
Innovation in Africa

Some Basic Concepts

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Innovation in the African Context
A Forum for Policymakers

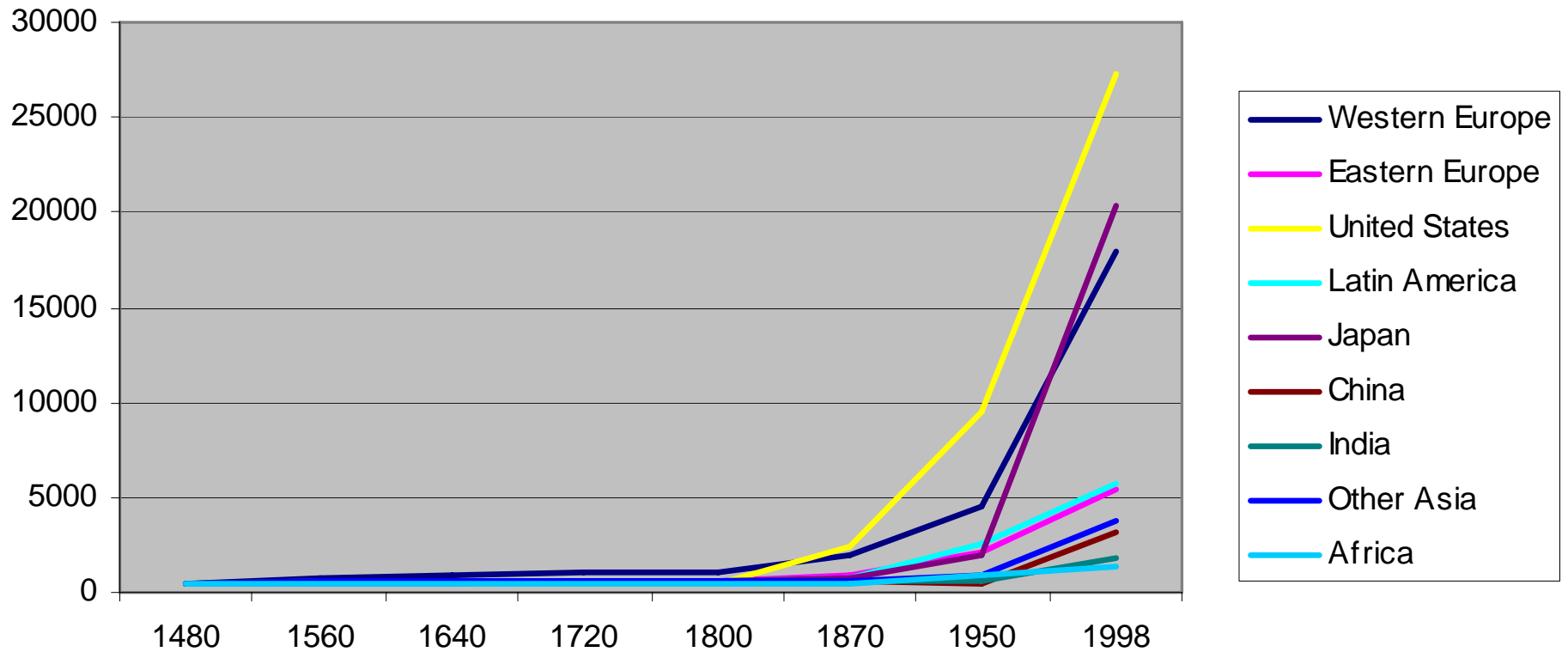
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Structure of Presentation

1. Growth of Different Regions
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 3. Benchmarking Africa
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 5. Lessons Learned
 6. Market Failures in Use of Knowledge
 7. Top Down Initiatives
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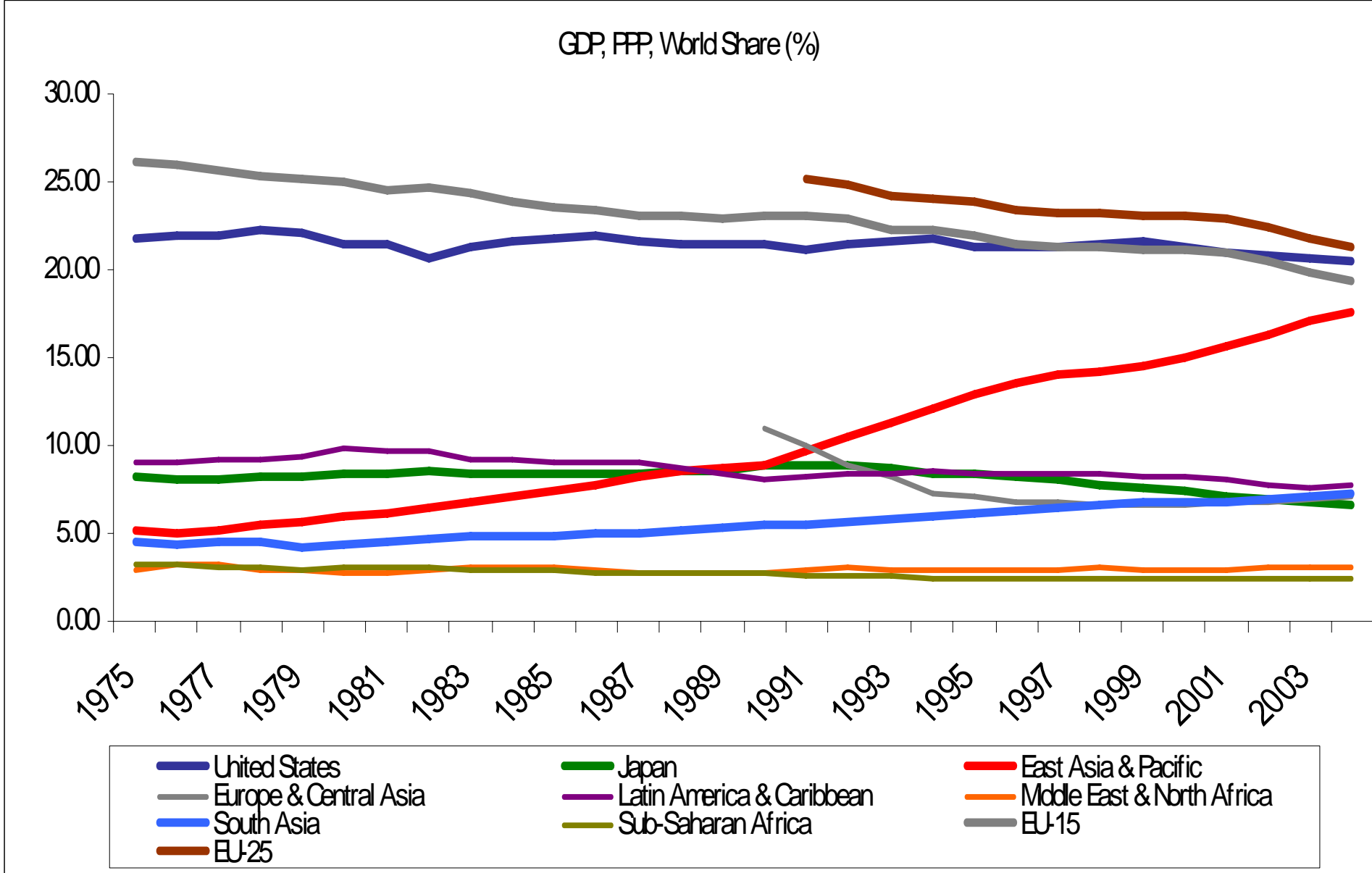
Growing Regional Differences in GDP/Capita

**Per Capita GDP for Selected Regions or Countries
(1990 international \$, 1480-1998)**



Source: Calculated from Angus Maddison, *The World Economy : A Millennial Perspective*, OECD: Paris, 2001

Changing Regional Shares of Global GDP (PPP)



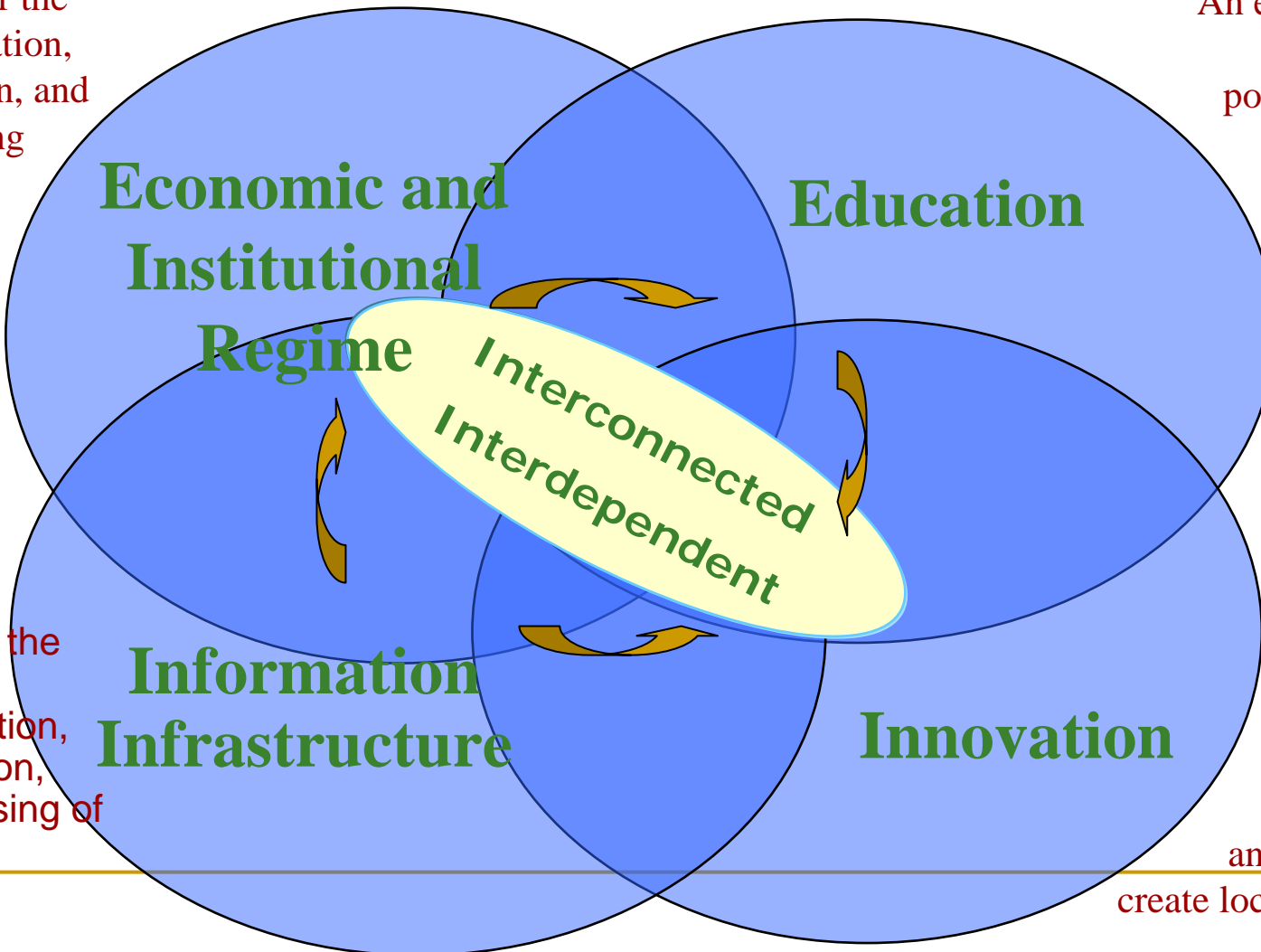
Global Innovation & Competition Trends

- Speed-up in creation and dissemination of knowledge
 - Increased trade liberalization
 - Increased globalization
 - Increasing role on MNCs
 - Increasing importance of ICTS
 - Increasing importance of education and training, and high level human capital
 - Increased importance of innovation
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The Four Pillars of the Knowledge Economy

EIR provides incentives for the efficient creation, dissemination, and use of existing knowledge

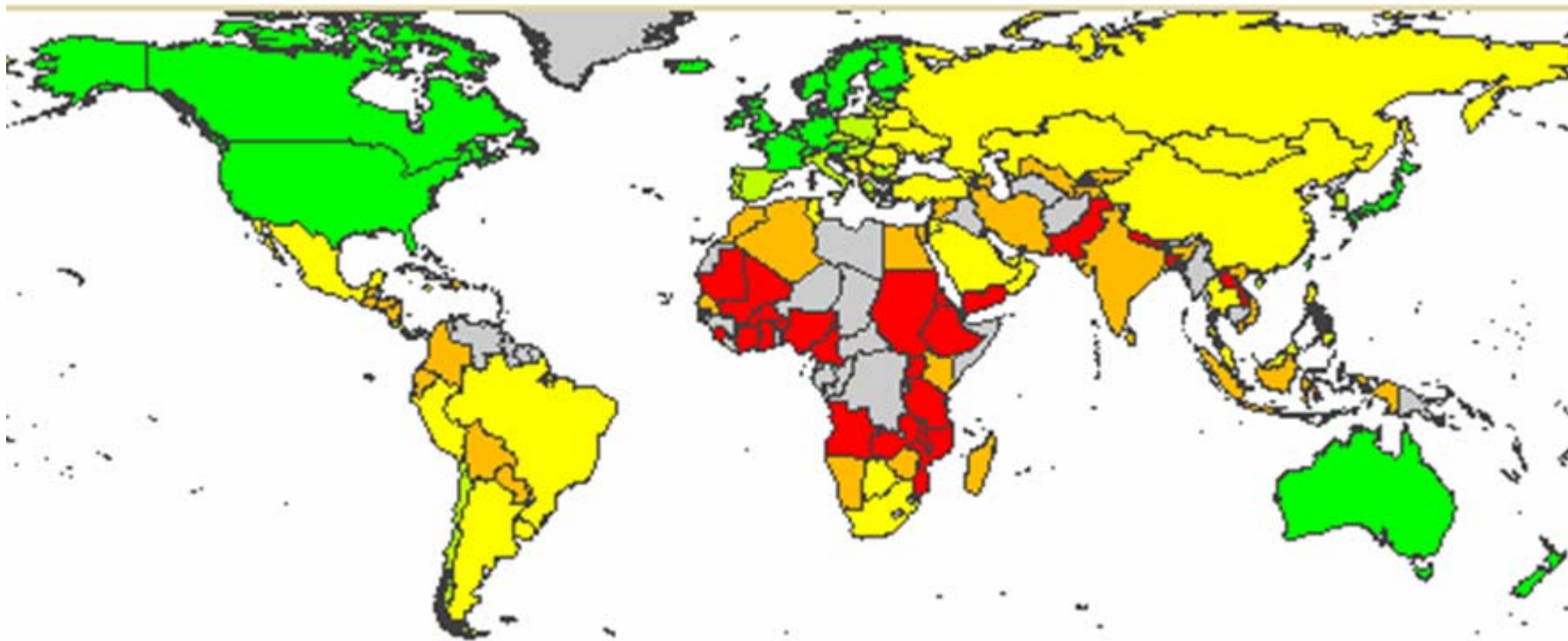
An educated and skilled population that can use knowledge effectively



To facilitate the effective communication, dissemination, and processing of information.

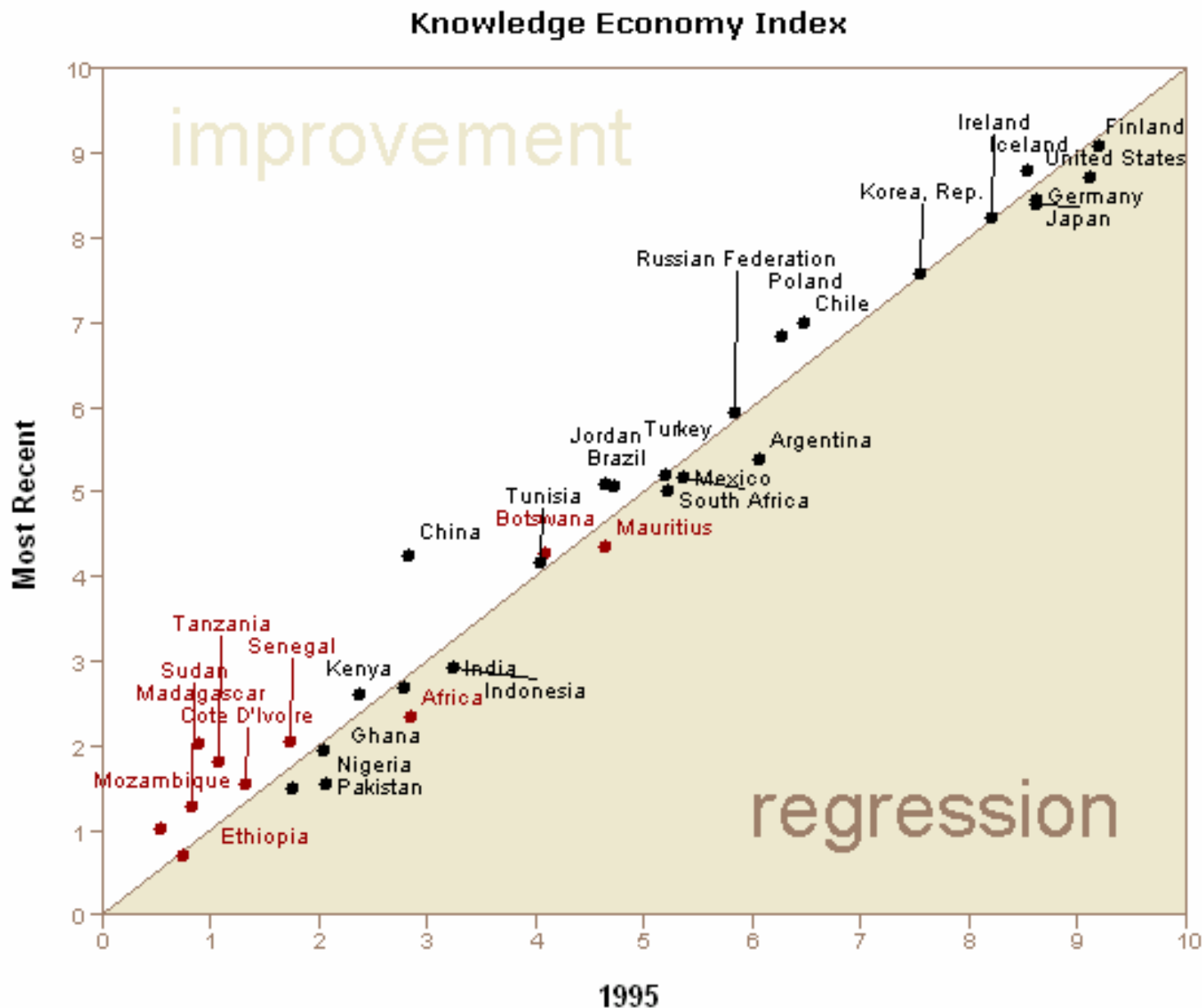
Innovation consisting of organizations that can tap into the stock of global knowledge, assimilate and adapt it and create local knowledge

KE Map of the World (2006 KAM)



Source: www.worldbank.org/kam

Knowledge Economy Index-Africa in World



Population Indicators for Country Groups at Different levels of GDP/Capita

Average per capita income	Low Income (\$825 or less) \$507	Sub-Saharan Africa (\$90-\$4360) \$601	Lower Middle Income (\$826-\$3255) \$1686	Upper Middle Income (\$3256-\$10,066) \$4767	High Income (\$10,006 or more) \$32,112
Population Growth rate 1990-2004	2.0	2.5	1.1	0.9	0.8
% Population below 15 yrs	36.8	43.7	25.5	24.9	18.4
Life Expectancy at Birth 2004	59	46	70	69	79
% Population Rural 2004	69	64	51	28	22
Secondary enrollment ratio	46	30	72	87	105
Tertiary enrollment ratio	9	5	20	40	67

Some Basic Innovation Concepts

- Innovation is the first application of knowledge in practical use
- Innovation in developing countries is not just new at global frontier, but new to local context
- Useful to distinguish five innovation related concepts
 - Creation
 - Acquisition
 - Adaptation
 - Dissemination
 - Use
- They require different policies, mechanisms and capabilities

Policy, Institutions, Capabilities Matrix

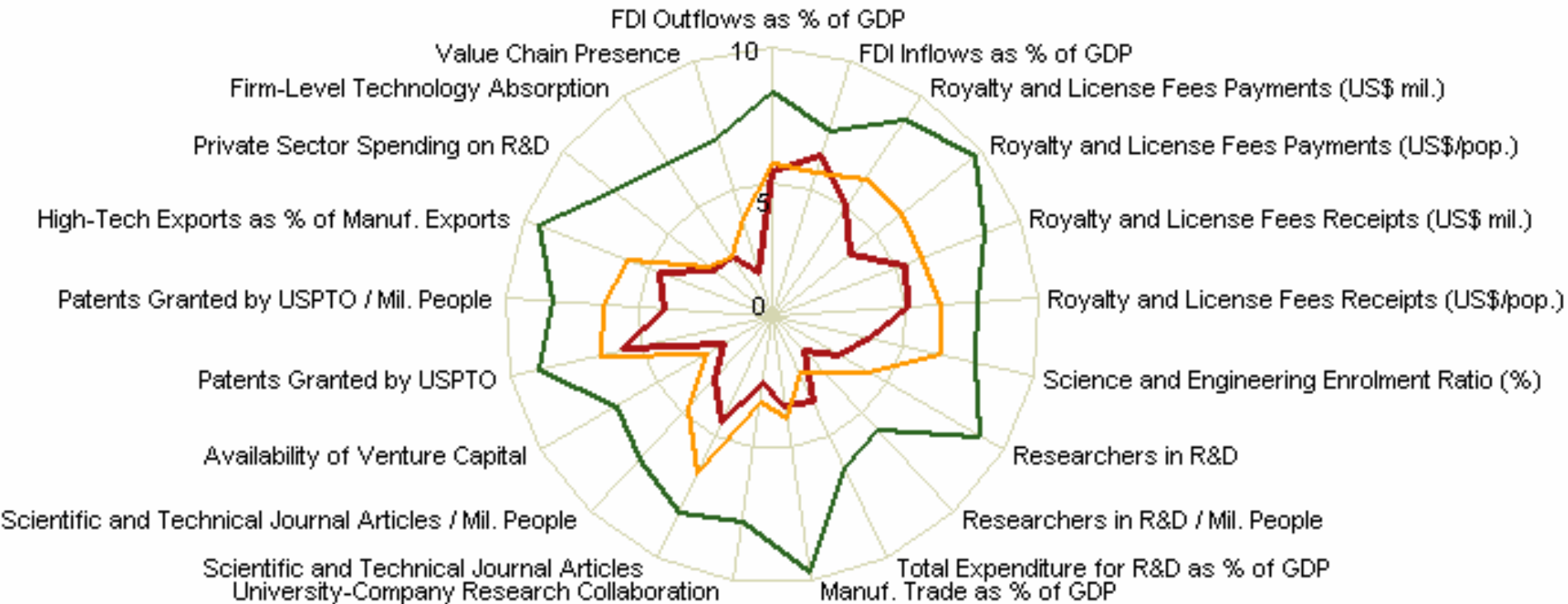
	Policies/Instruments	Institutions	Capabilities
Creating and Commercializing Knowledge	<ul style="list-style-type: none"> ● Public spending on R&D <ul style="list-style-type: none"> - National Mission Programs - Competitive R&D Grants - Peer Review ● Public policies for R&D <ul style="list-style-type: none"> - Matching R&D Grants - Tax Subsidies for R&D - IPR Regime ● Public policies for the commercialization of publicly financed knowledge such as new innovation law ● National Research Education Networks 	<ul style="list-style-type: none"> ● Public R&D Labs and Universities ● Private R&D labs in firms and private universities ● Informal innovation taking place in firms ● Specialized govt agencies supporting creation and commercialization of knowledge ● Specialized NGO innovation institutions ● Intellectual property right institutions ● Technology transfer officers in public R&D Labs and universities ● Science Industrial Parks ● Business incubators. ● Early stage finance and venture capital 	<ul style="list-style-type: none"> ● High level human capital for R&D <ul style="list-style-type: none"> - Scientists - Engineers - Technicians ● Techno-entrepreneurship
Acquiring Global Knowledge	<ul style="list-style-type: none"> ● Openness to outside <ul style="list-style-type: none"> - Trade - Foreign direct investment - Technology import policy ● Foreign <ul style="list-style-type: none"> - Education - Business travel and trade shows - Publications and databases - Internet access ● Attracting Diaspora back home ● Setting up R&D antennae abroad 	<ul style="list-style-type: none"> ● Firms ● Universities ● Government Departments ● Individuals ● NGOs 	<ul style="list-style-type: none"> ● Global Scanning ● Technology assessment ● Technology Negotiation ● Adaptation to domestic conditions

Policy, Institutions, Capabilities Matrix (continued)

	Policies/Instruments	Institutions	Capabilities
Diffusing and Using Knowledge	<p>Public policies towards the dissemination and use of knowledge such as for setting up technological information and technology extension services</p> <ul style="list-style-type: none"> • Policies toward standards • Policy toward Intellectual Property Rights 	<ul style="list-style-type: none"> • Technical information services • Extension services in <ul style="list-style-type: none"> - Agriculture - Industry and services • Productivity organizations • Technology support institutions and programs • Metrology, Standards and Quality Control System • Industrial Clusters 	<p>Literacy Numeracy</p> <ul style="list-style-type: none"> • Communication Skills • Job and technology specific skills • Management skills
Broader Enabling Environment	<ul style="list-style-type: none"> • Competition and trade policy • Effective Regulatory Policy • Support for entrepreneurship • Good rule of law • Good macro stability 	<ul style="list-style-type: none"> • Efficient Financial System • Flexible Labor Markets • Fair Courts and Justice System • Effective Governance • Effective Formal Education Institutions and Lifelong Learning System 	<ul style="list-style-type: none"> • Capabilities to ensure <ul style="list-style-type: none"> • Macro stability • Rule of law • Security • Efficient capital and labor markets • Basis citizenship skills • Education and skills required to compete in an increasingly demanding global economy

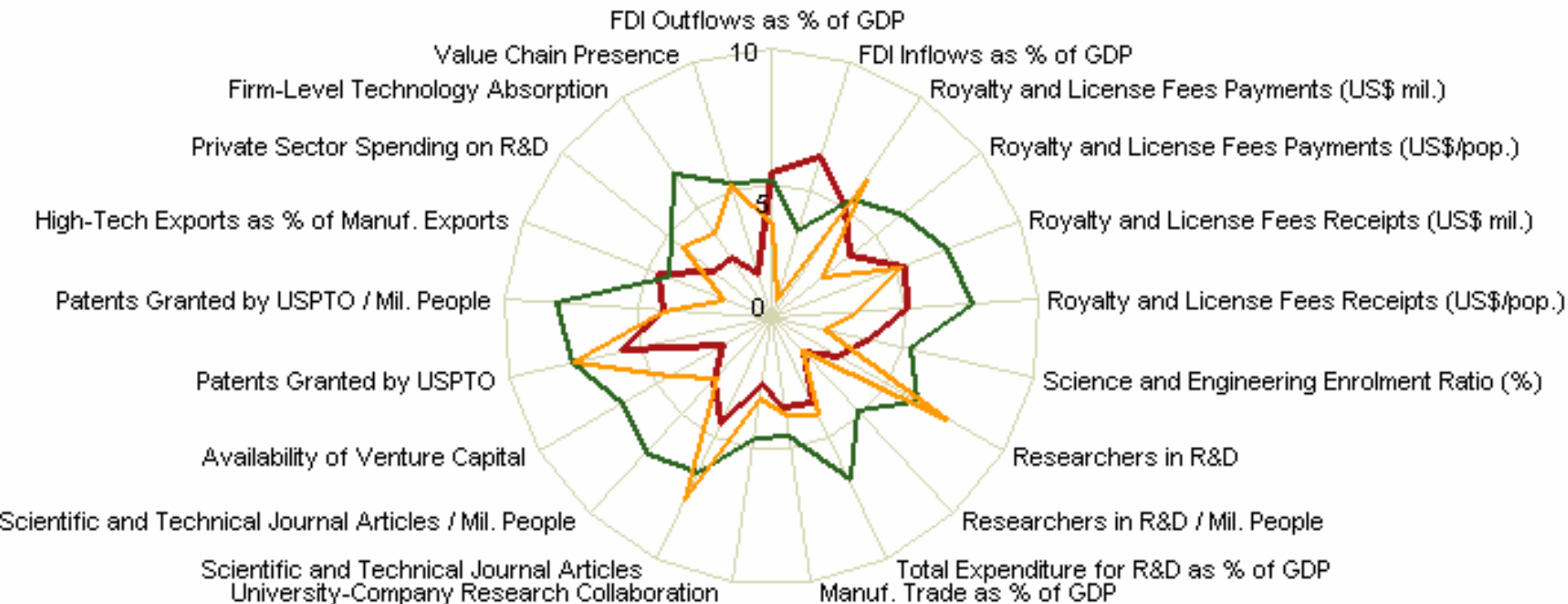
Africa Innovation Scorecard--1

Africa, East Asia, Latin America



Africa Innovation Scorecard-- 2

Africa, Middle East and North Africa, South Asia



Lessons Learned-Creation

- Don't focus just on R&D. Innovation also comes from knowledge already existing elsewhere
- Don't focus just on creating knowledge. Also need to get knowledge into use.
- Develop incentives and mechanisms make knowledge creation relevant to needs of economy and to transfer it.
- Don't focus just on agriculture and industry. Services is the largest sector.
- Need to promote more interaction among research centers, enterprises and universities.
- Tap formal R&D in public and private sector to address needs of the poor
- Support collection and improvement of indigenous knowledge

Lessons Learned-Acquisition

- Don't reinvent the wheel. Scan the world for knowledge relevant to countries needs.
- Remove constraints on accessing global knowledge
 - Trade policy, especially imports of K goods
 - Direct foreign investment
 - Restriction on licensing foreign technology or using foreign expertise
 - Foreign education and training
- Develop explicit strategies and policies to leverage knowledge from the country's

Diaspora

Lessons Learned-Dissemination and Use

- Go beyond first application of new knowledge to explicit efforts to disseminate
 - Develop explicit programs to help raise average productivity at least to domestic best practice
 - Don't neglect metrology and quality control—they may not be exciting, but they are very important to disseminate technology and to help firms and countries compete in global markets
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Lessons Learned—General Enablers

- Don't neglect the education and skills necessary to create, acquire or make effective use of new knowledge
 - Innovation is not just about hardware. Don't ignore the cultural and social aspects. They need to be taken into account to succeed in innovation
 - Don't ignore the need to improve the general enabling environment as that affects the overall incentive regime for all aspects of innovation
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Knowledge Failures in Use of Knowledge

Nature of Problem	Actions to solve it
Lack of information of existence of knowledge	Provide more technical information through print, radio, television and internet
Lack of understanding of its relevance	Educate people on the value and relevance of different types of knowledge and how to look for an access it
Lack of education or skills to be able to use it	Beyond general education train people with the specific skills necessary to use the knowledge
Lack of access to complementary inputs or supporting infrastructures and institutions to be able to use it.	Provide easier access to finance Provide extension services and other technical assistance to demonstrate the proper use of the new knowledge and to support its application. Remove regulations that make it difficult to access the knowledge or to start up new business or activities with it
	Provide a supportive environment in terms of good rule of law and contract and enforceability of contracts.

Top Down Actions

- Improving the enabling environment affecting innovation
 - Governance, rule of law, macro policy
 - Trade and competition policy
 - Financial and labor markets
 - Education and Training
 - Formal education system: access, content, quality
 - Specialized training and retraining
 - Regulatory and institutional regime for life long learning
 - Information and communications infrastructure
 - Not just hardware and connectivity but also
 - Regulatory and legal issue: electronic signatures, control of cyber crime, skills to use, etc
 - Technology infrastructure
 - Public research infrastructure and incentive regime to make it relevant
 - Human capital to undertake and manage research
 - Metrology, standards, quality control
 - Technology diffusion programs and mechanisms
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Bottom Up Actions

■ Types

- Enterprise level
- Clusters
- Special development zones (EPZs, industry or service zones)
- State initiatives

■ Key elements

- How to get them started
 - How to support their scale up
 - How to use them as models for replication
 - How to use them to pressure for top down change
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International Actions to Support Innovation In Developing Countries

- Creating new global public goods knowledge relevant for Africa
 - Basic needs: nutrition, preventive medicine, water, sanitation
 - Environment
 - Energy
- Disseminating of relevant innovations to Africa
 - Not just in agriculture and industry
 - Also services: government, health, education
- Most critical—developing of African capability to innovate
 - Improving formal education at all levels
 - Special training programs
 - Management training for all aspects of innovation

Conclusions

- Acceleration in creation and dissemination of knowledge is creating a more demanding global environment where innovation is becoming more important
 - Africa runs risk for falling behind even though there are many opportunities
 - Necessary to develop explicit innovation strategies
 - Agenda for action is very large
 - Necessary to start on various fronts
 - Top down reform actions to address binding constraints
 - Bottom up actions to take advantage of concrete opportunities
 - Very important to discuss strategies and share experiences such as through this forum
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Thank YOU!

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