Regional Bureau for Science in Asia and the Pacific: Science Support for Disaster Risk Reduction

Ardito M Kodijat
Programme Officer for Disaster Risk Reduction and Tsunami Information Unit
UNESCO Office Jakarta
Disaster Risk Reduction and Tsunami Information Unit
UNESCO Office Jakarta

DRR in UNESCO

Science
Earth Sciences and Geo-hazards Risk Reduction

IOC
Tsunami Unit

Disaster Risk Reduction and Tsunami Information Unit
UNESCO Office Jakarta

IOC Structure
IOC High Level Objectives

HIGH LEVEL OBJECTIVE 1
Healthy ocean ecosystems and sustained ecosystem services

HIGH LEVEL OBJECTIVE 2
Effective early warning systems and preparedness for tsunamis and other ocean-related hazards

HIGH LEVEL OBJECTIVE 3
Increased resilience to climate change and variability, and enhanced safety, efficiency and effectiveness of all ocean-based activities through scientifically-founded services, adaptation and mitigation strategies

HIGH LEVEL OBJECTIVE 4
Enhanced knowledge of emerging ocean science issues

IOC Programmes

• Ocean Science
• Capacity Development
• Tsunami
• GOOS - Global Ocean Observation System
• JCOMM - WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology
• IODE - International Oceanographic Data and Information Exchange
• IOC Law of the Sea
• Ocean Carbon
• Marine Management
IOC SDG Focus

#11: Make cities inclusive, safe, resilient and sustainable

#14: Conserve and sustainably use the oceans, seas and marine resources

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 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.

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

DRR in UNESCO’s Medium-Term Strategy for 2014-2021
UNESCO will maintain a major focus on disaster risk reduction (DRR), as the most cost-effective means to mitigate the effects of disasters and save lives, heritage and infrastructure. Emerging areas of DRR competence for UNESCO include the remote sensing of emergency groundwater resources in drought-affected countries; national floods forecasting and water resource management; DRR education including through radio and other media; as well as the global expansion of Tsunami Early Warning Systems.

UNESCO’s disaster response strategy will focus on access, including access to fresh water, to education, to disaster risk reduction information, to hazard assessments, and to capacity building for multi-hazard disaster early warning systems and resource management.
UNESCO’s Activity by Sector

Strategy for Reducing Risks from Disasters at World Heritage Properties

- Training Workshops
- International Technical Assistance
- Emergency Response
- Awareness-raising and Education

Comprehensive School Safety Framework

Identifies three overlapping pillars:
1. Safe Learning Facilities,
2. School Disaster Management, and
3. Risk Reduction and Resilience Education

with the following goals:
- To protect learners and education workers from physical harm in schools;
- To prevent interruption of the provision of education when faced with hazards;
- To safeguard education sector investments;
- To strengthen climate change adaptation and mitigation competencies and disaster resilience through education
The Earth Sciences and Geo-hazards Risk Reduction - Natural Science of UNESCO

VISUS: Visual Inspection for defining the Safety Upgrading Strategies

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

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

Regional Science Bureau for Asia and the Pacific Support Strategy

Science, Engineering, Technology, and Innovation for Disaster Risk Reduction
2017 - 2021
Disaster in ASPAC in 2015

16,000 fatalities in the region impacted by large scale catastrophic disasters — *more than a two-fold increase since 2014.*

160 disasters were reported in the Asia Pacific region, accounting for 47% of the world’s 344 disasters.

South Asia accounted for 64% of total global fatalities — the majority attributed to the 7.8 magnitude earthquake that struck Nepal in April causing 8,790 fatalities.

59.3 million people in Asia Pacific were affected by disaster in 2015

US$ 45.1 billion in economic damage in Asia and the Pacific and even higher with indirect losses.

Source: Disasters in Asia and the Pacific: 2015 Year in Review

Mission

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.
Science, Engineering, Technology and Innovation (SETI) for SFDRR (SFDRR Priority For Actions)

1. Understanding Disaster Risk
   - Knowledge needs of policy-makers and practitioners
   - Scientific data
   - Scientific information for better informed decision-making
   - Local and indigenous knowledge
   - DRR technical expertise
   - Synthesize, produce and disseminate scientific evidence in a timely manner
   - Scientific data and information for monitoring and reviewing progress for DRR and resilience building

SETI for SFDRR (SFDRR Priority for Action)

2. Strengthening Disaster Risk Governance to Manage Disaster Risk
   - Involvement and use of science to inform policy- and decision-making

3. Investing in Disaster Risk Reduction for Resilience
   - Scientific evidence for investment and development planning

4. Enhancing Disaster Preparedness for Effective Response, and to “Build Back Better” in Recovery, Rehabilitation and Reconstruction
   - Scientific data and information to strengthen preparedness, response and to “Build Back Better”
RSBAP Strategic Directions

- Risk Assessment
- Early Warning System
- Prevention, Preparedness and Risk Reduction
- Resilience and Sustainable Development

RSBAP SETI for DRR Programme

- Geo-hazards
- School Safety
- Water
- Heritage Sites
- Coastal (Tsunami)
- Crisis and Transition Response
Prioritisation

- SETI Application
- Transboundary
- UNESCO Competitive Advantage
- UNESCO Programme Priority
- Resource (Funding)
- Partnership
- Cross Cutting Issues
- Contribution to Global Frameworks

Support by RSBAP

- Tools and Guidelines
  - Coordinate Regional Cooperation in DRR Research
  - Coordinate Policy Development for SETI to support DRR
  - Establish and Strengthen Cooperation with Partners
  - Promote Public Awareness on SETI for DRR
  - Coordinate with scientific community on SETI for DRR
  - Assistance on technical studies and capacity building
UNESCO
Examples of SETI for DRR

FLOOD TECHNOLOGY & DISASTER RISK REDUCTION
Strategic Strengthening of Flood Warning and Management Capacity in Pakistan
Following the 2010 Pakistan floods, UNESCO with the aid of the Government of Japan supported the Flood Warning and Management Capacity of Pakistan’ project. The project focused on strengthening the country’s capacity to deal with floods and watershed management in a holistic manner by developing 3 inter-related pillars; strategic augmenting of flood forecasting and hazard maps; data sharing platforms; and capacity development.

- Establishment of the technical foundation for sustainable capacity development on the flood management, forecasting, early warning and flood hazard analysis in Pakistan agencies.
- Technical studies to promote strengthening of cooperation with Indus river basin countries for transboundary flood management and transboundary data sharing.
- Capacity building and education to community on flood management for proper utilization of flood hazard information and tools.

UNESCO
Examples of SETI for DRR

VISUS (Visual Inspection for defining the Safety Upgrading Strategies).
Multi-hazard school safety assessment methodology and tools through science-based information

The VISUS methodology is based on a technical engineering approach that can be used by engineering students and building construction vocational students to assist the government to better prioritize safer school programs in their region.

The method aims to help policy makers in deciding where to focus their risk reduction efforts and interventions based on available resources and scientific-evidence information.
Mobile Application for Preparedness

TANAH and SAI FAH are prime examples of educational gamification for disaster risk reduction. The mobile apps provide integral lessons on, and reinforces the importance of, disaster preparedness, through exploring potential situations that may occur. Offered as platform-based games with various levels, users are provided with key survival lessons for all phases of disaster in an interactive manner. While SAI FAH disseminates information on flood preparedness and survival, TANAH teaches users how to prepare, respond to and recover from tsunamis and earthquakes. Both succeed in their underlying objectives of delivering quality, interactive, and accurate material in an organic way to a wide audience.

Protecting People from Marine Hazards: Tsunami

UNESCO, through the Intergovernmental Oceanographic Commission (IOC/UNESCO), works with the Member States to build sustainable tsunami early warning and mitigation systems.

- Tsunami risk assessment includes the evaluation of the hazard and the levels of vulnerability of coastal communities.
- Development and coordination of tsunami early warning and mitigation systems based in the Indian Ocean
  - IOC/UNESCO established Indian Ocean Tsunami Information Centre (IOTIC) to support on public education, awareness and building tsunami ready community
Thank you