Role of SETI to Deliver UN 2030 Agenda for Sustainable Development

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Hotel Timor, Dili 7-9 June 2017

UN Agenda 2030 SDGs

1. No Poverty
2. Zero Hunger
3. Good Health and Well-being
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life Below Water
15. Life on Land
16. Peace, Justice and Strong Institutions
17. Partnerships for the Goals
Related International Developments

Sendai Framework for Disaster Risk Reduction 2015 - 2030

Recognition of Key Global Challenges

Climate Change/Global Change
Adaptation to increased hazard, innovation, focus on natural disasters

Rapid urbanization and population growth
Sustainable Infrastructure

Poverty
Access to infrastructure, services, rights, and technologies

Sustainability  Innovation  Technology
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

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
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

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
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.

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’
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)

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
The Role of Science

The Past

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

Mobility

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

Science for Development

Present

ICT Revolution
Science for Development

The Future

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

We need:
A Sustainable Development Revolution

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

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
Related UNESCO Initiatives

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
ICTs for Managing Floods in Pakistan
Flood forecasting system using satellite-based information

Rainfall observation by satellite
Satellite-based rainfall data
Satellite information of basin features (Elevation, Land use, Geology)

Flood forecasting/warning
Flow/water level calculation
Reduce/Prevent flood damage
Promoting safe evacuation

- Input satellite rainfall
- Empirical self-correction method is also applicable.
- Create runoff analysis model with GIS
- Conduct runoff analysis/forecast calculation

Available on internet
User friendly display

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.

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

Introduction of Mr Aziz Aimaq, director ANDMA and Mr Farhad Nayyer, 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

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

http://connect-asia.org

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

Our Network Partners

Supported by JFIT:
Banajarmasin Green Schools – Science Education Teachers Training Center
UNESCO Sustainability Sites in SEA

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

Indonesia

Tropical Rainforest Heritage of Sumatra
Malaysia

- **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

Cambodia

- **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
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**
VISUS: Visual Inspection for defining the Safety Upgrading Strategies

UNESCO-VISUS parameters:
- Global structure,
- Local structure,
- Site location / situation,
- Operational aspects, and
- Non-structural elements

HAZARDS
- Earthquake
- Volcano
- Landslide
- Fire
- Wildfire
- Flood
- Tsunami
- Earthquake
- Volcano
- Landslide
- Fire
- Wildfire

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

IOC- UNESCO Tsunami Monitoring and Warning System

Pacific (and Asia):
- Pacific Tsunami Early Warning System – Hawaii
- Japan Meteorology Agency

Indian Ocean (Asia and Africa):
- BOM – Australia
- INCOIS – India
- INATEWS - Indonesia

- 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
Indian Ocean Tsunami Information Centre (IOTIC)

The IOTIC is an IOC UNESCO entity housed in UNESCO office Jakarta that serves 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.

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

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
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
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.

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
Partner in building the future we want for all
Thank You!