Evaluation of Risbang Strengthening Program 2015-2019 for Development of Renstra Strengthening Structure 2020-2024

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Abstract. In accordance with the mandate of the Presidential Regulation of the Republic of Indonesia Number 13 the Year 2015, the Ministry of Research, Technology, and Higher Education has the task of holding government affairs in the fields of research, technology, and higher education to assist the President in organizing state government. To be able to carry out its duties and functions, the Ministry of Research, Technology and Higher Education establishes the organization's vision, mission, goals and strategic objectives. In order to carry out the assigned tasks and functions, the Directorate General of Research and Development Strengthening has established a vision, mission and strategic plan. In the 2015-2019 period, the Directorate General of Research and Development Strengthening was established as a Research and Development Strengthening program. To measure the performance achievements in the scope of the Directorate General of Research and Development Strengthening, several strategic objectives have been set out that describe the conditions that must be achieved in 2019 which is one year left. In preparing the new strategic plan, it is necessary first to evaluate the previous program. The result Analysis based on the performance of Universities obtained a sequence of focus areas with high indexed publications are Social Humanities, Cultural Arts & Education; followed by ICT; Health and Medicine Technology. While the least is Defense and Security. Thus, if the focus area will be prioritized, then all grant schemes under the Ministry of Research, Technology and Higher Education can be directed to the focus areas whose publications are indexed on many Scopus.
1. Introduction

1.1. Background

In accordance with the mandate of the Presidential Regulation of the Republic of Indonesia Number 13 the Year 2015, the Ministry of Research, Technology, and Higher Education has the task of holding government affairs in the fields of research, technology, and higher education to assist the President in organizing state government.

In 2017 the Ministry of Research and Technology conducted a review and revision of the 2015-2019 Strategic Plan, setting Strategic Targets and Strategic Target Performance Indicators (IKSS), namely: Innovation Index, Higher Education Index and Bureaucracy Reform Index. To measure the achievement of these strategic goals (Innovation Index and Higher Education Index) measured from the achievement of Program Performance Indicators (IKP) which directly contribute to the achievement of Strategic Targets while the Bureaucracy Reform Index was obtained from the evaluation results of the implementation of the Ministry of Research and Technology's bureaucratic reform by the Ministry of PAN & RB. Evaluation theories and practices have evolved considerably over the past decades. Thus, this research is using evaluation method to achieve the goal.

The results of 2017 performance measurements can be seen from the achievement of each strategic target and key performance indicators, namely : (1). Strategic Targets (SS 1): Increased Relevance, Quantity, and Quality of Higher Education, with performance indicators (IKSS 1) Higher Education Index targeted 26.17 with performance achievements was 39.89. (2). Strategic Targets (SS 2): Increased Science and Technology Capability and Innovation, with performance indicators (IKSS 2) Innovation Index targeted at 16.85 with 48.56 performance achievements. (3). Strategic Targets (SS 3): Implementation of Bureaucratic Reform, with performance indicators (IKSS 3) Bureaucracy Reform Index is targeted at 75 with performance achievements of 71.23 (Kemenristekdikti, 2017).

In order to achieve the vision and mission, the vision and mission are formulated in a more directed and operational form in the formulation of strategic objectives (strategic goals) that must be achieved are:

a. Increased relevance, quantity, and quality of higher education for excellence nation's competitiveness;

b. Increasing innovation for the excellence of the nation's competitiveness; and

c. The realization of effective, efficient, deep integrity governance order for bureaucratic reform.

From the description above, it is necessary to evaluate the 2015-2019 Research and Development strengthening program. These results will be used in the context of developing Renstra for strengthening research and development 2019-2014.

1.2. Objective and target

1.2.1. Objective. This study aims to evaluate the 2015-2019 Research Strengthening Strategic Plan in the context of developing the 2020-2024 Strengthening Research Strategic Plan. Strategic Planning method for the Sustainability which aims to guide, facilitate and accelerate the sustainability. The evaluation needs to be carried out in order that the strategic planning strengthening for the next period of research synergies with the previous period. The aim of this study is that the Strategic Plan for Strengthening Research and Development for the 2020-2024 period be more directed and sustainable.

1.2.2. Target. In order to achieve the objectives, they must be formulated in a more directed and operational form in the form of strategic goals that must be achieved, which are:

a. Increased relevance, quantity, and quality of higher education for the excellence of the nation's competitiveness;

b. Increasing innovation for the excellence of the nation's competitiveness; and

c. The realization of effective, efficient, integrated governance in the context of bureaucratic reform.
2. Novelty and technological breakthrough

The novelty and technological breakthrough of this research is the evaluation of all the 2015-2019 strengthening Research and Development programs, especially in terms of quality. So far, the measure of success has only been measured in terms of quantity. Research and development strengthening programs that are often reported or delivered are only limited to the amount that has been achieved.

3. Method

3.1. Data.

Data needed or collected in research on the evaluation of the 2015-2019 Research Strengthening Strategic Plan in the context of preparing the 2020-2024 Research Strengthening Plan includes:

a. Reputable International Journal,
b. Accredited National Journal,
c. Textbooks / Texts,
d. Intellectual Property Rights (HKI),
e. Appropriate Technology (TTG),
f. Prototype,
g. Other data.

The data that must be collected is the data output above for 5 years, starting from 2015 to 2018. In this study also conducted a survey about service satisfaction/performance of the Director-General of Strengthening Research and Development.

3.2. Data analysis

3.2.1. Performance output. The first step is the performance outcomes in the field of research and community service, especially in the form of reputable international journals, checked one by one into what areas of focus. The area of focus in question is in accordance with the focus area in the 2015-2019 and 2020-2024 National Medium-Term Development Plans (RPJMN) which are;

a. Food: Developing technology to increase agricultural productivity.
b. Creation and Utilization of New and Renewable Energy: Develop energy technology which includes exploration, exploitation, and energy production technology.
c. Development of Technology and Transportation Management: Develop national transportation technology and management.
d. Information and Communication Technology: Develop information and communication technology to reduce information gaps, reduce intellectual property piracy, and reduce spending on imported technology.
e. Development of Defense and Security Technology: Developing technology to obtain the independence of the national defense and security industry.
f. Development of Health and Drug Technology: Develop health science and technology and especially natural medicine.
g. Advanced Material: Conducting research and development in the field of advanced material technology.
h. Maritime Affairs: Conduct research and development in the field of maritime technologies.
i. Management of Disaster Division/Sector: Conducting research and development in technology to anticipate climate change and disaster.
j. Social Humanities - Art and Culture – Education: Conducting research and development in the field of social humanities and cultural education.
k. Basic Science/MIPA: To anticipate that research outputs or community service from universities in the form of reputable international journals cannot be included in one of the focus areas above, then the focus area is added to the Basic Science / MIPA field.

3.2.2. Service satisfaction/performance survey. In this research, a survey on service satisfaction/performance of the Director-General of Strengthening Research will also be conducted. The units under the Director-General of Strengthening Research and Development include:
   a. Secretariat of the Directorate General of Research and Development Strengthening,
   b. Directorate of Research and Development Systems,
   c. Directorate of Research and Community Service,
   d. Directorate of Industrial Technology Development, and
   e. Directorate of Intellectual Property Management.

4. Metadata analysis

4.1. Performance-based analysis

General description of data based on data collection and mapping conducted by the Directorate of Research and Community Service (DRPM), performance-based approaches able to analyse the complexity and the performance outcomes. Directorate General of Research and Development Strengthening (Risbang) during 2014-2018 presented in table 1.

| No | Output                      | 2014   | 2015   | 2016   | 2017   | 2018   |
|----|-----------------------------|--------|--------|--------|--------|--------|
| 1  | International Journal       | 5.104  | 9.443  | 19.928 | 28.366 | 38.266 |
| 2  | Books                       | 1.772  | 3.199  | 7.193  | 9.133  | 9.494  |
| 3  | Intellectual Property Rights| 791    | 1.144  | 3.056  | 6.571  | 16.616 |
| 4  | Appropriate Technology      | 237    | 448    | 951    | 1.056  | 1.265  |
| 5  | Prototypes                  | 122    | 295    | 486    | 861    | 1.212  |

The data in table 1 is data on research performance and community service outcomes reported by PT in the 2014-2018 period. The data is reported in Simlitabmas. The data above has been validated and verified, especially for reputable international journals (Scopus indexed publications), taken from data available at www.scopus.com. For international journal data in table 1 is a journal whose data is entered by PT in Simlitabmas and has been validated by Kemenristekdikti. The data is not only publications that are indexed by Scopus.

| Years | 2014 | 2015 | 2016 | 2017 | 2018 |
|-------|------|------|------|------|------|
| Scopus| 5.855| 7.354| 10.951| 18.144| 28.703|

If the publications in table 2 are examined one by one of the focus areas, then the results will be obtained as table 3.

| No | Focus Field                          | Total | Percentage |
|----|--------------------------------------|-------|------------|
| 1  | Food and Agriculture                 | 4.922 | 6.92       |
| 2  | Renewable Energy                     | 3.879 | 5.46       |
| 3  | Transportation                       | 1.234 | 1.74       |
| 4  | Information Technology and Communication | 10.452 | 14.70     |
| 5  | Defense and Security                 | 359   | 0.50       |
Table 4 is a publication of Scopus based on the order of the number of publications per focus area.

| No | Focus Field                                      | Total  | Percentage |
|----|--------------------------------------------------|--------|------------|
| 6  | Health Technology and Medicine                   | 9.137  | 12.85      |
| 7  | Advanced Material                                | 7.989  | 11.24      |
| 8  | Maritime Affairs                                 | 1.321  | 1.86       |
| 9  | Disaster Management                              | 2.414  | 3.40       |
| 10 | Social Humanities, Art, Culture, and Education   | 13.116 | 18.45      |
| 11 | Basic Science / MIPA                             | 16.274 | 22.89      |
|    | **Total**                                        | **71.097** | **100.00** |

Actually, the top order (Basic Science/Mathematics) is not included in the 10 focus areas. The sequence of focus areas with high Scopus indexed publications are Social Humanities, Cultural Arts & Education; followed by ICT; Health and Medicine Technology while the least is Defense and Security. Thus, if the focus area will be prioritized, then all grant schemes under the Ministry of Research, Technology and Higher Education can be directed to focus areas whose publications are indexed on a large scale.

4.2. Strategic objectives-based analysis

In the framework of efficiency, effectiveness, and sharpening the work results of the Directorate General of Strengthening Research and Development, program management in the form of: activity planning, implementation of activities and reporting of activities improved to performance management (work results) in the form of: performance planning, performance implementation, performance measurement, performance control and performance reporting.

Improving the quality of research and development is also an urgent urgency to be improved. Higher education and the world of work are not just to prepare graduates who are ready to work because they have the skills or expertise needed by the industry. Higher education must also train graduates to be able to become independent entrepreneurs who open jobs for themselves and others. Education and the world of work are becoming an important focus at this time. Main Performance Indicator shown in table 5.
Table 5. Achievements of key performance indicators

| No | Strategic target | Performance Indicator | Target 2015-2019 | Realization | Total | Realization (%) |
|----|------------------|-----------------------|-------------------|-------------|-------|-----------------|
| 1  | Increased Productivity of Intellectual Poverty | International Publication HKI | 56.237 | 6.47 | 9.57 | 16.147 | 29.031 | 61.222 | 108.86 |
| 2  | Increased productivity of Higher Education Research, Research and Development, Community Service | Prototype R&D | 4.145 | 641 | 791 | 1.412 | 1.042 | 3.886 | 93.75 |
| 3  | Increased Industry Worthiness Technology Readiness | Industrial Prototype | 95 | 4 | 45 | 86 | 41 | 176 | 185.26 |

As of December 31, 2018, all performance indicators had been almost reached, even more than 100%, except for prototypes. Most likely, the prototype will also be fulfilled because there is still 1 year of work (in 2019). Thus, performance indicators need to be improved in the next strategic plan. In the new strategic plan also needs to be considered in terms of quality, for example, for international publications, at least 50% is in the form of journals, not from seminars. Intellectual Property Rights are also directed not only in terms of quantity but also measured by quality, for example, what amounts to an industrial scale.

4.3. Satisfaction survey-based analysis

A survey of the Public Satisfaction Level within the Directorate General of Research and Development Strengthening (Dirjen Risbang) has been collected in detail in table 6.

Table 6. Number of respondents by category of respondents

| No | Type of Respondent                | Total |
|----|-----------------------------------|-------|
| 1  | Regional Research and Development | 4     |
| 2  | Research and Development KL       | 58    |
| 3  | LPNK                              | 12    |
| 4  | Rector                            | 63    |
| 5  | Lecturer                          | 1.465 |
| 6  | LPPM and Other Similar            | 522   |
| 7  | LLDIKTI / Kopertis                | 15    |
| 8  | BUMN                              | 3     |
| 9  | Public                            | 21    |
| 10 | Foreign Researcher                | 17    |
| 11 | Other Stakeholders                | 6     |
|    | **Total**                         | **2.186** |
From the data in table 6, it can be seen that the majority of respondents came from Lecturers with a total of 1,465, then followed by LPPM and Research and Development KL. For the types of BUMN and R & D respondents, occupy the least number of respondents, namely BUMN as many as 3 respondents and R & D as many as 4 respondents.

Results of measurement of the level of public satisfaction based on work units, Directorate of Research & Development Systems (DSRP), Directorate of Research and Community Service (DRPM), Directorate of Industrial Technology Development (DPTI), Directorate of Intellectual Property Management (DPKI), Secretary of the Directorate General of Research and Development (SESDITJEN), Directorate General (DITJEN) of Kemenristekdikti can be seen from the table 7.

| No | Unit                         | Unsatisfied | Less Satisfied | Satisfied | Very Satisfied |
|----|------------------------------|-------------|----------------|-----------|----------------|
| 1  | DSRP                         | 5.37 %      | 35.34 %        | 46.66 %   | 12.62 %        |
| 2  | DRPM                         | 1.74 %      | 26.10 %        | 66.16 %   | 6.00 %         |
| 3  | DPTI                         | 5.78 %      | 26.83 %        | 60.45 %   | 6.93 %         |
| 4  | DPKI                         | 5.34 %      | 25.40 %        | 64.49 %   | 4.78 %         |
| 5  | SESDITJEN                    | 0.57 %      | 25.36 %        | 63.03 %   | 11.04 %        |
| 6  | DITJEN                       | 7.07 %      | 21.77 %        | 51.35 %   | 19.80 %        |

From table 7, it can be seen that in all work units are dominated by respondents who answered the satisfied category. In the DSRP work unit, the most respondents answered in the satisfied category were 46.66%, the DRPM work unit was the most respondents who answered in the satisfied category by 66.16%, the DPTI work unit was the most respondents who answered in the satisfied category by 60.45%, DPKI work units with the most respondents who answered in the satisfied category were 64.49%, SETDITJEN work units were the most respondents who answered in the satisfied category by 63.03%, and for DITJEN the most respondents who answered in the satisfied category were 51.35%.

Furthermore, the results of measurement of the level of public satisfaction based on categories of respondent types (Regional R&D, Research and Development Planning, LPNK; Rector; Lecturers; LPPM; LLDikt; BUMN; Society; Foreign Researchers and other Stakeholders) can be seen entirely in the table 8.

| No | Respondent                  | Unsatisfied | Less Satisfied | Satisfied | Very Satisfied |
|----|------------------------------|-------------|----------------|-----------|----------------|
| 1  | Regional Research and Development | 0.00 %      | 6.25 %         | 82.81 %   | 10.94 %        |
| 2  | Research and Development KL  | 0.00 %      | 25.00 %        | 62.50 %   | 12.50 %        |
| 3  | LPNK                         | 0.00 %      | 18.75 %        | 81.25 %   | 0.00 %         |
| 4  | Rector                       | 0.10 %      | 11.81 %        | 79.62 %   | 8.47 %         |
| 5  | Lecturer                     | 3.67 %      | 23.20 %        | 68.05 %   | 5.08 %         |
| 6  | LPPM and Other Similar       | 1.60 %      | 18.08 %        | 72.38 %   | 7.94 %         |
| 7  | LLDIKTI / Koperti            | 0.00 %      | 1.71 %         | 78.86 %   | 19.43 %        |
| 8  | BUMN                         | 0.00 %      | 10.00 %        | 90.00 %   | 0.00 %         |
| 9  | Public                       | 4.58 %      | 43.57 %        | 49.46 %   | 2.40 %         |
| 10 | Foreign Researcher           | 7.01 %      | 77.82 %        | 14.31 %   | 0.86 %         |
| 11 | Other Stakeholders           | 0.00 %      | 27.00%         | 70.00%    | 3.00%          |
In general, respondents who were very satisfied/satisfied with the performance of the Directorate General of Research and Development Strengthening were Regional R&D, KL R&D, and LPNK while the respondents who are less/dissatisfied are the public and foreign researchers.

5. Conclusion

Analysis based on the performance of PT obtained a sequence of focus areas with high indexed publications are Social Humanities, Cultural Arts & Education; followed by ICT; Health and Medicine Technology. While the least is Defense and Security. Thus, if the focus area will be prioritized, then all grant schemes under the Ministry of Research, Technology and Higher Education can be directed to the focus areas whose publications are indexed on many Scopus.

As of December 31, 2018, all performance indicators had been almost reached, even more than 100%, except for prototypes. Most likely, the prototype will also be fulfilled because there is still 1 year of work (in 2019). Thus, performance indicators need to be improved in the next strategic plan. In the new strategic plan also needs to be considered in terms of quality, for example, for international publications, at least 50% is in the form of journals, not from seminars. Intellectual Property Rights are also directed not only in terms of quantity but also measured by quality, for example, what amounts to an industrial scale.

Results of measurement of the level of public satisfaction based on work units, Directorate of Research & Development Systems (DSRP), Directorate of Research and Community Service (DRPM), Directorate of Industrial Technology Development (DPTI), Directorate of Intellectual Property Management (DPKI), Secretary of the Directorate General of Research and Development (SESĐTJEN) In general, the Directorate General (DITJEN) of the Ministry of Research, Technology and Higher Education has been encouraging.

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