

Institutional Technology Transfer Policies and Strategies in East Africa: Lessons from Universities and R&D Institutions

A Background Paper for Tanzania

By

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STIPRO

Structure

- Socio-economic situation for Tanzania
- Development plans & Place of STI
- National R&D Policy 2010
- Size & Types of R&D
- Linkage between Research & use
- Problems associated with commercialization of R&D findings
- Conclusion

Socio-economic Situation of Tanzania

- Rapid population growth
- According to Census 2012: 44,299,002 with birth rate of about 2.9% increase per year
- About 80% of population live in rural areas and depend largely on agriculture for livelihood (ILS 2006)
- Tanzania is recording both rapid & unwilling improvement in the socio-economic indicators (World Development Indicators database)

Social Indicators, Selected

	2005	2006	2007	2008	2009	2010	2011
Life expectancy at birth, total (years)	53.3	54.1	54.1	55.7	56.5	57.3	58.1
Mortality rate, infant (per 1,000 live births)	62	59.1	55.9	53	50.5	47.8	45.4
Literacy rate, adult total (% ages 15+)						73.2	
Health expenditure, total (% of GDP)	3.88	6.5	5.69	5.45	5.5	6.01	
Public spending on education, total (% of GDP)					6.82	6.18	
Prevalence of HIV, total (% of pop - ages 15-49)	6.1	6	5.8	5.8	5.8	5.8	5.8
Prevalence of undernourishment (% of pop)	35.1			36.1			38.8

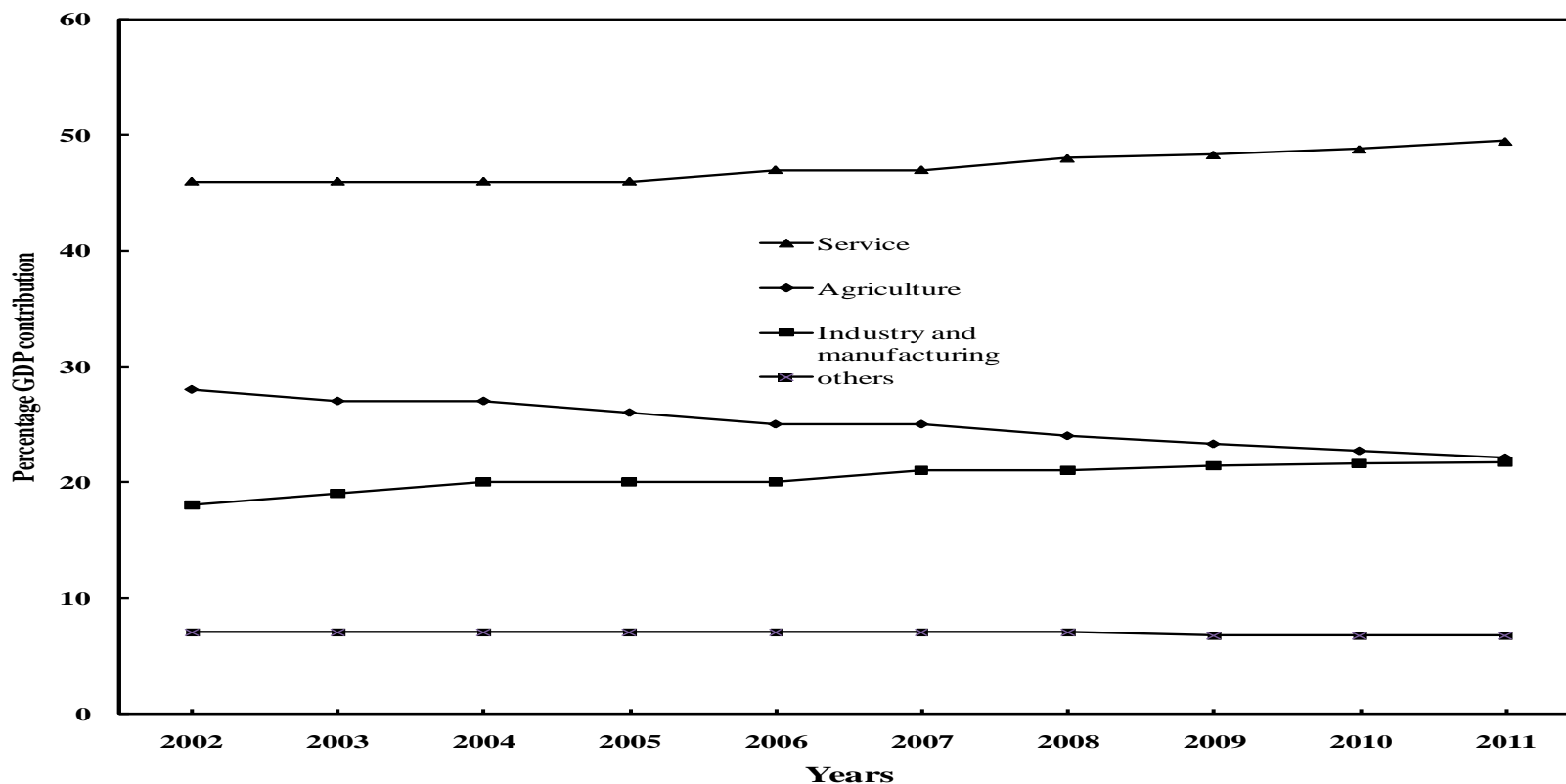
Economic Indicators, Selected

	2005	2006	2007	2008	2009	2010	2011
GDP growth (annual %)	7.3	6.7	7.1	7.4	6.02	7.04	6.4
Gross savings (% of GDP)	17.4	17.4	16.2	18.7	19.9	24.5	20.3
GDP fixed capital formation (% of GDP)	24.6	24.6	27.2	29.3	28.4	31.5	36.05
Inflation, consumer prices (annual %)	5.03	5.03	7.2	10.2	12.1	6.2	12.6
Current account balance (% of GDP)	-7.7	-7.6	-10.1	-12.3	-8.4	-8.3	-16.5
GDP per capita (constant 2000 US\$)	379.6	394.2	410.6	428.7	441.5	458.7	473.8

Socio-economic Situation (cont...)

- Poverty is the main problem & Government interventions are recording slight reduction of incidence
- In 2000, 36% were poor with most of vulnerability (83%) found in rural areas (ILS, 2000)
- The incidence is still high despite a decrease to 33.6% in 2007 (Osberg & Bandara, 2012)
- Persistence of poverty reflects that growth of GDP is mostly from non-employment generating sectors

Socio-economic Situation (cont..)



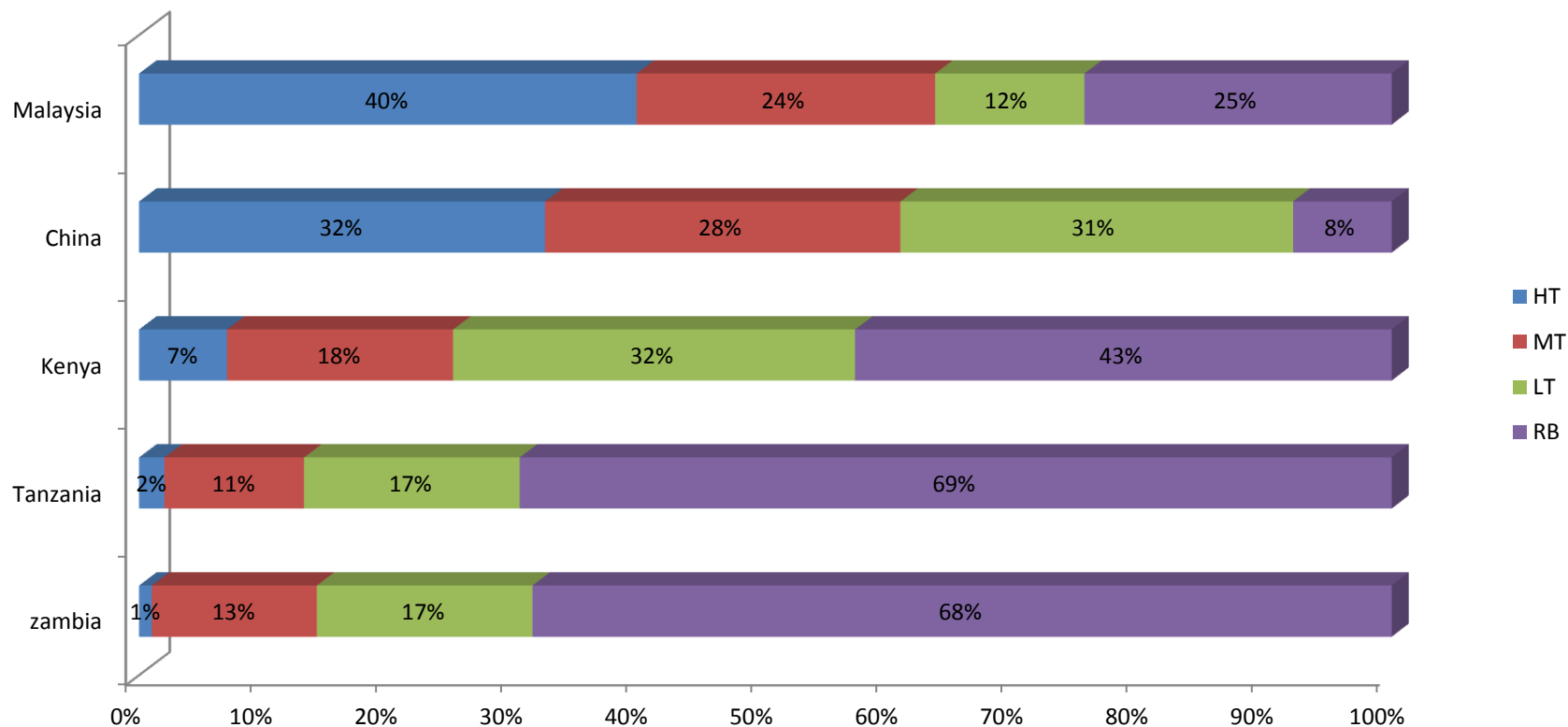
Socio-economic Situation (cont...)

- This suggests a premature structural transformation
- Normal process starts with modernization of agriculture to modern industrial society
- Currently, the structural composition of Tanzania manufactured exports shows that Tanzania is heavily dependent on low value added, resource-based manufactured and low technology products

Socio-economic Situation (cont...)

Structure of Exports by Technology Classification

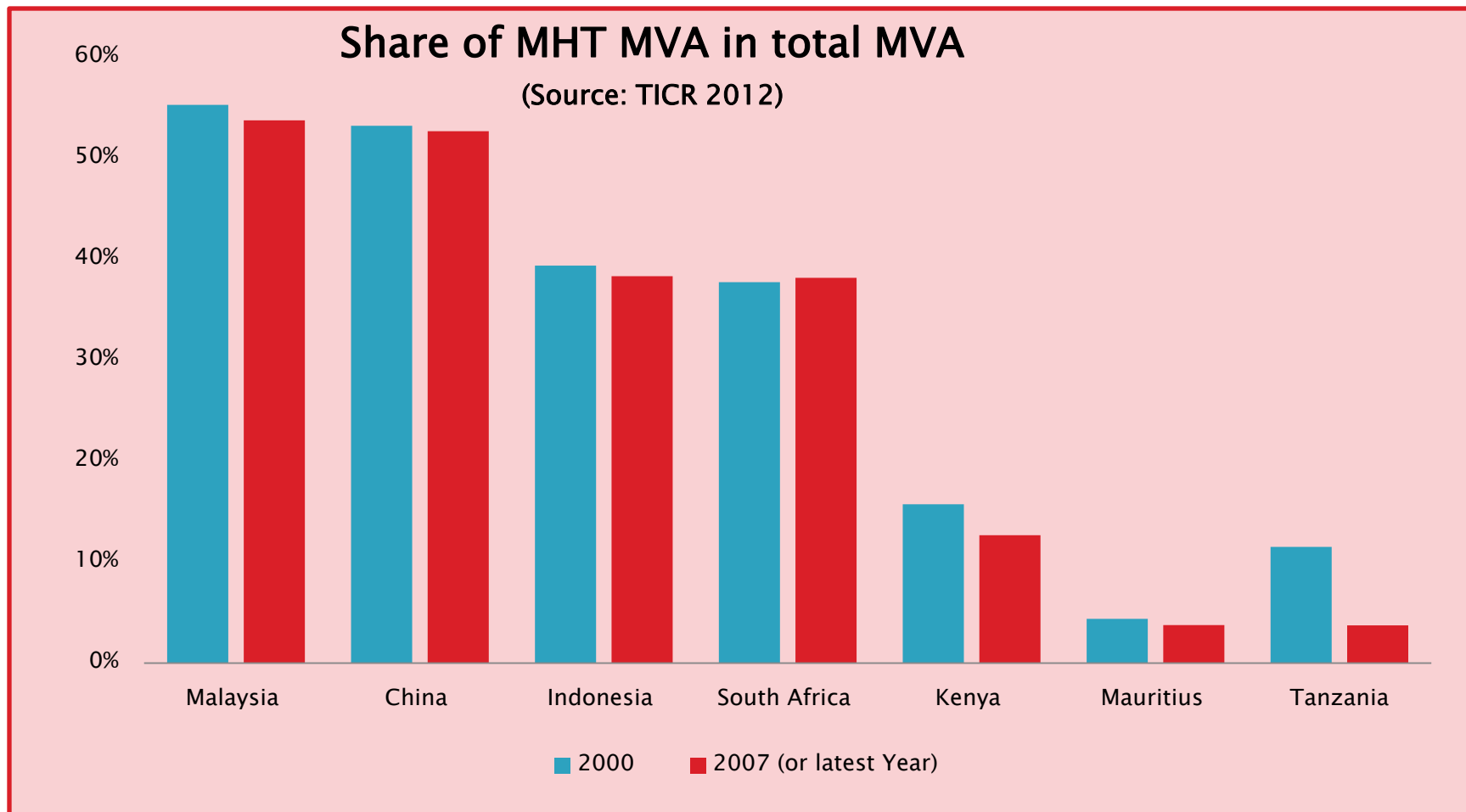
(Source: TICR 2012)



Socio-economic Situation (cont...)

- For Tanzania to compete in better position in the world market, it needs to engage in activities of high value addition and use sophisticated technologies and specialized human resources
- Currently, value addition in Tanzania is still dominated by low processing of resource-based products
- The level of technology sophistication is low, and Tanzania has become less sophisticated over the period

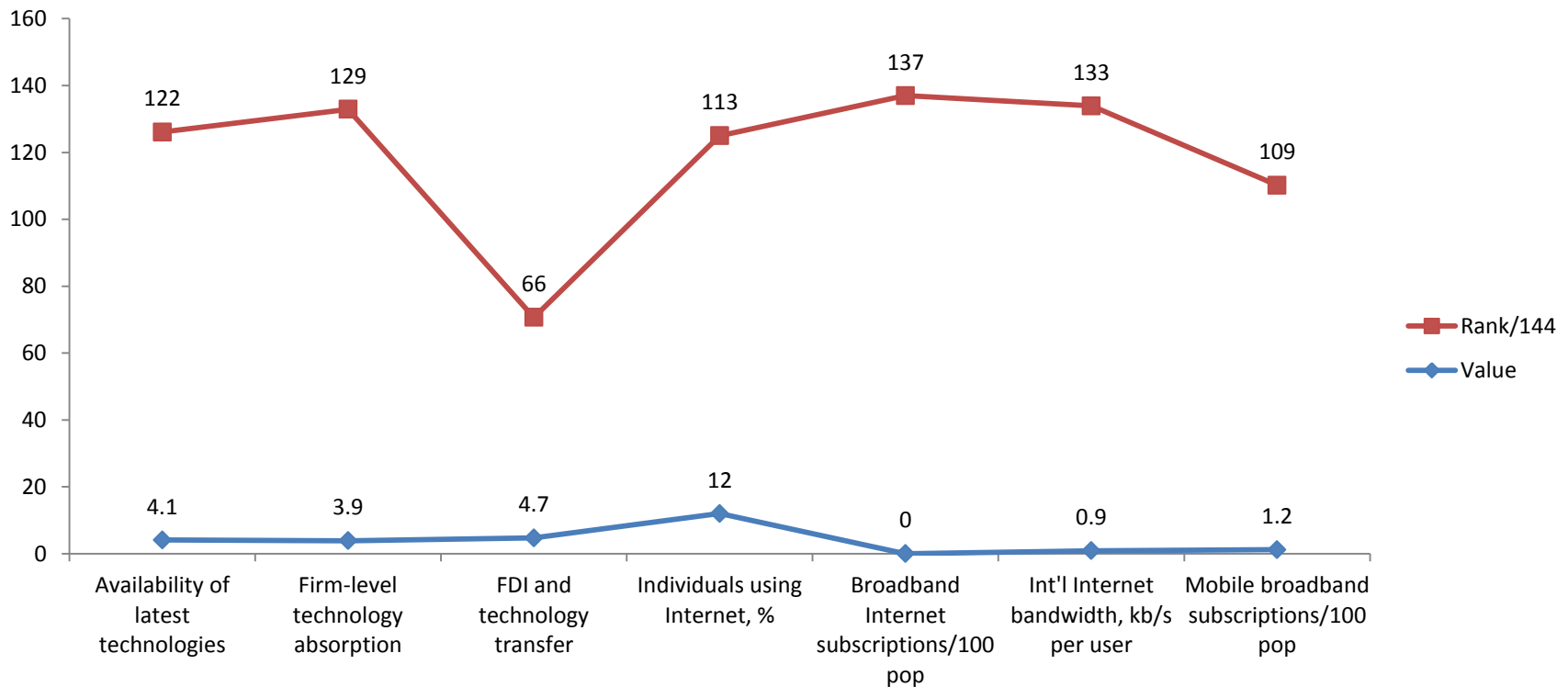
Socio-economic Situation (cont...)



Socio-economic Situation (cont...)

Technology Readiness in Tanzania

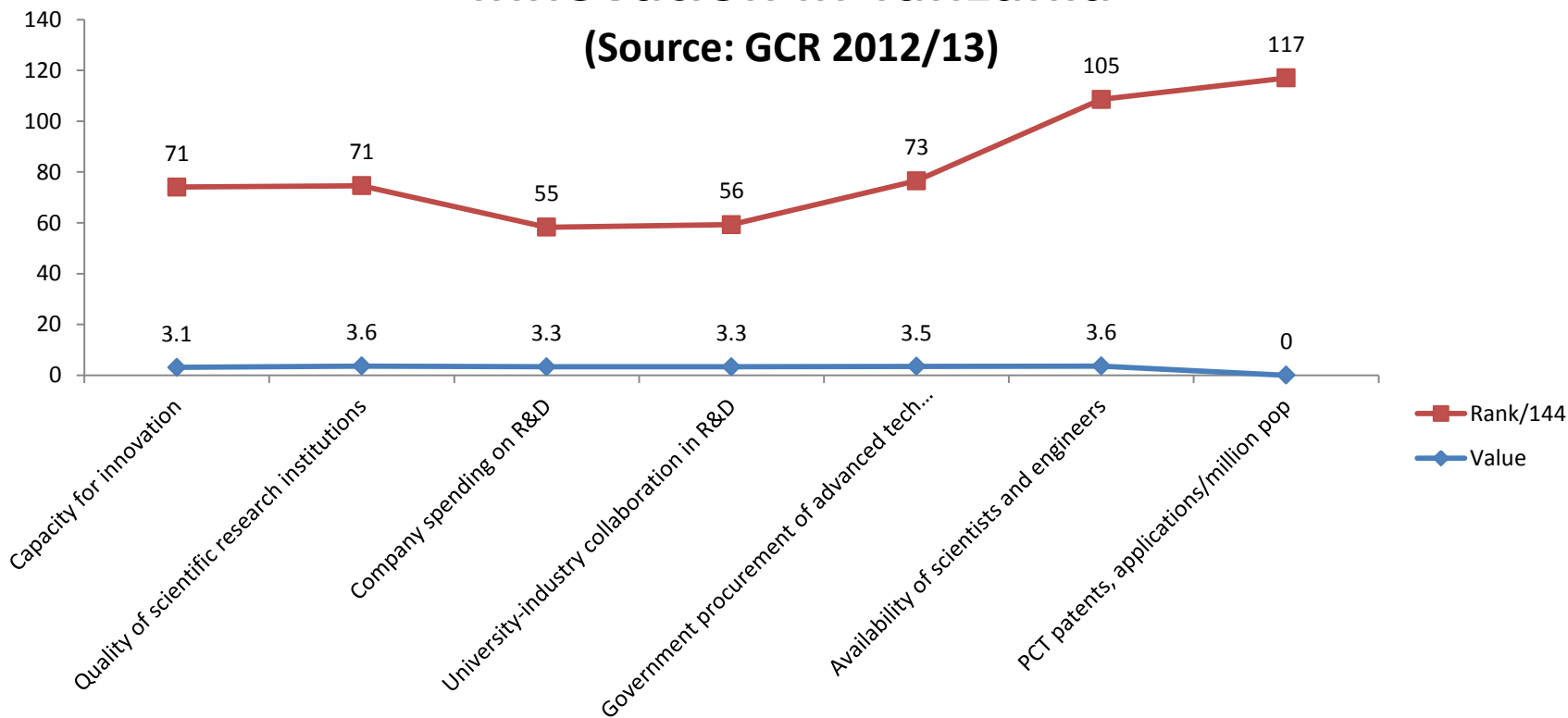
(Source: GCR 2012/13)



Socio-economic Situation (cont...)

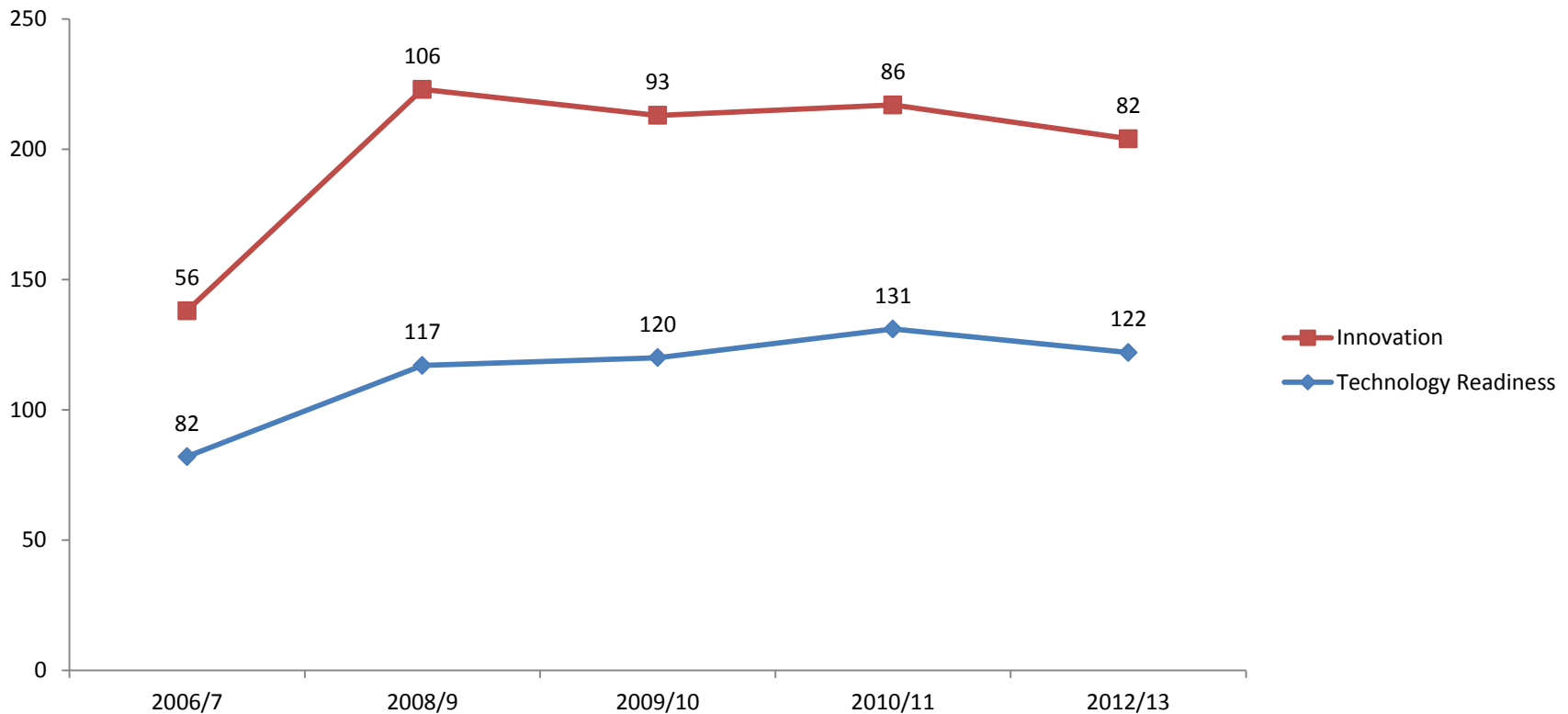
Innovation in Tanzania

(Source: GCR 2012/13)



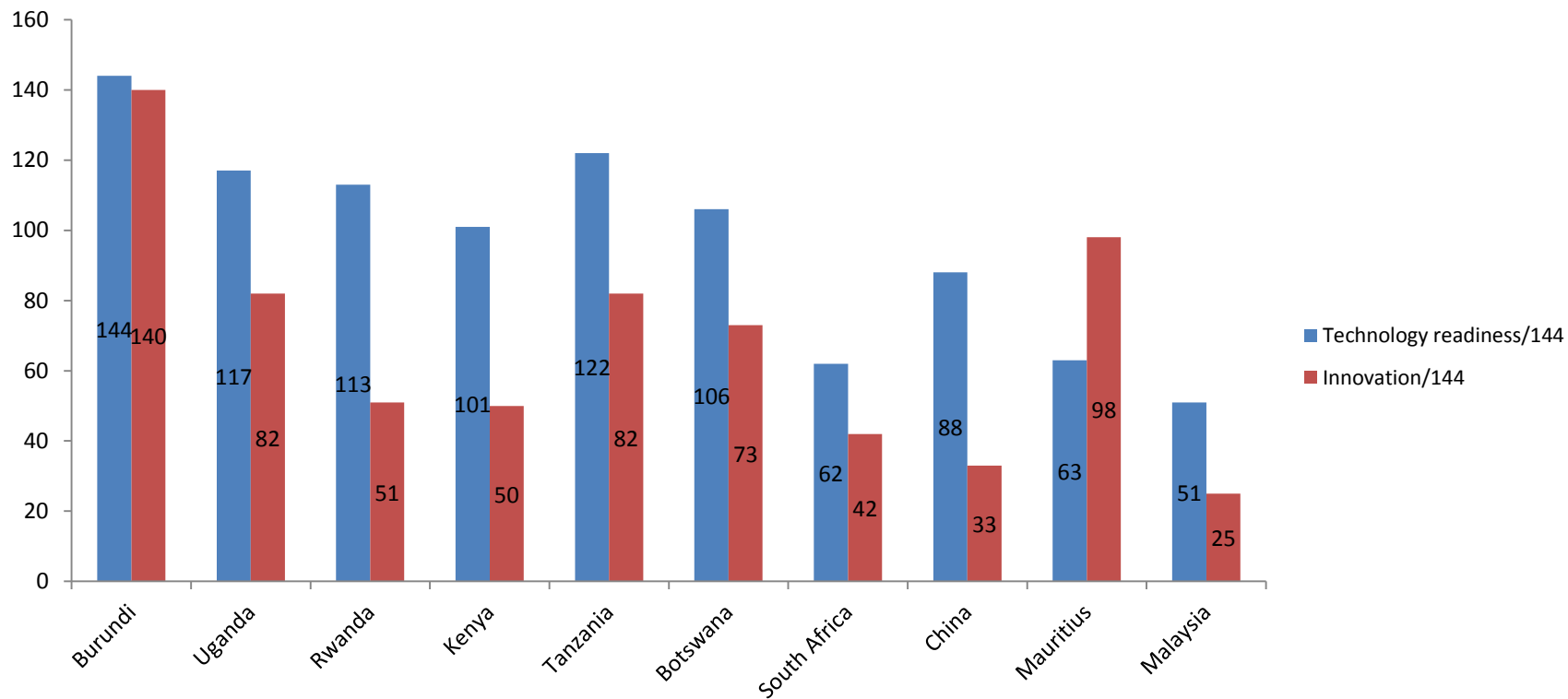
Socio-economic Situation (cont...)

Technology and Innovation Ranking Trend: Tanzania
 (Source: GCR 2012/13)



Socio-economic Situation (cont...)

Ranking: Tanzania and Comparators
(Source: GCR 2012/13)



Development Plans & Place of STI

- Aspirations to achieve rapid and sustainable socio-economic development
- Vision 2025: build strong dynamic, resilient & competitive economy
- FYDP (2011/12-2015/16): unleash the country's resource potentials to fast track the provision of the basic conditions for broad-based & pro-poor growth
- Kilimo Kwanza: transform agriculture into modern & commercial use

Development Plans & Place of STI (cont...)

- IIDS 2025: make industrial sector the engine of economy growth
- MKUKUTA II: growth & productivity . The target is to increase the GDP growth from 6% (2009) to 8-10% per annum by 2025
- STI is key driver for competition, growth & development in agriculture, manufacturing, and services. It is therefore imperative for Tanzania to embrace STI in its development activities
- Yet, there exists the ICT backbone: national fibre-optic cables

National R&D Policy 2010

- R&D is key instrument for growth & productivity
- So far, there is no National Innovation Policy, but we have National R&D Policy 2010 formulated to ensure that knowledge from R&D is relevant to address socio-economic challenges
- Innovation & commercialization of R&D findings are key drivers of economic growth & solution to societal problems: Supply & demand sides
- Its implementation enables Tanzania to address the challenges of technological innovation & globalization

National R&D Policy 2010 (cont...)

- Priority areas:
 - Coordination, Prioritization; Research capacity development & ICT; Commercialization & dissemination; HRD & management; financing; Ethics & IPR; Partnership & Networking; Regional & International cooperation; Cross-cutting issues (gender, environment & occupational risks, e.g. HIV/AIDS)
- Level of funding:
 - donor: 51%; R&D: 31%; Government: 14.14%; local donors: 4.4%
 - 0.22% of GDP (2005); 0.43% (2007)
 - 1% of GDP (Government decision)

Size & Types of R&D

Public Research institutions:

- 30 agriculture & livestock; 9 industry & energy; 4 natural resources; 6 medicine & public health (COSTECH website)

Private Research institutions

Tertiary institutions: 31 Universities/colleges (R&D Policy 2010)

Responsibility of R&D institutions:

- Providing skills & knowledge
- Reviewing priorities from time to time
- Undertaking research that meet the demand including commercialization

Linkage between Research & Use

- A number of researches carried out have been applied to solve societal problems (R&D Policy 2010)
- E.g.
 - Eradication of tsetse flies in Zanzibar
 - Conservation of indigenous fruits and development of tree biotechnology
 - Development of new drugs and formulations from indigenous plants
 - Development of improved breeds of cattle, goats, sheep, chicken
 - Introduction and commercialization of seaweed farming
 - Development & dissemination of equipment and machinery
 - Development of better environment and natural resources management methods

Problems with Commercialization of R&D Findings

- Low level of commercialization
 - Low level of linkage; low demand of R&D outputs (Diyamett & Makundi, 2012; Wangwe & Diyamett, 1998))
 - Efficiency & relevance of R&D results (Diyamett & Makundi, 2012)
 - Huge competition from cheap imported technologies (Mmasi & Koshuma, 2008)
- Weak coordination mechanisms for linkages & harmonization of R&D activities (R&D Policy 2010)
 - Finance for commercialization (CAMARTEC & TEMDO)
 - Weak linkage between researchers & extension service providers at district level (Coulson & Diyamett, 2012)
 - Poor infrastructure & legal instruments (IPR) (R&D Policy 2010)

Conclusion

R&D stimulates growth and increased productivity

A big challenge with R&D activities: most of results are not put into practice

Mechanism to Transfer Research results from R&D is thus less effective that hinders its role as key driver of economic growth & solution to societal problems

Previous studies based on anecdotal findings of isolated cases. In addition, they lack elements of institutional policies & strategies

Conclusion (cont...)

- Need for a comprehensive research to derive lesson for policy and strategies at institutional level that will foster commercialization of research products.
- It is important to document strategies & practices that led to successes in TT, so that they can be emulated elsewhere and feed-back into both at institutional & national level policies

Thank you very much