

Indonesia's Sub-national Innovation System Policy and Programmes

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**National Workshop on Subnational Innovation Systems and Technology
Capacity Building Policies to Enhance Competitiveness of SMEs**

3 - 4 April 2007

Kartika Chandra Hotel, Jakarta, Indonesia

OUTLINE



INTRODUCTION

BRIEF REVIEW

CURRENT INDONESIAN CONTEXT

PROPOSED STRATEGIES

DISCUSSION

OUTLINE



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CURRENT INDONESIAN CONTEXT

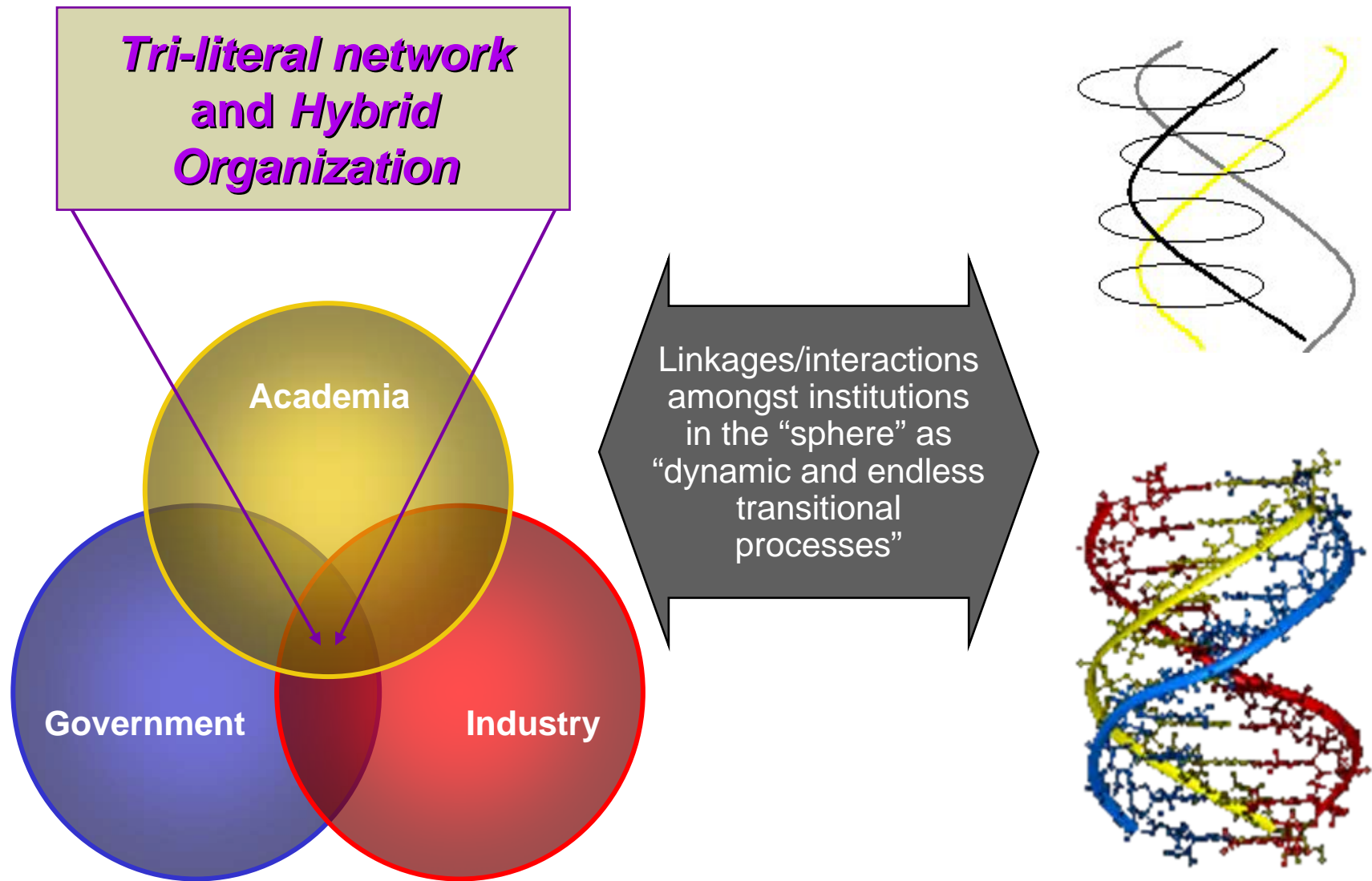
PROPOSED STRATEGIES

DISCUSSION

NIS : A PERSPECTIVE

- ❑ The views change : from “linear-sequential” perspectives (of “technology push” and “demand pull” models) ➔ a system perspective/approach of a dynamic and interactive-recursive model.
- ❑ Among some recent important trends, more attentions have been given on:
 - Interactions and roles of actors (e.g., the *triple helix model*);
 - Local/regional dimensions, where social learning and social capital, and other local specificities play as more and more determining factors (e.g., *regional/local innovation systems* and *industrial clusters*).
- ❑ Among policy implications, a more balanced attention on national and regional contexts/dimensions of the innovation policy has been increasingly acknowledged.

THE TRIPLE HELIX MODEL

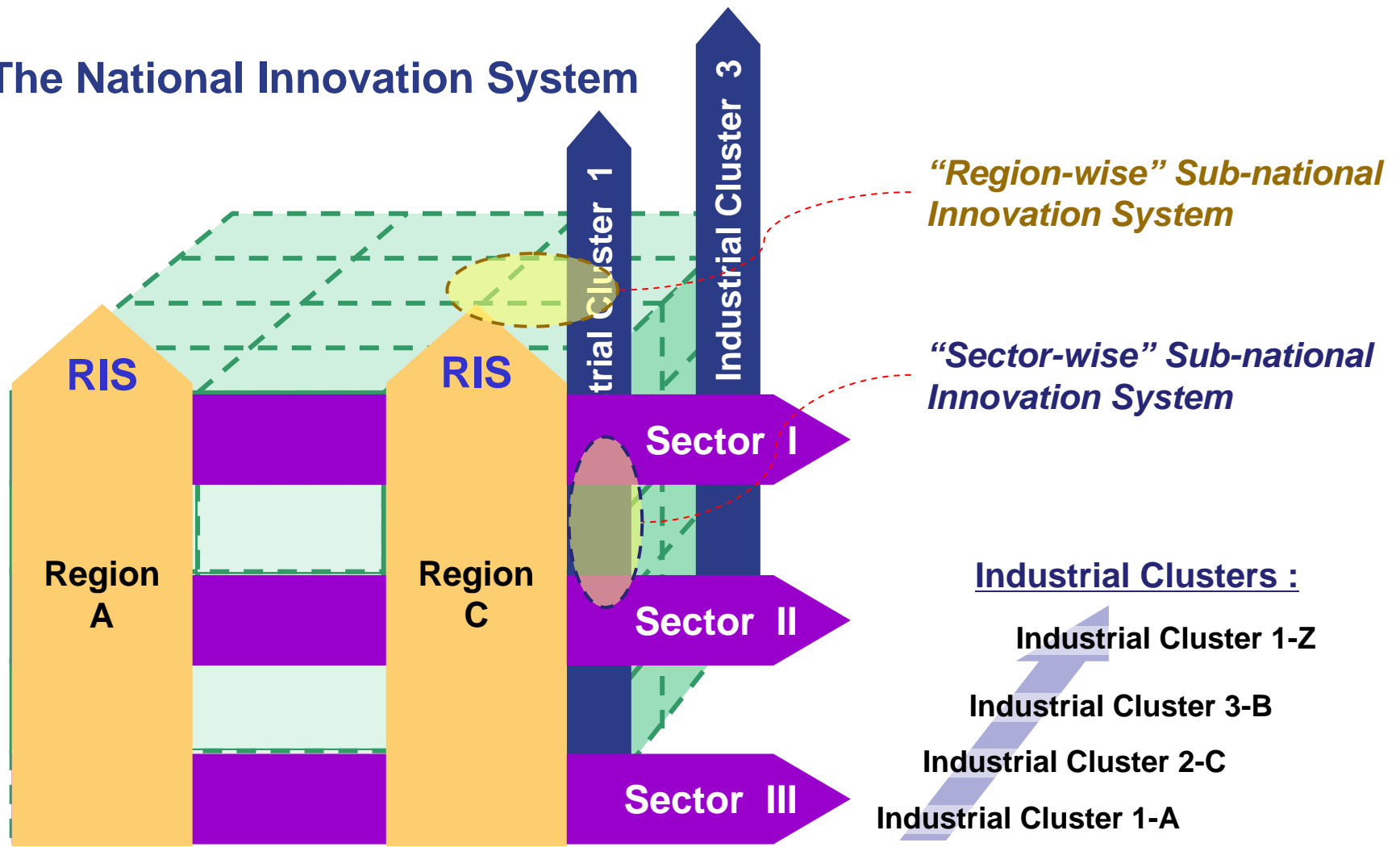


Source : *Etzkowitz and Leydesdorff (2000)*.

NATIONAL AND SUB-NATIONAL INNOVATION SYSTEMS :

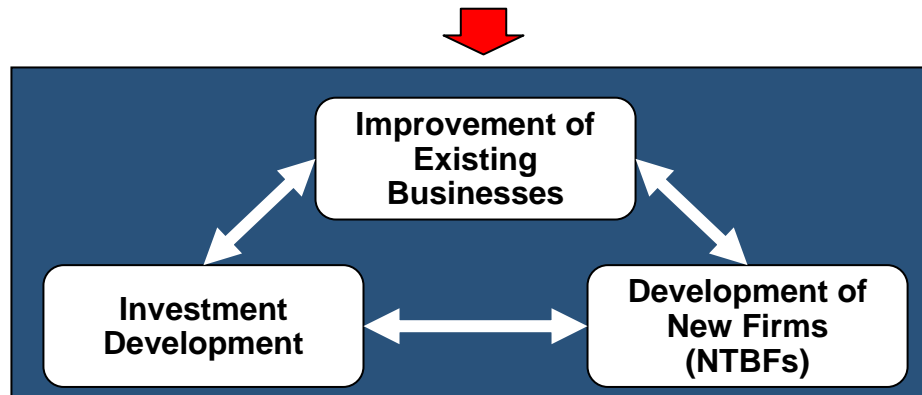
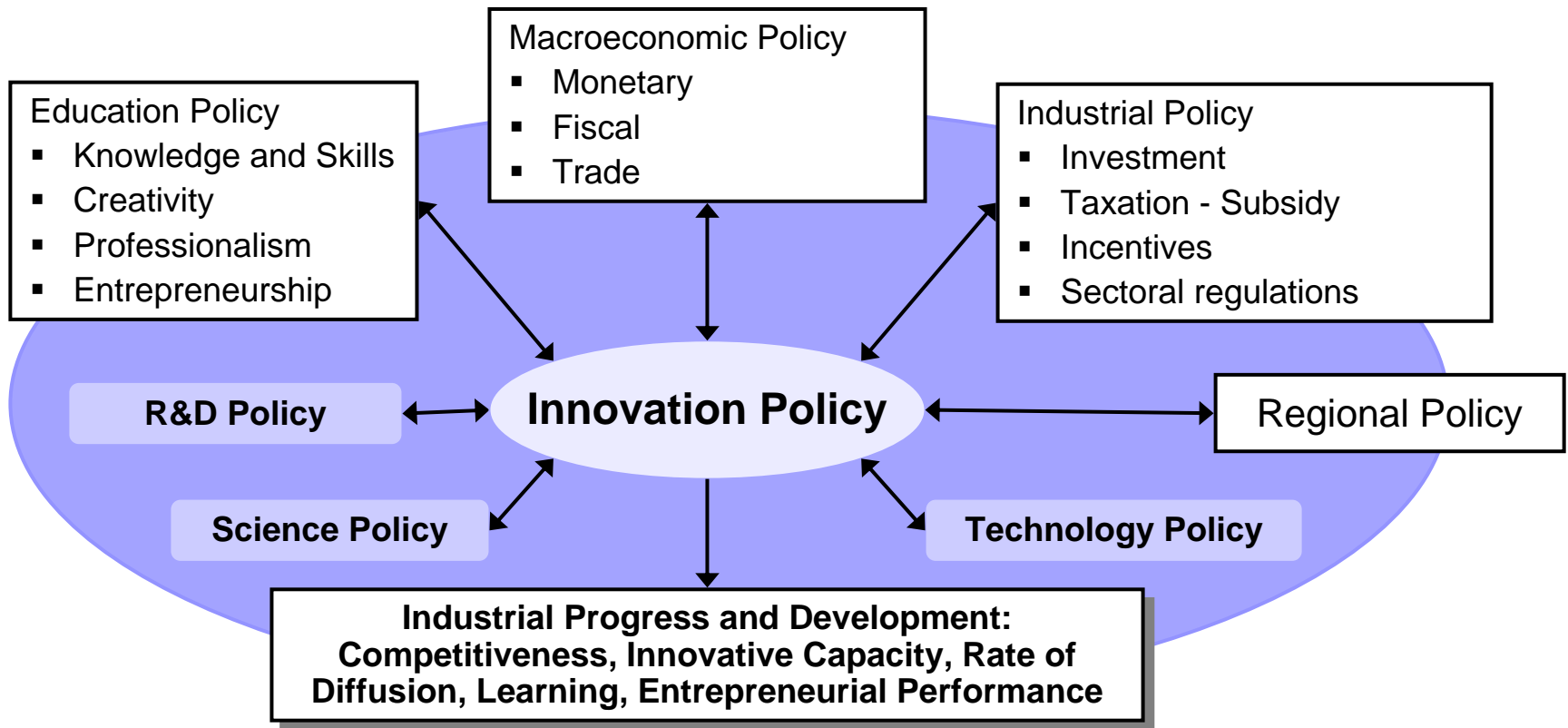
A Perspective on Regional/Local Uniqueness, Competence, and Cross-sectoral Linkages

The National Innovation System



RIS : Regional Innovation System.

AN INNOVATION POLICY FRAMEWORK



Example of main focus of the policies

SOME PARADIGM SHIFTS ON INNOVATION AND POLICY IMPLICATIONS

The View	The Era	Main Policy Implications
Innovation (i.e., “technological change”) as residual factors of economic growth (neoclassical models).	Innovation has not received special attentions (prior to 1960s).	No adequate attention and efforts for special intervention (as policy issues).
Innovation as a “linear-sequential process” (<i>pipeline linear model</i>).	<i>Technology push era</i> (1960s – 1970s).	<ul style="list-style-type: none"> ▪ Policies emphasized on the supply side of technology were dominant (<i>supply driven</i>). ▪ Science/research policy were the central theme in the government interventions. ▪ Technology policy began to develop.
	<i>Demand pull era</i> (1970s – 1980s).	<ul style="list-style-type: none"> ▪ Policies emphasized on the demand side of technology were increasingly dominating the government attention to intervene the market (<i>demand driven</i>). ▪ Technology policy and/or science and technology (S&T) policies developed, but most attentions were in a one-way perspective (<i>one-side policy</i>).
Innovation viewed in a system approach as a system of an “interactive-recursive process” (<i>feedback loop/chain link model</i>) of a complex and dynamic elements of creation (actors, activities such as <i>discovery</i> , invention, etc., and other elements), utilization, diffusion, and learning process holistically.	<i>Innovation system era</i> (1980s – now). <i>Note: New Growth Theory developed.</i>	<ul style="list-style-type: none"> ▪ Innovation policy (based on system approach) began to develop. ▪ Innovation policy are more two-side policy considered also as a learning process developed towards the development/strengthening a more adaptable innovation system. ▪ Innovation policy was no longer the “monopoly” of the “Central” government, but “Regional” government as well.

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COUNTRY PROFILE



- The largest archipelago country, of 17,508 islands (6,000 inhabited),
- The area of 1,919,440 sq km, populated with about 245,452,739 people (july 2006 est.)
- GDP (purchasing power parity) = \$935 billion (2006 est.) ,
- GDP per capita = \$3,800 (2006 est.),
- GDP real growth rate of 5.4% (2006 est.)
- Still struggles to overcome the Asian financial crisis, and
- Still grapples with persistent poverty and unemployment, inadequate infrastructure, endemic corruption, a fragile banking sector, a poor investment climate, and unequal resource distribution among regions.
- It was estimated that the country's unemployment rate was 12.5% with population below poverty line of 17.8% (2006 est.)

THE POLICY DIRECTION OF S&T CAPABILITY ENHANCEMENT

1. To sharpen R,D,& E priorities (in S&T) to be oriented to private sector and society's demand and needs with clear roadmaps.
2. To enhance S&T capacity and capability by strengthening S&T institutions, resources and networks at the central and regional level as well.
3. To create innovation climate in terms of the right incentive schemes to foster industrial structure strengthening.
4. To implant and foster S&T culture to enhance the nation civilization.

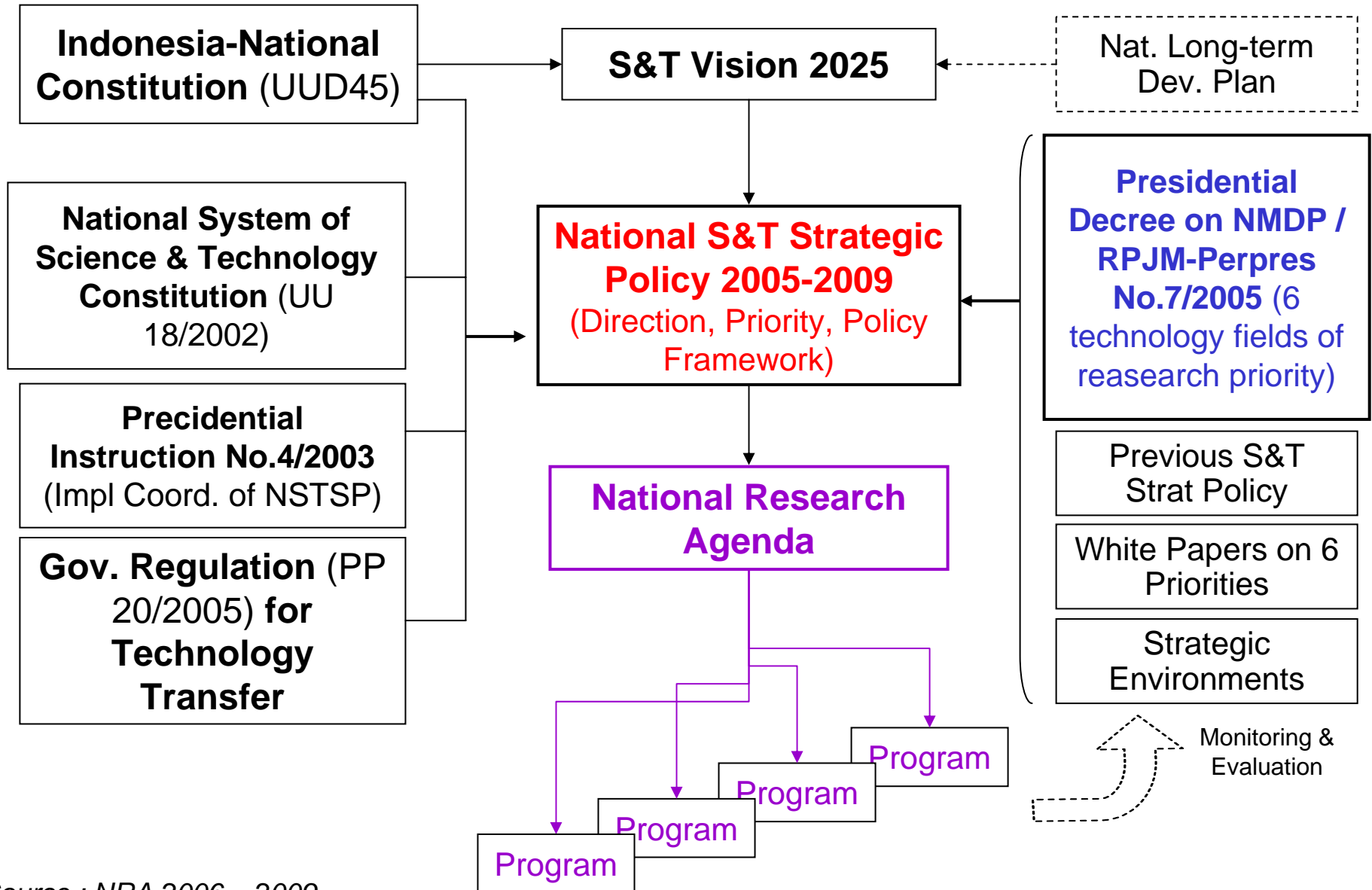
S&T PRIORITIES

1. Development of **food security**,
2. Generation and utilization of **new and renewable energy resources**,
3. Development of **transportation technology and management**,
4. Development of **information and communication technology (ICT)**,
5. Development of **defence technology**, and
6. Development of **health and medicine technology**.

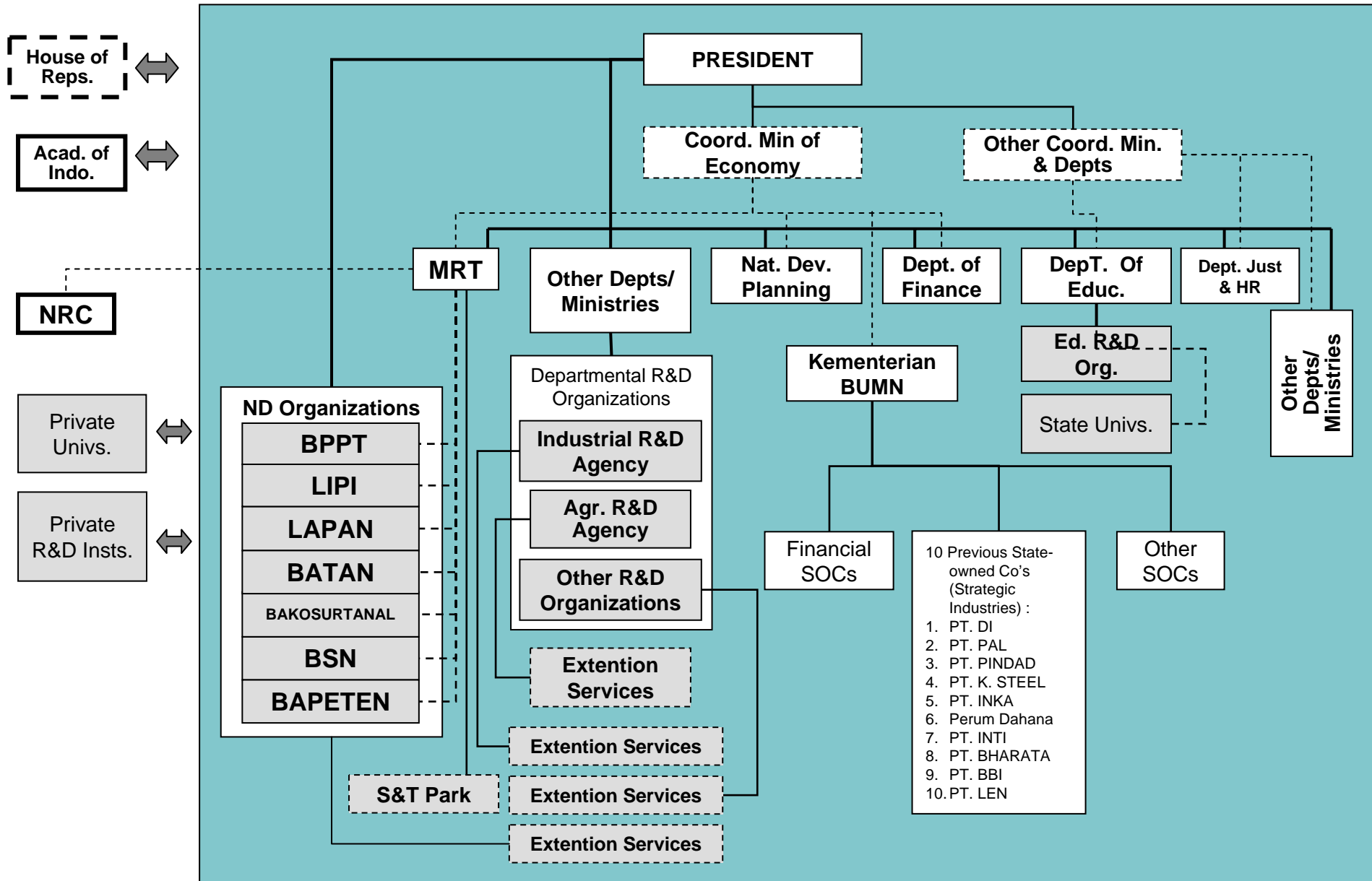
DEVELOPMENT PROGRAMS IN S&T CAPABILITY ENHANCEMENT

1. **S&T Research and Development Program.** The objective of the program is to enhance the focus and quality R&D activities in basic and applied research and technology as well in accordance with users' core competence and needs.
2. **S&T Diffusion and Utilization Program.** The objective is to foster dissemination process of R&D results and their utilization by private sectors, industries, and societies.
3. **S&T Institutional Strengthening Program.** The objective is to enhance S&T organizational capacity and capability in the national economic growth.
4. **Production System S&T Capacity Enhancement Program.** The objective of the program is to foster the enhancement of technological capacity of production systems in private sectors and industries, and synergetic enhancement among various components of innovation system.

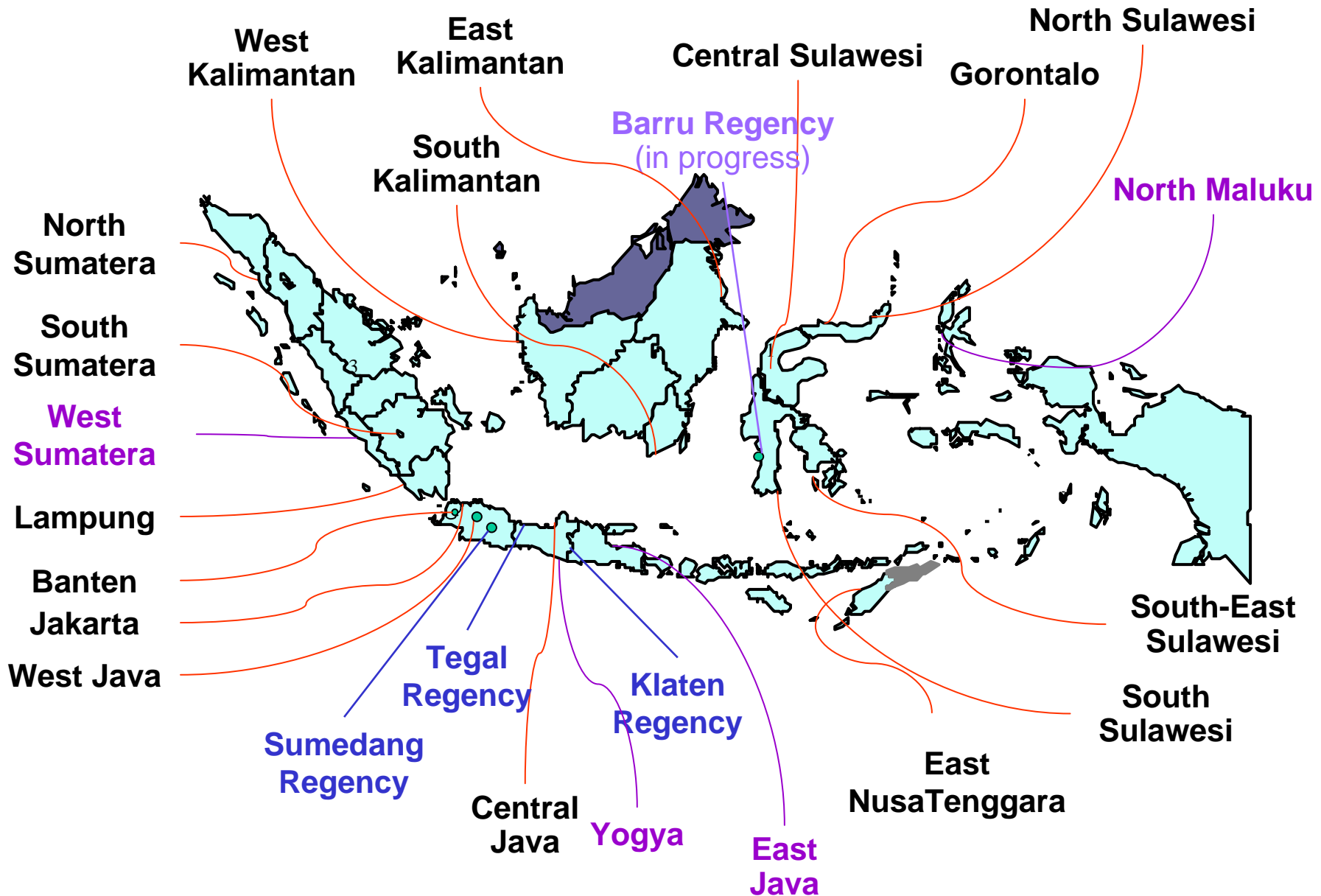
REFERENCED LEGAL FRAMEWORK AND STRATEGIC ENVIRONMENTS IN THE NRA FORMULATION



SIMPLIFIED ORGANIZATIONAL SETTING IN INDONESIA'S INNOVATION SYSTEM (THE CENTRAL GOVERNMENT LEVEL)

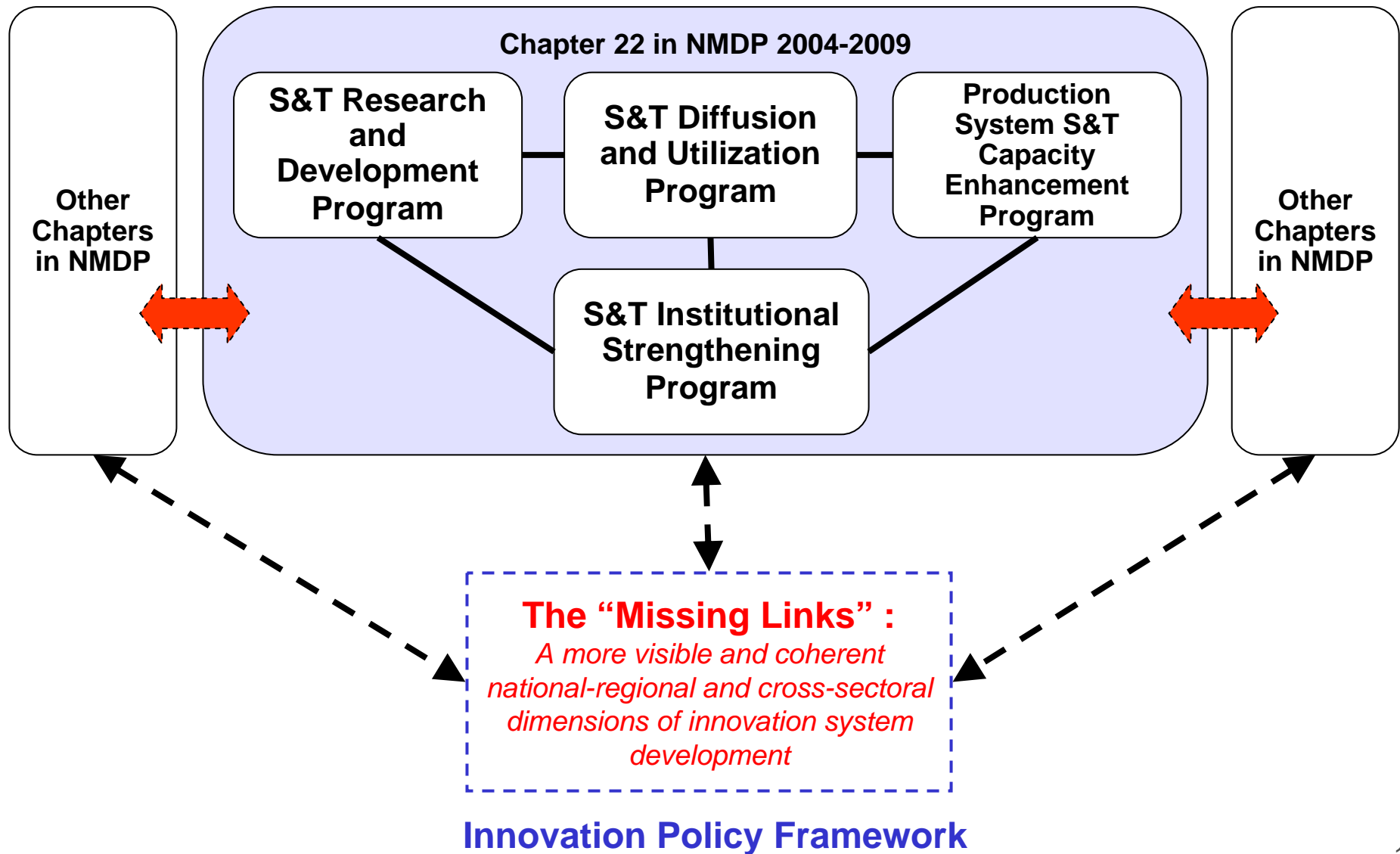


SOME REGIONAL RESEARCH COUNCILS ESTABLISHED IN INDONESIA



SIMPLIFICATION OF A RATHER-VAGUE POLICY FRAMEWORK IN INDONESIA'S INNOVATION SYSTEM

NMDP 2004-2009

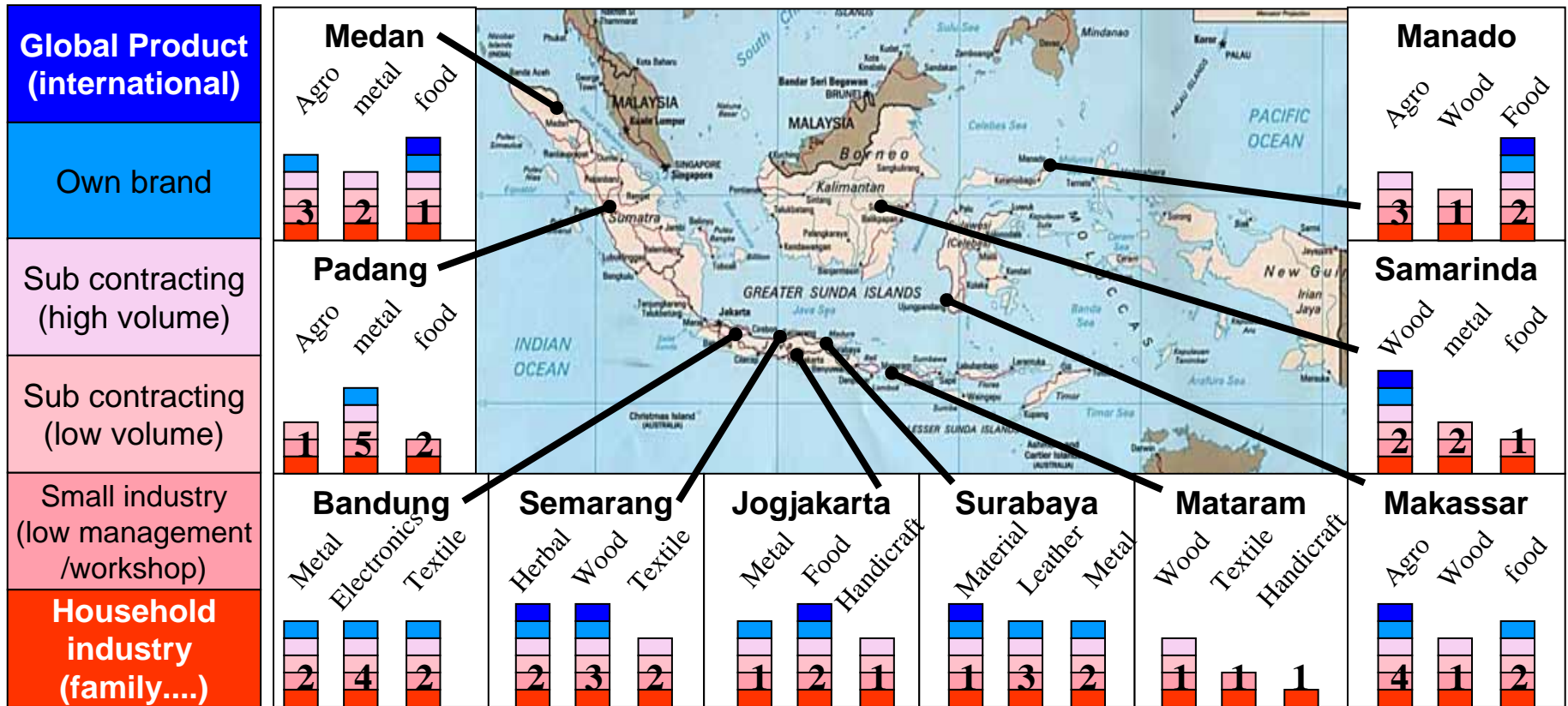


REGIONAL ASSESSMENT

- Previous Studies, e.g. PERISKOP Study (2001)*;
- Regional Research Institutions Strengthening, e.g. Regional Research Councils (RRCs);
- Selected regional action research initiatives on RIS and industrial cluster development, e.g. BPPT – *action research* (Taufik, 2005).

* MRT-BMBF. (2001). *Program Evaluasi Riset Sains Teknologi untuk Pembangunan / Evaluation of the Indonesian Science Research and Technology Landscape to Strengthen the National Innovation System (PERISKOP)*. Reports and several work package reports, and supporting materials. Indonesian State Ministry for Research and Technology (KRT) in collaboration with German Ministry for Research and Education (BMBF).

PERISKOP STUDY (2001)



• Selected Assessment : 10 Regions & 8 Sectors

• Most “comprehensive” study so far :

- Contacted companies/institutions : 451
- Interviews : 649
- Workshops : 401
- Contacted persons : 1,501

Source : PERISKOP Study (2001)

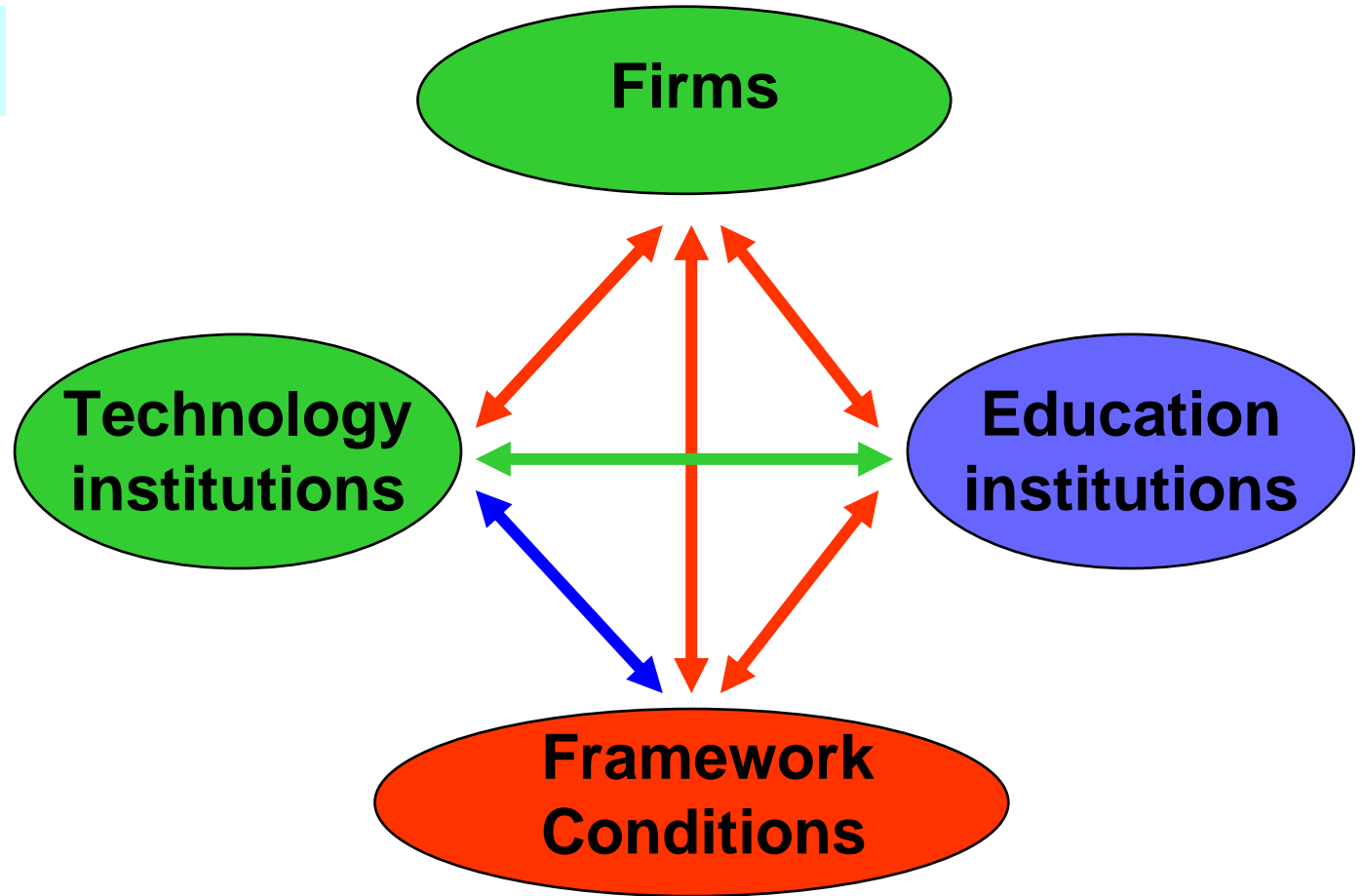
RELATIVE STRENGTH OF ELEMENTS OF REGIONAL INNOVATION SYSTEMS

Strength of elements of Innovation Systems

Above Average

Around Average

Below Average



Source : PERISKOP Study (2001)

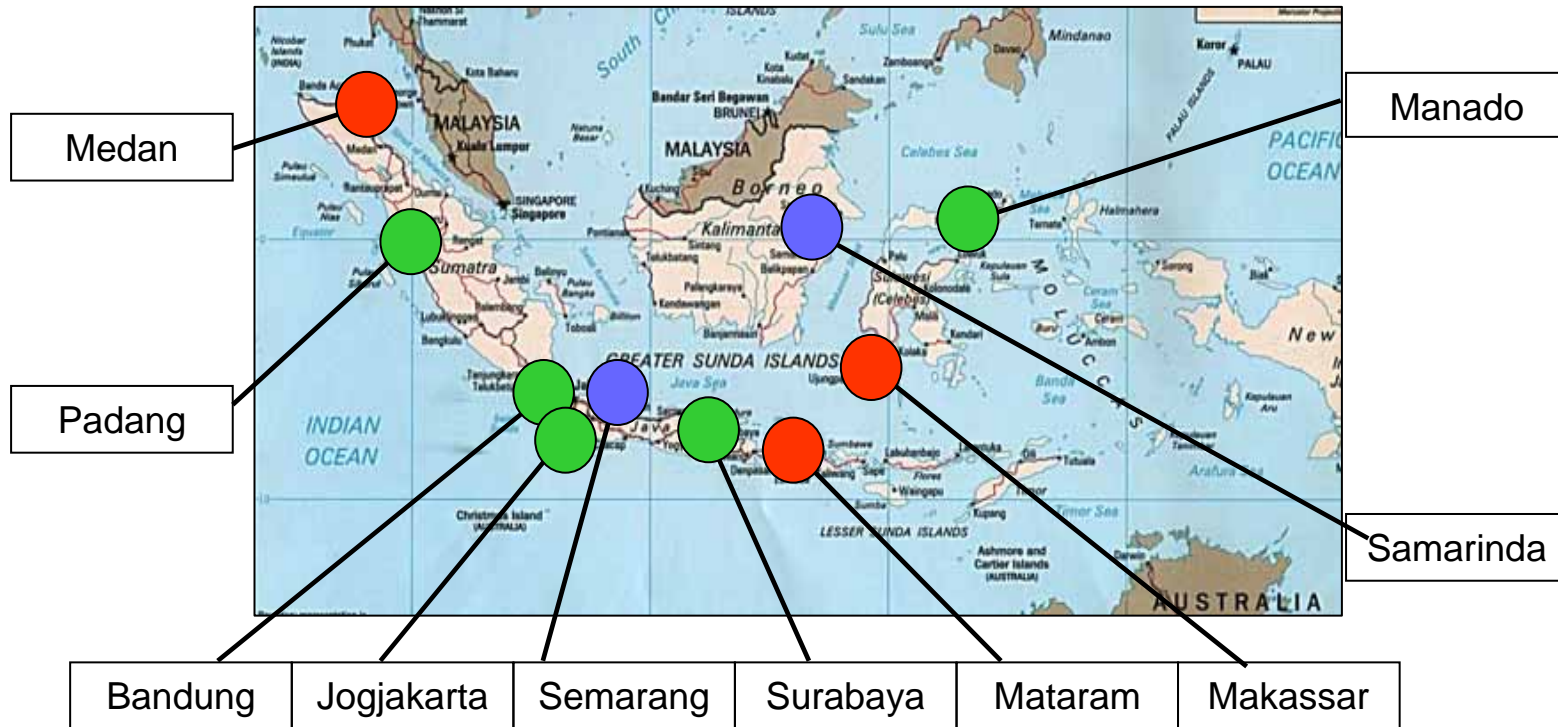
RELATIVE STRENGTH OF REGIONAL INNOVATION SYSTEMS

Strength of Regional Innovation Systems

Above Average

Around Average

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Source : PERISKOP Study (2001)

REGIONAL INVESTIGATIONS - MAIN FINDINGS

- **Hardly any local/regional innovation system**
- **Little interaction** between firms and training/research institutions
 - Inward-orientation of training- and research-institutions
 - Incentive structure so far against networking with firms
 - enormous distrust of firms vis-à-vis government institutions
- Suppliers and customers = main sources of technology
- Decentralisation may create potential to strengthen local/regional innovation systems
- Little contribution of MRT + BPPT
- Indonesia's **Technological Capability to absorb and improve** upon complex imported technologies is rather narrow
- Exact quantitative information on the actual magnitude of cross-border technology flows to Indonesia is not available
- Pre-assumption: The bulk of Indonesia's technology imports takes place through FDI, imports of capital goods and technology licensing agreements
- The bulk of international technology transfer to Indonesia takes place in the private sector
- Another channel for international technology transfer takes place in the public sector through official development assistance (ODA) programs.

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INNOVATION POLICIES FOR INDONESIA

1. Unsolved basic conditions as prerequisites for effective NIS development initiatives;
2. Main policy issues to deal with to accelerate NIS development;
3. Low pioneering/leadership for long-term development efforts; and
4. Fragmented policies in most of development agenda.

Problems of poor environments :

- *Lack of local institutional capacity*
- *Lack of critical mass or substantive outcome*
- *Lack of entrepreneurial resources*
- *Mismatch between science base and knowledge users*
- *Market failures, government failures, **systemic failures***

2. MAIN INNOVATION POLICY ISSUES

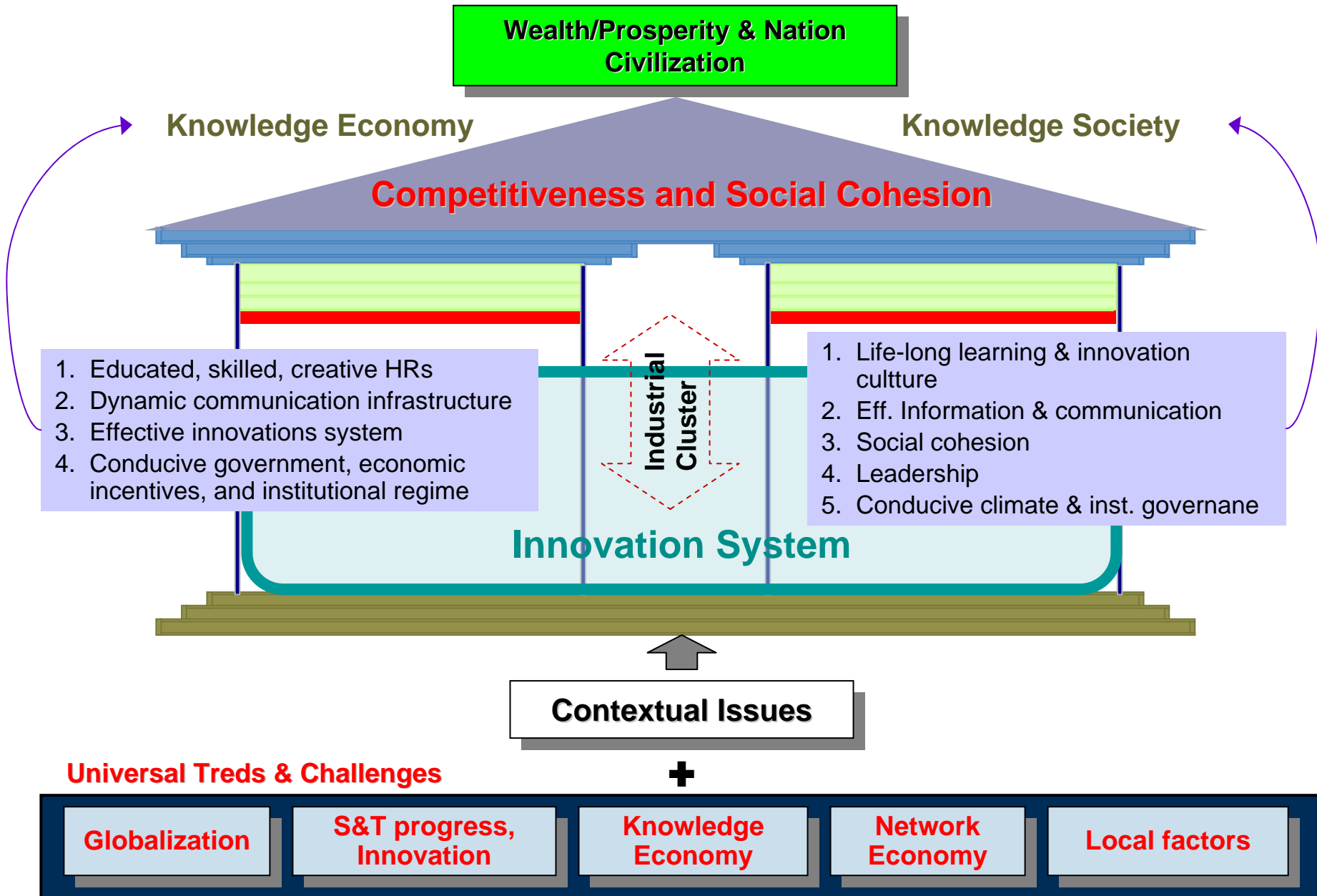
Generic and Challenging Issues in Innovation System Development :

- 1. Weaknesses in general framework.**
- 2. Weaknesses in institutions and S&T supports, and low knowledge (technological) absorption of SMEs.**
- 3. Weaknesses in mutually beneficial linkages and interactions, and collaboration in diffusion of innovation (including best practices and/or R&D outputs).**
- 4. Weaknesses in innovation culture.**
- 5. Weaknesses in development focus, value chains, competence development and improvement of the sources of economic progress.**
- 6. Global (Globalization) challenge.**

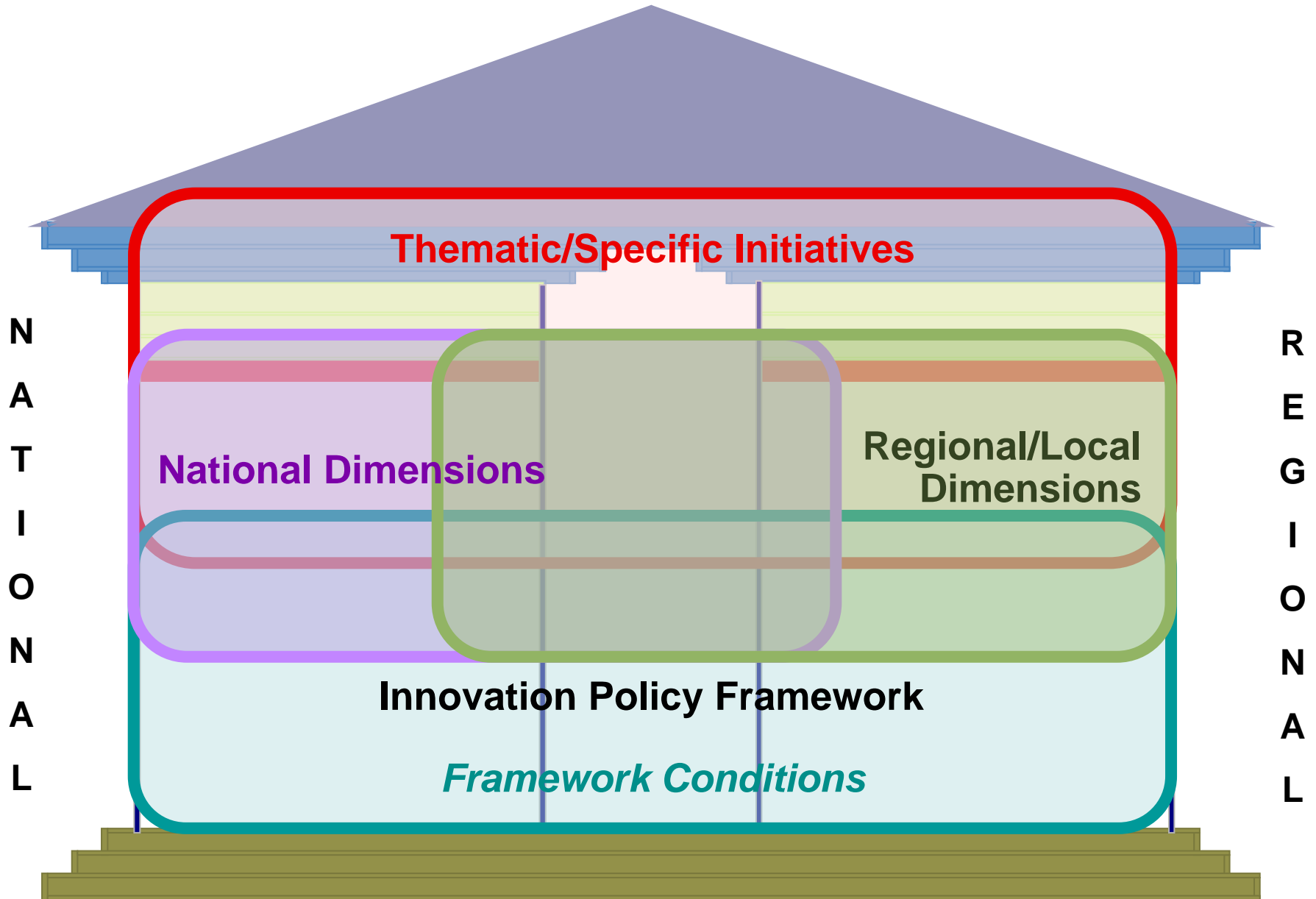
INNOVATION POLICIES FOR INDONESIA : A GRAND STRATEGIES

1. **Improving basic conditions** as prerequisites to NIS development initiatives.
2. **Reforming innovation policies** in each and cross-sectoral development and at different governmental levels as well in a more systemic and long-term perspective.
3. **Developing pioneering spirits and leadership**, and **strengthening nation-wide commitment** to national and regional innovation development efforts.
4. **Enhancing innovation policy coherence** at the national and regional levels as well.

KNOWLEDGE-BASED DEVELOPMENT



COORDINATION MODEL/PATTERN IN INNOVATION POLICY

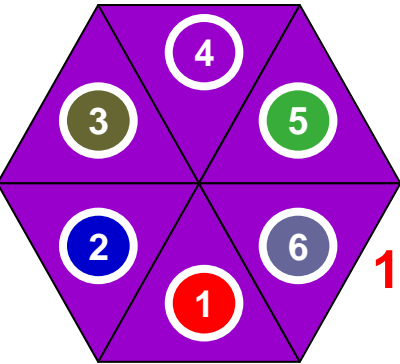


2. REFORMING INNOVATION POLICIES

Consideration :

- Broad and fundamental policy themes;
- Universal to the national and regional contexts of Indonesia;
- Interrelated and *cross-cutting* issues/areas;
- Keys to the initiatives based on current situations and may be relevant to 10-20 year future challenges; and
- Challenging but very important areas for initiating a more open policy coordination of the national-regional collaborative agenda.

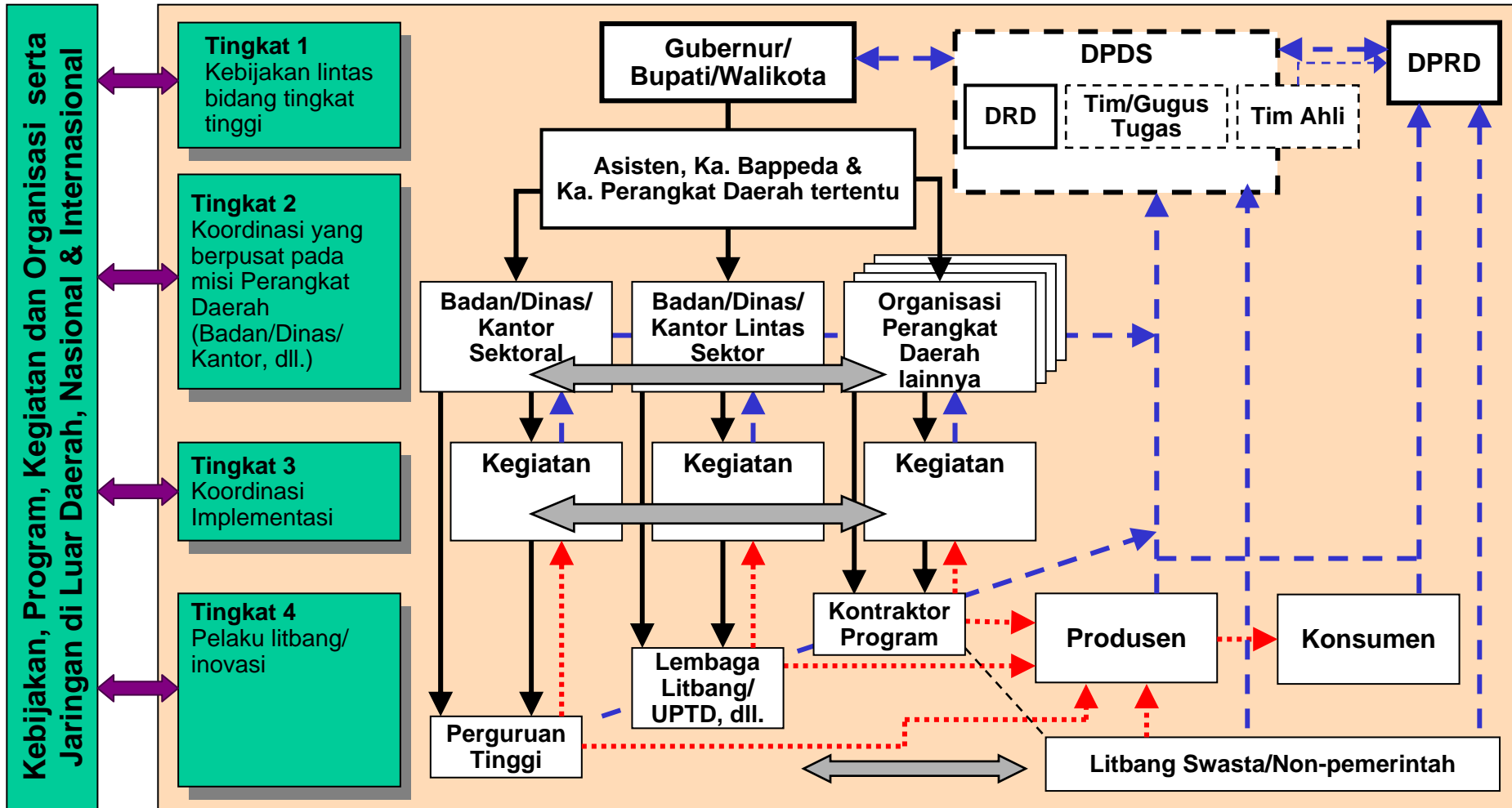
2. REFORMING INNOVATION POLICIES



HEXAGON OF INNOVATION POLICY

1. **Developing general framework conducive to innovation and business development.**
2. **Strengthening the s&t institutions and supports, and developing absorptive technological capacity and capability of SMEs.**
3. **Fostering collaboration for innovation and enhancing diffusion of innovation, best practices and/or R&D outputs.**
4. **Developing innovation culture.**
5. **Fostering and strengthening integrated efforts of regional innovation system and industrial cluster development initiatives.**
6. **Developing strategic responses to the global changes.**

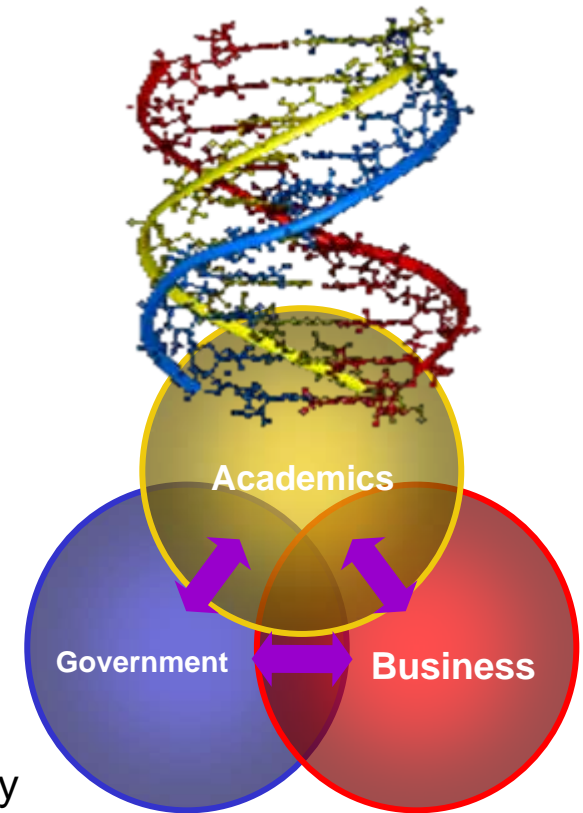
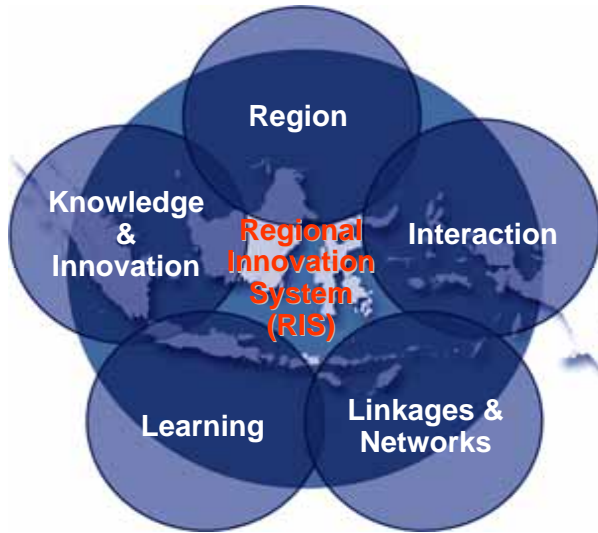
"STRUKTUR ORGANISASI" PENADBIRAN (GOVERNANCE) KEBIJAKAN DI DAERAH



Keterangan:

- Instruksi, Sumber Daya
- Saran (Advis) / Pelaporan
- Hasil
- Koordinasi dan Integrasi Horisontal (Kerjasama)
- Instruksi, Sumber Daya, Saran/ Pelaporan, Hasil, Koordinasi dan Integrasi Horisontal & Vertikal (Kerjasama)

Thank You



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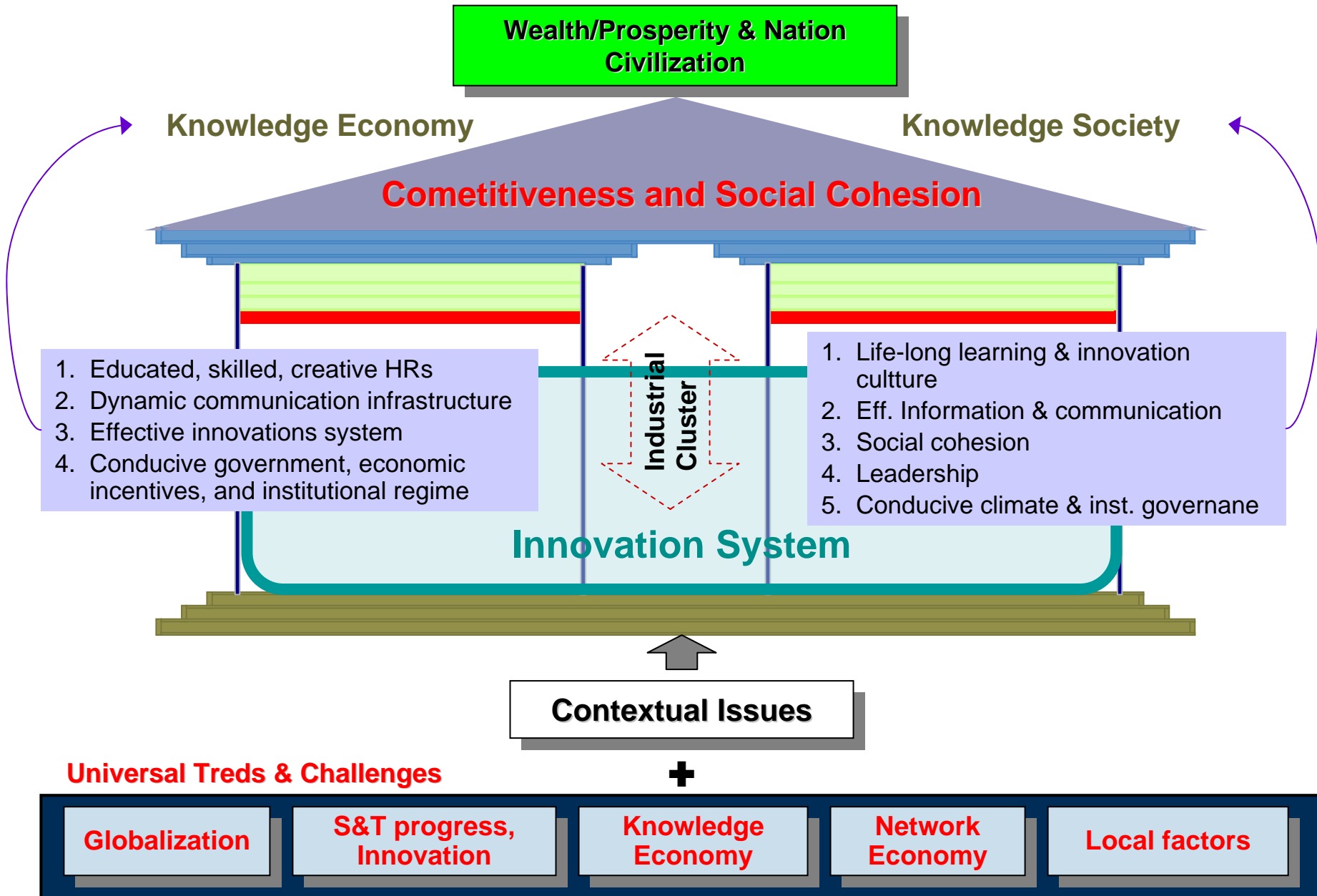
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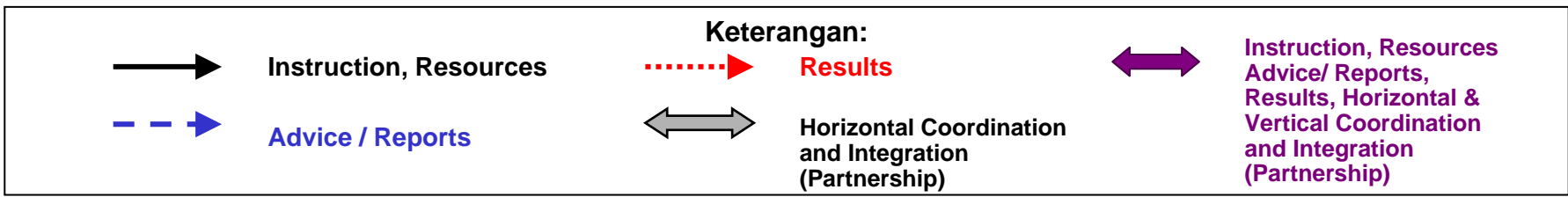
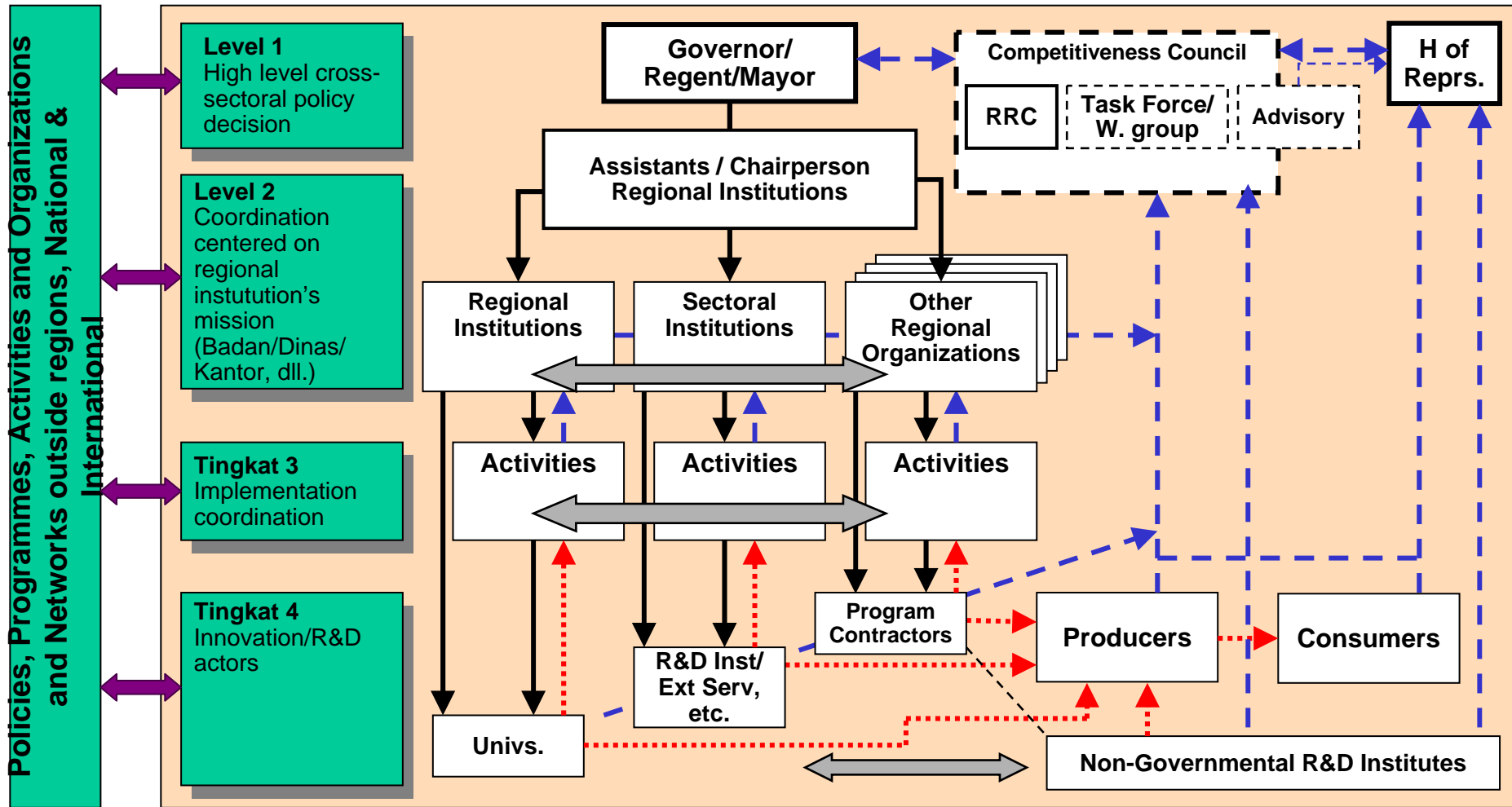
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KNOWLEDGE-BASED DEVELOPMENT



PROPOSED REGIONAL GOVERNANCE



GENERIC AND CHALLENGING ISSUES IN INNOVATION SYSTEM DEVELOPMENT :

1. **Weaknesses in general framework.** These are related to some issues such as :

- Fundamental framework issues related to the innovation system, e.g., :
 - Regulatory impediments to development of business and innovation;
 - Weaknesses in legal and regulatory development needed to foster innovation progress;
 - Weaknesses in specific infrastructural supports important to innovation;
 - Costly bureaucracy administration process;
- Very limited investment (financial supports) for innovative activities;
- Uncompetitive fiscal supports (taxation structures/schemes) for innovation;
- Weaknesses related to intellectual assets (including IPR awareness, protection, and law enforcement).

GENERIC AND CHALLENGING ISSUES IN INNOVATION SYSTEM DEVELOPMENT : *(Cont'd)*

2. Weaknesses in institutions and S&T supports, and low knowledge (technological) absorption of SMEs. These are related to

- “not yet properly” developed (and/or missing) important functions in the innovation system, and
- weaknesses in science and technological supports relevant to the development of the best local resources and specificities;
- on the other hand, small and medium enterprises (SMEs) as the majority of the business actors ($\pm 99\%$ of business actors in Indonesia), in general, have limited capability and opportunity in accessing, utilizing, and developing knowledge (technology) important to their business competitiveness enhancement.

GENERIC AND CHALLENGING ISSUES IN INNOVATION SYSTEM DEVELOPMENT : *(Cont'd)*

3. **Weaknesses in mutually beneficial linkages and interactions, and collaboration in diffusion of innovation (including best practices and/or R&D outputs).**
 - “Mismatch” in relevance and complementing functions amongst knowledge pool development (*knowledge supply side*) and technological needs and utilization (*demand side*), especially by private sectors in many technological areas are widely acknowledged.
 - Limited development and supports related to both business (commercial) and non-business (non-commercial) technology-based transactions amongst actors, asymmetric information and limitations in capability and opportunity for interactions important to innovation, diffusion and learning process especially in “traditional sectors in the economy” are among policy issues identified that impede mutually beneficial linkages, productive interaction, and synergetic collaboration amongst actors in both the national and regional innovation systems.

GENERIC AND CHALLENGING ISSUES IN INNOVATION SYSTEM DEVELOPMENT : *(Cont'd)*

4. Weaknesses in innovation culture. Among other factors, these are related to

- Low appreciation to creativity/innovativeness spirits and entrepreneurial business profession;
- Slow development in entrepreneurship knowledge and skills, and weak education system in supporting entrepreneurial culture development;
- Limited talents (high quality human resources) in many regions (regional brain drains), low high talent mobility and interactions important to innovation and entrepreneurship in the society;
- Public authorities in general (at the national and regional levels) are also among the weakness points for both the development of innovation and entrepreneurship in their environments and the significant progress in the society.

GENERIC AND CHALLENGING ISSUES IN INNOVATION SYSTEM DEVELOPMENT : *(Cont'd)*

5. Weaknesses in development focus, value chains, competence development and improvement of the sources of economic progress. Weaknesses in interrelated business and non-business activities (and actors) important to the economic dynamism and the strong foundations for unique competitive advantages are caused by some underlying factors such as :

- Varieties of business activities and the supporting non-business activities and regional unique competences developed in general are not geared towards the more focused regional competitive advantage development;
- Business/industrial structures and linkages are weak;
- Limited leadership and pioneering in progressing innovation and diffusion of innovation;
- Low development of start-up/new innovative companies (sometimes called as the new technology based firms/NTBFs);
- Most SMEs are lagging behind in creating and capitalizing the opportunities from technological and non technological progress/change.

GENERIC AND CHALLENGING ISSUES IN INNOVATION SYSTEM DEVELOPMENT : *(Cont'd)*

6. Global (Globalization) challenge. Various weaknesses (eventually) influence the "readiness" of Indonesia (at the national and regional levels) to play the better and strategic role in the global arena and responding some important changes to maximize the benefits for and minimize the negative impacts to the society.