### Health risk reduction and its implications in the global risk landscape

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www.rajibshaw.org AND www.rikaindia.com

Academia Science Policy interface Start-up and innovation WEF Global Risk Outlook 2020

Figure I: The Evolving Risks Landscape, 2007–2020

#### Top 5 Global Risks in Terms of Likelihood

### Global risk landscape

	2007	2008	2009	The second s	Concession of the local division of the loca	The second second		The second se	The second se	The second second		Concession of the local division of the loca		
	Infrastructure breakdown	Blow up in asset prices	Asset price collapse	Asset price collapse	Storms and cyclones	Income disparity	Income disparity	Income disparity	Interstate conflict	Involuntary migration	Extreme weather	Extreme weather	Extreme weather	Extreme weather
nd	Chronic diseases	Middle East Instability	China economic słowdown	China economic slowdown	Flooding	Fiscal imbalances	Fiscal imbalances	Extreme weather	Extreme weather	Extreme weather	Involuntary migration	Natural disasters	Climate action failure	Climate action failure
d	Oil price shock	Failed and failing states	Chronic discases	Chronic disease	Comuption	Greenhouse gas emissions	Greenhouse gas emissions	Unemployment	Failure of national governance	Climate action failure	Natural disasters	Cyberattacks	Natural disasters	Natural disasters
h	China hard landing	Oil price shock	Global governance gape	Fiscal crises	Biodiversity loss	Cyberattacks	Water crises	Climate action failure	State collapse or crisis	Interstate conflict	Terrorist attacks	Data fraud or theft	Data fraud or theft	Blodiversity k
	Blow up in	Chronic	Deglobalization (emerging)	Global	Climate change	Water crises	Population	Cyberattacks	Unemployment	Natural catastrophes	Data fraud	Climate action	Cyberattacks	Human-made
th	asset prices	diseases	(emerging)	governance gaps			ageing			catastrophes	or theft	failure		disasters
	5 Global Risk			gaps			ageing			Catastophes				
	asset prices	diseases			2011	2012	ageing 2013	2014	2015	2016	2017	2018	2019	
	5 Global Risk	diseases	npact	gaps	2011 Fiscal crises	2012 Financial failure		2014 Fiscal crises	2015 Water crises				2019 Weapons of mass destruction	disasters
ор	5 Global Risk 2007 Blow up In	diseases as in Terms of In 2008 Blow up in	npact 2009 Asset price	gaps 2010 Asset price	In the second	The second s	2013	1 mm	in the second	2016 Climate action	2017 Weapons of mass	2018 Weapons of mass	Weapons of mass	disasters 2020 Climate actio
op at	asset prices 5 Global Risk 2007 Blow up in asset prices	diseases as in Terms of It 2008 Blow up in asset prices Deglobalization	npact 2009 Asset price collapse	2010 Asset price collapse Deglobalization	Fiscal crises	Financial failure	2013 Financial failure	Fiscal crises	Water crises	2016 Climate action failure Weapons of mass	2017 Weapons of mass destruction	2018 Weapons of mass destruction	Weapons of mass destruction	disasters 2020 Climate action failure Weepons of mass destruction
op st	asset prices 5 Global Risk 2007 Blow up in asset prices Deglobalization	disesses as in Terms of In 2008 Blow up in asset prices Deglobalization (devaloped) China hard	npact 2009 Asset price collapse Deglobalization (developed) Oil and gas	2010 Asset price collapse Deglobalization (developed)	Fiscal crises Climate change Geopolitical	Financial failure Water crises	2013 Financial failure Water crises	Fiscal crises Climate action failure	Water crises Infectious diseases Weapons of mass	2016 Climate action failure Weapons of mass destruction	2017 Weapons of mass destruction Extreme weather	2018 Weapons of mass destruction Extreme weather	Weapons of mass destruction Climate action failure	disastors 2020 Climate action failure Weapons of mass

📕 Economic 📕 Environmental 📕 Geopolitical 📕 Societal 📕 Technological

Source: The Global Risk Report 2020: World Economic Forum

Impacts

Likelihoods

- Infectious diseases
- Livelihood crisis

Risks are getting interconnected

### 2021

- Digital power concentration
- Digital inequality

7th

Digital divide

Top Global Risks by Impact

	1st	2nd	3rd	4th	5th	6th	and the second
2021	Infectious diseases	Climate action failure	Weapons of mass destruction	Biodiversity loss	Natural resource crises	Human environmental damage	Liveliho
	1st	2nd	3rd	4th	5th		
2020	Climate action failure	Weapons of mass destruction	Biodiversity loss	Extreme weather	Water crises		
2019	Weapons of mass destruction	Climate action failure	Extreme weather	Water crises	Natural disasters	12.0	
2018	Weapons of mass destruction	Extreme weather	Natural disasters	Climate action failure	Water crises	08.4	
2017	Weapons of mass destruction	Extreme weather	Water crises	Natural disasters	Climate action failure	Se -	
2016	Climate action failure	Weapons of mass destruction	Water crises	Involuntary migration	Energy price shock		
2015	Water crises	Infectious diseases	Weapons of mass destruction	Interstate conflict	Climate action failure	5-	
2014	Fiscal crises	Climate action failure	Water crises	Unemployment	Infrastructure breakdown		
2013	Financial failure	Water crises	Fiscal imbalances	Weapons of mass destruction	Climate action failure		
2012	Financial failure	Water crises	Food crises	Fiscal imbalances	Energy price volatility		
	Economic	Environmental	Geopolitical	Societal	Technological		

Top Global Risks by Likelihood

	A			Property and the second	And Taxable Lines		
021	Extreme weather	Climate action failure	Human environmental damage	Infectious diseases	Biodiversity loss	Digital power concentration	Digital inequality
	1st	2nd	3rd	4th	5th		
020	Extreme weather	Climate action failure	Natural disasters	Biodiversity loss	Human-made environmental disasters		
019	Extreme weather	Climate action failure	Natural disasters	Data fraud or theft	Cyberattacks		
018	Extreme weather	Natural disasters	Cyberattacks	Data fraud or theft	Climate action failure		
017	Extreme weather	Involuntary migration	Natural disasters	Terrorist attacks	Data fraud or theft	3.4	
016	Involuntary migration	Extreme weather	Climate action failure	Interstate conflict	Natural catastrophes	1000	
015	Interstate conflict	Extreme weather	Failure of national governance	State collapse or crisis	Unemployment		
014	Income disparity	Extreme weather	Unemployment	Climate action failure	Cyberattacks		
013	Income disparity	Fiscal imbalances	Greenhouse gas emissions	Water crises	Population ageing		
012	Income disparity	Fiscal imbalances	Greenhouse gas emissions	Cyberattacks	Water crises		

### Global Risk Report 2022

#### FIGURE 1.3

#### "Identify the most severe risks on a global scale over the next 10 years"

	Climate action failure	6th	Infectious diseases
ĺ	Extreme weather	7th	Human environmental damage
	Biodiversity loss	8th	Natural resource crises
	Social cohesion erosion	9th	Debt crises
	Livelihood crises	10th	Geoeconomic confrontation

The Global Risks Report 2022 14

0-2 years: Cybersecurity failure, digital inequality2-5 years: Cybersecurity failure5-10 years: Adverse tech advances

#### FIGURE II

#### Global Risks Horizon When will risks become a critical threat to the world?

	E de la constante de	% of respondents
	Extreme weather	31.1%
	Livelihood crises	30.4%
	Climate action failure	27.5%
	Social cohesion erosion	27.5%
-2 years	Infectious diseases	26.4%
	Mental health deterioration	26.1%
	Cybersecurity failure	19.5%
	Debt crises	19.3%
	Digital inequality	18.2%
	Asset bubble burst	14.2%
	Climate action failure	35.7%
	Extreme weather	34.6%
	Social cohesion erosion	23.0%
	Livelihood crises	20.1%
	Debt crises	19.0%
-5 years	Human environmental damage	16.4%
	Geoeconomic confrontations	14.8%
	Cybersecurity failure	14.6%
	Biodiversity loss	13.5%
	Asset bubble burst	12.7%
	Climate action failure	42.1%
	Extreme weather	32.4%
	Biodiversity loss	27.0%
	Natural resource crises	23.0%
	Human environmental damage	21.7%
-10 years	Social cohesion erosion	19.1%
	Involuntary migration	15.0%
	Adverse tech advances	14.9%
	Geoeconomic confrontations	14.1%
	Geopolitical resource contestation	13.5%

Global Risk Report 2023

**Rising inflation** 

Economic

"Please rank the top 5 currently manifesting risks in order of how severe you believe their impact will be on a global level in 2023"

Environmental

Food supply crisis

Geopolitical

Cyberattacks on

critical infrastructure

Societal

Technological

Currently manifesting risks

**Risk categories** 

Cost-of-living crisis

FIGURE D

Source

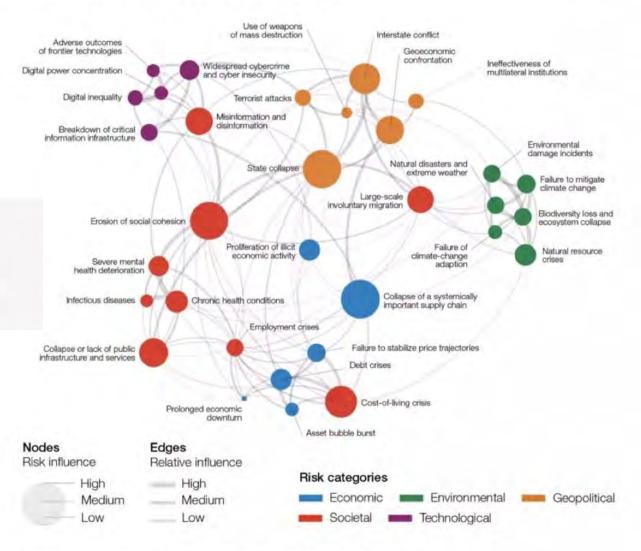
Energy supply crisis

World Economic Forum Global Risks

Perception Survey 2022-2023

Global Risks Report 2023

### Global risks landscape: an interconnections map



WORLD

FORUM

### Global Risk Report 2023

#### Global risks ranked by severity over the short and long term

"Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period"

1	Cost-of-living crisis
2	Natural disasters and extreme weather events
3	Geoeconomic confrontation
4	Failure to mitigate climate change
5	Erosion of social cohesion and societal polarization
6	Large-scale environmental damage incidents
7	Failure of climate change adaptation
8	Widespread cybercrime and cyber insecurity
9	Natural resource crises
0	Large-scale involuntary migration

Economic

**Risk categories** 

Environmental

#### 10 years

incidents

Societal

Geopolitical

1	Failure to mitigate climate change
2	Failure of climate-change adaptation
3	Natural disasters and extreme weather events
4	Biodiversity loss and ecosystem collapse
5	Large-scale involuntary migration
6	Natural resource crises
7	Erosion of social cohesion and societal polarization
8	Widespread cybercrime and cyber insecurity
9	Geoeconomic confrontation
10	Large-scale environmental damage

Technological

#### FIGURE E

ception Survey 2022-20

"Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period"

Global risks ranked by severity

nort term	Lona term
Cost-of-living crisis	1 Failure to mitigate climate change
Natural disasters and extreme weather events	2 Failure of climate-change adaption
Geoeconomic confrontation	3 Natural disasters and extreme weather events
Failure to mitigate climate change	4 Biodiversity loss and ecosystem collapse
Erosion of social cohesion and societal polarization	5 Large-scale involuntary migration
Large-scale environmental damage incidents	6 Natural resource crises
Failure of climate-change adaption	7 Erosion of social cohesion and societal polarization
Widespread cybercrime and cyber insecurity	8 Widespread cybercrime and cyber insecurity
Natural resource crises	9 Geoeconomic confrontation
Large-scale involuntary migration	10 Large-scale environmental damage incidents
Lebt crises	11 Misinformation and disinformation
Failure to stabilize price trajectories	12 Ineffectiveness of multilateral institutions and international cooperation
Prolonged economic downturn	13 Interstate conflict
Interstate conflict	14 Debt crises
Ineffectiveness of multilateral institutions and international cooperation	15 Cost-of-living crisis
Misinformation and disinformation	16 Breakdown of critical information infrastructure
Collapse of a systemically important industry or supply chain	17 Digital power concentration
Biodiversity loss and ecosystem collapse	18 Adverse outcomes of frontier technologies
Employment crises	19 Failure to stabilize price trajectories
Infectious diseases	20 Chronic diseases and health conditions
Use of weapons of mass destruction	21 Prolonged economic downturn
Asset bubble bursts	22 State collapse or severe instability
Severe mental health deterioration	23 Employment crises
Breakdown of critical information infrastructure	24 Collapse of a systemically important industry or supply chain
State collapse or severe instability	25 Severe mental health deterioration
Chronic diseases and health conditions	26 Collapse or lack of public infrastructure and services
Collapse or lack of public infrastructure and services	27 Infectious diseases
Proliferation of illicit economic activity	28 Use of weapons of mass destruction
Digital power concentration	29 Proliferation of illicit economic activity
Terrorist attacks	30 Digital inequality and lack of access to digital services
Digital inequality and lack of access to digital services	31 Asset bubble bursts
Adverse outcomes of frontier technologies	32 Terrorist attacks

Risk categories

Economic

Environmental

Geopolitical

Source World Economic Forum Global Risks Perception Survey 2022-2023. Societal Technological

### Context 1: Evolving risk landscape and health risk

Risk landscape is dynamic and changing

Risks are becoming inter-connected

Digital divide, digital inequality is a key issue

Cybersecurity as a potential future risks

Inclusive growth is very critical irrespective of development status

### Sendai Framework: 2015-2030: Health and hazards

To enhance the resilience of national health systems, including by integrating disaster risk management into primary, secondary and tertiary health care, especially at the local level; developing the capacity of health workers in understanding disaster risk and applying and implementing disaster risk reduction approaches in health work; promoting and enhancing the training capacities in the field of disaster medicine; and supporting and training community health groups in disaster risk reduction approaches in health programmes, in collaboration with other sectors, as well as in the implementation of the International Health Regulations (2005) of the World Health Organization

• "Health" used 76 times within 37 pages

#### Scope of hazards expanded

- Biological hazards
- Natech (Natural hazards induced technological disasters)
- Cascading risk
- Complex emergencies

#### Non traditional stakehodlers

- Science technology community
- Private sectors

### Biological hazards and Disaster Risk Reducion and Response

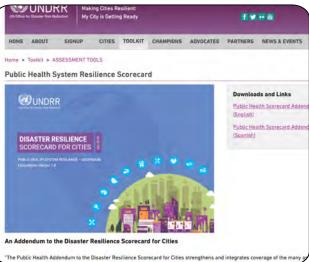
- Health EDRM (Health Emergency Risk Management): WHO 2019
- Health Addendum to City Resilience
   Score Card: 2019
- Public Health and Disasters 2020
  - by Emily Chan and Rajib Shaw
- 1. Financing and fiscal policy
- 2. Data management and scenario projection /risk assessment
- 3. Supply chain management
- 4. Transport planning
- 5. Resource mobilization, and
- 6. Early recovery planning: livelihoods

# Methods, Approaches and Practices Emily Ying Yang Chan Rajib Shaw Editors Public Health and Disasters

Health Emergency and Disaster Risk Management in Asia

**Disaster Risk Reduction** 

🖄 Springer



Health **Emergency and Disaster Risk Management** Framework World Healt Context 2: Global Health and disaster framework SFDRR provides a great framework to link health and disasters

HEDRM enhances the framework

Health risk management needs interdisciplinary approach

### **Risk Assessment:** Communication and Governance

https://www.covid19risk.net

https://www.sciencedirect.com/science/article/pii/S2590061720300466?via%3Dihub

- Health (age, co-morbidity, gender, smoking habit)
- Behaviour (mask, hand wash, sanitizing, social distancing, anxuety, trust)
- Exposure (residential type, occupation, travel history)
- Social Policy (lockdown, community compliance)







Risk: High Gautam Buddha Nagar: Your district is a hotspot Explore risk around you on the map

#### You are at high risk. Do not let your guards down.

1. If you develop any of the following symptoms (Fever, dry cough, loss of smell or taste, tiredness, body ache, pain in chest). Please call the Toll Free number 1075 or (7)

2. If you are above the age of 60, do not go out for your own safety.

3. Maintain safe distance from people (even family members) who seem to be slok.

4. If you are into essential services wear Personal Protective Equipment (PPE) at work For more Information, you can check: (7)



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journal homepage: www.elsevier.com/locate/pdisas



Invited ViewPoint

COVID-19 Risk Assessment Tool: Dual application of risk communication and risk governance

Ranit Chatterjee<sup>a,b</sup>, Sukhreet Bajwa<sup>a</sup>, Disha Dwivedi<sup>a</sup>, Repaul Kanji<sup>c</sup>, Moniruddin Ahammed<sup>d</sup>, Rajib Shaw<sup>a,e,\*</sup>

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#### ARTICLE INFO

#### ABSTRACT

Article history. Received 16 May 2020 Accepted 22 May 2020 Available online 02 June 2020

Keywords: COVID-19 pandemic Risk governance Risk communication Awareness generation Social behaviour

Risk awareness is the best way to prevent and slow-down the transmission of the COVID-19 pandemic. Risk awareness is achieved through communication of risk assessment. Effective risk communication is an important measure to control the infodemic. Most risk assessment tools focus on either tracking the affected patients or diagnosing a probable health condition through symptoms. RIKA India introduces an innovative Risk Assessment Tool which goes beyond the symptom detection and patient tracking. It includes four factors in assessment of risk: Health, Behaviour, Exposure and Social Policy. Each of these four factors have sub-factors which help to assess the overall risk in a more comprehensive way and also present it to the user in a simplified way. The paper discusses the importance of the Risk Assessment Tool for awareness generation and decision making. Further, the datasets generated through the tool have been analysed to understand the key intervention areas for COVID-19 response and management.

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### Risk Governance:

### Science based decision making and Risk Communication



Article

### **COVID-19 Pandemic Response in Japan: What Is behind the Initial Flattening of the Curve?**

#### Ai Tashiro <sup>1</sup> and Rajib Shaw <sup>2,\*</sup>

Purpose of new coronavirus measures

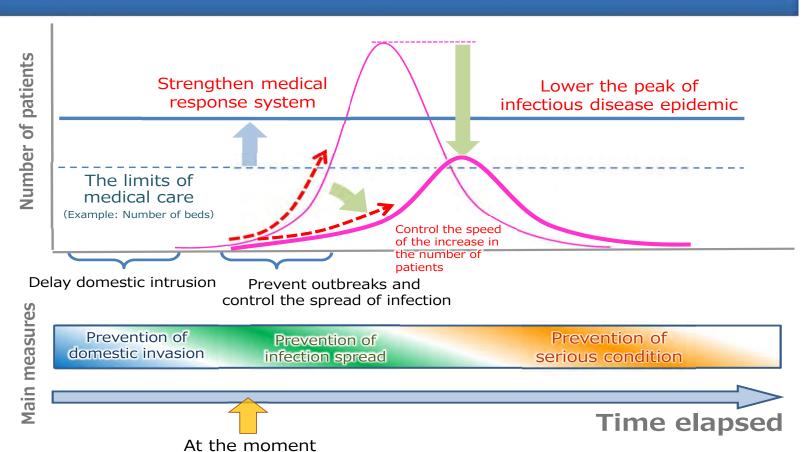
- <sup>1</sup> Graduate School of Environmental Studies, Tohoku University, 468-1 Aoba, Aramaki, Aoba-ku, Sendai, Miyagi 980-0845, Japan; ai.tashiro.q7@dc.tohoku.ac.jp
- <sup>2</sup> Craduate School of Media and Covernance Faculty of Policy Management Kein University 5322 Endo

### S

- Cluster approach
- Scenario planning

### Six key factors

- Government response
- Culture
- Health care system
- Sanitation
- Food habits
- Immune system





### Adaptive governance: Addressing multiple risks

- Control the disease spread in the evacuation center
  - Critical health monitoring
  - Separation of spaces
  - Ensure air circulation etc.
- Volunteer management: specific incentive schemes with local government and business sectors
- Data management: link to contract tracing
  - Cluster approach and early detection











Context 3: COVID-19 enhanced the link of health and disasters

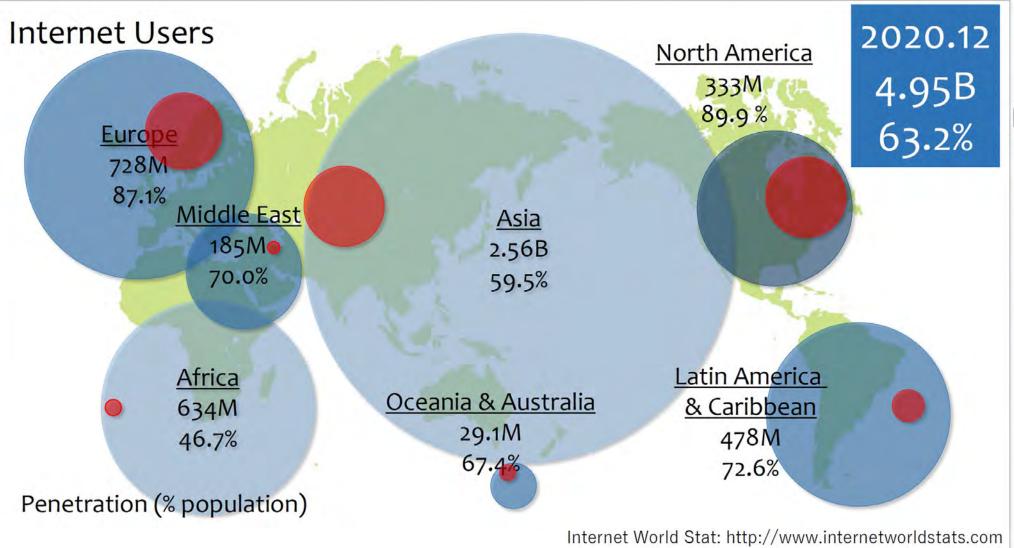
### Risk assessment

## Science based decision making

### Adaptive governance

### Towards Digital World: Internet users: Global in 2021

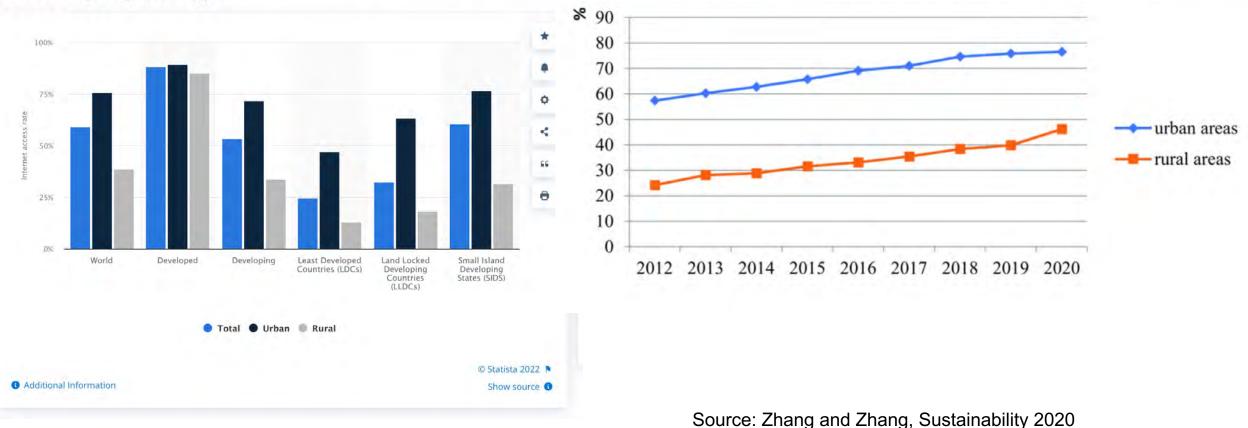
### July 2022: 5.03 Billion



Internet Users as of Dec 31, 2020

### Internet and digital world: urban rural divide

Estimated share of individuals using the internet worldwide ar in 2020, by regional type

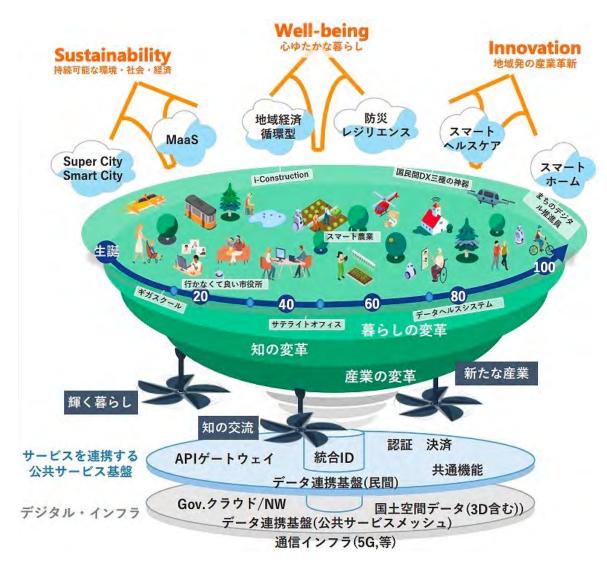


Source: statista.com

Context 4: Inclusive Digital growth

# Asia has the most internet users

Urban rural divide a concern



Keys to the Success of the Digital Rural City State Concept (Source: Digital Agency,

"2nd Digital Rural City Nation Concept Realization Conference" materials (December 2021))

### Digital Den-en-toshi

Current society Knowledge and information are not shared and cross-sector value is difficult to create.

Current society

With an overflow of information, the work o

is difficult and burdensome.

Distance CAO, Japan

finding and analyzing the information desired



Al will free humans from the

burdensome work of analyzing

huge amounts of information.

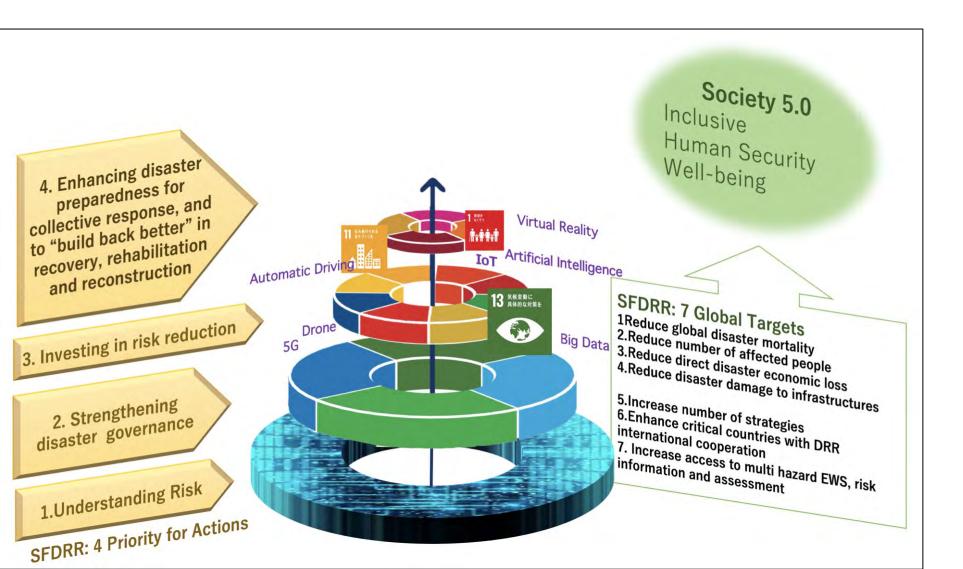
dge and d, and d

A variety of constraints exists with respect to social problems such as the aging society and regional depopulation making a sufficient response difficult.

The concept of the Kishida Cabinet, which is launched in 2022.

The objective is "to promote regional revitalization through digitalization", and furthermore, to realize bottom-up growth from the regions to the entire country.

### Health, well being and DRR



Disaster Risk Reduction Methods, Approaches and Practices

Sakiko Kanbara · Rajib Shaw · Naonori Kato · Hiroyuki Miyazaki · Akira Morita *Editors* 

### Society 5.0, Digital Transformation and Disasters

Past, Present and Future

🖄 Springer

Disaster Risk Reduction Methods, Approaches and Practices

Mihoko Sakurai Rajib Shaw *Editors* 

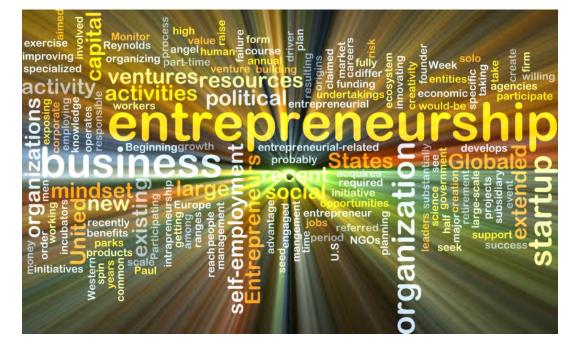
### Emerging Technologies for Disaster Resilience

**Practical Cases and Theories** 

### Science-preunership: Science based entrepreunership

- Entrepreneur mindset and ecosystem : incubation hub (government – academic – enterprise linkage)
- Developing incubation centers for DRR in universities

How to bring **Youth and Young Professionals** to solve local problems and achieve the targets of SDGs?



Science-preuner (Scientist + Entrepreneur) bring research into the core of disaster management activities of the private sector and policy making

Resilience Innovation Knowledge Academy (RIKA) <u>www.rikaindia.com</u>

Society 5.0: sustainability, well being and innovation

### Context 5: Innovation and Entrepreneurship

Digital drive and emerging technologies

Entrepreneurship and youth involvement

```
Science advice to government
                                                  Inclusiveness
                                                                  Climate change
Extreme weather
                                Sendai Framework
                                                          Open Data
                     Sci-preunership
                                         Social Innovation
     Governance
                                                         Open science
                                             Digital divide
                 Young professionals
Science link to people
                                                                    Incubation
                         Urbanization
                                            Health risk
                                                                HEDRM
                                                             Multi-disciplinary science
            Digital world
                                        Society 5.0
Urban rural linkage
               Sciencepreunership
                   Technology
                                                New Urban Agenda
                                  Regional Circular Ecological Sohere
                            Citizen science
                                                           Education and Awareness
Disruptive technology
                                                            Innovation
                               Smart governance
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