

**Government of Rwanda - World Bank
Science, Technology and Innovation
Capacity Building TA Program:**

***Practical Solutions for
Practical Problems***

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Plan of Presentation

- Guiding Philosophy
- What is STI Capacity?
- Government of Rwanda -- World Bank STI Capacity Building TA Program
- Key Findings
- Detailed Findings
- Conclusion



Guiding Philosophy

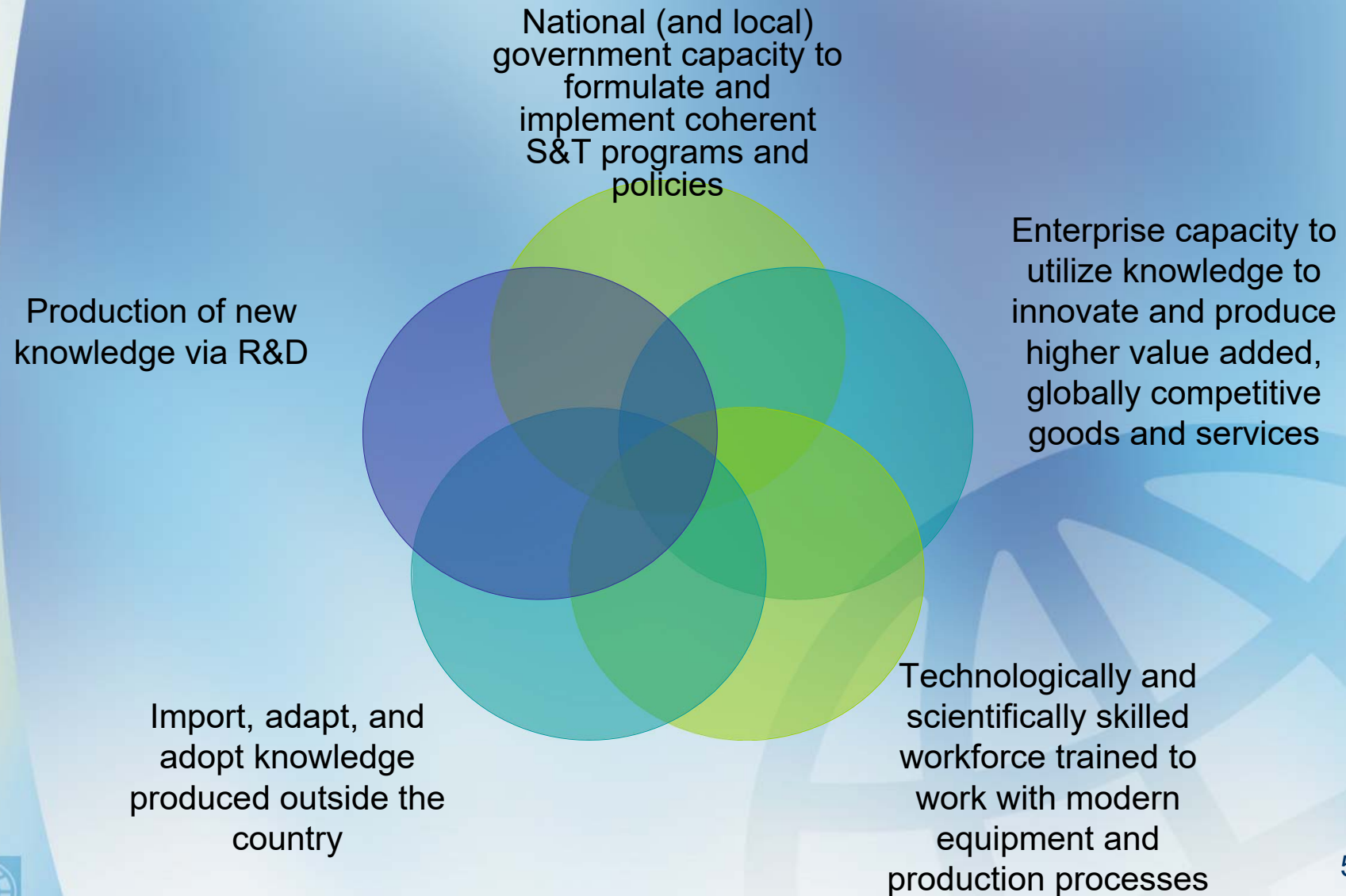
- Rwanda will have difficulty achieving its growth, poverty reduction, wealth creation, and export diversification objectives unless it embarks on a concerted effort to build science, technology and innovation capacity.
- Investments in STI are necessities, **not luxuries**
- Rwanda is too poor to afford the luxury of NOT investing in STI



What STI Capacity?



Five Dimensions of STI Capacity



Getting the Balance Right is Important!



***Government of Rwanda – World
Bank Science Technology and
Innovation Capacity Building
TA Program***



Starting Point

- 90%+ of population are rural subsistence farmers with limited or no access to electricity or potable water
- Poor or non-existent infrastructure, very high electricity prices when it is even available
- Per capita income of \$260/yr or \$0.71/day
- Must rise by 40% just to reach \$1/day



Starting Point (2)

- No sustainable poverty reduction or sustainable social programs without generating additional wealth
- No wealth generation without capacity to produce more knowledge intensive, higher value added goods and services
- Rwanda needs to focus on low volume, high value, high quality production
- Numerous development challenges



Challenges (From Vision 2020)

- **Meet food security and nutrition needs**
- **Generate off-farm productive activities in rural areas**
- **Diversify the economic base**
- **Generate cash income for subsistence farmers**
- **Improve access to housing, water, and sanitation services**



Challenges (2)

- **Improve access to electricity and reduce biomass use**
- **Improve access to clean drinking water**
- **Improve nutrition and hygiene**
- **Reduce prevalence of Malaria and HIV-AIDS**
- **Add value to natural resources and compete in knowledge-intensive market segments**



Work Plan

- Detailed consultation with ministries, agencies, donors, NGOs, rectors, research institute directors, training institutions, private sector associations, entrepreneurs, and Bank colleagues
- Preparation of detailed TORs for a series of Needs Assessments and Action Plans
- Assemble teams of local and international experts to conduct Needs Assessments



Needs Assessment and Action Plan

Questions:

- What is Rwanda's current capacity?
- What capacity does Rwanda need to address each issue?
- How can Rwanda build the requisite capacity?
 - Detailed action plan – Finding Practical Solutions to Practical Problems



Six Needs Assessments and Action Plans

- Appropriate Technology Development and Diffusion
- Food Processing
- Deliver clean water to rural villages
- Agriculture Productivity through Research and Extension
- Geosciences and Geothermal Energy
- Adding value to natural resources throughout value chain



Next Steps

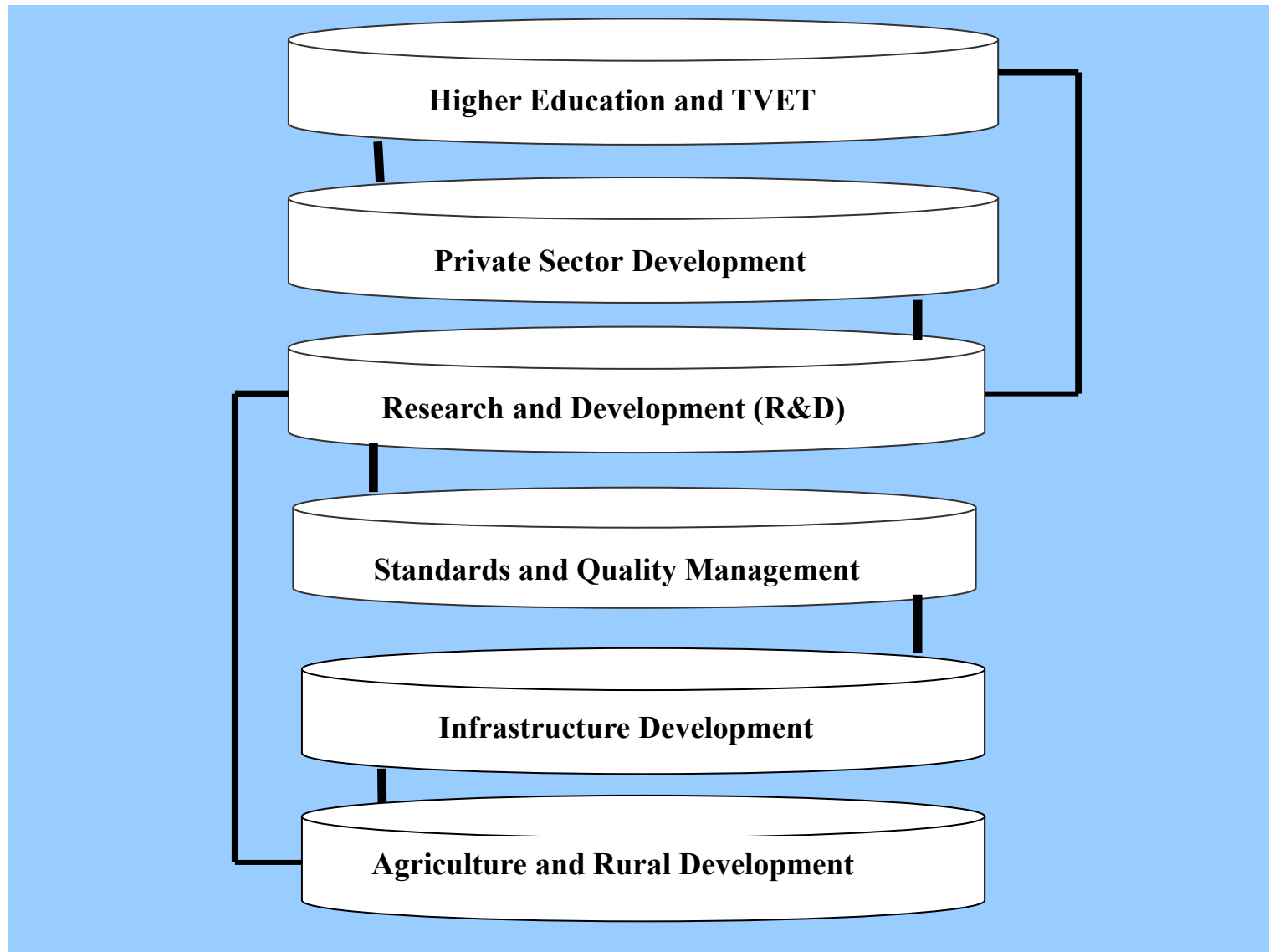
- DFID work commences
- Incorporate results of Needs Assessments and Action Plans into EDPRS
- Financial support for implementation via:
 - ✓ PRSG
 - ✓ World Bank STI Capacity Building Project
 - ✓ Monitoring and evaluation
 - ✓ Private Sector Advisory Council
 - ✓ Active stakeholder involvement in preparation **AND IMPLEMENTATION!!**
 - ✓ Link to DFID program – and support from other donors including GTZ, UNIDO, JICA, etc.



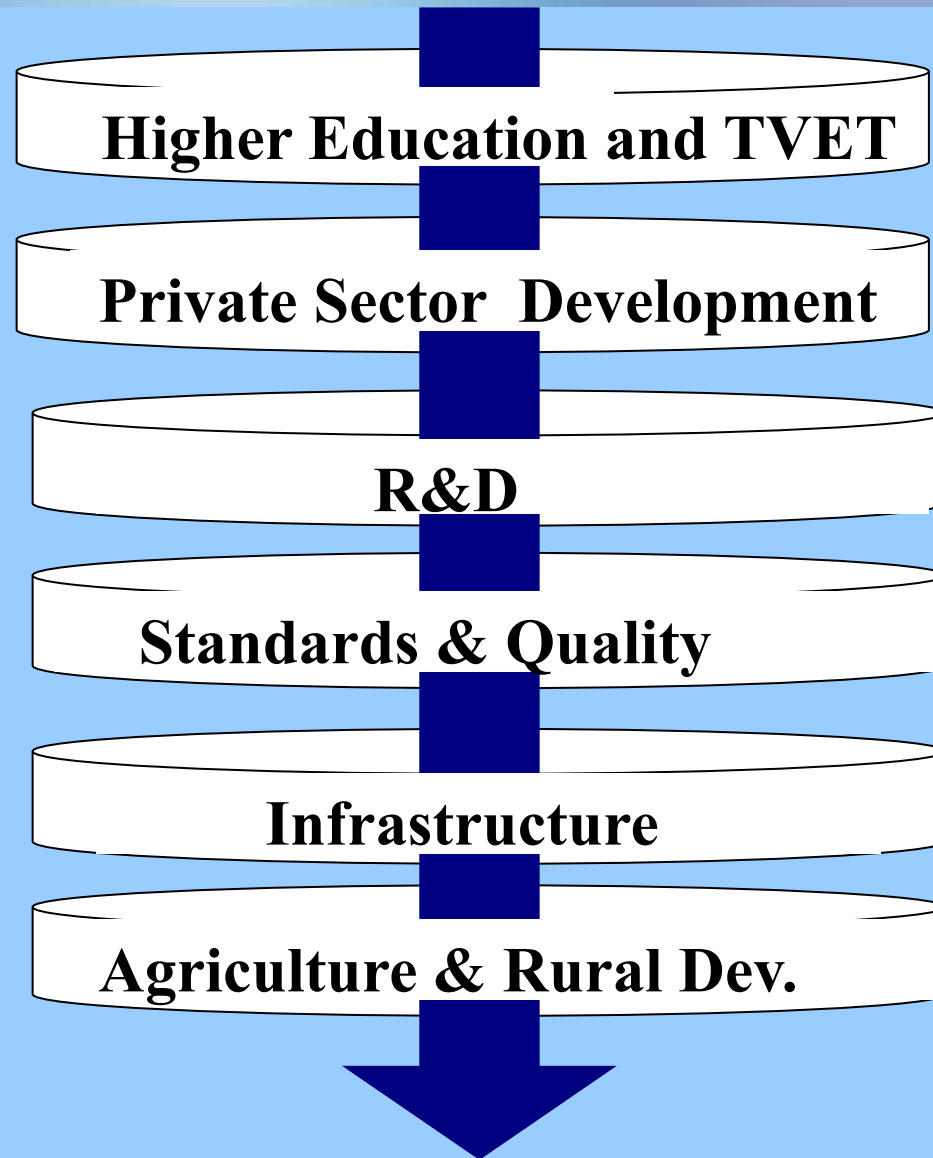
Key Findings



Reforms in Individual Sectors are Necessary but Not Sufficient



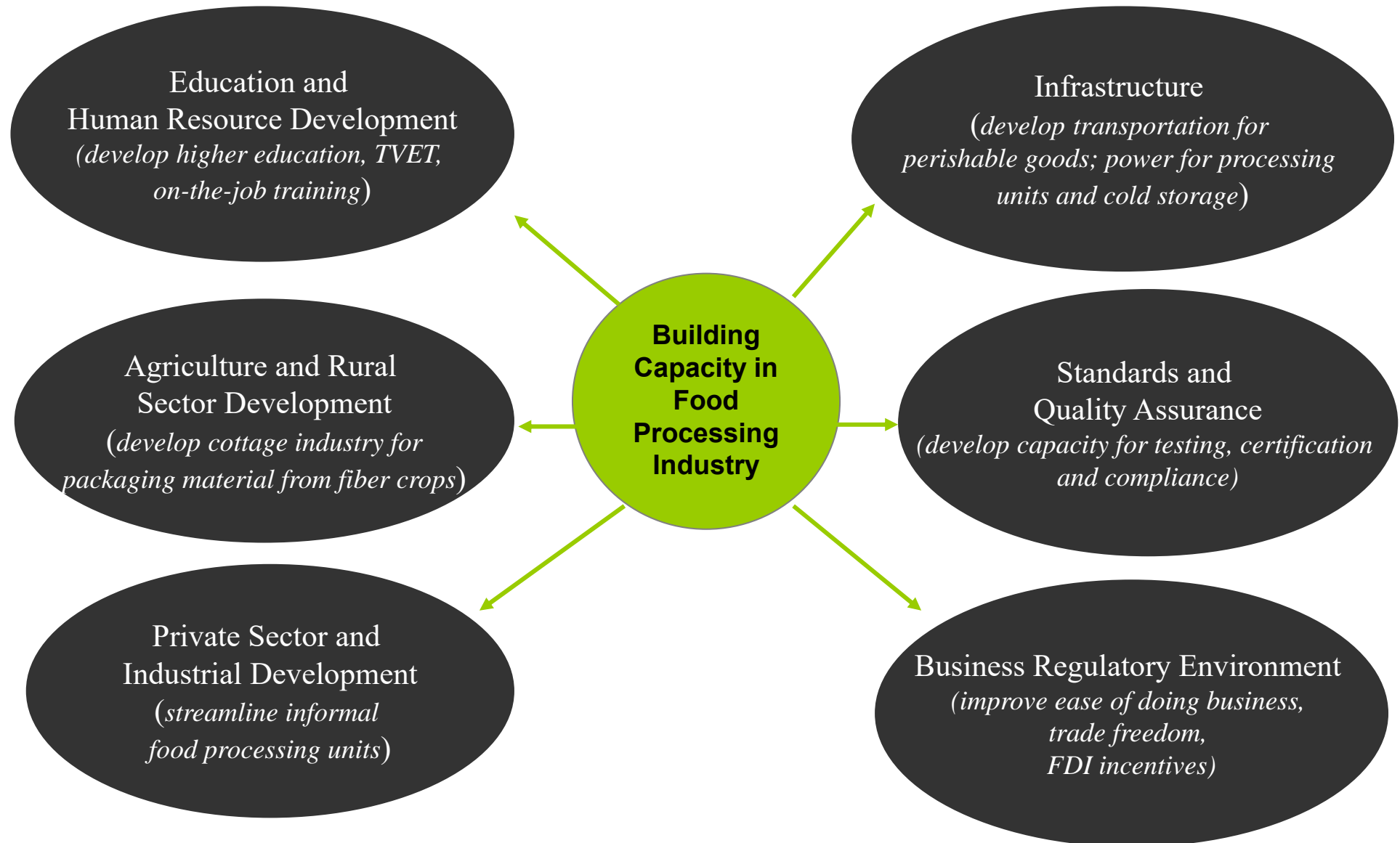
STI Capacity Building: A Cross Cutting Issue



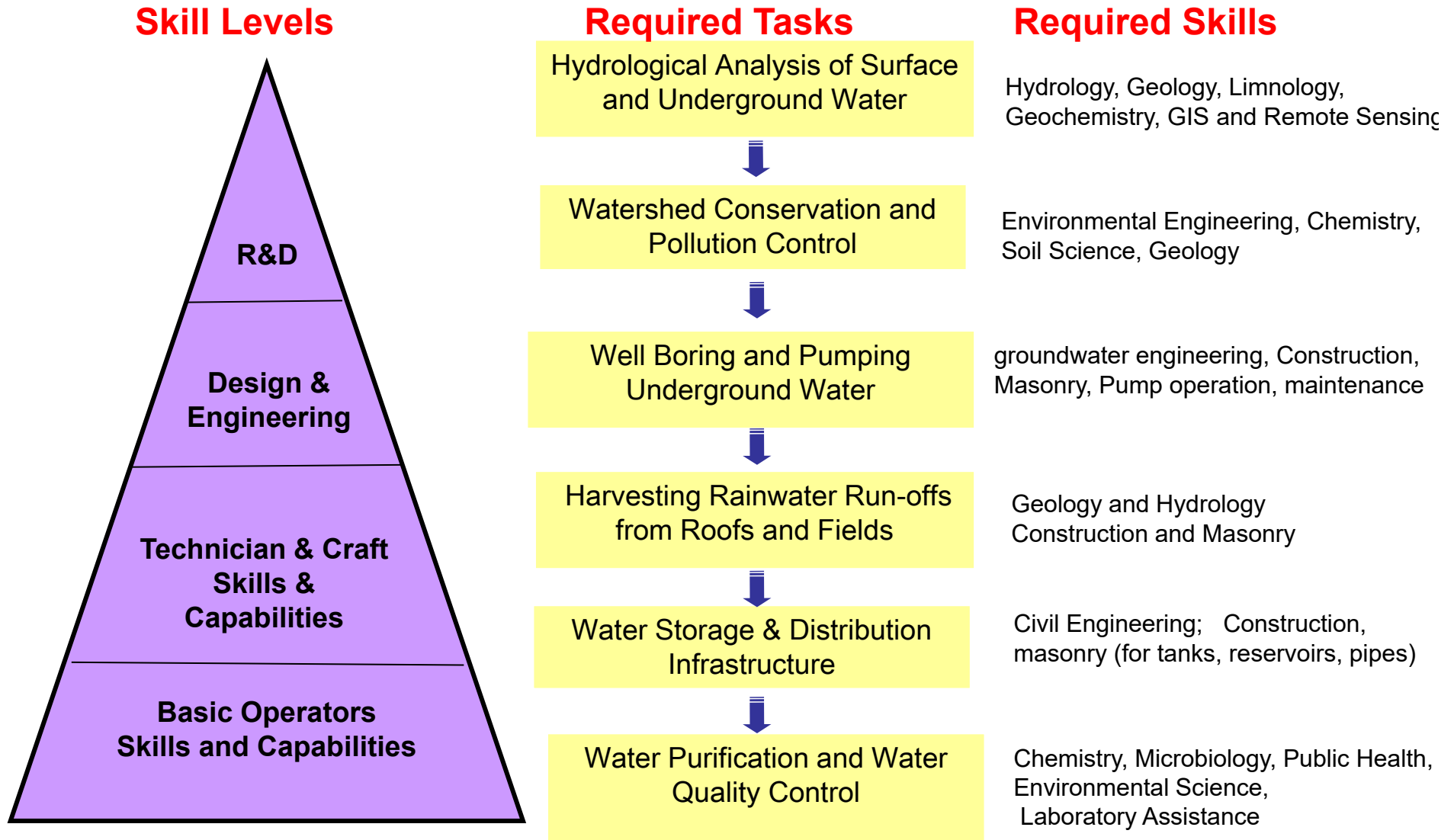
STI needs assessment focuses on solving a problem (ex: food processing capacity building) and probes across multiple silos to identify capacity needs.



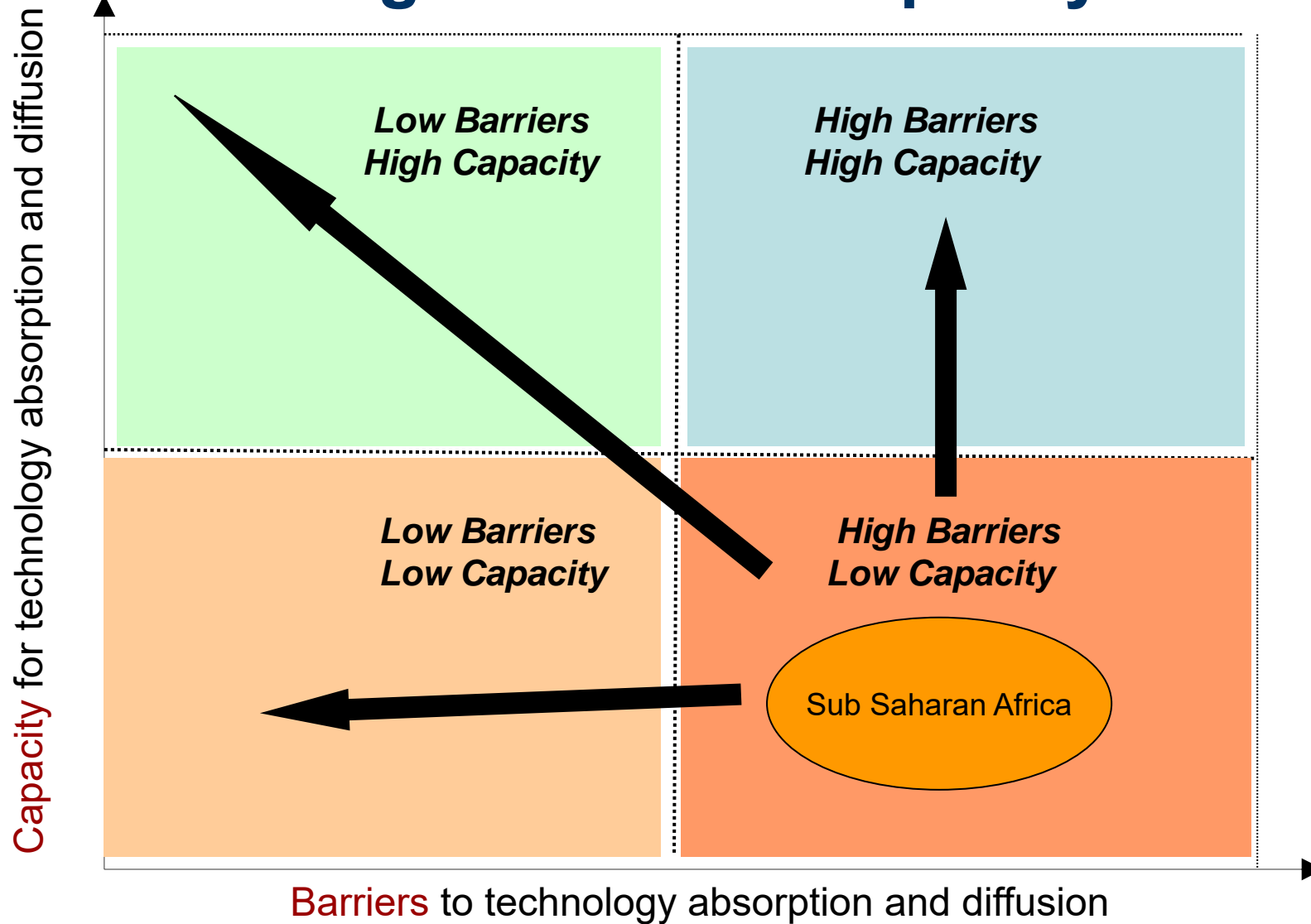
Cross-Cutting Nature of STI Capacity Building



Capacity building is needed at all skill levels



Removing Barriers ≠ Capacity Building



Public Private Partnerships are Essential

- The Government has an essential role to play in supporting essential research, providing basic education and creating an environment that will enable the private sector to create the jobs that will diversify the economy and generate wealth.
- But government investments in science and education will be wasted unless government capacity building programs are consistent with the needs and requirements of the private sector.

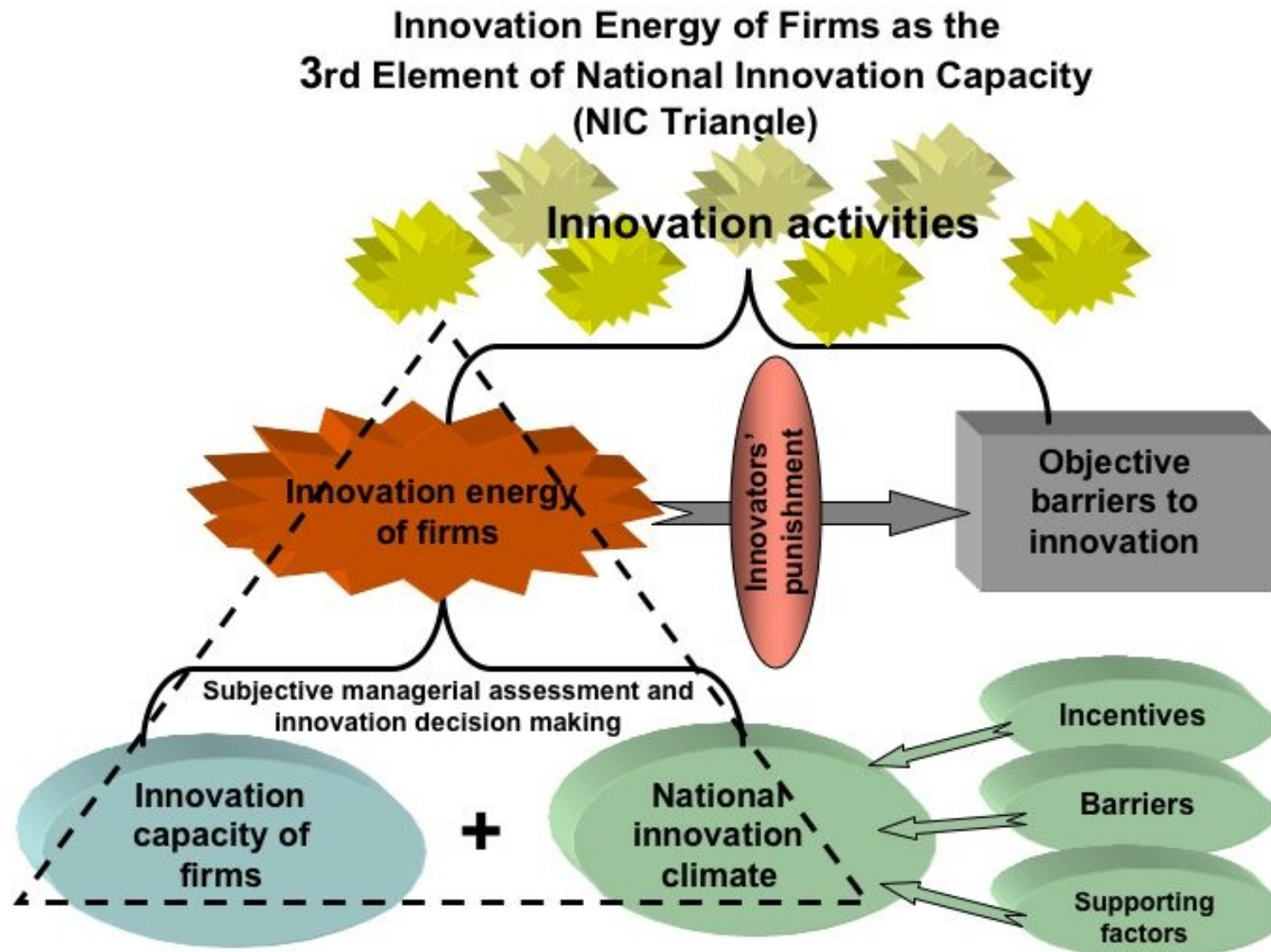


Entrepreneurship, Marketing, Management and Worker Training are Essential Elements of STI Capacity

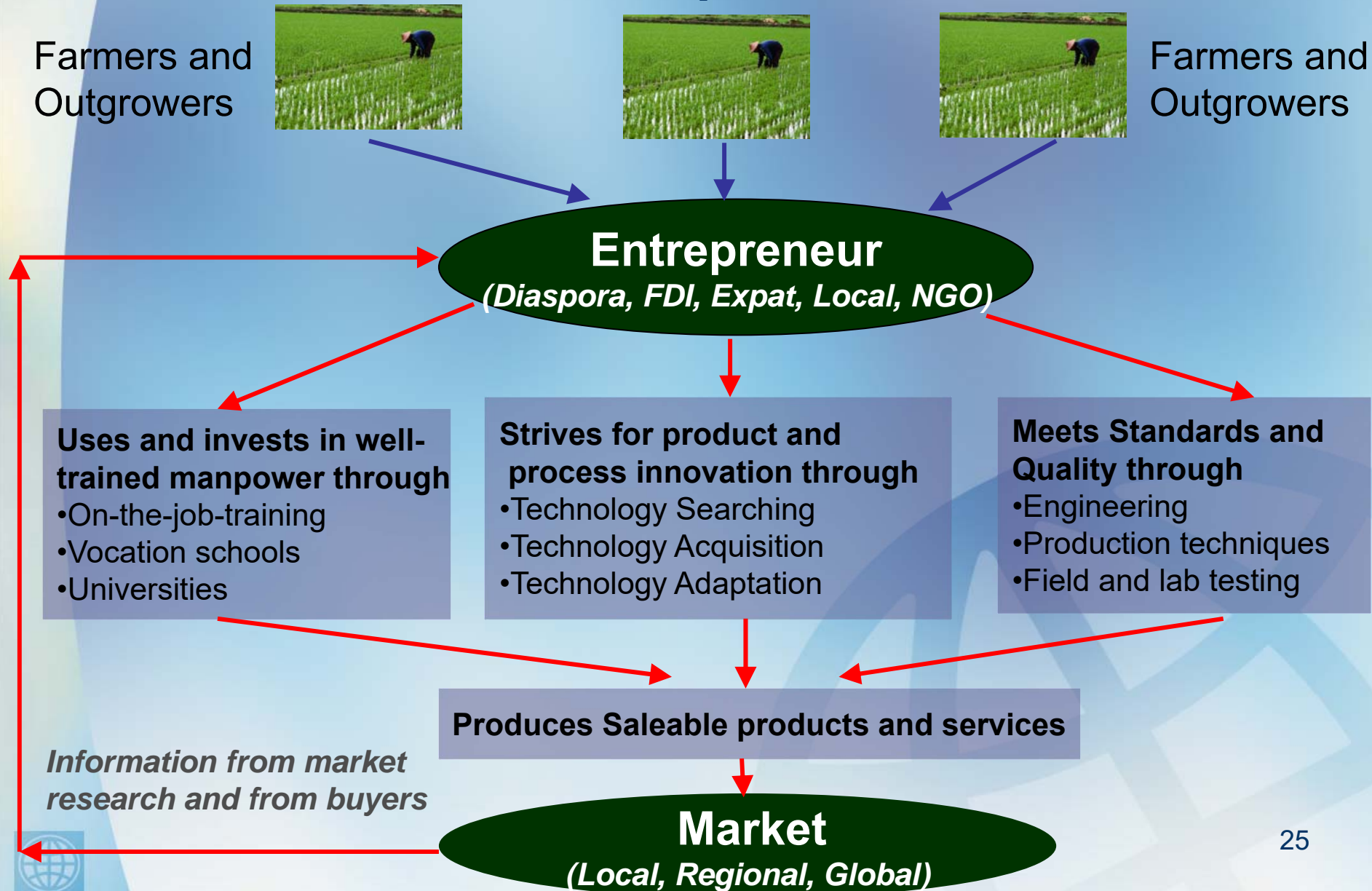
- ❑ STI capacity building is not just about research and development. It is also about ensuring that farmers and enterprises have the marketing, managing and entrepreneurship capacity to utilize new and existing knowledge to produce higher value added, more knowledge-intensive goods and services.
- ❑ It also means ensuring that Rwandan workers have the necessary skills to perform more sophisticated tasks.



Determinants of Enterprise Innovation



Enterprise-based model of STI Capacity Building: PPP Options



Implementation Capacity is Critical

- Because STI capacity building is a multi-sectoral, cross cutting issue, an effective capacity building program will put a premium on developing high quality implementation, monitoring, and coordination capacity within the Government
- Donor coordination and harmonization
- Private sector design and implementation



Implementation Challenges

Education and Human Resource Development

Ministry of Education
 Ministry of S&T
 Ministry of Labor
 Ministry of Commerce

- National University of Rwanda
- Kigali Institute of S&T
- Institute for Scientific and Technological Research

Rural Development

Ministry of Agriculture
 Ministry of Labor
 Ministry of Infrastructure

- Rural innovation Centers
- Farmers Association

Vocational and Technical Education and Training

Ministry of Education
 Ministry of Labor
 Ministry of Commerce
 Ministry of Infrastructure

- Vocation schools
- Technical School
- Rwanda Private Sector Federation

Packaging

Ministry of Infrastructure
 Ministry of Commerce
 Ministry of Agriculture

- ISAR
- Rwanda Environment Management Agency (REMA)
- Rwanda Private Sector Fed.

On the Job Training

Ministry of Education
 Ministry of Labor
 Ministry of Commerce
 Ministry of Infrastructure

- KIST, NUR
- Vocation and Technical schools
- Rwanda Private Sector Fed.

Building Capacity in Food Processing Industry

Private Sector Development

Ministry of Commerce
 Ministry of Education
 Ministry of Infrastructure
 Ministry of Finance

- Kigali Institute of S&T
- Rwanda IT Agency
- Business Dev. Service
- RIEPA

Transport and Power

Ministry of Commerce
 Ministry of Education
 Ministry of Infrastructure
 Ministry of S&T

- CITT(KIST)
- Institute for Scientific and Technological Research

Regulatory and Quality Management

Ministry of Commerce
 Ministry of Education
 Ministry of S&T
 Ministry of Agriculture
 Ministry of Sanitation & Environment

- KIST
- Rwanda Environment Mgmt Agency
- Rwanda Bureau of Standards

Detailed Findings



STI Needs Assessment

Appropriate Technology

- ***Linking SMEs and public technology agencies to end users and clients:*** A Technology Diffusion Fund to support technology diffusion proposals originating from firms, public technology agencies, and NGOs
- ***Building diffusion capacity in public agencies:*** Programs to build capacity in IRST and CITT for technology commercialization and diffusion capacity, and not just new development
- ***Building capacity for appropriate technology through TVET:*** Technical and vocational courses in hydro-energy, food processing, health technologies

STI Needs Assessment

Geosciences, Geothermal

- ***Building technical capacity in the government:*** A three-year technical support program in MININFRA to lead to resource assessment, resource testing and development of a pilot geothermal plant.
- ***Building applied research capacity in Geosciences:*** Setting a geosciences center of excellence in a Rwandan institution for underground water study, geothermal development, and mining development
- ***On-the-job training and international and regional training programs*** for engineers from local drilling company and from Electrogaz power company, local geologists and KIST and NUR students

STI Needs Assessment

Food Processing

- ***Capacity building in universities and linkage to industry:*** The establishment at KIST of self-financing 'production units' in dairy, milk, meat fruit, vegetables, beverages, cereals, bakery & brewing
- ***TVET training for food processing technicians*** in hygiene, basic food science, food handling and hotel skills. The graduating students to build micro-enterprises in rural areas.
- ***Building capacity in public regulatory agencies:*** Developing short, technical courses in KIST for Rwanda Environment Management Authority officials.

STI Needs Assessment

Value-Added Enterprises

- ***Building technical skills for workers through enterprise-based training*** through a Training Grant Facility to fund targeted training modules in horticulture, coffee, silk, pyrethrum enterprises
- ***Providing technical and financial assistance for technology searching and acquisition*** through a *technology advisory service and a technology acquisition trust fund is recommended*
- ***Building product design and development skills*** through short and medium term courses outside Rwanda for local industry workers

STI Needs Assessment

Value-Added Enterprises (2)

- ***Building capacity for soil management and organic production in horticulture enterprises*** through a proposed Rwanda Organic Production and Research Association working closely with local soil labs
- ***Codifying existing expertise in value-added industries and linking it to technical institutions*** through published textbooks on specific topics (such as “coffee cultivation and washing”) and linking these textbooks to technical and vocation school courses

STI Needs Assessment

Drinking Water

- ***Building capacity in water technicians through TVET system:*** Technical and vocational courses for spring workers, mechanics, tap keepers and managers for building and maintaining water networks
- ***Building capacity in public institutions:*** Training courses for Eletctogaz engineers in regional labs (Tunisia, Kenya) for water quality management and underground water assessment
- ***Building capacity in universities:*** Linking physics and chemistry courses in KIST to hydrogeology courses in regional universities for students and Electrogaz engineers

CONCLUSIONS



There is No Choice: “The world is moving fast...with or without you!”

Countries must develop the capacity to run faster



Because sometimes, falling behind is not a viable option







THANK YOU

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