



Measuring the Impact of STDF on STI indicators in Egypt

Science and Technology Development Fund

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Background



- **S&T governance system reform**
- **Higher Council for Science and Technology**
- **Science and Technology Development Fund**



STDF Objectives



- **Funding scientific research and technology development;**
- **Supporting the complete cycle of innovation;**
- **Disseminating information on S&T in Egypt; and**
- **Developing and monitor S&T indicators.**



Challenges



- Absence of a National Strategy for S&T
- Human Resources
- Incomplete Cycle of Innovation

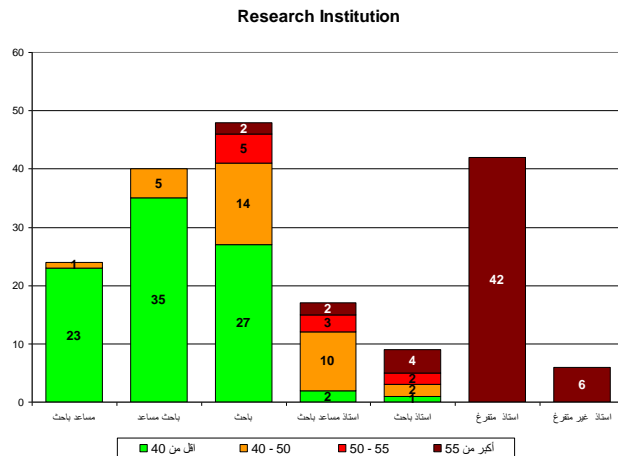


Challenges



- Human Resources

– Brain drain





Challenges



- Incomplete Cycle of Innovation

S&E article output, share of world total, and change rate, by median S&E article-producing country: 1995 and 2005

Country	1995		2005		Average annual change (%)
	Number	Share (%)	Number	Share (%)	
World	894,846	100	709,541	100	-2.3
Iran	279	0.1	2,026	0.4	25.2
Turkey	1,715	0.3	7,015	1.1	19.4
Thailand	340	0.1	1,248	0.2	13.9
Singapore	1,141	0.2	3,809	0.5	12.2
Portugal	990	0.2	2,910	0.4	11.4
Sri Lanka	3,439	0.6	9,889	1.4	11.2
Slovenia	404	0.1	1,056	0.1	9.1
Greece	2,059	0.4	4,201	0.6	7.6
Mexico	1,937	0.3	3,932	0.5	7.3
Chile	899	0.2	1,559	0.2	5.8
Ireland	1,218	0.2	2,120	0.3	5.7
Czech Republic	1,988	0.3	3,169	0.4	5.0
Argentina	1,067	0.3	2,059	0.4	4.5
Poland	4,549	0.6	9,844	1.0	4.2
Hungary	1,704	0.3	2,614	0.4	4.0
Austria	3,425	0.6	4,599	0.6	3.9
Belgium	3,172	0.9	6,841	1.0	3.8
Norway	2,929	0.5	3,844	0.5	2.2
New Zealand	2,442	0.4	2,983	0.4	2.0
Switzerland	7,220	1.3	8,748	1.2	1.8
Egypt	1,388	0.2	1,659	0.2	1.8
Finland	4,077	0.7	4,811	0.7	1.7
Denmark	4,330	0.6	5,040	0.7	1.5
Israel	3,741	1.0	6,399	0.9	0.9
South Africa	2,351	0.4	2,392	0.3	-0.2
Ukraine	2,019	0.4	2,105	0.3	-1.8

National Science Foundation, 2008, Science and Engineering Indicators 2008



Challenges



- Incomplete Cycle of Innovation

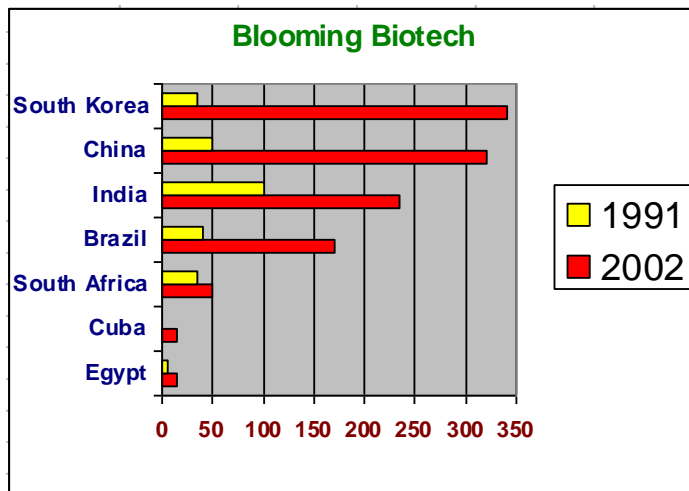


Chart of Papers in Biotechnology in Developing Countries



Challenges



- **Incomplete Cycle of Innovation**

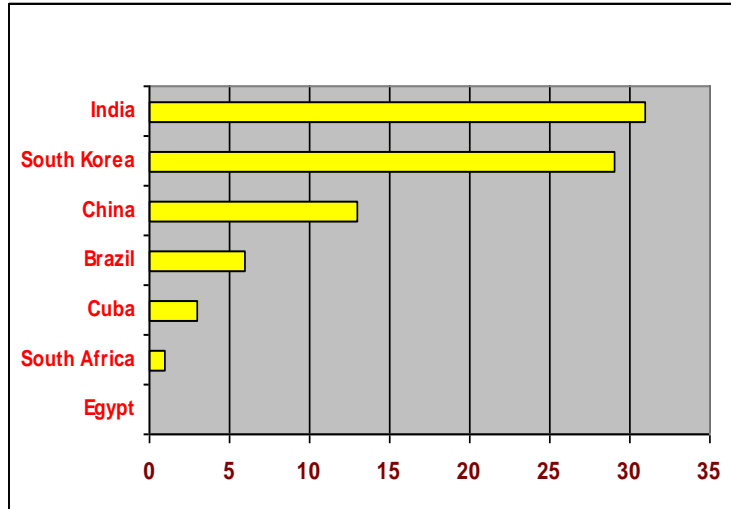


Chart of Patents in Biotechnology in Developing Countries



Funding Mechanisms



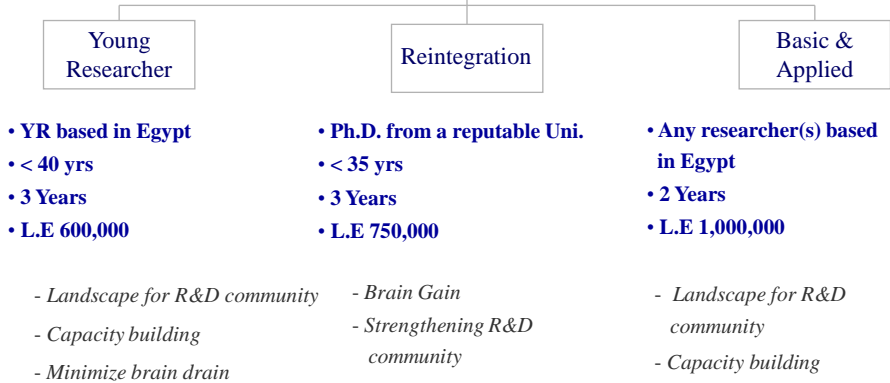
- **National Research Grants (NRG)**
- **Joint Research Grants (JRG)**
- **Targeted Calls (TC)**
- **Partnership with Industry**



Funding Mechanisms



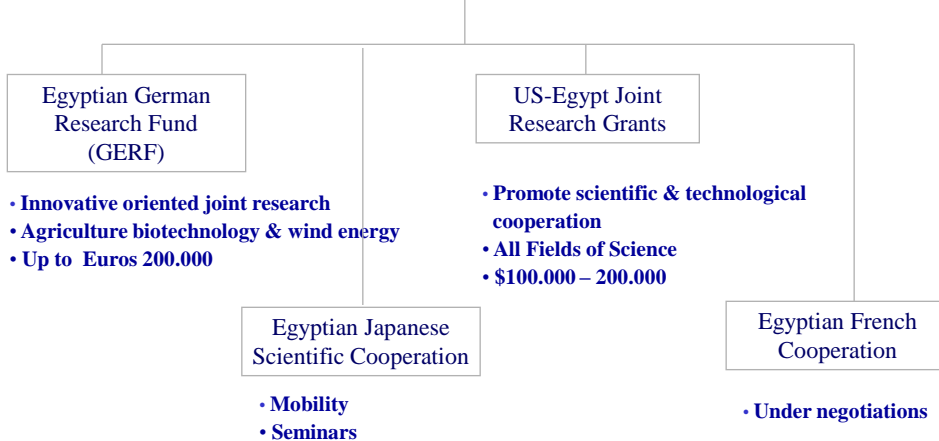
National Research Grants



Funding Mechanisms



Joint Research Grants





Funding Mechanisms



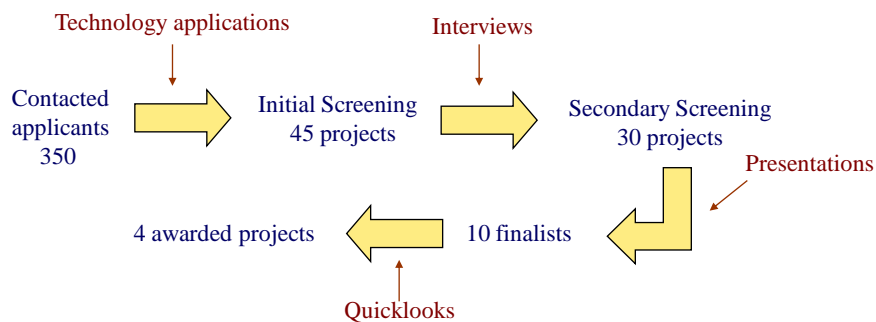
Funding Mechanisms: Partnership with Industry

- Joint fund with the Industrial Modernization Center
- Similar to SBIR
- L.E 100 million
- 5 funding schemes



Technology Commercialization

- Pilot program with IC² at the University of Texas
- Investigating the marketability of Egyptian technologies on the international level



Partnerships

- **International Cooperation:**
 - United States: US-Egypt Joint Scientific Cooperation
 - Germany: Egyptian German Cooperation
 - BMBF and DFG
 - Japan: Joint Egyptian Japanese Scientific Cooperation
 - French: Egyptian French Scientific Cooperation
- **Regional and National Cooperation:**
 - Arab Science and Technology Foundation
 - Misr El Khair



Impact of STDF on STI indicators



• Input Indicators

Indicator / STDF program	National Research Grants	Joint Research Grants	Targeted Calls	SBIR	Technology Commercialization
Human Resources	H	H	H	H	No Impact
Total R&D personnel (FTE)	*	*	*	*	
Technicians (FTE)	*	*	*	*	
Other supporting staff (FTE)	*	*	*	*	
Number of Technicians by researcher	*	*	*	*	



Impact of STDF on STI indicators



• Input Indicators

Indicator / STDF program	National Research Grants	Joint Research Grants	Targeted Calls	SBIR	Technology Commercialization
Financial Resources	M-H	M-H	M-H	H	No Impact
Total Gross Domestic Expenditure on R&D	*	*	*	*	
Gross Domestic Expenditure on R&D by source of funds				*	
Total Gross Domestic Expenditure on R&D per capita	*	*	*	*	
Average Gross Domestic Expenditure on R&D per researcher	*	*	*	*	



Impact of STDF on STI indicators



· Output Indicators

Indicator / STDF program	National Research Grants	Joint Research Grants	Targeted Calls	SBIR	Technology Commercialization
Bibliometric indicators	H	H	H	H	No Impact
Number of publications (all disciplines and per discipline)	*	*	*	*	
World share of publications	*	*	*	*	
Quotations frequency	*	*	*	*	



Impact of STDF on STI indicators



· Output Indicators

Indicator / STDF program	National Research Grants	Joint Research Grants	Targeted Calls	SBIR	Technology Commercialization
International cooperation	H	H	H	H	L
Internationalization of scientific production	*	*	*	*	*
Co publications	*	*	*	*	



Impact of STDF on STI indicators



• Output Indicators

Indicator / STDF program	National Research Grants	Joint Research Grants	Targeted Calls	SBIR	Technology Commercialization
Innovation & Technology Indicators	M	M	M-H	H	H
Number of Patents	*	*	*	*	*
Technological Balance of payment	*	*	*	*	*
High technology exports as % of total export			*	*	*
University-company research collaboration	*	*	*	*	*
Private Sector spending on R&D				*	*
Number of spin off companies					*

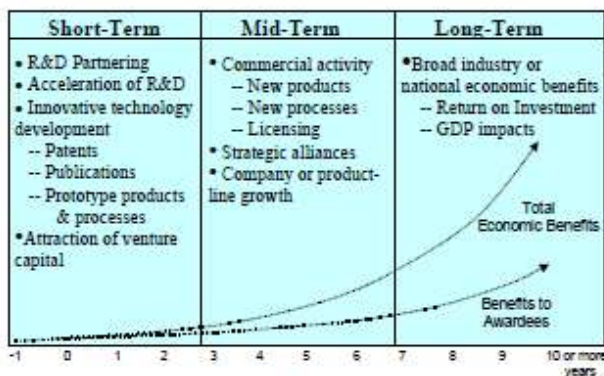


Impact of STDF on STI indicators



• Impact on Economy

*Organization of Metrics by Technology Life Cycle:
NIST's Advanced Technology Program*



Source: Adapted from Ruegg [1999, p. 19]

Timeline for the impact of R&D



STI indicators in Egypt



- **STDF conducted an analytical baseline study on STI in Egypt, July 2009.**
- **The Study revealed the following:**
 - There are several sources of information for the same indicator in Egypt.
 - This has led to data inconsistency and lack of data on the methodology used by different entities.
 - Data inconsistency in terms of quality and type of the developed indicators.
 - Lack of pattern in data submission which leaves the methodology of data collection largely ambiguous.
 - Lack of data for a number of indicators and for some years.
 - Lack of data on the ongoing research in different fields of science in Egyptian institutes.



STI indicators in Egypt: the Way Forward



- **Establishing an S&T Observatory to:**
 - Properly design, develop and monitor basic STI indicators using a well defined and documented methodology
 - Identify and develop a set of country specific STI composite Indicators to provide an overview of Egypt's scientific and technological capabilities
 - Informing the decision making process
 - Utilizing STI indicators for policy formulation and redirection, cost effective strategic planning, priority setting, monitoring and evaluation, and gauging the general health of S&T system
 - Comparative analysis with other countries
 - Conduct Foresight exercises (e.g. S&T Roadmaps)
 - Produce studies and disseminate information on relevant STI aspects (e.g. State of the art in different fields of science)



Impact Assessment



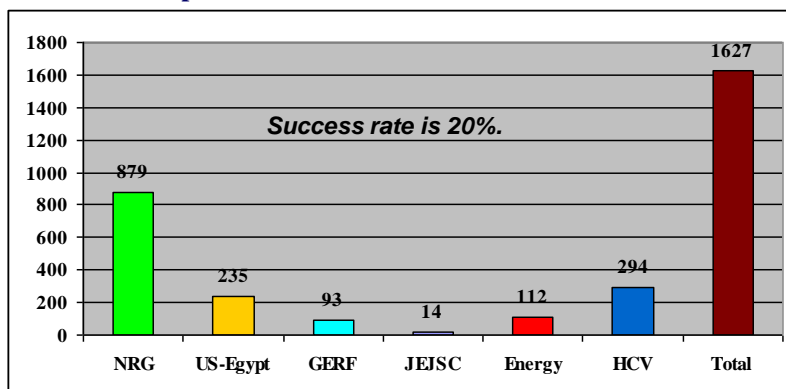
- **Measuring the Impact of STDF funded projects on science, training, technology, industry, economy, and human resources.**
- **Baseline impact assessment survey for all accepted projects: sent to all started projects**
- **Annual impact assessment survey: sent to all projects started November 2008**
- **End of project impact assessment survey**



STDF Achievements



Proposals Submitted to STDF in all Grant Schemes



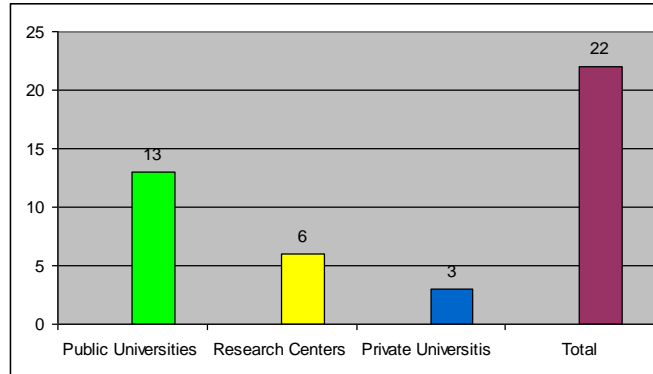
221 projects were accepted for funding with a total budget of L.E 155 million



STDF Achievements



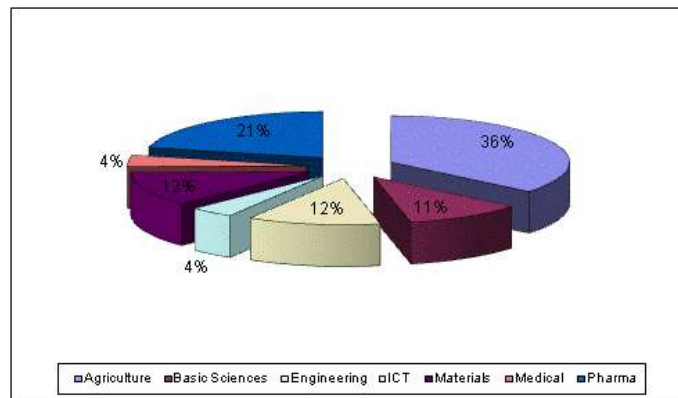
Number of awarded institutions



STDF Achievements



Budget distribution per field of Science





www.stdf.org.eg