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# Role of SETI to Deliver UN 2030 Agenda for Sustainable Development

**Shahbaz Khan**  
Director and Representative  
UNESCO Regional Science Bureau for Asia and the Pacific

**Hotel Timor, Dili 7-9 June 2017**

REGIONAL WORKSHOP ON  
CAPACITY FOR ACCELERATING SCIENCE AND TECHNOLOGY (FAST)  
TO FOSTER THE IMPLEMENTATION OF THE SUSTAINABLE DEVELOPMENT GOALS  
IN ASIA AND THE PACIFIC AND LAUNCHING OF ASIA PACIFIC – FAST  
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## UN Agenda 2030 SDGs

<b>1</b> NO POVERTY 	<b>2</b> ZERO HUNGER 	<b>3</b> GOOD HEALTH AND WELL-BEING 	<b>4</b> QUALITY EDUCATION 	<b>5</b> GENDER EQUALITY 	<b>6</b> CLEAN WATER AND SANITATION 
<b>7</b> AFFORDABLE AND CLEAN ENERGY 	<b>8</b> DECENT WORK AND ECONOMIC GROWTH 	<b>9</b> INDUSTRY, INNOVATION AND INFRASTRUCTURE 	<b>10</b> REDUCED INEQUALITIES 	<b>11</b> SUSTAINABLE CITIES AND COMMUNITIES 	<b>12</b> RESPONSIBLE CONSUMPTION AND PRODUCTION 
<b>13</b> CLIMATE ACTION 	<b>14</b> LIFE BELOW WATER 	<b>15</b> LIFE ON LAND 	<b>16</b> PEACE, JUSTICE AND STRONG INSTITUTIONS 	<b>17</b> PARTNERSHIPS FOR THE GOALS 	<b>SUSTAINABLE DEVELOPMENT GOALS</b> 

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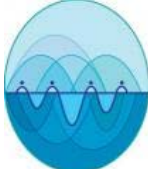


## Related International Developments

**Sendai Framework  
for Disaster Risk Reduction  
2015 - 2030**


UNITED NATIONS  
**PARIS CLIMATE  
AGREEMENT**  
SIGNING CEREMONY  
— 22 APRIL 2016 —






**ISLAND VOICES**  
GLOBAL CHOICES

UN Conference on  
Small Island  
Developing States  
Apia, Samoa | 2014



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## Recognition of Key Global Challenges

<b>Climate Change/Global Change</b>	Adaptation to increased hazard, innovation, focus on natural disasters
<b>Rapid urbanization and population growth</b>	Sustainable Infrastructure
<b>Poverty</b>	Access to infrastructure, services, rights, and technologies

Sustainability

Innovation

Technology

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## Convergence of Innovation in the Development Agendas




- Energy Efficiency
- Reduction in usage of high quality drinking water
- Selection of materials based on environmental performance
- Contribute to sustainable urban environment
- Contribute in reducing world hunger and poverty alleviation
- Contribute to the improvement of quality of life
- Contributing to healthy and safe working environment
- Contribute in preparations for disasters (Human and Natural)

Innovation - clean technologies for sustainable development;  
robotics, nano-engineering, life-cycle analysis






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## UNESCO SCIENCE REPORT Towards 2030


### Key influences on STI policy and governance

- Geopolitical events have reshaped science in many regions
  - the pursuit of a knowledge economy as being the best way to harness an effective growth engine
  - Supporting women role in science
  - Allowing investment for modernizing infrastructures and the nuclear deal
  - Multilateral co-operation for STI
- Environmental crises raising expectations of science
  - Regional climate change programme
- Energy has become a major preoccupation
  - Development of futuristic, hyperconnected 'smart' cities or 'green' cities which use the latest technology to improve efficiency in water and energy use, construction, transportation, etc.
- The quest for a growth strategy that works






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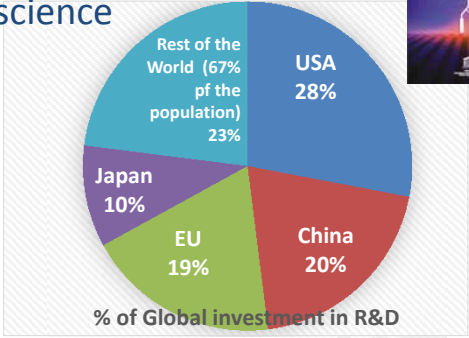
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## UNESCO SCIENCE REPORT Towards 2030

### Global trends in R&D expenditure

- Public research budgets: a converging, yet contrasting picture
- In search of an optimal balance between basic and applied science
- The gap in R&D expenditure is narrowing







**% of Global investment in R&D**


Region	% of Global investment in R&D
USA	28%
China	20%
EU	19%
Japan	10%
Rest of the World (67% of population)	23%

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## UNESCO SCIENCE REPORT Towards 2030

### Global trends in human capital

- Widespread growth in researchers, little change in the global balance
  - Today, there are some 7.8 million researchers worldwide (+21% since 2007)
- The other half of human capital still a minority



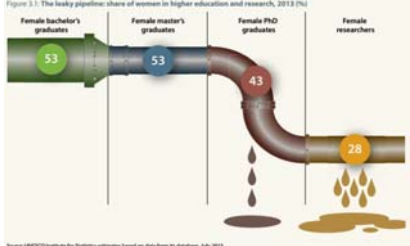




Figure 3.1: The leaky pipeline: share of women in higher education and research, 2013 (%)

Level	Share of Women (%)
Female bachelor's graduates	53
Female master's graduates	53
Female PhD graduates	43
Female researchers	28


Source: UNESCO Institute for Statistics estimates based on data from its database, July 2015

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## UNESCO SCIENCE REPORT Towards 2030

### Trends in knowledge generation

- The EU still leads the world for publications
- Innovation occurring in countries of all income levels
  - UN: technology bank for least developed countries to enhance the ability of these countries to access technologies developed elsewhere and to increase their capacity to patent.
  - Adoption of a Technology Facilitation Mechanism for clean and environmentally sound technologies in Sept 2015 in NY, USA.





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## UNESCO SCIENCE REPORT Towards 2030



### Key messages

- An evolving public commitment to science and research
- Innovation spreading but policy hard to get right
- Open science and open education within ‘closed’ borders?
- Good governance is good for science
- The consequences for science of the ‘resource curse’





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## UNESCO SCIENCE REPORT Towards 2030

### Central Asia

- A region of growing strategic importance
  - Central Asia Regional Economic Cooperation (CAREC) Program, which also includes Afghanistan, Azerbaijan, China, Mongolia and Pakistan [CAREC 2020 Strategy](#)
  - [US\\$ 50 billion](#) is being invested in priority projects in [transport, trade](#) and [energy to improve members' competitiveness](#).
- High literacy and medium development → all adult Central Asians are literate
- A focus on university and research infrastructure
  - The governments of Central Asia have adopted the same policy of gradual, selective reforms when it comes to science and technology (S&T).
  - 3 universities have been set up in CA in recent years to foster competence in strategic economic areas
  - Countries are not only bent on increasing the efficiency of traditional extractive sectors ICTs, modern technologies to develop the business sector, education and research
  - International cooperation as a strong focus of the research institutes and hubs set up in recent years
  - Will to adopt a more sustainable approach to environmental management
  - Combine R&D in traditional extractive industries for greater use of renewable energy (solar)





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## Challenge and Opportunity



The Challenge:

- The past 3-4 decades have seen the emergence of complex global challenges

The Opportunity:

- We have 3-4 decades to move towards a sustainable development path




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FAST  
FACULTY FOR ACEI (FACILITIES AND CENTRE FOR ADVANCED TECHNOLOGY)




Malaysia  
Majlis Persekutuan


# The Role of Science


## The Past

- **Industrial revolution** (1686 – steam engine; later electricity, mechanisation, mass production)
- **Medical revolution** (19<sup>th</sup> century – discovery mircoorganisms, 20<sup>th</sup> century – antibiotics, pharmaceutical industry)
- **Green revolution** (20<sup>th</sup> century – fertiliser, pesticides, crop improvement)




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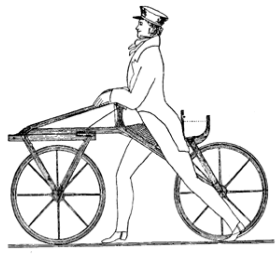
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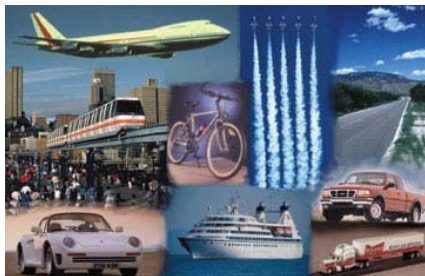
# Mobility

- **Transportation revolution**  
(1790 first bicycle)




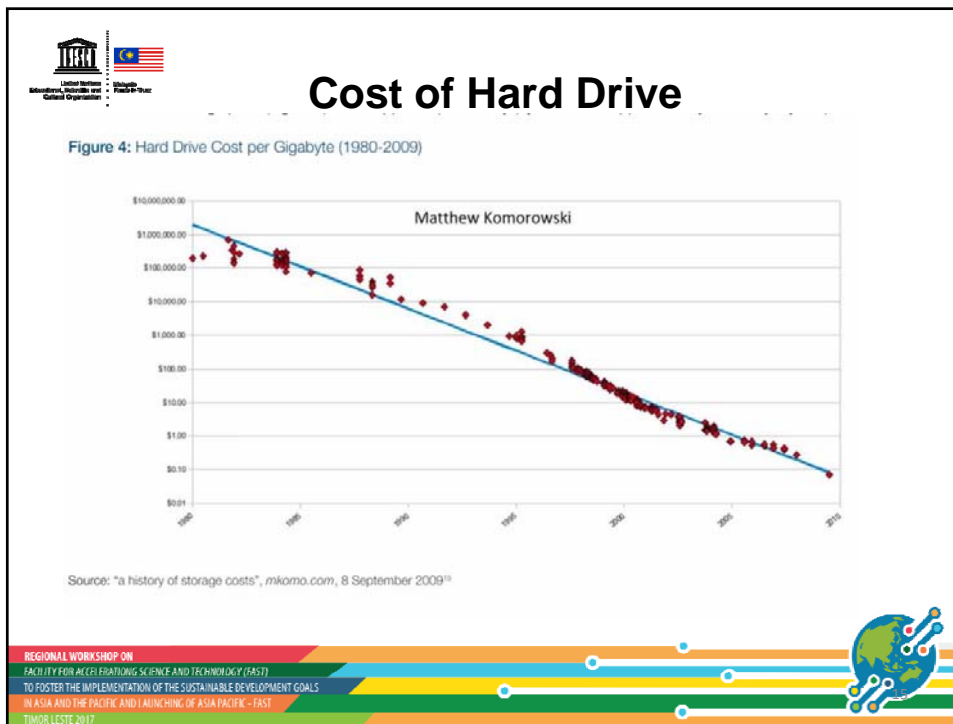
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## Science for Development

### *Present*

### ICT Revolution


"If the automobile and airplane business had developed like ICT, a Rolls Royce would cost \$2.75 and would run for 3 million miles on one gallon of gas. And a Boeing 767 would cost just \$500 and would circle the globe in 20 minutes on five gallons of gas." - Tom Forester

Computer Science Center  
University of Virginia


Sherridge 500 Computer  
1960-1964

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# Science for Development

## The Future




- Biotechnology revolution?
- Nanotechnology?
- Combinations of above with ICT.....


**We need:**  
**A Sustainable Development Revolution**



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# Natural Science for 2030 Agenda

**Harnessing STI and knowledge for sustainable development**

- Develop and monitor inclusive STI policy and knowledge systems
- Increase capacity to produce, disseminate and apply STI
- Increase capacity of LINKS and SIDS

4  
QUALITY  
EDUCATION

5  
GENDER  
EQUALITY

9  
INDUSTRY, INNOVATION  
AND INFRASTRUCTURE

17  
PARTNERSHIPS  
FOR THE GOALS

**Advancing science for sustainable management of natural resources, disaster risk reduction and climate change resilience**


- IHP - water security challenges
- IGGP & DRR - natural resources
- MAB - natural resources, biodiversity, climate change resilience
- UNESCO-designated sites as learning sites for sustainable development

6  
CLEAN WATER  
AND SANITATION


11  
SUSTAINABLE CITIES  
AND COMMUNITIES

13  
CLIMATE  
ACTION


15  
LIFE ON LAND



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## Related UNESCO Initiatives




World Water  
Assessment  
Programme




Engineering




LINKS  
Linking  
Institutions  
for  
Knowledge  
Sharing




COMEST  
Centre for  
International  
Cooperation  
in  
Higher  
Education




GLOBAL  
GEO PARKS  
NETWORK




UNESCO  
BIODIVERSITY  
INITIATIVE (UBI)




DISASTER  
PREPAREDNESS  
AND MITIGATION




THE UNESCO  
CLIMATE CHANGE  
INITIATIVE




World  
Heritage  
Convention




INTERNATIONAL  
BIOETHICS  
COMMITTEE  
(IBC)




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International  
Basic Sciences  
Programme




MAB  
Biosphere  
Programme




International  
Hydrological  
Programme



International  
Geosciences  
Programme



Intergovernmental  
Commission  
on Global  
Change



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## Intel and UNESCO Partnership



Mobile learning



Education in  
emergency situations



Gender Equality



Policies in Africa



Open Educational  
Resources



Teacher training



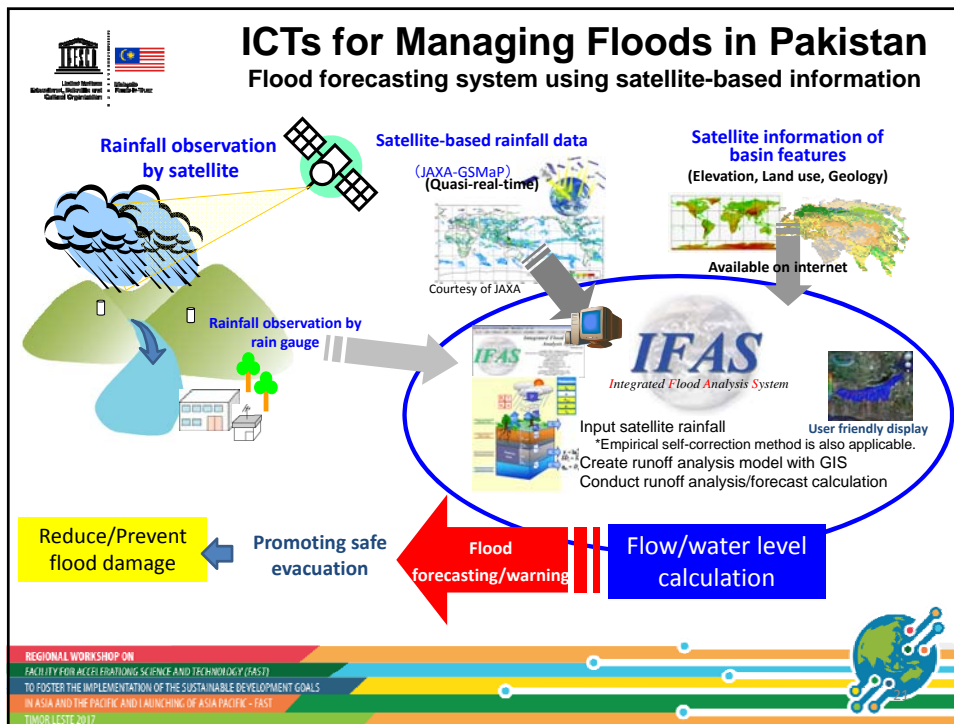
Access to technical  
vocational and  
tertiary education,  
including university



Massive Open Online  
Courses



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## Training Pak and Afghan Professionals

**13 participants (incl. 2 Afghan officers from ANDMA and MEW, FFD, NUST and UET with 4 women) received a 4 days intensive training delivered by ICHARM on IFAS and RRI in FFD.**

**Introduction of Mr Aziz Aimaq, director ANDMA and Mr Farhad Nayer, Modeller MEW to Mr Riaz, Chief Meteorologist, FFD in presence of ICHARM (Mr Iwami, Dr Tsuda)**

**RRI-Graphic User Interphase and IFAS Quick Reference manuals**

**Dr Amara, lecturer at UET Lahore receiving IFAS/RRI training certificate.**

**Mr Aziz (top right) and Mr Farhad (down) receiving their IFAS/RRI training certificates from Prof Shahbaz (UNESCO)**

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# UNESCO Jakarta ICTs Based Learning



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Japan  
国連加盟国  
科学技術振興  
機構



<http://connect-asia.org>

Collaboration for Network-eNabled Education, Culture,  
Technology and science



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 **green schools asia**  
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Climate Change Education  
for Sustainable Development



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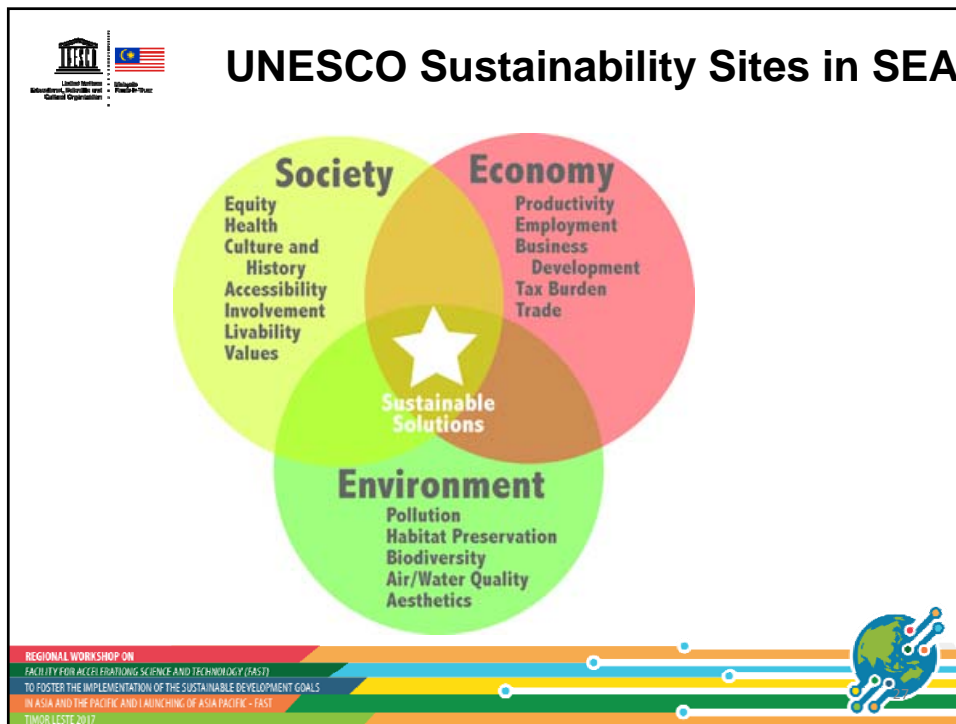
   
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## Banjarmasin Green Schools –Science Education Teachers Training Center



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**UNESCO Sustainability Sites in SEA**

**Society**  
Equity  
Health  
Culture and History  
Accessibility  
Involvement  
Livability  
Values

**Economy**  
Productivity  
Employment  
Business  
Development  
Tax Burden  
Trade



**Environment**  
Pollution  
Habitat Preservation  
Biodiversity  
Air/Water Quality  
Aesthetics

**Sustainable Solutions**

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**Indonesia**

**Tropical Rainforest Heritage of Sumatra**

- **Main threats:** Road Development, Agricultural Conversion, Increasing Mining/Oil Palm/Coffee Plantations, Lack of Coordination Mechanism
- **Key areas for sustainability science demonstration**
  - Integration of socio-ecological systems
  - Synthesis of participatory approaches and co-learning
  - Application of network theory towards sustainability
  - Recognising complexity and overlapping jurisdiction for dealing with sustainability issues

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**Malaysia**

**Langat River**







- **Status:** 3 administrations (Selangor, Negeri Sembilan, Putrajaya), 27 km to Kuala Lumpur
- **Main threats:** Impact of sewage discharge in the river, high dynamics of storm water runoff, limited groundwater recharge, fragmentation, and etc.
- **Key areas for sustainability science demonstration**
  - Knowledge of the interrelations between urban conditions and the state of waters as well as instruments and techniques for their management

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**Cambodia**

**Angkor WH Site & Siem Reap City Water Systems**

- **Main threats:** Excessive groundwater pumping under the city of Siem Reap, water pollution, periodic flooding and degraded ecosystems of Tonle Sap
- **Key areas for sustainability science demonstration**
  - Strategic planning of the surface and groundwater systems of the Siem Reap and their interactions with the ecosystems and cultural biodiversity of the Tonle Sap Biosphere Reserve

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**Philippines**

**Rice Terraces of Philippines Cordilleras**






- **Status:** UNESCO World Heritage List in 1995, Placed in the Ifugao Province, Built 2,000 years ago and passed on from generation to generation
- **Main threats:** Dangers of deforestation and climate change, migration of young generation, lack of sustainable rice production knowledge and practices to build social capital
- **Key areas for sustainability science demonstration**  
Community based sustainable development approaches

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**Philippines**


**Davao**



- **Main threats:** Typhoons and floods affect the island of Mindanao and Davao city and its metropolitan area are the most flood-prone urban areas.
- **Key areas for sustainability science demonstration**
  - Assess and address the climate vulnerability of the urban water system and how to help develop a resilient society
  - Strengthen integrated planning and coordination
  - Raise awareness on climate change adaptation among key stakeholders.

**SWITCH Pilot**

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## The Earth Sciences and Geo-hazards Risk Reduction - Natural Science of UNESCO

### VISUS: Visual Inspection for defining the Safety Upgrading Strategies



**HAZARDS**


Earthquake	Flood
Volcano	Tsunami
Landslide	Fire
Wind	Wildfire

**Pillar 1 Save Learning Facilities of the Comprehensive School Safety:**  
**UNESCO-VISUS parameters:**


Global structure,  
 Local structure,  
 Site location / situation,  
 Operational aspects, and  
 Non-structural elements

#### VISUS Adaptation Programme


- Adaptation of the methodology and survey tools to local Context (building typology, hazards, construction method, language, etc.)
- Transfer of scientific knowledge through capacity building of local engineers, decision makers, and surveyors;
- Training on VISUS for Decision Makers
- Pilot VISUS Methodology in Schools and School's individual and collective reports;
- Geo-referenced national inventories of schools in mapping platforms such as Open Street Map and Disaster Management Platform





2015: 60 Schools in Bandung and Pangandaran



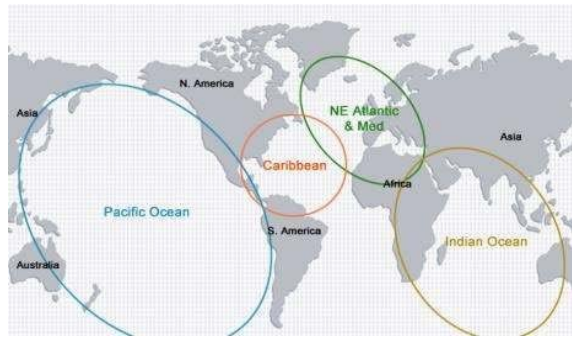
2016: 100 Schools in Ambon and North Moluccas



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## IOC- UNESCO Tsunami Monitoring and Warning System




- Support the Development of National Tsunami Warning and Mitigation System
- Sea Level Monitoring System and Sharing of Data
- Standard Operating Procedures
- Mitigation, Preparedness, and Education

**Pacific (and Asia):**



- Pacific Tsunami Early Warning System – Hawaii
- Japan Meteorology Agency

**Indian Ocean (Asia and Africa):**

- BOM – Australia
- INCOIS – India
- INATEWS - Indonesia




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## UNESCO-IOC in the Indian Ocean Region

**Indian Ocean Tsunami Information Centre (IOTIC)**

The IOTIC is an IOC UNESCO entity housed in UNESCO office Jakarta that serve as information resource to support the Indian Ocean member states in capacity building, education, awareness and preparedness for an effective tsunami warning and mitigation system in the region.



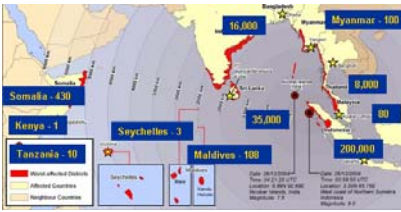
**Intergovernmental  
Oceanographic  
Commission**

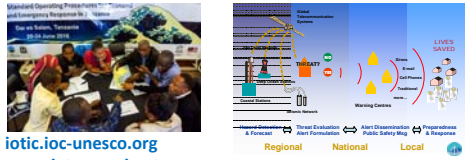


**Indian Ocean  
Tsunami Information  
Centre**


**Programme: Education, Awareness, and Preparedness**

1. Indian Ocean Tsunami Ready Programme
2. Tsunami Risk Reduction Policies
3. TEWS Standard Operating Procedures
4. Coastal Hazard Risk Assessment (Tsunami)
5. Tsunami Evacuation Map, Plan, and Procedures
6. How To conduct Plan, and Implement Tsunami Exercises
7. Preserving Past Tsunamis for Future Preparedness








[iotic.ioc-unesco.org](http://iotic.ioc-unesco.org)  
[www.iotsunami.net](http://www.iotsunami.net)  
[www.iotsunami.info](http://www.iotsunami.info)  
[www.iotsunami.org](http://www.iotsunami.org)



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## A Sustainable Development Revolution




**This requires that we:**

- Uplift the position of S&T on national and international agenda and in the hierarchy of institutions
- Ensure a more forward looking approach to minimise negative consequences of new solutions
- Apply inter- and trans-disciplinary approaches

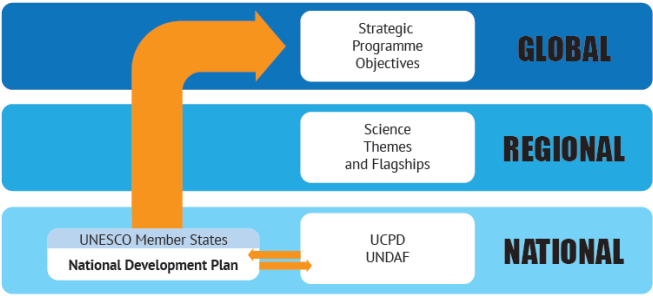



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## Natural Sciences Programmes


### Linking Global and Regional Medium Term Strategic Objectives





**R&D, Capacity Building, Training, Networking, and Policy Advice**

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## The Regional Bureau's Science Support Strategy 2014-2021

- Vision: Fostering Science for Sustainable Development in Asia and the Pacific Region
- Building of peace and sustainable development in Member states of Asia and the Pacific through enabling science-policy interface
- Strengthen the sharing and management of knowledge, data and innovation on science-related issues
- Work in close collaboration with the Bureau's regional partners



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Cultural Organization

Malaysia  
Kementerian Pendidikan  
Majlis Pendidikan

## Regional Science Bureau for Asia and the Pacific SETI for DRR 2017-2021





To advance the use of science, engineering, technology, and innovation (SETI) to mitigate disaster risks and strengthen the resilience of societies through better understanding the hazard and risk, prevention and risk reduction, preparedness, and early warning.

To help to prioritize and streamline the programmatic disaster risk reduction measures in Asia and the Pacific to build Resilience and mitigate risks.

To work in collaboration with its regional and global partners on the use of science and technology to support the member states' needs in disaster risk reduction and building sustainable resilience.



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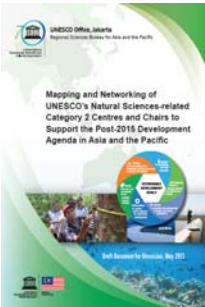
Malaysia  
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## UNESCO Natural Sciences Centres and Chairs in Asia and the Pacific


- Mapping and Networking of UNESCO's Natural Sciences related Category 2 Centers and Chairs to support the Post-2015 Development Agenda in Asia and the Pacific



● UNESCO Natural Sciences Category 2 Centers in Asia and the Pacific  
● UNESCO Natural Sciences Chairs in Asia and the Pacific



**28 Natural Sciences Chairs**  
**15 Natural Sciences Category 2 Centers**



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# UNESCO

**Partner in building the future we want for all**



# Thank You!

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