

TWAS:

Advancing science in the South

Mohamed H.A. Hassan, executive director
The World Academy of Sciences (TWAS)
for the advancement of science in developing countries

20th Meeting of COMSATS Coordinating Council
NRC
Cairo, Egypt
14-15 May, 2017

Foundation

- 1983: Foundation meeting in Trieste
(*42 Founding Members, 10 NLs*)
- 1984: \$1.5M from Italian foreign minister
Giulio Andreotti
(*Policy for science*)
- 1985: Launching by UN Secretary
General Javier Perez de Cuellar
(*Science for policy and diplomacy*)



Five TWAS Regional Offices



The Regional Offices nominate scientists for membership and prizes, select Young Affiliates, and organize conferences for young scientists

Strategic Objectives (*SP 5: 2017-2021*)

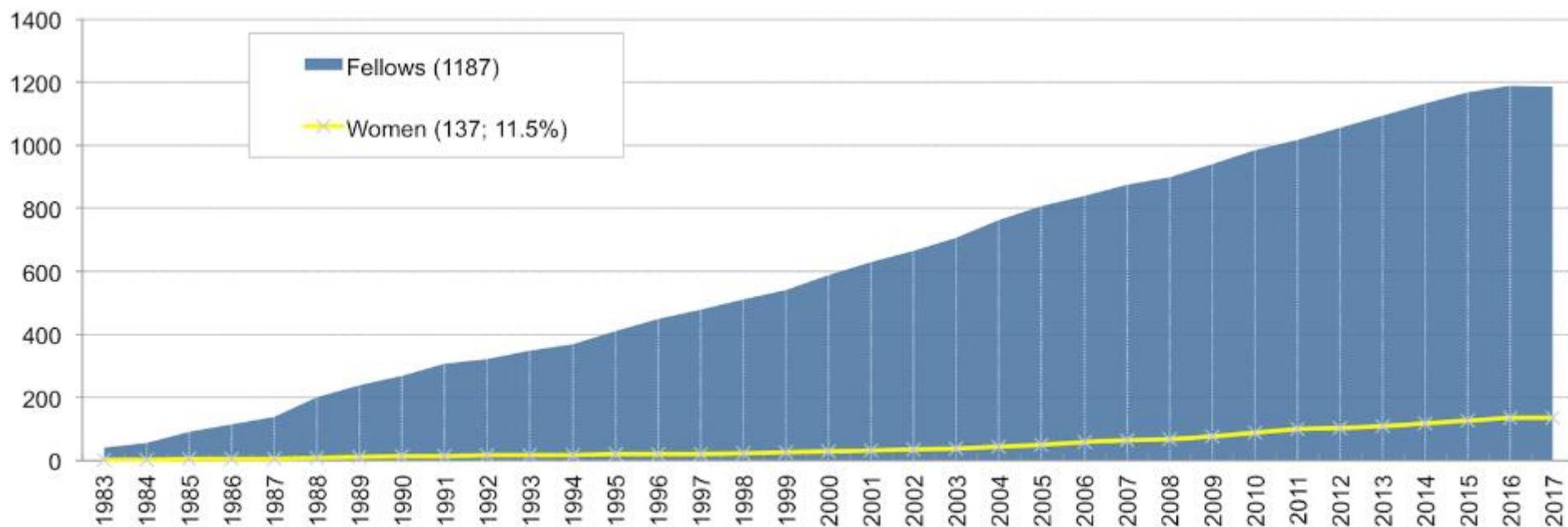
- Recognizing and rewarding outstanding scientists
- Supporting young scientists and research groups
- Promoting South-South collaboration in education and research
- Fostering North-South cooperation and international partnership
- Enhancing science-policy-diplomacy links for achieving SDGs

Strategic Objective 1

Recognizing and Rewarding Excellence in Science

- Election into TWAS Membership
- Awarding Prizes and Medals

Evolution of Membership



Over the past four years,
25% of new TWAS Fellows have been women

TWAS Awards:

recognizing excellence in scientific research in the developing world



TWAS has awarded 350 prizes since 2009

TWAS - Lenovo Science Prize

- TWAS-Lenovo Prize is the premier honor given to scientists in the developing world.

- It carries a monetary award of **USD100,000**, provided by **Lenovo**, as well as a medal and a certificate highlighting the recipient's major contributions to science

2016: Zhao Dongyuan (China)
Chemistry



2015: Artur Avila (Brazil)
Mathematics



2014: Abdool Karim (south Africa)
Biology



Strategic Objective 2

Supporting young Scientists and Research Groups

- *Grants to young scientists*
- *Grants to research groups*

TWAS target countries

- Key TWAS programmes focus on **66** S&T-lagging countries, including
 - **48** Least Developed Countries
 - **52** Low-Income Countries
 - **14** Lower Middle-Income Countries
 - **10** COMSATS Countries

TWAS Research Grants

About USD1.5 million per year to young scientists and research groups in Africa and S&T-lagging countries (\$ 15-30 K)

2,500 grants awarded (1986-2017)



***Virima Mudogo,
Department of Chemistry,
University of Kinshasa, Dem.
Rep. of Congo***

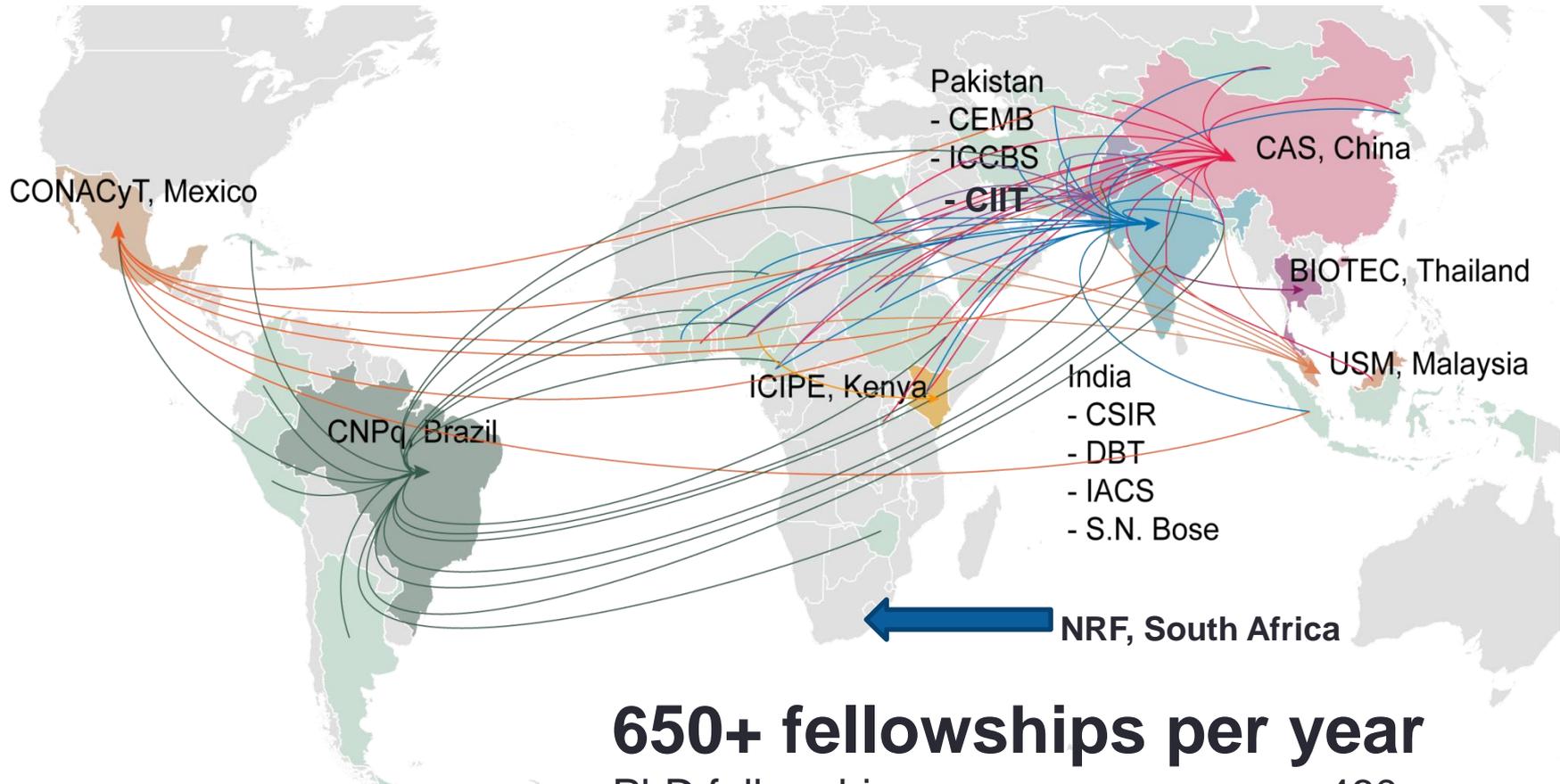
*Macromolecules extracted
from indigenous medicinal
plants with potential
antimalarial or anti-sickle cell
anaemia effects*

Strategic Objective 3

Through **South-South cooperation**, developing nations can build capacities, share experiences, build regional partnerships and initiatives, and address global challenges.

TWAS Fellowships for Advanced Training *(S&T-Lagging Countries)*

Largest South-South fellowship Program in the World



650+ fellowships per year

PhD fellowships	+460
Postdoctoral fellowships	+150
Visiting researchers/professors	+ 45

17 Programme Partners Worldwide

 <p>CNPq Conselho Nacional de Desenvolvimento Científico e Tecnológico</p>	<p>BRAZIL: CNPq - National Council for Scientific and Technological Development</p>	 <p>UPM UNIVERSITI PUTRA MALAYSIA</p>	<p>MALAYSIA: UPM – Universiti Putra Malaysia</p>
	<p>CHINA: CAS - Chinese Academy of Sciences</p>	 <p>icipe African Insect Science for Food and Health</p>	<p>KENYA: <i>icipe</i> – International Centre for Insect Physiology and Ecology</p>
	<p>INDIA: CSIR - Council of Scientific & Industrial Research</p>	 <p>CONACYT</p>	<p>MEXICO: CONACYT– National Council on Science and Technology</p>
	<p>INDIA: DBT - Department of Biotechnology</p>	 <p>CEMB</p>	<p>PAKISTAN: CEMB – National Centre of Excellence in Molecular Biology</p>
	<p>INDIA: IACS - Indian Association for the Cultivation of Science</p>		<p>PAKISTAN: ICCBS – International Centre for Chemical and Biological Sciences</p>
	<p>INDIA: S.N. Bose National Centre for Basic Science</p>	 <p>COMSATS</p>	<p>PAKISTAN: CIIT – COMSATS Institute of Information Technology</p>
 <p>IROST</p>	<p>IRAN: IROST - Iranian Research organization for Science and Technology</p>	 <p>NCP</p>	<p>PAKISTAN: NCP – National Centre for Physics</p>
 <p>USM UNIVERSITI SAINS MALAYSIA</p>	<p>MALAYSIA: USM - Universiti Sains Malaysia</p>	 <p>NRF National Research Foundation</p>	<p>SOUTH AFRICA: NRF – National Research Foundation</p>
		 <p>BIOTEC a member of NSTDA</p>	<p>THAILAND: BIOTEC - National Centre for Genetic Engineering and Biotechnology</p>

CAS-TWAS Centers of Excellence

Water and Environment
Space Science and Disaster Mitigation
Climate and Environmental Sciences
Biotechnology
Green Technology



<http://twas.org/article/cas-twas-centres-world-excellence>

Building a career with TWAS support



Emmanuel Unuabonah from Nigeria



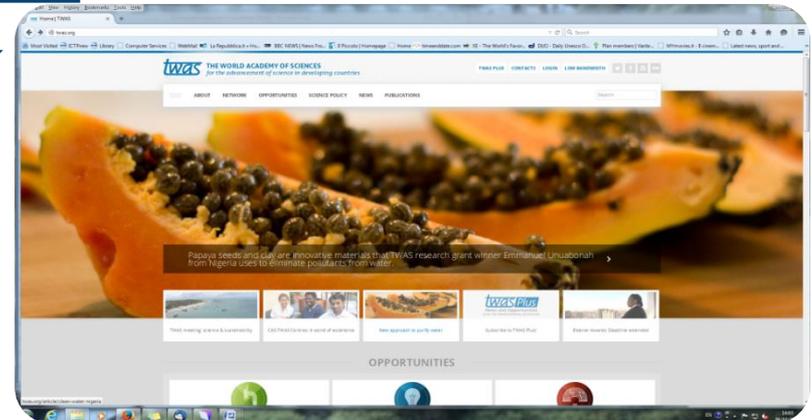
Awarded CAS PhD fellowship in China in 2005



Elected TWAS Young affiliate (2009 to 2013)



Awarded a TWAS Research Grant in 2012



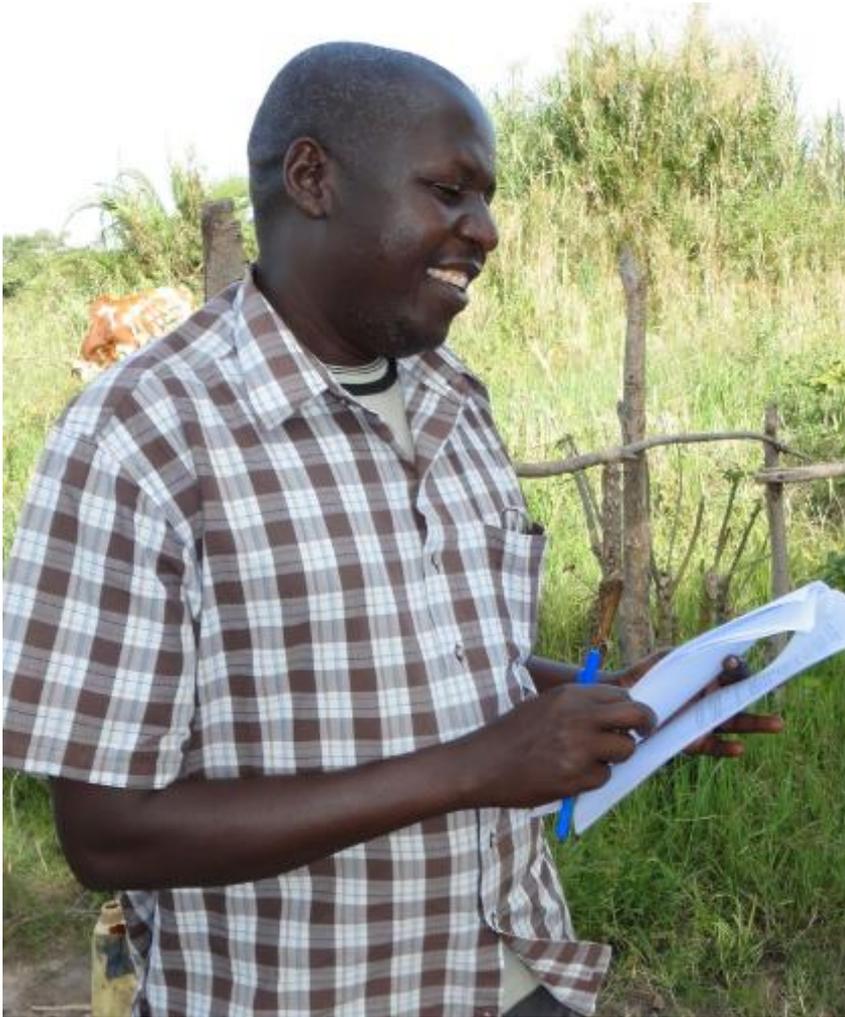
Recently featured on the new TWAS website for research regarding the use of papaya seeds and clay to eliminate pollutants from water



Strategic Objective 4

- **North-South scientific links** are crucial to addressing global challenges. TWAS builds such links through:
 - postdoctoral fellowships
 - visiting professorships

TWAS-DFG postdoctoral programme



The TWAS-DFG programme provides researchers from sub-Saharan Africa three-month visits to German research institutes.

Joseph Erume, at Makerere University in Uganda, spent three months at **Friedrich Loeffler Institute** pursuing research crucial to African **food security**: the seroprevalence and molecular characterization of *Brucella suis* in pigs.

TWAS Research Professorship for LDCs



Professor **Bishal Upreti** from Nepal appointed TWAS Research Professor at **School of Mining, University of Zambia** (*2012-2017*)

He paid several visits to the University: lecturing, supervising students and organizing geological **field work** for them

Strategic Objective 5



Promoting **science-policy-diplomacy**
links for achievement of SDGs

Science-Policy-Diplomacy workshop

Policy for Science

- Meeting of G8 foreign ministers in Trieste (2009)
- Italian Ministry of Foreign Affairs (MAE) asked TWAS/IAP to organize a workshop involving Afghanistan and neighboring countries to **develop a regional network of cultural and scientific cooperation** (with Italian support) as a contribution to peace and development
- Participants: Academies of science of *Afghanistan, Pakistan, India, Iran, Turkey, China, **Italy***
- Workshop opened by the foreign ministers of *Italy, Pakistan, Afghanistan*
- Conclusions and recommendations submitted to MAE

AAAS-TWAS Science Diplomacy course

Aims:

- bring together scientific, policy and diplomatic communities to address critical sustainability issues and publish case studies
- build capacity of young scientists in concept and practice of science diplomacy

Participation:

- over 200 applications per year
- applicants: young scientists, diplomats, government officials and development practitioners
- about 30-40 selected from 20-30 countries

Science-Policy-diplomacy workshops

Transboundary issues:

- Energy policies for a sustainable future – Trieste, December 2013;
- Sustainable fisheries – Mexico, September 2014;
- Climate change & high-altitude agriculture – Trieste, December 2014;
- Sustainable water management – Trieste, Nov/Dec 2015.



Role-playing exercise (2016)



Norman Neureiter, first science adviser to the US Secretary of State (2015)

Refugee Scientists Workshop (March 2017)



- 50 participants from 19 countries in Europe and the Middle East/North Africa region
- Participants included: policymakers, science leaders, diplomats, refugee program administrators and some refugee scientists
- Examine challenges and opportunities facing refugee scientists and recommend positive action and interventions
- Extensive coverage in Italian and European media

Refugee Scientists Workshop

*Keynote talk by **Daryl Copeland** (former Canadian Diplomat)*



"The problem of how best to harness the untapped potential resource of refugee scientists, as a tool for advancing the goals of international policy and relations, falls squarely within the province of science diplomacy."

"National governments and international organizations....are best positioned to facilitate action and collaboration, **but they face a knowledge and information gap.**"

Key Recommendations

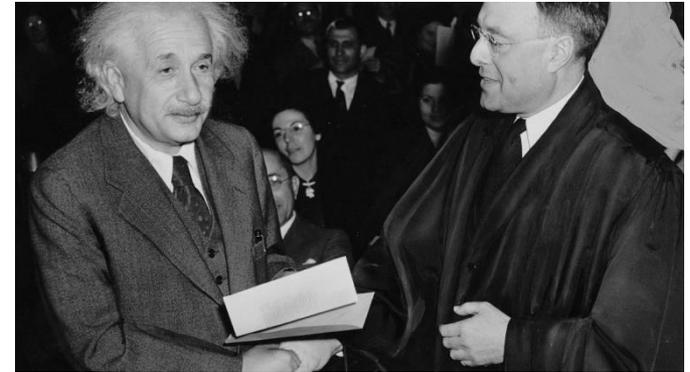
- **Strong mechanisms for identifying refugee scientists and assessing their potential and professional needs:**
 - Establish links with refugee processing centers and UN Refugee Agency
 - Establish a website (*to be viewed on mobile phones*) that provides information about refugee scientists and offers information about opportunities
 - Develop a database of refugee scientist and their areas of expertise
- **Harmonized policies to support education, training and job opportunities**
 - Utilize education and training opportunities provided by Academies ([TWAS](#),...)
 - Provide startup grants to young refugee scientists



Successful initiative

Professor Carmen Bachmann founded "Chance for Science," a [website](#) that connects refugee academics with scientists working in German

"One Syrian engineer I met in the camp was just happy that I recognize him as a professor. He told me, 'I feel like nothing here. In Syria I was a professor, and I come here — [I can do much more than sitting around.](#)'"



world's most famous science refugee



Next Einstein!!

TWAS hosts:

twas

The World Academy
of Sciences

OWSD



The Organization
for Women in
Science

IAP

iap SCIENCE
RESEARCH
HEALTH
the interacademy partnership

The InterAcademy
Partnership

Organization for
Women in
Science for the
Developing
World (OWSD)



- 4,000+ members;
- Offers up to 50 PhD fellowships per year;
- OWSD Postgraduate Training Fellowships have helped nearly 150 women from sub-Saharan Africa and LDCs earn their PhDs.



IAP InterAcademy Partnership

Science

Health

Eng.

Regional Networks

Asia

Europe

Americas

Africa

Member academies (150)

Action by IAP

- **Promoting STEM education through its flagship program:
Inquiry-Based Science Education Program (IBSE)**
- Producing consensus policy-relevant short statements on topical issues
- Producing consensus reports on scientific issues related to global challenges
- Insuring that issued statements and reports reach policy makers and measuring impact

Inquiry-Based Science Education (IBSE)

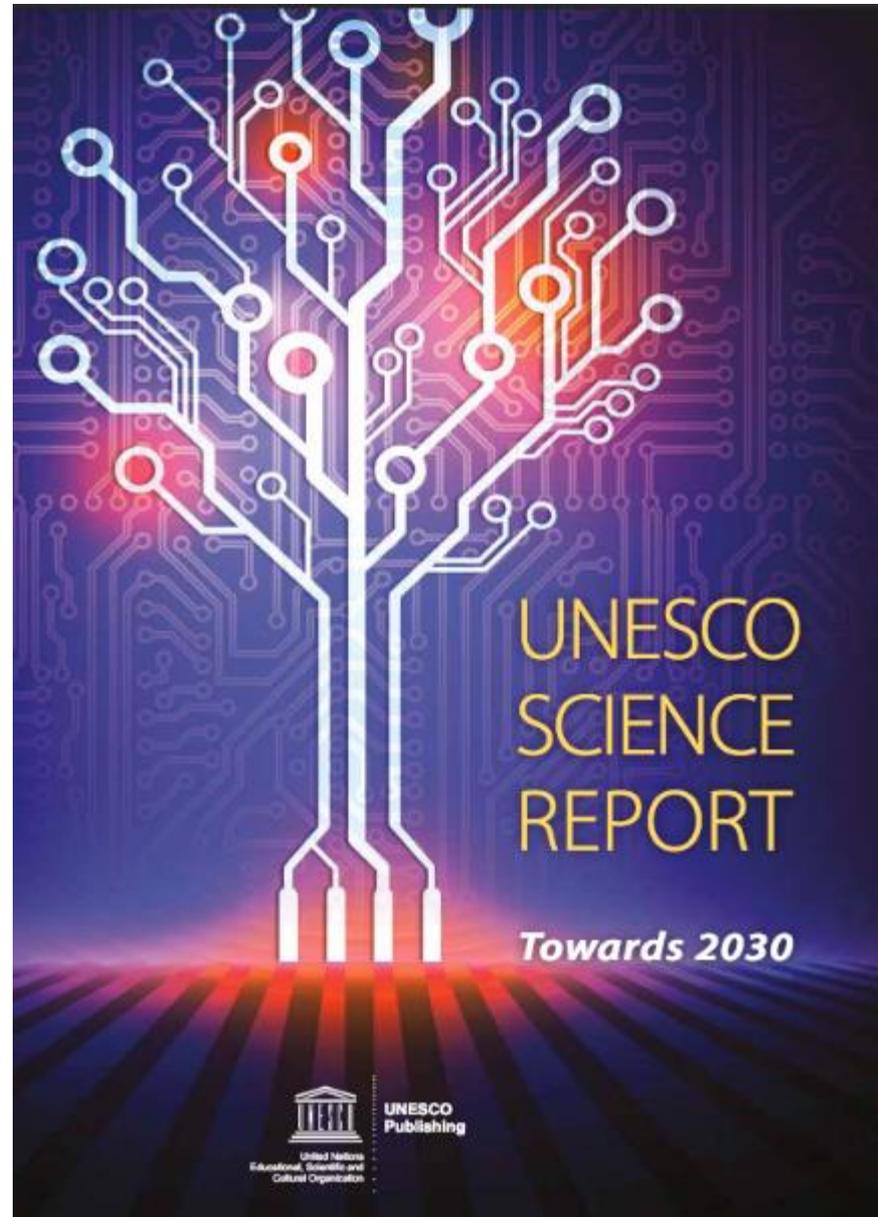
- Program promotes the use of **IBSE** in classrooms as a more effective way of teaching science and evidence-based rational thinking skills.
- It achieves this through regional activities that engage national academies of science and Ministries of Education
- Workshops designed to train teachers how to introduce **IBSE**



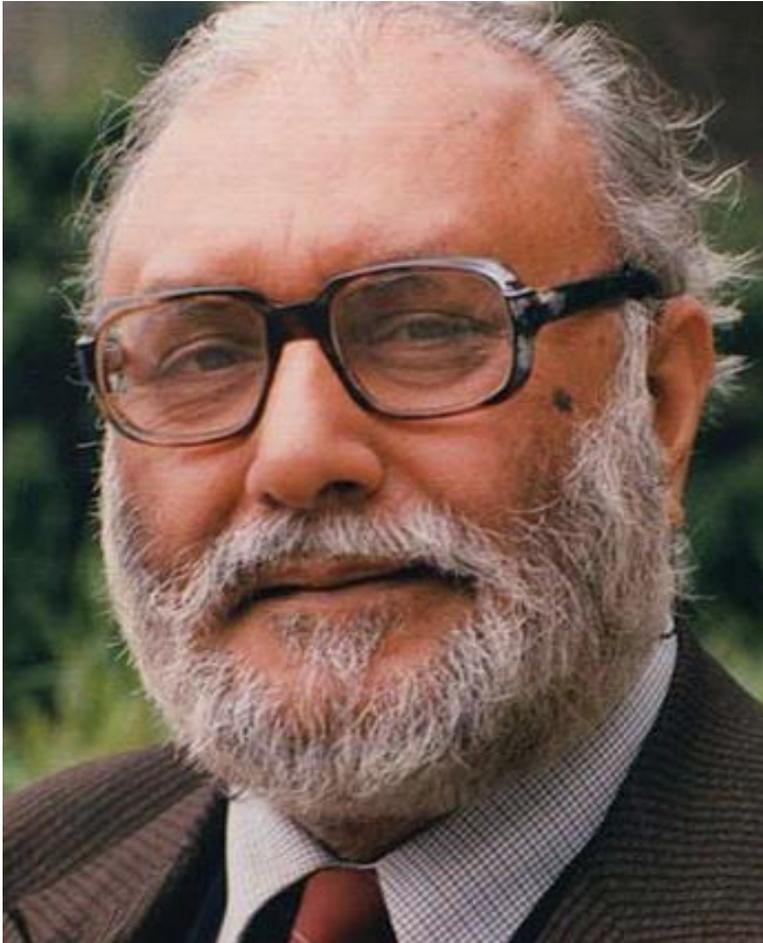
Collaboration with COMSATS

- Postdoctoral Fellowships for young researchers in COMSATS Countries, tenable at COMSATS Centers of Excellence
- Grants for joint research projects involving **2-3** COMSATS Centers in areas related to the **SDGs**
- Training courses in science-policy-diplomacy nexus for scientists, diplomats and policy experts in COMSATS Countries
- Training workshops in IBSE in Member Countries
(*in collaboration with Academies in Member Countries*)

“In the long run, no region or nation can remain a simple ‘user’ of new knowledge but must also become a ‘creator’ of new knowledge.”



A dream of science in the South



“...with man’s recent mastery of science and technology there is no physical reason left for the existence of hunger and want for any part of the human race.”

— TWAS Founder Abdus Salam
Nobel laureate, Pakistan

twas



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