The STI Landscape in the Arab World

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Inventing a better future
building worldwide capacity in S & T

UN Millennium Development Goals (MDGs)

1. Eradicate extreme poverty and hunger.
2. Achieve universal primary education.
3. Promote gender equality & empower women
4. Reduce child mortality.
5. Improve maternal health.
7. Ensure environmental sustainability.
8. Develop a global partnership for development.

- MDGs: to be reached worldwide by 2015 and by every individual country.
- Success will require breaking with “business as usual” and achieving a “sustained action” by all.
Where are we in the Arab region:

• In education:
  – Some countries have liberated themselves from illiteracy down to 2-8%, while others continue to have a high rate. Illiteracy rate averages 34% where 72% of them women: world’s highest adult illiteracy, driven by population growth.
  – Investment in education raised to 6% of GDP (comparable to Europe), however, delivery in term of quality, is below standards.
  – Higher education has expanded to 300 universities of 3.6 million students with a ratio of 1:20 in some countries to a ratio of 1:40 in other countries, but delivery is of lower quality and relevance particularly in populous universities.
Arab Literacy as Compared to Other Regions in the World

Developed countries
North America and Western Europe
Central and Eastern Europe
Latin America
World
Developing countries
Arab States
Sub-Saharan Africa

% of popul.
0
20
40
60
80
100
120

2004
2015

MDGs Goals.
Where are we in the Arab region:

- In science:
  - Arab investment in science is 0.2% of GDP as compared to 1% of developing countries, 1.7% of world average, 2.3% of developed countries.
  - Arab R&D, education and health combined less than expenditure on military.
Arab R&D expenditure as % of GDP 1996 – 2003, as compared to other countries

<table>
<thead>
<tr>
<th>Country</th>
<th>R&amp;D Expenditure % of GDP</th>
</tr>
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<tbody>
<tr>
<td>Israel*</td>
<td>4.9</td>
</tr>
<tr>
<td>Japan*</td>
<td>3.13</td>
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<tr>
<td>USA*</td>
<td>2.8</td>
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<tr>
<td>S Korea*</td>
<td>2.64</td>
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<td>Developed Cs</td>
<td>2.36</td>
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<tr>
<td>N Korea*</td>
<td>2.05</td>
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<tr>
<td>E Asia &amp; Pacific</td>
<td>1.31</td>
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<tr>
<td>China*</td>
<td>1.31</td>
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<tr>
<td>Russia*</td>
<td>1.15</td>
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<tr>
<td>Malaysia*</td>
<td>1.12</td>
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<tr>
<td>Brazil*</td>
<td>1.00</td>
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<tr>
<td>E.Europe &amp; C.Asia</td>
<td>0.98</td>
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<tr>
<td>India*</td>
<td>0.85</td>
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<tr>
<td>L.America &amp; Car</td>
<td>0.57</td>
</tr>
<tr>
<td>Arab States</td>
<td>0.21</td>
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</tbody>
</table>

* Indicators 2006

Source: UNESCO institute of Statistics / Badran
GERD per inhabitant: Arab vs. other regions

Who funds what in R&D

• R&D in the Arab region
  – 3% private sector
  – 27% universities
  – 70% govt. sector

• R&D in the OECD
  – 70% private sector
  – 3% non-profit sector
  – 17% universities
  – 10% by govt. sector
Researchers per million inhabitants: Arab vs. other regions

R&D expenditure as % of GDP
1996 – 2003: Arab vs. OIC

Source: UNESCO institute of Statistics / Badran

* Indicator 2006
Scientific and Technical Journal Articles Published (1996 – 2005): OIC including Arab Countries

Source: ISI Web of knowledge Database, which represents all articles covered by Science Citation Index Expanded (SCI-EXPANDED), Social Science Citation Index (SSCI), and Arts & Humanities Citation Index (A&HCI) / Badran 2006
Scientific and Technical Journal Articles Published (1996 – 2005): OIC vs. others

Source: ISI Web of knowledge Database, which represents all articles covered by Science Citation Index Expanded (SCI-EXPANDED), Social Science Citation Index (SSCI), and Arts & Humanities Citation Index (A&HCI) / Badran 2006
Scientific and Technical Journal Articles Published in 2005 per million people: OIC including Arab countries

Source: ISI Web of knowledge Database, which represents all articles covered by Science Citation Index Expanded (SCI-EXPANDED), Social Science Citation Index (SSCI), and Arts & Humanities Citation Index (A&HCI) / Badran 2006
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Where are we in the Arab region:

- In Innovations & Technology
Share of High-Technology Exports in Total Manufacturing Exports (2004): Arab vs. other regions

Patent Applications Filed by Residents (1997-2004): Arab vs. other regions

Source: World intellectual property organization's industrial property statistics database / Badran 2006
Internet Penetration: Top 10 Arab-OIC Countries

Internet Penetration: Lowest Arab-10 OIC Countries

What to do: In education

- Merit-based system to promote excellence from childhood to career development.
- From childhood (KG) to higher education, emphasize learning to learn, to think, to analyze, to solve problems, to create and structure knowledge from vast avalanche of information, and to build skills.
- Strengthen science, mathematics, languages, computing, and ethics at the very early age from birth to build logics and induce creativity and innovation.
- Change schooling from disseminators to facilitators to create K-workers
- Blend ICT and e-learning in the learning process and develop Just-in-time (JIN) self-learning and life-long learning
What else to do: In education

- Allocate 7% of Arab GDP for education
- Promote centers of excellence in quality and relevance
- Invite private sector to create quality learning schools and universities
- Continuous assessment of education delivery at every stage of development
- International yardstick of accreditation and quality assurance
- Aptitude tests of graduates for rating institutions to create competition
- Certifications of teachers in skills and pedagogy
- Decentralized governance to create competition among educational institutions
What to do: In Science & Innovation

• Invest 1 % Arab GDP in R & D by 2010.
• Shift brain-drain to brain-gain in bridging with scientists abroad for capacity building: Link with Diaspora Arab Scientists.
• Stimulate inviting friendly research environment
• Create incubators to nurture ideas and creativity in every campus.
• Graduation project is a must to trigger innovation.
• Time and space to nurture entrepreneurs
• Networking with comparable North & South institutions.
• Venture capital to fund ideas and outputs of R & D.
• Contractual research and business parks to create new companies.
• Patents and registration procedures for R&D delivery
• Incentives and rewards
• R&D linked with industry – creating demands
Jordan Initiative
Educational Reform For Knowledge Economy Program

COMPONENT 1
National Strategy and Public Relations Campaign
Organizational Change
Education Decision Support System
Monitoring and Evaluation
Institutional Arrangements

COMPONENT 2
Curriculum Renewal
Teacher Training
Student Assessment
Resources for Learning

COMPONENT 3
Renovation of Existing Schools
Building of New Schools
Computer Labs and Science Labs
Kindergarten Classrooms

COMPONENT 4
KG Curriculum, Licensing and
ECE Teacher Training
Kindergartens for the Poor
Public Awareness and Understanding

Source: Ministry of Education - Jordan
Thank you