CHAPTER V

FINDINGS AND DISCUSSION

1.1 Findings

This research examines reasons behind low public R&D expenditure in Indonesia. Data have been collected in line with research focus to support analyzing problems as formulated in the research questions. It comprises process and dynamics of the State Budget formulation in central Government of Indonesia, factors underpinning low allocation for public R&D in Indonesia and R&D results utilization in Indonesian industries.

5.1.1   The State Budget Formulation in Indonesia Central Government

Understanding process of the State Budget in Indonesia central government is important in this research to examine the political economy of R&D in Indonesia. This within this framework data collection is focused in observing the process of the State Budget formulation and the dynamics during the process.

5.1.1.1 Process of the State Budget Formulation in Indonesia

The National budget in Indonesia governmental system is known as the State Budget of Indonesia (APBN). It represents what the government will do in a year by setting up program priority to conduct. The 1945 Constitution article 23 paragraph 2 has clearly explained that State Budget is formulated as an Act and openly implemented for the benefit of social welfare.

President's direction on national development priority

Budgeting process in Indonesia is begun by President's direction on national development planning priority. President who has vision and missions to be realized in the five years administrative governance should divide it into yearly program priority. It is wholly the President's right to manage the State Budget based on priorities to succeed it within particular year. In the five years ahead, President expects his vision and mission can be realized through programs arranged in each fiscal year.

On this issue, Siti Maftukhah, assistant of Subdivision Head for Research and S&T Development – Ministry of National Development Plan[1], states that the State Budget is representation of President's vision and mission. As well, Satya Wirya Yudha, member of Commission VII House of Representatives[2], affirms that "budget distribution is fully President's right to support his vision and mission to the utmost".

Fiscal capacity (resource envelope) preparation

Ministry of National Development Planning (Bappenas) then reviews Long-term Budget Framework (LTBF) covering 20 administrative years to prepare Medium-term Budget Framework (MTBF) of 5 years plan. The MTBF represents vision, mission and programs of current president.

In order to learn the capacity of the government to finance development in fiscal year ahead, Ministry of Finance calculates national fiscal capacity together with reference from Bank of Indonesia, National Statistics Agency (BPS), and Ministry of Energy and Mineral Resources. Ministry of Finance, through Directorate General of Budget then prepares scheme of fiscal policy and

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[1] Interview, 9 June 2016
[2] Interview, 29 June 2016

resource envelope as the foundation for institutional expenditure which is formulated together with Ministry of National Development Planning/Bappenas.

Preparing indicative ceiling

Following the President's direction for the upcoming fiscal year, Bappenas begins preparing framework particularly for prioritized program. The product is Government Work Plan (RKP) as guidance for each Ministry/Agency to arrange program one year ahead (Renja). Ministry/Agency arranges their work plan (Renja) based on the Government Work Plan (RKP) as issued by Bappenas.Document of Government Work Plan explicates not only the work plan for each Ministry/Agency but also initial fund as referred to Ministry of Finance's resource envelop (fiscal capacity) (Direktorat Penyusunan APBN, 2014). Normative base of the RKP is Law 25/2004 on National Development Plan System. The Article 4 Paragraph 3 defines RKP as the representation MTBF. It comprises priorities of development plan and macroeconomic framework which involves economic description, including fiscal policy, programs of Ministry/Agency, and inter ministries/agencies programs. Also Article 25 Paragraph 1 affirms that the RKP is the guidance in the State Budget formulation.

In this case, Ministry of National Development Planning (Bappenas) is responsible for resource distribution which Ministry of Finance holds it previously. Resource distribution and allocation works in the scheme of "money follows program", not "money follows function" anymore. Bappenas considers the fiscal capacity and prioritized programs to be achieved.

Public expenditure as financed by Indonesian Government through the State Budget comprises some functions as well.

1. Public Service Function

2. Defense Function

3. Economic Function

4. Environment Function

5. Housing and Public Facilities Function

6. Heath Function

7. Tourism and Creative Economic Function

8. Religious Affair Function

9. Education Function

10. Social Security Function

As data from Ministry of Finance describing the State Budget's performance in the period of 2007-2013, these functions consist of some programs. They are directed not only for management improvement, infrastructure development, empowerment, but also research and development (R&D). R&D presents in each function of public expenditure distribution in the State Budget.

Public expenditure as spent by Indonesian government comprises the following sectors:

1. Ministry/Agency Expenditure

   Budget which is allocated through the Ministry/Agency to finance certain affairs in the government.

2. Transfers to Regions

   Allocated to reduce imbalance funding source between central and regions, reduce the funding gap between local government affairs,

reduce the gap of public services between regions, and to fund the implementation of regional autonomy and privileges.

3. Payments of Debt Interests

    It is the central government expenditure on the use of domestic and foreign debt, calculated from the existing debt and new debt estimates, including costs related to debt management.

4. Subsidies

    Providing support in the form of budget allocations to the state enterprises, government agencies, or third parties based on the laws and regulations that apply to the supply of goods or services that are strategic or dominate the life of the people according to the ability of state finances.

5. Village Fund

    Funds from APBN allocated for villages that is transferred trough district/town budget and used to finance the government administration, the implementation of development, coaching civic, and community empowerment.

6. Other Expenditures

    State expenditures for payment of government obligations which are not included in the category of ministries/institutions expenditures, local transfers, subsidies, interest payments and village funds.

Of those functions, public expenditure of the State Budget is spent for public service function utmost. On this issue, assistant of Subdivision Head for

S&T Development – Bappenas, affirms that in preparing program for the State Budget is still dominated by public service affairs. Besides, as she continues,

> "It is also for infrastructure development. President only holds 5 years of administration. It is such a short time to realize many achievements. On the other hand, he has to prove to people his success. The most realistic is through *physical* development whose results can be *seen*."

Following the President's direction for the upcoming fiscal year, Bappenas begins preparing framework particularly for prioritized program. The product is Government Work Plan (RKP). Document of Government Work Plan explicates not only the work plan for each Ministry/Agency but also initial fund as referred to Ministry of Finance's resource envelop (fiscal capacity) (Direktorat Penyusunan APBN, 2014). Normative base of the RKP is Law 25/2004 on National Development Plan System. The Article 4 Paragraph 3 defines RKP as the representation MTBF. It comprises priorities of development plan and macroeconomic framework which involves economic description, including fiscal policy, programs of Ministry/Agency, and inter ministries/agencies programs. Also Article 25 Paragraph 1 affirms that the RKP is the guidance in the State Budget formulation.

Based on Law 17/2013 on Public Finance, Article 12 paragraph 2 explicates that the State Budget formulation should be based on the Government Work Plan (RKP). Ministry/Agency arranges their work plan (Renja) based on it. In the previous governmental administration, budget is mostly formulated based on Ministry/Agency's tasks and functions. This method which is called "money follows function" often leads to program duplication in some ministries due to lack of coordination. Besides, budget is used inefficiently and ineffectively as it focuses on Ministry/Agency's function instead of national objectives. This system

has been changed into "money follows programs". By using this new mechanism, Ministries/Agencies are expected to coordinate their programs based on the RKP. This way, budget is projected to be distributed and used effectively and efficiently to achieve national development goals[3].

On this issue, Satya Wirya Yudha, member of Commission VII House of Representatives affirms that the mechanism in budget formulation has been changed. "It is now money follows programs, no longer money follows function. Ministries should be able to prepare their programs well to get appropriate allocation. Budget should not be used for *unimportant programs*"

The RKP preparation involves trilateral meeting of Ministry/Agency, Ministry of Finance and Ministry of National Development Planning/Bappenas. Each ministry/agency is expected to draw programs which fully supported President's vision and missions with sufficient fund as Bappenas has allocated. They should also be able to convince government about the urgency of programs to be executed can lead to social welfare as the goal.

> If the Ministry/Agency failed to present their program in front of Bappenas and Ministry of Finance, never blame Bappenas to reallocate the funding to another ministry. The program should be clearly explained, what is the goal, how to achieve it, what is the benefit for society. And of course it should be in line with President's vision and mission.

Besides, discourse capacity is as important as well in the State Budget formulation process. On this political communication, Yudha states that "cabinet is all about relation and communication". A minister should be smart not only in

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[3] See http://www. Bappenas.go.id/files/penyusunan_rkp_2017/22022016/Tema_Arah_Kebijakan_dan_Prioritas_Pe mbangunan_RKP_2017.pdf, cited on 23 June 2016 at 11.00 a.m.

preparing program but also in presenting program particularly during trilateral meeting and other chances. He continues,

> "If a minister is busy being occupied with bureaucracy in his institutions, will he be drowned of these all. But, if he can establish *good relation* with other, it will be good. Budget is fully government (president)'s right. We, house of Representative only can give political support. For example, when BATAN needs more allocation to succeed his project on rocket, we can help persuade government this program is important. And it works."

Besides, Siti Maftukhah the assistant of Subdivison Head for Research and S&T Development Bappenas also give example how important is presentation and negation in the budget formulation. She takes Ministry of Marine and Fisheries in convincing the President on the importance of budget to support his ministry's programs. The result, her ministry's allocation is added by reallocating resources from other sectors.

Budget negotiation also involves incentives allocation. An informant involved in the budget formulation states,

> "we can understand, the adding allocation in their proposal if still *tolerable*…..(it is for) some stakeholders… and for infrastructure development, particularly in the remote area of Indonesia because member of House of Representative*,* can *earn* more from that. …… around 30% from each program is still tolerable."

Preliminary discussion with House of Representatives and the State Budget Legitimization

The initial work plan, fiscal policy principles and macro economy structure as prepared by Ministry of Finance are then discussed with the House of Representatives in the preliminary discussion. The confirmed fiscal policy and budget ceiling as the discussion output are used to formulate the State Budget

Plan (RAPBN) which will be ratified and legitimized as the State Budget Law by the House of Representatives (Direktorat Penyusunan APBN, 2014).

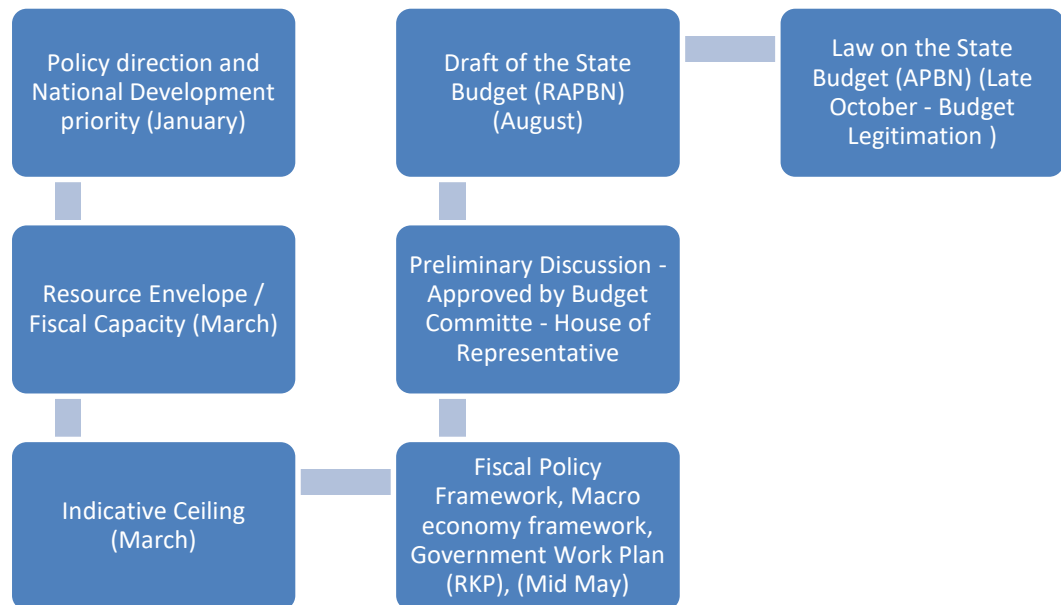The following figure gives a detail flow of budgeting mechanism in Indonesia.

Figure 5.1. State Budget Formulation in Indonesia
Source: (Direktorat Penyusunan APBN, 2014)

5.1.1.2 The Dynamics of Resource Distribution in the State Budget Formulation Process

A member of Commission VII House of Representative, Satya Wirya Yudha, affirms that budget formulation "cannot be separated from political budget. Moreover Indonesia has low fiscal capacity but lots of societal and political problems." There are some problems in the State Budget Formulation:

1. *Low fiscal capacity being faced with lots of problems to be solved*

Indonesia is still occupied with deficit budget as Yudha, member of Commission VII House of Representatives affirms that "Indonesia is a country

with deficit budget". Furthermore, Siti Maftukhah, assistant of Subdivison Head for Research and S&T Development – Bappenas gives similar statement that "Indonesia's fiscal capacity is limited but developmental problems are too much."

In regards to this problem, state revenue should be managed carefully to meet public use. Many economic and societal problems still haunt people of Indonesia. In economic sector, performance of Indonesia's economy based on per capita income as compared to some other ASEAN countries is the lowest (Figure 3.1). This places Indonesia into category of lower middle income country as set by World Bank.

Another sector which needs government's attention to solve by allocating sufficient resources is to reduce poverty. The poverty rate in Indonesia is relatively high. It reaches 11.4% in 2013 after gradually declined from 12.5% in 2011 and 12% in 2012.

The poverty level in Indonesia closely relates to the availability of job opportunities. Unfortunately, there are many people have not got job to fulfill their needs. As indicated by the figure 3.6, the number of unemployment in Indonesia is alarming compared to some other ASEAN countries.

In health sectors, Indonesia is threatened by the high number of mother mortality. Maternal mortality ratio is measured based on number of women who die from pregnancy-related causes while pregnant or within 42 days of pregnancy termination per 100,000 live births. The Figure 3.7 signifies mother mortality in Indonesia is higher than some other ASEAN countries in spite of the decreasing trend in the last decade (World Bank, 2016).

Low fiscal capacity becomes one factor which makes government to set development priority in budget management. This limited resource will be needed by Ministries/Agencies to conduct programs to support President's visions and missions.

Yudha continues that each institution should be able to perform their program in their best presentation, covering the goal and benefit "what is the impact of the program will be for (society development)", in order to convince the Government to give them sufficient funding. Moreover, the current budget mechanism is "money follows program". Each program of Ministry/Agency "will be paired" as Yudha stated with other to see which one should be prioritized. If a leading sector of a Ministry/Agency "fails in presenting their program", meaning that Bappenas as program assessor think another program is better in supporting President's direction, they will get fewer allocation than other Ministries/Agencies who have better program presentation.

2. *The Short Time of Presidential Administrations*

Program priority planning relates with the short time of presidential administration in Indonesia. Based on the 1945 Constitution article 7, President and Vice President hold the presidential administration in Indonesia for 5 years and can be elected afterwards.

Maftukhah, assistant of Subdivison head for Research and S&T development – Bappenas explains about program priority in relation with this issue. President only has five years to conduct government. Because Indonesia as developing country has a lot of problems to solve, he has to

prioritize which sectors is to develop first. "… because he has to prove people such tangible results. That's why program priority is also political issue."

Moreover, Satya Wirya Yudha, member of Commission VII House of Representatives affirms President for five years come with his visions and missions so that budget distribution should be prioritized. Nevertheless, political economy in budget formulation has "advantage and disadvantage". Despite some allocation is properly used to successfully conduct programs, some others is not. "Budget is prioritized to support President's vision and mission instead of better readiness of other sector which is considered less priority."

The Following table describes the State Budget in the period of 2007-2013 based on function distribution. It may represent government's priority in the utilization of public expenditure for national development.

Table 5.1. Public Expenditure Based on Function, 2007-2013
(Billion IDR)

Function	2007	2008	2009	2010	2011	2012	2013
Public Service	316,139.3	534,567.2	417,557,6	417,557.6	508,945.5	659,142.5	720,059,7
Defense	30,685.9	9,158.5	13,145.7	17,080.5	51,121.0	73,919.7	81,769.1
Security	28,315.9	7,019.2	7,753.9	13,835.4	21,691.2	33,448.0	36,486.8
Economy	42,222.0	50,484.8	58,845.1	52,178.4	87,246.2	120,145.5	122,888.4
Environment	4,952.6	5,315.1	10,703.0	6,549.6	8,615.	10,738.6	12,446.4
Housing and Public Facilities	9,134.6	12,448.7	14,648.5	20,053.2	22,937.8	29,454.2	30,722.1
Health	16,004.5	14,038.9	15,743.1	18,793.0	14,088.8	15,376.1	17,493.0
Tourism	1,851.2	1,293.7	1,406.2	1,408,7	3,553.5	3,166.8	2,509.3
Religious Affair	1,884.2	745,7	773,5	878,8	1,424,7	3,577.7	4,100.1
Education	50,843.4	55,298.0	84,919.5	90,818.3	97,854.0	114,962.7	118,467.1

Social Security	2,650.4	2,986.4	3,102.3	3,341.6	3,906.4	5,556.0	7,416.4
Not registered in Reference	(60.5)	-	-	911.4	62,337.8	47.3	22.4

Source: Data Pokok APBN 2007-2012, Kementerian Keuangan RI[4]

3. *Political Discourse in Cabinet and Parliament*

Despite some actors involved in the budget formulation, there are key actors there: Ministry of Finance who holds fiscal capacity, Ministry of National Development Planing (Bappenas) who is responsible for program planning and priority, and House of Representatives who give opinion and will legitimize the State Budget. Ministries/Agencies who are obliged to prepare programs for a year ahead should be able not only develop good programs but also build good relation and communication with those stakeholders to get sufficient allocation.

A member of Commission VII House of Representatives, Satya Wirya Yudha states that "cabinet is all about relation and communication". A minister should be smart not only in preparing program but also in presenting program particularly during trilateral meeting and other chances. He continues,

> "If a minister is busy being occupied with bureaucracy in his institutions, will he be drowned of these all. But, if he can establish *good relation* with other, it will be good. Budget is fully government (president)'s right. We, house of Representative only can give political support. For example, when BATAN needs more allocation to succeed his project on rocket, we can help persuade government this program is important. And it works."

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[4] Downloaded from
http://www.anggaran.depkeu.go.id/dja/acontent/Data%20Pokok%20APBN%202013.pdf on 17 August 2016 at 10.25 am.

Maftukhah the assistant of Subdivison Head for Research and S&T Development Bappenas also give example how important is presentation and negation in the budget formulation. She takes Ministry of Marine and Fisheries in convincing the President on the importance of budget to support his ministry's programs. The result, her ministry's allocation is added by reallocating resources from other sectors.

Furthermore, leading sector of Ministry/Agency should be good not only to set up program for national development but how they can build good communication and *profitable* program for all actors who are involved in the budget and program implementation. It closely correlates with incentives allocation.

> "we can understand, the adding allocation in their proposal if still *tolerable*…..(it is for) some stakeholders… and for infrastructure development, particularly in the remote area of Indonesia because member of House of Representative, can *earn* more from that. …… around 30% from each program is still tolerable."

5.1.2 Causes of Low Public Research and Development Expenditure in Indonesia

This research analyzes the bottom line of low public R&D in Indonesia. After understanding the State Budget formulation in which priority of development is decided, it examines the position of R&D in national development plan. Thus, it is to investigate reasons behind low public expenditure allocation for R&D in Indonesia.

1.1.2.1 R&D in National Development Plan

In Indonesia, R&D activity is regulated based on The 2002 Act No. 18. This substance focuses on national system on research, development and implementation of S&T in Indonesia (Sisnas P3 Iptek)[5]. Article 8 of this Act explains that Sisnas P3 Iptek aims to create a synergy among institutions, resources and S&T networking for S&T development and utilization in order to achieve national development goals and improve competitiveness in international relation.

Furthermore, this Act states four elements which are involved in the S&T development. First is R&D actors from public institutions and universities whose funding are from government. Second is element whose function is conducting innovation and technology diffusion by utilizing the results of R&D. This element is part of production-consumption sector. Third is institution that is responsible to conduct training and education to create credible researchers and scientist. Last is policy maker who monitor the development of S&T and synergize all elements to achieve the goal (MoRT in Tampubolon 2013).

Besides Act on Sisnas P3 Iptek, there are some derivative policies on S&T development. Since 2000, Ministry of Research and Technology has prepared Strategic Policy on S&T Development (Jakstra Ipteknas) 2004-2009[6]. It comprises policy and strategy in the utilization of national S&T development. Other is National Research Agenda which involves strategy and tactics in research, development and diffusion. And the other is Research Program which explains more detail about who does what, when, where, and how. It also explains about funding as needed by the research (Tampubolon, 2013).

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[5] In this research Sisnas P3 Iptek is solely referred to National System on Research, Development and Implementation of S&T
[6] In this research, Strategic Policy on S&T Development is solely referred to Jakstra Ipteknas

The government's attention on urgency of S&T development is represented in Master Plan for Indonesian Economic Development Acceleration (MP3EI). It is a planning document which was formulated in 2011 during the administration of President Susilo Bambang Yudhoyono as complement for 2005-2025 Long-term Budget Framework (LTBF). It is formalized by the 2011 Government Regulation No. 32. There are three strategies developed to accelerate and expand economy development in Indonesia. The third strategy to achieve this goal is through strengthening human capital and S&T development and utilization. This document implies government's consideration that innovation through R&D is the key to achieve sustainable economic development and compete in the global world. Of efforts to achieve this goal, R&D should be financed 1% of GDP annually in which the fund can be gradually increased until 2014 with support from government, State Owned Enterprises (BUMN) and private sector (MP3EI 2011).

Nevertheless, government's concern on the urgency of S&T development and utilization is not represented in the State Budget distribution. R&D agenda has not involved in the function based public expenditure distribution. Of the eleven functions as public expenditure distributions, R&D does not stand independently. Instead, basic research and S&T development is involved in the public service function. Furthermore, R&D is included in each function to support the development of the function.

Indonesia public R&D is conducted by sector. There are 18 research agencies under ministerial sector, 7 research institutes (non-ministerial) under coordination of Ministry of Research and Technology directly responsible to

president[7], and university research which have belonged to MoRT since 2014. These research institutions are obliged to do R&D to support the functions. It can be observed through the following table.

Table 5.2. Public Expenditure Based on Function, 2007-2013
(Billion IDR)

Function	2007	2008	2009	2010	2011	2012	2013
Public Service	316,139.3	534,567.2	417,557,6	417,557.6	508,945.5	659,142.5	720,059,7
01.04. Basic Research and S&T Development	1,543.4	1,431.7	1,241.7	1,580.5	2,797.0	2,300.5	2,553.9
01.07 Public Service R&D	-	-	-	(0.0)	119.8	205.5	317.6
Defense	30,685.9	9,158.5	13,145.7	17,080.5	51,121.0	73,919.7	81,769.1
02.04 Defense R&D	93.4	94.6	53.0	81.8	106.9	165.8	1,173.1
Security	28,315.9	7,019.2	7,753.9	13,835.4	21,691.2	33,448.0	36,486.8
03.06 Security Defense	-	0.0	-	-	24.0	16.9	20.8
Economy	42,222.0	50,484.8	58,845.1	52,178.4	87,246.2	120,145.5	122,888.4
04.10 Economy R&D	-	-	-	-	2,191.5	3,408.3	4,038.9
Environment	4,952.6	5,315.1	10,703.0	6,549.6	8,615.	10,738.6	12,446.4
05.06 Environmental R&D	-	-	-	-	-	-	-
Housing and Public Facilities	9,134.6	12,448.7	14,648.5	20,053.2	22,937.8	29,454.2	30,722.1
06.05 Housing & Public Facilities R&D	-	-	-	-	-	-	-

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[7] See LIPI's presentation at 6th ASIAHORCS, Beijing 9-12 October 2012

Health	16,004.5	14,038.9	15,743.1	18,793.0	14,088.8	15,376.1	17,493.0
07.05 Health R&D	197.7	198.5	134.1	257.6	341.4	324.2	435.0
Tourism	1,851.2	1,293.7	1,406.2	1,408,7	3,553.5	3,166.8	2,509.3
08.04 Tourism R&D	-	-	-	-	64.7	80.6	15.7
Religious Affair	1,884.2	745,7	773,5	878,8	1,424,7	3,577.7	4,100.1
09.03 Religious Affair R&D	20.0	44.9	30.2	28.7	61.3	1,672.7	1,981.4
Education	50,843.4	55,298.0	84,919.5	90,818.3	97,854.0	114,962.7	118,467.1
10.9 Education R&D	550.8	803.5	547.9	609.3	1,140.9	1,288.4	1,170.4
Social Security	2,650.4	2,986.4	3,102.3	3,341.6	3,906.4	5,556.0	7,416.4
11.09 Social Security R&D	87.0	65.3	73.6	69.7	220.5	242.0	269.9
Not registered in Reference	(60.5)	-	-	911.4	62,337.8	47.3	22.4

Source: Data Pokok APBN 2007-2012, Kementerian Keuangan RI[8]

The comparison of R&D expenditure as compared by GDP is presented in

the following table.

Table 5.3. Comparison of R&D Expenditure to GDP, 1993-2013

	1993	1995	1997	1999	2001	2003	2005	2007	2008	2009	2013
GDP	295.7	454.5	627.7	1099.7	1467.7	1786.7	2774.281	3950.893	4948.688	5606.203	9083.972
R&D	469	420	608	659	966	1270	1314.5	2713	2970	2101	5102
%GDP	0.158607	0.092409	0.096862	0.059925	0.065817	0.071081	0.05	0.068668	0.060016	0.037476	0.056165

Source: LIPI, 2014

The details of government's spending on R&D can be observed from the following figure over the period of 1969-2013 (Figure 1.2). It is the accumulation of expenditure used to finance R&D in Ministry of Research and Technology (MoRT), Non-ministrial research institutes under MoRT, research agencies in some ministries and universities. Overall, expenditure on public R&D has performed a declining trend .

The Figure 1.1. gives comparison of R&D expenditure between countries. The figure descrbes that the levels of R&D spending viewed from economic prosperity vary by countries. The general pattern is that an increase in R&D expenditure is in line with the increase of country economic prosperity. Most developed economies with high level of R&D expenditure are prosperious countries and vice versa. Among categry of less prosperous country, Indonesia is still lower than Thailand and Philipines.

The 2002 Act No. 18. of Sisnas Iptek also defines about the funding mechanism for R&D activity in Indonesia. Chapter VI (Funding), article 26, 27 and 28, states that government and society (private sector) should collaborate in supporting R&D including in term of funding. However, it does not state clearly the amount of fund needed for R&D.

Being asked about sufficient fund to foster R&D activity and S&T development in Indonesia, Satya Wirya Yudha, member of Commission 7 House of Representatives does not suggest to finance R&D as education sector has. As suggested by the 1945 Constitution, education should be allocated 20% of the State Budget.

> I don't agree if research should be given (for example) 10%. It may lead to budget distortion because the concept is no longer money follow program. They still can get 10% in spite do

nothing. Treatment should be the same. Budget allocation must be stiff based on ministry's program.

Furthermore, Siti Maftukhah, assistant of Subdivison Head for Research and S&T Development – Bappenas states research has not been the government's main agenda. "Not the main priority" as she said. To date, the government's main priority in budget distribution is still dominated by "infrastructure development, like road particularly outside Java" she continued. Therefore, it is not easy to improve budget allocation for R&D while research is still considered less priority.

1.1.2.2 Factors Underpinning Low Public R&D Expenditure in Indonesia

There are some factors considered as the reasons why the Government of Indonesia allocates low public expenditure for S&T development through R&D. These factors are summarized based on data from interview with key informants who are involved in the State Budget formulation process, particularly for R&D program.

1. *Indonesia has low fiscal capacity*

Low fiscal capacity is identified as a significant factor which has the Government set priority programs for development. This way, financial equality between expenditures and revenue must be balanced. Unfortunately, Satya Wirya Yudha, member of Commission VII House of Representatives states that "Indonesia is a country with deficit budget". Furthermore, Maftukhah, assistant of Subdivison Head for Research and S&T Development – Bappenas gives similar statement that "Indonesia's fiscal capacity is limited but developmental problems are too much."

Moreover, President only has five years to conduct governance. Because Indonesia as developing country has a lot of problems to solve, he has to prioritize which sectors is to develop first. Unfortunately R&D is considered cannot give tangible results in the short time. One year of fiscal time for the State Budget is not enough mostly to conduct R&D till results implementation. She continues,

> "… Indonesia is wide, and development in some regions is still left behind. That becomes priority. Also, because President has to prove people such tangible results. R&D results cannot be seen directly in the short time."

Director of Business Innovation Center, Kristanto Santosa[9], affirms that R&D results, particularly basic research cannot be felt the contribution in the short time. He gives an example about cultural collection (microbe) research whose result may open new opportunity for other research. This basic research demands government's funding because cannot give impact directly. It is different with R&D for technology innovation whose impact should be felt soon. Either government or business should prioritize indeed.

However, Satya Wirya Yudha, member of Commission VII House of Representatives disagree if R&D does not get more fund due to the indirect results. If the leading sector of research institution can convince President the urgency of research despite the result in the next couples of years, it does not matter. The State Budget is absolutely the President's right to manage. Any programs will be given sufficient allocation as long as it supports Presidents visions and missions. He argues further that

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[9] Interview, 3 June 2016

research should not depend on the State Budget considering low fiscal capacity of the State. Otherwise, "there should be cooperation between universities, research institution and industries" as he continued.

The other interesting point related to program priority is as Maftukhah states, "…That's why program priority is also political issue". It relates with the urgency of program which can bring advantages in the short term. It is not only to realize social welfare but also political agenda.

2. *Research is not a popular issue in Indonesian society*

Public awareness also influences the Government in formulating the State Budget. The more people care about the urgency of an issue, the more popular it is, the more chance this issue will be government's priority.

R&D has not been popular issue in Indonesian society. Satya Wirya Yudha, member of Commission VII House of Representative states that "to date research is not publicly announced. People are not aware on it." Siti Maftukhah, assistant of Subdivision Head for Research and S&T development, Bappenas argue the similar statement that people awareness on the importance of R&D is still low. Both argue research unpopularity is caused by lack of publication and dissemination of research results publicly.

Meanwhile, publication can be done not only by research institutions; it can be national agenda indeed. It fully depends on the ruling regime. It is as Yudha and Maftukhah argue that if the President declares S&T development is priority, it will be. Unfortunately, there are just few

politicians who have such consideration, including those involved in the agenda setting of the State Budget formulation. Ministry of Research and Technology period of 2004-2009, Kusmayanto Kadiman, once openly criticized Indonesian politicians. He suggested people not to elect legislative candidates who have low capacity on S&T. Otherwise, S&T development will not be priority in national development. And expenditure for R&D will not be allocated as priority either.[10]

3. *Research results is considered has not significantly contributed to national development*

Another issue considered as reason behind low expenditure on public R&D in Indonesia is that R&D result has not much contributed in the national development. Satya Wirya Yudha, member of Commission VII House of Representative states, "research which is done by governmental institution has not been applicative. They do research for themselves. It tends to be spending, wasting budget". Indonesia's vice president period of 2010-2014, Budiono, once criticized that S&T in Indonesia has not yet been optimally utilized for national development due to the weaknesses in national S&T development planning[11]. Most of the out-puts end in academic papers, publications and prototypes. There are still many results of public R&D have not been applied in industries[12].

Due to this condition, Yudha argues that we cannot blame Ministry of Finance to allocate small budget for R&D as long as it bring concrete

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[10] See Menristek Jangan Pilih Caleg Gaptek, Jakarta: *Sinar Harapan*, 21 Januari 2009.
[11] See Kompas daily. 8 May 2013 ed. Jakarta
[12] See http://print.kompas.com/baca/2015/12/11/Kebutuhan-Industri-Bertemu-Tawaran-Riset, browse on 15 February 2016 at 11.31 am.

results. "If behavior isn't changed, never expect for bigger budget" Yudha affirms his statement.

Yudha suggests with limited allocation, R&D should be conducted by inviting industries as partners. University should have become center of excellence of S&T development whose results can be utilized directly by partner industries. This cooperation can lead to joint funding scheme, so that R&D will not depend on limited public expenditure only.

To date, cooperation between university-industries in S&T development and utilization is still low as compared to other countries, particularly ASEAN countries. The following table indicates how strong the relation between industries and universities in R&D.

Table 5.4. Country's Rank in University-Industry Collaboration in R&D

Country	Rank in University-Industry Collaboration in R&D
Singapore	4
Malaysia	17
Indonesia	23
Philippines	51
Viet Nam	59
Thailand	60
Brunei Darussalam	67

Source: Global Competitiveness Report 2013

4. *Political discourse capacity of research institution's leading sector is considered weak*

The State Budget formulation is full of political negotiation as there are some actors involved in the process. Satya Wirya Yudha, member of Commission VII House of Representative states that "cabinet is all about

relation and communication". Leading sector of ministry holds influential role in budget negotiation. Ministry's task is to campaign his program on R&D to become priority. A minister should be smart not only in preparing program but also in articulating program and building networking. Trilateral meeting and preliminary discussion with the House of Representatives are of chances in which he can present program and build political communication. He has to present it on his best to be competed with others. If he fails in the presentation, never blame Bappenas or Ministry of Finance, because other programs must be better and convincing. He continues,

> "If a minister is busy being occupied with bureaucracy in his institutions, will he be drowned of these all. But, if he can establish *good relation* with other, it will be good. Budget is fully government (president)'s right. We, house of Representative only can give political support. For example, when BATAN needs more allocation to succeed his project on rocket, we can help persuade government this program is important. And it works."

Besides, Maftukhah the assistant of Subdivison Head for Research and S&T Development Bappenas also give example how important is presentation and negation in the budget formulation. She takes Ministry of Marine and Fisheries in convincing the President on the importance of budget to support his ministry's programs. The result, her ministry's allocation is added by reallocating resources from other sectors.

The important figure of a leading sector is represented by B.J. Habibie, Minister of Research and Technology during New Order of 1983-1998. At that time, budget allocation for public R&D is significantly higher than todays. It was reaching around 0.7% of the State Budget in 1993 or

0.16% GDP. Meanwhile in 2013, public R&D expenditure was 0.06%GDP. Furthermore, New Order is known by its achievement in science and technological development. The government takes an integral role in directing the focus of national research and development. New paradigm on S&T development and management was begun during this era by Decree of Ministry of Research and Technology No. 02/M/Kp/2000 on National Strategy Policy on S&T Development (Jakstra Ipteknas) 2000-2004 on 15 February 2004.

Also, budget negotiation should be able to give advantage for the authorized actors. During budget negotiation, *profitable* programs (incentives) still dominate the succession of budget negotiation.

> "we can understand, the adding allocation in their proposal if still *tolerable*…..(it is for) some stakeholders… and for infrastructure development, particularly in the remote area of Indonesia because member of House of Representative, can *earn* more from that. …… around 30% from each program is still tolerable."

5. *Lack of private sector contribution*

In 2013, Indonesia spent 0.08% GDP to finance R&D. Of this funding, government still dominates around 74% while private sector contributes 26% (Handayani, et.al, 2014).

The government of Indonesia has regulated business sector participation in R&D funding mechanism. The 2002 Act No. 18 on National System on S&T Chapter VI (Funding), article 26, 27 and 28, government and society (private sector) states that government and society (private sector) should collaborate in supporting R&D including in term of funding. It is supported by document of M3EI 2011 which obliges

government, State Owned Enterprises (BUMN) and private sector to collaboratively finance R&D.

Private or business sector, based on The 2002 Act No. 18, Chapter 1 article 13, is one of institutions in the national system of research, development and utilization of S&T. It is responsible for technology innovation and diffusion in order to produce economically valuable goods and services. The explanation of Chapter 9 article 1 of this Act states that the main mission of business sector is not only utilizing the results of technological progress but also diffusing technology either their own products or others'. Thus, basically the Act of Sisnas P3 Iptek regulates that instead of research institution, innovation is business sector's main responsibility.

Unfortunately, business has not contributed as it is expected in the S&T development in Indonesia. Satya Wirya Yudha, member of Comission VII House of Representatives affirms small contribution of business (private sector) both in funding R&D and conducting R&D. S&T development in Indonesia cannot fully depend on public expenditure. There should be cooperation on it. Business can make use of technology capacity as resulted by research institution or universities by paying royalties of the patents. They can fund the expenditure of the research and utilize the results. They can also collaborate in research both in the activity, funding, or both and utilize the results.

On this issue, Siti Maftukhah, assistant of Subdivison Head for Research and S&T Development – Bappenas states similarly concerning to low business participation on R&D in Indonesia. Thus, as she explains

research institutions should be proactively promote their research to attract business sector attention. The development of Technopark in Centre for S&T Research and Development (PUSPIPTEK), Serpong is aimed to be a showroom for technological development as R&D results in Indonesia. It is expected to attract private or business sector either to utilize or collaboratively fund do R&D.

Actually, government has offered incentives for private or business sector who would participate in R&D. The Government Regulation number 35/2007 and also Act number 36/2008, stated that the Indonesian government will provide tax incentives in the form of income tax reduction or exemption of import duty fees for companies that spend on R&D purposes and activities conducted in Indonesia. These regulations should create conducive environment to make enterprise or institution to conduct R&D within Indonesia. The scheme also provides custom exemption for equipment which will be used in R&D activity.

Income Tax Act Number 36 Year 2008 (Article number 6) offers another option. The company that issued the costs of research and development conducted in Indonesia can obtain tax incentives in the form of a reduction in income tax. Similarly, a reduction in income tax is offered as well issued company that issued financial contribution to R&D institutions in the framework of R&D conducted in Indonesia. It is regulated on the Government Regulation Number 93 Year 2010.

Government of Indonesia also issued the Government Regulation Number 52 Year 2011. Private sector can earn additional 1-year compensation for losses (Investment Allowance) with provisions "if the

cost of R&D in the country in order to develop a product or production efficiency of at least 5% (five percent) of the investment within a period of 5 (five) years".

Another government's effort to encourage private's contribution for R&D is through the Ministry of Finance Regulation Number 70 Year 2013. It eases the distribution of goods for &D use. Goods for the purposes of scientific R&D are exempted from levy of import duty. The Director General of Taxation Regulation Number 16 Year 2013 is in line with this regulation. It states that goods for the purposes of R&D of S&T are exempt from income tax collection.

And, the Government of Indonesia also seeks to encourage the defense industry to allocate part of the company's net profit for research and development activities through Law no. 16 in 2013. Compensations for the company will be obtained in a reduction of the corporate tax.

However, the government's effort to encourage private sector's participation in R&D has not brought significant impact. In 2007, there were 52 applications that were approved for tax allowance. However, in the following years, the number of tax allowance applications dropped to under 10 approvals every year (Darussalam Tax Center 2014).

5.1.3 The Utilization of Public R&D Results in Indonesian Industries

The Director of Business Innovation Centre, Kristanto Santoso, argues that usually public research in Indonesia is done based on "supply push" characteristics. It is in which researchers do research without considering the targeted customer, whether to solve public problems or business needs. As the

consequence, many of the research results are useless or rest on publication or prototypes. It is as Satya Wirya Yudha considers as "not contributed much for national development." Thus, this mechanism should be redirected into "demand driven". Researchers should understand the needs of business or public demand. This way, the result of their research can give benefit as utilized by business sector or solve public problems.

S&T development and utilization in Indonesia now employs the Triple Helix scheme. Triple Helix model represent networked relations among universities, industries and governments (U-I-G). In 2008, Ministry of Research and Technology established Business Innovation Center (BIC) as Non-governmental Organization to bridge innovation process within this networking. BIC identifies the activity of technology transfer and commercialization of R&D results.

In order to monitor innovation development in Indonesia, BIC has conducted such kind of innovation competition "Inovasi Indonesia" annually since 2008. It opens opportunity for all stakeholders not only from universities and governmental institutions, but also from private sector to join the competition. Kristanto explains that this event reveals that there are innovation created in Indonesia but many of them are unrecorded, as found by Soenarso and Sadewo (2014). By involving scientist and professionals as assessors, each year some innovations are selected and published publicly to attract business's attention. The scheme is as in 2008 selects 100 innovations, in 2009 selects 101 innovations, and so for. That in 2015 selects 107 innovations.

In 2013 BIC conducted a survey to investigate the utilization of published selected innovations. Through this method, the development of innovation in

Indonesia can be monitored. It has intermediated R&D results utilization and commercialization which has been problem for years

The following table indicates number of proposals who join innovation competition in 2008-2012.

Table 5.5. Number of Proposed Innovation in "Inovasi Indonesia"

Stakeholder	2008	2009	2010	2011	2012	Total
Research institution under MoRT	181	236	354	389	421	**1581**
Research agencies in ministries	63	147	244	400	506	**1360**
Universities	269	387	611	749	960	**2976**
Private organization / NGO	47	79	145	154	164	**589**
Private Business / State Owned Enterprises (BUMN)	60	84	126	247	352	**869**
Others	3	54	77	89	116	**339**
Total	**623**	**987**	**1557**	**2028**	**2519**	**7714**
Selected in "Inovasi Indonesia"	**101**	**102**	**103**	**104**	**105**	**510**

Source: BIC, 2016

The selected proposals are then compiled and published in the form of book "100 Inovasi Indonesia" in 2008, "101 Inovasi Indonesia" in 2009, and so for. Publication of this innovation is a way to promote innovative technology to be utilized publicly

The table below presents the utilization of innovation in the period 0f 2008-2012 following the publication of "Inovasi Indonesia".

Table 5.6. Number of R&D results utilized by Indonesian industries

Innovation Intermediary	2008	2009	2010	2011	2012	Total	%
BIC	10	13	3	8	4	**38**	**7.5**
Local Intermediary	2	0	0	0	1	**3**	**0.6**

BIC partners	0	5	1	2	0	**8**	**1.6**
Utilized without intermediary	34	46	56	66	68	**270**	**52.9**
Not yet utilized/intermediated	2	3	1	22	0	**28**	**5.5**
Unclear	52	34	41	5	31	**163**	**32.0**
Total	100	101	102	103	104	510	100.0

Source: BIC, 2016

1.2 Discussion

Data as presented in the findings is analyzed by using relevant theories to gain scientific answer for research problems. It involves discussion on the State Budget formulation in Indonesian Central Government, the political economy of R&D to see the bottom line of its low public expenditure and R&D results utilization in Indonesian industries too see the funding's efficiency and effectiveness in supporting Indonesian economy.

5.2.1   The State Budget Formulation in Indonesia Central Government

The study on policy substance focuses on a description of the content of public policy. It analyzes the impact of social, economic and political forces on the content of public policy. Also it examines the effect of various institutional arrangements and political processes on public policy (Dye, 2013).

In this research which aims to investigate the bottom line of low research and development public expenditure in Indonesia, understanding institutional and political process of the State Budget (APBN) Formulation is important. As public policy is a series of political phases, the dynamics within the process leads to find out the grass roots of political economy of R&D in Indonesia.

1.2.1.1 Process of the State Budget Formulation in Indonesia

Political scientist David Easton defines public policy as "the authoritative allocation of values for the whole society" but it turns out that only the government can "authoritatively" act on the "whole" society, and everything the government chooses to do or not to do results in the "allocation of values". Meanwhile, Harold Lasswell and philosopher Abraham Kaplan define policy as "a projected program of goals, values, and practices" (as in Dye 2013).

Of these behaviors, government's expenditure has been a common indicator representing governmental functions and priorities (Dye, 2013). The formulation of national budget considers a series of policy-making process and the broad relationship among policy actors within each stage of political system. It includes identification of problems and agenda setting, formulating policy proposals, legitimating policies, implementing policies, and evaluating their effectiveness (Sabatier 2007, Dye 2013).

The National budget in Indonesia governmental system is known as State Budget of Indonesia (APBN). It represents what the government will do in a year with setting up priority of programs to conduct. The 1945 Constitution article 23 paragraph 2 has clearly explained that State Budget is formulated as an Act and openly implemented for the benefit of social welfare.

State Budget is formulated through several political stages. There are some actors involved in each stage. It is proposed by the government (executive) and legitimized by legislative. The legitimized State Budget is run in one fiscal year and will be evaluated post implementation. The cycle of budgeting process can be described as the following figure.
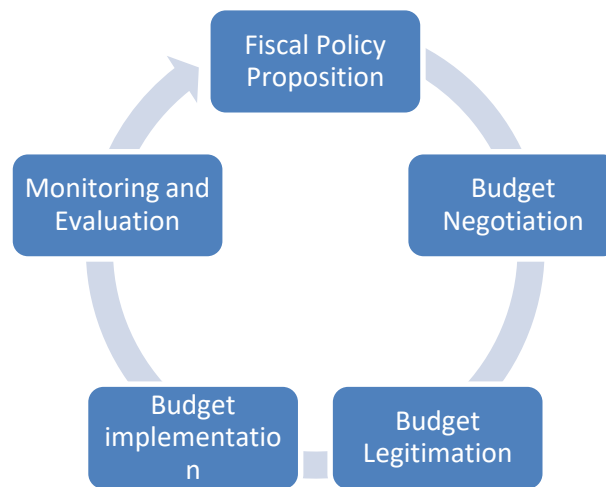
Figure 5.1. The State Budget Cycle

Formulating State Budget in Indonesia governmental system is such a long and complicated system. It involves some stages and several actors along the policy formulation process. The details of State Budget formulation in Indonesia is the following:

1. *Problem Identification*

In the identification stage, process of the State Budget formulation is begun by reviewing Long-term Budget Framework (LTBF) covering 20 administrative years, and Medium-term Budget Framework (MTBF) of 5 years plan which is prepared by Ministry of National Development Planning (Bappenas). The MTBF represents vision, mission and programs of current president. In the five years ahead, President expects his vision and mission can be realized through programs arranged in each fiscal year. Therefore, it is wholly the President's right to manage the State Budget to support his vision and mission to the utmost.

As Musgrave (1959) explains the objectives of budget policy, preparing fiscal capacity is considerably to secure adjustments in the allocation of

resources and to secure economic stabilization particularly. Preparing scheme for the State Budget considers the fiscal capacity as calculated by Ministry of Finance together with reference from Bank of Indonesia, National Statistics Agency (BPS), and Ministry of Energy and Mineral Resources.

It is followed by determination of policy direction and prioritized programs for national development. President can use his right to direct the development through the State Budget distribution. Ministry of Finance, through Directorate General of Budget then prepares scheme of fiscal policy and resource envelope as the foundation for institutional expenditure which is formulated together with Ministry of National Development Planning/Bappenas. In this case, Bappenas is obliged to prepare national plan and initial fund allocation based on President's policy direction.

2. Agenda Setting

Setting agenda for national development plan for national budget should be done carefully. Ministry of National Development Planning (Bappenas) is responsible for resource distribution which Ministry of Finance holds it previously. Resource distribution and allocation works in the scheme of "money follows program", not "money follows function" anymore. Bappenas considers the fiscal capacity and prioritized programs to be achieved.

It is in line with the objectives of budget policy as Musgrave (1959) defined. That budget policy is determined as the result of three interdependent plans, each of which involves different objectives and principles of action. It is then cleared and consolidated into a net budget involving but a single set of tax and expenditure measures. The three objectives of budget policy comprise:

1. to secure adjustments in the allocation of resources

2. to secure adjustments in the distribution of income and wealth

3. to secure economic stabilization.

J.M. Keynes as in (Musgrave 1959) introduces the role of public expenditure in the determination of level of income. Besides to improve income distribution, public expenditure can be used to direct the allocation of resources in the desired lines and to influence the composition of national product. Thus, the role of public expenditure is highly significant both in the developed and developing countries. Furthermore, in the developing countries, the variation in public expenditure is not only to ensure economic stability but also to generate and accelerate economic growth, to promote employment opportunities, and to alleviate poverty.

Public expenditure as financed by Indonesian Government through the State Budget comprises some functions. As data from Ministry of Finance describing the State Budget's performance in the period of 2007-2013, these functions consist of some programs. They are directed not only for management improvement, infrastructure development, empowerment, but also research and development (R&D). R&D presents in each function of public expenditure distribution in the State Budget.

Furthermore, details of public expenditures are generally classified as "capital" and "current" expenditures. Capital expenditures involve non-recurring costs arising from investment and creating the socioeconomic infrastructure in the form of roads, bridges, power generation, agricultural production, industrial expansion, communication infrastructure, among others. Current expenditures are also called "revenue" expenditures which are considered as non-investment,

exhaustive and recurrent in nature and as such hardly create productive assets which generate returns to government. Hence they are categorized into "consumption" and "transfer" expenditures. Consumption expenditures relate to the day to day expenses of governments in the form of administration, maintenance, employment and debt-related costs. Meanwhile transfer expenditures are payments for which no goods or services are exchanged. It comprises costs in the form of subsidies, educational grants, state pensions, social benefits, unemployment benefits, sickness benefits and old-age pensions (Aronson 1985, Musgrave 1959).

Public expenditure as spent by Indonesian government comprises some sectors. Nevertheless as Indonesia is a developing country. People still face many social and economic problems and partiality is unavoidably existence between regions. Thus, public expenditure of the State Budget is spent for public service function utmost. It is in line with The 1945 Constitution article 23 paragraph 2 has clearly explained that State Budget is formulated as an Act and openly implemented for the benefit of social welfare.

It is yet undeniably that the State Budget is also used for political purposes. Resource distribution in the State Budget is not only on the benefit of public but it is politically purposive. In the relationship of state and society, people's behavior can be influenced and controlled. Government who has power and authority in public resource management can both form as well as be perceived by social structure. Accordingly, many positive impacts will arise when a leader can be accepted by society (Greiner & Schein, 1989). The most important one is he can earn more support to be elected for next period. It is not

only for the personage, but also for coalition and supporting party as politic is about power and authority.

Following the President's direction for the upcoming fiscal year, Ministry of National Development Planning (Bappenas) begins preparing framework particularly for prioritized program. The product is Government Work Plan (RKP) as guidance for each Ministry/Agency to arrange program one year ahead (Renja). Document of Government Work Plan explicates not only the work plan for each Ministry/Agency but also initial fund as referred to Ministry of Finance's resource envelop (fiscal capacity) (Direktorat Penyusunan APBN, 2014).

3. Budget Formulation

Law 17/2013 on Public Finance, Article 12 paragraph 2 explicates that the State Budget formulation should be based on the Government Work Plan (RKP) in order to achieve national goals. Ministry/Agency arranges their work plan (Renja) based on the Government Work Plan (RKP) as issued by Bappenas.

In the previous governmental administration, budget is mostly formulated based on Ministry/Agency's tasks and functions. This method which is called "money follows function" often leads to program duplication in some ministries due to lack of coordination. Besides, budget is used inefficiently and ineffectively as it focuses on Ministry/Agency's function instead of national objectives. This system has been changed into "money follows programs" method in formulating budget. By using this new mechanism, Ministries/Agencies are expected to coordinate their programs based on the RKP. This way, budget is projected to be

distributed and used effectively and efficiently to achieve national development goals[13].

The RKP preparation involves trilateral meeting of Ministry/Agency, Ministry of Finance and Ministry of National Development Planning/Bappenas. Each ministry/agency is expected to draw programs which fully supported President's vision and missions with sufficient fund as Bappenas has allocated. They should also be able to convince government about the urgency of programs to be executed can lead to social welfare as the goal.

Within this new budgeting scheme, Ministry/Agency will not get similar allocation to fund their function and tasks. The positive side of this mechanism is budget should be better allocated and more effectively. Ministry/Agency should prepare their programs until the goal achievement. No more programs duplication or *unimportant programs* will be funded. If it is well implemented, the objective of the State Budget to realize social welfare can be achieved more easily.

On the other side, it may lead to *unfair* budget negotiation. And as Kusmayanto Kardiman (as in Tampubolon 2013) argued that there are four factors influence social capability. First is natural environment. Second, activities particularly collective activities between institutions which demand coordination also play important role. Also, collective knowledge is developed through social interaction, communication and learning. And, motives or politically collective decision is the last factor. Also, in new network society of deliberative policy making as Hajer and Wagenaar (2003) argued that political discourse plays such important roles to accommodate actors' interest.

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[13] See http://www. Bappenas.go.id/files/penyusunan_rkp_2017/22022016/Tema_Arah_Kebijakan_dan_Prioritas_Pe mbangunan_RKP_2017.pdf, cited on 23 June 2016 at 11.00 a.m.

In the State Budget formulation, a minister or leading sector of each ministry/agency is demanded to be smart not only in preparing program but also in presenting program particularly during trilateral meeting and other chances. Negotiation is very important aspect in budget formulation. Despite the RKP as the guidance, program assessment as done by Bappenas is very subjective. It is fully negotiation works here. A ministry has to be able to convince the urgency of the programs to be funded for the benefit of the society. Also, he ought to be able as well to build good communication and relation to collect support for budget legitimization both in the cabinet and from the House of Representative. Otherwise, his program will not get sufficient fund because it fails to attract collective decision.

Moreover, a program of a ministry should be *profitable* for all actors who are involved in the budget and program implementation. The word *profitable* here is chosen by the author following a statement by an informant. During budget negotiation, *profitable* programs still dominate the succession of budget negotiation.

The work plan of each Ministry/Agency which has been approved is compiled together fiscal policy principles and macro economy structure to be discussed with the House of Representatives in the preliminary discussion.

4. Budget Legitimation

The initial work plan, fiscal policy principles and macro economy structure as prepared by Ministry of Finance is discussed with the House of Representatives in the preliminary discussion. The confirmed fiscal policy and budget ceiling as the discussion output are used to formulate State Budget Plan

(RAPBN) which will be ratified and legitimized as the State Budget Law by the House of Representatives. The following figure gives a detail flow of budgeting mechanism in Indonesia (Kamaroesid, 2013; Direktorat Penyusunan APBN, 2014).

1.2.1.2 The Dynamics of Resource Distribution in the State Budget Formulation Process

Budgeting formulation as a policy process goes through a series of political phase. The whole stages of the State Budget formulation in Indonesia can be described as the following figure:
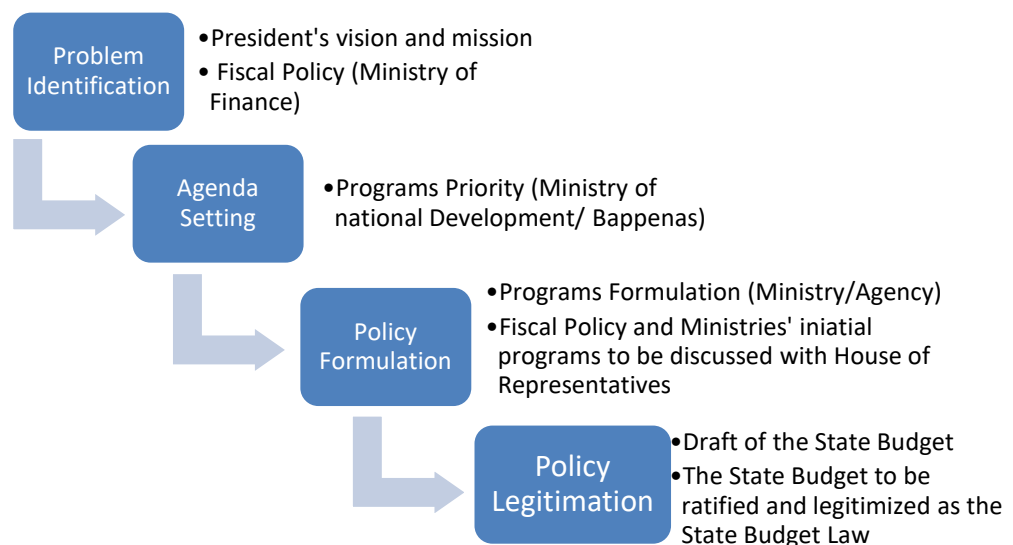
Figure 5.2. Political Stages of the State Budget Formulation
in Indonesia
Source: author

Preparing fiscal policy to secure adjustments in the allocation of resources, adjustments in the distribution of income and wealth, and economic stabilization is not a simple process. Moreover, Indonesia as a developing

country faces lots of problems, not only economic but also social as well as political issues.

It is in line as Caiden (as in The World Bank 1998) states that in preparing fiscal policy, developing countries face different problems from developed countries. The low income countries which still in its quite early stages of development, such aggregative analysis in terms of consumption, saving and investment, may well miss the crucial part of the problem.

Indonesia also faces some problems as Caiden (as in The World Bank 1998) identified as obstacles for developing countries in regards to their budgeting policy:

1. *Low fiscal capacity being faced with lots of problems to be solved*

To meet the aim of budget policy, the government should be able to choose among alternatives use of resources to secure the allocation resources. This way, financial equality between expenditures and revenue must be balanced. The amount of resources withdrawn from private use must be equal to the resources added to public use.

Unfortunately, Indonesia is still occupied with deficit budget but occupied with piles of socio economic problems. In economic sector, performance of Indonesia's economy based on per capita income as compared to some other ASEAN countries is the lowest. The poverty rate and unemployment in Indonesia is relatively higher than some other ASEAN countries.

In regards to this problem, state revenue should be managed carefully to meet public use unless the budget balance cannot be achieved. Low fiscal

capacity becomes one factor which makes government to set development priority in budget management.

On the other side, this limited resource will be needed by Ministries/Agencies to conduct programs to support President's visions and missions. Hence each institution should be able to perform their program in their best presentation, covering the goal and benefit, what is the impact of for society development in order to convince the Government to give them sufficient funding. Moreover, the current budget mechanism is "money follows program". Each program of Ministry/Agency will compete to be the priority. If a leading sector of a Ministry/Agency fails in convincing the authorized actors (Bappenas, Ministry of Finance and President), they will get fewer allocation than other Ministries/Agencies.

2. *The Short Time of President's Administration*

Based on the 1945 Constitution article 7, President and Vice President hold the presidential administration in Indonesia for 5 years and can be elected afterwards. During this time, the government is expected to succeed in realizing the vision and missions as the president has proclaimed.

For Indonesia case which has wide territory, big population and is occupied with piles of economic, social and political problems, five years can be too short time to realize a welfare society as the goal of President's vision and missions. On the other hand, the government has to prove to the people they have achieved development for the nation. Musgrave (1959) argued if resources are to be used for the satisfaction of certain public wants, they will not be available for the satisfaction of other public or private wants. In this

sense of opportunity cost, the budget of the allocation must be balanced. Thus, with the limited resources, the government should manage and set prioritized program to conduct. The strategy as the government of Indonesia has done to choose among alternatives use of resources in budget formulation is to meet the aim of budget policy.

President who rules Indonesia only has five years realize his visions and missions so that budget distribution should be prioritized. Nevertheless, political economy in budget formulation has "advantage and disadvantage". Despite some allocation is properly used to successfully conduct programs, some others is not. It is because budget is prioritized to support President's vision and mission instead of readiness or urgency of other sector which is considered less priority.

On this issue, Musgrave (1959) also argues that in formulating the budget allocation, there exists a desired or proper state of distribution to begin with. The distribution of income and wealth in a market economy depends on a number of factors including the laws of inheritance, the distribution of innate talent, the availability of educational opportunities, social mobility and the structure of markets. As a result of these factors, a state of distribution, with a given degree of equality or inequality comes about. This state will seem appropriate to some, while others will prefer a greater or lesser degree of equality.

In regards to limited time of a President in managing the state, public expenditure are prioritized mostly for short term program. Among others is infrastructure development, social help (subsidies). Besides to gain successful development which can be observed through economic growth,

number of established high ways and other infrastructure, President may get support from society particularly for next election. Thus, President should make use each fiscal year until five years ahead not only to realize social welfare but also to strengthen his figure and political position.

Table 5.1 describes the State Budget in the period of 2007-2013 based on function distribution. It may represent government's priority in the utilization of public expenditure for national development. Generally, the State Budget is allocated mostly for public service and economic function.

3. *Political Discourse in Cabinet and Parliament*

In setting out program to be prioritized in budget preparation, the government considers not only the urgency of the problems or program. Negotiation among stakeholders also plays an important here. Adam and Dercon (2009) states that the distribution of resources considers the distribution of and struggle for power and analyses the attributes of underlying formal structures to identify and understand interest and incentives. It deals with the political economy of the regime in fiscal policy distribution.

Tolentino (in Luttrel 2014) also emphasize stakeholders, institutions and process play a key role in the political economy by which the reforms is negotiated and played out. There are three levels of political and institutional analysis. Political traditions concerns with long-standing cultural traditions underpinning political and social institutions. Political regimes relates to the set of procedures determining the distribution of power. And the last is political institutions, rules of the game, players, organizations, and expected patterns of behavior.

Political economy in the State Budget formulation is also influences by these factors. Collective decision of Law on State Budget (APBN) is the final result of such long process of budget formulation. Many actors are involved in this politically negotiated process. Thus, as Kusmayanto Kardiman (as in Tampubolon, 2013) argued that collective activities between institutions play important role in forming a system. It needs collective knowledge which is developed through social interaction, communication and learning. Also, in new network society of deliberative policy making as Hajer and Wagenaar (2003) argued that political discourse plays such important roles to accommodate actors' interest.

Political communication is crucial during budget formulation process. "Cabinet is all about relation and communication", Satya Wirya Yudha, member of Commission VII House of Representatives said. A minister should be smart not only in preparing program but also in building relation and communication with colleagues particularly to build coalition.

When coalition is built, they can construct similar perspective on particular issue. It is substantially significant in collecting support to make proposed program become priority and get sufficient fund in budget distribution.

Negotiation involves how much advantages a ministry can give for those who have contributed in winning the priority. It closely relates to incentive of corruptive behavior. Despite program capacity, *profitable* programs still dominate the succession of budget negotiation.

In this case, of *profitable* program which indicates corruptive behavior is supported by Cornway and Bratton & van de Walle's' concept (in Luttrel

2014). They identifiy that there are three levels of political and institutional analysis to extend the political economy. First is political traditions, which concerns with long-standing cultural traditions underpinning political and social institutions. It has been tradition in Indonesia governmental institution to provide "incentive" to ease program assessment. The statement of "we can understand, the adding allocation in their proposal if still *tolerable…*" indicates an expected behavior has been done continuously.

In the State Budget formulation, political traditions, political regimes, political institutions should be well considered. President has an absolute right in budget management. Policy direction as he commence in the beginning of budget formulation process cannot be separated from people around him. Not only political group but also psychologically he needs to be perceived positively by society which can lead to political interests.

Despite some actors involved in the budget formulation, there are key actors there: Ministry of Finance who holds fiscal capacity, Ministry of National Development Planing (Bappenas) who is responsible for program planning and priority, and House of Representatives who give opinion and will legitimize the State Budget. Ministries/Agencies who are obliged to prepare programs for a year ahead should be able not only develop good programs but also build good relation and communication with those stakeholders to get sufficient allocation.

Even more, incentives have become "expected behavior" in budget negotiation. It seems to be one rule of the game that besides program quality, communication and coalition, incentives should be considered as well. When program assessor "can understand if still tolerable" (the added fund) which

means to be used as incentives, it is not a good situation indeed. Unfortunately, it has been "patterns of behavior" that has been one of the game's rules.

1.2.2 Causes of Low Public Research and Development Expenditure in Indonesia

The study on policy substance focuses on a description of the content of public policy. It analyze of the impact of social, economic, and political forces on the content of public policy; an inquiry into the effect of various institutional arrangements and political processes on public policy; and an evaluation of the consequences of public policies on society, both intended and unintended. The substance of public policy to be analyzed can be in the area of civil rights, education, welfare policies, health care policies, criminal justice, taxation, spending and deficits, defense policies, and homeland security (Dye, 2013).

This research analyzes the bottom line of low public R&D in Indonesia. In this subchapter, some detailed analysis is presented to explain position S&T development and utilization through R&D activity in national development plan. Some explanation regarding to why public R&D in Indonesia get small allocation is presented as well.

1.2.2.1 R&D in National Development Plan

Dye (2013) explains that policy analysis begins with finding out what government is doing. The annual budget is the most comprehensive document representing government's policy priorities. It sets out political debate between government and House of Representatives over fiscal capacity and expenditure.

To begin with, it describes the position of R&D in the national development plan because it is from which political economy of R&D in Indonesia can be understood.

Research and Development (R&D) is main source of technical change by resulting in new goods, new process and new knowledge. Frascati Manual defines Research and Development (R&D) comprising creative work undertaken on a systematic basis in order to increase the stock of knowledge and the use of this stock of knowledge to devise new applications (OECD, 1993).

There are four types of R&D activities: basic research, applied research process and product development. Basic research is an original experimental work with no specific commercial purpose and this occurs in most universities' and governmental institutions' R&D. Applied research has a specific aim as an original experimental work. Product development is concerned with the improvement and extension of existing products. And the generation of new or improved processes is process development (UNCTAD 2005).

In regards to the importance of R&D for S&T development, it is regulated in form of science policy. The government regulates science and technology policies in order to legally interfere the utilization of research and development. The government promotes the development and dissemination of knowledge. It is also through which the results of research can be utilized through innovation into production of goods and services on the benefit of public. Policy can encompass the nation out of underdevelopment through national initiatives and international cooperation in science and technology (Forje, 2008).

In Indonesia, R&D activity is regulated based on The 2002 Act No. 18. This substance focuses on national system on research, development and

implementation of S&T in Indonesia (Sisnas P3 Iptek)[14]. Article 8 of this Act explains that Sisnas P3 Iptek aims to create a synergy among institutions, resources and S&T networking for S&T development and utilization in order to achieve national development goals and improve competitiveness in international relation.

There are other derivative policies on S&T development and utilization which regulate policy and strategy in the utilization of national S&T development. The government's attention on urgency of S&T development is also represented in Master Plan for Indonesian Economic Development Acceleration (MP3EI). The third strategy to achieve this goal is through strengthening human capital and S&T development and utilization. This document implies government's consideration that innovation through R&D is the key to achieve sustainable economic development and compete in the global world. Of efforts to achieve this goal, R&D should be financed 1% of GDP annually in which the fund can be gradually increased until 2014 with support from government, State Owned Enterprises (BUMN) and private sector (MP3EI 2011).

Nevertheless, R&D agenda has not involved in the function based public expenditure distribution. Of the eleven functions as public expenditure distributions, R&D does not stand independently. Instead, basic research and S&T development is involved in the public service function. R&D is also included in each function to support the development of the function. Indonesia public R&D is conducted by sector. There are 18 research agencies under ministerial sector, 7 research institutes (non-ministerial) under coordination of Ministry of

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[14] In this research Sisnas P3 Iptek is solely referred to National System on Research, Development and Implementation of S&T

Research and Technology directly responsible to president[15], and university research which have belonged to MoRT since 2014. These research institutions are obliged to do R&D to support the functions. But still, some functions do not allocate fund for R&D activity. It can be observed through Table 5.2 which describes public expenditure based on function in the period of 2007-2013.

The details of government's spending on R&D can be observed from the Figure 5.8 which explicates the Governmental R&D expenditure in Indonesia over the period of 1969-2013. It is the accumulation of expenditure used to finance R&D in Ministry of Research and Technology (MoRT), Non-ministrial research institutes under MoRT, research agencies in some ministries and universities. Overall, expenditure on public R&D has performed a declining trend .

The highest spending on public R&D is in 1982 reaching about 0.5% GDP then begins to gradually decrease. Financial crisis of 1998 that leads to economic decline with high inflation has been the starting point of the low portion for R&D activities. In 2013, investment on public R&D is 0.06%.

Moreover, Figure 5.9 gives comparison of R&D expenditure between countries. The figure descrbes that the levels of R&D spending viewed from economic prosperity vary by countries. The general pattern is that an increase in R&D expenditure is in line with the increase of country economic prosperity. Most developed economies with high level of R&D expenditure are prosperious countries and vice versa. Among categry of less prosperous country, Indonesia is still lower than Thailand and Philipines.

The 2002 Act No. 18. of Sisnas Iptek also defines about the funding mechanism for R&D activity in Indonesia. Chapter VI (Funding), article 26, 27 and

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[15] See LIPI's presentation at 6th ASIAHORCS, Beijing 9-12 October 2012

28, states that government and society (private sector) should collaborate in supporting R&D including in term of funding. However, it does not state clearly the amount of fund needed for R&D.

R&D does not get fixed allocation in the State Budget as education gets 20%. If it is examined from Government's consideration on its low contribution to national development, it can be accepted. Also, currently government apply "money follow program" scheme in budget distribution not "money follow function". If R&D is given fixed allocation, it may leads to budget distortion with consideration to its performance record.

Besides, R&D has not become priority in national development plan examining its position in public expenditure as compared to GDP and the State Budget. To date, the government's main priority in budget distribution is still dominated by "infrastructure development, like road particularly outside Java" she continued. Therefore, it is not easy to improve budget allocation for R&D while research is still considered less priority despite normative policies and regulation explaining its significance in national development.

1.2.2.2 Factors Underpinning Low Public R&D Expenditure in Indonesia

Political economy approach is relevant in to investigate and analyze any factor behind low public R&D expenditure in Indonesia. The political economy approach examines the ways in which institutional structures are formed and the political and economic choices of governments and citizens are made and influenced (Adam and Dercon 2009). Meanwhile, the production of scientific research and technological innovation depends on national system structure and strongly supported by human and economic resources (Coccia, 2007). As a

matter of fact, it leads to debates on how to allocate economic resources on R&D to support science and technology improvement to spur patterns of economic development.

In inquiring about the causes, or determinants, of public policy in doing policy analysis, Dye (2013) formulated a "system model". It is to understand why is public policy? What it is? Why do governments do what they do? The "system model" comprises what is the impact of lobbying by the special interests on Public Policy? We can also inquire about the effects of social, economic, and cultural forces in shaping public policy. In scientific terms, when studying the causes of public policy, policies become the dependent variables, and their various political, social, economic, and cultural determinants become the independent variables.

This research employs Dye's "system model" in analyzing why public R&D expenditure in Indonesia is low. The analysis involves the effect of socio economy condition on political and governmental institution, processes and behaviors which influences collective decision on the policy. It also analyzes the effect of political and governmental institutions, processes, and behaviors on the policy. Last is the impact of social and economic condition on the policy.

1. Effect of social and economy condition on political system and government institution

The condition of social and economy of society will influence the way government behaves and any political process in the governmental system. Kusmayanto Kardiman (as in Tampubolon 2013) argued that one of four factors which can influence social capability is the environment. Also the

"emerging network society" is being stimulated by "technological developments, globalization, individualization, and emancipation". The results of these changes, society is experiencing a shift in language from institutions to networks. This shift is important because institutional language implies stability and networks imply fluidity. It also notes a shift in vocabulary from words associated with government (state, power, and authority) to governance (networks, complexity, trust, interdependence). The networks are eroding the power of previously powerful institutions (Hajeer & Wagenar 2003).

Moreover, the objectives of political economy of R&D depend much on the social welfare function of a country, which considers the preferences of the society and the structure of driving industries of the economic system (Coccia, 2012). Condition of social welfare will direct the government in resource distribution. It is if government will consider R&D as priority whose impact is influential in social welfare improvement that needs more allocation. It can be the government considers it less priority while other programs are more urgent and significant to accelerate socio economic development.

This research identified some problems concerning to social and economic conditions in Indonesia. These conditions have affected and formed political behavior of the government and institutions particularly in the political economy of R&D.

- *Indonesia has low fiscal capacity*

    To meet the aim of budget policy, the government should be able to choose among alternatives use of resources to secure the allocation resources. This way, financial equality between expenditures and revenue

must be balanced. Unfortunately, Indonesia is still occupied with deficit budget as Yudha, member of Commission VII House of Representatives affirms that "Indonesia is a country with deficit budget". Furthermore, Maftukhah, assistant of Subdivison Head for S&T Development – Bappenas gives similar statement that "Indonesia's fiscal capacity is limited but developmental problems are too much."

Furthermore, President's in Indonesia has five years to lead and manage the state. Five years can be too short time to realize a welfare society as the goal of President's vision and missions considering Indonesia has wide territory, big population and is occupied with piles of economic, social and political problems. On the other hand, the government has to prove the people he has achieved development for the nation.

Musgrave (1959) argues that in formulating the budget allocation, there exists a desired or proper state of distribution to begin with. In regards to limited time of a President in managing the state, public expenditure are prioritized mostly for short term program. Among others is infrastructure development, social help (subsidies).

Maftukhah, assistant of Subdivison head for Research and S&T development – Bappenas explains about program priority. President only has five years to conduct government. Because Indonesia as developing country has a lot of problems to solve, he has to prioritize which sectors is to develop first.

To date, R&D is considered cannot give tangible results in the short time. One year of fiscal time for the State Budget is not enough

mostly to conduct R&D till results implementation. Director of Business Innovation Center, Kristanto Santosa, affirms that R&D results, particularly basic research cannot be felt the contribution in the short time. He gives an example about cultural collection (microbe) research whose result may open new opportunity for other research. This basic research demands government's funding because cannot give impact directly. It is different with R&D for technology innovation whose impact should be felt soon. Either government or business should prioritize indeed.

However, Satya Wirya Yudha, member of Commission VII House of Representatives disagree if R&D does not get more fund due to the indirect results. If the leading sector of research institution can convince President the urgency of research despite the result in the next couples of years, it does not matter. The State Budget is absolutely the President's right to manage. Any programs will be given sufficient allocation as long as it supports Presidents visions and missions. He argues further that research should not depend on the State Budget considering low fiscal capacity of the State. Otherwise, "there should be cooperation between universities, research institution and industries" as he continued.

From this view point, there are two different arguments if the indirect impact of R&D becomes reason behind low allocation in the State Budget. However, something important here that low fiscal capacity of the State Budget make President and his cabinet set priority in the resource distribution. It can be blamed if public expenditure is mostly allocated for public service as this sector is alarming as the infrastructure condition, particularly in some underdeveloped regions. Meanwhile, in case of R&D

whose impact cannot be seen directly and some are intangibly, it may be consideration for government to catch up the limited years of the regime.

The interesting point here is as Maftukhah states, "…That's why program priority is also political issue". Achievement in development will bring lots of advantages. People can feel relieved to see successful development which can be observed through economic growth, number of established high ways and other infrastructure. Besides, President can escalate his popularity. It can be a golden chance to get support from society particularly for next election. Thus, President should make use each fiscal year until five years ahead not only to realize social welfare but also to strengthen his figure and political position.

- *Research is not a popular issue in Indonesian society*

    Each phase of the State Budget formulation is political process. Public expenditure should be justly distributed to realize President's vision and mission which for social welfare. Nevertheless, it cannot be denied that negotiation plays important role during the process. In setting up agenda for next year program, the Government considers public problems and their crucial needs. It relates to popularity of the programs to be perceived by society.

    In the network society, Hajeer & Wagenar (2003) explains the national government changed to an "interactive strategy", giving people more opportunities to be involved in deliberation in the early stages of considering a policy. Solutions to difficult problems are found outside of official governmental institutions. They engage large numbers of groups,

agencies, and sectors with different interest and levels of power. Politics and definition of self-interest sometimes follow policy making rather than precede it and that in those situations it is better for government to involve more people in deliberation.

Therefore, public awareness on particular problem can influence the Government on formulating the State Budget. Political economy on R&D thus is also affected by the way public perceive it. The more people care about the urgency of an issue, the more popular it is, the more chance this issue will be government's priority.

R&D has not been popular issue in Indonesian society. Satya Wirya Yudha, member of Commission VII House of Representative states that "to date research is not publicly announced. People are not aware on it." Siti Maftukhah, assistant of Subdivision Head for S&T development, Bappenas argue the similar statement that people awareness on the importance of R&D is still low. Both argue research unpopularity is caused by lack of publication and dissemination of research results publicly.

Kadiman (in Tampubolon 2013) defines that social capacity is also influenced by politically collective decision. People's low awareness on R&D is also as the impact of the political system in Indonesia. Publication can be done not only by research institutions; it can be national agenda indeed. It fully depends on the ruling regime. It is as Yudha and Maftukhah argue, if the President declares S&T development is priority, it will be.

Unfortunately, there are just few politicians who have such consideration, including those involved in the agenda setting of the State

Budget formulation. Ministry of Research and Technology period of 2004-2009, Kusmayanto Kadiman, once openly criticized Indonesian politicians. He suggested people not to elect legislative candidates who have low capacity on S&T. Otherwise, S&T development will not be priority in national development. And expenditure for R&D will not be allocated as priority either.[16]

From this viewpoint, public awareness on R&D is influenced by collective decision of political system in Indonesia. People will not understanding on particular issue unless being told. Moreover, many Indonesian societies are occupied with social and economic problems, like poverty, jobless, and health. Their attention is thus more intended to that problem which they felt directly and urgently.

Therefore, unpopularity of R&D issue that position it in less priority in the State Budget allocation actually is closely relates to political system in Indonesia. Popularity is one consideration in agenda setting, including in the State Budget distribution. Yet popularity can be elevated or eroded as the regime needs to.

- *Research results is considered has not significantly contributed to national development*

    Low fiscal capacity makes government to make priority in the public expenditure distribution. Each Ministry/Agency is expected to conduct program which can bring great advantage for social welfare development.

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[16] See Menristek Jangan Pilih Caleg Gaptek, Jakarta: *Sinar Harapan*, 21 Januari 2009.

Another issue considered as reason behind low expenditure on public R&D in Indonesia is that R&D result has not much contributed in the national development. Satya Wirya Yudha, member of Commission 7 House of Representative states, "research which is done by governmental institution has not been applicative. They do research for themselves. It tends to be spending, wasting budget". Indonesia's vice president period of 2010-2014, Budiono, once criticized that S&T in Indonesia has not yet been optimally utilized for national development due to the weaknesses in national S&T development planning[17]. Most of the out-puts end in academic papers, publications and prototypes. There are still many results of public R&D have not been applied in industries[18].

Indonesia faces similar problem of public R&D as in developing countries (Ynalvez and Shrum 2011). It is usually managed under the idea of "business-as-usual" without any attention to special qualifications or distinctive requirements. Furthermore, under the current budgeting system for public institutional research, there is no strong motivation for public research institutions to build cooperation with other sector for technology development. It accordingly leads to weak linkage between public R&D institutions and industries.

It then becomes reason not to blame Ministry of Finance to allocate small budget for R&D as long as it bring concrete results. The performance of R&D results utilization is then becomes another factor which influences the government in setting priority. Moreover, the current

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[17] See Kompas daily. 8 May 2013 ed. Jakarta
[18] See http://print.kompas.com/baca/2015/12/11/Kebutuhan-Industri-Bertemu-Tawaran-Riset, browse on 15 February 2016 at 11.31 am.

mechanism of the State Budget formulation employs "money follow programs" rule. Each Ministry/Agency should perform their best program to be competed with other sector to get sufficient allocation.

Instead of depending on the State Budget, public R&D in Indonesia should find alternatives over this limited allocation. R&D should be conducted by inviting industries as partners. University should have become center of excellence of S&T development whose results can be utilized directly by partner industries. This cooperation can lead to joint funding scheme, so that R&D will not depend on limited public expenditure only.

2. Effect of political and governmental institutions on the policy

Analyzing the cause of a public policy should examine the impact of political, governmental institution, processes, and behaviors on public policies (Dye, 2013). Government as policy maker has authority in determining what program should be prioritized for national development. In deliberative policy of the State Budget formulation process, to the role of argumentation, rhetoric, and narratives takes important part. New political practices have emerged between institutional layers of the state and between state institutions and societal organization. These new inter-organizational activities "reshape what politics and policymaking are about" (Hajeer and Wagenar, 2003).

To examine reasons behind low public R&D expenditure in Indonesia, it considers the behavior of institutions and government who have authority in producing the policy which resulted on allocation in the State Budget as

priority representation. In this case, such political behavior is identified as political discourse in building relation within the political system.

- *Political discourse capacity of research institution's leading sector is considered weak*

  The State Budget formulation is full of political negotiation. It is not only between government and the House of Representatives (Dye, 2013) but also inter actors within the executive board. There are some actors in the State Budget formulation in which some has more authority to decide what is priority and what is less or not.

  Budget formulation has become deliberative policy as the involvement of some actors and the importance of political discourse along the process. Deliberative policy analysis emerges in large part as an epistemological alternative to the neopositivist, technocratic tendencies that have had a strong influence on the discipline. In this approach the focus is on language and argumentation rather than evidence narrowly conceived. It emphasizes the need to attend to particular audiences in the construction and presentation of policymaking (Fischer, 2007).

  Furthermore, as Kusmayanto Kardiman (as in Tampubolon 2013) argued that there are four factors influence social capability. First is natural environment. Second, activities particularly collective activities between institutions which demand coordination also play important role. Also, collective knowledge is developed through social interaction, communication and learning. And, motives or politically collective decision is the last factor.

Once the condition of social and economy of Indonesia gives small chance for sufficient allocation for R&D, there are still three other factors. The last three relates to political negotiation. And they are considered holding the key to achieve politically collective decision.

Leading sector of ministry holds influential role in budget negotiation. Ministry's task is to campaign his program on R&D to become priority. A minister should be smart not only in preparing program but also in articulating program and building networking. Trilateral meeting and preliminary discussion with the House of Representatives are of chances in which he can present program and build political communication. He has to present it on his best to be competed with others. If he fails in the presentation, never blame Bappenas or Ministry of Finance, because other programs must be better and convincing.

It suggests that another factor behind low allocation of the State Budget is low capacity of research institution leading sector in political discourse. Despite long term impact of a research program, the minister should be able to convince the importance of conducing and funding the proposed program. Each ministry has their own perception about their program and funding needs. All these programs should be synergized to support President's visions and missions. Synergy and cooperation among ministries/agencies are important. Taking a look to this case, technical ministries which can offer knowledge and human resources should cooperate with ministries whose function at policy side. Yudha gives an example, when Ministry of Industry can impose

telecommunication industries in Indonesia to use technological product by BPPT.

The important figure of a leading sector is represented by B.J. Habibie, Minister of Research and Technology during New Order of 1983-1998. At that time, budget allocation for public R&D is significantly higher than todays. It was reaching around 0.7% of the State Budget in 1993 or 0.16% GDP. Meanwhile in 2013, public R&D expenditure was 0.06%GDP. Furthermore, New Order is known by its achievement in science and technological development. The government takes an integral role in directing the focus of national research and development. New paradigm on S&T development and management was begun during this era by Decree of Ministry of Research and Technology No. 02/M/Kp/2000 on National Strategy Policy on S&T Development (Jakstra Ipteknas) 2000-2004 on 15 February 2004.

Besides discourse capacity in program presentation, budget negotiation should be able to give advantage for the authorized actors. Good communication is completed with *profitable* program for all actors who are involved in the budget and program implementation. The word *profitable* here is chosen by the author following a statement by an informant. During budget negotiation, *profitable* programs still dominate the succession of budget negotiation.

The interesting point over the issue of ministry's political discourse capacity is that it has been politically organized. President comes to regime with his vision and mission. Then to support it, he selects ministries which are absolutely his prerogative. Who gets what position is

politically as well. So, when program priority and resource distribution is addressed to minister's lobbying capacity, it does not just enough.

As Kardiman (in Tampubolon 2013) states that to achieve a society capacity it should be articulated in collective activity which in turn to be (politically) collective decision. It needs collective coordination to make S&T development and utilization well implemented in Indonesia. There has been Law on National System on S&T and other derivative rules. Nevertheless, it does not significantly affect S&T development in Indonesia whose benefit is for social welfare. Collective decision thus cannot be realized by holding only normative rules. Neither can we blame leading sector of ministry of his low capacity in negotiation. It may be influential, but not the main case.

Determining program priority is fully president's right, including to decide who will take position in what ministry, when and how. Deep consideration including political negotiation must have been done in deciding who gets what. Accordingly, a system which can support S&T development and utilization in Indonesia should be built not only the capacity but also politically so that it can be priority in national development.

3. The impact of social and economic condition on the policy

To analyze the cause of a public policy is to learn about the impact of the social and economic condition on the policy. The State Budget formulation is a deliberative process in which citizen is considered another actor involved within the process (Hajeer nad Wagenar 2003). In this research, small

contribution of private sector is considered as another reason why public R&D expenditure in Indonesia is low.

- *Lack of private sector contribution*

    In 2013, Indonesia spent 0.08% GDP to finance R&D. Of this funding, government still dominates around 74% while private sector contributes 26%. This data reveals that business participation in R&D in Indonesia is still low. Meanwhile Guellec and Potteire (2001) who conducted a cross countries study in 16 OECD countries by using panel data analysis found that public R&D is as important as business R&D. Both can significantly improve productivity growth of a country.

    The government of Indonesia has regulated business sector participation in R&D funding mechanism. The 2002 Act No. 18 on National System on S&T Chapter VI (Funding), article 26, 27 and 28, government and society (private sector) states that government and society (private sector) should collaborate in supporting R&D including in term of funding. It is supported by document of M3EI 2011 which obliges government, State Owned Enterprises (BUMN) and private sector to collaboratively finance R&D.

    Private or business sector, based on The 2002 Act No. 18, Chapter 1 article 13, is one of institutions in the national system of research, development and utilization of S&T. It is responsible for technology innovation and diffusion in order to produce economically valuable goods and services. The explanation of Chapter 9 article 1 of this Act states that the main mission of business sector is not only utilizing the

results of technological progress but also diffusing technology either their own products or others'. Thus, basically the Act of Sisnas P3 Iptek regulates that instead of research institution, innovation is business sector's main responsibility.

Unfortunately, business has not contributed as it is expected in the S&T development in Indonesia. S&T development in Indonesia cannot fully depend on public expenditure. There should be cooperation on it. Business can make use of technology capacity as resulted by research institution or universities by paying royalties of the patents. They can fund the expenditure of the research and utilize the results. They can also collaborate in research both in the activity, funding, or both and utilize the results.

On this issue, Siti Maftukhah, assistant of Subdivison Head for S&T Development – Bappenas states similarly concerning to low business participation on R&D in Indonesia. Thus, as she explains research institutions should be proactively promote their research to attract business sector attention. The development of Technopark in Centre for S&T Research and Development (PUSPIPTEK), Serpong is aimed to be a showroom for technological development as R&D results in Indonesia. It is expected to attract private or business sector either to utilize or collaboratively fund do R&D.

Actually, government has offered incentives for private or business sector who would participate in R&D. However, the government's effort to encourage private sector's participation in R&D has not brought significant impact. In 2007, there were 52 applications that were approved for tax

allowance. However, in the following years, the number of tax allowance applications dropped to under 10 approvals every year (Darussalam Tax Center 2014). It is also important to note that R&D conducted by foreign investment companies or an affiliate of the parent companies are still conducted in the overseas. Most of the multinational companies only carry out market research and product development. These figures may also indicate that the stimulus or fiscal incentives have not been utilized maximally by business entities (Soenarso & Sadewo, 2014).

As the consequence, Indonesia's economic performance is still dominated by low medium technology intensity. As indicated by the following graph, the contribution of manufacturing industry with high technology intensity is relatively low as compared to other Asian countries (Figure 3.3). Also, manufacturing industries based on high-medium technology is lower than Low medium capacity. In the period of 2000-2012, Indonesia' manufacturing industry had been dominated by low technology capacity (Figure 3.4).

The government as the authoritative power in Indonesia should have been able to build a system in which business sector is eager to participate in development. Public private partnership is needed conducting governance and realizing development. Moreover, public sector is considered as an integral part of research system in a country. In most developing countries government takes most portions of the R&D activities as well as the funding. On one side, it is beneficial to make implementation of programming techniques more feasible. Government as the policy maker can identify areas for technology improvement

particularly to overcome economic and societal problems, including industrial market oriented. In this case, government takes its role to manage the inclusion of spillover in research sectors and also between public and private sectors to maximize growth attainment and development achievement (Park, 1998).

Thus, if the Government would like to encourage business sector participation in S&T development and utilization, a system should be developed. It is policy in which private sector should utilize innovation as public R&D results to support their industries. In another side, research institutions should actively improve its capacity and networking in doing R&D. Researchers should understand the needs of business or public demand. Research scheme should be shifted from "supply push" into "demand driven". This way, synergy on S&T development and utilization can be built, not only in the funding of S&T production and but also utilization of the results to increase productivity.

1.2.3 The Utilization of Public R&D Results in Indonesian Industries

Dye (2013) explains besides inquire the causes of public policy, policy analysis should concern about consequences, or impacts, of public policy. Learning about the consequences of public policy is often referred to as policy evaluation. It might inquire about the effects of public policy on political institutions and processes. It examines the impact of public policies on conditions in society. In scientific terms, when studying the consequences of public policy, policies become the independent variables, and their political, social, economic, and cultural impacts on society become the dependent variables.

This research analyzes the low public R&D expenditure in Indonesia. In this subchapter, it analyzes the impact of the State Budget distribution for R&D on economic sector. It observes how technological progress as the result of R&D is utilized by business sector.

The transfer, exploitation and commercialization of public research results are critical areas of science, technology and innovation policy. Public R&D in Indonesia faces similar problem as developing countries does. It is usually managed under the idea of "business-as-usual" without any attention to special qualifications or distinctive requirements. Furthermore, under the current budgeting system for public institutional research, there is no strong motivation for public research institutions to build cooperation with other sector for technology development. It accordingly leads to weak linkage between public R&D institutions and industries (Ynalvez and Shrum 2011).

The Director of Business Innovation Centre, Kristanto Santoso, argues that usually public research in Indonesia is done based on "supply push" characteristics. It is in which researchers do research without considering the targeted customer, whether to solve public problems or business needs. As the consequence, many of the research results are useless or rest on publication or prototypes. It is as Satya Wirya Yudha considers as "not contributed much for national development." Thus, this mechanism should be redirected into "demand driven". Researchers should understand the needs of business or public demand. This way, the result of their research can give benefit as utilized by business sector or solve public problems.

S&T development and utilization in Indonesia now employs the Triple Helix scheme. Triple Helix model represent networked relations among

universities, industries and governments (U-I-G). This model can provide with a neo-evolutionary interpretation as three selection environments operating upon one another: market, organization and opportunity for technological progress. Within this network, it opens opportunities to encourage and optimize innovation in a knowledge-based economy (Leydesdorff, 2000).

This networking occurs when universities, industries, and government R&D institutions interact to find solution over problems faced by public research. It can lead to innovation improvement despite limitation of low economic resources in R&D intensity (Nishimura and Okamuro in Lee and Kim, 2015). This interaction is known as an innovation process that includes knowledge creation and knowledge transfer.

In the collaboration of triple helix, the knowledge, which is transformed to the value in business sectors and markets, can be created when institutional actors play their roles properly and interact actively with the others (Betz, 2010).

Public R&D as conducted by universities and governmental institutions can create new knowledge or technology, which can stimulate ideas for new industrial products or processes. But, there are some problems that have hampered the development. Among others is limited funding and product commercialization due to lack of business partnership.

Business sector face similar problems. Market is dynamic. It has a quick product cycle time which make them to develop their innovative product. Unfortunately, new knowledge or technology as research institutions resulted is not easily adopted by industries into their products or manufacturing processes due to not well maturity for practical technologies or lack of skilled human resources.

Government R&D institutions can solve technological problems for industries' commercialization with their better R&D resources and experiences to be transformed by industries into value using products or process innovations. As a matter of fact, Ministry of Research and Technology in 2008 established Business Innovation Center (BIC) as Non-governmental Organization to bridge innovation process within this networking. BIC identifies the activity of technology transfer and commercialization of R&D results.

In order to monitor innovation development in Indonesia, BIC has conducted such kind of innovation competition "Inovasi Indonesia" annually since 2008. It opens opportunity for all stakeholders not only from universities and governmental institutions, but also from private sector to join the competition. Kristanto explains that this event reveals that there are innovation created in Indonesia but many of them are unrecorded, as found by Soenarso and Sadewo (2014). By involving scientist and professionals as assessors, each year some innovations are selected and published publicly to attract business's attention. The scheme is as in 2008 selects 100 innovations, in 2009 selects 101 innovations, and so for. That in 2015 selects 107 innovations.

In 2013 BIC conducted a survey to investigate the utilization of published selected innovations. Through this method, the development of innovation in Indonesia can be monitored. It has intermediated R&D results utilization and commercialization which has been problem for years.

Table 5.5 indicates number of proposals which join innovation competition of "Inovasi Indonesia" in 2008-2012. Based on the table, it can clearly observed that generally the number of innovation proposal competed in "Inovasi Indonesia" is significantly improved annually. Universities still dominates the competition.

Meanwhile private or business sector whose participation in national R&D is expected to be high propose less proposals.

The selected proposals are then compiled and published in the form of book "100 Inovasi Indonesia" in 2008, "101 Inovasi Indonesia" in 2009, and so for. Publication of this innovation is a way to promote innovative technology to be utilized publicly. Some utilization networking is mediated by BIC. Some others through local intermediary, BIC partners, and some are directly to the inventor without mediator. Nonetheless, some innovations have not been utilized.

Table 5.6 presents the utilization of innovation in the period 0f 2008-2012 following the publication of "Inovasi Indonesia". Based on the table, the number of utilized innovation is more than the "not yet utilized". Overall, there are about 62% of published innovation has been utilized by industries while the rest has not been utilized. Surprisingly, more than half of the innovations are utilized without any intermediary. It means that the publication is effective in attracting business sector to utilize the innovation.

This kind of mechanism can be developed more to improve the development and utilization of S&T in Indonesia. It also signifies that fund is not the main problem in S&T development and utilization. These figures of synergy as developed in U-I-G networking indicate each actor have responsibility in the S&T development and utilization. Research institution can produce knowledge and innovation in coordination with business sector or other stakeholder with mechanism of "demand driven". Thus industry can utilize the products which in turn is expected to be able contributive in productivity improvement whose part of the profit is used to fund R&D in Indonesia. Government as policy maker should

monitor the synergy to create such environment to support S&T development and utilization.

This way, networking among Government – University/Research Institution – Industry can lead to fruitful benefit. Limited funding as public R&D face can be solved and industry's need for technology acceleration for product improvement can be met. Finally, it is expected to support government program to develop a sustainable knowledge based economy.