STI FOR HEALTH AND OTHER EMERGING HAZARDS

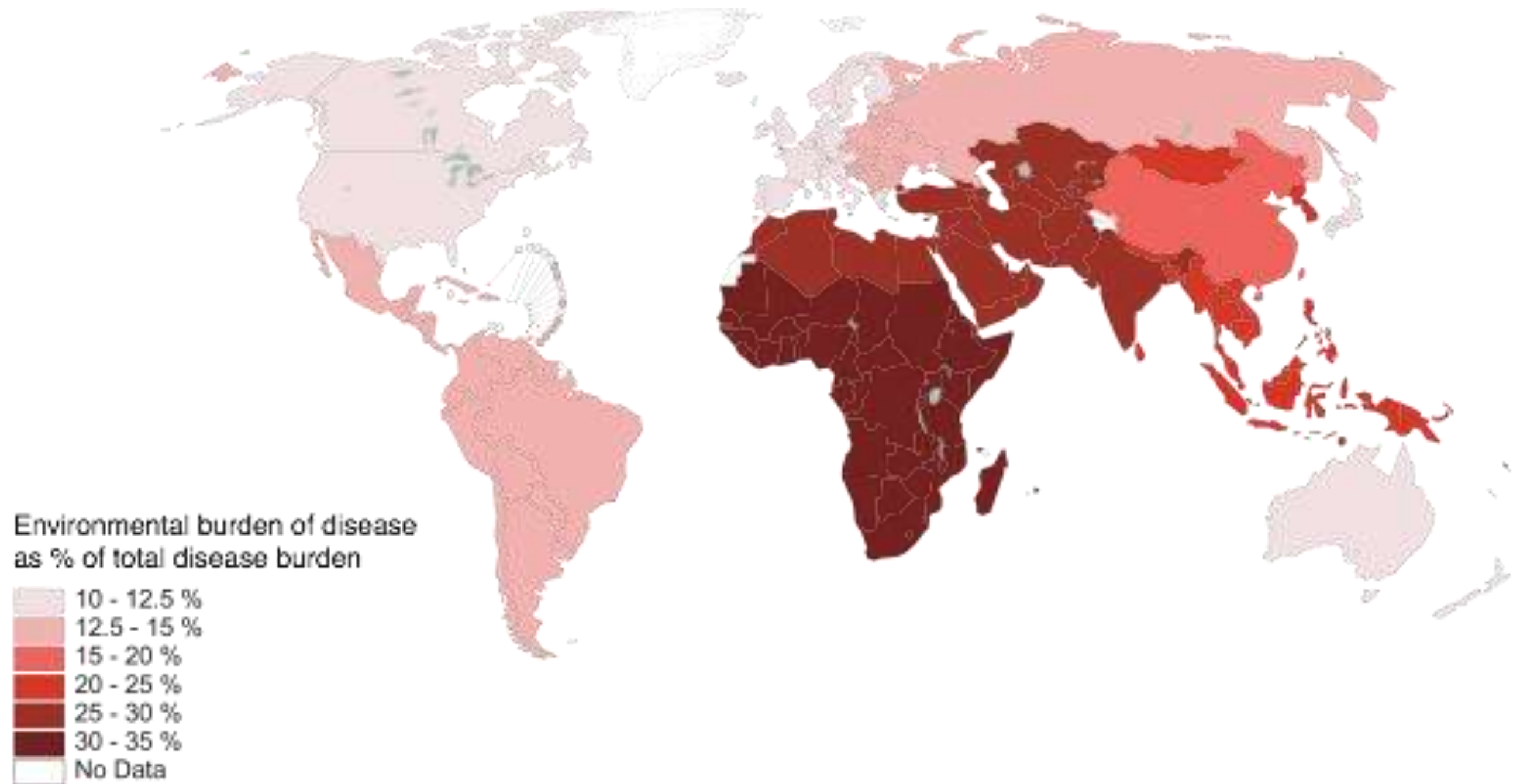**DATO' DR AHMAD FAIZAL PERDAUS**
President, MERCY Malaysia
Consultant Physician

BENGKEL KONSULTATIF
PELAN SAINS, TEKNOLOGI DAN INOVASI BAGI DRR
Kelab Golf Danau, Universiti Kebangsaan Malaysia
24 Julai 2017

Environmental burden of disease globally

Environmental burden of disease
as % of total disease burden

- 10 - 12.5 %
- 12.5 - 15 %
- 15 - 20 %
- 20 - 25 %
- 25 - 30 %
- 30 - 35 %
- No Data

Estimated proportion of total disease burden caused by environmental risk factors by region of the world

Source: World Health Organization, 2016

INTRODUCTION

STI for health and other emerging hazards

- Every minute, 5 children in developing countries **die from malaria or diarrhea.**

- Waterborne diseases cause about 1.5 million human deaths annually, usually attributable to **unsafe water supply, sanitation and hygiene.**

- Hundreds of **floods, storms, heat waves and droughts** have left about 606,000 people dead and 4.1 billion injured or homeless around the world since 1995.

- People suffer from a wide range of **mental health problems** during and long after emergencies, which **post traumatic stress disorder (PTSD)** is the most commonly identified disorder that occurs after exposure to a traumatic event.

Emergency Medical Team (EMT)

EMT (also known as ERU/EHU) is part of capacity building in the **pre-disaster phase.** It is a practical solution in the form of a **vehicle for emergency life-saving medical assistance** in the acute emergency phase of a major disaster. This has **expanded to include longer term health engagements** such as mental health and psychosocial support (MHPSS)

FEATURES OF MERCY MALAYSIA'S EMT

• Light weight- all items can be carried by hand

• Modular

• Set-up time of 24 hours

• Operational on-site for 4 weeks

The EMT is designed to cater to varying needs and can be deployed in different module combinations:
• Module A: Outpatient Department and Pharmacy
• Module B: A + Emergency Room and Wards
• Module C: A + B + Operation Theatre
• Module D: Operational in a partially functioning existing hospital

INNOVATIONS include

Lightweight tent systems

Modular – able to deploy singular & multiple frames

Enhanced water & sanitation systems for the ERU

Solid floor boarding for tents eg NRS HuggyPRO

Vehicular-based ERU models

Are recommended to have lightweight modular tent-based back ups for access & mobility

Example will be the IFRC Field hospital -130 BED

Level 2 EMT with Lab, OT & Radiology

New system innovation-CERT

Community based Emergency Response Team

Practical in highly disaster prone & prolonged conflict situations – eg Aceh, Kelantan, besieged cities

As well as difficult to access areas – e.g. mountainous regions Himalayas, Kinabalu

Resilient Health Infrastructure (RHI)

RHI focuses on the combination of **capabilities between the hospital/health infrastructure and its human resources** whom are **prepared and responsive** to meet pressures during the disaster and are able to recover in a timely manner.

Considering hospital is a complex organization; building, infrastructure and built environment representing **aspects related to physical components, to people and hospital management** through which space are planned and designed, the program aims to advocate the improvement in making a hospital more resilience.
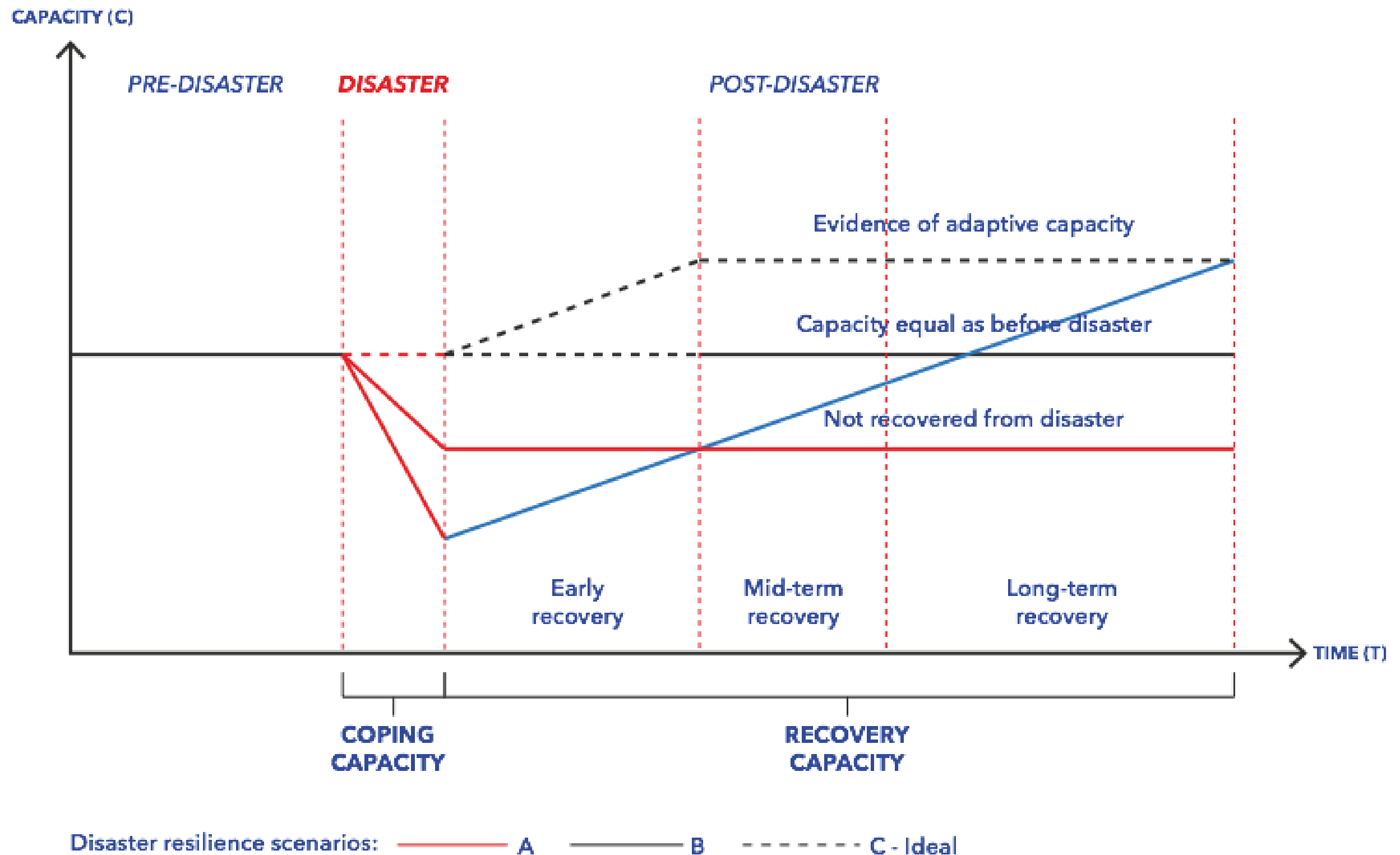
Resilient Health Infrastructure (RHI) - Framework

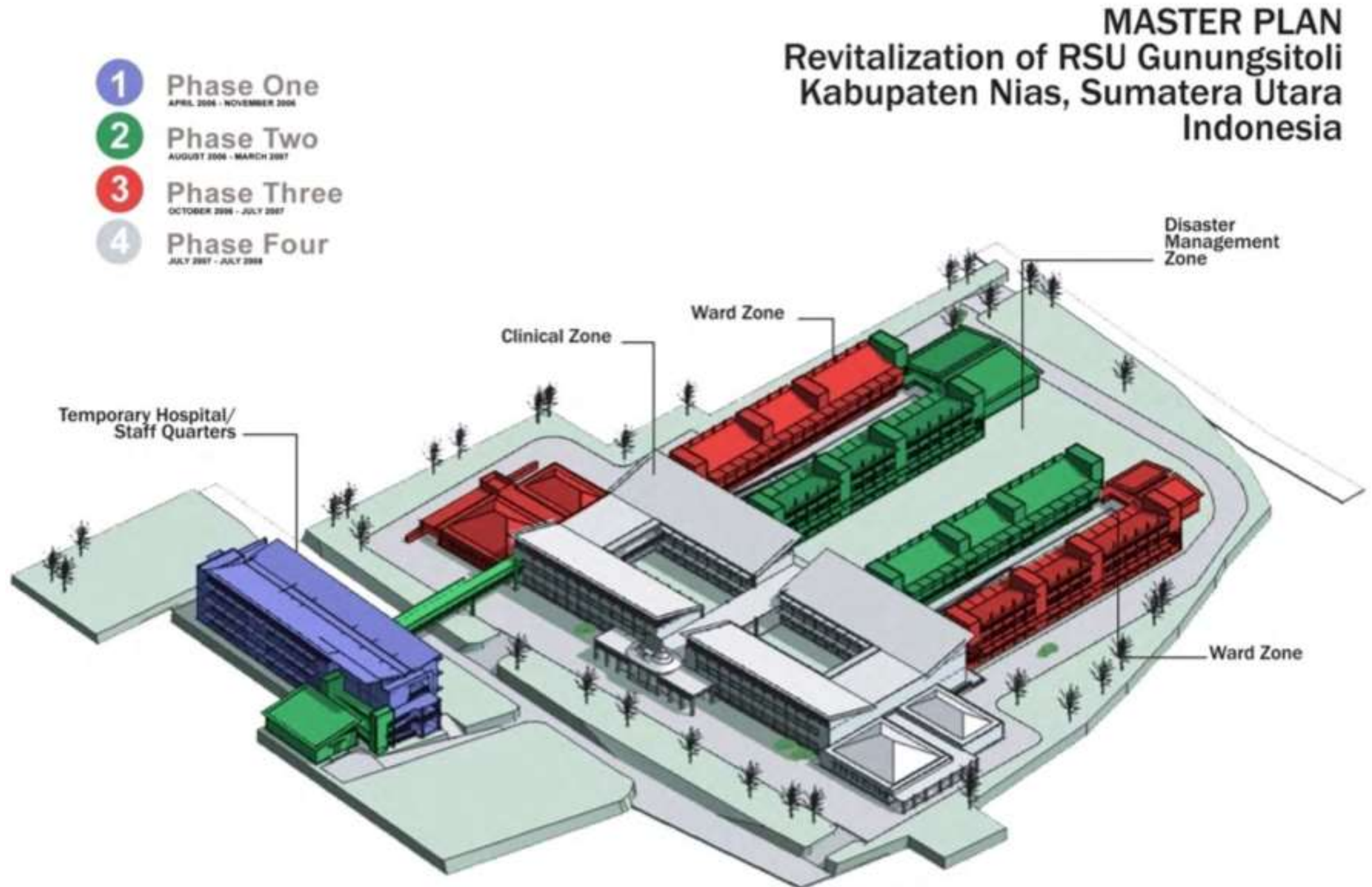| Dimensions	Domains	Sub-domains
Hospital Safety and Vulnerability	1. Hospital Safety	1.1 Disease Surveillance
		1.2 Hospital Risk and Safety
		1.3 Laboratory Test
Disaster Preparation and Resource	2. Emergency Leadership and Cooperation	2.1 Emergency Leadership
		2.2 Community Cooperation and Communication
	3. Disaster Plans	3.1 Disaster Plan System
		3.2 Standard Operating Procedures
	4. Disaster Stockpiles and Logistics Management	4.1 Disaster Resources
		4.2 Emergency Medicine Administration
		4.3 Disaster Fundraising
	5. Emergency Staff	5.1 Constitution of Emergency Staff
		5.2 The Protective and Incentive Strategies for Key Staff
	6. Emergency Training and Drills	6.1 Emergency Training
		6.2 Emergency Drills
		6.3 Public Emergency Education
Continuity of Essential Services	7. Emergency Essential Service Capabilities	7.1 Emergency Surge Capacity
		7.2 Emergency Response Procedures
		7.3 On-site Rescue
		7.4 Hospital Medical Treatment
Recovery and Adaptation	8. Recovery and Adaptation	8.1 Recovery Capability
		8.2 Evaluation and Adaptation

Source: Shuang Zhong. Developing an Evaluation Framework for Hospital Disaster Resilience: Tertiary Hospitals of Shandong Province, China, 2014

Resilient Health Infrastructure (RHI) - Needs

Resilient Health Infrastructure (RHI) - Physical Innovation

MASTER PLAN
Revitalization of RSU Gunungsitoli
Kabupaten Nias, Sumatera Utara
Indonesia

Phase One
APRIL 2006 - NOVEMBER 2006

Phase Two
AUGUST 2006 - MARCH 2007

Phase Three
OCTOBER 2006 - JULY 2007

Phase Four
JULY 2007 - JULY 2008

Disaster Management Zone

Ward Zone

Clinical Zone

Temporary Hospital/Staff Quarters

Ward Zone

Major salient points

Disaster resistant & adjusted technology eg appropriate retrofitting
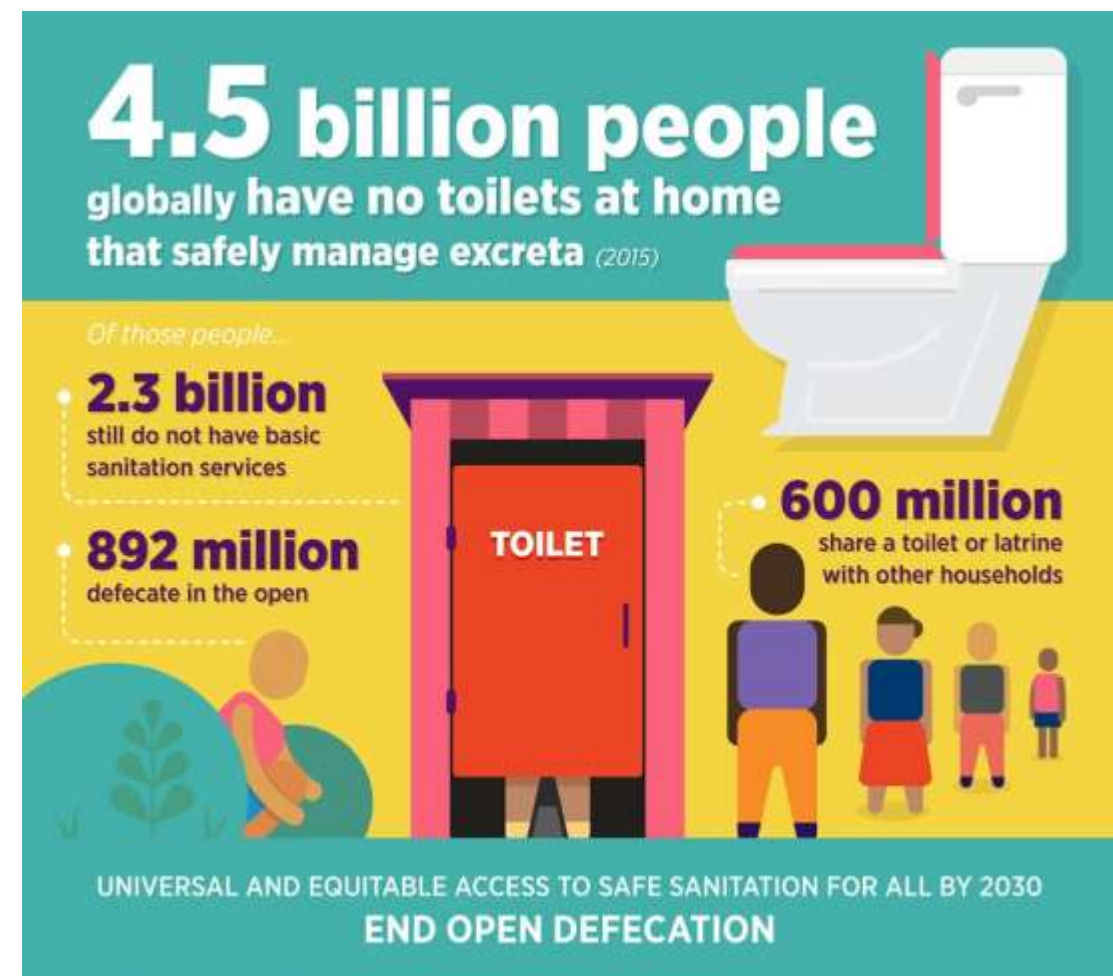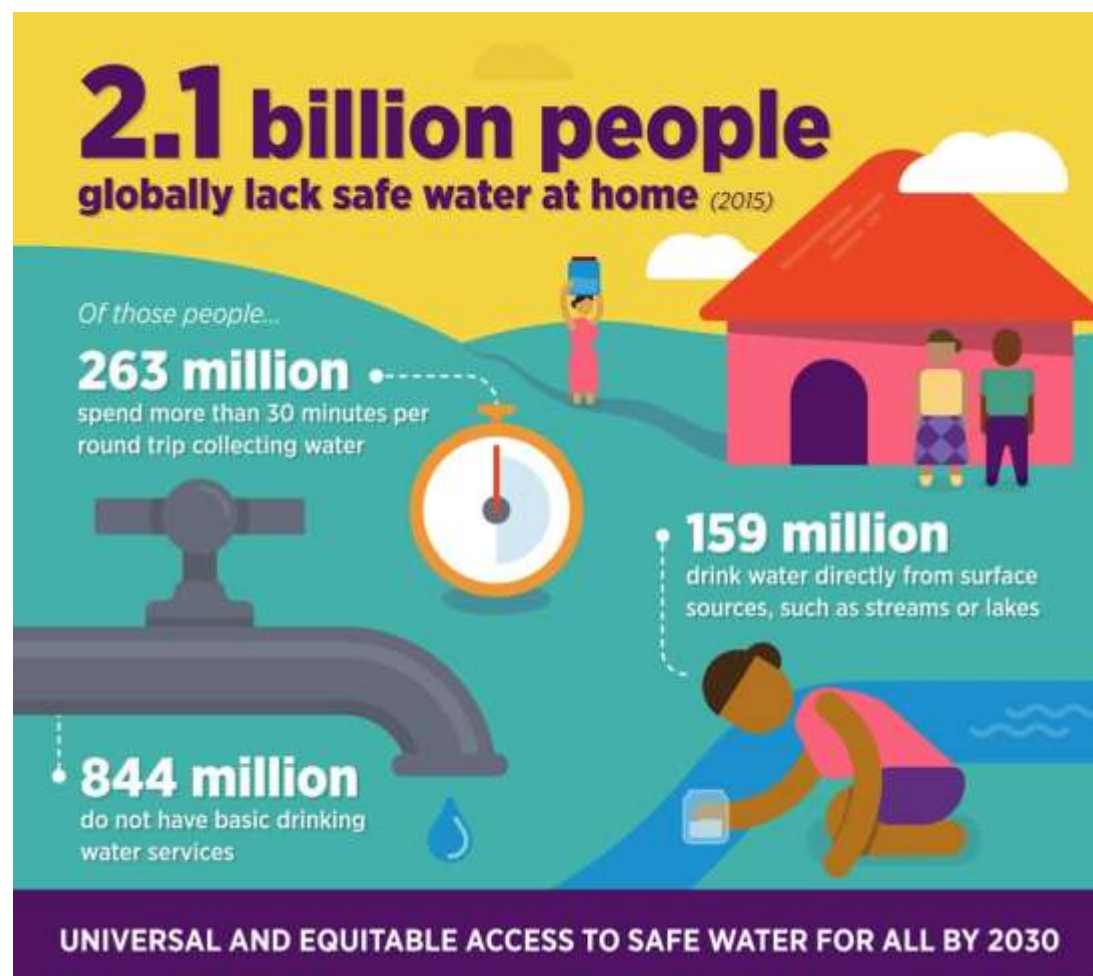
Application of disaster preparedness topography

Build resilient hospital/instituiton internal community together with adjacent
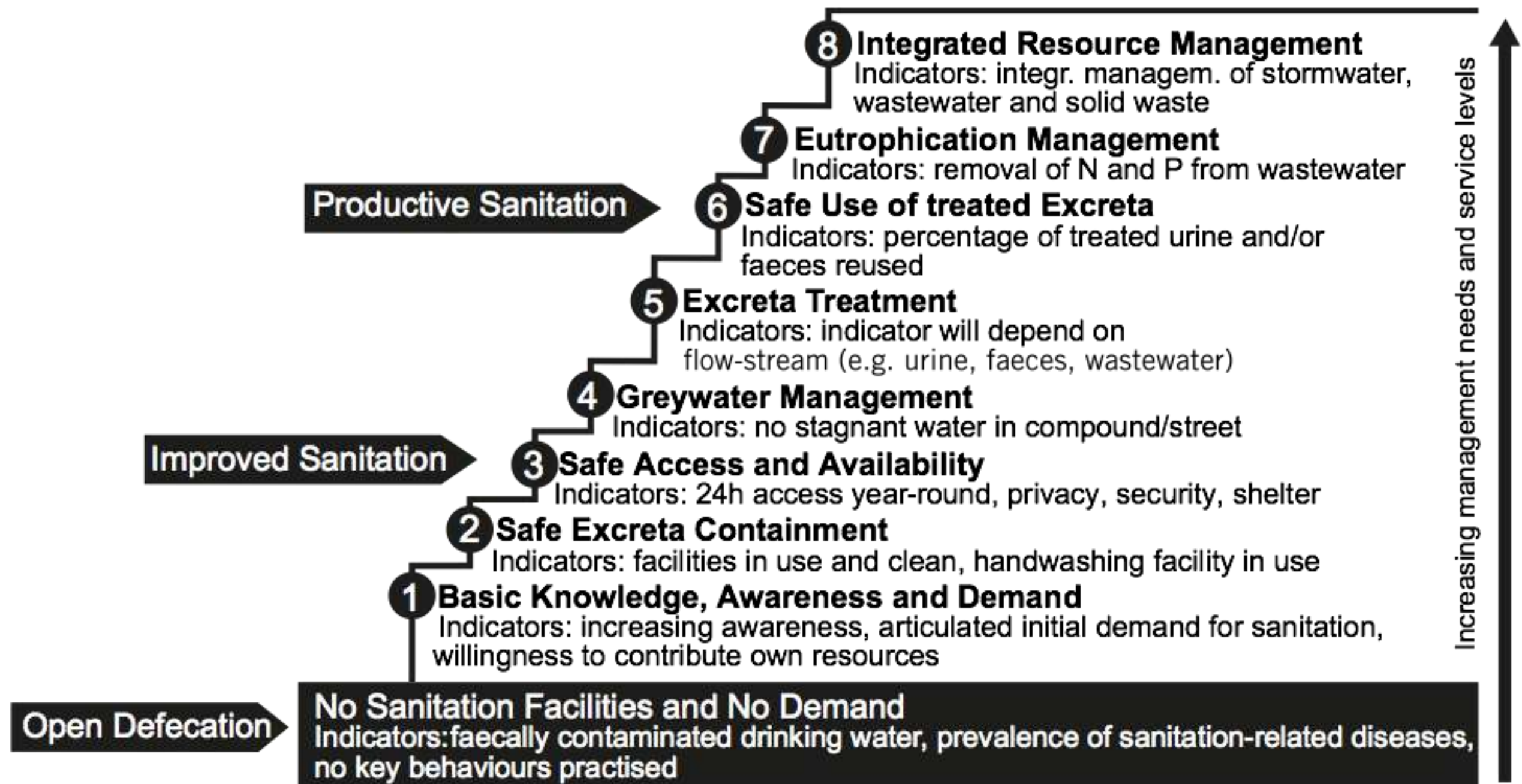community resilience

Water, Sanitation and Hygiene (WASH)

2.1 billion people lack safe drinking water at home, more than twice as many lack safe sanitation. MERCY Malaysia began systematically focusing on Water, Sanitation, and Hygiene (WASH) in its humanitarian relief operations in 2005. This include **provision of safe water supply, sanitation facilities and hygiene promotion.**
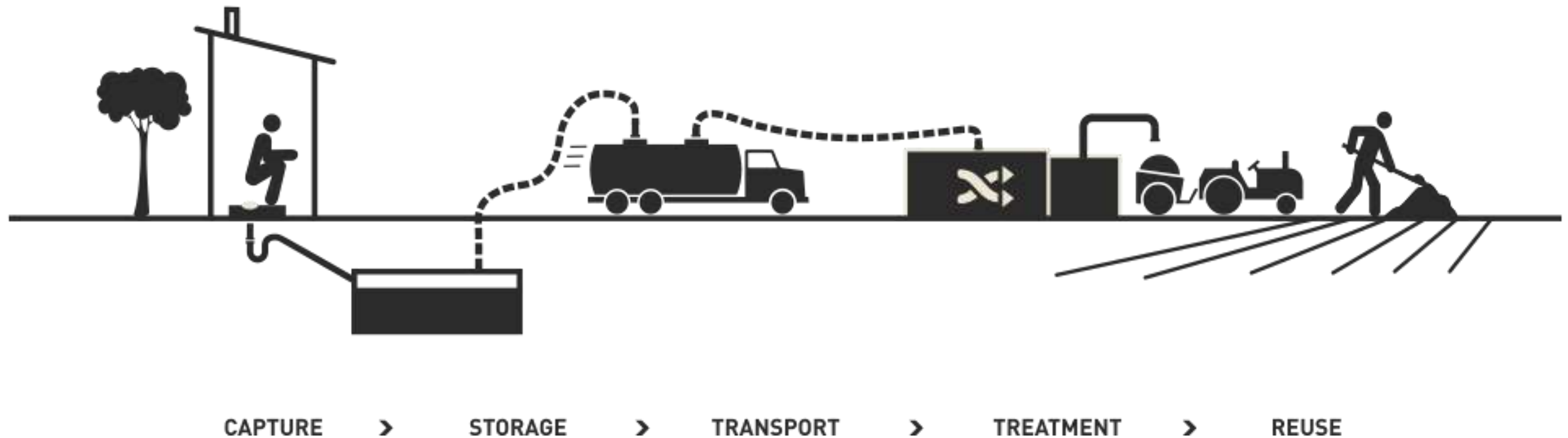
Water, Sanitation and Hygiene (WASH) - Innovation Ladder Framework

Integrated Resource Management
Indicators: integr. managem. of stormwater, wastewater and solid waste

Eutrophication Management
Indicators: removal of N and P from wastewater

Safe Use of treated Excreta
Indicators: percentage of treated urine and/or faeces reused

Excreta Treatment
Indicators: indicator will depend on flow-stream (e.g. urine, faeces, wastewater)

Greywater Management
Indicators: no stagnant water in compound/street

Safe Access and Availability
Indicators: 24h access year-round, privacy, security, shelter

Safe Excreta Containment
Indicators: facilities in use and clean, handwashing facility in use

Basic Knowledge, Awareness and Demand
Indicators: increasing awareness, articulated initial demand for sanitation, willingness to contribute own resources

No Sanitation Facilities and No Demand
Indicators: faecally contaminated drinking water, prevalence of sanitation-related diseases, no key behaviours practised

Productive Sanitation

Improved Sanitation

Open Defecation

Increasing management needs and service levels

Water, Sanitation and Hygiene (WASH) - Innovation on Value Chain

CAPTURE ❯ STORAGE ❯ TRANSPORT ❯ TREATMENT ❯ REUSE

EXAMPLES OF INNOVATION IN WASH PROGRAMS

1. Community mobilization linked with supply chain strengthening and coordination with local government institutions.

2. Gender-specific WASH motivation, which included interpersonal communications at places and times suitable to different gender age groups and the poor: a redesign of the communication strategy, focusing on fewer practices and two-way communication.

3. The provision of toilet loans for the poor and grants for the ultra poor.

4. Low-cost sanitation technology in areas with a high water table

Source: Bill & Melinda Gates Foundation, WASH Strategy Overview Report, 2016, and BRAC, WASH: Nine years of scale and innovation in Bangladesh, 2016

Water-Borne and Communicable Diseases

THE CAUSE

Waterborne disease, which can be bacterial, parasitic, viral, or chemical, occurs due to exposure to one of these three types of water:

RECREATIONAL WATER
- swimming pools
- hot tubs
- etc.

NON-RECREATIONAL WATER
- water not intended for drinking
- water of unknown intent

DRINKING WATER
- tap water
- well water
- etc.

DEFINING THE TERM

WATERBORNE DISEASE:
- Disease caused by pathogenic microbes which can directly spread through contaminated water
- Can be bacterial, parasitic, viral, or chemical

COMMON TYPES:
- E coli
- Legionellosis
- Salmonella
- Cryptosporidiosis

COMMON SYMPTOMS:
- Diarrhea
- Vomiting
- Nausea
- Chills
- Abdominal pain
- Dehydration
- Headache
- Fever

BACTERIAL

PARASITIC

VIRAL

CHEMICAL

WHY IS WASH IMPORTANT?

Public health diseases in emergencies

Disease	Cause
Diarrhoea, dysentery, cholera	Water borne (contaminated water)
Infectious skin and eye diseases	Lack of water
Malaria, dengue, river blindness	Water- related and vector borne (breed in water)
Schistosomiasis, guinea	Water based life

OXFAM

Water-Borne and Communicable Diseases

Measures in reducing risks of water-borne and communicable disease risks:

- Chlorination of water
- Vaccination against hepatitis A
- Malaria prevention
- Health education
- Enforce high standards of hygiene through legislative/administrative ways

Innovative WASH programs

Sustainable health programs

BRC programs (CBDRM, SPP, LGUs)

Source: MERCY Malaysia, Annual Report, 2016

Health innovations

Disease-specific kits for field laboratories & field hospitals e.g. rapid tests & easy-dispense antibiotics & oral & IV Fluid replacement systems

Water purification packs for ERTs & communities – need to be part of preparedness trainings

STI INITIATIVES

Epidemics and Pandemics

Epidemics and pandemics along with other hazards cause significant health impacts and disruption to the functioning of society including social, economic and political stability. **Epidemics may be a primary event or a secondary consequence of the impact of other hazards, such as cyclones, drought and floods.** The Sendai Framework for DRR is advocating for more explicit inclusion of epidemics and pandemics in the framework:
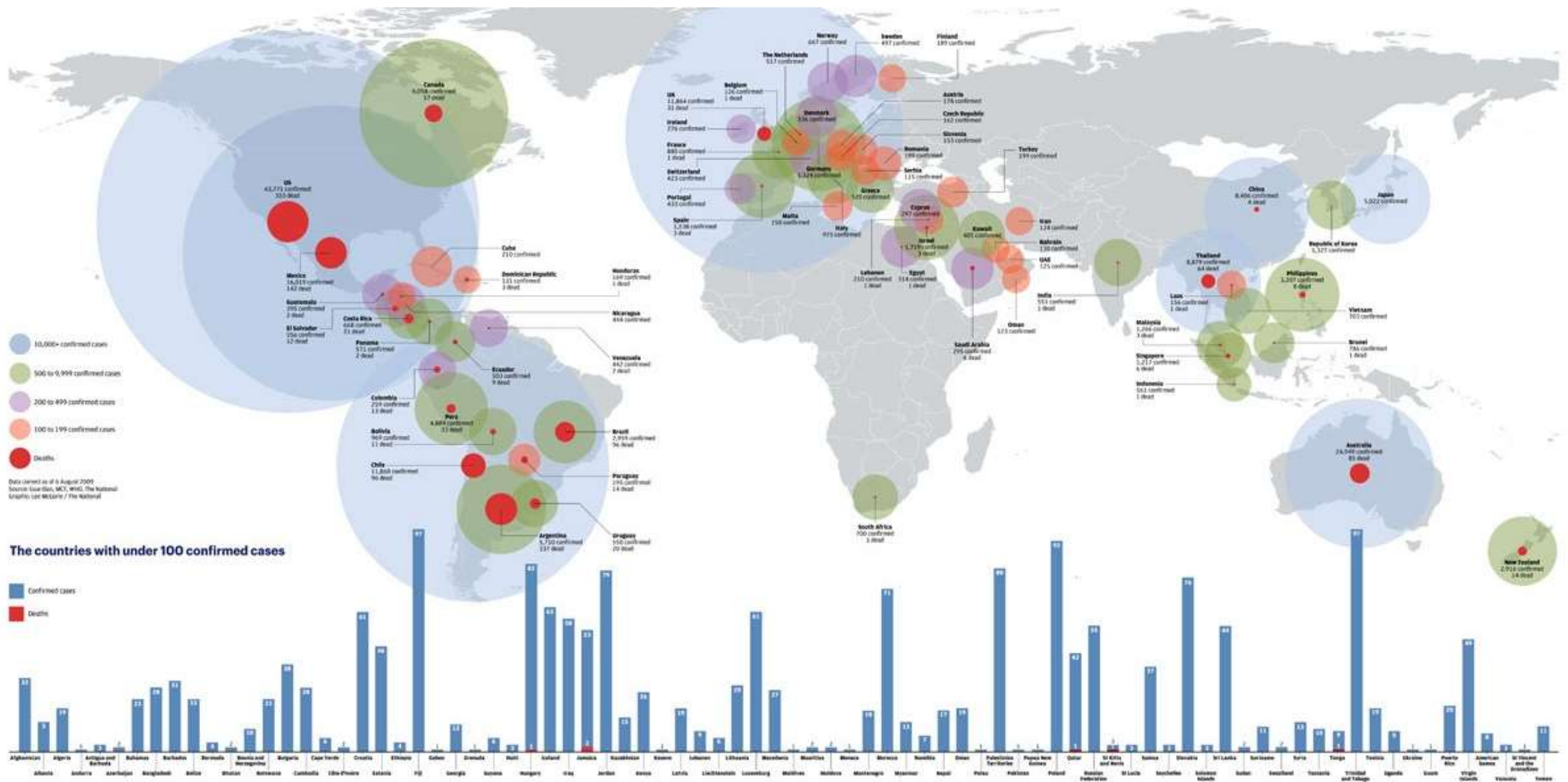
1. **Integration of epidemic and pandemic risks into the all-hazard emergency** and disaster risk management policies, plans and practices of governments, private sector and stakeholders within and across all sectors and at all levels of society.

2. Increased understanding, recognition and implementation by all sectors of the **International Health Regulations (2005)** as a complementary framework that contributes to disaster risk reduction.

3. Knowledge and technology transfer between communities and actors involved in managing risks of epidemics and pandemics with those working in disaster risk reduction.

4. **Reinforcement and scaled up action** on linking epidemics and pandemics **to risk assessment and early warning systems.**

5. Continuing focus on improving **access to safe water and resilient water and sanitation systems**

6. **Strengthening capacities of health systems to manage the risks** of epidemics and pandemics including through primary, secondary and tertiary care, disease surveillance, risk communication, Resilient Hospital programs to address epidemics, multi-hazard emergency preparedness and other programs.

7. Means to promote more urgent **scientific research** on epidemics and pandemics, and effective risk management strategies.

Epidemics and Pandemics

Innovations

Technical- identification of virulent and dangerous pathogens & microbes – viral, bacteria & fungi as well as new tube & box systems for cold chain for anti-dote & vaccines

Regular pandemic preparedness training

Integrate epidemic & pandemic preparedness & response in field hospitals

Involve communities in disaster prone areas early in pandemic preparedness & training

Mental Health and Psychosocial Support Services (MHPSS)

In times of disaster, the mental health of the affected population may not be seen as immediate need if compared with physical injuries. However, traumatized survivors need emotional support and guidance in the aftermath of a disaster. MHPSS may assists by providing psychosocial intervention through programs such as **Psychosocial First Aid (PFA), Child Friendly Space (CFS) and Women Friendly Space (WFS)** during the crisis situation.

Humanitarian crises impact mental health by:

1. Producing grief and acute stress as psychological reactions to adversity and loss
2. Triggering common mental disorders such as depression and anxiety, and in some cases post-traumatic stress disorder
3. Exacerbating pre-existing chronic mental health conditions and placing people who need long
4. term care at increased risk of neglect
5. Increasing use of alcohol and drugs, resulting in further health and social problems

Key recommendations:

Weak mental health systems not only fail to meet the needs of the general population; they also represent a major liability if a crisis emerges. Therefore, some of the key recommendations are:

1. Set up cost-effective, nation-wide community mental health systems in countries at risk
2. Plan for emergency preparedness—including mental health and psychosocial support—within the health system
3. Prioritize engagement of local expertise for sustainable change

Mental Health and Psychosocial Support Services (MHPSS)

Mental health care by mental health specialists (psychiatric nurse, psychologist, psychiatrist, etc).

Specialized services

Basic mental health care by public healthcare doctors. Basic emotional and practical support by community workers

Focused (person-to-person) non-specialized supports

Activating social networks
Communal traditional supports
Supportive child-friendly spaces

Strengthening community and family supports

Advocacy for basic services that are safe, socially appropriate and protect dignity

Social considerations in basic services and security

Source: International Federation of Red Cross and Red Crescent Societies, 2014

Psychosocial innovations

Integrating CFS & WFS INTO Field hospitals/ERUs

Psychosocial & mental health preparedness programs initiated pre-disaster in
   highlhy prone areas

Training members of local community in MHPSS as part of CERT pre-disaster

STI INITIATIVES

Building Resilient Communities (BRC) - Innovation in DRR

PROGRAMS

CBDRM

SPP

RH

PS

LGUs

OBJECTIVES

To provide a platform for communities to actively participate in disaster risk reduction activities, gain knowledge, skills and competencies in DRR and indigenous early warning systems are enhanced and used.

To generate a culture of disaster awareness and response amongst school children, teachers and staff.

To increase and introduce hospital and its management to DRR and improve the hospital's disaster preparedness and early warning systems through the implementation of DRM.
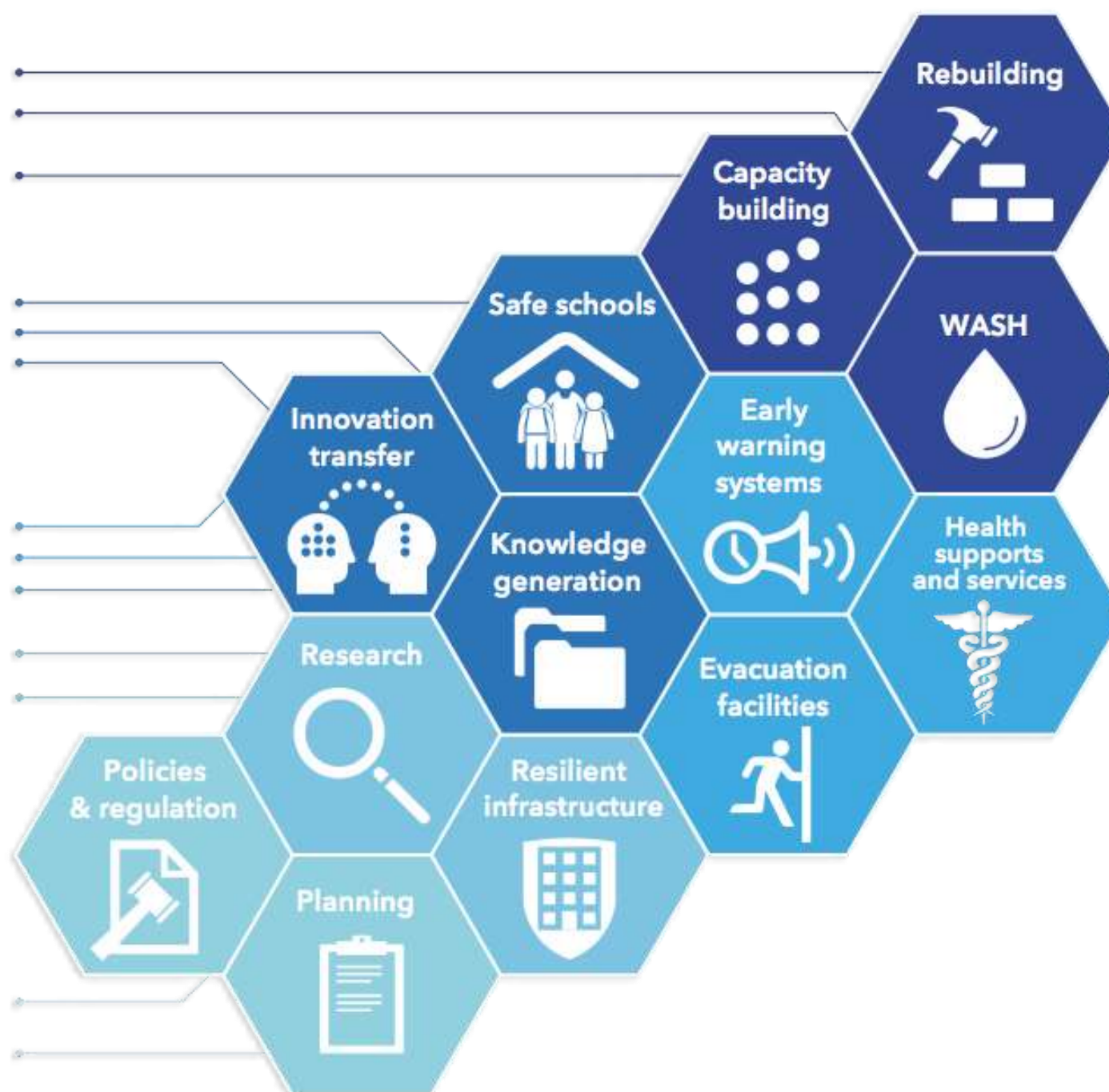
To provide DRR and DRM education for private and corporate sector through DRR for Private Sector and Business Continuity Plan (BCP).

To educate, train and strengthen relevant LGU stakeholders on DRR and DRM.

EXAMPLE ACTIVITIES

- Rebuilding
- Capacity building
- WASH
- Safe schools
- Innovation transfer
- Early warning systems
- Health supports and services
- Knowledge generation
- Research
- Evacuation facilities
- Policies & regulation
- Resilient infrastructure
- Planning

STI INITIATIVES

Alignment to Sustainable Development Goals 2015 - 2030

STI INITIATIVES

Alignment to Sendai Framework for Disaster Risk Reduction 2015 - 2030

Priority 1	**Understanding disaster risk**	National and local dimensions	Regional and global dimensions
	Policies and practices for DRR should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment.		
Priority 2	**Strengthening disaster risk governance to manage disaster risk**		
	Disaster risk governance at the national, regional and global levels is of great importance for an effective and efficient management of disaster risk.		
Priority 3	**Investing in disaster risk reduction for resilience**		
	Public and private investment in DRR are essential to enhance the economic, social, health & cultural resilience of persons, communities, countries, their assets, as well as environment		
Priority 4	**Enhancing disaster preparedness for effective response, and to "Build Back Better" in recovery, rehabilitation and reconstruction**		
	Strengthened disaster preparedness for response, recovery, rehabilitation and reconstruction are critical to build back better		