



*Online Workshop on
Risk-informed Governance, Climate Action and Finance Mechanisms for Local Resilience*

Presentation on
Leveraging Digital Technologies for DRR and Resilience

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Contents

This part of the programme will relate Module 2 of the toolkit. This session will showcase practical application of emerging technologies and innovation for disaster risk reduction and resilience.

Contents Module 2

Part I	Part II
<ol style="list-style-type: none"> 1. Unmanned Vehicles 2. Using Unmanned Vehicles to Support DRR and Resilience 3. Robotics 4. Sensing Systems 	<ol style="list-style-type: none"> 1. Additive Manufacturing 2. Innovative Materials
Part III	Part IV
<ol style="list-style-type: none"> 1. Cloud Computing 2. 5G Mobile Technology and Wireless Mesh Networks 3. Mobile Messaging Systems 4. Internet of Things (IOT) 5. Distributed Ledger Technology (DLT or Blockchain) 	<ol style="list-style-type: none"> 1. Big Data Analytics 2. Artificial Intelligence (AI) and Machine Learning 3. Virtual Reality (VR) and Augmented Reality (AR)
Part V	
<ol style="list-style-type: none"> 1. Social Media 2. Crowdsourcing and Crowdfunding 3. Volunteered Geographic Information (VGI) 4. Citizen Science 	

SDG Evolution

June 1992

- Agenda 21 signed by 178 countries

September 2000

- Millennium Declaration Adopted
- Millennium Development Goals (MDGs) Established

September 2002

- Johannesburg Declaration Adopted

June 2012

- “The Future We Want” Adopted

January 2013

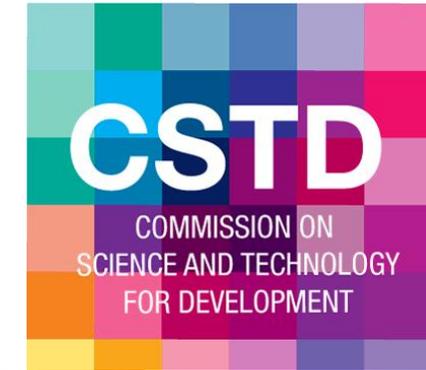
- 30-Member Open Working Group Established

January 2015

- UNGA begins the negotiation process on the “Post-2015 Development Agenda”

Characteristics of Tech for DRR

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



■ 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



- 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.

■ 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





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Leveraging Digital Technologies for DRR and Resilience





Innovative technologies as tools for pandemic preparedness and response



Digital technology used in the COVID-19 pandemic response: selected examples

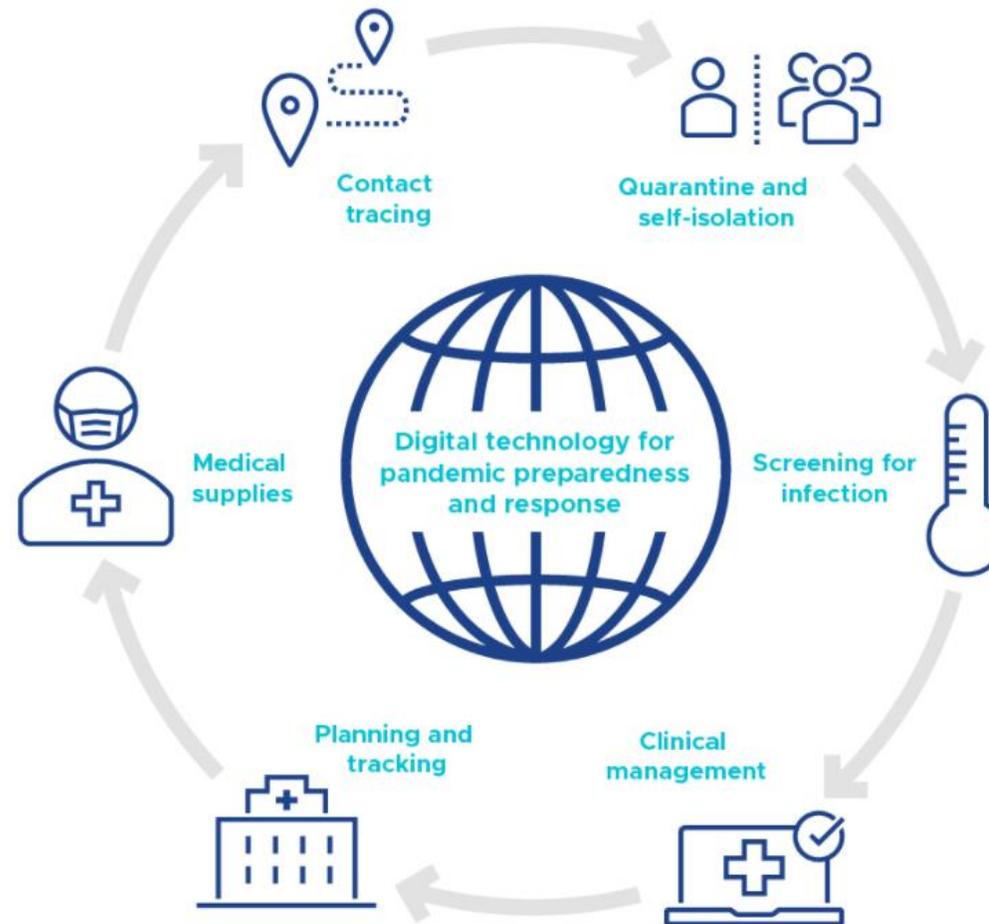
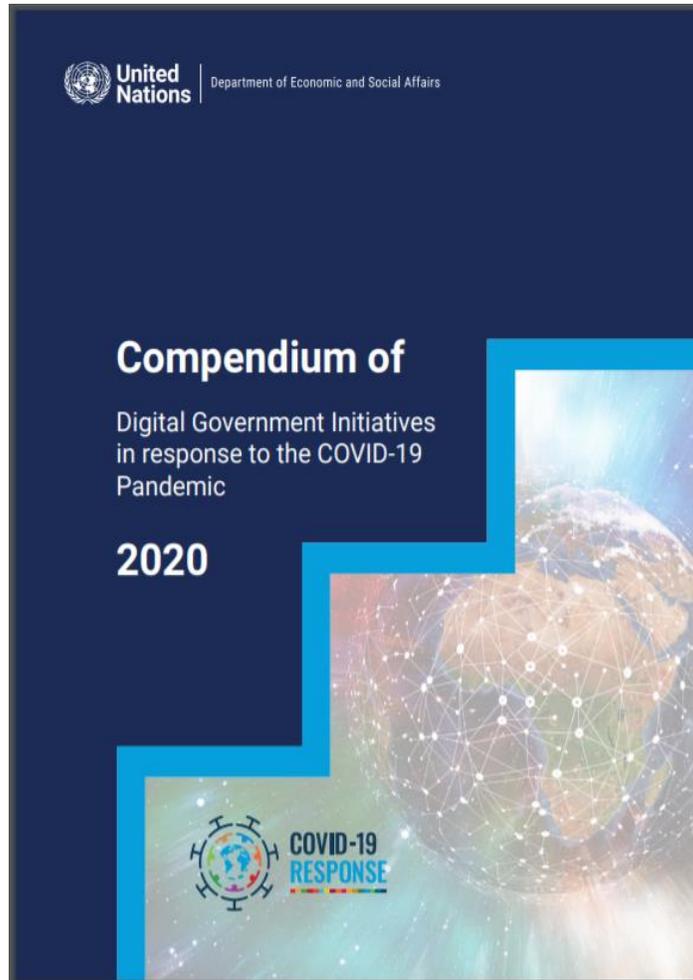
Purpose	Digital tool or technology	Examples of use	Asia-Pacific Countries (selected)
Epidemiological Surveillance; Tracking	Machine learning	Web-based epidemic intelligence tools and online syndromic surveillance	China, Singapore, Australia, New Zealand, Turkey
Survey apps and websites	Symptom reporting	Smartphone app and web-based epidemic intelligence tools	Japan, Kazakhstan
Rapid case identification; Screening for infection	Connected diagnostic device	Point-of-care diagnosis	Australia, China, Thailand, Singapore, New Zealand, Turkey
Interruption of community Transmission	Smartphone app, low-power Bluetooth technology	Digital contact tracing; Quarantine and self-isolation	Republic of Korea, China, Australia, Viet Nam, India, Pakistan
Clinical care and management	Tele-conferencing	Telemedicine, referral	Australia, Thailand, China, Singapore, New Zealand, Pakistan
Public communication	Social-media platforms	Targeted communication	Viet Nam, Australia, New Zealand, China, Mongolia, Pakistan, Afghanistan

Source: Modified based on Sera Whitelaw and others, "Applications of digital technology in COVID-19 pandemic planning and response", Lancet Digital Health, vol. 2, issue 8 (August 2020), e435-e440.

Sources: Nature Medicine, vol. 26 (August 2020), pp 1183-1192; Lancet Digital Health, vol. 2 (August 2020): e435-40, ESCAP, Promoting meaningful and affordable access to broadband Internet for inclusive development (February 2021).



UN DESA's Compendium of Digital Government Initiatives for COVID-19



- Information sharing
- E-Participation
- E-Health
- Partnerships



Case Study: Drones Fly Disaster Relief in Puerto Rico

- **Problem:** Communities in remote locations have ongoing public health requirements requiring outside delivery of supplies and equipment
- **Need:** Reliable delivery mechanisms
- **Obstacle:** Distance and vulnerable infrastructure
- **Solution:** Alternative delivery mechanisms using long-distance UAV flights



Image: Medical package loaded onto UAV in Puerto Rico during pilot testing program.
Image Source: Butschli, Jim, 2018. <http://bit.ly/2BLvOIL>.



Case Study: Vaccine Delivery in Vanuatu

- **Problem:** Public health needs remain unmet in remote parts of the country
- **Need:** Vaccines and other medications
- **Obstacle:** Transportation options are not conducive to delivery of vaccines and medication
- **Solution:** UAV equipped to carry and monitor a climate-controlled package used to quickly transport vaccines



Video: Vanuatu vaccine delivery pilot program footage.
Image Source: UNICEF, 2018.



Case Study: Humanitarian Cash Transfers in Vanuatu

- **Problem:** Disaster impacted populations experience cash shortages for a variety of reasons.
- **Need:** Access to cash or a viable cash alternative.
- **Obstacle:** Banks may not be operating; cash programs are often associated with poor transparency / accountability.
- **Solution:** Blockchain-based cash card program in partnership with verified businesses in the impacted area.



Image: Sempo employees train Oxfam Vanuatu project team members to use the blockchain-based cash transfer technology..
Source: Sempo, 2019.



■ Innovative technologies for Smart and Resilient Cities

- **Smart cities** initiatives are emerging globally
- By 2050, more than two thirds of the world's population are expected to live in cities
- Cities are taking advantage of advancements in digital government innovation to become smarter
- Smart cities are characterized by conscious efforts to use ICTs
- Digital government and ICTs emerges as a fundamental tools in making cities smart

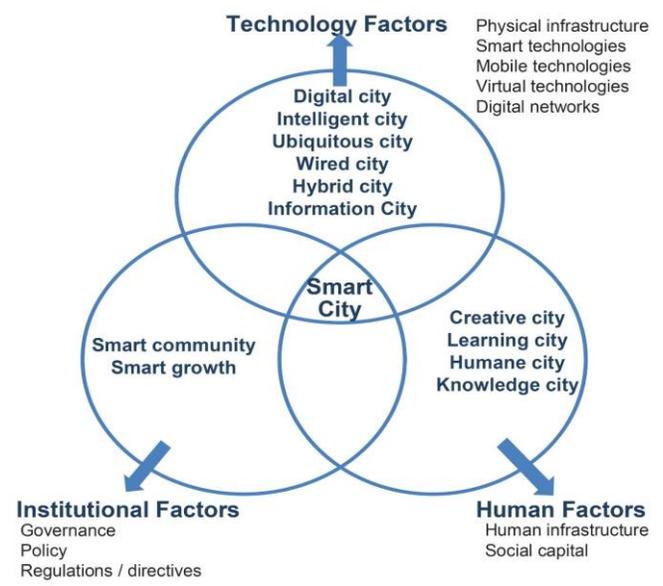
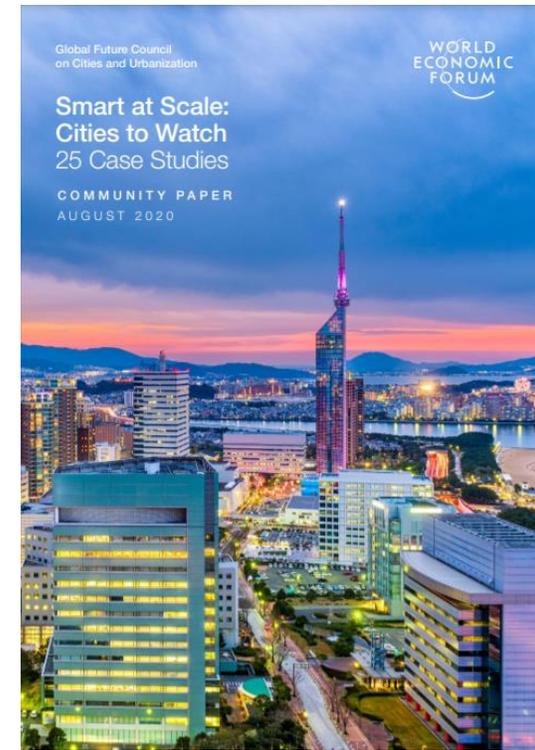


Image: Fundamental components of a Smart City
Image credit: Taewoo and Pardo, 2011



http://www3.weforum.org/docs/WEF_Smart_at_Scale_Cities_to_Watch_25_Case_Studies_2020.pdf



Smart City Case Study – Songdo, Korea Innovation in Service Delivery

- Planned Smart City with construction started in 2008
- Wide range of public and private services, including
 - ✓ transportation, energy, Safety and Security



Songdo Emergency and Response Services

- Real-time emergency / disaster information collected
- Hazard monitoring
- Public alert and warning



Image Above: Songdo, Incheon, Republic of Korea; Image credit: IDB-KRIHS, 2016
 Image: Diagram of emergency response services provided by Songdo Smart City system.
 Image credit: IDB-KRIS, 2016.



Case Study: FINDER

Problem: Victims trapped under debris must be identified and rescued quickly

Need: Information confirming the presence and location of victims

Obstacle: Detecting humans through debris is difficult, and no system can locate victims in any condition or scenario

Solution: Radar systems able to detect a human heartbeat through mixed or solid concrete



Image: The Finding Individuals for Disaster and Emergency Response (FINDER) system being used in Nepal to assist in rescue efforts after the April 25, 2015, earthquake.
Image Source: NASA, 2015.