Global Challenges and Korean STI Development Experiences

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1. Introduction

- Requests to Develop STI Strategies by Benchmarking Korean Experiences
  - Poverty Traps of LDCs by UNESCAP-APCTT
  - Health Challenges of Africa by WHO and ANDI
  - Global Challenges of ASEAN by ASEAN COST

- Lack of Longitudinal Approaches and Prevalence of Benchmarking Practices
  - Rush to Benchmark Korean Experiences without Contextualized Understanding

- Need to Develop New Approaches for Diagnosis and Strategy Development
● Pilot STI Strategies Development and Extension to Other Countries
  - ASEAN Global Challenges (2013): Indonesian Water, Vietnamese Green Energy, and Filipino Food

● Iterative Process for Multilateral and Bilateral STI Strategy Development with Selected Cases
2. New Approaches with Korean Experience

- **Strategy Development Principles**

  **Korean Experience**
  - Future-oriented vision and goal
  - Coordinating mechanism for successful innovation
  - Collective adaptation to changes and cumulative capacity building

  **Global STI Context**
  - Importance of innovation and extension of its scope
  - Uncertainties and changes in government intervention
  - Proper STI strategy implementation

**Principles**
- Oriental holistic approach for prioritization of focus areas
- Intuitive decision making leading to strong execution and consensus building
- Future-oriented goals and a pathway to minimize uncertainties
**Strategy Simulation**

- Necessity for system innovation transformation
- Diagnosis (3C)
- Solutions (3A)
- Action Plan (Roadmap)
- Implementation
- Monitoring and Evaluation

Governance Capability
  - Failure
  - Leadership, stakeholder capacity, etc

Success

Corrective Actions
Holistic Approach: 3C Diagnosis and 3A Prescription

3C Diagnosis

- **Componentization**: Identification of major components of system weaknesses and bottlenecks in a holistic viewpoint with statistically described and overviewed symptoms of system.

- **Contextualization**: Structurized and heuristic understanding of identified components in the context of system dynamics with several rounds of deepening diagnosis process.

- **Conceptualization**: Synthesized diagnosis that provides a plausible explanation of the structural problems of the system and leads to consensus among stakeholders by having a common understanding of system weaknesses and bottlenecks.

3A Prescription

- **Articulation of Action-oriented, Actor-based Policies**
Future Design Approach: Goals and Pathways

- 3C Diagnosis Result
- Scenario
- Core Variables
- Current Status
- Pathways
- Goals
- Triggering Programs/Projects
- Intuitive Approach
  - Appropriate methodology for effective planning with limited resources and time
  - Expert panel brainstorming
3. Poverty Traps: Least Developed Countries

Landlocked Economy with 6.5 Million Population of Peasant Industry

- Trade Deficit↑
- Poverty Surveillance
- Budget Deficit↑
- Lack of Government Industrial Promotion
Landlocked 6.5 Million Peasant Industry

- Trade
- Poverty
- Budget
- Industry
- Little Investment Dominated by FDI
- Mining & Hydro Electricity Export↑
- Export↑
- Lao Product Competitiveness ↓
- Lao KIP Exchange Rate↑
- Job Market↓

Peasant Poverty Trap
Landlocked 6.5 Million Peasant Industry

Trade

Poverty

Job

Product

KIP

Tertiary Education Enrollment↑

Infant Mortality ↓

MDG of last 10 years

No quality jobs for new graduates, potential social problems

Peasant Poverty Trap

Natural Resource Trap

Budget

Industry

FDI

Mining & Hydro

University Teaching Burden ↑

General Education↑
Landlocked 6.5 Million Peasant Industry

Trade

Poverty

Budget

Industry

Job

Product

KIP

FDI

Mining & Hydro

Structural Bottlenecks of ISR

Isolation

Peasant Poverty Trap

Natural Resource Trap

Unintended Policy Gaps between Job Market and Education

Synthesized understanding of Lao IS

Contract Research

Tertiary

Infant

University

General

MDG

Tertiary
- Critical Review of Lao Initiatives
  
  Peasant Poverty Trap
  
  Natural Resource Trap
  
  Structural Bottlenecks of ISR
  
  Unintended Policy Gaps between Job Market and Education

- MME wants to use its money to promote industry.
- MPI is trying to build core capacity of HRD.
- MOE’s HRD plan focuses on tertiary education.
- MOI’s industrial plan is vague and not related to the core capacity building.
- MOST was just established and previous NAST’s plan was not oriented for industrialization.
• Solutions

- Poverty reduction
  - Industrial promotion and job creation
  - Targeting Products
    - Peasant Poverty Trap
    - Natural Resource Trap
      - Resource mobilization from domestic and abroad
      - Strategic HRD
        - Unintended Policy Gaps between Job Market and Education
          - Procurement

- Mission Researches
- Steering Governance

- Structural Bottlenecks of ISR
### Innovation Direction

- **Structural bottlenecks and policy gaps**
- **Prioritized industrialization with mission research and HRD**
- **Strategic coordination for critical mass creation**
- **Sustainable economy**

**Triggering Programs**
- Prioritization of industrial development
- Two programs of mission research and strategic HRD
- Steering governance design and resource mobilization
4. Health Challenges: Africa

- Synthesized understanding of Tanzanian health and pharmaceutical innovation

Vicious Circle I: Substandard Drugs
- Disease Prevalence
- Substandard & Counterfeit Drugs

Vicious Circle II: Quality Assurance
- Insufficient Supply of Drugs
- Limited Quality Assurance Capacity
- Weak Procurement
- Reliance on Imported drugs
- Quality Products ↓

Vicious Circle III: Weakening Competitiveness of Local Pharmaceutical Industry
- Government Budget Burden
- Need for Quality Control ↓
- Facility Investment ↓

Oligopoly and political collusion driven market

Facility Investment ↓
Limitations of six pillars of pharmaceutical promotion for East Africa

I. Procurement

- Disease Prevalence
- Insufficient Supply of Drugs
- Government Budget Burden
- Substandard & Counterfeit Drugs
- Limited Quality Assurance Capacity
- Weak Procurement

II. Investment

- Facility Investment ↓
- Oligopoly and political collusion driven market
- Reliance on Imported drugs
- Quality Products ↓
- Need for Quality Control ↓

III. Regulatory Capacity

IV. Skills

V. IPR

VI. Research and Innovation
Proposed Solutions

1. Quality Assured Drugs
2. Incentive to Invest in Infrastructure
3. Supply of Quality Drugs

Deter the continuity of Political Collusion Driven Market

- Limited Quality Assurance Capacity
- Quality Products ↓
- Government Procurement ↓
- Reliance on Imported drugs
- Facility Investment ↓
- Oligopoly and political collusion driven market

Break-off of the Low Innovation Trap

- Technology Platform for QA and Capacity Building
- Need for Quality Control ↓
- Substandard & Counterfeit Drugs
- Insufficient Supply of Drugs
- Government Budget Burden
- Insufficient Supply of Drugs
- Limited Quality Assurance Capacity
- Limited Quality Assurance Capacity
- Disease Prevalence
## 5. Water, Food and Green Energy: ASEAN

<table>
<thead>
<tr>
<th>Country</th>
<th>Framework Conditions</th>
<th>Diagnosis</th>
<th>Solutions</th>
<th>Innovation Directions</th>
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</table>
| Indonesia     | • Decreasing quality & quantity of water in rural and urban areas  
                 • Limitations of financial assistance and tax income | • Ecological degradation  
                 • Fragmented governance  
                 • Decreased pipe services | • Strengthening coordination and capacity through tech localization  
                 • Promotion of water-related industries to reduce financial burden | • Pathway: Domestic capacity building through implicit coordination  
                 • Goal: ASEAN Water Innovation Hub |
| Philippines   | • Food price surges and endangered food security  
                 • Weakening agricultural productivity and agricultural technology leading to low rural income | • Low productivity and low rural income  
                 • Industry and research isolation  
                 • Laissez-faire policy and lack of strategic intervention | • Export promotion of agricultural products and processed food driven by global challenges  
                 • Inclusive development and mission-oriented R&D | • Pathway: Competitiveness building through pooling and sourcing of international technologies  
                 • Goal: Strategic positioning of Filipino agricultural and food industry in global value chain |
| Vietnam       | • Premature green energy market and limited capacity  
                 • Climate change adaptation | • Weak producers/providers  
                 • Poor market  
                 • Incompetent governance | • Promotion of new energy service and production industry  
                 • Provision of affordable products/services | • Pathway: Sustainable production mechanism  
                 • ASEAN Green Energy Innovation Hub |
6. Conclusion

- Action planning of priority setting, program design and roadmapping will follow.

- Theoretical extension of the Korean STI experience and verification with several cases from LDCs, Africa and ASEAN, which complements the humble address of Dr. Choi describing what Korea has achieved.

I have not attempted to present a theoretical or systematic exposition of a science and technology development strategy for developing countries. Rather, I have tried to describe the approach we took in Korea in the background of conditions we confronted in the late 1950s and early 1960s with the emphasis on how we actually went about implementing the project planned (Choi, 1988, v).

Choi, Hyung Sup, 1988, *Springboard Measures for Becoming Highly Industrialized Society*, APCTT/UN ESCAP
Position of Korean STI ODA

AID Effectiveness fragmentation and duplication →

Ownership and Capacity Building
• Global partnership for ODA coordination and linkage

Triangular Partnership

Public Private Partnership

Global Governance

DAC accession and ODA expansion by Korean government →

Global platform leadership
leading multilateral and bilateral coordination

Korean experience as strategic solutions for developing and less developed countries
- Scale-up for global governance
Thank you for your attention!