

# **The Centrality of Science, Technology and Innovation to societal and economic transformation:**

## **Examples from local and international community.**

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# Introduction

## Definitions:

- **Science: Generation of new knowledge**
- **Technology: The use of science to develop products and services**
- **Innovation: Refers to Products, processes and services arising from technology**

## Introduction Cont..

- ST&I is essential components of social and economic development
- Social and economic forces drive research and technological development and the use of the outputs – the technological innovations.
- These outputs in turn impact society and the economy in different ways, intended or not.
- The results is new and/ or improved products, services and processes that can help raise the productivity and competitiveness of both enterprises and countries.
- The differences in ST&I capacities between developed and developing countries contribute to the growing social and economic divide

# Development Challenges in the 21<sup>st</sup> Century (Why the need for ST&I?)

“The changing Times: Agrarian age – Industrial age – Information age”

## Challenges facing Developed and Developing countries:

### Common Challenges;

Insecurity – Terrorism; Crimes

- Natural Disaster: Tsunamis, Earthquakes, Floods, Desertification, Global warming, Pollution, Rising sea levels etc

### Developed Countries (Examples)

- Market competition; Aging population; Drugs Abuses;

### Developing Countries:

Hunger, Poverty, Diseases and provision health care, Environmental Degradation, Peace and Security, physical infrastructure, unemployment, trade barriers etc.

# The Role of ST&I as cross-cutting and improving socio-economic activities.

Harnessing ST&I can lead to;

- Better provision of clean water and improved sanitation
- Improved health care, low mortality and morbidity
- Efficient and effective infrastructure
- Safer food and increased agricultural productivity,
- Better and more responsive disaster management,
- Improved quality and increase access to education through modern technology
- Access to new and more efficient and cleaner sources of energy and Environmental protection.

## Global Competitiveness Ranking

	2006/2007	2004	2003	2002
■ Finland	2	1	1	2
■ USA	6	2	2	1
■ Sweden	3	3	3	5
■ Taiwan	13	4	5	3
■ Denmark	4	5	4	10
■ Norway	12	6	9	9
■ Singapore	5	7	6	4
■ Switzerland	1	8	7	6
■ Japan	7	9	11	13
■ Iceland	14	10	8	12
■ UK	-	11	15	11
■ Netherlands	9	12	12	15
■ Germany	8	14	13	14
■ Australia	-	15	10	7

Source: World Economic Forum (WEF) Report 2007<sup>6</sup>

# Finland's Socio-economic Competitiveness Driven by ST&I

- Population of 5 M and area of 338,000 km<sup>2</sup>
- App. 80,000 people employed in R&D
- ICT sector is leading in its economy
- Export of electronic and electrical products make up to 1/3 of total export- Nokia
- Its strength: R&D support, Venture Capital Market, high education and lifelong learning
- Development mainly in University cities: Helsinki Univ. – Wireless comm. And IT; Uni. Oulu- Electronics and IT; Tampere- Electro-mechanical and automation industries; Turku- Biotechnology
- Cooperation between universities and private sector

## Finnish Innovations in different fields

- Leading in forest improvement
- Low temperature physics
- Brain research, biotechnology, genetics and communication technology
- Products: mobile phones, icebreakers, cruise liners, lifts, paper machines, contraceptives functional foods and numerous products in ICT
- 2000 patents applications annually- 70% patents.
- 1945 Nobel price in Chemistry (A. I. Virtanen); Method of treating silage
- Heart rate monitor, a major product around the world

# BENEFITS TO THE FINNISH SOCIETY

- Better quality of life and long life expectancy
- Better security: amongst the best in the world
- Respect amongst international community - pride
- Stable economy –High income per capita
- Good political dispensation
- Good infrastructure
- Excellent health care and provision
- Good social security
- Low unemployment rate
- Good environment protection

# Kenya's ST&I

- Main challenge facing Kenya in this century is the development of a knowledge-driven economy.
- The four pillars of a knowledge economy are:
  - Education and training
  - Information infrastructure
  - Economic incentives and institutional regimes
  - Innovations systems.

# Kenya's Sectoral Priority Areas

- Agriculture, Rural Development and related industries
- Health and Life Sciences
- Manufacturing, Trade & Industry
- Education, Training and Research
- Physical Infrastructure
- Energy
- Environment and Natural Resource Management
- Water resources sub sector
- Wildlife management
- Fisheries sector
- Minerals and mining sub-sector
- Information Communication Technology (ICT)

# Promoting farmer innovation in farmer field schools - Kenya's practical example

- A farmer field school (FFS) is a community-based practically-orientated field study programme,
- involving a group of farmers, facilitated by extension staff or by other farmers.
- The FFS provides an opportunity for farmers to learn together, using practical, hands-on methods of discovery learning.
- The methods emphasize observation, discussion, analysis collective decision making, presentation and taking appropriate action.

# Adapted technologies and their benefits

- Rain water harvesting in dry areas and water treatment
- Malaria prevention using pyrethrin treated bednets
- Vaccination- reduction in child mortality
- Mobile phone- revolutionize business and social activities
- Use of renewable energy in rural areas- wind, solar and biogas
- Teaching aided by computer images in schools
- Information access to the population- radio and TV

# **Lessons from Finland and Recommendations**

## **(What should be done!)**

**Define and establish high priority innovative platform and promote networking in all related activities**

**Encourage investment in the development and commercialization of STI products and services including ICT**

**Develop a broad-based, holistic innovation that goes beyond traditional industrial and technology policy**

**Develop and implement programs to facilitate public-private sector partnerships for product development, up-scaling and commercialization.**

**Policy fields should include competition and enterprise, environment, and labour policies**

## Quotes!

- *"We are happier if we have reason to believe that the future will be better than the past. Stated simply, ongoing innovation makes us feel that way."*  
*Alexander Wehr.*
- *Success is a poor teacher, we learn the most about ourselves when we fail....*
- *You can never find until you define!*

THANK YOU