Institutional Reform to Promote Innovation

Byung-Joo Kang (Professor, Hananm University)
Deog Seong, Oh(Professor, ex vice president of Chungnam National University)
David Bullon(Director of Innovation, MICITT)

2014 KSP with Costa Rica
Senior Policy Dialogue & Final Reporting Workshop
July 6 2015, San Jose
Contents

I. Introduction

II. Analysis and assessment of institution for innovation in Costa Rica

III. Analysis of institution for innovation in Korea

IV. Institutional reform to promote innovation capacity in Costa Rica

V. Conclusion and policy recommendations
Part I

Introduction
Introduction

A. Background and Objectives

▶ Background
- The 2013 KSP report emphasized the importance of a national innovation drive that includes institutional bodies and support policies.

▶ Main Goal of the Project
- Assessing the role and the capabilities of the main institutions for innovation
- Establishing a proposal of organizational and functional structure for the innovation
- Providing suggestions to promote innovation capacities: short term (1 year) and mid-term (3 years)
Introduction

B. Research Flow

- Theoretical framework

- Analysis and assessment of institution for innovation of Costa Rica

- Analysis of institution for innovation of Korea

- Institutional reform to promote innovation capacity of Costa Rica

- Conclusion & Policy Recommendations
C. Operational definition: Institutional reform for innovation

- Institutional reform for innovation:
  - Establishing an environment where innovation could be easily generated
  
  - Three areas were covered for the institutional reform to promote innovation
    
    - Reinforcing organizations
    - Formulating policies
    - Building-up governance structure
Part II

Analysis and Assessment of
Institution for Innovation
of Costa Rica
A. Organizations for innovation

- Key organizations for innovation in Costa Rica are: PCCI (policy guide) MICITT (formulator) and CONICIT (implementer)

- Related ministries are: Ministry of Agriculture, Ministry of Foreign Trade, Ministry of Economy, Industry and Commerce

- Other related agencies: PROCOMER, CICR (Chamber of Commerce and Industry)

- General problems of organizations for innovation are as follows:
  - Lack of unified approach: key ministries should work together with the presidential office to guarantee results
  - Insufficient centralization in political decision making
  - Important technical stakeholders are excluded
### Roles and functions of organizations for innovation in Costa Rica

<table>
<thead>
<tr>
<th>Name of the organization</th>
<th>Role and function of organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key organizations</strong></td>
<td></td>
</tr>
<tr>
<td>PCCI</td>
<td>Increasing economic development potential through the enhancement of country’s human capital and capacity for innovation</td>
</tr>
<tr>
<td>MICITT</td>
<td>S&amp;T policy formulation, implementation and coordination of innovation</td>
</tr>
<tr>
<td>CONICIT</td>
<td>Implementation of innovation policies established by MICITT</td>
</tr>
<tr>
<td><strong>Related ministries</strong></td>
<td></td>
</tr>
<tr>
<td>Ministry of Agriculture</td>
<td>Innovation in agricultural production and exploring foreign market for agricultural products</td>
</tr>
<tr>
<td>Ministry of Foreign Trade</td>
<td>Organization responsible for trade and attraction of foreign investment</td>
</tr>
<tr>
<td>MEIC</td>
<td>Deregulation in production and marketing process and promotion of domestic SMEs</td>
</tr>
<tr>
<td><strong>Other agencies</strong></td>
<td></td>
</tr>
<tr>
<td>PROCOMER</td>
<td>Acceleration of export and attraction of foreign investment</td>
</tr>
<tr>
<td>CICR</td>
<td>Supporting sustainable development in industry and business</td>
</tr>
</tbody>
</table>
B. Innovation policies and programs


- Six policies and programs for strengthening SMEs’ capacity and fostering entrepreneurial capacities

- Two innovation plans only innovation a few areas, so missions and objectives of innovation in Costa Rica as a whole are only partially visible

- Hierarchy or relationship between policies and programs for innovation are weak

- Benefits of innovation are easily spread through the well prepared policies and programs for innovation, but policies and programs were made to solve demanding problems

- Programs for FDI-local company linkage are weak, and few policies or programs exist to enhance national competitiveness
### Plans and policies for innovation in Costa Rica

<table>
<thead>
<tr>
<th>Plans and policies for innovation</th>
<th>Contents of plans and policies for innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plans for innovation</strong></td>
<td></td>
</tr>
<tr>
<td>Century XXI Strategy</td>
<td>- Improvement of knowledge and innovation levels of Costa Rica</td>
</tr>
<tr>
<td>National, Technology and Innovation Plan 2015-2021</td>
<td>- Enhancement of innovation capacity in five fields such as education, water resources and environment, energy, health and food and agriculture</td>
</tr>
<tr>
<td><strong>Policies and programs for innovation</strong></td>
<td></td>
</tr>
<tr>
<td>SMEs strengthening Program</td>
<td>- Program for the implementation of a Food Security System through the training and consulting program</td>
</tr>
<tr>
<td>UNA-Entrepreneurs program</td>
<td>- Increasing the entrepreneurial capacities of students and Costa Rican society in order to foster the creation of small and medium enterprises</td>
</tr>
<tr>
<td>Central America Innovates</td>
<td>- Regional project based in San Jose to support enterprises by introducing management, diagnostic, training and consulting in the innovating process</td>
</tr>
<tr>
<td>AL INVEST</td>
<td>- Regional project in collaboration with the European Union to support the consolidation and internationalization of SMEs</td>
</tr>
<tr>
<td>PROPYME</td>
<td>- Promotion of innovation in the private sector, particularly in SMEs</td>
</tr>
<tr>
<td>CR Provee</td>
<td>- Increasing backward linkages between Costa Rican SMEs and multinational companies operating in Costa Rica</td>
</tr>
</tbody>
</table>
C. Innovation governance

- Three layer of governance structure is desirable for the effective implementation.

- Innovation governance exist in law, but significant amount of autonomy makes governance system not work as intended.
  - 19 ministries under the supervision of the president
  - 34 autonomous institutions and 77 decentralized entities got guidelines from ministries
  - Government renders full autonomy to 81 municipalities and 5 public universities

- Key ministries are not designed for policy coordination, so coordination is poor.
- Ministries are not designed for implementation, so rules do not allow incentives for performance and use of funds.
- Current governance structure does not include private organizations and other implementing agencies, so coordination among agencies is poor.
Analysis and assessment of institution for innovation in Costa Rica

Current innovation governance structure in Costa Rica

- President
  - Orders
    - Guidelines
      - 19 Ministers
        - Full Autonomy
          - Governance Approximated
          - 77 Decentralized Entities
          - 19 Ministers
            - Guidelines
              - 77 Decentralized Entities

- 34 Autonomous Institutions
- 81 Municipalities (Local Governments)
- 5 Public Universities
Part III

Analysis of Institution for Innovation in Korea
A. Organizations for innovation

- **Organizations** for innovation in Korea are composed of **three categories**

- **Organizations** for **policy formulation** in Korea: 2 committees, 3 ministries and 2 agencies
  - **Functions:** policy formulation, policy management, project operation
    - Advisory Council on Science & Technology, Regional Development Committee
    - Small and Medium Business Administration and KIAT

- **Organizations** for **policy implementation**: innovation related offices and center for regulatory reform at local governments
  - **Function:** policy implementation

- **Agencies for coordination**: **innovation platform** (Techno-Parks and Center for Creative Economy & Innovation)
  - **Function:** coordination of innovation policies
### Roles and functions of organizations for innovation in Korea

<table>
<thead>
<tr>
<th>Classification of organizations</th>
<th>Main functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advisory Council on Science &amp; Technology</td>
<td>Policy formulation for innovation of science and technology</td>
</tr>
<tr>
<td>Regional Development Committee</td>
<td>Policy formulation for balanced territorial development</td>
</tr>
<tr>
<td>Ministry of Science, ICT and Future Planning</td>
<td>Establishment of start-up ecosystem and innovation centers</td>
</tr>
<tr>
<td>Ministry of Education</td>
<td>Management of four representative innovation programs</td>
</tr>
<tr>
<td>Ministry of Trade, Industry and Energy</td>
<td>Developing business model by supporting creative ideas</td>
</tr>
<tr>
<td>Small and Medium Business Administration</td>
<td>Operation of Inno-Biz project and conducting related projects</td>
</tr>
<tr>
<td>KIAT</td>
<td>Operation of innovation projects from MTIE</td>
</tr>
<tr>
<td>Innovation related office</td>
<td>Implementation of innovation policies for ministries from central government</td>
</tr>
<tr>
<td>Center for regulatory reform</td>
<td>Implementation of policies for regulatory reform</td>
</tr>
<tr>
<td>Techno-Park</td>
<td>Supporting new technology based start-ups, R&amp;D, pilot production</td>
</tr>
<tr>
<td>Center for Creative Economy &amp; Innovation</td>
<td>Connecting and synthesizing related programs for SMEs</td>
</tr>
</tbody>
</table>
B. Innovation policies

-2 categories of policies for innovation and 1 category of related programs

- Policies for the enhancement of national competitiveness
  - Policy for new growth engine: searching for new technologies for next generation
  - Policy for science/technology capacity building: establishing KISTEP and designation of 4 R&D Special Zones

- Policies for the regional innovation capacity building
  - Policy for balanced regional development: strengthening national and regional competitiveness by balanced development
  - Policy for fostering locally specialized industries: developing specialized products by using regionally located resources or distinguished regional brand

- Policies for the other innovation capacity building
  - Policy for fostering manpower: LINK Project of Ministry of Education and BK21 project
  - Policy for regulatory reform: regulatory reform in environment, market failure, safety, etc
### Analysis of institution for innovation in Korea

#### Objectives and contents of innovation policies

<table>
<thead>
<tr>
<th>Category</th>
<th>Name of the policy</th>
<th>Objectives and contents of policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhancement of national competitiveness</td>
<td>New growth engine</td>
<td>- Searching new technologies, new products and services which are expected to generate jobs and to become leading industries in the next generation</td>
</tr>
<tr>
<td></td>
<td>Science/technology capacity building</td>
<td>- Building huge facilities such as IBS and Isol Separator as a representative facility for International Science Business Belt Project</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Policy for enhancing technology competitiveness by the establishment of KISTEP and designation of 4 R&amp;D Special Zones</td>
</tr>
<tr>
<td>Regional innovation capacity building</td>
<td>Balanced regional development</td>
<td>- Strengthening national and regional competitiveness by balanced development</td>
</tr>
<tr>
<td></td>
<td>Fostering locally specialized industry</td>
<td>- Creation of value added through the development of specialized products by using regionally located resources or through the distinguished regional brand</td>
</tr>
<tr>
<td>Other innovation capacity building</td>
<td>Fostering manpower</td>
<td>- LINK Project of Ministry of Education and BK21 project (Korean Brain 21)</td>
</tr>
<tr>
<td></td>
<td>Regulatory reform</td>
<td>- Regulatory reform in the field of environment, market failure, safety, etc.</td>
</tr>
</tbody>
</table>
C. Innovation governance

- Innovation governance is composed of three layer structure

- Organization for policy formulation is composed of three categories
  - 2 committee: Advisory Council on Science & Technology and Regional Development Committee
  - 3 ministries: Ministry of Science, ICT and Future Planning, Ministry of Education, Ministry of Trade, Industry and Energy
  - 2 agencies: Small and Medium Business Administration and KIAT

- Organization for policy implementation is composed of two categories
  - 1 innovation related offices and 1 center for regulatory reform on the local government level

- Agency for coordination is composed of 1 category
  - Regional platform (Techno-Parks and Center for Creative Economy & Innovation as Public private partnership)
Analysis of institution for innovation in Korea
## D. Comprehensive approach for the acceleration of innovation

<table>
<thead>
<tr>
<th>Classification</th>
<th>Contents and aims of the entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusive innovation committee</td>
<td>- Highest level of committee dealing with negotiation and coordination for the innovation policies among related organizations (ex: Regional Development Committee).</td>
</tr>
</tbody>
</table>
| Special law for supporting innovation  | - Strengthening regional development capacity, fostering local industries, generating jobs and activating regional economy  
                                        | -(ex: Special Law for Regional Balanced Development).                                                                                                                                                                          |
| Special account for supporting innovation | - Synthesizing and combining accounts for the implementation of innovation policies and promoting efficiency in using fund for the implementation of innovation policies from 2005 (ex: Special Account for National Balanced Development). |
| Mid and long term plans for innovation  | - Introducing "Innovation oriented regional development model" for the sake of regional prosperity and quality oriented convergence model for the sake of capital region’s prosperity (ex: 5 Year Plan of National Balanced Development). |
Part IV

Institutional Reform to Promote Innovation Capacity in Costa Rica
A. Innovation Organizations

- Reinforcement of role for key organizations such as PCCI, MICITT and CONICIT is necessary

- Creation and operation of one task-force team in PCCI is desirable
  - MICITT and MEIC, MAG and COMEX participate in task-force team together for policy formulation
  - CONICIT and CNP, PROCOMER participate in task-force team together for policy implementation

- Creation of office at local government is needed and its participation in governance structure is required with two options
  - Option 1: participating in innovation platform
  - Option 2: participating in task-force team in PCCI

- Agency for coordination is innovation platform (option one is techno-park and planning board for strategic industry and option two is collaboration of industry with academy) and function of this agency is coordination of polices from various organizations
Institutional reform to promote innovation capacity in Costa Rica

-Since Costa Rican government puts implementation as a key factor for institutional reform in innovation, the following four principles are recommended to enhance policy implementation effectiveness

- Four key ministries got rotation of presidency in productive development policy
- Equal participation of government and non-government stakeholders
- Equal participation of stakeholders representing established firms and new firms
- Power to approve and remove programs of support at will
Institutional reform to promote innovation capacity in Costa Rica

### Roles and functions of organizations for innovation in Costa Rica

<table>
<thead>
<tr>
<th>Classification of organizations</th>
<th>Main functions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Committee</strong></td>
<td>-Building consensus around policy priorities and provide guidance in designing and implementing effective policies</td>
</tr>
<tr>
<td><strong>PCCI</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Ministry</strong></td>
<td>-Policy formulation for S&amp;T research, and coordination of innovation</td>
</tr>
<tr>
<td><strong>MICITT</strong></td>
<td></td>
</tr>
<tr>
<td><strong>MEIC</strong></td>
<td>-Deregulation in production and promotion of domestic SMEs</td>
</tr>
<tr>
<td><strong>MAG</strong></td>
<td>-Policy for innovation in agricultural production</td>
</tr>
<tr>
<td><strong>COMEX</strong></td>
<td>-Formulating policy for foreign trade</td>
</tr>
<tr>
<td><strong>Agency</strong></td>
<td>-Implementation of innovation policies established by MICITT</td>
</tr>
<tr>
<td><strong>CONICIT</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CNP</strong></td>
<td>-Implementation of agricultural policy</td>
</tr>
<tr>
<td><strong>PROCOMER</strong></td>
<td>-Acceleration of export and attraction of foreign investment</td>
</tr>
<tr>
<td><strong>Policy implementation</strong></td>
<td>-Implementation of innovation policies for ministries from central government</td>
</tr>
<tr>
<td><strong>Innovation related office</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Coordination</strong></td>
<td>-Supporting new technology based start-ups, R&amp;D, pilot production</td>
</tr>
<tr>
<td><strong>Innovation platform</strong></td>
<td>-Connecting and synthesizing related programs for SMEs</td>
</tr>
<tr>
<td><strong>Techno-Park</strong></td>
<td></td>
</tr>
<tr>
<td><strong>PBSI</strong></td>
<td></td>
</tr>
</tbody>
</table>
Institutional reform to promote innovation capacity in Costa Rica

B. Innovation policies

- Establishment of a basic plan for innovation in Costa Rica is necessary

- Two options are available
  - Option 1: Re-planning of National Science, Technology & Innovation 2011-2015
  - Option 2: new plan for innovation in Costa Rica
  - In this study, Option 2 is highly recommended

- Planning body of basic innovation plan is task-force team in PCCI and including following three categories of policies in the basic plan as key contents is recommended
Institutional reform to promote innovation capacity in Costa Rica

- **First** category of policy is about **enhancing national competitiveness**
  - Policy for acquisition of new growth engine, promotion of competitiveness in science and technology and fostering technology centered domestic SMEs in collaboration with MNCs

- **Second** category of policy is about **regional innovation capacity building**
  - Policy for regional capacity building through fostering regional strategic industries and establishment of coordination link between industry, university and research institute

- **Third** category of policy is about **other innovation capacity building**
  - Policy for fostering manpower and regulatory reform (regulatory reform is the most demanding item from private sectors, universities and research institutes)
C. Innovation governance

- Establishing **three layer innovation governance structure** is strongly recommended.

- **Top layer** (three categories) organizations with high inter-connectivity.

- Establishing a **innovation platform** through establishment of **TP with BPSI** or collaboration of academia with **private firm** is important.

- **Creation of office for innovation** policy implementation **at local government** is a task to be taken in long term perspective.
Institutional reform to promote innovation capacity in Costa Rica
Institutional reform to promote innovation capacity in Costa Rica

- **Innovation is initiated and managed by private sectors** over the many advanced countries
  - Building an innovation platform (Establishing TP with PBSI or establishing private industry with academy collaboration) is one of the options for private sector initiative innovation system

  - Four support mechanisms for SMEs in innovation platform are internalization of SMEs for integration into GVC, technology innovations, human resources development and acceleration of startups

- **Local governments** are the **frontline implementers** of innovation policies
  - Therefore, propelling innovation with cooperation between central and local government as a team is strongly recommended

- **Innovation is generated in the private sector and local governments more frequently**
  - Therefore, it is logical to **include private sector players in the governance structure** and **create a new office at local government** for implementation
Institutional reform to promote innovation capacity in Costa Rica

- **Innovation Platform** carry out and **connect innovation policies** from ministries, and **local governments implement** innovation policies

Desirable governance structure for middle and bottom level
D. Suggestions to promote innovation capacity for short and mid terms

1) Suggestions for short-term (3 suggestions)

- Strengthening the dynamics of the Presidential council for innovation
- **Using existing ministerial funds to pilot programs**
  - Program for technology innovation for SMEs
  - Program for integrating SMEs into Global Value Chain
  - Program for the activation of start-ups
  - Program for fostering high quality human power

- **Establishing a basic plan for innovation**

  **Vision**
  - Establishment of an innovation platform to promote R&BD and support sustainable SME's growth by facilitating cooperation among research centers, universities, industries and governments

  **Mission**
  - Technology-based economic growth through the creation and support of knowledge-based enterprises from Costa Rica and aboard
  - Sustainable development of high-tech intensive SME's
  - Settlement of regional innovation platform in Costa Rica (and in Latin America)
Institutional reform to promote innovation capacity in Costa Rica

2) Suggestions for mid-term (3 suggestions)

- Creation of National Agency for Productivity and Innovation
Institutional reform to promote innovation capacity in Costa Rica

- **Redefinition of laws that map the institution for innovation**
  
  - Law for supporting university-industry collaboration, deregulation, fostering technology centered SMEs and supporting acceleration of start-ups

- **Interministerial effort to create innovation policy for development**
  
  - Formulation of policy for building linkage between SMEs and MNCs, establishing a demo techno-park near San Hose, building business incubators at universities in collaboration with private firms and accelerating start-ups by teamwork from 4 ministries and 3 agencies
Part V

Conclusion and Policy

Recommendations
Conclusion and Policy Recommendations

1) Reinforcement of organizations for innovation
   - Creation of one task-force team under PCCI is recommended
   - MICITT is the key organization, so it is desirable to give more budget, staff members, and legal support to MICITT

2) Formulation of innovation policies
   - Establishment of a basic plan for innovation in Costa Rica is necessary
   - Such plan should be include in the National Science, Technology and Innovation 2015-2021
   - Second alternative seems better and task-force team is in charge of establishing new plan

3) Building-up governance structure
   - Establishing three layer innovation governance structure such as central level, innovation platform level and local level is necessary
   - One of the fundamental issues of current institution for innovation is very few private sectors are included in governance structure
   - Including many private firms, universities and research institutes in governance structure is strongly recommended for effective innovation institution
4) Recommendation of following Costa Rica KSP Project

- Establishment of a innovation platform

- There are two alternatives for this
  - First alternative is Building Techno-Parks with Board of Planning Strategic Industries
  - Second alternative is Making collaboration of academia with industries
Thank you

Byung-Joo Kang (Professor, Hananm University)
Deog Seong, Oh(Professor, ex vice president of Chungnam National University)
David Bullon(Director of Innovation, MICITT)