Research Article

Risk Management Analysis in International Collaborative Research

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Abstract.
Risk management is a systematic approach to determining the best course of action in conditions of uncertainty through identification, understanding, action, and communication of risk issues. Risk management is a culture, process, and structure that is directed and provides adequate confidence to achieve organizational goals through risk management at a tolerable level. Indonesian foreign research permit policy has been implemented based on Government Regulation Number 41 of 2006. The policy implementation can be elaborated by risk management analysis. This article explains the implementation of foreign research permit in international collaborative research in Indonesia. The Indonesian government has implemented the policy since 1993 and used a security approach blended with a scientific benefits approach. This article elaborates on the approaches in the decision-making process when the research permit application is submitted by foreign nationals and then reviewed by coordinating team reviewers from their perspective and interpretation. In another perspective, the struggle of Indonesian researchers as research collaborators or local counterparts for intellectual property rights performance in international collaborative research will also be elaborated by using risk management analysis. This research uses qualitative methods in data collection and analysis. Samples were selected purposively by using certain criteria.

Keywords: risk management, research permit, international collaborative research

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1. INTRODUCTION

1.1. Foreign Research Permit

The foreign research permit policy has been implemented since 1993 [1]. There are three foreign research permit regulations that have been implemented by the Government of the Republic of Indonesia, namely: 1) Presidential Decree Number 100 of 1993 concerning Research Permits for Foreigners [1]; 2) Law of the Republic of Indonesia Number 18 of 2002 concerning the National System of Research, Development, and Application of Science and Technology [2]; and Law of the Republic of Indonesia Number 11 of 2019 concerning the National System of Science and Technology [3].

This research will analyze a decision-making process of foreign research permits conducted by a Coordinating Team for Foreign Research Permits, an ad hoc team who provide recommendation to the Minister of Research and Technology for granting a research permit for foreign nationals who will conduct international collaborative research in Indonesia.

1.1.1. Presidential Decree Number 100 of 1993

Presidential Decree Number 100 of 1993 is an independent Presidential Decree which does not constitute a delegation of authority that is derived by higher regulations, either by law or by government regulations above it [1]. Presidential Decree No. 100 of 1993 is the first regulation as the basis for the implementation of foreign research permit policies in Indonesia [1]. This Presidential Decree authorizes the Indonesian Institute of Sciences (LIPI) as the regulator to implement research permit policies for foreigners [1].

The regulated aspect is that foreigners are required to have foreign institutional sponsors as guarantors. Foreign researchers are also required to have research partners who are R&D institutions or national universities. In implementing the policy, foreign research permits use a very strict security approach and foreign researchers who conduct research are considered as objects of supervision.

LIPI implements the foreign research permit policy assisted by an ad hoc team called the Coordinating Team for Granting Research Permits to Foreigners whose members are ex officio echelon II officials from various ministries and government agencies. This team meets regularly every month to discuss the latest security issues related to foreign research activities, but the team does not specifically review research proposals submitted by foreign researchers. The decision to grant research permits is entirely left to the State Intelligence Coordinating Agency (BAKIN). However, since October 2000, the decision to grant permits has been made based on the results of a review of research proposals in the Coordination Team sessions.

1.1.2. Law Number 18 of 2002

Based on the Law of the Republic of Indonesia Number 18 of 2002 and Government Regulation Number 41 of 2006 [2, 4], the policy of foreign research permit and international collaborative research is implemented in two approaches at once. The first approach is the scientific benefits approach, while the second is the security approach [2, 4]. Government Regulation Number 41 of 2006 stipulates that the assessment of the

object of permit and the nature of the losses arising from research activities carried out by foreign researchers will pay attention to and consider the following aspects: 1) the benefits of science and technology; 2) foreign relations; 3) environmental sustainability; 4) politics, defense and security; 5) social, cultural, and religious; and 6) economic benefits [4].

These two approaches are also reflected in the formation of the TKPIPA (Coordination Team for the Granting of Foreign Research Permits) as an ad hoc committee that helps provide decision recommendations on applications for foreign research permits to the Minister of Research, Technology, and Higher Education. TKPIPA membership clearly reflects both approaches.

TKPIPA membership consists of 2 groups, namely: a group of members from Ministries/Institutions with tasks and functions in the field of research and development while the second group is members from Ministries/Government Agencies who have the duties and functions of coordinating and monitoring the activities of foreigners. The first group is functional researchers from LIPI, the Agency for the Assessment and Application of Technology (BPPT), the National Institute of Aeronautics and Space (LAPAN), the National Nuclear Energy Agency (BATAN), the Health Research and Development Agency, the Ministry of Health, Agricultural Research and Development Agency, Ministry of Agriculture, Research & Development and Innovation Agency Ministry of Environment and Forestry, Marine and Fisheries Research and Development Agency, Ministry of Marine Affairs and Fisheries. Eijkman Institute for Molecular Biology. The second group is the State Intelligence Agency, the Strategic Intelligence Agency of the Indonesian National Armed Forces, the Directorate of Diplomatic Security of the Ministry of Foreign Affairs, the Directorate of National Vigilance of the Ministry of Home Affairs, the Directorate of Defense Areas of the Ministry of Defense, Intelligence and Security Agency of the National Police, Directorate of Immigration Traffic, Directorate General of Immigration, Ministry of Law and Human Rights.

1.1.3. Law Number 11 of 2019

The year 2019 is a new era of international research collaboration policies and foreign research permit in Indonesia. Law Number 11 of 2019 concerning the National System of Science and Technology has laid a solid policy foundation and views the development of national science and technology (science and technology) through international science and technology cooperation as very important and strategic. The law obliges every

national science and technology institution that conducts partnerships to develop an international science and technology network with the obligation to transfer technology.

Law Number 11 of 2019 also regulates several obligations that must be carried out by every foreign science and technology institution that collaborates with research and development institutions and national universities, including: 1) producing outputs that benefit the Indonesian nation; 2) involving Indonesian science and technology human resources with equivalent scientific capacity as working partners; 3) include the names of Indonesian science and technology human resources in each output produced in joint activities; 4) carry out technology transfer; 5) submit primary data on research, development, assessment, and application activities; 6) provide a proportional distribution of profits in accordance with the agreement of the parties concerned; and 7) make a written agreement regarding the transfer of material in the context of the transfer or transfer of material in physical and/or digital form. The policy of international science and technology cooperation is very strategic to increase the productivity of intellectual property, especially scientific publications and patents as well as to realize equality in international research partnerships (equal partnership) with the principles of mutual respect and respect in distributing profits and benefits fairly and in a balanced manner. mutual respect, mutual trust and mutual benefits).

Law Number 11 of 2019 has fundamentally shifted the policy of foreign research permit international research collaboration. If Law Number 18 of 2002 and Government Regulation Number 41 of 2006 use a scientific benefit approach and a relatively balanced security approach, the policy for foreign research permit international research collaborations shifts towards a scientific approach. scientific approach) and put more emphasis on legal protection of Natural Resources and the potential for Intellectual Property Rights that will be generated in international research partnerships.

Since 20 May 2022, the foreign research permit policy has been implemented based on the Regulation of the National Research and Innovation Agency Number 22 of 2022 (PERBRIN No. 22 of 2022). Policies are implemented with a scientific approach (scientific approach). The head of BRIN is assisted by five ad hoc Ethics Clearance Committees whose membership is based on scientific expertise and is determined by a decree from the Head of BRIN. The five ad hoc commissions consist of: 1) Experimental Animal Ethical Clearance Commission, 2) Socio-Humanities Ethical Clearance Commission, 3) Chemical Ethical Clearance Commission, 4) Health Ethics Clearance Commission 5) Nuclear Energy Ethical Clearance Commission. Each applicant for a research permit is required to fill out a self-assessment form. Based on the results of the self-assessment, foreign research proposals will be categorized based on the research methodology

applied by foreign researchers. If the foreign research proposal does not fall into the category of one of the five commissions, the proposal will be categorized into other groups (*Other*) and the next process is through checking the black list of foreign researchers. Foreign researchers who pass the blacklist check can be granted research permits. A summary of the implementation and evaluation of foreign research permit policies is listed in table 1.

TABLE 1: The Dynamics of Foreign Research Permit Policy (1993 – 2022).

	(a) Regulation, (b) Validity Period, (c) Regulator	**Policy Implementation**
1	Presidential Decree Number 100 of 1993 1 November 1999–1 December 2007 LIPI	The policy is implemented with a security approach in conducting a review of foreign research proposals by involving the Research Permit Coordination Team for Foreigners as an ad hoc Team that assists the Head of LIPI. Members of the Coordinating Team from Ministries/Institutions who carry out the duties and functions of coordinating and supervising the activities of foreigners (especially BAKIN) are very decisive in making decisions on permit foreign research.
2	Law Number 18 of 2002 & Government Regulation Number 41 of 2006 1 December 2007–20 May 2022 Kemristek & Kemristekdikti	The policy is implemented using a scientific & security approach in conducting a review of foreign research proposals by involving the Research Permit Coordination Team for Foreigners as an ad hoc Team that assists the Minister of Research and Technology. Coordination Team membership consists of Ministries/Agencies implementing R&D tasks and functions and coordinating & supervising the activities of foreigners. Since 2017 the decision making on research permits has been carried out by the Reviewer Team, which is dominated by functional researchers from Ministries/Government Agencies who have the duties and functions of R&D such as LIPI, BPPT, Balitbang KLHK, Balitbang KKP, Balitbang ESDM, Balitbang Health, LBM Eijkman, Balitbang Agriculture. Public service innovations by optimizing the use of Information Technology have also begun to review foreign research proposals online. The security approach no longer dominates the research permit policy.
3	Law Number 11 of 2019 & PERBRIN Number 11 of 2022 20 ay 2022–present BRIN	The policy is implemented with a security approach in conducting a review of foreign research proposals by involving the Research Permit Coordination Team for Foreigners as an ad hoc Team that assists the Head of LIPI. Members of the Coordinating Team from Ministries/Institutions who carry out the duties and functions of coordinating and supervising the activities of foreigners (especially BAKIN) are very decisive in making decisions on permit foreign research.

2. THEORETICAL STUDY

2.1. Definition of Risk Management

Risk is the possibility of an event occurring that has an impact on the achievement of organizational goals. Risk management is a coordinated activity to direct and control an organization related to risk [5]. Risk management, according to the definition of the State Audit Board of the Republic of Indonesia (BPKP), is a systematic approach to determine the best course of action in conditions of uncertainty through identification, understanding, action, and communication of risk issues. Risk management is a culture, process and structure that is directed and provides adequate confidence to achieve organizational goals through risk management at a tolerable level. Risk management process is the systematic application of policies, procedures, and management practices for communication and consultation activities, context setting, risk identification, risk analysis, risk evaluation, risk management, as well as monitoring and review. Risk management is a logical and systematic method of setting context, identifying, analyzing, evaluating, managing, monitoring and communicating risks associated with any activity, function or process in a way that enables the organization to minimize losses and maximize opportunities.

2.2. Risk Management in Public Policy

Based on the managerial sequence of public policy, there are five types of policy risk, namely: 1) risk in planning, 2) risk at the time of formulation, 3) risk at the time of implementation or implementation or organization, 4) execution risk or leadership risk, and 5) risk during control policy planning. Risks relates to how sufficient planning information is, how sufficient planning tools are, which includes organization, people and methods, and how sufficient planning capital is. Formulation risk relates to the risk of how correct and good the policy agenda is, how appropriate and appropriate the methods and practices of policy analysis, and how efficient and effective policy decisions are. The risk of implementing the policy relates to the readiness of the implementing organization, implementing people, and the implementation system. Leadership risk relates to how willing the leader is to lead the implementation of policies, which relates to the willingness factor, plus the intelligence of the leader to maneuver or innovate when there is a bottleneck in policy implementation, including rearranging organizations, people, and systems. Risk in control relates to the ability to monitor, assess or evaluate, and reward the implementation of policies.

By sector, almost all sectors are vulnerable to risk, from education, health, to defense. The causes of risk are also divided into systemic causes, or originating from the system, and non-systemic causes, namely those originating from the system environment. In relation to the framework of this research, it only focuses on the risk management aspect for public policy. Government Regulation Number 60 of 2008 concerning the Government Internal Control System (SPIP) has regulated risk management in the public sector [6]. SPIP is built by 5 elements, namely: 1) control environment, 2) risk assessment, 3) control activities, 4) information and 5) communication and monitoring of internal control. Public sector organizations can implement a risk management system in accordance with Standard ISO 31000:2018 to implement elements related to risk assessment [7]. Changes in the management of the business sector have inspired and attracted the public sector. New public management and reinventing government entrepreneurial government and good governance have emerged driven by best practices in the public sector which are the main part of learning for the public sector. Today, especially in the banking, investment, trade, energy, and mining sectors, risk management has become a major part of the business processes carried out by leading business actors [6].

The state sector also adopts risk management in its management process. In this regard, the main role of the state is to make public policies [6]. Public policy is the core competency of the state. Not others. To ensure that the life of the state and society brings the common good, public policy is an order that regulates life together within the country or between countries. Countries that are able to develop superior public policies will become superior countries. There are three basic criteria for superior public policy, namely smart public policy, which is solving problems at the core of the problem, wise, namely solving problems without problems, and giving hope, because it represents the public interest. Every public policy-making must include an analysis process with the aim of assessing the risks that will occur if the policy is determined and then implemented because public policy is closely related to risk management.

In public policy, risk management relates to three things, namely: 1) identifying public policy risks; 2) assessing how much risk can be tolerated so that the policy does not fail; and 3) develop management to anticipate and overcome risks that will arise both during formulation, implementation, and post-implementation. This includes a management strategy for distributing policy resources [6].

Effective risk management has at least a framework that must cover two aspects, namely aspects of implementation and continuous improvement. The elements in the implementation aspect include: 1) commitment and mandate, 2) communication and

training, and 3) structure and responsibilities [6]. The elements in the aspect of continuous improvement include: 1) structure and responsibilities, 2) review, and 3) improvement [6].

2.3. Stages and Process

At the identification stage, all risks, both inside and outside the organization, with a number of considerations, will be identified and managed. First, what could happen? The purpose of this stage is to compile a comprehensive risk list of events that can impact each element of the activity. This stage provides an exploration of the problems faced, which will provide the magnitude of the consequences that can occur. To determine the level of risk in the future, consequences are an important variable. Second, how and why did it happen? at this stage the process of events that will pose a risk based on the information on the description of the results of the exploration of the problem above, a scenario is carried out. To provide a series of ”story” about the process of occurrence of a risk, including the factors that can be suspected to be the cause or influence of the occurrence of the risk, Scenarios are important. This stage will provide a range of existing probabilities. Probability is also an important element to determine the level of risk later [6].

In order to separate between minor risk and major risk which can then be used as evaluation and consideration of control treatment, a risk analysis is carried out. Risk analysis aims to distinguish acceptable minor risks or major risks that require control measures [6].

The purpose of the risk analysis stage is to measure the risks that have been identified in terms of their probabilities and impacts. Existing control aspects are an important consideration in measuring risk. The purpose of risk evaluation is to determine the level of risk because the agency has tolerance for that risk and to reduce the likelihood and/or impact of a potential risk. Based on the evaluation stage, treatment can be carried out, for example by avoiding, reducing, or transferring risk.

2.4. Benefits of Risk Management

The main benefit of Public Sector Risk Management (MRSP) is to help public sector agencies manage their risks properly, systematically and in a planned manner. Decision making that has taken into account the risks in the process and the results is expected to be more precise and effective, namely:

1. Assess the impact of risk to ensure that the risk has been managed to reduce the risk;
2. Prioritizing, for example in areas where public sector agencies have a high risk in achieving program outcomes, so that resources can be directed especially to areas with high risk.
3. Minimize waste, fraud and errors;
4. Assess options regarding opportunities for better services and outcomes.

In accordance with the guidelines of the National Standardization Agency (BSN), there are several elements that must be met in implementing risk management: 1) risk management process; 2) risk management principles; and 3) risk management assessment.

2.5. Elements of Risk Management

2.5.1. Risk Management Process

The risk management process can be explained briefly using a chart like the one below:

Figure 1: Risk Management Process [8].

2.5.2. Risk Management Principles

The application of risk management principles in accordance with SNI ISO 31000:2009 Article 4, Principles, is shown in *Figure 1*. These principles are the foundation in implementing risk management frameworks and processes in public sector organizations to achieve the main objectives of risk management.

The purpose of risk management is to create and protect value while the operational objectives of risk management are to improve performance, encourage innovation, and support the achievement of objectives. The purpose of implementing risk management in the organization is basically to create and protect organizational value in achieving the stated vision and mission. Some of the benefits for public sector organizations if they are able to achieve these goals, include at least the following:

Ensure the achievement of key objectives;

Increase opportunities to take advantage of opportunities;

Improve the quality of planning and performance achievement;

Improve good relations with stakeholders;

Improve the quality of decision-making;

Increase the sense of security for management and all employees;

Improve organizational accountability and governance; and

Reduce surprises.

A risk management coordination model in an organization divides organizational functions into three lines of defense against risk:

1) Risk management carried out by risk owners.

2) Risk monitoring carried out by the risk management work unit.

3) Independent assurance provider carried out by the examiner.

Risks can be grouped into three categories as follows:

1) generally acceptable, indicated by the green block risk matrix table.

2) Tolerable, for control with special requirements, indicated by the yellow block risk matrix table.

3) totally unacceptable, indicated by the colored block risk matrix table.

2.5.3. Risk Management Assessment

Risks are assessed based on risk identification, analysis, and evaluation.

2.5.3.1 Risk Identification

Sources, areas of impact, events and causes, as well as potential impact risks, should be identified by the organization. This stage aims to compile a comprehensive list of risks based on the factors that affect the organization's performance goals.

KEKERAPAN (FREQUENCY/F)	KEPARAHAN (SEVERITY/S)			
	1	2	3	4
1.	1	2	3	4
2.	2	4	6	8
3.	3	6	9	12
4.	4	8	12	16

Figure 2: Risk Categories [7].

2.5.3.2 Risk Analysis

In making a decision whether a risk requires treatment or not, as well as a decision on what risk management method is the most appropriate, a risk analysis is required. Risk analysis includes several considerations including the causes and sources of risk, positive and negative consequences, and the possibility of these consequences being faced.

2.5.3.3 Risk Evaluation

Risk evaluation aims to help make decisions based on risk analysis outputs, related to risks that require priority treatment. Comparison of the level of risk found in the analysis process based on the criteria specified in the context setting also need to be evaluated.

2.5.3.3.1 Risk Identification

The process of analyzing events and potential events that will occur can affect the achievement of organizational goals and even have the potential to harm the organization, is a risk identification activity. Risk identification is carried out by risk owners through observing indications, sources and causes of risk, types of activities affected by risk, consequences and consequences if a risk occurs, and documentation.

Based on problems that occurred in the past or during the current period, both from internal and external cases, the level of complexity of the process of an activity, policy changes or changes in the activity process, as well as from expert and community opinions, risk indications are carried out.

For decision making, in general terms, the sources of risk that can come from environmental risk, process risk and information risk must be considered. Internal risks that are generally still under management control are process risks and information risks. Most of the environmental risks come from external sources which are generally beyond management's control. Controllable risks should have an action plan immediately prepared directly, while risks that cannot be controlled need to be reported or coordinated with relevant external officials.

2.5.3.3.2. Risk Analysis

To determine the level of risk that can indicate the magnitude of the influence of risk on the achievement of objectives, as well as to develop a priority scale for risks that require certain treatment, it is necessary to develop and use risk analysis. The magnitude of the risk value is the result of multiplying the level of probability of the occurrence of the risk with the estimated magnitude of the impact value.

2.5.3.3.3 Source of Risks

In general, the sources of risk can come from environmental risk, process risk and information risk in decision making.

3. METHODS

This research uses qualitative method in data collecting and analysis. The sample of this research was taken purposively and using internal sampling technique. The research sample was deliberately selected based on certain criteria and categories that have been determined so that it is relevant to the design of qualitative research, because it is considered to have certain characteristics, which can enrich research data [9]. Furthermore, in the internal sampling technique, qualitative research will decide who will be interviewed, when to make observations, or what documents and how much need to be studied [9]. In this study, primary data collection techniques will be used through structured in-depth interviews with 5 key informants with strictly defined criteria. The key informants selected to be interviewed have been determined based on the following criteria: a) the regulator or Director of Intellectual Property Management, Kemristekdikti (2015 – 2019); b) researchers or lecturers who have experience in conducting international research collaborations for a minimum of 20 years; c) foreign researchers who

have experience in conducting international research collaborations in Indonesia for at least 20 years; d) members of the Coordinating Team for the Foreign Research Permits (TKPIPA). In addition to interviews, secondary data collection will also be carried out by collecting documents deemed relevant to the research questions and objectives. The documents in question are a) laws and regulations; b) scientific publications in the form of books, journals and scientific proceedings; c) Kemristekdikti reports; d) text of research cooperation agreements such as Memorandum of Understanding (MoU) and Technical Agreements; e) Focused Group Discussion video recording.

Secondary data such as meeting records, relevant regulations, research agreement documents and electronic media were also collected to be analyzed.

4. RESULTS AND DISCUSSION

4.1. Risk Management in International Collaborative Research

The policy of foreign research permit by applying two approaches, the scientific benefits approach and security approach, is aimed at obtaining benefits in international research collaborations with foreign researchers from various countries while still considering the calculation of risks and aspects of losses that can be caused. Potential risks and losses that can arise in international research collaboration include theft of intellectual property rights through transferring research samples or specimens abroad without being accompanied by a written Material Transfer Agreement. Potential risks can also occur through the preparation of research cooperation agreement documents that are detrimental to the Indonesian side.

Although the Law Number 18 of 2002 and Government Regulation Number 41 of 2006 considers it important to maintain and protect genetic resources, natural resources, socio-cultural diversity including traditional knowledge, traditional medicine (traditional healing) and the use of plants traditionally by indigenous peoples (ethnobotany) [2,4], the Material Transfer Agreement has not been regulated explicitly and clearly by the regulation.

The foreign research permit policy is implemented with those two approaches, with the aim that the benefits obtained in international research collaboration with foreign researchers from various countries still take into account the calculation of risks and aspects of losses that can be caused.

Potential losses can also be in the form of negative campaigns or black campaigns against policy issues of the Government of the Republic of Indonesia carried out by

groups of Non-governmental Organizations (NGOs) who misuse data and information on research outputs produced by foreign researchers in Indonesia.

Sensitive issues that are often targeted include environmental issues such as land use conversion, oil palm plantation issues, issues of carbon release or exhaust emissions, and security issues in research areas, for example in the remote areas of Papua Province. The foreign research permit policy is very concerned about the negative impact of these sensitive issues. In outline, this policy is contained in the Regulation of the Minister of Research, Technology and Higher Education Number 14 of 2017 concerning the List of Activities and Objects of Foreign Research Permit that are not Recommended [10] and the Decree of the Director General of Strengthening Research and Development, Kemristekdikti Number 32/E/KPT/2018 concerning Guidelines for the Assessment of Foreign Research Permit Proposals [11].

Risk analysis in the process of assessing foreign research permit proposals involves considering: the causes and sources of risk, positive and negative consequences, and the likelihood of these consequences occurring. This can be clearly illustrated in *Figure 3*. The analysis of the causes and sources of risk in the foreign research permit proposal assessment session is a hot issue debated by reviewers from the R&D government agencies reviewer group and reviewers from government agencies with the task of coordinating and monitoring foreigners. The research proposal that is assumed to have a potential risk to national security or raises sensitive issues that have the potential to harm national interests is also a serious concern as a positive and negative consequence. The decision-making process by TKPIPA reviewers in conducting an assessment of a research proposal can be described as that of a motorized vehicle driver. On the one hand, the R&D reviewer group tends to step on the gas pedal and approve research proposals submitted by foreign researchers that offer a balanced benefit sharing and have the potential to produce productive Intellectual Property in research collaborations in Indonesia.

On the other hand, the reviewer group from government agencies who are in charge of coordinating and monitoring foreigners, with a perspective and consideration of security, tends to step on the brake pedal and refuse or agree with additional requirements to proposals that are considered to have the potential to cause or be a source of risk to national security and interests. The reviewer government agencies group from the task of coordinating and monitoring foreigners even conducted an analysis of the curriculum vitae and track record of each foreign researcher who was judged to be a potential cause and a source of risk.

An example of a decision-making case for a foreign researcher's proposal that offers research collaboration in the field of ecology or agroforestry in an oil palm plantation area that has a very strong nuance of environmental issues has been criticized from two different perspectives from the two groups of reviewers. From the perspective of technology transfer and strengthening the capacity of national science and technology institutions, the reviewer group of R&D institutions will approve the proposal with the consideration that the collaboration will have positive consequences in the form of research grants, training facilities, infrastructure assistance for R&D partner institutions, and acquisition of Intellectual Property in particular. joint scientific publications published in high reputable international scientific journals.

On the other hand, from the perspective of the reviewer group of government agencies with the task of coordinating and monitoring foreigners, will criticize potential risks such as misuse of research data and information, including scientific publications published for negative campaign usage by non-governmental organizations (NGOs) activists to influence the state government. The purpose of the negative campaign is to refuse exports of crude palm oil and its derivative products on the estates that the land use conversion for oil palm plantations has damaged tropical forest ecosystem as the lungs of the world.

The positive and negative consequences, as well as the possibility of these consequences occurring, have also been considered by the TKPIPA reviewers.

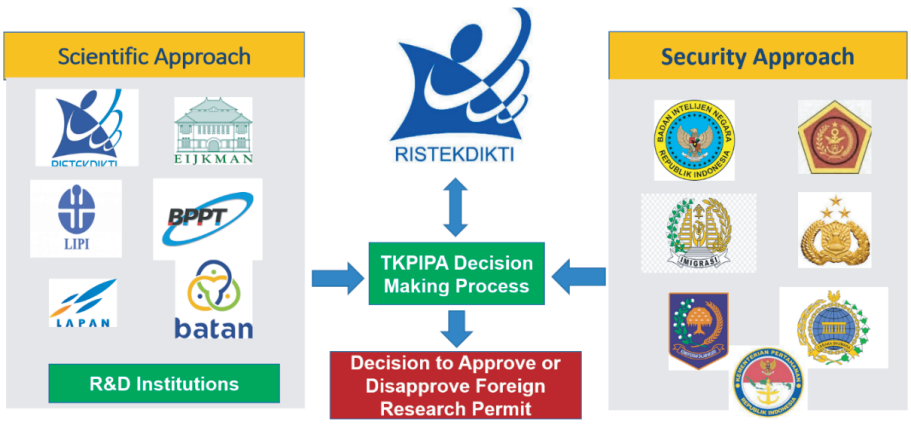

Figure 3: Risk Analysis in Reviewing Foreign Research Proposals.

Risk management aspects are also very clearly formulated in the Regulation of the Minister of Research, Technology and Higher Education Number 14 of 2017 concerning the List of Activities and Objects of Foreign Research Permit that are not Recommended [10]. The Ministerial Regulation confirms that the Minister in granting written permission is based on the results of the assessment of the object of the permit and the nature of the

losses that maybe impacted from research activities. The Risk Management approach in research permit policies that really considers the potential and risk calculations, namely: (1) Assessment of the object of permit and the nature of losses that can be caused by research activities by the authorized government agency coordinated by the Minister; (2) Permit objects are compiled in a list of activities and objects of foreign research permit that are not recommended; (3) The list of activities and objects of foreign research permits that are not recommended are compiled by taking into account and considering national interests and security, which include: a) the benefits of science and technology; b) foreign relations; c) environmental sustainability; d) politics; e) defense; f) security; g) social; h) culture; i) religion; and j) economy.

In evaluating foreign research permit proposals submitted by foreign researchers, the TKPIPA Reviewer Team always considers two aspects. On the one hand, the Assessment Team from various Ministries/Institutions whose duties and functions are in the coordination and monitoring of foreigners will assess research proposals based on national security considerations. These considerations consist of list of questions shown on *Table 3*. For example, in agroforestry research in oil palm plantations, the scientific publications produced can be misused by environmental NGO activists as a scientific justification for campaigns against exporting crude palm oil in European Union countries.

Risk analysis in the process of assessing foreign research permit proposals from the risk perception of the reviewer group consisting of non-researcher structural and functional officials from Ministries/Institutions with the duties and functions of coordinating and supervising foreigners is reflected in the description of the questions in *Table 3* while risk analysis in the proposal appraisal process foreign research permit from the risk perception of the reviewer group consisting of functional researchers from Ministries/Agencies with R&D tasks and functions is reflected in the description of the questions in *Table 4*.

On the other hand, from a different perspective, the reviewer team from R&D governmental organizations, tends to evaluate foreign research permit proposals with consideration of the benefits of science and technology. These considerations are shown on *Table 4*.

The TKPIPA Reviewer Team has mitigated and anticipated the potential risks posed by the implementation of international research collaborations by foreign researchers in Indonesia.

In the process of planning and negotiating international research collaborations by Indonesian partner institutions with foreign researchers, it can also be explained with the theoretical framework of Risk Management. In this case, the Partner institutions

Table 2: Non- Recommended Activities & Research Objects [10].

	Activity and Research Object	Description
1	Research topics are seen as sensitive for the government and the wider community.	Topics that are considered sensitive can be related to ideology, politics, economy, social, culture, religion, defense and security, government policies, and regulations/laws, which have the potential to cause conflict or disintegration between communities and nations.
2	The research site is seen as prone to conflict, restricted areas, and areas that are not recommended in terms of security and protection of natural resources. Conflict-prone areas are areas that are vulnerable according to security considerations, both for the foreign researcher's own security and for local security; areas where it is feared that there are groups of security intruders, or conflicts between communities. This includes areas that have not been widely explored by Indonesian researchers, so there are concerns over the theft of natural resources.	Conflict-prone areas are areas that are vulnerable according to security considerations, both for the security of Foreign Researchers themselves and for local security; areas where it is feared that there are groups of security intruders, or conflicts between communities. This includes areas that have not been widely explored by Indonesian researchers, so there are concerns over the theft of natural resources.
3	Research period coincides with national/regional political events, or after the occurrence of a conflict in society.	Research conducted to coincide with national/regional political events is feared to disrupt security stability and endanger the safety of the researchers concerned. Examples of national/regional political events are legislative elections, presidential elections and regional head elections.
4	Unbalanced cooperation in terms of competence between foreign researchers and Indonesian counterparts	Indonesian counterparts must have competence and/or duties and functions in accordance with the proposed research field.
	Cooperation based on an unequal agreement	The cooperation agreement must be signed by parties of equal position and authority and must contain balanced rights and obligations.
	Unbalanced cooperation in terms of balancing the research team	Foreign researchers must be accompanied by a balanced partner.
	Unbalanced cooperation in terms of benefits	Cooperation must bring benefits to both parties in terms of patents, publications, and other intellectual property.
5	Research conducted by foreign researchers who are blacklisted	Based on the recommendation of the Coordinating Team for the Foreign Research Permits.

in their efforts to obtain and optimize benefit sharing must also take into account the risks and potential losses. In addition to the benefits obtained in international research collaborations such as Intellectual Property Rights in the form of joint scientific publications (joint publications), patents, new plant varieties, discovery of new species of wild plants or animals.

Table 3: Analysis of Risk Perceptions of Security Monitoring Coordination Group Reviewers.

	Description Questions	Perceptions of Reviewers					Average	Risk Level
		R1	R2	R3	R4	R5		
1	Will the research for which a permit application be submitted by a foreign researcher who is blacklisted?							
2	Does the research period coincide with national/regional political events, or after the occurrence of a conflict in the community?							
3	Is the research location seen as a conflict-prone area, a restricted area, and a non-recommended area in terms of security and protection of natural resources?							
4	Is the research topic considered a sensitive matter for the government and the wider community?							
5	Will the scientific publications produced not be used to carry out negative campaigns by Non-Governmental Organization activists that can harm the national interest?							

Another benefit derived from research collaboration is the capacity building of national science and technology institutions. The benefits obtained in this case include increasing the competence of human resources through the providing of undergraduate and postgraduate scholarships as well as post-doctoral programs, training facilities, research grants, and research and laboratory equipment grants.

On the other hand, in the process of planning and negotiating as well as conducting joint research in the field, taking and transferring samples from the host country to foreign research countries, analyzing samples and writing manuscripts for joint scientific publications, Indonesian partner institutions also face the potential risk of loss. The potential risk of loss can be in the form of loss of Intellectual Property Rights (scientific publications, patents, new plant varieties, discovery of new species of wild plants and animals) due to not being careful in drafting and agreeing on the clauses made in the Research Cooperation Agreement. as well as at the implementation stage of research collaboration.

Risk analysis in the planning and negotiation processes carried out by partner institutions (national S&T institutions) with foreign S&T institutions can also be explained by using the following considerations: causes and sources of risk, positive and negative

Table 4: Analysis of Scientist Reviewer Group's Risk Perceptions.

	Description Questions	Perceptions of Reviewers					Average	Risk Level
		R1	R2	R3	R4	R5		
1	Will the cooperation document bring benefits to both parties in sharing benefits such as patents, scientific publications, and other intellectual property							
2	Has the agreed cooperation document shown a balanced research partnership (equal partnership) in terms of competence between foreign researchers and Indonesian partners?							
3	Does the cooperation document reflect benefit sharing, for example payment of ABS (Access and Benefits Sharing) based on the Nagoya Protocol Ratification Law such as training facilities, for young researchers, research grants, providing of superior seeds for farmers?							
4	Has transferring research samples abroad been accompanied by a Material Transfer Agreement and providing training facilities for sample analysis for researchers and granting laboratory equipment to Indonesian R&D institutions as part of human resource capacity building and science and technology institutions?							
5	Is the Foreign Researcher's Competence relevant to the proposed research topic?							
6	Does the proposed research proposal require ethical clearance from the Scientific Ethics Commission?							

consequences, and the possibility of these consequences occurring. This can clearly be described in *Figure 4* and *Figure 5*.

Analysis of the causes and sources of risk can arise and occur in the planning and negotiation process carried out by the parties in negotiating and compiling cooperation agreement documents. Accuracy and caution are needed when drafting a cooperation agreement document in English. The achievement of outputs and outcomes as well as the expected targets in benefit sharing in research collaborations starts from and is largely determined by the cooperation agreement document which is approved by and legally considering the parties who signed it. It is at this stage that the causes

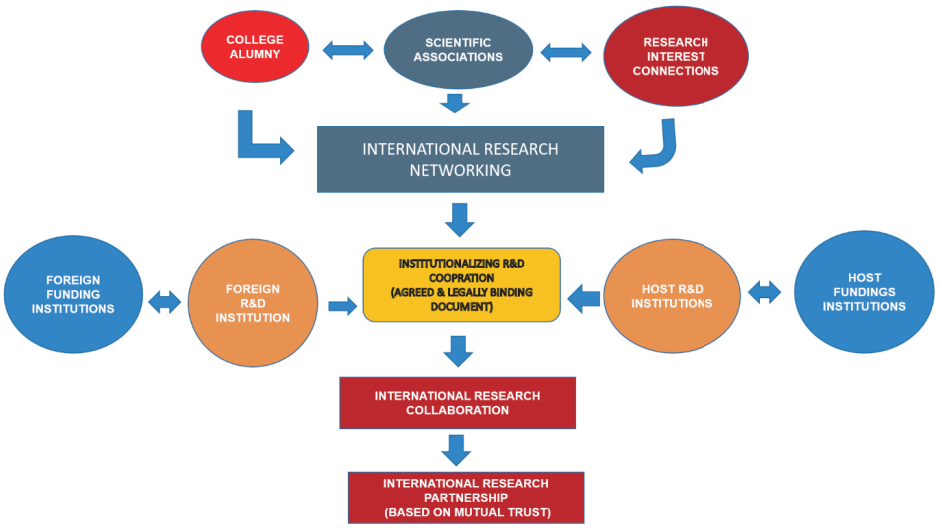

Figure 4: The Process of International Collaborative Research.

and sources of risk must begin to be identified by negotiators and collaborators of Partner institutions. At this stage the principle of ”who gets what, how much, when and how” (”Who gets What, How Much, When and How”) applies. Some universities in the European Union even pay civil law expert lawyers in preparing and negotiating draft Memorandums of Understanding (MoU), and Implementing Arrangements or Technical Agreements and derivative agreements such as the Intellectual Property Right Agreement, Material Transfer Agreement and Counterpart Agreement. Inaccuracy in the analysis of risk sources and potential risks at this stage will result in losses experienced by the Partner Institution and the host country government. The potential losses include loss of opportunity to obtain Intellectual Property Rights (IPR) in the form of patents, scientific publications, discovery of new species, discovery of new plant varieties.

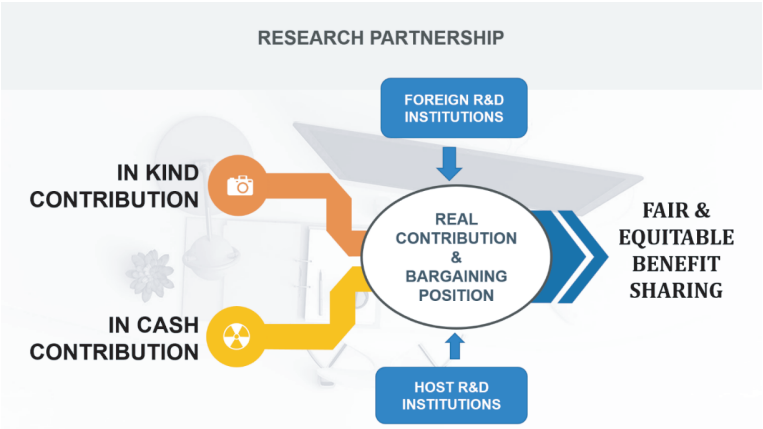

Figure 5: Negotiation Process in International Collaborative Research.

In 2010, a governmental R&D agency lost three patents due to careless in reading and understanding the draft Technical Agreement proposed by its foreign research partner. The three patents are: a patent for processing fish animal feed made from palm oil waste in the form of magot or maggots (life feeding) where the business potential is very large considering that palm oil waste as the raw material is very abundant in Indonesia; and two simple patents on freshwater ornamental fish breeding techniques. The three patents have been registered in Paris on behalf of foreign R&D institutions. After careful scrutiny, it turns out that in the cooperation agreement document there is a clause that the owner of the patent in the agreement is the party that finances the research. The parties that finance research collaborations are R&D institutions of foreign research partners.

Risk analysis along with positive and negative consequences, as well as the possible consequences can also occur at a later stage, namely at the stage of collecting sample or specimen and collecting primary data in the field (joint fieldwork) by Indonesian researchers and foreign researchers. In 2011, Prof. Rosichon Ubaidillah and his LIPI research team who conducted research collaborations with researchers from an reputable university in the Western country managed to find a species of monster wasp in the Mekongga Mountains of Southeast Sulawesi through the Mekongga expedition [12]. In the latest publication of the scientific journal ZooKeys, Friday, 23 March 2012, scientists finally described the wasp as a species as well as a new genus of wasps, named Megalara Garuda [13]. LIPI scientists involved in the discovery, including a foreign researcher from Western country and a scienrist from a museum of nature history in the Western country. The foreign researcher was proven to have taken and brought specimens of the giant beetle Megalara Garuda without permission and published the findings of a new wasp genus without permission and did not include the name of his partner, Prof. Rosichon Ubaidillah as co-author. The discovery of the new genus involved LIPI researcher, Prof. Rosichon Ubaidillah. However, Rosichon's name was not listed as the author of the article when the research results were published in the February 2012 issue of the academic journal ZooKeys. LIPI felt disadvantaged because one of the studies conducted with foreign researchers did not include Rosichon's name. Scientific publication of research collaboration results in an article entitled "*Megalara garuda, a new genus and species of larrine wasps from Indonesia (Larrinae, Crabronidae, Hymenoptera)*" only included the names of two foreign researchers [13]. The scientific article uploaded to the Pensoft.net page only lists the name Rosichon Ubaidillah Zoologicum (Bogorense Museum) in the list of acknowledgments [13]. The list also lists a number of scientists who helped and the funders [13]. This dispute was finally resolved amicably

with a compensation payment of USD 25,000.00 by the foreign partner institution to the LIPI Biological Research Center.

Costello and Zumla described semicolonial practices carried out by foreign researchers from Western countries in collaborative research in African and Asian countries [14]. Costello and Zumla developed the principles behind investing in international research collaborations in developing countries [14]. Does current practice overemphasize research results and ignore issues such as ownership, sustainability, and national research capacity building? They criticize that the research model supported by many funding agencies remains semi-colonial [14]. Foreign dominance in setting research priorities and management of research projects may have negative consequences that outweigh the actual benefits of research findings. National academic leaders and institutions need to be involved if research is to be translated into practice. The deterioration of academic infrastructure in many developing countries needs to be considered as part of any research investment. According to Costello and Zumla [14], a truly cooperative research partnership, which donor agencies must monitor, rests on four general principles:

1) Mutual trust and joint decision making;

2) National ownership;

3) Emphasis on incorporating research findings into policy and implementation; and

4) National research capacity development.

There are two research models that exist in developing countries, namely: 1) the semicolonial model and 2) the partnership model. Some research interaction styles pay less attention to ownership, sustainability and development of national research capacity. “Post research” in which foreign researchers from Western countries ask their African research colleagues to send them biological samples, is still practiced, though less frequently than in the past. “Parachute research” in which researchers travel to Africa or Asia for short periods and collect and bring home biological samples, is still relatively common. Results from both types of research are often published with minimal co-authorship of African or Asian authors. “Annexed research sites” for field research, led and managed by foreign researchers, still dominate as models for research investment. Undoubtedly, these sites have produced some of the most important, influential and innovative research in tropical medicine, and many of the best researchers have been trained there. Proponents of such a model might argue that tight foreign controls increase the likelihood of good quality research results when work is carried out in difficult environments. The authors believe these “annexed sites” now

attract potential academics from national institutions and their research findings are less likely to translate into policy and practice.

The results of the research by Costello and Zumla above, it is in line with the very relevant risk management framework used to analyze international research collaborations in Indonesia [14]. Borrowing the analytical framework of Costello and Zumla [14], several core issues are used for risk analysis in the planning and negotiation stages of international research collaborations by partner institutions in *Table 5*.

The risk analysis simulation with the answer (V) in the table above shows that the international research collaboration carried out by the host R&D institution with foreign R&D institutions is at a high level of risk. The characteristics of this international research collaboration clearly reflect the semicolonial nature and domination of foreign researchers and foreign donor agencies over the host R&D institutions.

5. CONCLUSION

Risk analysis in the process of assessing foreign research permit proposals involves considering: the causes and sources of risk, positive and negative consequences, and the likelihood of these consequences occurring.

The policy of foreign research permit by applying these two approaches is aimed at obtaining benefits in international research collaborations with foreign researchers from various countries while still considering the calculation of risks and aspects of losses that can be caused. Potential risks and losses that can arise in international research collaboration include theft of intellectual property rights through transferring research samples or specimens abroad without being accompanied by a written Material Transfer Agreement. Potential risks can also occur through the preparation of research cooperation agreement documents that are detrimental to the Indonesian side.

On the other hand, in the process of planning and negotiating as well as conducting joint research in the field, taking and transferring samples from the host country to foreign research countries, analyzing samples and writing manuscripts for joint scientific publications, Indonesian partner institutions also face the potential risk of loss. The potential risk of loss can be in the form of loss of Intellectual Property Rights (scientific publications, patents, new plant varieties, discovery of new species of wild plants and animals) due to not being careful in drafting and agreeing on the clauses made in the Research Cooperation Agreement. as well as at the implementation stage of research collaboration.

Table 5: Risk Analysis in the Planning and Negotiation Stages [14].

	Description Questions	Perceptions of Partners		Risk Level	
		Yes	No	High	Low
1	Is the research setting agenda dominated by external parties (foreign researchers and donor agencies)?	V		V	
2	Is research setting agenda negotiated with the host party (research partner)?		V	V	
3	Are links with national institutions and training programs peripheral?	V		V	
4	Is the link with national institutions and training programs integral?		V	V	
5	Is the line of Research Management determined by foreign science and technology institutions and foreign donor agencies?	V		V	
6	Is the line of research management defined by the host agency?		V	V	
7	Is the research investment provided more balanced and sustainable in the long term?		V	V	
8	Is the emphasis of collaborative research on sustainability and generalizability of research findings low?	V		V	
9	Is the collaborative research emphasis on sustainability and generalizability of research findings more likely?		V	V	
10	Is Dissemination of research collaboration results highly oriented towards international journals and conferences?	V		V	
11	Is the dissemination of research collaboration results published in international journals balanced with publications in national or regional journals, and in the media to reach a wider audience?		V	V	
12	Is the impact of research collaboration with local policy makers low?	V		V	
13	Is the impact of research collaboration with local policy makers high?		V	V	
14	What is the impact of negative and high research collaboration on the capacity building of R&D institutions of the host country's partners, such as attracting the best and brightest science and technology human resources from national research institutions?	V		V	
15	Is the impact of research collaboration low and positive on the capacity building of R&D institutions of the host country's partners, for example building local academic infrastructure?		V	V	

Risk analysis in the planning and negotiation processes carried out by partner institutions (national S&T institutions) with foreign S&T institutions can also be explained by

using the following considerations: causes and sources of risk, positive and negative consequences, and the possibility of these consequences occurring.

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