



Risk-informed Governance and Innovative Technology for Disaster Risk Reduction and Resilience

Module 1.3: Global, Regional, and National Efforts to Advance Innovative Technologies Use in DRR and Resilience

Contents

1. Science, Technology, and Innovation (**STI**) in the Sendai Framework.
2. Science, Technology, and Innovation (STI) in the 2030 Agenda
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5. National Promotion and Support of STI

Learning Outcomes

At the conclusion of this Session, participants will be able to:

- Define science, technology, and innovation, and explain why some technologies are described as being ‘emerging’, ‘disruptive’, or ‘frontier’.
- Explain how science, technology, and innovation impact and improve societies.
- Describe the role and importance of data and information for science, technology, and innovation, including open data movements.
- Describe how governments have embraced technology and innovation through e-Governance, Smart Cities, and related initiatives.
- Explain what resilience is, and how it applies to individuals, communities, organizations, and societies.

■ Introduction

- DRR and Resilience are common goals
 - Many decades of collaboration
 - Many stakeholders / agencies involved
- Global, regional, and national efforts
- Adoption and application of science, technology, and innovation require a concerted effort / plans / frameworks



Image: Painting by a primary school child in Sri Lanka after the 2005 Boxing Day tsunami
Image source: UNESCO, 2019.

1. STI in the Sendai Framework

■ STI in the Sendai Framework for DRR



Images: Scenes from the 3rd UN World Conference for Disaster Risk Reduction held in Sendai, Japan in March 2015. Image credit: UNDRR, 2015.

Sendai Framework Global Targets

The Sendai Framework: seven targets and four priority actions



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■ Sendai Framework Global Targets

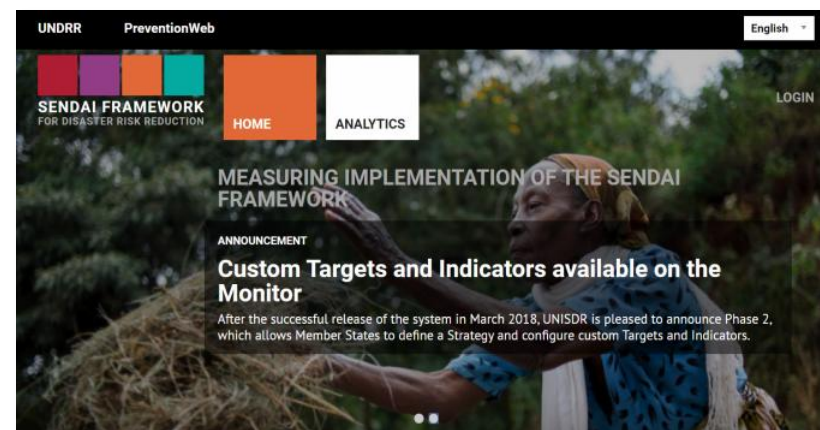
1. Substantially reducing global disaster **mortality** by 2030, aiming to lower average per 100,000 global mortality rate in the decade 2020-2030 compared to the period 2005-2015.
2. Substantially reducing the number of **disaster-affected people** globally by 2030, aiming to lower average global figure per 100,000 in the decade 2020 -2030 compared to the period 2005-2015.
3. Reducing direct disaster **economic loss** in relation to global gross domestic product (GDP) by 2030.
4. Substantially reducing disaster damage to **critical infrastructure** and disruption of **basic services**, among them health and educational facilities, including through developing their resilience by 2030.

Sendai Framework Global Targets (continued)

5. Substantially increasing the number of countries with national and local disaster risk reduction strategies by 2020.

6. Substantially enhancing international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this Framework by 2030.

7. Substantially increasing the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030.



■ Sendai Framework Priorities for Action

Priority 1: Understanding disaster risk

Priority 2: Strengthening disaster risk governance to manage disaster risk

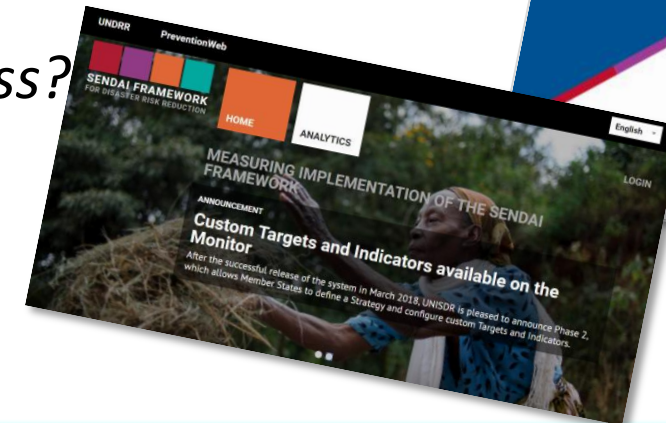
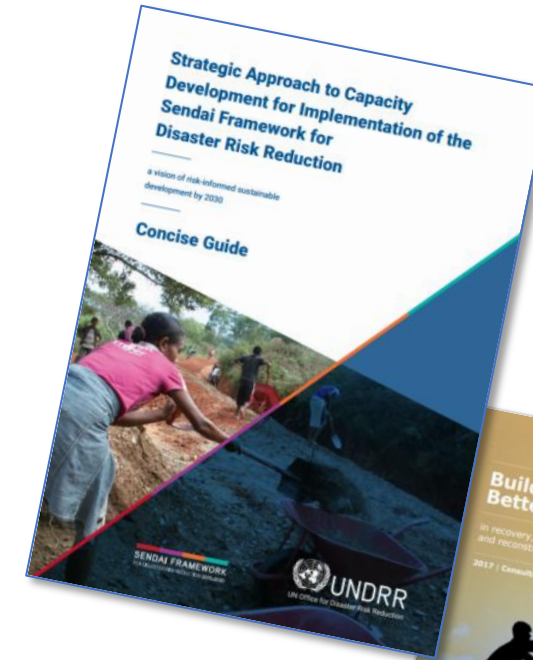
Priority 3: Investing in disaster risk reduction for resilience

Priority 4: Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction

1. STI in the Sendai Framework

■ Sendai Framework Implementation Guide

- Strategic Approach to Capacity Development Guide
What capacity do we need to implement DRR?
<http://bit.ly/2OCsmxr>.
- Words Into Action Guides
What actions do we need to take to implement DRR?
<http://bit.ly/2PPAQWY>.
- Sendai Framework Custom Indicators
How can we measure our implementation progress?
<http://bit.ly/2DyJSll>.

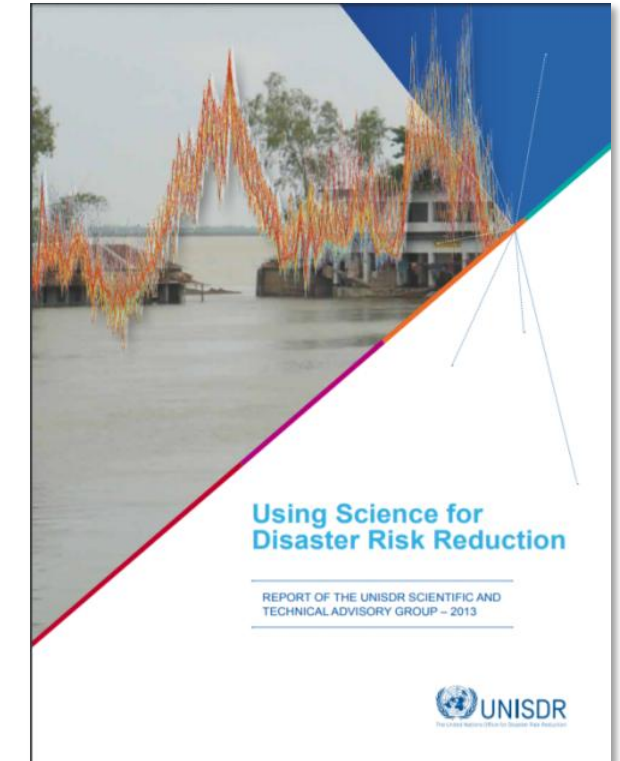


1. STI in the Sendai Framework

■ STI and Global DRR Efforts

Years of advocating for STI to better support DRR goals

- **1990**: IDNDR Scientific and Technical Committee (STC) formed
- **2001**: Scientific and Technical Advisory Group (STAG)
- **2008**: UNISDR Scientific and Technical Committee (STC) formed
- **2013**: STAG report



1. STI in the Sendai Framework

■ Global Development Frameworks Embraces DRR

- **Sendai Framework** for DRR 2015-2030
- **2030 Agenda** for Sustainable Development
- **Paris Agreement** under the UN Framework Convention on Climate Change
- Agenda for Humanity
- New Urban Agenda
- **Addis Ababa Action Agenda** under the Third International Conference on Financing for Development



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1. STI in the Sendai Framework

■ Sendai Framework and STI calls for:

- Science-based risk knowledge (defensible, risk-based decision-making support)
- Scientific methodologies and tools
- The products of research and development produced by intersectoral networks and research institutions (an expanded community of stakeholders)
- A strengthening of the interface between science and policy

1. STI in the Sendai Framework

(g) To enhance the scientific and technical work on disaster risk reduction and its mobilization through the coordination of existing networks and scientific research institutions at all levels and in all regions, with the support of the United Nations Office for Disaster Risk Reduction Scientific and Technical Advisory Group, in order to strengthen the evidence-base in support of the implementation of the present Framework; promote scientific research on disaster risk patterns, causes and effects; disseminate risk information with the best use of geospatial information technology; provide guidance on methodologies and standards for risk assessments, disaster risk modelling and the use of data; identify research and technology gaps and set recommendations for research priority areas in disaster risk reduction; promote and support the availability and application of science and technology to decision-making; contribute to the update of the publication entitled "2009 UNISDR Terminology on Disaster Risk Reduction"; use post-disaster reviews as opportunities to enhance learning and public policy; and disseminate studies;

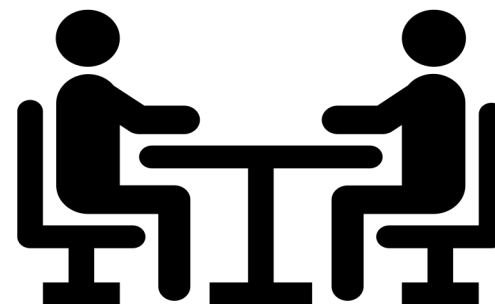
(h) To promote and improve dialogue and cooperation among scientific and technological communities, other relevant stakeholders and policymakers in order to facilitate a science-policy interface for effective decision-making in disaster risk management;

(b) Academia, scientific and research entities and networks to focus on the disaster risk factors and scenarios, including emerging disaster risks, in the medium and long term; increase research for regional, national and local application; support action by local communities and authorities; and support the interface between policy and science for decision-making;

■ Science and Technology Roadmap

Sendai Framework Priority for Action	S&T Expected Outcomes
1. Understanding Disaster Risk	1.1 Assess and update the current state of data, scientific and local and indigenous knowledge and technical expertise availability on disaster risks reduction and fill the gaps with new knowledge. 1.2 Synthesize, produce and disseminate scientific evidence in a timely and accessible manner that responds to the knowledge needs of policy-makers and practitioners. 1.3 Ensure that scientific data and information support are used in monitoring and reviewing progress towards disaster risk reduction and resilience building. 1.4 Build capacity to ensure that all sectors and countries have access to, understand and can use scientific information for better informed decision-making
2. Strengthening Disaster Risk Governance to Manage Disaster Risk	2.1 Support a stronger involvement and use of science to inform policy-and decision-making within and across all sectors at all levels
3. Investing in Disaster Risk Reduction for Resilience	3.1 Provide scientific evidence to enable decision-making of policy options for investment and development planning
4. Enhancing Disaster Preparedness for Effective Response, and to “Build Back Better” in Recovery, Rehabilitation and Reconstruction	4.1 Identify and respond to the needs of policy-and decision-makers at all levels for scientific data and information to strengthen preparedness, response and to “Build Back Better” in Recovery, Rehabilitation and Reconstruction to reduce losses and impact on the most vulnerable communities and locations.

Group Work and Activities



■ Discussion 1: Focus of S&T in the Sendai Framework

- The focus of the Roadmap is very much on data and information.
- The Facilitator can initiate a discussion about whether these expected outcomes fully capture the range of capabilities offered from ongoing scientific research, discovery, and innovation.
- **The Facilitator** may note that the focus of the roadmap expected outcomes is on data and information. Participants may wish to refer to the lessons from Module 1, Session 1 in this discussion.
 - Is data and information the sole focus?
 - Does that adequately capture all desired capabilities? If not, what is missing?

2. Science, Technology, and Innovation in the 2030 Agenda

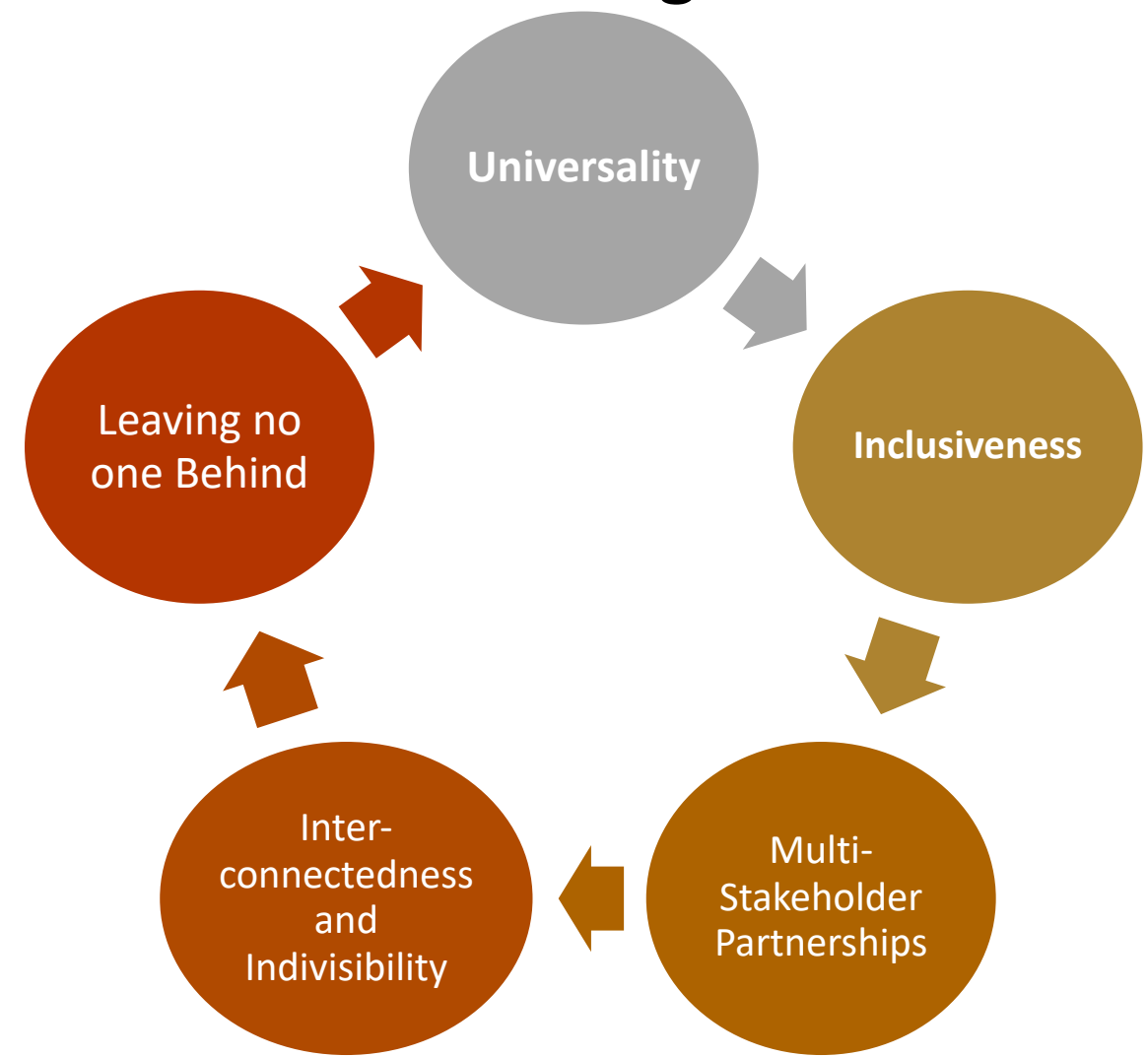
STI in the 2030 Agenda for Sustainable Development



Images: Scenes from the 2015 Sustainable Development Summit held in New York, USA in September of 2015. Image credit: UN, 2015.

2. Science, Technology, and Innovation in the 2030 Agenda

5 Core Principles



2. Science, Technology, and Innovation in the 2030 Agenda

Nature and Characteristics of the 2030 Agenda for Sustainable Development



2. Science, Technology, and Innovation in the 2030 Agenda

Alignment between the Sendai Framework and SDG indicators

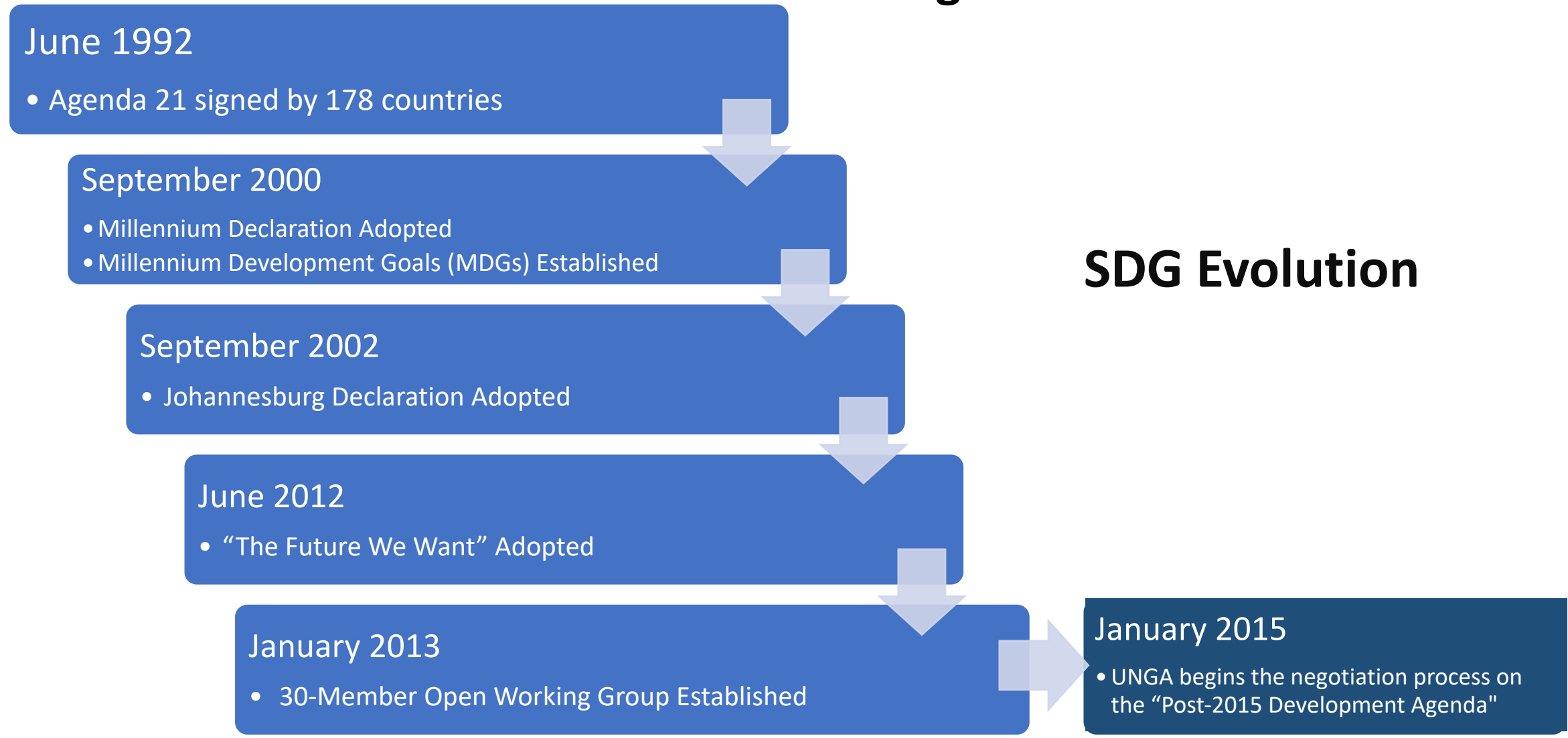
- There is the need for a deliberate and coherent approach that place DRR at the heart of Sustainable Development.
- At the heart of the Sustainable Development Agenda is disaster resilience.



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2. Science, Technology, and Innovation in the 2030 Agenda

SDG Evolution



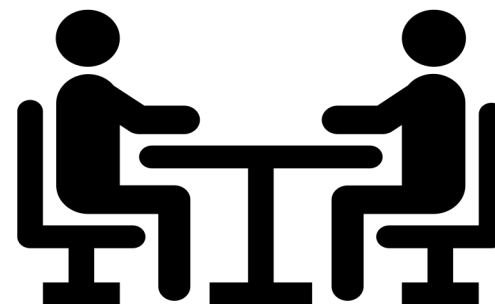
2. Science, Technology, and Innovation in the 2030 Agenda

Geospatial Tech and the SDGs



Video: Geospatial Technology and Sustainable Development Goals.
Video length: 3:23

Group Work and Activities



■ Discussion 2: Linking Sustainable Development and Disaster Resilience

- It has long been said that disasters and sustainable development are closely linked.
- In that same vein, it can be said that development and resilience are linked.
- **The Facilitator** can ask Participants to consider where, if at all, a line may be drawn between technologies that support development, and those that support disaster risk reduction and likewise enhance disaster resilience.

2. Science, Technology, and Innovation in the 2030 Agenda

- **Technology Facilitation Mechanism**

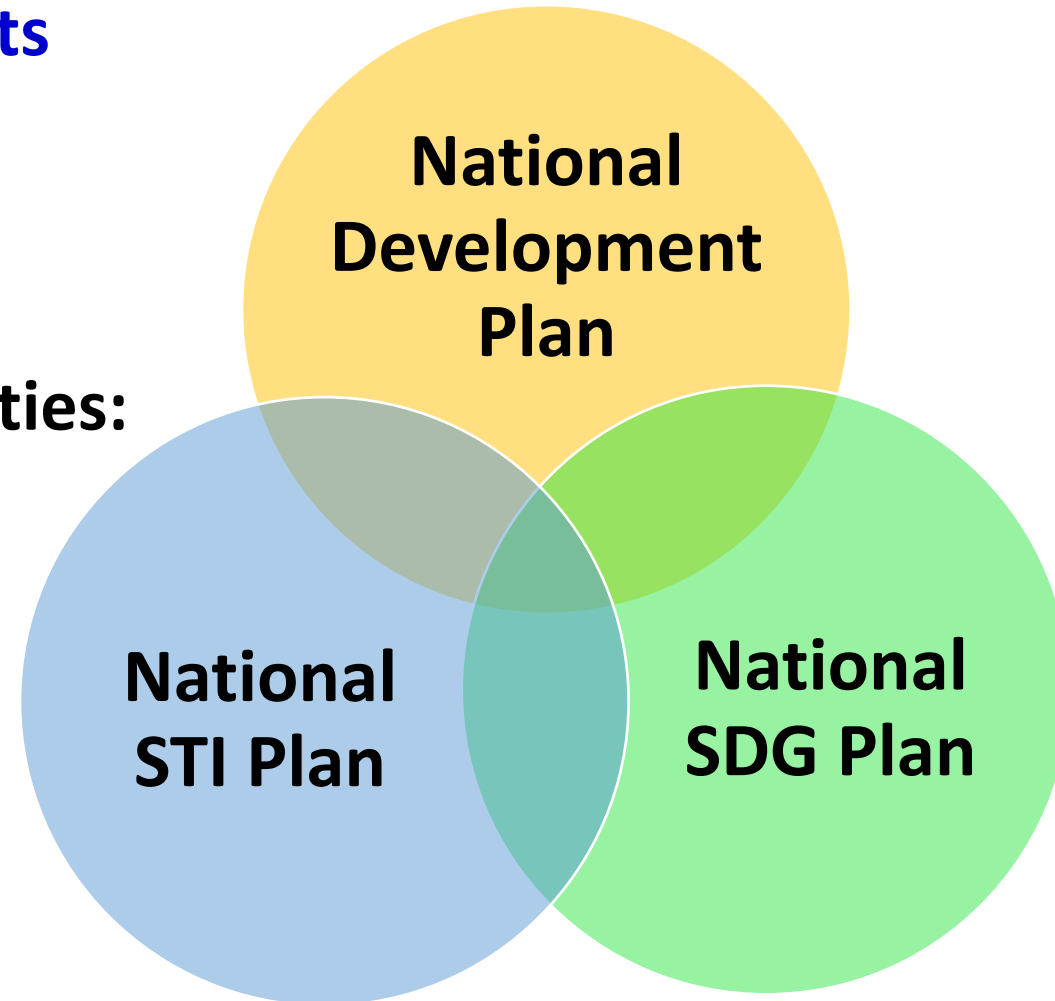


Video: Technology facilitation for Sustainable Development Goals.
Video length: 3:55

2. Science, Technology, and Innovation in the 2030 Agenda

Integration of STI Planning Efforts

Three STI Planning Opportunities:



2. Science, Technology, and Innovation in the 2030 Agenda

STI Planning Stakeholder Engagement

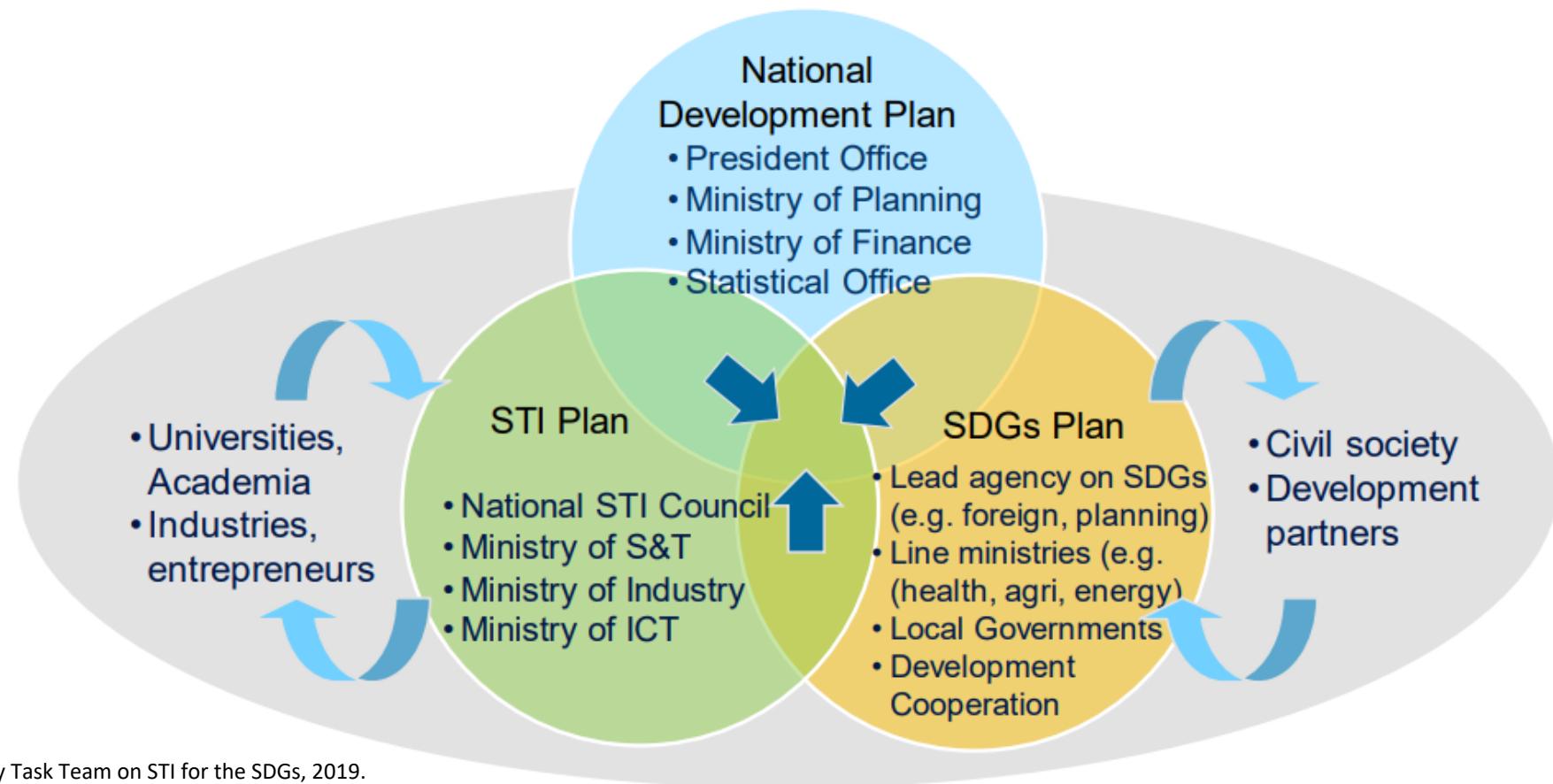


Image Source: UN Interagency Task Team on STI for the SDGs, 2019.

2. Science, Technology, and Innovation in the 2030 Agenda

STI Planning Process

Six-step Process:

1. Define objectives and scope
2. Assess current situation
3. Develop vision, goals, and targets
4. Assess alternative pathways
5. Develop detailed STI for SDG roadmaps for implementation
6. Monitor evaluate and update plan

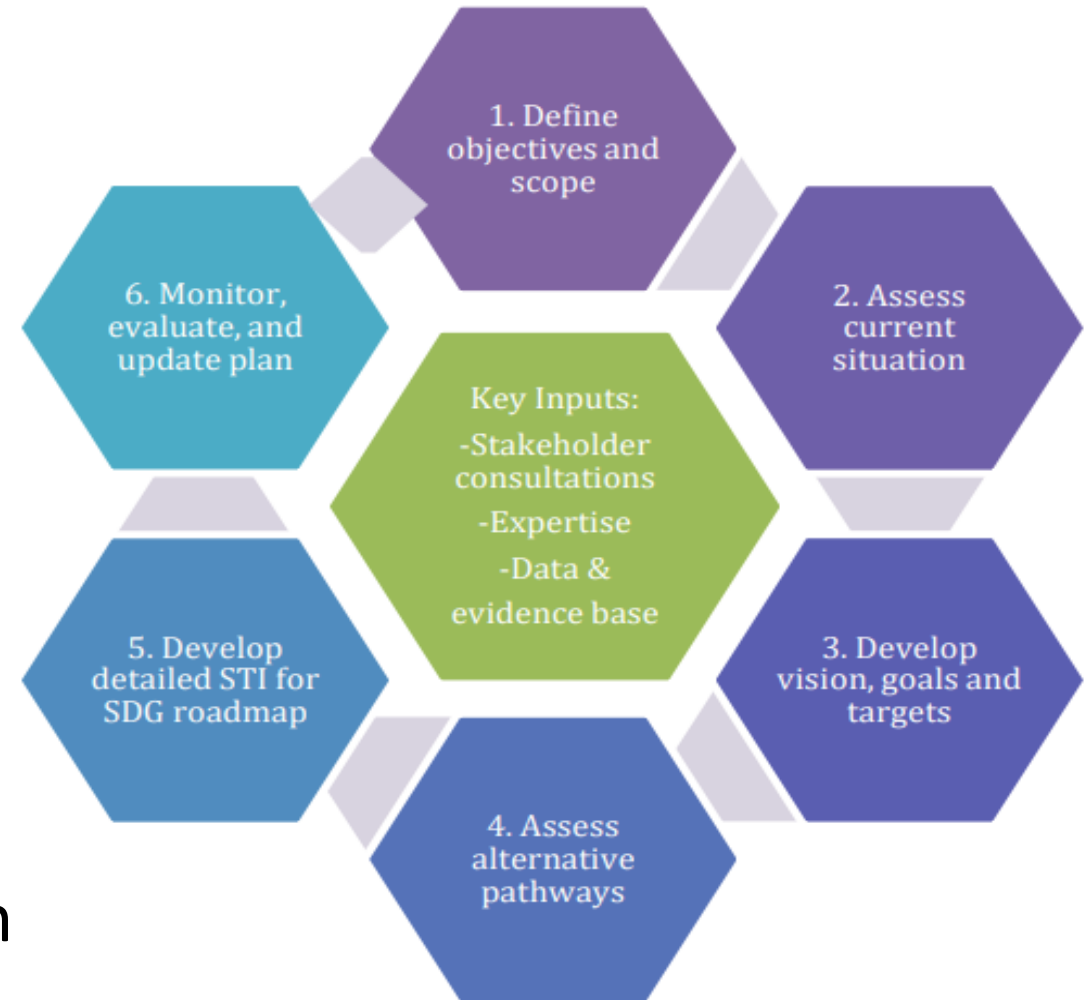


Image Source: UN Interagency Task Team on STI for the SDGs, 2019.

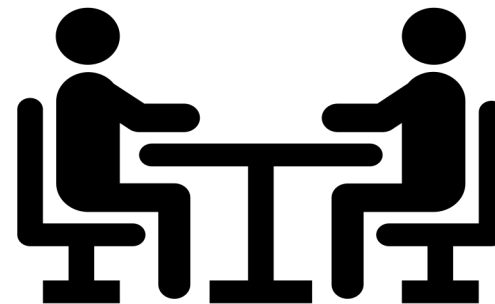
UN Commission on Science and Technology for Development (CSTD)

1. Began in 1992, but rooted in 1979 Conference on Science and Technology for Development
2. A functional commission of ECOSOC
3. Focal point for science and technology information and advancement
4. Tracks situation and trends
5. Provides a forum to frame critical issues



Video: Colin Tukuitonga SPC Citizen Science in the Pacific FINA.
Source: UNCTAD Online, 2019.

Group Work and Activities



■ Discussion 3: Information Sharing Experience

- **The Facilitator** can ask Participants what opportunities exist in their regions to share information in this way.

3. Global Efforts to Promote STI for DRR

Characteristics of Tech for DRR

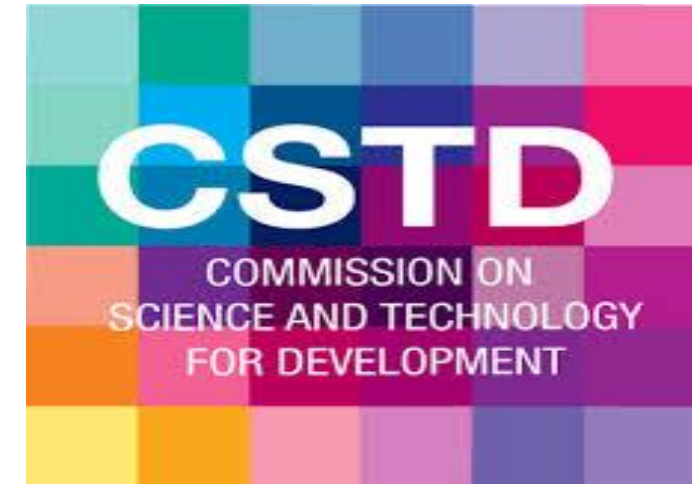
1. Multipurpose
2. Easy to learn and use
3. Scalable
4. Accessible and affordable



3. Global Efforts to Promote STI for DRR

■ Commission on Science and Technology for Development (CSTD) Recommendations

1. Participatory research methods & scientific collaboration;
2. Traditional, local and indigenous knowledge;
3. Developing an analytical framework;
4. Leveraging private sector participation;
5. Incubators, accelerators, innovation labs, marketplaces, and grass-roots social innovations;
6. Open dialogue between the scientific and technology sectors and policymakers;
7. Citizen science initiatives;
8. Embedding citizen science in the policymaking process;
9. Promoting data use in ways that respect citizen's rights;
10. Establishment of platforms for the coordination and compilation of data;
11. Establishing linkages, programs and projects between citizen science and the SDGs;
12. Ensuring that STI for resilience and citizen science projects are documented



4. Regional Promotion and Support of STI

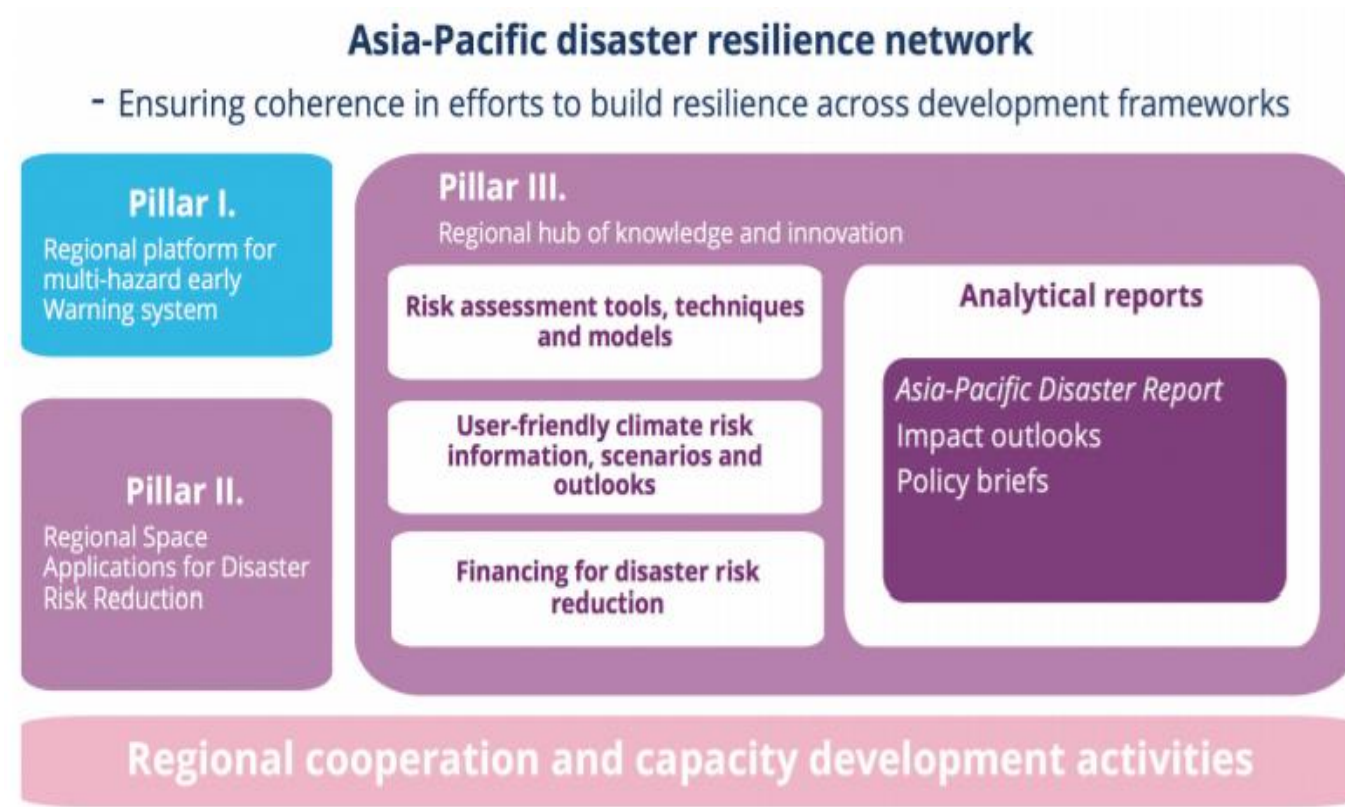
- Regional Science and Technology Advisory Group(R-STAGs)
 - E-STAG
 - Arab STAG
 - ASTAAG
 - Latin America and Caribbean STAG
 - Af-STAG
 - PSTAG
- Regional Organizations



Image : UNISDR head Mami Mizutori speaking at the opening of the AMCDRR meeting in Ulaanbaatar, July 4, 2018.
Image Source: UNDRR, 2018.

4. Regional Promotion and Support of STI

■ Schematic Diagram of Asia-Pacific Disaster Resilience Network (APDRN)



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4. Regional Promotion and Support of STI

Case Study: Asia Science Technology Academia Advisory Group (ASTAAG)

- Established 2015
- 9 Member Countries
- Group advises governments and other stakeholders on policy / decision making
- Periodic assessments of STI for DRR efforts
- Helps to review Sendai Framework implementation progress



Image : Hazard exposure in Malaysia.
Image Source: ASTAAG, 2018.

4. Regional Promotion and Support of STI

■ Case Study: CARICOM STI for SD Strategy

- Caribbean Council for Science and Technology (CCST)
- 2007 – Regional STI Capacity Development Strategy released
- Section on “Disaster Preparedness”
- Early version of STI for DRR plan



4. Regional Promotion and Support of STI

Case Study: STI Strategy for Africa 2024

- Priority areas identified
- Pillars
- Governance / implementation arrangements
- Funding mechanisms
- Communication and publicity
- Monitoring and evaluation

	Priorities	Research and/or innovation areas
1	Eradicate Hunger and ensure Food and Nutrition Security	- Agriculture/Agronomy in terms of cultivation technique, seeds, soil and climate - Industrial chain in terms of conservation and/or transformation and distribution infrastructure and techniques
2	Prevent and Control Diseases and ensure Well-being	- Better understanding of endemic diseases - HIV/AIDS, Malaria Hemoglobinopathie - Maternal and Child Health - Traditional Medicine
3	Communication (Physical & Intellectual Mobility)	- Physical communication in terms of land, air, river and maritime routes equipment and infrastructure and energy - Promoting local materials - Intellectual communications in terms of ICT
4	Protect our Space	- Environmental Protection including climate change studies - Biodiversity and Atmospheric Physics - Space technologies, maritime and sub-maritime exploration - Knowledge of the water cycle and river systems as well as river basin management
5	Live Together - Build the Society	- Citizenship, History and Shared values - Pan Africanism and Regional integration - Governance and Democracy, City Management, Mobility - Urban Hydrology and Hydraulics - Urban waste management
6	Create Wealth	- Education and Human Resource Development - Exploitation and management of mineral resources, forests, aquatics, marines etc - Management of water resources

5. National Promotion and Support of STI

■ National Role:

- Support development of STI solutions
- Design and implement STI policies
- Align STI policies with public health, disaster management and other relevant policies
- Adopt inclusiveness in formulating STI for resilience strategies
- Establish/strengthen existing national platforms
- Strengthen research programs
- Promote the use of scientific tools to provide and share risk information
- Invest in enabling technology infrastructure



5. National Promotion and Support of STI

■ Case Study: Kenya STI for SDGs Roadmap

Key characteristics:

- Institutional arrangement that integrate the roots of both resources and demand for the STIs focused on SDGs
- Coordination with Existing Policy frameworks
 - Kenya's SDG Roadmap
 - National STI Policy
- International input and partnerships



5. National Promotion and Support of STI

■ National Planning Principles

- Multi-Stakeholder Partnership
- Focused Approach
- Inclusive Approach
- Cultural Calibration
- Dynamic Evolution
- Youth Voices



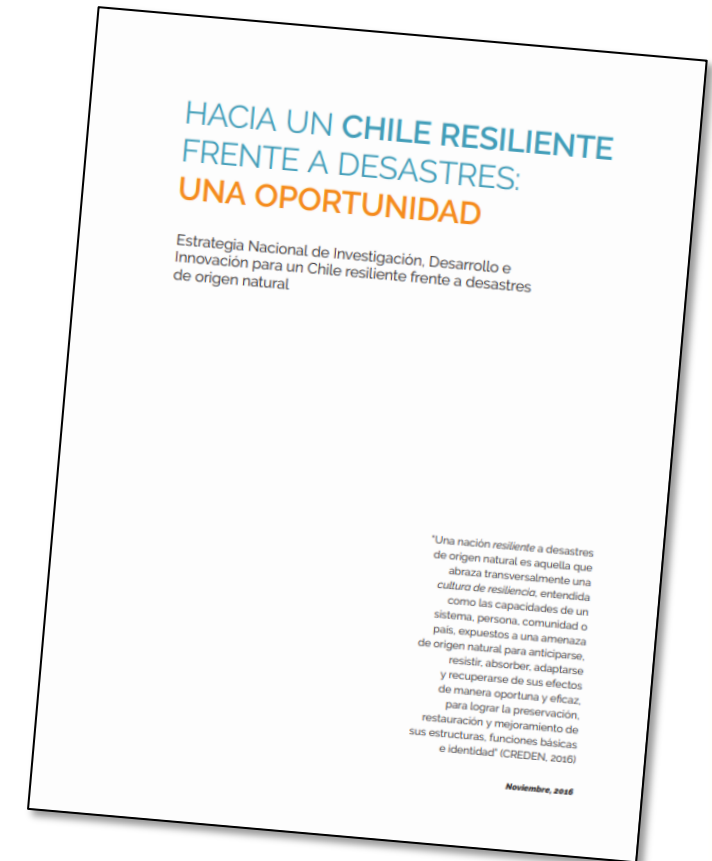
Image : First Planning Workshop, August, 2016.

Image Source: IRDR. 2018. Science Technology Plan For DRR.

5. National Promotion and Support of STI

■ Case Study: Chile STI for DRR Strategy

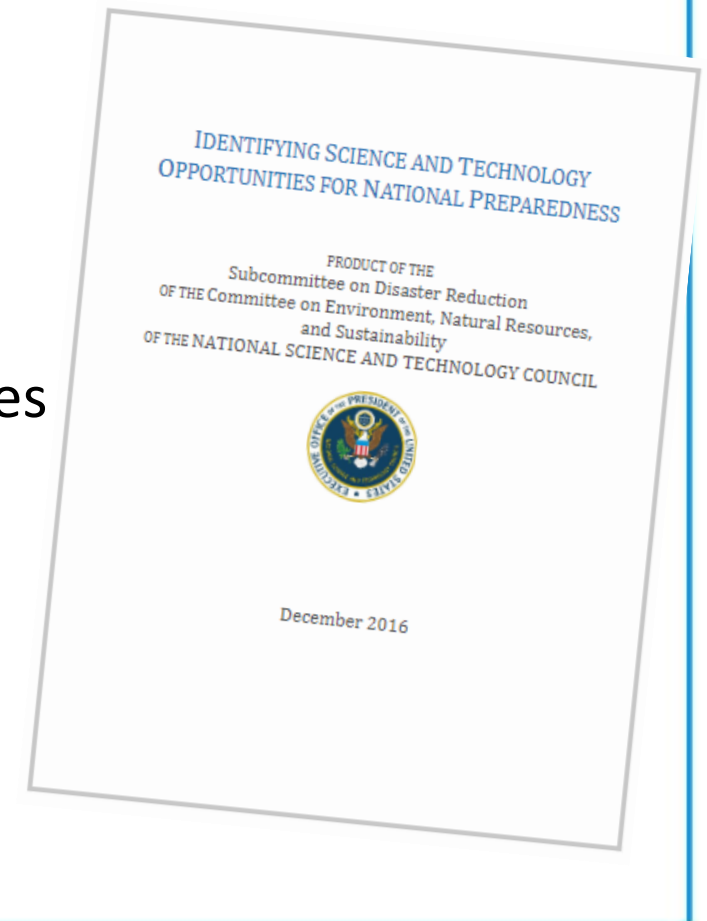
- CREDEN (national disaster resilience commission)
 - Formed in 2015
 - Charged with drafting an STI strategy
- R&D+I Roadmap – December 2016
- Linked to two existing policy instruments:
 - National Policy for Disaster Risk Management
 - Strategy for Science, Technology, and Innovation
- Objective (two-fold)
 - *To use STI to achieve a higher standard in physical and social community natural hazard resilience, and to make the Chilean expertise in dealing with disasters a differentiating innovative and sustainable advantage for the country.*



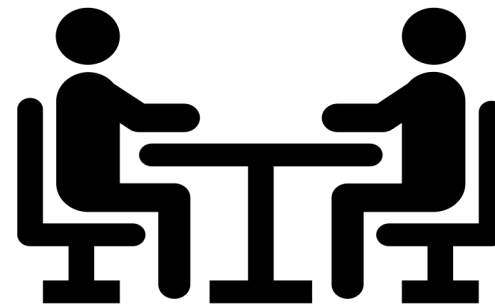
5. National Promotion and Support of STI

■ Case Study: US STI for DRR Policy Development Framework

- **National Science and Technology Council (NSTC)**
 - **Committee on Environment, Natural Resources, and Sustainability**
 - **Subcommittee on Disaster Reduction (SDR)**
- **Six Policy Directives for STI Development:**
 1. Improve Public Communication of Warnings and Advisories
 2. Enhance Fundamental Understanding of Hazards
 3. Improve Event Characterization and Risk Assessment
 4. Enhance Observations, Modeling, and Data Management
 5. Develop Technology for Safer, Effective, and Timely Response and Recovery
 6. Integrate Science into Preparedness Decisions



Group Work and Activities



■ **Discussion 4: Good Practices for Advancing STI National and Local Strategies**

- The advancement of STI, and the implementation of emerging technologies for DRR, resilience, or any other purpose, is best guided by a national strategy or plan.
- **The Facilitator** can explore the integration of national frameworks with local level efforts, and the integration of global frameworks (e.g., Sendai Framework, 2030 Agenda).
- **Questions for discussion** include:
 - Are there any examples of projects or policies that exist in your country that support or use STI to increase resilience or reduce disaster risk?
 - What roles do NGOs and private businesses play in these policies, or more generally in the use of STI to reduce disaster risk or increase resilience?
 - What have been the most effective policy instruments to support the advancement of STI for DRR or resilience?
 - How can governments best coordinate an STI policy with DRR and other resilience-linked policies (e.g., climate change adaptation) to provide more effective support?

<p>Key Readings</p>	<ul style="list-style-type: none"> • UNDRR. 2019. The Science and Technology Roadmap to Support Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030. http://bit.ly/2mkomcW. • Shaw, R., L. Lu and F. Lian. 2017. Science Technology Plan for Disaster Risk Reduction: Asian and Pacific Perspectives. ICSU and IRDR. Beijing, China. http://bit.ly/2YLqhIL • Asian Science and Technology Conference for DRR. 2018. Science-Policy Dialogue for Implementation of the Sendai Framework. UNISDR. April. http://bit.ly/2Zzp98f.
<p>Further Readings</p>	<ul style="list-style-type: none"> • United Nations. 2017. Asia-Pacific Disaster Report 2017. https://www.unescap.org/sites/default/files/12_Chapter%206_APDR%202017.pdf • United Nations. 2015. Strengthening the Role of Science and Technology for Disaster Risk Reduction in the Arab Region. United Nations Office for Disaster Risk Reduction. Geneva. http://bit.ly/2YjFBNi



Thank you