

Partnership Valuation of Membership of Indonesia in Asia Pacific Space Cooperation Organization (APSCO) with STPLEE

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Abstract: Indonesian membership in Asia Pacific Space Cooperation Organization (APSCO) refers to the provisions of Presidential Decree of the Republic of Indonesia Number 64 year 1999 on Indonesian Membership and Contributions Government of The Republic of Indonesia at the international organizations, in article 3 that first need to be assessed the benefits to be gained and the contribution to be paid. Indonesia's status as a state signatory to the convention is urgency in this study. Indonesia signed the APSCO convention in 2005 and actively involved in various activities of the organization forum. The purpose of this research is to identify the costs and benefits of Indonesia membership in APSCO. The method used is a descriptive qualitative and quantitative approach to the data sources both primary and secondary data. The results are (i) the membership will have a high cost impact from economic aspect from annual fee, but high benefit from technical aspect if Indonesia active on the programme (ii) the benefits and costs of this membership can be equal, or greater by optimizing action in the organization, (iii) and based on the multicriteria valuation, the technical benefits be the basis of the first priority, followed by sequential economic, legal, political, social and environmental in determining Indonesia's membership in APSCO.

1 INTRODUCTION

The Asia-Pacific Space Cooperation Organization (APSCO) is a collaborative organization outside the United Nations system for the Asia-Pacific region initiated by China. The establishment of APSCO aims to collaborate between countries in the Asia-Pacific Region in the field of application and development of space technology, as well as establishing institutions as a forum for cooperation. On October 27-29 2005 a meeting was held in Beijing in the context of the establishment of APSCO, and on October 28, 2005, Indonesia along with seven other countries, namely: Bangladesh, China, Iran, Mongolia, Pakistan, Peru, and Thailand have signed the APSCO Convention.

The LAPAN study (2012, 2018) recommends that Indonesia immediately ratify the convention which has implications for the change of status of the countries signing the convention into APSCO member countries. Indonesia's participation in an international organization including APSCO according to Presidential Decree No. 61 of 1999 must consider the following (Sekretariat Negara, 1999): benefits that can be obtained from membership in the

relevant international organization;

- 1) contributions to be paid as agreed upon and regulated in the provisions of the organization concerned and the calculation formula; and
- 2) state financial capability and financial capacity of Non Structural Institutions.

Therefore, it is necessary to study the costs and benefits that Indonesia will get if it becomes a member of APSCO, and the costs required with benefit cost review (BCR) approach. Cost-benefit analysis is a tool to aid to decision making or, and use in space technology (Hein, Gerald et al., 1976 and Hockley, Neal., 2014)

The benefits that need to be considered are the benefits of ideology, politics, economy, socio-culture, international peace and security, humanity and other benefits (Sekretariat Negara RI, 1999). FEM (2007) evaluates benefits and costs by involving multicriteria namely social, technical, administrative, political, legal, economic and environmental by considering benefits and costs not only in monetary terms but also non-monetary measures. The cost-benefit analysis clearly embraces an enormous field.

It offers clear guidelines for the evaluation of government decisions in such varied fields (Dreze, Jean., and Ster, Nicholas. 1987). The decision about becoming or not becoming a full-member of APSCO, will depend on many factors, and one of them is financial performance (Diana, Shinta Rahma and Syafriana, Maya., 2018). Based on the description, the purpose of this research is counting and benefit cost review analysis Indonesia membership on APSCO from the multicriteria analysis.

2 LITERATURE REVIEWS

2.1 APSCO

The APSCO organization was established with the initiation of the establishment of the Asia-Pacific Multilateral Cooperation in Space Technology and Applications (AP-MCSTA) forum by China, Pakistan and Thailand in Beijing in 1992. At the signing meeting, Beijing, October 27-29, 2005, Indonesia co-signed the APSCO Convention on October 28, 2005 along with seven other countries namely Bangladesh, Iran, Mongolia, Pakistan, Peru, Thailand and China. The seven countries have ratified the APSCO Convention and have become members. Indonesia is still on progress ratification. The aim of this organization according to the convention (Article 4) is (APSCO, 2005):

- 1) Enhance and strengthen the development of space programs among its Member States by forming the basics of peaceful cooperation in the application of space science and technology;
- 2) Take effective actions in these areas such as research and development of space technology, implementation and training, elaborating and implementing space development policies.
- 3) Enhancing cooperation, joint development and sharing of results among the Member States in the field of space technology and its application and space science research by bringing together the potential of regional cooperation;
- 4) Encourage cooperation between relevant companies and institutions of Member States and improve the industrialization of space technology and its application;
- 5) Contribute to the peaceful use of space in activities of international cooperation in the field of space technology and its application.

2.1.1 Consequences of Indonesian Membership at APSCO and Programs

In accordance with the provisions of the Convention, the APSCO provides equal opportunities for all of its member countries in utilizing basic activities. Some of the APSCO activities offered and APSCO member countries obtain the same benefits as percentage-based contributions are (LAPAN, 2018):

- a) Space Technology Applications, which includes 5 sub-fields namely Earth Observation Applications, Navigation and Positioning Applications, Weather Forecast Applications, Communication Applications, Experimental Technologies and Applications;
- b) Space Technology Development, which includes 8 sub-fields namely Earth Observation Satellite Systems, Communication Satellite Systems, Navigation Satellite Systems, Metrological Satellite Systems, Scientific experimental satellites, Space Ports, Space Launch, Deep Space Missions;
- c) Space Science which includes 3 subfields namely Space and solar physics, Study on an exploration of deep space, Study on space life and microgravity,
- d) Education and Training, which includes 6 sub-fields namely Short training, Degree education, Distance education, Space education, Education resources, cross-country platform development, International cooperation for education.
- e) Space Policies, Law and Regulations, which include 4 subfields namely Space policies, Space law, Space regulations, Space Law Research Center,
- f) Capacity Building which includes 5 sub-fields, namely Data and information sharing and service capacity, Mission planning and implementation capacity, Infrastructure construction and management capacity, Standardization and policy coordination capacity, Space education and training capacity.

2.2 Benefit and Cost Analysis

Cost-benefit analysis (CBA) is the method used by economists to evaluate public policies (Belfield, Clive., 2012). CBA is a policy assessment method that quantifies the value to a given agency of public policy impacts and consequences in monetary terms with the goal being to help effective social decision

making through efficient allocation of society's resources when markets fail (Boardman et al., 2006; Adler & Posner, 2006). BCA method is in principle almost the same as the CBA, which is relatively simpler. Cost Reviews (BCR) benefits are not complex and more comprehensive so they can cover the lack of costs and benefits from a monetary perspective (FEMA, 2007).

3 METHODS

The method in this paper was descriptive qualitative and quantitative analysis with benefit cost review. Loeb, Susanna, et al. (2017) said that descriptive analysis characterizes the world or a phenomenon to answering questions about who, what, where, when, and to what extent, and the goal is to identify and describe trends, aimed at identifying causal effects, description plays a critical role in the scientific process in general.

The data sources were primary and secondary data. This study modifies FEMA (2007) in benefit and cost reviews method. The perspective of the benefit cost from the multicriteria analysis in this study was from sosial, technical, political, legal, economic and environmental (STPLEE) factors approach. The steps to conducting BCR are as follows:

- a) list identification;
- b) identification benefits and cost reviews; and
- c) action priority- qualitative and quantitative approach.

At this stage a list of identified actions, identify benefits and cost and assign priorities is carried out by providing high, medium, and low ratings and performance associated with the cooperation scheme.

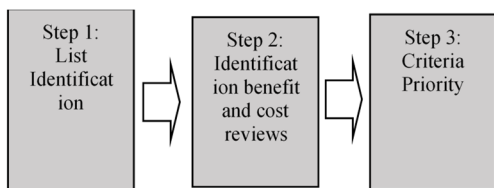


Figure 1: Steps Benefit- Cost Reviews.

4 RESULT

Indonesia's membership in the APSCO organization will provide benefits and costs that are tangible and intangible.

4.1 Benefit

Membership in an organization will have an impact on both the positive and negative rights and obligations of member countries, including Indonesia if it becomes ratified by the APSCO convention. Some benefits if Indonesia becomes an APSCO member country, as follows:

- rights obtained Indonesia to participate in programs related to the development of space technology,
- Indonesia's membership in APSCO will certainly enhance bilateral relations between APSCO member countries in terms of space transfer of technology. The joining of Indonesia in APSCO can facilitate the realization of bilateral cooperation among APSCO member countries, such as cooperation between Indonesia and China through LAPAN and the China National Space Agency (CNSA) which aims to improve the development of national space research & development (LAPAN, 2018), and
- the right as a member country is also having the same voting rights, participation in the program and proposing Indonesian representatives in the administrative position of the organization. (LAPAN, 2018; and Nasution, Husni., et al. 2018),
- income in salary (LAPAN, 2018, and Nasution, Husni et. All, 2018), or other benefit likes health insurance, or facilities for Indonesian staff working at APSCO,
- participating in promotions and exhibitions related to space technology in the APSCO program as part of share and management marketing, and
- extending the organization to improve efficiency and bargain position, and other.

4.2 Cost

As a member state, the obligations related to the funding contribution of the APSCO program are regulated in the provisions of Article 18 (APSCO, 2005). Membership at APSCO has an impact on the financial consequences of annual fees. APSCO's annual fee uses to calculate the scale of contribution by member countries using GDP and population data issued / published by the World Bank. The results of the calculation of the contribution (%) of each member country by using the basis of data taken from the World Bank are as follows:

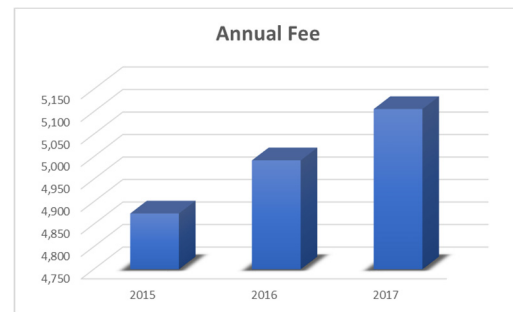
According Table 1, there is a deviation from the percentage of Indonesia's contribution if it is a member state of 0.07 percent, where the value will change every 3 years or other conditions such as (i) the existence of new member countries, (ii) macroeconomic conditions of each country (exchange rates against the US dollar, gross domestic product, total population), and (iii) increasing activity. The contribution of each member state, including Indonesia, will be changed annually according to the scale of APSCO's annual fee for basic activities and if additional for optional activities. Differences in the calculation of the scale of contributions from the previous 2 studies indicate the possibility of misdata, so for the initial analysis for the LAPAN report (2018a) use a version of APSCO.

Table 1: Percentage of State Contributions of APSCO and Indonesia Members 2015-2017 (USD).

Country	Percentage (A)	APSCO Versi (B)	Deviation (A-B)
Bangladesh	8	8	0
China	18	18	0
Iran, Islamic Rep.	10,11	9,08	1,03
Mongolia	4,61	4,19	0,42
Pakistan	8	8	0
Peru	7,63	7,99	-0,36
Thailand	7,52	7,87	-0,35
Turkey	15,12	15,75	-0,63
Indonesia	7,88	7,81	0,07
TOTAL	76,87	76,63	0,24

Source: LAPAN (2018), data processed

If we are assuming the amount and data are same with planned expenditure in 2015, 2016, and 2017, that if Indonesia becomes a member state it will have an increasing annual fee (See Fig 1). The trend of annulling fee slope is positif (increase), for staff, basic activity and administrative expenditure. LAPAN (2018a) has calculated Indonesia's annual fee estimates in 2015-2017. From these calculations, if 2015 is the base year, it will show how much progress, the trend is increasing each year. This value increases by 2.42 percent in 2016, and increase by 4.75 percent in 2017. Thus, if Indonesia will become a member in 2019, then what needs to be anticipated is an annual fee increase every year. This is based on the provisions of member contributions that have been arranged in the organization.



Source: LAPAN (2018a), data processed

Figure 2: Estimated Indonesian Annual Contribution to APSCO (in IDR Million).

4.3 Benefit-cost Reviews

From Fig 2, the obligation of annual fees in the calculation of 2017 is equal to 5,106 billion Rupiah. Based on the assumption that if 2019 is the same value that is paid to APSCO, then the need to see the priority of how important benefits can be taken from the membership. In Table 2, the priority of benefits and costs can be seen from the social, technical, political, legal, economic and environmental aspects.

Table 2: Prioritization using STPLEE.

Action	Basic Activity	
	BENEFIT	COST
Sosial	L	M
Technical	H	L
Political	M	L
Legal	M	H
Economic	L	H
Environmental	L	L

Definition: H-High, M-Medium, L-Low

Source: data processed

The finding in these studies, Indonesia has created high benefits from technical aspects, medium benefits from political and legal aspects and low benefits from social, economic and environment aspect. From this membership will have an impact to cost, that high cost from legal and economic aspects, medium cost from the social aspect, and low cost from the environment, technical, and politic aspects (see Table 2). The high priority of technical factor is based on the benefits that can be obtained, from the basic activity program can support in terms of collaborative research collaboration and increase capacity building for mastering space technology. So, it can be concluded that utilization that has technical benefits must be optimized from the organization. This is because on a cost basis, it has high consequences from economic and political aspects.

From a cost and benefit perspective it can be assumed to have an equal score (costs (-3) = benefits (3)), and this benefit can be greater. LAPAN reports (2018) shows that the benefits of Indonesia's membership to APSCO are greater than the costs incurred. However, there are other costs and benefits that are not measurable, intangible, where the value will be greater. Table 3, it can be seen that technically the benefits from APSCO are highest, followed by legal benefits, while in terms of costs they have consequences on costs from technical, legal and economic aspects (see Tabel 3).

Table 3: Valuation Benefits and Cost.

Action Criteria	Basic Activity	
	BENEFIT	COST
Sosial	0	0
Technical	2	1
Political	0	0
Legal	1	1
Economic	0	1
Environmental	0	0
Sub Total Of Cost/ Benefit	3	3

Definition: 2=Very beneficial, 1=Favorable, 0=None/Not applicable, -1=Not Favorable

Source: data processed

Table 4: Priority Action from Benefit and Cost Reviews.

No	Action Criteria	Basic Activity		
		Benefit	Cost	Priority
1	Sosial	<ul style="list-style-type: none"> Increase the bargaining position as member states and organization Improving data sharing to mitigation 	<ul style="list-style-type: none"> none 	5
2	Technical	<ul style="list-style-type: none"> Use of research in the fields of regulation, space law, the science between examinations, space technology, space applications Capacity building (short training course, degree education program, etc) 	<ul style="list-style-type: none"> Administrative to support program Research in domestic to transfer knowledge 	1
3	Political	<ul style="list-style-type: none"> APSCO as a forum to establish connectivity with member states and open bilateral cooperation between partners 	<ul style="list-style-type: none"> political cost (no data available yet) 	4

No	Action Criteria	Basic Activity		
		Benefit	Cost	Priority
		<ul style="list-style-type: none"> to obtain the transfer of technology increasing national pride 		
4	Legal	<ul style="list-style-type: none"> Indonesia has the right to determine policies and make decisions about APSCO 	<ul style="list-style-type: none"> administrative (additional regulatory requirements related to national legislation) 	3
5	Economic	<ul style="list-style-type: none"> Salary if occupying a strategic position in the administration Savings budget space savings in basic activity 	<ul style="list-style-type: none"> annual fee 	2
6	Environmental	<ul style="list-style-type: none"> Encouraging stability in the Asia Pacific Region 	(no data available yet)	6

Source: data processed

In Table 4, it shows the priority scale, so to optimize the benefits of Indonesian membership at APSCO it is necessary to actively participate in the use of the forum for technical needs, and support national space programs. This is because annual fees that have to be spent are very large compared to other international organizations. To optimize the benefits and cost reviews of this membership, the strategies that must be taken are:

- national coordination related to involving academics, industry and government for opportunities for participation and collaboration from the cooperation offered,
- active participation in APSCO;
- utilize rights in organizations in accordance with national interests; and
- sets a national roadmap related to the APSCO program.

5 CONCLUSION

From this study, Indonesia's membership in APSCO can conclude that the benefits and costs obtained are

both tangible and intangible that not come from only one aspect but many aspects such as social, technical, legal, political, economic and environmental. From a qualitative valuation, technical benefits are the highest priority, followed by legal and political aspects as a medium priority. From weighing score, the benefits and costs of this membership can be equal, or greater by optimizing action in the organization. Then from benefit and cost reviews based on the multicriteria valuation, the technical benefits are the basis of the first priority, followed by sequential economic, legal, political, social and environmental in determining Indonesia membership in APSCO.

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