

# SOUTH EAST ASIA

## Indonesia





Innovate UK





**UNDERSTANDING  
INDONESIA'S INNOVATION  
SYSTEM**

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# 1. COUNTRY PROFILE

# 1.1 INTRODUCTION

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Indonesia has seen a steady economic growth in the past 20 years after going through multiple crises in 1997-1998.<sup>1</sup> Home to nearly 252 million people and 360 ethnic groups, Indonesia is divided into 34 provinces, 415 regencies and 93 cities.<sup>2</sup> This extreme diversity is also reflected in many sectors, including the innovation system itself.

Currently, Indonesia is also considered as the 10<sup>th</sup> biggest market in the world.<sup>3</sup> A large proportion of the Indonesian population, nearly 50%, is young and productive.<sup>4</sup> Private consumption has been a key factor in driving the country's economic growth in recent years. At the same time, Indonesia's economy is still heavily dependent on natural resources.

The Government of Indonesia (Gol) has shown its commitment to developing innovation and technology capabilities. The Gol mainly focuses on improving research and development (R&D) and support for science and technology (S&T), by providing human resources, facilities, institutional and network support, as well as building new Science and Techno Parks (STP).<sup>5</sup> However, there are still gaps in Information and Communication Technology (ICT) infrastructure and education quality between regions, hindering the full implementation of a national innovation policy.

1 OECD (2013)

2 BPS (2017)

3 World Bank (2017)

4 2016 Population (BPS, 2017)

5 Government of Indonesia, Planning, M.o.N.D. (2015)

# 1.1 INTRODUCTION

## Key statistical findings:

- In Global Competitiveness Index 2017-2018, Indonesia ranked 36<sup>th</sup>, 87<sup>th</sup> in innovation and 80<sup>th</sup> in technology readiness pillar.
- The government total expenditure in education is relatively stable from 2010 to 2015.<sup>1</sup>
- In 2013, the Indonesian government's expenditure in R&D was only 0.0846% of total GDP.<sup>1</sup> However, in 2016, LIPI stated that Indonesia's GERD has reached 0.25% of total GDP.<sup>2</sup>
- Indonesia ranked 107<sup>th</sup> in Knowledge Economy Index 2012. This index captures the ability of countries to generate and diffuse knowledge. The number of patent applications consistently increased from 2010 to 2015.<sup>1</sup>
- Indonesia has a low level of exports of high technology goods. The percentage has consistently decreased from 2009 to 2015.<sup>1</sup>

INDICATOR	INDONESIA
Global Innovation Index Rank (2018)	85
Global Competitiveness Index (2017-2018)	36
R&D gross domestic expenditure as % of GDP (2016)	0.2%
High tech exports, in % of manufactures exports (2015)	6.625%
Patent applications, residents (2015)	1,058
Percent growth in total patent applications (2010-2015)	51.98%
Time to start a business, days (GCI 2017-2018)	105

<sup>1</sup> World Bank (2017)

<sup>2</sup> LIPI (2017)

## 1.2 HIGHLIGHTS OF KEY INNOVATION PROGRAMME

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- President SBY formed Komite Inovasi Nasional (KIN/National Committee of Innovation) in 2010. However the agency was dissolved in 2014.<sup>1</sup>
- President Jokowi merged the higher education unit from Ministry of Education and Culture with Ministry of Research and Technology in 2014 into Ristekdikti.<sup>2</sup>
- Establishment of the DG Strengthening Innovation under the Ministry of Research Technology and Higher Education in 2015.<sup>2</sup>
- President Jokowi's administration has targeted the development and use of 100 Science and Techno Parks.<sup>3</sup> This ambitious programme failed to achieve its target and has already been reduced to 66 Techno Parks.<sup>4</sup>
- Centers of Excellence (PUI) is a Ristekdikti-driven initiative. It aims to increase the capacity of research centers. As of 2017, 78 institutions benefit from strategic support in order to increase three different capacities, namely sourcing, R&D, and dissemination capacity.

1 Presidential Decree No. 32/2010

2 Presidential Decree No. 13/2015

3 RPJMN 2015-2019

4 Ristekdikti (2016)

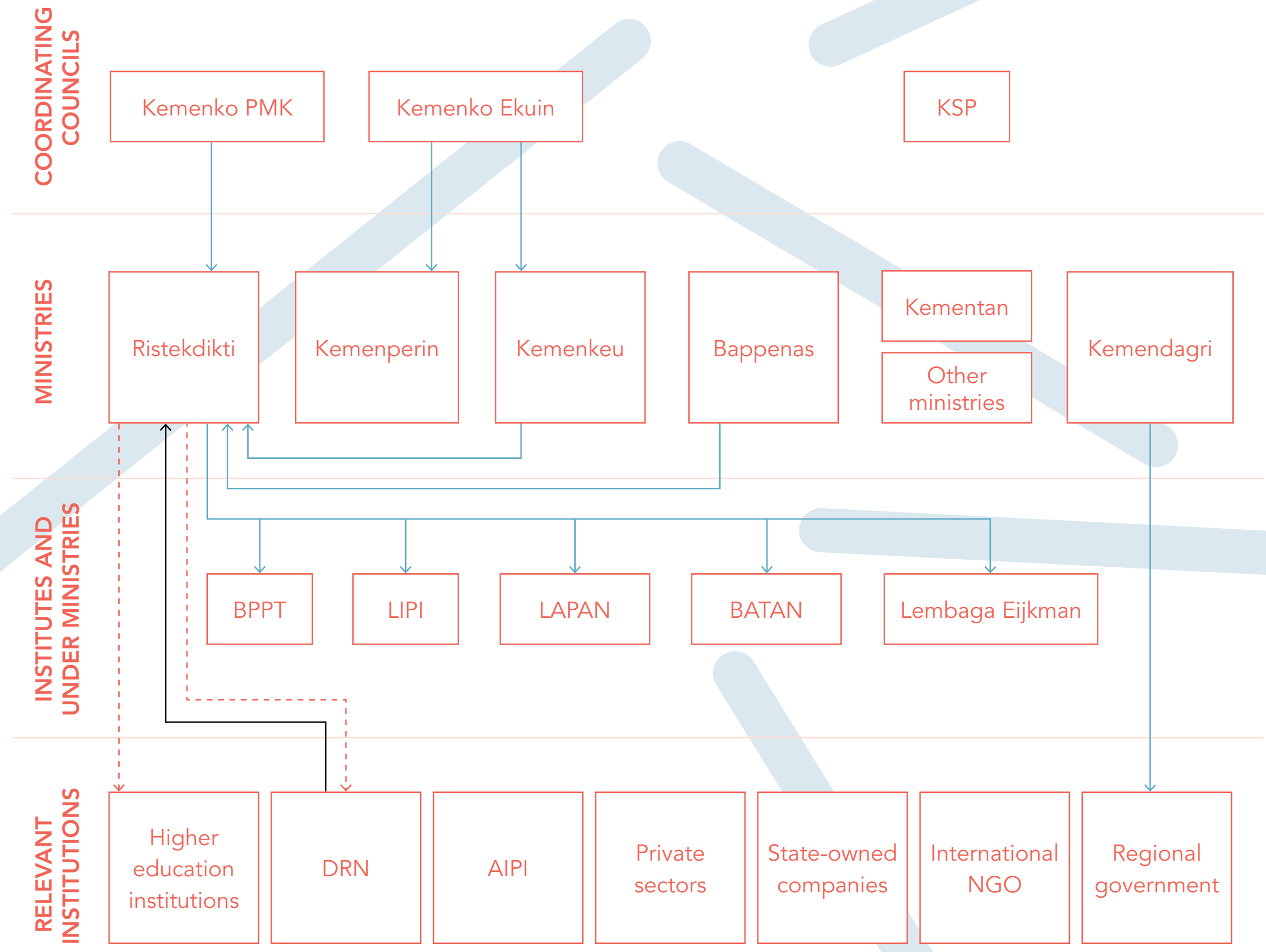


# 1.3.1 INSTITUTIONAL MAP OF THE INNOVATION SYSTEM

## National System of Innovation

This graph shows there are many agencies dealing with innovation in the system, but the persistent problem is the lack of coordination among them.

- Attached to
- - - - - Provides funds
- Political influence



## 1.3.2 ROLE AND INFLUENCE DIAGRAM OF KEY MINISTRIES AND AGENCIES

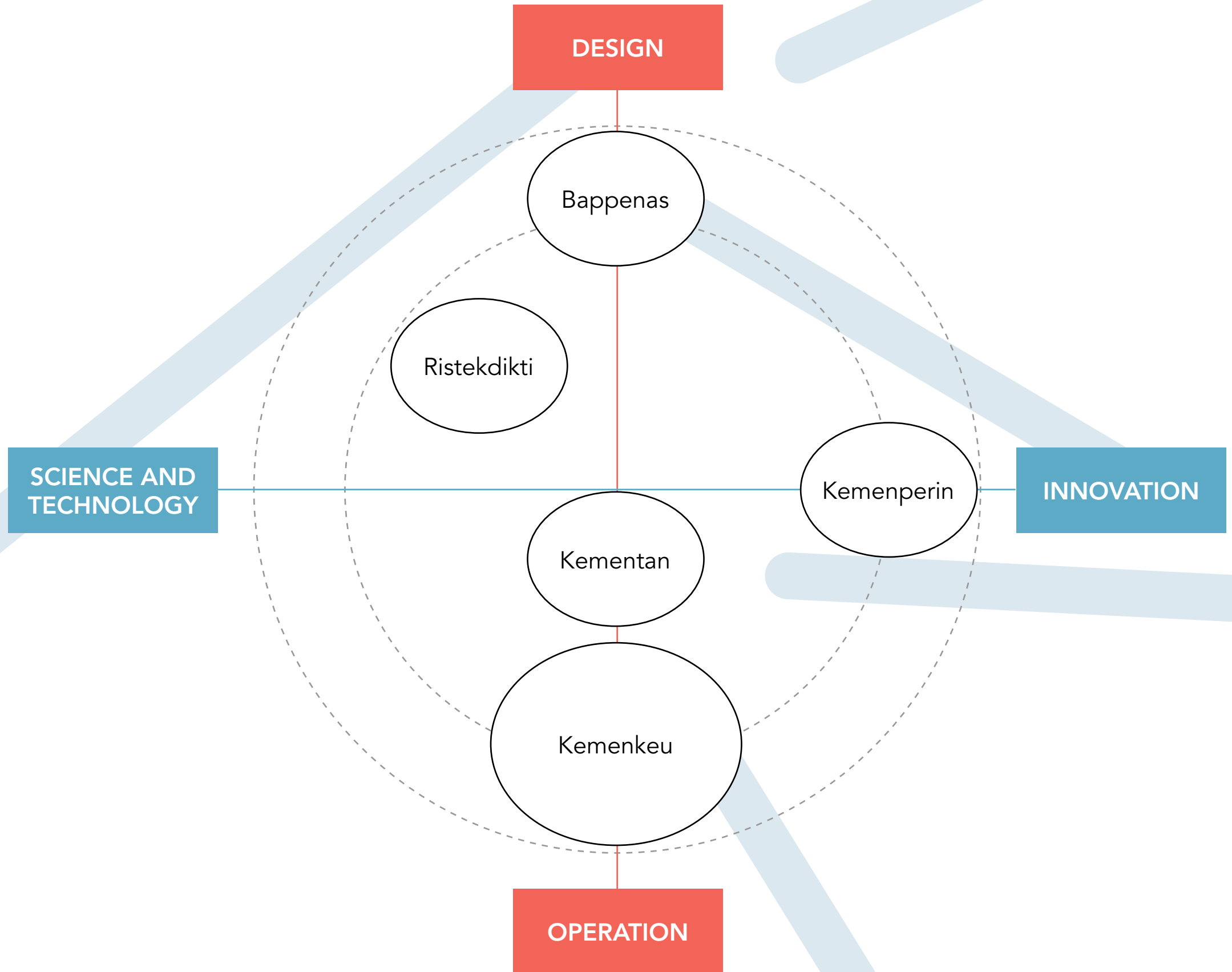
In terms of innovation policy in Indonesia, the main actor is still the government. There are four main agencies that are very relevant for the innovation ecosystem in Indonesia. They are:

1. Bappenas
2. Ristekdikti
3. Kemenperin
4. Kemenkeu

Budget spending is by far the only relevant indicator for government agencies' key performance. Kemenkeu has the power to determine whether a programme will be continued the next year based on this year's spending. Therefore, Kemenkeu arguably has become the most influential agency. Kementan is a relevant actor for agriculture-related innovation policies. Balitbangtan, a public research institution under Kementan, is the most established public research institution (PRI) in Indonesia and receives the largest government budget allocation for R&D.

Level of influence: the bigger the size of the bubble, the more influence in the innovation system.

This influence map is indicative and reflects the insights of the project team rather than a formal statement of roles and structures.



# 1.4 GLOSSARY OF INSTITUTIONAL ABBREVIATIONS AND ACRONYMS

- **AIPI:** *Akademi Ilmu Pengetahuan Indonesia/ Indonesian Academy of Sciences*
- **BAPPENAS:** *Kementerian Perencanaan Pembangunan Nasional/Badan Perencanaan Pembangunan Nasional/Ministry of National Development Planning*
- **BATAN:** *Badan Tenaga Nuklir Nasional/National Nuclear Energy Agency*
- **BPPT:** *Badan Pengkajian dan Penerapan Teknologi/ Agency for The Assessment and Application of Technology*
- **DRN:** *Dewan Riset Nasional/National Research Council*
- **GOI:** *Government of Indonesia*
- **JOKOWI:** *Joko Widodo, President of Indonesia 2014-2019*
- **KEMENDAGRI:** *Kementerian Dalam Negeri/Ministry of Home Affairs*
- **KEMENDIKBUD:** *Kementerian Pendidikan dan Kebudayaan/Ministry of Education and Culture*
- **KEMENKEU:** *Kementerian Keuangan/Ministry of Finance*
- **KEMENKO EKUIN:** *Kementerian Koordinator Bidang Perekonomian/Coordinating Ministry of Economic Affairs*
- **KEMENKO PMK:** *Kementerian Koordinator Bidang Pembangunan Manusia dan Kebudayaan/ Coordinating Ministry of Human Development and Culture*
- **KEMENPERIN:** *Kementerian Perindustrian/Ministry of Industry*
- **KEMENTAN:** *Kementerian Pertanian/Ministry of Agriculture*
- **KOMINFO:** *Kementerian Komunikasi dan Informatika/Ministry of Communication and Informatics*
- **KPI:** *Key Performance Indicators*
- **KSP:** *Kantor Staf Presiden/Presidential Staff Office*
- **LAPAN:** *Lembaga Penerbangan dan Antariksa Nasional/National Institute of Aeronautics and Space*
- **LEMBAGA EIJKMAN:** *Eijkman Institute for Molecular Biology*
- **LIPI:** *Lembaga Ilmu Pengetahuan Indonesia/ Indonesian Institutes of Sciences*
- **LPDP:** *Lembaga Pengelola Dana Pendidikan/ Indonesia Endowment Fund for Education*
- **PUI:** *Pusat Unggulan Iptek/Centers of Excellence*
- **RISTEK:** *Kementerian Riset dan Teknologi/Ministry of Research and Technology. Merged with Higher Education Unit from Kemendikbud in 2015 into Ristekdikti.*
- **RISTEKDIKTI:** *Kementerian Riset Teknologi dan Pendidikan Tinggi/Ministry of Research Technology and Higher Education. Established in 2015.*
- **SBY:** *Susilo Bambang Yudhoyono, President of Indonesia 2004-2014*
- **STI:** *Science, Technology, and Innovation*

# 1.5 STRENGTHS AND WEAKNESSES ANALYSIS

## INSTITUTIONAL FRAMEWORK

### STRENGTHS

#### Dedicated government working unit for innovation policy:

- DG Strengthening Innovation was formed in 2015.<sup>1</sup>
- There have been recent attempts to focus government policy on innovation-related growth.
- There has been a recent attempt to improve overall co-ordination of government R&D and innovation policies.

### WEAKNESSES

#### Lack of co-ordination among innovation policymakers:

- There is a highly fragmented R&D and innovation governance structure, with few attempts at overall co-ordination until recently.
- The National Innovation Committee (KIN) was established in 2010 to oversee and co-ordinate developments across the national innovation system, but was dissolved in 2014.<sup>2</sup>

## FUNDING

#### Several potential funding sources have been identified, but not yet optimised:<sup>3</sup>

- Potential funding source in philanthropy (up to one billion rupiahs).
- Potential funding source from LPDP (Lembaga Pengelola Dana Pendidikan/Indonesia Endowment Fund for Education) for research commercialisation.

#### Major challenges in the research funding system in Indonesia:<sup>4</sup>

- The allocation of research funds need to be better co-ordinated.
- Total amount of research funding is 0.2% GDP.
- Research funding schemes need to be more flexible in design and disbursement.
- Research infrastructure needs to be improved.
- Inadequate policies and regulations enforcing research fund mechanisms.

<sup>1</sup> Presidential Decree No. 13/2015

<sup>2</sup> No. 32/2010;

<sup>3, 4</sup> Ristekdikti (2016)

## COUNTRY PROFILE

# 1.5 STRENGTHS AND WEAKNESSES ANALYSIS

1 OECD (2013)

2 World Bank

3 Ministry of Research and Technology (2014)

4 Presidential Decree No. 13/2015

## STRENGTHS

## WEAKNESSES

## HUMAN CAPITAL

Indonesia is the 4th most populous country in the world:<sup>1, 2</sup>

- There are notable S&T and R&D experts, however they are concentrated primarily in the public sector.<sup>1</sup>
- Entrepreneurship and startup climate is improving and boosting digital and creative economy.<sup>1</sup>
- Expanding higher education sector and small number of well-known universities.<sup>1</sup>

Unfortunately, the size of population is not matched by the quality of its human resources:

- For a country of its size, Indonesia has a relatively small number of researchers and scientists. Indonesia only has 89,597 researchers in R&D (per million people).<sup>2</sup>
- The number of entrepreneurs in Indonesia is very low, partly linked to a lack of publicity around business success stories.<sup>3</sup>

## KNOWLEDGE ASSETS

There is a good political will to govern the knowledge assets in Indonesia:

- New regulations on patents are put in place (Law No. 13/2016).<sup>1</sup>
- A Centre of Data and Information for Science, Technology, and Higher Education was set up within Ristekdikti.<sup>4</sup> This unit will integrate all the relevant data in science, technology, and higher education.

However, knowledge governance is still lacking:

- Number of patents in Indonesia is rather low.<sup>1</sup>
- Number of SCOPUS-indexed articles in Indonesia are still low despite a recent increase.<sup>1</sup>
- Indonesia does not yet have a suitable technological learning scheme.<sup>3</sup>

## COUNTRY PROFILE

# 1.5 STRENGTHS AND WEAKNESSES ANALYSIS

- 1 OECD (2013)  
2 RPJMN 2015-2019  
3 World Bank (2014)

## THE BROADER ENVIRONMENT

### STRENGTHS

#### Indonesia has a strong natural resource base:<sup>1</sup>

- Trade-based growth rates are high, largely based on natural resources.
- Trade links with Japan and the United States are good. Trade links with regional neighbours and China are improving.
- Indonesia has reasonable levels of international competitiveness.
- The contribution of Total Factor Productivity to output growth has been improved.
- Ease of Doing Business in Indonesia has been improved.

### WEAKNESSES

#### The inefficient bureaucracy and levels of corruption are still challenging:

- Bureaucracy is still perceived as highly inefficient, with high levels of corruption.
- There are still regions with underdeveloped infrastructure, including ICT infrastructure.
- There are still high barriers to business formation.

## ECOSYSTEM CONNECTIONS

#### The innovation ecosystem is slowly getting better:

- Companies appreciate the benefits of innovation.
- There is growing public awareness of the importance of innovation.
- 'Millennial' generation are striving for innovation and novelty.
- By 2025, Indonesia will experience a demographic bonus.

#### However, there are lots of aspects still to be improved:

- There is a lack of indicators and evidence underpinning innovation policy.
- Indonesia is currently categorised as a middle-income country but risks getting caught in the middle income trap.
- It has low capacity to absorb domestic industries. Companies in Indonesia prefer trading over STI.

**2.**  
**CAPACITY BUILDING FOR INNOVATION  
IN INDONESIA**



## 2.1 UNDERSTANDING THE RANGE AND SPREAD OF INNOVATION POLICYMAKERS

- Ministers are political appointees. They are chosen by the President. Generally, there are two kind of ministers, professional and political party-affiliated.
  - Minister of Finance and Head of Bappenas are usually professionals selected from his/her expertise.
  - Minister of Research, Technology, and Higher Education; Minister of Industry; and Minister of Agriculture are usually from political parties.
- Technically, civil servants can be assigned and transferred to any ministry.
- Level 1, 2, 3, and 4 officials are career civil servant positions.
- When there is an opening for level 1 and 2 positions, interested civil servants can follow a bidding process. Usually, qualified candidates from related ministries are given priority. However, if there are no qualified candidates from related ministries, these positions can be opened to candidates from other ministries/government agencies.
- Most civil servants in Ristekdikti are researchers and engineers from four non-ministerial government agencies, namely: BATAN, BPPT, LAPAN, and LIPI. These agencies are co-ordinated by Ristekdikti.
- Most of the senior Ristekdikti civil servants are from BPPT. Historically, in B.J. Habibie's era (former Minister of Research and Technology, who later became President of Indonesia), Ristekdikti and BPPT were headed by a single minister.



## 2.2 INNOVATION POLICYMAKER MAPS

### References:

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[https://www.bappenas.go.id/files/4114/6578/9509/Peraturan\\_Menteri\\_Bappenas\\_No\\_4\\_Tahun\\_2016.pdf](https://www.bappenas.go.id/files/4114/6578/9509/Peraturan_Menteri_Bappenas_No_4_Tahun_2016.pdf)  
<http://www.kemenperin.go.id/download/11682>  
<http://www.jdih.kemenkeu.go.id/fullText/2015/234~PMK.01~2015Per.pdf>  
<http://www.jdih.kemenkeu.go.id/fulltext/2016/143~pmk.01~2016per.pdf>  
<http://www.litbang.pertanian.go.id/profil/>

	L1	L2	L3	L4	TOTAL CORE INNOVATION POLICYMAKERS
Ristekdikti	5	14	63	126	208
Bappenas	1	1	4	8	14
Kemenperin	1	4	12	24	41
Ministry of Finance	1	1	4	12	18
LPDP (echelon level)	-	1	5	13	19
Kementan	1	13	20	40*	74
<b>TOTAL CORE INNOVATION POLICYMAKERS</b>	<b>9</b>	<b>33</b>	<b>108</b>	<b>223</b>	<b>374</b>

\*estimated

Most of the numbers are extracted from the official bureaucratic structure of each organisation.

## 2.3 INNOVATION POLICYMAKER PERSONAS



### Director General of Innovation

He started his career 30 years ago in a non-ministerial government agency focusing on technology application. He has been transferred to Ministry X for the last 3 years and is responsible for strengthening and advancing innovation policy, reporting to the minister. He has an engineering background, and has enrolled in several innovation short courses.

“Our researchers complain a lot that the industry doesn’t want to use their products.”

“The Indonesian market is big, but we are not on the same page in terms of supporting our national products. We are not very supportive.”

“Policymakers here are very good at planning or making policies, but not good at implementing those.”

“We need to appeal to the private sector to invest more in R&D.”

### KEY INDIVIDUAL AND COLLECTIVE CHALLENGES

- He is one of the key innovation policymakers in the country, however his vision has not been interpreted well by his subordinates.
- Co-ordination between policymakers, especially at top-level, is still a challenge in the innovation policymaking process.
- Collaboration principle in policymaking process between policymakers is often clouded by respective vested interests.
- Incoherent innovation policy and regulation.
- Country’s big market size but incoherent policies for supporting national products development and innovation.
- A major knowledge gap in innovation between senior-level policymakers and subordinate level.
- Different perspective on innovation across stakeholders even among policymakers in the government sector.

### A DESIRE TO ADVANCE INNOVATION IN THE COUNTRY BY IMPROVING ACTIVE INVOLVEMENT FROM OTHER STAKEHOLDERS, ESPECIALLY IN THE PRIVATE SECTOR

- Very interested in international best practices on engaging private sector in R&D.
- Advancing regional innovation system by conducting a policy pilot project.
- Scaling up national product adoption by the industry.
- Improving policy monitoring and evaluation.
- Very interested in best practice on increasing engagement and interaction between innovation actors.



## Director of Research & Development System

She started her career in a non-ministrial government agency then transferred to Ministry X 10 years ago. She reports to the Director General and is responsible for improving the R&D system in the country. She has a Bachelor's and Master's degrees in microbiology from a national university and a doctorate from an Australian university.

"Policymakers should always stay updated. Policies should be made by considering all the possible and relevant scenarios."

"Complex bureaucracy is exhausting and non-productive."

"We need less vested interests in policymaking. National interests should be common cause in policymaking process."

### KEY INDIVIDUAL AND COLLECTIVE CHALLENGES

- Complex bureaucracy in managing R&D in the country.
- The country's lack of diverse backgrounds. STI policymakers are mostly from hard science and engineering.
- Policymakers also have a linear and narrow mindset on problem-solving and policymaking.
- Lack of collaboration and co-ordination in policymaking, particularly in STI-related policies.
- Policymakers are too focused on past policy successes. They need to stay current and open to new breakthrough policies.
- Each of the innovation actors should know their respective roles and actively engage with each other in advancing innovation in the country.

### A DESIRE TO IMPROVE R&D IN THE COUNTRY BY FOCUSING ON IMPROVING THE FUNDING SYSTEM

- Very interested in international best practice in research funding system.
- Increasing private sector's role in R&D investment.
- De-bottlenecking research funding regulation in the country.
- Making sure that the country's R&D policymaking process can clearly regulate all stakeholder roles.

**3.  
ASSESSMENT OF CURRENT  
AVAILABLE RANGE OF SUPPORT AND  
TRAINING FOR INNOVATION  
POLICYMAKERS**

To increase civil servants' knowledge and skill in doing their jobs professionally, Ristekdikti frequently hold two kinds of training.<sup>1</sup> They are:

**1.** Substantive Technical Training. This training is held once a year by the Centre of Education and Training, Ristekdikti. Types of substantive technical training provided by Ristekdikti:

- Innovation management training;
- Science and Techno Park management training; and
- Higher education management training.

**2.** General/Administrative and Management Training. This training is held 1-2 times a year by the Centre of Education and Training, Ristekdikti in collaboration with other state/private-owned education and training agencies. Types of training:

- Officer course training;
- Training for trainer;
- Trainer management training;
- Facilitator training;
- Procurement training;
- Accounting training;
- Financial report training;
- Archiving training.

Civil servants in Ristekdikti can take all types of training depending on their seniority. In addition to the training provided, all civil servants can propose training from other institutions, such as short courses or short-term training relevant to their position/tasks.<sup>2</sup>

<sup>1</sup> <http://pusdiklat.ristekdikti.go.id/program-diklat/teknis/>

<sup>2</sup> Interview

**4.  
ASSESSMENT OF LIKELY AREAS  
OF FOCUS FOR A GLOBAL INNOVATION POLICY  
ACCELERATOR TEAM FROM INDONESIA**

One of the main agenda of the Government of Indonesia is to maintain the country's food security and to achieve food sovereignty. Thus, most cross-sectoral policies are directed to support the main agenda, including innovation policies.

There are three main crops in Indonesia, they are: rice, corn, and soy. The production chain of all three commodities is supervised by Kementan. Kementan also supervises the R&D and cultivation of rice seeds, corn seeds, and soy-seeds. There are conflicting regulations regarding seed governance. As a result, the Indonesian Policy Accelerator team proposed to learn more about:

1. **Regulating mapping of seeds in Indonesia**
2. **A new or revised Plant Cultivation Act.**

However, both of these objectives are currently in development, and the Policy Accelerator's timeframe cannot accommodate them, so the Indonesian team has proposed a different objective, that is:

### **To assess the relevance of UPOV membership for Indonesia.**

In this programme, the Indonesian team will find out know more about:

1. **Seed governance in the UK, from cultivation to commercialisation.**
2. **The UK's perspective on international conventions for seeds, such as International Union for the Protection of New Varieties of Plants (UPOV).**
3. **The relation between research groups and the seed industry in the UK.**

**5.  
DIAGNOSIS AND  
RECOMMENDATIONS**



## DIAGNOSIS

Through the Policy Accelerator programme, there has been an improvement of co-ordination between Ristekdikti and Kementan. In particular, the co-ordination between DG Strengthening Innovation, Ristekdikti and Kementan. Prior to the Policy Accelerator, Ristekdikti (and R&D communities in general) was not included in discussing seed governance in Indonesia. The Policy Accelerator has helped Ristekdikti, Kementan, and R&D communities (particularly in seeds production and commercialisation) by increasing their level of engagement. However, the level of engagement needs to be maintained even after the Policy Accelerator ends.

## RECOMMENDATIONS

As stated in 'Summary of Innovation' section, one of the main challenges of innovation in Indonesia is the lack of co-ordination between innovation actors. Therefore, Indonesia needs more programmes like the Global Innovation Policy Accelerator to encourage innovation actors to collaborate. In terms of innovation policy in Indonesia, there are four main agencies that are very relevant for innovation ecosystem: Bappenas, Ristekdikti, Kemenperin, and Kemenkeu. To improve the innovation ecosystem in Indonesia, more coherent policies at least from those four agencies are needed, and to achieve that, engagement between these agencies needs to be improved.

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Global  
**Innovation**  
**Policy**  
Accelerator