The Result of an Analysis to Determine the Highest International Publication based on Food-Agriculture in Indonesia

A Hakim¹, P Jumaryatno², A Fauzy³ and A W Raharjo³

¹ Department of Economics, Islamic University of Indonesia
² Departement of Pharmacy, Islamic University of Indonesia
³ Departemen Statistics, Islamic University of Indonesia

Abstract. Scientific research on mapping the strength of Food-Agriculture focus research BASED on the 2014-2018 Scopus data has been done. The Ministry of Research Technology and (KemenristekDIKTI), especially the Directorate General of Research and Development (RISBANG) has a significant role in improving the quality of higher education. One way to improve higher education quality is through mapping the strengths of research. The advantage of the study that forms the basis of this mapping refers to RPJPN 2005-2025 and RPJMN 2015-2019, which focuses on Food-Agriculture. This study used three steps methodology; (1) Data were obtained from subsequent Scopus data year 2014-2018 from KemenristekDIKTI in scientific publication focus on Food-Agriculture, (2) identifying Scopus data based on sub-focus of Food-Agriculture, (3). Data analysis using frequency distribution, (Determine the range of data, determine the classes, and determine the class interval). The Result Shows that 94.9 % (353) of 372 universities published journal indexed Scopus on range 1-59 journal publications within five years. IPB (Bogor Agricultural Institute) has the most journal publications of Food-Agriculture focus.

1. Introduction

Higher education is education after secondary education includes educational programs diploma, bachelor's, master's, specialist, and doctoral organized by universities [1]. Colleges are obliged to provide education, research, and community service [2]. In this case, studies are an activity performed by the rules and systematically scientific method to obtain information, data, and information relating to the understanding and testing of a branch of science and technology [3]. Research results useful for the enrichment of Science and Technology as well as learning; improving the quality of Higher Education and the progress of civilization; increase the independence, growth and competitiveness of the nation; fulfillment of strategic needs of national development; and changes in Indonesian society into a knowledge-based society [4]. And research results shall be disseminated using a seminar, publication, and patented by the College, except for confidential research results, disruptive, and harm the public interest [5].
Universities are obliged to embed education, conducting research and perpetuate to the public under the auspices of the Ministry for Research and Technology Higher Education (Kemenristekdikti). As stated in Law No. 20 Year 2003 on National Education System, and in line with those obligations in the Act No. 12 of 2012 on Higher Education Article 45, paragraph 1 asserts that research in universities aimed to develop science and technology, as well as improving social welfare and competitiveness of the nation [6].

Therefore we need control over the quality of Higher Education. Power of Higher Education carried out by establishing a national standard. National Standard Research is the minimum criteria of the research system in universities that apply throughout the territory of the Republic of Indonesia [7]. National research standards used to measure the quality of research activities. This standard is also used as a minimum performance standard for research activities conducted by the University of Indonesia. In other words, some rules must be achieved minimum results for each research activity [8]. Besides, the creation of national standards is also used as an evaluation.

There are many areas of material in an environment that has been incorporated in the focal plane of journal publications, including agriculture food, renewable energy, health, transportation, information - communication technology, defense and security, advanced materials, maritime, disaster, social and cultural arts - elementary science. They can be developed by the College to improve social welfare and enhance the competitiveness of the Indonesian nation. The development effort would require a restructuring program as well as mapping or mapping strategy to see the advantages of each college of published research. In this case, the study conducted focuses on the field of agriculture food.

In this study there are several sub focus to distinguish the focus of this agriculture-food research. that is Agricultural Human Resource Development, Cultivation technology and sub-optimal use of land, Technology resilience and self-sufficiency, Postharvest technology engineering and food processing technology, and Breeding technology seeds, livestock, and fish. From the sub focus of Agricultural Human Resource Development contains many studies that discuss the improvement of human resources in agriculture that aims to improve its quality. Then Cultivation technology and sub-optimal use of land where there is still a lot of research that needs to be improved for this sub focuses, to address this, a study was conducted to find a method of sustaining the productivity of marginal lands for food crop production. Agricultural practices (fallow and traditional cultivation) used by the local small-scale farmers in managing soil fertility to meet the natural biological processes above and below the ground were studied in Muna Island Southeast Sulawesi, Indonesia [9].

In some studies on environmental degradation associated with intensive agricultural practices, however, there are other factors that can degrade the environment, such as soil erosion and soil compaction resulting from certain agricultural practices, and deforestation resulting from agricultural expansion. These are also important environmental impacts [10]. And herbicides have been widely used for weed control in modern agriculture. However the use of herbicides is potentially introducing negative impact to the environment due to excessive use of herbicides [11]. Also then Technology resilience and self-sufficiency contains many researches related to technological development in agriculture, such as development of robots for agriculture, This new agriculture has many examples of operational applications of robotics that are an overwhelming trend. These advances in Agriculture 4.0, explaining that intelligent machines and crop sensors on farms have obtained large amounts of agricultural data and that the amount, quality, and scope has grown tremendously, enabling data availability to improve agricultural processes [12]. In this agricultural context, innovations are developing in an accelerated way [13]. Postharvest technology engineering and food processing technology in this sub focus contain example like Jember Regency was selected as the research location, because information obtained from the preliminary survey shows that paddy fields with technical irrigation system were common in Jember Regency and thus several planting patterns can be used in a particular year, namely: Rice – Corn planting pattern. In addition, farmers are also used to breed cattle especially beef cattle as an additional activity to their main farming business [14]. And for Breeding technology seeds, livestock, and fish contains like the development of plant seeds, one of the present major limitations of seedling production of kopyortype coconut using embryo culture is
that only one seedling can be produced from a single embryo [15]. And for analysis of variance revealed significant differences among populations for all the characteristics studied, except the radicle length [16].

Agriculture food is one of the focus areas of importance. This condition is because the state of Indonesia is an agricultural country that is covered by farmland and plantations. This condition may lead to many studies that can pull out the best potential in the field of agriculture food, such as high-yielding varieties of rice seeds which produce average yields more than types regular rice seedlings. In this study, researchers used to map the frequency distribution of the focal plane Agriculture Food. The frequency distribution is an arrangement of numeric data according to size (quantity) or by category (qualitative) [17]. It is expected that this study can be useful for Kemenristekdikti, especially DG of Risbang in developing strategic policies, especially in the focal plane of Agriculture Food. Results from this study is a script that can be used as one of the considerations in determining policy recommendations to a problem according to the Agriculture Food.

2. Methodology

The Data used in this study are secondary items, namely the Scopus Data for 2014 - 2018 Obtained from the Ministry of Research and Technology. The population in this study is the collection of data of Scopus in 2014 - 2018. The samples taken in this study is the Scopus Data of the Agriculture Food focus areas in 2014-2018.

2.1. Collecting data

The data were collected from KEMENRISTEKDIKTI in scientific publications focus on Agriculture Food. The search covers the journal published from 2014 until 2018. In the beginning, the study uses the keywords "Agriculture Food". The initial search keywords were limited to the title of the paper and the keywords.

2.2. Identify scopus data based on areas of focus of agriculture food

The initial search keywords were limited to the title of the journal and the keywords. At first, 4934 Reviews, those papers were derived using combinations Reviews those combinations of keywords and the keywords specific to Agriculture Food.

2.3. Data analysis using frequency distribution

Data from all universities that publish journals with a focus on Agriculture Food analysed were using frequency distribution. The frequency distribution is useful to see the class division for universities that send the most journals in 2014-2018 range on Scopus. Frequency distribution formula that is used in Determining the class of journal publications such as 1) Determine the scope of the data, 2) Determine the levels, 3) Determine the class interval. Determine the range of the data using the Reviews most significant value and the smallest value. The data range is the result of the difference between the Reviews largest value and the lowest value of existing data [4].

\[ R = X_{max} - X_{min} \]  
\[ R = \text{Range} \]
\[ X_{max} = \text{Largest value} \]
\[ X_{min} = \text{Smallest value} \]

Where \( R \) is the data range; \( X_{max} \) is the most significant value of the data; \( X_{min} \) is the smallest value of the data.

Sturges rules Determining can be used in many classes. Sturges rules in this research methodology apply a total of data.

\[ K = 1 + 3.322 \log(n) \]
where is the total number of classes; is the total of the data. \( K_n \)  
Determine the class interval or commonly called length is the result of the difference from the largest value and the smallest value of the data then divided by the total number of classes.

\[
P = \frac{X_{\text{max}} - X_{\text{min}}}{1 + 3.322 \log(n)}
\]

where is the largest value of the data; is the smallest value of the data; is the total of the data. \( X_{\text{max}} \) \( X_{\text{min}} \)  

3. Results and discussion

This study uses secondary data obtained from the data collection of reputable journals (Scopus) in 2014-2018. This study uses Food - Agriculture focuses data with an overall data of 4934 Journals. From the collected data obtained, frequency distribution has been made, then proceed with mapping into the low, medium and high categories by the numbers of universities based on numbers of journals uploaded on Scopus. The results of the mapping areas follow.

| No. | Interval   | Frequency | Percentage |
|-----|------------|-----------|------------|
| 1.  | 1-59       | 353       | 94.9       |
| 2.  | 60-118     | 8         | 2.2        |
| 3.  | 119-177    | 3         | 0.8        |
| 4.  | 178-236    | 4         | 1.1        |
| 5.  | 237-295    | 2         | 0.5        |
| 6.  | 296-354    | 1         | 0.3        |
| 7.  | 355-413    | 0         | 0.0        |
| 8.  | 414-472    | 0         | 0.0        |
| 9.  | 473-531    | 0         | 0.0        |
| 10. | 532-590    | 1         | 0.3        |
| TOTAL |           | 372       | 100        |

Table 1 shows that the majority of universities in Indonesia, or about 94.9% of the total college to publish Scopus indexed journals are only able to release the journal in small amounts, which only ranged between 1-59 publications. While universities can publish in large quantities amounted to only one college, or only 0.3 of the total number of college to publish Scopus indexed journals. From the analysis above, the government is expected to make a sustainable policy regarding the number of publications, which makes the minimum limit for a university publication, so that all universities will be together - equally competent in the established standards. As for college has published a journal in large quantities is expected to be awarded by the government, so that the universities can maintain and even increase the quality and quantity of their research.

| Ranking | University | Number of Publications | Research Focus | Number of Research Focus |
|---------|------------|------------------------|----------------|-------------------------|
| 1       | IPB        | 583                    | Agricultural Human Resource Development Cultivation technology and sub- | 20 | 103 |
Table 2 obtained that IPB (Bogor Agricultural Institute) has the highest journal publication, with most research focuses on seed breeding technology, field crops, livestock, and fish. UGM (Gadjah Mada University) occupies the second-highest, with the focus of most research in the field of technology of breeding seeds, livestock, and fish. While Diponegoro (Diponegoro University) occupies the third position, with the focus of most research in the field of technology of breeding seeds, livestock, and fish.

### 4. Conclusion

This research concluded that the majority of universities in Indonesia (94.9%) of the total college Scopus indexed journals publish only able to release the journal in small amounts, which only ranged between 1-59 publications. While universities can publish in large quantities amounted to only one college, or only 0.3 of the total number of college to publish Scopus indexed journals. The college with the highest number of journal publications in the field Agriculture Scopus Food is the Bogor Agricultural Institute with a focus on the most top technology subfields breeding plant seeds, livestock, and fish with the number 205 journal publications. The University of Gajah Mada occupied the second position with the highest number of focus on technology subfields breeding plant seeds, livestock, and fish with the number 104 journal publications. The University of Diponegoro occupies the third place by the number of subfields focus on breeding technologies Most plant seeds, livestock, and fish with the number 91 journal publications.
Acknowledgements

We want to express the most profound appreciation to the Ministry of Research, Technology and Higher Education (KEMENRISTEKDIKTI) of the Republic of Indonesia, in particular, the Directorate of Research and Development Strengthening (RISBANG) which has provided funding so that this research can be carried out.

References

[1] Indonesia the Republic 2003 Law of the Republic of Indonesia number 20 of 2003 National Education System Article 19 Paragraph 1 (Jakarta: The government of the Republic of Indonesia)

[2] Indonesia the Republic 2003 Law of the Republic of Indonesia number 20 of 2003 National Education System Article 20 Paragraph 2 (Jakarta: The government of the Republic of Indonesia)

[3] Indonesia the Republic 2012 Law of the Republic of Indonesia number 12 of 2012 Higher Education Article 1 Paragraph 8 (Jakarta: The government of the Republic of Indonesia)

[4] Indonesia the Republic 2012 Law of the Republic of Indonesia number 12 of 2012 Higher Education Article 46 Paragraph 1 (Jakarta: The government of the Republic of Indonesia)

[5] Indonesia the Republic 2012 Undang Law of the Republic of Indonesia number 12 of 2012 Higher Education Article 46 Paragraph 2 (Jakarta: The government of the Republic of Indonesia)

[6] Indonesia the Republic 2003 Law of the Republic of Indonesia number 20 of 2003 National Education System Article 45 Paragraph 1 (Jakarta: The government of the Republic of Indonesia)

[7] Research, B National Standard, and c National Standards Community Services 2014 National Standard of Higher Education.

[8] Dimyati, Muhammad, and A Fauzy 2018 Evaluation of Research Standards at the Ministry of Research, Technology and Higher Education with the I-MR Map Control Analysis. Telkomnika 16 4

[9] Namriah, and L M H Kilowasid 2014 Local Soil Fertility Management on Small-Scale Farming Systems for Sustainable Agriculture AIP Conference Proceedings 1677

[10] Mariyono J 2015 Green Revolution- and Wetland-Linked Technological Change of Rice Agriculture in Indonesia. Management of Environmental Quality An International Journal 26 683-700

[11] Sampurno 2014 Weed Control Decision Support System Based on Precision Agriculture Approach Rizky Mulya Telkomnika 12 475-484

[12] Wolfert S 2017 Big Data in Smart Farming – A review Agricultural Systems

[13] Bechar A 2016 Agricultural robots for field operations: Concepts and components Biosystems Engineering

[14] Sulistyono N B E 2018 Sustainability Status of Integrated Rice-Corn and Beef Cattle Farming Agriculture Business in Jember Regency IOP Conference Series: Earth and Environmental Science 207

[15] Sisunandar 2015 Embryo Incision as A New Technique for Double Seedling Production of Indonesian Elite Coconut Type “Kopyor” Journal of Mathematical and Fundamental Sciences 47 252-260

[16] Sudrajat D J 2016 Genetic Variation of Fruit, Seed, and Seedling Characteristics Among 11 Populations of White Jabon in Indonesia Forest Science and Technology 12 9-15

[17] Soejoeti Zanzawi 1986 Statistical Methods I Karunika Universitas Terbuka