
4	*Balai Besar Sumber Daya Lahan Pertanian*	75	0.003
5	Soil Survey Staff	53	0.002
6	Food and Agriculture Organization	43	0.002
7	Subagjo, H.	40	0.001
8	Simatupang , P.	39	0.001
9	Sinurat, A. P	39	0.001
10	WidjajaAdhi, IPG	39	0.001

Table 4.14 showed the pattern of cited author on IAARD journals. Most of the authors on IAARD journals were cited one time only, the citation reached 13820 occurrences. The next two highest citation numbers were belonged to authors who were cited 2 and 3 times with 2508 and 721 occurrences. Other authors were cited 4 times or more with 326 occurrences or less.

Table 4.14. Pattern of top ten of cited authors on IAARD journals (1995 to 2010, n=17,957)

NO. OF CITATIONS	FREQUENCY	PERCENT
1	13820	76.96
2	2508	13.97
3	721	4.02
4	326	1.82
5	179	1.00
6	98	0.55
7	71	0.40
8	63	0.35
9	48	0.27
10	22	0.12

The previous research related to author citation, Fasae (2011) reported that cited author of Master Technology theses submitted in the Department of Agricultural Economics and Extension, Federal University of Technology Akure, Nigeria had maximum of 48

citations. This numbers is smaller comparing to the maximum citations of personal author of this research. The maximum personal author's citation was 80 citations.

4.1.1.5. Languages of IAARD Journals' cited articles

Languages of the articles cited on IAARD journals presented on table 4.15 (see also appendix L for detail). The table informs that cited articles in IAARD journals using at least four languages, namely, English, Bahasa Indonesia, Dutch, and French.

Table 4.15. Language of the cited articles of IAARD journals (1995 to 2010)

No.	Language Of Cited Articles	No. Articles	Percentage
1	English	7,878	66.59
2	Indonesia	3,916	33.10
3	France	19	0.16
4	Netherland	13	0.11
5	Other	4	0.03
	Total	11,830	100

Most of IAARD journals' authors cited articles, which were written in English. Number of cited articles on this language achieved 66.59% of the total cited articles (11,830). This citation was double comparing to the citation, which were written in Bahasa Indonesia (33.10%). The Dutch, French and other languages cited low in number.

English is the highest cited language with number of citation reached 7878. This number related to non-IAARD cited articles. The high number of English articles citation is also related to the easy access of researchers to information resources/databases via internet application. This access allowed researchers to download a lot of information related to their research topics. Supporting informations through electronic journals/databases subscribtion by ICALTD also strengthened the easy access of IAARD researchers' information resources.

Most of IAARD authors cited articles in English. The higher number of citation articles in English concurrent to research on *Index Islamicus Database*. The research showed the domination of citation of the articles written in English that reached 56.3 percent of 277 citations. The remaining percentage belonged to French, German, Russian, Polish, Italian, Dutch, Swedish, Hungarian, Danish, and Lithuanian (Anwar, 2001). Keat and Kaur (2008) reported more extreme research finding. They showed that most of the student of the Master in Library and Information Science at the University of Malaya cited 93.77% articles in English in preparing their dissertation. Similarly, Shahbodaghi and Sajjadi (2010) who conducted research on Iranian medical informatics found that articles 98.4% of 183 citing articles were written in English, and the remaining is in French.

4.1.1.6. Knowledge Fields of IAARD cited articles

Knowledge Fields of cited articles on IAARD journal was classified articles were cited on IAARD journals based on AGRIS/CARIS categorization scheme. Table 4.16 revealed the knowledge fields of the cited articles on IAARD journals (see also appendix M)

Table 4.16. Knowledge fields of the cited articles on IAARD journals (1995 to 2010)

No.	Field Of Knowledge	No.Occurrences	Percentage
1	Plant Science And Production	3115	25.77
2	Natural Resources And Environment	1967	16.27
3	Plant Protection	1680	13.90
4	Economics, Development And Rural Sociology	1521	12.58
5	Animal Science, Production And Protection	1498	12.39
6	Processing Of Agricultural Products	719	5.95
7	Methodology	431	3.57
8	Agricultural Machinery And Engineering	283	2.34
9	Human Nutrition	207	1.71
10	Postharvest Technology	180	1.49
11	Agriculture In General	149	1.23
12	Education, Extension And Information	127	1.05
13	Pollution	103	0.85
14	Fisheries And Aquaculture	91	0.75
15	Forestry	10	0.08
16	Administration And Legislation	6	0.05
	Total	12,087	100

The table showed that 16 subject categories (knowledge field) of AGRIS/CARIS categorization scheme with 12,087 occurrences had been found. Plant Science and Production achieved the highest occurrence with 25.77 percent of the total occurrences. While, Natural Resources and Environment with the percentage of 16.27 percent taken the second place, and Plant Protection with the percentages of 13.90 percent taken the third places. In contrast, the lowest ones were: a) Administration and Legislation, b) Forestry, and c) Fisheries and Aquaculture with the percentages of 0.05, 0.08, and 0.75 percent respectively. Detail information of field of knowledge with high number of articles will be discussed later.

Plant Science and Production; Natural Resources and Environment; Plant Protection; Economics, Development and Rural Sociology; and Animal Science, Production and Protection were the field of knowledge dominated the cited articles. The explanation of this fact is related to field of knowledge of articles. Similarly, these fields of knowledge are related to the importance of field of research regarding food fulfillment. Three of the field of knowledge, namely, Plant Science and Production; Plant Protection; also

Animal Science, Production and Protection directly related to food fulfilment. Two other field of knowledge support the food fulfilment mentioned above.

From Table 4.16, five knowledge fields of cited articles on IAARD journal have dominant contribution on agricultural research and development in Indonesia than others. The next paragraph will describe the five knowledge fields in detail.

4.1.1.6.1. Plant Science And Production

Plant Science and Production revealed articles related to plant characteristics and plant cultivation. Study on this knowledge field found 15 sub fields of plant science and production with 3115 citation (See table 4.17). Plant Genetics and Breeding, Crops Husbandry, and Fertilizing dominated this sub field of study. These knowledge fields reached 20.61, 13.64, and 12.52 percent of total number of citation of this sub fields respectively. In contrast Irrigation, Plant Structure, and Plant Physiology-Reproduction are is the least with 1.54, 1.32, and 0.93 percent of this sub field total citation of respectively.

Table 4.17. Plant Science and Production sub knowledge fields of the cited articles on IAARD journals (1995 to 2010)

No.	Sub Field Of Knowledge	No. Occurrences	Percentage
1	Plant Genetics And Breeding	642	20.61
2	Crop Husbandry	425	13.64
3	Fertilizing	390	12.52
4	Plant Physiology And Biochemistry	383	12.30
5	Plant Propagation	256	8.22
6	Plant Physiology - Growth And Development	252	8.09
7	Plant Physiology - Nutrition	167	5.36
8	Plant Ecology	146	4.69
9	Cropping Patterns And Systems	115	3.69
10	Soil Cultivation	110	3.53
11	Plant Taxonomy And Geography	62	1.99
12	Seed Production And Processing	49	1.57
13	Irrigation	48	1.54
14	Plant Structure	41	1.32
15	Plant Physiology - Reproduction	29	0.93
	Total	3115	100

4.1.1.6.2. Natural Resources And Environment

Natural resources and environment consisted of articles related to soil, water, energy and their environments. The research found 14 sub fields related to field of natural resources and environment. Table 4.18 showed that soil chemistry and physics, soil biology, also water resources and management were the sub fields with the highest number of cited articles. These sub fields dominated with 647, 249, and 171 articles for Soil Chemistry and Physics, Soil Biology, Water Resources and Management respectively. Drainage, Renewable Energy Resources, and Non-Renewable Energy Resources showed the lowest number of cited articles. These sub fields had 47 articles for Drainage, 19 articles for Renewable Energy Resources, and 6 articles for Non-Renewable Energy Resources.

Table 4.18. Natural Resources and Environment sub knowledge fields of the cited articles on IAARD journals (1995 to 2010)

No.	Sub Field Of Knowledge	No.Occurrences	Percentage
1	Soil Chemistry And Physics	647	32.89
2	Soil Biology	249	12.66
3	Water Resources And Management	171	8.69
4	Soil Science And Management	156	7.93
5	Soil Erosion, Conservation And Reclamation	146	7.42
6	Soil Surveys And Mapping	143	7.27
7	Soil Classification And Genesis	133	6.76
8	Soil Fertility	104	5.29
9	Meteorology And Climatology	104	5.29
10	Nature Conservation And Land Resources	47	2.39
11	Energy Resources Management	21	1.07
12	Drainage	21	1.07
13	Renewable Energy Resources	19	0.97
14	Non-Renewable Energy Resources	6	0.31
	Total	1967	100

4.1.1.6.3. Plant Protection

This knowledge field consisted of articles on how to protect plant from diseases, pests, and weeds. Table 4.19 reported 5-sub fields and 1680 occurrences related to plant protection. Pest of Plant and Plant Diseases dominated this sub field with the number of articles reached 963 and 649 occurrences respectively. Miscellaneous Plant Disorders and Weeds and Weed Control had similar number of occurrences i.e. 9 occurrences each for both sub field.

Table 4.19. Plant Protection sub fields of knowledge of the cited articles on IAARD journals (1995 to 2010)

No.	Sub Field Of Knowledge	No.Occurrences	Percentage
1	Pests Of Plants	963	57.32
2	Plant Diseases	649	38.63
3	Protection Of Plants - General Aspects	50	2.98
4	Miscellaneous Plant Disorders	9	0.54
5	Weeds And Weed Control	9	0.54
	Total	1680	100

4.1.1.6.4. Economics, Development And Rural Sociology

Table 4.20 presented numbers of articles related to economics, development and rural sociology. This field comprise of 17 sub knowledge fields and 1631 occurrences. The highest number of articles in this field was achieved by Agricultural Economics and Policies; Organization, Administration and Management of Agricultural Enterprises or Farms; and Production Economics with the number of articles were 356, 184, and 149 occurrences respectively. In the opposite, Agrarian Structure, Cooperatives, and Rural Population were the three least sub field with number of occurrences reached 16, 13, and 10 respectively.

Table 4.20. Economics, Development and Rural Sociology sub fields of knowledge of the cited articles on IAARD journals (1995 to 2010)

No.	Sub Field Of Knowledge	No.Occurrences	Percentage
1	Agricultural Economics And Policies	356	21.83
2	Organization, Administration And Management Of Agricultural Enterprises Or Farms	184	11.28
3	Production Economics	149	9.14
4	Trade, Marketing And Distribution	140	8.58
5	Rural Sociology And Social Security	138	8.46
6	Development Economics And Policies	134	8.22
7	International Trade	102	6.25
8	Investment, Finance And Credit	88	5.40
9	Agro-Industry	75	4.60
10	Labor And Employment	61	3.74
11	Domestic Trade	59	3.62
12	Consumer Economics	54	3.31
13	Land Economics And Policies	28	1.72
14	Home Economics, Industries And Crafts	24	1.47
15	Agrarian Structure	16	0.98
16	Cooperatives	13	0.80
17	Rural Population	10	0.61
	Total	1631	100

4.1.1.6.5. Animal Science, Production And Protection

Different to plant science and production field of knowledge that separated this field of knowledge with plant protection, AGRIS/CARIS categorization scheme showed

different way on classifying animal related articles. AGRIS/CARIS gathered Animal Science and Production with animal Protection into Animal Science, Production, and Protection. Table 4.21 showed this kind of categorization.

The research reported 14 sub-fields of knowledge and 1498 occurrence of Animal Science, Production and Protection fields of knowledge. Animal feeding, Animal Diseases, and Animal physiology–Reproduction were the highest three sub fields contributed in this field with number of contribution reached 263, 245, and 205 articles respectively. In the other hand, Animal Structure, Animal Taxonomy and Geography, and Miscellaneous Animal Disorders were the sub fields with the lowest contribution. These sub fields contributed only 22, 14, and 8 articles.

Table 4.21. Animal Science, Production and Protection sub knowledge fields of the cited articles on IAARD journals (1995 to 2010)

No.	Sub Field Of Knowledge	No.Occurrences	Percentage
1	Animal Feeding	263	17.56
2	Animal Diseases	245	16.36
3	Animal Physiology - Reproduction	205	13.68
4	Animal Physiology - Nutrition	190	12.68
5	Veterinary Science And Hygiene - General Aspects	137	9.15
6	Animal Genetics And Breeding	116	7.74
7	Animal Husbandry	99	6.61
8	Pests Of Animals	85	5.67
9	Animal Physiology And Biochemistry	61	4.07
10	Animal Physiology - Growth And Development	31	2.07
11	Animal Ecology	22	1.47
12	Animal Structure	22	1.47
13	Animal Taxonomy And Geography	14	0.93
14	Miscellaneous Animal Disorders	8	0.53
	Total	1498	100

Comparing to the previous research, Anwar (2001) reported that 21 unique subject on the Index Islamicus Database. The subject related to agriculture were Plant Physiology, Plant Diseases, Food and Feed Chemistry, Plant Biochemistry, Biochemistry and

Biochemical Studies, Post-Harvest Technology, Genetics, Soil Fertility, Human Health and Pharmaceuticals, Agrochemicals, Plant Sciences, Environmental Ecology, Animal Sciences, Organic and Inorganic Chemicals, Fats and Waxes, Agricultural Products, Horticulture, Water Resource Management, History, and Education and Documentation. These subjects' categories showed many similarities to the field of study in this research.

Working on *Nigella sativa*, Anwar (2005) showed that Agriculture field of knowledge contributed 18.5% of the total articles. Even the categorization of the field of knowledge were different, some field of knowledge were almost similar to the field of knowledge on this report. For instances: a) Oil Composition, Chemical Composition, and Food Chemistry of *Nigella sativa* literatures were related to Processing of Agricultural Product of this report; b) Plant Diseases and Their Treatment, also Insecticidal properties belong to Plant Protection; c) Plant Growth, Seed Technology, Tissue Culture, Also Cropping Systems and Crop Yields were associated with Plant Science and Production; and d) Animal Feed were belong to Animal Science, Production and Protection.

4.1.1.7. Publication Types of Cited Articles on the IAARDJournals

Seventeen different types of publication have been cited in the IAARD journals. The publication types included journal, monograph, proceeding, paper, report, thesis/dissertation, bulletin, instruction manual, newsletter, statistical data, map and other types of publication (see Table 4.22 and Appendix N). Other types of publication consist of dictionary and encyclopedia, government document, television program, abstract, brochure and software with a low number of citations.

Table 4.22. Publication types of cited articles in the IAARD journals (1995 to 2010)

No	Type Of Cited Publications	No. of Cited Articles	Percentage
1	Journal	4,895	41.38
2	Monograph	3,157	26.69
3	Proceeding	1,437	12.15
4	Report	446	3.77
5	Seminar, workshops, and meeting paper	386	3.26
6	Thesis and dissertation	377	3.19
7	Bulletin	362	3.06
8	Instruction manual	285	2.41
9	Newsletter	194	1.64
10	Statistical data	148	1.25
11	Others	143	1.21
	Total	11,830	100

Most researchers selected journal, monograph, and proceeding due to the publications' contents that are scientific, current, and abundance. In this case, journal is the highly seekedpublication type. Journal is commonly selected by the researchers due to its high scientific contents compared to the other publications. Articles in the journal will have to pass tight screening of editorial board/referee that determined whether a manuscript passed the journal requirement or not. The other characteristic of a journal, which become a selection criteria is its current information content. Journals commonly published in a certain period of time that will enable the journals' contents to be updated periodically. Journals also provided researchers with a vast of information. Many journals with similar fields of study published a number of articles in a year. This will enable researchers to harvest information to support their researches. Even with lower scientific values compared to journals, monograph and proceeding,they have almost similar characteristics to the journals with contents that were scientific, current, and abundance. The authors of the IAARD journals considered three main types of source for supporting their articles namely journal, monograph, and proceeding.

4.1.1.7.1. Cited Journals

The IAARD journals' authors used journals as their primary source for their articles. The top eleven from the total of 1,232 journals' titles were cited in the IAARD journals can be seen in Table 4.23 (see also Appendix O). The table showed that, out of eleven most cited journals, three journals were published by the IAARD, namely, *Jurnal Hortikultura*, *Jurna lIlmu Ternak dan Veteriner*, and *Pemberitaan Penelitian Tanah dan Pupuk*. The remaining eight cited journals were not IAARD journals which consisted of the Soil Science Society of America journal, the Crop Science, the Journal of Animal Science, the Journal of Economic Entomology, Horticultural Science, the Agronomy Journal, the Plant Physiology, and the Poultry Science. *Jurnal Hortikultura*, Soil Science Society of American journal, and *Jurnal Ilmu Ternak dan Veteriner* had been the most cited journals with 155, 129 and 86 out of 4,895 total citations accordingly.

Table 4.23. Top eleven cited journals in the IAARD journals (1995 to 2010, n = 4,895)

No.	Journal Titles	No. Cited Articles	Percentage
1	*Jurnal Hortikultura*	155	3.17
2	Soil Science Society Of America Journal	129	2.64
3	*Jurnal Ilmu Ternak dan Veteriner*	86	1.76
4	Crop science	85	1.74
5	*PemberitaanPenelelitian Tanah Dan Pupuk*	57	1.16
6	Journal of Animal Science	56	1.14
7	Journal of Economic Entomology	55	1.12
8	Horticultural Science	52	1.06
9	Agronomy Journal	51	1.04
10	Plant Physiology	47	0.96
11	Poultry Science	47	0.96

Table 4.24 shows pattern of the top eleven journal citations in the IAARD journals. The citations were varied from a minimum of one citation to a maximum of 146 citations of a single IAARD journal. Majority of the journals had one citation only with 1,104 occurrences. Journals with two and three citations in a single IAARD journal had 274

and 121 occurrences respectively. The remaining journals that were cited 4 times or less

had 80 citations and lower.

Table 4.24. The pattern of the top eleven journal citations in the IAARD journals
(1995 to 2010, n=1796)

No.	No. Of Citations	No. Of Occurrences	Percentage
1	1	1104	61.47
2	2	274	15.26
3	3	121	6.74
4	4	80	4.45
5	5	47	2.62
6	7	34	1.89
7	6	24	1.34
8	8	23	1.28
9	10	11	0.61
10	9	10	0.56
11	15	10	0.56

4.1.1.7.2.   Cited Monographs

The second most cited type of publication is monograph. This research found that 2,456

titles of monograph had been cited in theIAARD journals with 3,157 total citations.

Table 4.25 shows the top 15 monographs cited in theIAARD journals (see also

Appendix P).

Table 4.25. The top 15 cited monographs oin the IAARD journals (1995 to 2010, n=3157)

No.	Monograph Titles	No. Cited Articles	Percentage
1	Principles And Procedures Of Statistic. A Biometrical Approach	26	0.82
2	Malignant Catarrhal Fever In Asian Livestock	17	0.54
3	Soil Fertility And Fertilizers	12	0.38
4	Agricultural Process Engineering	10	0.32
5	Fundamental Of Rice Crop Science	10	0.32
6	*Kedelai*	10	0.32
7	Principles And Practices Of Rice Production	10	0.32
8	The Nature And Properties Of Soil	9	0.29
9	Biometrical Methods In Quantitative Genetic Analysis	8	0.25
10	Effective Use Of Agricultural Materials And Insect Pest Control On Soybean	8	0.25
11	*Jagung*	8	0.25
12	*Monograf Tanaman Lada*	8	0.25
13	Reproduction In Farm Animals	8	0.25
14	*Teknologi Pengelolaan Lahan Kering Menuju Pertanian Produktif Dan Ramah Lingkungan*	8	0.25
15	Volcanic Ash Soil – Genesis, Properties, And Utilization. Developments In Soil Science	8	0.25

Principles and procedures of statistic: A biometrical approach was the highest monograph cited in the IAARD journals. The citations received were 26 which was 0.82% of the total 3,157 citations. Placed second and third were *Malignant catarrhal fever in the Asian Livestock* journal which was cited 17 times with 12 citations in the IAARD journals. Meanwhile, four other monographs, namely Agricultural Process Engineering, Fundamental of Rice Crop Science, *Kedelai*, and Principles and Practices of Rice Production ranked fourth with a similar citation number (10 citations). The Nature and Properties of Soil was placed fifth with 9 citations. Whereas the other seven monographs namely: a) Biometrical Methods in Quantitative Genetic Analysis, b) Effective Use of Agricultural Materials and Insect Pest Control on Soybean, c) *Jagung*, d) *Monograf Tanaman Lada*, e) Reproduction in Farm Animals, f) Teknologi Pengelolaan Lahan Kering Menuju Pertanian Produktif dan Ramah Lingkungan, and g) Volcanic Ash Soil – Genesis, Properties, Utilization, and Developments in Soil Science

placed sixth in the rankings. These monographs had similar citation number, i.e. 8 citations for each monograph.

Table 4.26. The pattern of monograph citations in the IAARD journals (1995 to 2010)

No.	No. Of Citations	No. Of Occurrences	Percentage
1	1	2312	87.91
2	2	218	8.29
3	3	59	2.24
4	4	19	0.72
5	5	13	0.49
6	6	2	0.08
7	7	2	0.08
8	8	3	0.11
9	17	1	0.04
10	24	1	0.04
	Total	2630	100

Table 4.26 reported on the pattern of monograph citationsin theIAARD journals with a minimum citation of one to a maximum of 24 citations. The highest occurrence of a single monograph citation was 87.91 percent represented by 2,312 out of 2,630 total citations. The second and third were monographs that were cited two and three times that reflected by 218 and 59 occurrences respectively. The other monographs that were cited for more than four times had 19 occurrences and less.

4.1.1.7.3.   Cited Proceedings/Papers of Seminars, Workshops, and Scientific Meetings

The authors of theIAARD journals cited 862 proceedings and papers of seminars, workshops, and scientific meetings out of 1,437 citations. Table 4.27 presents 12 top proceedings that were cited in the IAARD journals (see also Appendix Q).

Table 4.27. The twelve top cited proceedings and papers of seminars, workshops, and scientific meetings in the IAARD journals (1995 to 2010, n=1,437)

No.	Journal Title	No. Cited Articles	Percentage
1	Soil Science Society of American Proceeding	29	2.02
2	Australian Central for International Agricultural Research Proceeding		
3	*Prosiding Pertemuan Pembahasan dan Komunikasi Hasil Penelitian Tanah dan Agroklimat.*	16	1.11
4	Proceedings of Modsim 97	11	0.77
5	Second International Conference on Science and Technology for the Assessment of Global Climate Change and Its Impact on Indonesian Maritime Continent	10	0.70
6	*Prosiding Seminar Nasional Sumberdaya Lahan*	10	0.70
7	*Prosiding Seminar Nasional Sumberdaya Lahan Pertanian*	10	0.70
8	*Prosiding Balai Penelitian Tanaman Sayuran*	8	0.56
9	Proceeding of the 3rd AAAP Animal Science Congress	7	0.49
10	Proceeding of the ATA 106 midterm seminar	7	0.49
11	*Prosiding Seminar Ekologi Lautdan Pesisir*	7	0.49
12	*Seminar Nasional Diseminasi Hasil Penelitian*	7	0.49

The Soil Science Society of America proceeding was the highest proceeding cited in the IAARD journals followed by the Australian Central for International Agricultural Research proceeding and *Prosiding Pertemuan Pembahasan dan Komunikasi Hasil Penelitian Tanah dan Agroklimat*. These proceedings had 29, 22, and 16 citations accordingly. Placed fifth was the Proceedings of Modsim 97 with 11 citations. Meanwhile, Second International Conference on Science and Technology for the Assessment of Global Climate Change and its Impact on Indonesian Maritime Continent, *Prosiding Seminar Nasional Sumberdaya Lahan,* and *Prosiding Seminar Nasional Sumberdaya Lahan Pertanian* had 10 citations each. The remaining proceedings/papers were *Prosiding Balai Penelitian Tanaman Sayuran* which was cited 8 times, proceeding of the 3rd AAAP Animal Science Congress, Proceeding of the ATA

106 Midterm Seminar, *Prosiding Seminar Ekologi Laut dan Pesisir*, and *Seminar Nasional Diseminasi Hasil Penelitian* were cited 7 times each.

The pattern of cited proceedings and papers of the seminars, workshops, and scientific meetings in the IAARD journals can be seen in Table 4.28. The table presented the cited monographs in the IAARD journals with one to 24 citations out of 1,021 total occurrences. Number of proceedings and papers of the seminars, workshops, and scientific meetings that were cited only once had 817 occurrences. This was the highest number of citations. Then those proceedings/papers which were cited 2 times had 110 occurrences, while the remaining proceedings/papers with 3 or more citations had 42 or less number of citations.

Table 4.28. The pattern of proceedings and papers of seminars, workshops, and scientific meetings on citation in the IAARD journals (1995 to 2010)

No.	No. Of Citations	No. OfOccurences	Percentage
1	1	817	80.02
2	2	110	10.77
3	3	42	4.11
4	4	25	2.45
5	5	14	1.37
6	6	6	0.59
7	7	4	0.39
8	8	2	0.20
9	24	1	0.10
	Total	1021	100

Compared to the previous researches, publication types of cited articles in theIAARD journals were almost similar to this particular research. Tiew and Kaur (2000) and Keat and Kaur (2008) reported that journals/serial publications, monographs/books, and conference proceedings as the main cited publications. Sutardji (2003) stated journals received 41.15% citations, monograph (31.08%), and proceeding (14.31%). These

resources were the most cited publication types in the *Jurnal Penelitian Pertanian Tanaman Pangan*. Sutardji (2011) also reported the increasing number of journal citations between the years of 2008 to 2010 to 49.21%. The increase was followed by the decreasing number of monograph and proceeding citations. Similarly, Fagbola and Adejoro (2012) reported that 46.86% of articles cited in The Nigerian Journal of Horticultural Science came from journals, followed by books and proceedings. Ezema and Eze (2012) also strengthened that journals (58 %), monographs (24.4 %), and proceedings (7.6 %) were the main information resources in the Nigerian agricultural researches.

Even most of the researchers believed that journal has been the most cited publication type, Edzan (2007) reported that the most citations of student's academic exercise in the Faculty of Computer Science and Information Technology, University of Malaya were books (43.8%), and journal articles (17.8%). Similarly, Makkasau and Mansjur (2006) found handbooks and journals as main resources in the *Risalah Penelitian Tanaman Jagung dan Serealia* publication. Davis (2001) also reported that books as the highest cited publication type of the undergraduate students' citation. On the contrary, Goodrum (2001) reported that the most cited publication type was conference proceedings, which were cited 87 times and only followed by journals and books. Other than the above mentioned publication types, they also used publications such as electronic media, newspapers, dictionaries/encyclopedias reports, laboratory manuals, patents, standards, government publications, private communications, and unpublished data.

4.1.1.8 Cited Literatures in the IAARDJournals

This research found that 10,216 literatures cited in the IAARD journals with the citation number reached up to 11,830 citations. Table 4.29 (see also Appendix R) shows the

Keys to Soil Taxonomy as the highest cited literature in the IAARD journals with 25

citations followed by two other literatures, namely, *Ilmu Tanah* and Official Methods of

Analysis of Association of Official Analytical Chemistry with 16 citations each. Plant

Physiology, and Principles and Procedures of Statistic: a Biometrical Approach, were

the other two literatures that had been cited 15 times each. Soil Survey Manual and Soil

Fertility and Fertilizer literatures were cited 13 and 11 times respectively. The other two

groups of literatures had been cited 10 and 9 times each. The literatures that had been

cited 10 times were Agricultural Process Engineering, Cashew, and Principles, and

Practices of Rice Production. Another group included 4 articles, namely, *Petunjuk*

Teknis Evaluasi Lahan untuk Komoditas Pertanian, Price and Investment Policies in

Indonesia: Food Crop Sector, Rainfall Types based on Wet and Dry Period Ratios for

Indonesia with W. N. Guinea, and SAS User's Guide: Statistics.

Table 4.29. The literatures that were cited in the IAARD journals (1995 to 2010,

n=11,830)

No.	Literature Titles	No. Cited Articles	Percentage
1	Keys To Soil Taxonomy	25	0.21
2	*Ilmu Tanah*	16	0.14
3	Official Methods Of Analysis Of Association Of Official Analytical Chemistry	16	0.14
4	Plant Physiology	15	0.13
5	Principles And Procedures Of Statistic: A Biometrical Approach	15	0.13
6	Soil Survey Manual	13	0.11
7	Soil Fertility And Fertilizer	11	0.09
8	Agricultural Process Engineering	10	0.08
9	Cashew	10	0.08
10	Principles And Practices Of Rice Production	10	0.08
11	*Petunjuk Teknis Evaluasi Lahan Untuk Komoditas Pertanian*	9	0.08
12	Price And Investment Policies In The Indonesian: Food Crops Sector	9	0.08
13	Rainfall Types Based On Wet And Dry Period Ratios For Indonesia With W. N. Guinea	9	0.08
14	SAS User's Guide: Statistics	9	0.08

Table 4.30 shows the pattern of cited literatures in the IAARD journals. The citation of the literature varied from one to 16 occurrences. Most of the literatures were cited once with 9,708 out of 10,607 total occurrences. The next two highest numbers of cited literatures were of those with two and three citations which had 729 and 106 occurences respectively. The literatures that were cited 4 times or more had 33 occurences and less.

Table 4.30. The pattern of the cited literatures in the IAARD journals (1995 to 2010)

No	No. Of Citations	No. Of Occurrences	Percentage
1	1	9,708	91.52
2	2	729	6.87
3	3	106	1.00
4	4	33	0.31
5	5	10	0.09
6	6	10	0.09
7	7	4	0.04
8	8	1	0.01
9	9	3	0.03
10	10	1	0.01
11	15	1	0.01
12	16	1	0.01
	Total	10,607	100

In previous researches, it was reported that 182 journal titles were cited only once, while eleven other journals cited two or more (Schaffer, 2000). Meanwhile, Hutchison and White (2003) reported that the citation of the *Journal of American Association of Taxation* reached the maximum number of nine citations per article, while the top ten articles of the *Journal Of Personal Selling And The Sales Management* were cited 12 to 76 times each (Leigh, Pullin and Commer, 2001). Roy et al. (2002) found that citation of Otolaryngology journals varied from 57 counts for Otorhinolaryngology and its related specialist and 640 counts for Laryngoscope. Redman, Manakyan, and Tanner (1999) reported that *Journal Citation Of Real Estate* and related journal reached 24 to 714 counts each.

Dhawan and Gupta (2005) found that 136 papers on Indian physics research papers have no citation at all. Meanwhile, 108 papers had 15 to 30 citations and 56 papers had 31 to 157 citations. Bodenhorn (2003) found that two departments published 130 top economic journals articles had no citation while other departments' publications received varied citations from 3 to 452 times. In addition, Ezema and Eze (2012) reported that 2,253 out of 4,832 articles had 45 to 424 citations. Konur (2011) who conducted a research on biodiesel from microalgae, found that an article written by Chisti (2007) had been the most cited paper with 320 citations. The other highest citations were researches conducted by Ram (2010) with 205 citations, Fasae (2011) with 51 citations, and Thomas, et. al (2010) with 70 citations.

The IAARD journal articles had been cited globally. Retrieving journal articles in the Google Scholar and Scopus showed that the *Indonesian Journal of Agricultural Science* received 91 citations compared to the *Jurnal Ilmu Ternak Dan Veteriner* (186 citations), *Jurnal Hortikultura* (125 citations) and *Jurnal Tanah dan Iklim* (21 citations). In Scopus, citations received by the above mentioned journals were 4, 26, 4, and 0 accordingly. The difference in citation number between Google Scholar and Scopus was due to that Scopus is an international indexing journal, meaning only articles in English language which were cited globally will be registered. The low number of the IAARD journals articles written in English limit the citation number of the journals globally. Meanwhile, Google Scholar does not limit the indexed for English language journals only. This will in turn give the opportunity for native language journals to be indexed in the Google Scholar.

4.1.1.9. Cited Agricultural Commodities in the IAARD Publications

Study onthe cited commodities in the IAARD journals found that there were 305 agricultural commodities which comprised 41 animals and 264 plants. Appendix S presented the list of agricultural commodities cited in the IAARD journals. Table 4.31 presentsthe cited agricultural commodities, which were classified into five subsectors. Food crops commodities were the highest with 2,140 citations followed by estate crop and horticulture in second and third places. Both sub sectors received 1,126 and 1,008 citations respectively. Meanwhile, subsector of the animal husbandry and, fish and aquaculture received 983 and 137 citations respectively.

Table 4.31. The agricultural commodities of cited articles in the IAARD journals based on sub sectors (1995 to 2010)

No.	Sub Sector Agricultural Commodities	No. Articles	Percentage
1	Food Crops	2,140	39.67
2	Estate Crops	1,126	20.88
3	Horticulture	1,008	18.69
4	Animal Husbandry	983	18.22
5	Fish And Aquaculture	137	2.54
	Total	5,394	100

Similar to the agricultural commodities of the cited articles, the research also found that the cited articles in theIAARD journals presented by the sub sector of food crops as the highest cited group of agricultural commodities. This fact proved the importance of food crops in the agricultural research. The remaining commodities were protein and fat resources. Meanwhile, commodities presented in the estate crops and horticulture groups were reflected as the commodities that support daily food supply. This two groups of commodities comprised commodities related to vegetables, fruits, ingredients, and others.

Citations of agricultural commodities in the IAARD journals varied from one to 301. Commodities, which were cited one time, had the highest occurrences (301 occurrences, 44.13%). The commodities with two and three citations had 106 and 54 occurrences respectively. The remaining commodities had four citations and more, received 33 occurrences or less (see Table 4.32).

Table 4.32. The pattern of the cited agricultural commodities in the IAARD journals (1995 to 2010)

No.	No. Of Citations	No. Of Occurrences	Percentage
1	1	301	44.13
2	2	106	15.54
3	3	54	7.92
4	4	33	4.84
5	5	25	3.67
6	8	16	2.35
7	7	14	2.05
8	6	13	1.91
9	10	11	1.61
10	12	11	1.61

Details of the agricultural commodities, which were cited in the IAARD journals will be described in the next paragraphs.

4.1.1.9.1. Food Crops Commodities

Food crop was the highest agricultural commodities sector cited in theIAARD journals. The study found 36 commodities that had 2,132 citations of this sub sector in the journals. Table 4.33 shows the top ten cited food crops commodities in the IAARD journals.

Table 4.33. The top ten cited food crops commodities in the IAARD journals (1995 to 2010, n = 2132)

No.	Food Crops Commodities	No. Articles	Percentage
1	*Oryza sativa*	986	46.07
2	*Glycine max*	308	14.39
3	*Zea mays*	264	12.34
4	*Solanum tuberosum*	158	7.38
5	*Arachishypogaea*	69	3.22
6	*Triticum*	65	3.04
7	*Manihot esculenta*	47	2.20
8	*Sorghum bicolor*	45	2.10
9	*Ipomoea batatas*	31	1.45
10	*Vigna unguiculata*	25	1.17

Oriza sativa was the most cited food crops commodity in the IAARD journals. Its citation reached 986 (46.2%) of the total citations. The next two highest citations of food crops commodities were *Glycine max* and *Zea mays,* which contributed 308 and 264 citations respectively. Other commodities, namely, *Solanum tuberosum, Arachis hypogaea, Triticum, Manihot esculenta, Sorghum bicolor, Ipomoea batatas, and Vigna unguiculata* that were also appeared in the IAARD journalshad 158 to 25 citations.

Table 4.34 shows the pattern of the top ten cited food crops commodities in theIAARD journals. The number of citations varied from one to 286. Most of the literatures were cited one time (42 occurrences - 31, 58% out of 133 total occurrences). The second and third places were commodities that had two and three citations with 23 and 9 occurrences respectively. The remaining citation pattern was the literatures cited four or more with six occurrences and less.

Table 4.34. The pattern of the cited food crops commodities in the IAARD journals

(1995 to 2010)

No. Of Citations	No. Of Occurrences	Percentage
1	42	31.58
2	23	17.29
3	9	6.77
4	6	4.51
5	6	4.51
6	3	2.26
7	2	1.50
8	3	2.26
9	3	2.26
10	1	0.75

4.1.1.9.2. Estate Crop Commodities

The study also found that 103 cited estate crops commodities with 1,126 citations in the IAARD journals. *Piper nigrum* was the commodity that had the highest citation as reflected in Table 4.35 with 129 citations (11.46% of 1,126 total citations).

Nicotiana tabacum and *Theobroma cacao* were ranked second and third with 98 and 80 citations respectively. The other commodities which included *Gossypium hirsutum, Cocos nucifera, Anacardium occidentale, Elaeis guineensis, Saccharum officinarum, Citrus, Hevea brasiliensis,* and *Zingiber officinale* recorded 78 citations and less.

Table 4.35. The top eleven cited estate crops commodities in the IAARD journals

(1995 to 2010, n = 1126)

No.	Estate Crops Commodities	No. Articles	Percentage
1	*Piper nigrum*	129	11.46
2	*Nicotiana tabacum*	98	8.70
3	*Theobroma cacao*	80	7.10
4	*Gossypium hirsutum*	78	6.93
5	*Cocos nucifera*	64	5.68
6	*Anacardium occidentale*	63	5.60
7	*Elaeis guineensis*	63	5.60
8	*Saccharum officinarum*	49	4.35
9	*Citrus*	42	3.73
10	*Hevea brasiliensis*	41	3.64
11	*Zingiber officinale*	41	3.64

Citation pattern of the estate crop commodities varied from one to 57 citations. Table

4.36 presents citation pattern of the top eleven Estate Crops Commodities in the IAARD

journals.

Table 4.36. The citation pattern of cited estate cropscommodities in the IAARD

journals (1995 to 2010)

No.	No. Of Citations	No. Of Occurrences	Percentage
1	1	98	44.75
2	2	31	14.16
3	3	23	10.50
4	4	15	6.85
5	5	6	2.74
6	6	4	1.83
7	7	4	1.83
8	8	4	1.83
9	10	4	1.83
10	13	4	1.83
11	22	4	1.83

Majority of the commodities were cited only one time with 98 out of 219 total

occurrences (44.75%). Commodities which ranked second and third received 31 and 23

occurrences respectively. Other commodities that were cited four times or more had 15 and less number of occurrences.

4.1.1.9.3. Horticultural Commodities

A total of 112 horticultural commodities were cited in the IAARD journals with 1,008 citations. Table 4.37 presented the top ten cited horticultural commodities in the journals.

Table 4.37. The top ten cited horticultural commodities in the IAARD journals
(1995 to 2010, n = 1008)

No.	Horticultural Commodities	No. Articles	Percentage
1	*Musa acuminata*	79	7.84
2	*Allium cepa*	74	7.34
3	*Chrysanthemum indicum*	74	7.34
4	*Capsicum/ Chili*	49	4.86
5	*Solanum lycopersicum*	48	4.76
6	*Mangifera indica*	47	4.66
7	*Jasminum sambac*	37	3.67
8	*Malus domestica*	34	3.37
9	Rosa	34	3.37
10	*Carica papaya*	31	3.08

Musa acuminata, Allium cepa, and *Chrysanthemum indicum* were the top three horticultural commodities that were cited in the IAARD journals with 79 and 74 citations respectively. *Allium cepa* and *Chrysanthemum indicum* had the same number of citations (74 citations). The other commodities included *Capsicum, Solanum lycopersicum, Mangifera indica, Jasminum sambac, Malus domestica, Rosa,* and *Carica papaya*, were cited 49 times and less.

The study also revealed that horticultural commodities were cited 1 to 65 times in the IAARD journals. Table 4.38 shows horticultural commodities that were cited one time became the highest in the rankings with 112 citations (48.70%). Commodities that were

cited two and three times became second and third in the rankings with 41 and 20 occurrences. The others, which were cited more than four times, had eight citations and less.

Table 4.38. The pattern of cited horticultural commodities in the IAARD journals (1995 to 2010, n=230)

No. Of Citations	No. Of Occurrences	Percentage
1	112	48.70
2	41	17.83
3	20	8.70
4	8	3.48
5	8	3.48
6	4	1.74
7	4	1.74
8	8	3.48
10	4	1.74

4.1.1.9.4. Animal Husbandry Commodities

There were 35 animal husbandry commodities with a total of 983 citations. Table 4.39 shows the top ten cited animal husbandry commodities in theIAARD journals with *Gallus gallusdomesticus* as the highest cited animal husbandry commodity in the journals. It reported a total of 207 citations (21.06%). *Ovisaries* and *Bosprimigenius* were the commodities with the second and third highest citations of 198 and 164 respectively. Other commodities, namely *Bostaurus, Capra aegagrushircus, Bovinae/Bovine*, Duck, *Ruminansia, Sus, and Leucaena leucocephala* were cited75 times and less. Whereas *Leucaena leucocephala* was a type of plant that was included in this sector due to its pivotal role as animal feedings.

Table 4.39. The top ten animal husbandry commodities of cited articles in the IAARD journals (1995 to 2010, $n = 983$)

No.	Animal Husbandry Commodities	No. Articles	Percentage
1	*Gallus gallusdomesticus*	207	21.06
2	*Ovisaries*	198	20.14
3	*Bos primigenius*	164	16.68
4	*Bos taurus*	75	7.63
5	*Capra aegagrushircus*	69	7.02
6	*Bovinae/Bovine*	61	6.21
7	Duck	41	4.17
8	*Ruminansia*	27	2.75
9	*Sus*	24	2.44
10	*Leucaena leucocephala*	17	1.73

Animal husbandry commodities in the IAARD journals had been cited one to 22 times with a total of 71 occurrences. Animal husbandry commodities with one citation had the highest occurrence, i.e. 32 citations (45.07%, see Table 4.40). This was followed by other commodities that were cited two and five times with eight and five occurrences respectively. The remaining commodities had four, six and more citations with three occurrences and less.

Table 4.40. The pattern of cited animal husbandry commodities in the IAARD journals (1995 to 2010, n=230)

No.	No. Of Citations	No. Of Occurrences	Percentage
1	1	32	45.07
2	2	8	11.27
3	5	5	7.04
4	4	3	4.23
5	7	3	4.23
6	6	2	2.82
7	10	2	2.82
8	12	2	2.82

4.1.1.9.5. Fisheries and Aquaculture Commodities

Fisheries and aquaculture commodities consisted of 18 commodities with 137 citations.

Table 4.41 shows five most cited fisheries and aquaculture commodities in the IAARD

journals. Fish ranked first with 25 citations (51.72%) followed by *Oreochromis*

niloticus and shrimp ranked second and third with 17 and 15 citations each.The last two

commodities were seaweed and prawn with 12 and 5 citations respectively.

Table 4.41. The top five fisheries and aquaculture commodities of cited articles in
the IAARD journals (1995 to 2010, $n = 983$)

No.	Fisheries and Aquaculture Commodities	No. Articles	Percentage
1	Fish	75	51.72
2	*Oreochromis niloticus*	17	11.72
3	Shrimp (*Penaeidae*)	15	10.34
4	Sea Weed	12	8.276
5	Prawn (*Palaemonidae*)	5	3.448

From the table above, each commodity is categorized as a group of fish and not as a

single commodity or species. For instance, fish was not a single commodity such as

Oreochromis niloticus; it consisted of all the fish species. Similarly, seaweed consisted

of several species of algae.

Table 4.42 shows the pattern of cited fisheries and aquaculture commodities in the

IAARD journals. Most of the fisheries and aquaculture commodities were cited one

time with 19 occurrences. There were a few commodities which were cited 2, 7, and 13,

times had two occurrences each. The others that were cited 3, 8, 12, 15, and 45 times

had only one occurrence each.

Table 4.42. The pattern of the cited fisheries and aquaculture commodities in the
IAARD journals (1995 to 2010)

No.	No. Of Citations	No. Of Occurrences	Percentage
1	1	19	63.33
2	2	2	6.67
3	7	2	6.67
4	13	2	6.67
5	3	1	3.33
6	8	1	3.33
7	12	1	3.33
8	15	1	3.33
9	45	1	3.33
	Total	30	100

Research on the cited agricultural commodities is rare. The only articles found on agricultural commodities were researches conducted by Sidinei et al. (2010) and Ezema and Eze (2012). Sidinei et al. (2010) had reported on several animal commodities such as macro-invertebrate, fish, zooplankton, amphibian, phytoplankton, plankton, macrophyte, bird, bacteria, and periphyton in the research on bibliometric of aquatic ecology. Meanwhile, Ezema and Eze (2012) reported on the occurrence of poultry, goats/sheep, cattle, rabbits, dogs, swine, fishery, rats, horses, monkeys, snails, grass cutters in the study of animal health and production in Nigeria. These two articles were the only articles containing animal commodities. None of the plant commodities were indicated in the researches.

The commodities mentioned by Sidineiet. al. (2010) and Ezema and Eze (2012) above, showed some similarities to several agricultural commodities in this research. Fish was the animal commodities, which was indicated in both researches. Meanwhile, shrimp and prawn were referred by Sidinei et al. (2010) as periphyton. Other than fish, comparing the animal commodities between this research and the research conducted by Ezema and Eze (2012), there were other available commodities commonly found,

namely, poultry (Duck, *Passer*, *Gallus gallusdomesticus*, and *Anser*), goats/sheep, cattle (*Bos primigenius*, *Bos taurus*, *Bovinae*, *Bubalus bubalis*), rabbits, dogs, swine, and horses.

4.1.1.10. Years Published of the Cited Articles in the IAARD Journals

Years published of the cited articles in the IAARD journals can be seen in Table 4.43 which the span of years published started from 1885 to 2010. Based on the grouping of a 5 year period, the period of 1991-1995 had the highest number of citations (2,444 citations, 20.66%). It was followed by the periods of 1996-2000 and 2001-2005 with 2,315 and 1,825 citations respectively. On the contrary, the periods of 1966-1970, 1961-1965, and 1885-1960 received the lowest citation percentage in theIAARD journals (1.83%, 1.27%, and 1.93%).

Table 4.43. Years published of the cited articles in the IAARD journals (1995 to 2010)

No.	Years Published	No. Cited Articles	Percentage
1	2006-2010	746	6.31
2	2001-2005	1,825	15.43
3	1996-2000	2,315	19.57
4	1991-1995	2,444	20.66
5	1986-1990	1630	13.78
6	1981-1985	1119	9.46
7	1976-1980	772	6.53
8	1971-1975	385	3.25
9	1966-1970	216	1.83
10	1961-1965	150	1.27
11	1885-1960	228	1.93
		11,830	100

Schaffer (2004) had used a similar grouping on the span of the years in his research. The said researcher found that the oldest citations in the year of 1894 which was almost similar to citations found within the period of 1885-1960 in this research. Another old publication which was published in 1935 was cited in the final year project reports

emanating from the Faculty of Computer Science and Information Technology, University of Malaya (Edzan, 2007).

Tiew and Kaur (2000) divided the years of published of the cited articles in their researches into a period of ten years. They reported that within the period of 1978-1987, the highest citations with 31.03% out of the total citations were found. Meanwhile, research on students' academic exercise conducted by Edzan (2007) showed that the most cited years of published articles were within the last three years (29.9%). Schaffer (2004) on the other hand found that the oldest citation in his samples was from 1894. The period of 1990 to 1999 had the highest cited articles.

Samdahl and Kelly (1999) found that the *Journal Leisure Research* was cited 156 counts for its journals published within 6 to10 year period. This followed by articles published within the period of 1-5 years and over 10 years old with the citations count reached up to 151 and 111 respectively. Most of the cited years of the computer science literature were between 1990-1999, followed by 1980-1989 and 1970-1979 with the total citations of 168, 25, and 3 counts respectively (Goodrom, 2001). Makkasau and Mansjur (2006) stated that most of the cited literatures published in 1991-2000 (341 out of a total of 762 articles, 44.75%). Only eight cited articles published in 2001-2005 and ten articles were published in 1921-1960. Similarly, Sutardji (2003) reported that most of the cited articles were published within 11-20 year period prior to the years of the publications (40.15%), followed by 1-10 years (36.15%) and 21-31 years (15.31%).

From the cited years of published articles as mentioned above, it could be summarized that the number of years were varied of all the previous researches. Tiew and Kaur (2000) and Ezema and Eze (2012) found that the highest citations were within 10-20

years after an article was published. Makkasau and Mansjur (2006) reported that the highest was within the period of 10-15 years after an article was published. Meanwhile, Samdahl and Kelly (1999) and Sutardji (2011) found that the highest cited no of years of an article was within 5-10 year period. In addition, Edzan (2007) reported that the highest citation was within the last three years. Comparatively, the cited years of published articles in the previous researches and this research, the highest citations were found between 1996-2000 (10-15 year period), we could conclude that the grouping of the years span was still within the grouping of the other researches.

4.1.1.11.   Fifteen Year Impact Factor

Table 4.44 shows the fifteen year impact factor of the IAARD journals. The table showed that HOR was the IAARD journal's contributor with the highest impact factor (1.23) comparing to the other journals. JPP and JAE were ranked second and third with the scores of 0.78 and 0.51 respectively. The other journals, namely JTV, JTP, TAN, TRI, JEP, and JAS with the scores of 0.10 to 0.51. JAS had the lowest impact factor in the publications.

Table 4.44. The top fifteen year impact factor of the IAARD journals (1995 to 2010)

No.	IAARD Publications	Total No. Of Samples	No. Of Cited Journal	No. Self-Citation On The Journal	Impact Factor
1	Jurnal Hortikultura (HOR)	91	150	38	1.23
2	Jurnal Penelitian dan Pengembangan Pertanian (JPP)	60	51	4	0.78
3	Jurnal Agro Ekonomi (JAE)	68	40	4	0.53
4	Jurnal IlmuTernak dan Veteriner (JTV)	67	86	52	0.51
5	Jurnal Penelitian Pertanian Tanaman Pangan (JTP)	61	27	4	0.38
6	Jurnal Tanah dan Iklim (TAN)	84	31	5	0.31
7	Jurnal Penelitian dan Pengembangan Tanaman Industri (TRI)	77	27	14	0.17
8	Jurnal Enjiniring Pertanian (JEP)	63	9	2	0.11
9	Indonesian Journal of Agricultural Science (JAS)	103	17	7	0.10

Eight of the IAARD journals received their impact factor scores less than one, except for HOR (1.23). The impact factors of the eight journals varied from 0.10 for JAS and 0.78 for JPP. Sutardji (2011) reported that impact factor of the *Jurnal Penelitian Pertanian Tanaman Pangan* was 0.30 which is comparatively similar to *JTP* (0.38) in this research findings. Azevedo et al. (2010) had conducted a research on Brazilian freshwater ichthyology. He also found almost similar findings where impact factor scores were less than one. In details, the findings had shown that journals like *Genetics and Molecular Biology received* 0.373, *Revista Brasileira de Zootecnia* received 0.250, *Brazilian Archives of Biology and Technology* received 0.131, and *Brazilian Journal of Medical and Biological Research* received 0.859.

Comparing to other international horticulture journals that were indexed in the Web of Science and Scopus, the *Jurnal Hortikultura* (HOR) received an impact factor of 1.23 which was higher than the *Indian Journal of Horticulture*, the *European Journal of Horticultural Science*, and the *Horticultural Science* (Table 4.45). However, the impact factor of HOR was lower compared to the J*ournal of the American Society for Horticultural Science*. This proved that the *Jurnal Hortikultura* had been cited higher in the national level compared to the other three international journals which had been cited globally, except for the *Journal of the American Society for Horticultural Science*.

Table 4.45. Comparison on the *Jurnal Hortikultura* to other international horticultural journals

No.	Journal Titles	Impact Factor	Scopus
1	Indian Journal of Horticulture	0.125	0.255
2	Journal of the American Society for Horticultural Science	1.280	0.716
3	European Journal of Horticultural Science	0.381	0.270
4	Horticultural Science	0.920	0.395

4.1.1.12. IAARD Journals' Self-Citations

Table 4.46 shows self-citationsin the IAARD journals' authors. In totality, the IAARD journals received 1,332 self-cited articles out of 11,830 cited articles. This reflected on the total rate of 11.26%. The *Jurnal Penelitiandan Pengembangan Pertanian* was the journal with the highest number of self-citations rate (17.71%). The next highest were the *Jurnal Ilmu Ternak dan Veteriner* on second with 14.18% self-citations rate and the *Jurnal Enjiniring Pertanian* with 13.39% self-citations rate. On the other hand, three IAARD journals, namely, the *Jurnal Tanah dan Iklim,* the *Jurnal Hortikultura* and the *Jurnal Agro Ekonomi* had the lowest self-cited articles of 8.69, 8.46, and 7.07 self-citations rates accordingly.

Table 4.46. IAARD journals' self-citations (1995 to 2010)

N0.	IAARD Journals	No. Self-Cited Articles	No.of Cited Articles	Self-Citations Rate
1	*Jurnal Penelitian dan Pengembangan Pertanian*	262	1,479	17.71
2	*Jurnal Ilmu Ternak dan Veteriner*	191	1,347	14.18
3	*Jurnal Enjiniring Pertanian*	119	889	13.39
4	*Jurnal Penelitian Tanaman Industri*	119	900	13.22
5	*Penelitian Pertanian Tanaman Pangan*	107	886	12.08
6	Indonesian Journal of Agricultural Science	186	2071	8.98
7	*Jurnal Tanah dan Iklim*	139	1,600	8.69
8	*Jurnal Hortikultura*	128	1,513	8.46
9	*Jurnal Agro Ekonomi*	81	1,145	7.07
	Total	1,332	11,830	11.26

The table 4.47 shows the pattern of the IAARD journals' self-citations. It also showed that 212 articles (31.45%) had no self-citation. Majority of the the journals had one to 19 self-citations per article. Other than zero self-citation, the articles with one self-citation ranked the highest (21.81) followed by articles with two self-citations (17.51%)

and three self-citation (10.68). In contrast, articles with 14, 16, and 19 self-citations per article had the least number of cited articles of one each.

Table 4.47. IAARD journals' self-citations pattern in the IAARD journals
(1995 to 2010)

No. of Self-Citation Per Article	No. of Self-Cited Articles	Percentage
0	212	31.45
1	147	21.81
2	118	17.51
3	72	10.68
4	45	6.68
5	28	4.15
6	22	3.26
7	11	1.63
8	4	0.59
9	2	0.30
10	4	0.59
11	2	0.30
12	2	0.30
13	2	0.30
14	1	0.15
16	1	0.15
19	1	0.15
Total	674	100

There are several ways for authors to reveal self-citations of a journal. Some authors reported on the actual number of self-citations made on a journal. Other authors showed the ratio between cited and self-cited articles and some reported on the percentage of cited and self-cited articles. Mehrad and Goltaji (2011) referred the later as a self-cited rate. Kurmis and Kurmis (2010) reported that the Academic Radiology had 399 self-citations out of 4,715 references. Meanwhile, Bakri and Willett (2008) found that 34 from 85 articles of the Malaysian Journal Library and Information Science were self-cited within the year of 2001-2006. In addition, Sutardji (2003) revealed that 90 out of 1,300 cited articles were actually self-cited.

Meanwhile, self-citations of the Journal of the Natural Rubber Research in the years of 1988 to 1997 reached 40.2% of its total articles that had one self-citation, two journal

self-citations (24.8%), and three journal self-citations (16.8%). The remaining articles had four and twelve journal self-citations (Tiew, 2000). Schaffer (2004) reported that a Psychology Faculty member of the Texas A&M University made 35 self-citations (10%) of the sample. Koehler et al. (2000) found that the self-citation of CM, IR, JIC, Libres, and JASIS reached up to 9.8, 6.1, 25.8, 5.1, and 11.0 percents accordingly. Meanwhile, Katerattanakul and Han (2003) reported that self-citations ratio of 11 well recognized IS journals and four European IS journals reached 0.16% and 0.26% respectively. Mehrad and Goltaji (2011) who worked on the *Agriculture and Veterinary Science Journals* found that most journals self-cited rate during the years of 2001 to 2007 is averaged at 30.05.

Compared to the previous researches, self-citations of the IAARD journals were still permissible. Mc Veigh (2004) in Mehrad and Goltaji (2011) stated that self-citation is acceptable to some extent (at the most 20%). Self-citation rates of the IAARD journals were varied from 7.07 to 17.71 percents (see Table 4.46). These scores were still under within the acceptable score mentioned above. In addition, the *Indonesian Journal of Agricultural Science,* the *JurnalTanah dan Iklim,* the *Jurnal Hortikultura* and the *Jurnal Agro Ekonomi* showed almost similar scores to the research conducted by Sutardji (2003) and Kurmis and Kurmis (2010) where their self-citations rates were around 8%. Compared to the other researches, the entire self-citations rates of the IAARD journals were lower than the findings of the researches conducted by Katerattanakul and Han (2003), Bakri and Willett (2008), and Mehrad and Goltaji (2011).

4.1.2. Journal Quality Based on BibliometricsAnalysis

Table 4.48 presents the information quality of the IAARD journals based on four attributes of bibliometric analysis, namely year published, self-citations, type of

information resources, and fifteen years impact factor. In general, level of the journal

quality of the IAARD journals reached 2.59%. In detail, information quality level of the

IAARD journals starts from 2.59% to 2.91%. HOR, JAE, and JAS were the top three

journals with the highest level of quality. Meanwhile, JTP, TRI, and JEP were the

IAARD journals that had the least quality on the information.

Table 4.48. Journal quality of the IAARD journals based on citation analysis

No.	Journals	Index Value Based On				Journal Quality Index
		Year Published	Self Citation	Type Of Info. Sources	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* (JTV)	1.77	3.78	4.25	0.51	2.58
5	*Jurnal Tanah dan Iklim* (TAN)	1.82	4.29	3.85	0.31	2.57
6	*Jurnal Penelitandan Pengembangan Pertanian* (JPP)	1.90	3.92	3.66	0.78	2.57
7	*Jurnal Penelitian Pertanian Tanaman Pangan* (JTP)	1.75	4.13	3.96	0.38	2.56
8	*Jurnal Penelitian Tanaman Industri* (TRI)	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
	IAARD	1.90	4.06	3.93	0.46	2.59

HOR ranked first on its journal quality amongst the IAARD journals due to its high

level of 3 indices value of the journals compared to the 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 (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. The high quality of

indices does affect the high journal quality whereas the lowest journal quality of the IAARD journals was due to their low of quality of indices.

4. 2. Trust And Usability Of Indonesia-Based Agricultural Science Journals

A survey had been conducted for determining trust and usability of the IAARD journals. This section will present the description of the findings of the survey and the discussions. It starts with the demography of the respondents.

A total of 229 respondents contributed in this survey, consisted of 158 (69%) male respondents, 65 (28.4%) females, and six respondents that did not state their genders. The respondents came from the IAARD institutions (207 respondents) and the university (22 respondents). Table 4.49 shows the detail of the respondents' affiliations. The Indonesian Institute for Agricultural Technology Assessment and Development was the highest (34.1%) followed by the Indonesian Center for Estate Crops Research and Development (19.2 %) and the Indonesian Center for Food Crops Research and Development (11.8 %). The lowest responses came from the Indonesian Center for Animal Husbandry Research and Development (2.6 %), followed by the Indonesian Center for Horticulture Research and Development (3.1%). The third lowest were shared by the Indonesian Center for Agricultural Social Economics and Policy Analysis and the Indonesian Institute for Agricultural Biotechnology and Genetic Resources Research and Development (3.9 % each).

Table 4.49. Respondents' affiliations of the IAARD institutes and university

No.	Institutions	Frequency	Percentage
1	Indonesian Institute for Agricultural Technology Assessment and Development	78	34.1
2	Indonesian Center for Estate Crops Research and Development	44	19.2
3	Indonesian Center for Food Crops Research and Development	27	11.8
4	Universities	22	9.6
5	Indonesian Institute for Agricultural Land Resources Research and Development	17	7.4
6	Indonesian Institute for Agricultural Post Harvest Research and Development	10	4.4
7	Indonesian Center for Agricultural Social Economics and Policy Analysis	9	3.9
8	Indonesian Institute for Agricultural Biotechnology and Germ plasma Research and Development	9	3.9
9	Indonesian Center for Horticulture Research and Development	7	3.1
10	Indonesian Center for Animal Husbandry Research and Development	6	2.6
	Total	229	100

In Indonesia, respondents for this research were classified into 4 classes. The highest class was made of senior researchers followed by intermediate researchers, junior researchers, and first level researchers. However, there were researchers who did not want to be classified in those classes. Distribution of the respondents from the highest to the lowest level can be seen in Table 4.50. The intermediate researchers were the highest participationsin the survey followed by the junior researchers and senior researchers with 91, 77, and 28 participants accordingly. First Level Researchers had the lowest participations. Twenty-two respondents did not indicate their job title level which had been classified as non-class researchers.

Table 4.50. Distribution of respondents by level of job title

No.	Level Of Job Title	Frequency	Percentage
1	Intermediate Researcher	91	39.7
2	Junior Researcher	77	33.6
3	Senior Researcher	28	12.2
4	Non Class Researcher	22	9.6
5	First Level Researcher	11	4.8
	Total	229	100

Respondents' field of study was investigated based on AGRIS/CARIS categorization scheme and classified into nine categories (see Table 4.51).

Table 4.51. Distribution of the respondents according to their fields of research

No.	Field Of Research	Frequency	Percent
1	Plant Science and Production	70	30.6
2	Economics, Development and Rural Sociology	38	16.6
3	Plant Protection	34	14.8
4	Animal Science, Production and Protection	32	14.0
5	Post-Harvest Technology	30	13.1
6	Natural Resources and Environment	16	7.0
7	Agricultural Machinery and Engineering	4	1.7
8	Not Available	3	1.3
9	Fisheries and Aquaculture	1	0.4
10	Pollution	1	0.4
	Total	229	100.0

The table showsthat most of the respondents indicated plant science and production (30.6%) as their fields of research. Whereas economics, development and rural sociology, and plant protection were the other two fields of knowledge with 16.6% and 14.8% responses respectively. The lowest responses were in the fields of fisheries and aquaculture, and pollution with 0.4% each. The field of agricultural machinery and engineering had 1.7% responses.

The lower responses from the fisheries and aquaculture field of research was due to the institution was formerly under the IAARD, Ministry of Agriculture but was later

absorbed under the Ministry of Fisheries and Maritime. This in turn, may have the consequences on the number of researchers in that field being reduced due to the movement.

The investigation on the conduct of the English language found that most of the respondents havea good English conduct (67.7 %, Table 4.52), followed by respondents with very poor English (16.2 %) and excellent English (13.5 %). Six respondents (2.6 %) did not state their level of English language.

Table 4.52. English mastering language of the respondents

No.	English Mastering Language	Frequency	Percentage
1	Good	155	67.7
2	Very poor	37	16.2
3	Excellent	31	13.5
4	Not Available	6	2.6
	Total	229	100

4.2.1. The Trust of the IAARD Journals

The findings and discussions of the IAARD journals revealed that there were 18 attributes related to Trust, namely, Impartial Preview, Recognition of Authors, Confidence, Accuracy, Correctness, Objectives, Clarity, Conciseness, Ease of Understanding, Clarity Of Measurement Unit, Currency, Relevance, All Necessarily Values, Comprehensiveness, Adequacy, Coverage, Reliability, and Overall Trust.

4.2.1.1. Impartial preview

Table 4.53 presented opinions of the respondent to the tendency of the journal to support negatively to the organization (impartial preview). The table (see also appendix T) showed that 53.07 percent of the respondent though that no impartial preview found on the journals. Only 13.41 percent of the respondent believed that impartial preview was found on the journals. Meanwhile, 33.52 percent of the respondents have no opinion.

Table 4.53. Impartial preview of IAARD journals

No.	Impartial Preview	Frequencies	Percentage
1	Yes	96	13.41
2	No	380	53.07
3	No opinion	240	33.52
	Total	716	100

IAARD journals are journals that had financial support from the government of Indonesia. There were no commercial efforts during the process of publication. From this statement, it could be understood that the number of respondent who believe that no impartial preview on the journal were more than half of the total number of respondents.

4.2.1.2. Recognition of Authors

Table 4.54 presents the recognition level of the IAARD authors by the respondents. The findings showed 66.76 percent of the respondents recognized less than 50 percent of the authors. Meanwhile, 21.24 percent of the respondents recognized more than 50 percent of the authors. Only 12.00 percent of the respondents did not recognize the authors. Detail of the findings can be seen in Appendix U.

Table 4.54. Recognition of authors from the IAARD journals

No.	Recognized Authors	Frequencies	Percentage
2	*< 50%*	484	66.76
3	*> 50%*	154	21.24
1	*None*	87	12.00
	Total	725	100

Authors who were commonly recognized by others were dueto their frequencies in publishing articles. The higher the number of articles published in a journal, the higher the recognition of the said authors. Most authors (74.45%) contributed only 1 article in the IAARD journals (see Table 4.54). The table shows that about 25% of the authors were more recognized than the authors with only one article which was why most of the respondents only recognized less than 50 percent of the authors.

4.2.1.3. Confidence

Table 4.55 and Appendix V show that most of the respondents (59.62%) demonstrate confidence of the entire journal articles. The remaining respondents (40.09%) trusted some of the articles and only 2 respondents did not trust the entire journals' articles.

Table 4.55. The confidence level of the respondents in the IAARD journals

No.	Confidence	Frequencies	Percentage
1	All articles	412	59.62
2	Somearticles only	277	40.09
3	None	2	0.29
	Total	691	100

Explanations on the findings are as follows:

a. The IAARD journals had passed the accreditation process conductedby LIPI. It means that the entire collection of the IAARD journals is of good quality. With good quality journals, it also reflects the good quality of the articles. The high number of the respondents who are confident of the journals by reading the entire

articles was possibly due to the good quality of the journals' contents. Without it, none of the readers will trust and read the journals;

b. The IAARD journals are peer reviewed journals which means the articles in the journals have been selected by editorial board/referee and passed the requirements determined by the management. The peer review process assures the quality of the articles published in the journals.

4.2.1.4. Accuracy

Table 4.56 shows the accuracy level of the IAARD journals (see also Appendix W). Most respondents agreed that the IAARD journals havea good accuracy level (55.86 %). More than 33 percent of the respondents believed that the journals have good accuracy and no respondent believed that the IAARD journals had very poor accuracy. This finding also showed that the data/information in the journals were presented accurately. The data/information that was presented was exact with high accuracy level and commonly found with a minimum of two digit frequencies. In certain cases, as a higher accuracy level is needed, the data accuracy level could reach up to three to four digit frequencies.

Table 4.56. The accuracy level of the IAARD journals

No.	Level Of Accuracy	Frequencies	Percentage
1	Good	343	55.86
2	Fair	205	33.39
3	Excellent	49	7.98
4	Bad	17	2.77
5	Very poor	0	0.00
	Total	614	100

4.2.1.5. Correctness

The correctness level of the IAARD journals can be seen in Table 4.57 (see also Appendix X). Most of the respondents (59.45%) believed that the journals had a good level of correctness, followed by 28.93% rated fair. Again, none of the respondents believed that the IAARD journals had very poor level of correctness.

The high achievement of the IAARD journals on correctness showed that managing editors of the journals had worked hard to minimize mistakes in the journals. The mistakes may appear not only on data/information presentation, but also editorial and typographical mistakes. These two types of mistakes could contribute to the declining quality level of the journals.

Table 4.57. The level of correctness of the IAARD journals

No.	Level Of Correctness	Frequencies	Percentage
1	Very poor	0	0.00
2	Bad	29	3.83
3	Fair	219	28.93
4	Good	450	59.45
5	Excellent	59	7.79
	Total	757	100

4.2.1.6. Objectivity

Table 4.58 shows that most of the respondents agreed that the IAARD journals had a good level on their objectives (60.62%, see also Appendix Y). Twenty nine point ninety six (29.96) percent respondents agreed the journals' objective was of a fair level.

Table 4.58. The level of objective of the IAARD journals

No.	Level Of Objectives	Frequencies	Percentage
1	Excellent	46	6.47
2	Good	431	60.62
3	Fair	213	29.96
4	Bad	19	2.67
5	Very poor	2	0.28
	Total	711	100

4.2.1.7. Clarity

Table 4.59 presents the clarity of the IAARD journals (see also Appendix Z). Most of the respondents (64.23%) agreed that the IAARD journals had a good clarity level and followed by a fair quality level (27.04%). This in turn, reflects on the articles in the IAARD journals that were written lucidly, without any ambiguities.

Table 4.59. The level of clarity of the IAARD journals

No.	Level Of Clarity	Frequencies	Percentage
1	Good	456	64.23
2	Fair	192	27.04
3	Excellent	44	6.20
4	Bad	17	2.39
5	Very poor	1	0.14
	Total	710	100

4.2.1.8. Conciseness

Table 4.60 shows the level of conciseness of the IAARD journals, where 47.45 percent respondents stated that the IAARD journals had a good quality on conciseness (also Appendix AA). Other respondents (43.77%) believed that the IAARD journals had a fair quality on conciseness.

Table 4.60. The level of conciseness of the IAARD journals

No.	Level Of Conciseness	Frequencies	Percentage
1	Good	335	47.45
2	Fair	309	43.77
3	Excellent	28	3.97
4	Bad	27	3.82
5	Very poor	7	0.99
	Total	706	100

Articles in the scientific journals should be written concisely. According to the findings, articles in the IAARD journals had been written in a concise manner. This means that during the publishing process, managing editor had assured that the sentences in the articles were composed as shortest as possible to avoid unnecessary information, without loosing the meaning. Concise sentences will help the reader to understand the messages instantly.

4.2.1.9. Ease of Understanding

Fifty nine point zero two (59.02%) of the respondents believed that the IAARD journals had a good level in easy to understand contents (see Table 4.61 and Appendix AB). A number of 29.93% respondents agreed that the contents of the journals were of a fair quality on easy to understand and none of the respondents believed that the IAARD journals had a very poor quality level.

Table 4.61. Ease of understanding of the IAARD journals

No.	Level Of Easy To Understand	Frequencies	Percentage
1	Good	422	59.02
2	Fair	214	29.93
3	Excellent	49	6.85
4	Bad	30	4.20
5	Very poor	0	0.00
	Total	715	100

Majority of the general readers think that the articles in the scientific journals are difficult to understand. However, this research revealed that the IAARD journals' articles were easy to understand which means that the readers were able to understand the articles easily. In order to be understood easily, managing editor helped the authors to improve their articles through editing and proofreading. The process assures the sentences are well written, concise, and precise, as to avoid ambiguities. It will make the readers to understand the articles easily.

4.2.1.10. Clarity of Measurement Unit

Most respondents (51.73%) believed that the clarity of measurement unit of the IAARD journals was good (see Table 4.62 and Appendix AC) followed by respondents who believed that the journals have a fair level of quality. Other respondents (6.21 %) selected an excellent quality level.

Table 4.62. The level of clarity measurement unit of the IAARD journals

No.	Level Of Clarity Of Measurement Unit	Frequencies	Percentage
1	Good	358	51.73
2	Fair	263	38.01
3	Excellent	43	6.21
4	Bad	25	3.61
5	Very poor	3	0.43
	Total	692	100

The articles in the IAARD journals show a high level of clarity of measurement unit due to the measurement units were taken based on the international standard. For instance, meter and kilometer were used to measure distance instead of using footsteps which can be differed from one to another. The measurement units were also written consistently. This will help the readers to understand the measurement units and no effort needed to convert to other measurement units.

4.2.1.11. Currency

Table 4.63 shows the level of currency information in the IAARD journals (see also Appendix AD), wherea good level was ranked the highest (47.30%). 39.73% respondents rated fair and followed by excellent (7.16%).

Table 4.63. The current information level in the IAARD journals.

No.	Level Of Current Information	Frequencies	Percentage
1	Good	350	47.30
2	Fair	294	39.73
3	Excellent	53	7.16
4	Bad	42	5.68
5	Very poor	1	0.14
	Total	740	100

Current information is needed and vital for researchers to support their activities. Researchers updated their knowledge base using recent information. Researchers also use the recent information to support their researches particularly on proposal making, writing report, and publishing their articles in a journal.

Editorial board/referee selects only articles with current information to be published in a journal. Selection of the members of the editorial board/referees also becomes a critical point in assuring a journal to publish only current topics and reject the obsolete ones. Senior researchers with high competency should be appointed as the members of editorial board/referee. The high competency commonly interpreted as researchers who hold doctorate degrees with similar educational background to the journals' scope.

4.2.1.12. Relevance

Table 4.64 and Appendix AE present the relevance of contents and the IAARD journals scopes. Most respondents believed that the IAARD journals have a good level for relevance (61.05%). While other respondents agreed that the IAARD journals have a

fair quality on relevance (28.47%) and 8.07% believed on excellent quality. The editorial board/referee only selected the articles that are relevant to the IAARD journals scopes to be published.

Table 4.64. The level of relevance in the IAARD journals

No.	Level Of Relevance	Frequencies	Percentage
1	Good	431	61.05
2	Fair	201	28.47
3	Excellent	57	8.07
4	Bad	16	2.27
5	Very poor	1	0.14
	Total	706	100

4.2.1.13. All Necessary Values

Most of the respondents (47.14%) believed that the IAARD journals have a good level for all necessary values (see Table 4.65 and Appendix AF). Meanwhile, respondents who believed that the IAARD journals have fair quality and excellent quality levels reached 44.43% and 5.71% respectively.

Table 4.65. All Necessarily Values in the IAARD journals

No.	Level Of All Necessarily Values	Frequencies	Percentage
1	Good	330	47.14
2	Fair	311	44.43
3	Excellent	40	5.71
4	Bad	19	2.71
5	Very poor	0	0.00
	Total	700	100

All necessarily values assure all elements that should be presented in an article of a certain journal were available. These elements include presence of title and running title, author, affiliation, abstract, background, literature review, methodology, result and discussion, conclusion and recommendation, reference, appendix, and acknowledgment.

All necessarily values also assure the consistency of the availability of the elements. The IAARD journals provided all the necessary values' elements.

4.2.1.14. **Comprehensiveness**

Most of the respondents believed that the IAARD journals have a fair quality (55.76%) for their comprehensiveness (Table 4.66 and Appendix AG). Thirty two point two nine (32.29%) of the respondents believed that the journals have a good quality of comprehensiveness.

Table 4.66. The level of comprehensiveness in the IAARD journals

No	Level Of Comprehensiveness	Frequencies	Percentage
1	Fair	392	55.76
2	Good	227	32.29
3	Bad	63	8.96
4	Excellent	18	2.56
5	Very poor	3	0.43
	Total	703	100

Comprehensiveness means that the IAARD journals provide all information regarding content and discussion of the research findings. The presentation of both elements should be completed without leaving any information out to satisfy the readers' needs. In the IAARD journals, the editorial board/referee recommended to the authors to provide complete information and discussion which will improve comprehensiveness of the articles.

4.2.1.15. **Adequacy**

The sufficient level of the IAARD journals can be seen in Table 4.67 and Appendix AH. Most of the respondents agreed that the IAARD journals have a fair sufficient level (51.06%) and some agreed they had a good quality (36.60%).

Table 4.67. The adequacy level of the IAARD journals.

No.	Level OfAdequacy	Frequency	Percentage
1	Fair	360	51.06
2	Good	258	36.60
3	Bad	60	8.51
4	Excellent	19	2.70
5	Very poor	8	1.13
	Total	705	100

Sufficiency means the requirements in the IAARD articles were fulfilled. The Editorial board/referee recommends the authors to improve their articles by providing a high level of information suffiency.

4.2.1.16.   Coverage

Table 4.68 presents most of the respondents stated that the IAARD journals have a fair quality (54.64%) level of coverage i.e. breadth and depth (see also Appendix AI). The other respondents of 30.81% agreed that the journals had a good quality in presenting breadth and depth.

Table 4.68. Coverage of the IAARD journals

No.	Level OfCoverage	Frequencies	Percentage
1	Fair	383	54.64
2	Good	216	30.81
3	Bad	74	10.56
4	Excellent	27	3.85
5	Very poor	1	0.14
	Total	701	100

Breadth and depth are related to details of the discussion of the research findings. A journal with deeper and broader discussions will have a better information quality. In the case of the IAARD journals, editorial board/referee recommended details discussion on how to improve the quality of the articles. The recommendation suggested the

authors to add details of data/information to support deeper discussions. When an article

reached a certain level of detail, the articles will be fit to be published.

4.2.1.17.   Reliability

Most of the respondents (43.48%) stated that the IAARD journals have a good quality

for reliability (see Table 4.69 and Appendix AJ). Meanwhile, other respondents

(33.84%) believed that the journals have a fair quality and excellent quality of 18.57%.

None of the respondents viewed the journals as having very poor level of reliability.

Table 4.69. The reliability of the IAARD journals

No.	Level Of Reliability	Frequencies	Percentage
1	Good	370	43.48
2	Fair	288	33.84
3	Excellent	158	18.57
4	Bad	35	4.11
5	Very poor	0	0.00
	Total	851	100

4.2.1.18.   Overall Trust

With regards to the overall trust level, most of the respondents agreed that the IAARD

journals had a good trust attribute with 46.68% as reflected in Table 4.70 and Appendix

AK. 41.18% responded with a fair trust attribute whereas 6.57% actually agreed that the

level overall trust of the journals was excellent.

Table 4.70. The overall trust level of the IAARD journals

No.	Level Of Overall Trust	Frequencies	Percentage
1	Good	323	46.68
2	Fair	285	41.18
3	Excellent	46	6.65
4	Bad	37	5.35
5	Very poor	1	0.14
	Total	692	100

4.2.1.19. Journal Assessment Based on the Trust

Eighteen attributes of trust were selected to assess IAARD journals. The selected attributes include impartial preview, recogniton of author, confidence, accuracy, correctness, objectives, clarity, conciseness, ease of understanding, clarity of measurement unit, currency, relevance, all necessarily values, comprehensiveness, adequacy, coverage, reliability, and overall trust. Table 4.71 reveals the asessment of the IAARD journals based on trust. Analysis of the index values on the IAARD journals showed that the trust of the journals was at mean of 3.26. Overall, the trust index value revealed that the IAARD journals were perceived to be trust worthy in between fair to good among the respondents.

Table 4.71. The IAARD journals quality based on trust indexes

No.	Parameters	Journal Quality									
		JAS	JPP	TAN	JTP	JTV	HOR	JAE	JEP	JTI	IAARD
1	Impartial preview	1.92	1.89	1.77	1.76	1.71	1.7	1.78	1.67	1.76	1.77
2	Recognized author	1.87	2.04	2.19	2.33	2.16	2.06	2.06	1.76	2.18	2.07
3	Trust	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	Easy to 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	All necessarily values	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	Sufficient	3.3	3.36	3.26	3.46	3.19	3.28	3.45	2.91	3.24	3.27
16	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 satisfaction	3.54	3.6	3.57	3.68	3.43	3.43	3.61	3.14	3.45	3.49
	Index Quality	**3.40**	**3.39**	**3.32**	**3.44**	**3.28**	**3.27**	**3.34**	**2.97**	**3.28**	**3.26**

The table also exposed each of the IAARD journal trust index. The trust index value of the individual IAARD journal varied from 2.97 to 3.44. These values showed that the entire journals were of fair to good trust level. JTP achieved the highest trust in the IAARD journals with an index of 3.44 followed by JAS (3.40), and JPP (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 JTV with indexes of 3.28 each.

Previous research on trust on a nursing information system was conducted by Michel-Verkerke et al. (2012). Eleven attributes of trust were investigated using surveys with a 5-points Likert scale. The research found that the information system had precise, no superfluous, no contradiction, and no wrong record, provided all information needs, and up-to-date information. This trust attributes were found similar to accuracy, concise, correctness, all necessarily value, and current information of the IAARD journals. The levels of information in the IAARD journals with those attributes were ranked between fair to good. Mohammadi et al. (2014) identified several attributes on the Internet-Based Software System that include completeness, accuracy, availability, failure tolerance, and reliability.

Gendron and D'onofrio (2001) also conducted a survey on the healthcare industry using a 5-points Likert scale. In the survey, they denoted one (1) as the highest score and followed by higher numbers that denoted lower score. The research had found that trust attributes of the industry included Accuracy with the score of 1.47, Comprehend (1.84), Concise (2.01), Easy to Understanding (1.78), Objectives (1.87), Obtain time (1.91), Relevance (1.89), Reliability (1.97), and Sufficient (2.09).

Alkhattabi et al. (2011) had conducted a survey on the e-learning system using a 10-points Likert scale beginning with one point. The research found that the values of the trust attributes were accuracy (0.82), all necessarily value (0.80), comprehends (0.61), concise (0.82), easy understand (0.77), objectives (0.87), obtain time (0.91), relevance (0.86), reliability (0.66), and sufficient (0.93).

Subsequently, the findings of the researches conducted by Gendron and D'onofrio (2001) and Alkhattabi, et al. (2011) had resulted in similarity of the trust attributes with the IAARD journals. The values have been marked between three to four points scale and above.

4.2.2. Usability Of the IAARD Journals

Keevil (1998) mentioned that the usability of a journal referred to how easy it was to find, understand and use the information displayed on a Website. Meanwhile, Nielsen (2012) defined usability as how easy and pleasant the feature was to be used. Jongseo and Sung (1998) identified attributes of usability of the DVD players, namely, simplicity, consistency, accessibility, error prevention, learn-ability, and efficiency. In a journal context, the definition should be how easy and pleasant the journals' features are to be used. Usability of the IAARD journals means the reader can use the journals easily and pleasant. A survey was conducted to assess the journals' usability. The assessment of the study attributed usability to obtaining time, number of articles read, journals read, and reading style. The assessment also studied on usability of a journal on expanding knowledge and supporting researches of the readers.

4.2.2.1. Journal Reading

Not all respondents read all of the IAARD journals. Table 4.72 reports 73.21% respondents read articles from JPP of the IAARD journals. The next two highest percentages were of JTP and JAS with 46.88% and 41.52% respectively. The number of respondents that read articles from JEP was the lowest with only 8.93%. The second lowest percentage was TAN (23.66) while JTV and JAE have similar percentage i.e. 28.57 and were placed on the third lowest place.

Table 4.72. The IAARD journals reading by the respondents

No	Journal Read by Respondent	Read		Not Read	
		Frequency	Percentage	Frequency	Percentage
1	Indonesian Journal of Agricultural Science (JAS)	93	41.52	131	58.48
2	Jurnal Penelitian dan Pengembangan Pertanian (JPP)	164	73.21	60	26.79
3	Jurnal Tanah dan Iklim (TAN)	53	23.66	171	76.34
4	Jurnal Penelitian Pertanian Tanaman Pangan (JTP)	105	46.88	119	53.13
5	Jurnal Ilmu Ternak dan Veteriner (JTV)	64	28.57	160	71.43
6	Jurnal Hortikultura (HOR)	84	37.50	140	62.50
7	Jurnal Agro Ekonomi (JAE)	64	28.57	160	71.43
8	Jurnal Enjiniring Pertanian (JEP)	20	8.93	204	91.07
9	Jurnal Peneltian dan Pengembangan Tanaman Industri (TRI)	72	32.14	152	67.86

The readers may have selected JPP due to two reasons, namely it publishes broader topics of articles and another due to the journal mainly publishes articles of agricultural fields of knowledge. This has enabled researchers from different agricultural sectors to download articles from the said journal and use them for their needs. As the journal is published in Bahasa Indonesia, this somehow made it easier for the readers to understand the contents. JAS on the other hand contains articles from the entire fields of knowledge and it is published in English. Meanwhile, JTP publishes articles limited on food crops and in Bahasa Indonesia.

4.2.2.2. Obtaining Time

The table 4.73 shows the obtaining time of the IAARD journals. The table showed that the obtaining time of the IAARD journals that is more than three months after they were published was of the highest frequency (47.18%) followed by those obtained in two months and one month.

Table 4.73. The obtaining time of the IAARD journals

No	Obtaining Time	Frequencies	Percentage
1	One month	110	15.13
2	Two months	171	23.52
3	Three Months	103	14.17
4	More than three months	343	47.18
	Total	727	100

The possible explanation of why the respondentsonly managed to obtain the journals after more than three months upon their publication was because most of the printed journals need time to reach the respondents. The geographic of Indonesia is also a factor which requires extra time to circulate the publications via post. A limited budget given for journal distribution also played a role in delaying the circulation which led to journals were not distributed immediately after they were published. However with the uploading of the journals into the designated websites in the internet, and circulating the journals at meetings and exhibitions, this has enhanced the journals distribution process.

4.2.2.3. Articles Read

Table 4.74 shows the number of articles in the IAARD journals that were read by the respondents. Most of the respondents did not read the entire articles in the IAARD journals with only 48.60% read the entire articles provided in a single issue. Thirty four point five zero (34.50%) of the respondents read within the range and 16.90% of them actually read between 75-100 percent of the entire articles.

Table 4.74. The number of the IAARD journals'articles read by the respondents

No	Number Of Articles Read	Frequencies	Percentage
1	0 - 50 %	348	48.60
2	51- 75 %	247	34.50
3	76- 100 %	121	16.90
	Total	716	100

Most of the respondents read less than 50% of the articles in the journals for several reasons. This may have been due to not the entire articles in a single issue of a journal provide the information needed by the respondent. The respondents will select articles only related to the topics of their researches. The different field of study of the respondent is also another explanation. JAS is a good example as it mainly publishes articles in the fields of agricultural science, soil science, physiology, plant genetic, and others. Respondents who were working on soil science subject did not look at the animal science articles in the journal, but he might be reading articles related to fertilizer that is still related to their field of study.

4.2.2.4. Reading Style

The respondents have different reading style or preference. Most of them (68.62%) read the entire articles in the journals (Table 4.75). Other respondents have the habits of reading the articles that they found interesting (20.00%) and some only read the articles that support their researches (11.38).

Table 4.75. The number of the IAARD journals' articles read by the respondents based on their reading style

No.	Reading Habit	Frequency	Percentage
1	Entire articles	1,369	68.62
2	Interesting articles only	399	20.00
3	Support research only	227	11.38
	Total	1,995	100

The researchers who managed to read all the articles mainly due to time availability and the availability of the articles that fit to their needs. These researchers who had extra time to spare tend to read articles more than the other researches who were occupied with work. The busy researchers will spend less time in getting the information required for their research activities. They will spend their limited time in getting articles spefically for their researches. They will not retrieve articles that do not support their researches. There were researchers who read the journals because they found the articles were interesting. These articles could be used for expanding their knowledge base or planning for their further researches. Preparing research and updating knowledge were part of researchers' purposes in conducting researchers in the Banasthali University on Visiting Library (Pareek and Rana, 2013) and in Vinayaka Mission's Kirupananda Variyar Engineering College (Lakshmi et al. 2011).

4.2.2.5. Purpose Of Reading

There were two main purposes of the respondents on reading the IAARD journals, namely to expand their knowledge base and also to support their researches. Table 4.76 shows that 22.89% respondents read the IAARD journals to expand their knowledge. Meanwhile, 22.52% respondents read the IAARD journals to support their researches (Table 4.77).

Table 4.76. Reading purposes of the IAARD journals' readers: expanding knowledge

No.	Reading Purpose	Frequency	Percentage
1	Expand Knowledge	455	22.89
2	Not Expand Knowledge	1,533	77.11
	Total	1,988	100.00

Table 4.77. Reading purposes of the IAARD journals' readers: support research

No.	Reading Purpose	Frequency	Percentage
1	Support Research	448	22.52
2	Not Support Research	1,541	77.48
	Total	1,989	100.00

As mentioned in the explanation of reading habits above, there were two main purposes of the researchers to visit the library include preparing for the research and updating information knowledge. Similarly, the same two purposes also arised by reading the IAARD journals. Khan and Shafique (2011) also reported that teachers, principals and vice principals who worked in the selected colleges in Bahawalpur used information for lecture preparation, improving personal competencies, conversing with co-workers and other experts in other institutions, and to read articles/books. Meanwhile, Maharana (2013) mentioned that faculty members and students in Veer Surendra Sai Medical College used information resources for research, publication, self-improvement, and study/preparing lectures. The utilization of CD-ROM database by users' at the Indian Institute of Technology, Kharagpur was for preparing examination, preparing project work, preparing competitive examination, preparing dissertation work, preparing notes, and general reading (Khan, 2011). The utilization of information by the faculty members and research scholars of Biological Sciences Academic Community of the University of Mysore was for research work and writing articles; keeping up to date; preparing for lectures; participating in meetings, seminars conference, etc.; and submitting funded projects (Nikam and Sathisha, 2014).

4.2.2.6. The IAARD Journals Assessment Based On the Usability Indices

The IAARD Journals quality based on the usability indices are determined by four (4) parameters, namely, obtaining time, number of articles read, journal reading, and reading style.

The mean of the usability index of the IAARD journals is 1.96. Table 4.78 indicates the usability index for each of the journals. JEP is the journal with the highest usability index (2.19), followed by TAN with the usability index of 2.03. JAS and JTV have similar the usability index of 1.98. In contrast, JPP has the lowest usability index (1.75) followed by HOR and TRI at 1.96 and 1.97.

Table 4.78. The IAARD journals quality based on usability indices

No.	Variables	JAS	JPP	TAN	JTP	JTV	HOR	JAE	JEP	TRI	IAARD
1	Obtaining Time	2.22	2.13	2.02	2.02	1.88	2.06	1.64	2.14	2.04	**2.02**
2	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	Journal Read	1.58	1.27	1.76	1.53	1.71	1.63	1.71	1.91	1.68	**1.64**
4	Reading Style	2.72	1.91	2.67	2.31	2.59	2.27	2.57	2.87	2.46	**2.49**
	Usability Indexes	**1.98**	**1.75**	**2.03**	**1.92**	**1.98**	**1.96**	**1.89**	**2.19**	**1.97**	**1.96**

4. 3.   **Internal Ranking Of The Indonesian Agricultural Journals**

Table 4.79 presents the IAARD journals quality based on three assessment approaches, namely usability, trust, and bibliometric. These journal assessment attributes were cumulative of weighted mean value on the IAARD journals. The levels of overall assessment based on quality, trust and usability varied from 2.52 to 2.71 with a mean of 2.62.

Table 4.79. The quality of the IAARD journals based on usability,
trusts and quality indices

No.	Journals	Assessment approaches			Overall Journal Indices	Ranking
		Usability Indices	Trust Indices	Quality Indices		
1	Jurnal Hortikultura (HOR)	1.96	3.27	2.91	2.71	1
2	Indonesian Journal of Agricultural Science (JAS)	1.98	3.4	2.59	2.66	2
3	Jurnal Penelitian Pertanian Tanaman Pangan (JTP)	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 (TAN)	2.03	3.32	2.57	2.64	3
6	Jurnal Penelitian dan Pengembangan Pertanian (JPP)	1.75	3.39	2.57	2.57	5
7	Jurnal IlmuTernak danVeteriner (JTV)	1.98	3.28	2.58	2.61	6
8	Jurnal Penelitian dan Pengembangan Tanaman Industri (TRI)	1.97	3.28	2.48	2.58	7
9	Jurnal Enjineering Pertanian (JEP)	2.19	2.97	2.39	2.52	8
				IAARD	**2.62**	

The table also exposed that HOR achieved the highest index among the IAARD journals with a value of 2.71. JAS ranked second with index value of 2.66, and JTP and TAN ranked third with its index of 2.64. In contrast, JEP, TRI, and JTV had the lowest index values of 2.52, 2.58, and 2.61 accordingly.

The maximum overall index value of the IAARD journals they may be achieved is 4.33. Journals with overall index values between 0-0.86 were categorized as very poor. Meanwhile, other journals were categorized bad (0.86-1.73), fair (1.73-2.54), good (2.54 – 3.45) and excellent (3.54-4.33). Based on these classifications, the IAARD journals with overall index values of 2.39 to 2.63 were fair to good.

It seems that the information quality level of the IAARD journals almost similar to the results of Indonesian Institute of Sciences (LIPI) accreditations for scientific journals.

LIPI (2012) conducted accreditations using peer review for scientific journals. An accredited journal is a journal which received a passing grade of the accreditation process. The passing grade is 70 and the journals with scores less than 70 will be stated as non-accredited journals. Those which passed will be stated as accredited journals. The accredited journals were classified into two categories namely; 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. The maximum accreditation score was 100.

LIPI had included the IAARD journals in its 2012 accreditation and resulted that the entire journals passed the passing grade (see Table 4.80).

Table 4.80. Accreditation results of the IAARD journals conducted by LIPI year 2012

No.	Journals	Accreditation Results	
		Value	Predicate
1	Indonesian Journal of Agricultural Science (JAS)	85.75	A
2	Jurnal IlmuTernak danVeteriner (JTV)	81.25	B
3	Jurnal Penelitian Pertanian Tanaman Pangan (JTP)	80.25	B
4	Jurnal Agro Ekonomi (JAE)	77.25	B
5	Jurnal Enjiniring Pertanian (JEP)	74.25	B
6	Jurnal Penelitian dan Pengembangan Pertanian (JPP)	73.25	B
7	Jurnal Tanah dan Iklim (TAN)	70.25	B
8	Jurnal Penelitian dan Pengembangan Pertanian Tanaman Industri (TRI)	82.00	B
9	Jurnal Hortikultura (HOR)	79.00	B

From the Table 7.80, the only IAARD journal which received A predicate was JAS. The remaining journals had B predicate with accreditation scores varied from 70.25 to

82.00. The accreditation results were almost similar to this research. Five-point Likert scales of this research were similar to the predicates belong to accreditation. The highest score of the accreditation was 100 point and it was converted into 5-point ABC scales. As for the information quality of the IAARD journals, it can be obviously seen that the predicates of the two assessments were almost the same. A and B predicate represented good and excellent quality of the journals, while, 3 and 4 represented fair and good level of information quality of the IAARD journals. Pairing the two assessment methods, led to a conclusion that the information quality of the journals were almost similar.

Respondent's perception of *Warta Litbang Pertanian* was studied by Mulyani et.al. (2006). They found that scores of contents attributes, namely, topic, current information, and relevancy were above 3 of the 5-point Likert scales. They concluded that the contents of *Warta Litbang Pertanian* were fair. Aggelidis (2012) also reported that the mean scores of Hospital information systems quality were higher than three points. Similarly, Lee (2010) also found that the total mean value of Clinical information system for nursing care services was 3.37 of the 5-point Likert scales. Meanwhile, Alkhattabi et al. (2011) reported that the average scores for the content quality on mathworld.wolfram and PalnetMath were 0.8111 and 0.9111 respectively. These scores reflected the high quality of both websites. As such, the quality of the information in the IAARD journals was almost similar to other earlier researches.

4. 4. Comparison And Contrast Of The Internal Ranking Of Indonesian Agricultural Journals Based On Quality, Trust and Usability Using Gap Analysis

Comparison of the internal rankings based on quality, trust and usability had been conducted using Gap Analysis. Table 4.81 shows the comparison of the internal rankings of the IAARD journals based on usability and quality assessment. The gap

analysis showed that there was no difference in the journal assessment index for JAS and JTP according to usability and quality attributes. TAN, JPP, and TRI had similar scores (3) for this comparison. JTV also showed scores of 1 using the gap analysis. On the hand, JEP showed a big difference between the two approaches with a score 7 using the gap analysis.

Table 4.81. Comparison of the internal rankings of the IAARD journals based on usability and quality approaches.

No.	IAARD Journals	Usability		Quality		Gap
		index	ranking	index	ranking	
1	Indonesian Journal of Agricultural Science (JAS)	1.98	3	2.59	3	0
2	Jurnal Penelitian Pertanian Tanaman Pangan (JTP)	1.92	6	2.56	6	0
3	Jurnal Ilmu Ternak danVeteriner (JTV)	1.98	3	2.58	4	1
4	Jurnal Tanah dan Iklim (TAN)	2.03	2	2.57	5	3
5	JurnalPenelitian dan Pengembangan Pertanian (JPP)	1.75	8	2.57	5	3
6	Jurnal Penelitian dan Pengembangan Pertanian Tanaman Industri (TRI)	1.97	4	2.48	7	3
7	Jurnal Hortikultura (HOR)	1.96	5	2.91	1	4
8	Jurnal Agro Ekonomi (JAE)	1.89	7	2.66	2	5
9	Jurnal Enjiniring Pertanian (JEP)	2.19	1	2.39	8	7

Table 4.82 shows the comparison of the internal rankings based on usability and trust. None of the IAARD journals had zero score using the gap analysis. It showed that there was no exact similarity of the journals by using these two approaches. JAS had the highest score (1) for the ranking based on the two approaches. HOR, TJP, and TRI had similar scores (2) that implied the narrow difference of the rankings. TAN and JAE, they had scores for the internal ranking of the IAARD journals of 3 and 4. JEP is the journal with the highest gap score (8) of the internal rankings based on the two said approaches.

Table 4.82. Comparison of the internal rankings of the IAARD journals based on usability and trust approaches.

No.	IAARD Journals	Usability		Trust		Gap
		Index	Ranking	Index	Ranking	
1	Indonesian Journal of Agricultural Science (JAS)	1.98	3	3.4	2	1
2	Jurnal Hortikultura (HOR)	1.96	6	3.27	8	2
3	Jurnal IlmuTernak danVeteriner (JTV)	1.98	4	3.28	6	2
4	Jurnal Penelitian dan Pengembangan Pertanian Tanaman Industri (TRI)	1.97	5	3.28	7	2
5	Jurnal Tanah dan Iklim (TAN)	2.03	2	3.32	5	3
6	Jurnal Agro Ekonomi (JAE)	1.89	8	3.34	4	4
7	Jurnal Penelitian Pertanian Tanaman Pangan (JTP)	1.92	7	3.44	1	6
8	Jurnal Penelitian dan Pengembangan Pertanian (JPP)	1.75	9	3.39	3	6
9	Jurnal Enjiniring Pertanian (JEP)	2.19	1	2.97	9	8

Comparison on trust and quality attributes on the internal rankings can be seen in Table 4.83. The table showed that there are similar gaps on the two approaches for TAN and JEP with scores of zero each. The score reflected that the two journals had no difference of the approaches. Similarly, JAS and TRI also had the same scores (1). JAE, JPP, and JTV also had similar scores (2) in the rankings. Meanwhile, JTP and HOR had scores of 4 and 5 using the gap analysis.

Table 4.83. Comparison of the internal rankings of the IAARD journals based on
Trust and quality approaches.

No.	IAARD Journals	Trust		Quality		Gap
		Index	Ranking	Index	Ranking	
1	Jurnal Tanah dan Iklim (TAN)	3.32	5	2.57	5	0
2	Jurnal Enjiniring Pertanian (JEP)	2.97	8	2.39	8	0
3	Indonesian Journal of Agricultural Science (JAS)	3.4	2	2.59	3	1
4	Jurnal Penelitian dan Pengembangan Pertanian Tanaman Industri (TRI)	3.28	6	2.48	7	1
5	Jurnal Agro Ekonomi (JAE)	3.34	4	2.66	2	2
6	Jurnal Penelitian dan Pengembangan Pertanian (JPP)	3.39	3	2.57	5	2
7	Jurnal IlmuTernak dan Veteriner (JTV)	3.28	6	2.58	4	2
8	JurnalIlmuTernakdanVeteriner (JTV)	3.44	1	2.56	6	5
9	JurnalHortikultura (HOR)	3.27	7	2.91	1	6

The three tables above showed that the gap analysis resulted from comparing the two
attributes did not differ much. The gap values were between 0 to 3 and hence, did not
show much difference between the trust. This has resulted that the rankings of the
journals were almost similar when compared based on quality and trust, quality and
usability and trust and usability.

4.5. Summary of Chapter Four

This chapter reveals the research findings of the IAARD journal assessment based on
quality, trust, and usability attributes founded on the revealed preference study using
bibliometrics approach, and stated preference study using expert survey. Bibliometrics
approach discusses research findings related to the bibliographic and citation data of the
nine journals. This contributes to the assessment of the journal quality. Expert survey
reveals the 18 attributes of trust and 4 attributes of usability of the IAARD journals. The
IAARD journals, ranking, and comparison of the rankings using the gap analysis based
on these attributes are also presented.