

DISASTER AND DISASTER MANAGEMENT.

National University
of Singapore

Date

No.

> Last few years, both frequency and intensity has increased.

Reasons: Ecological footprint, population rise, in disaster prone areas, disparity & poverty making such people most vulnerable.

IFRCC - WDR - Single Disaster critically hampers development & hence won't be sustainable development
10 out of 17 SDGs → Disaster related.

India - one of the 10 most disaster prone country

- CVI - Rank 2 [composite vulnerability index]
- 60% of land vulnerable to earthquakes
- 10-14% to cyclones
- 3/4th of the coast to cyclone & landslides
- Negligible investment for DM. (disa. mgmt)

Even Constitution makers could not foresee.

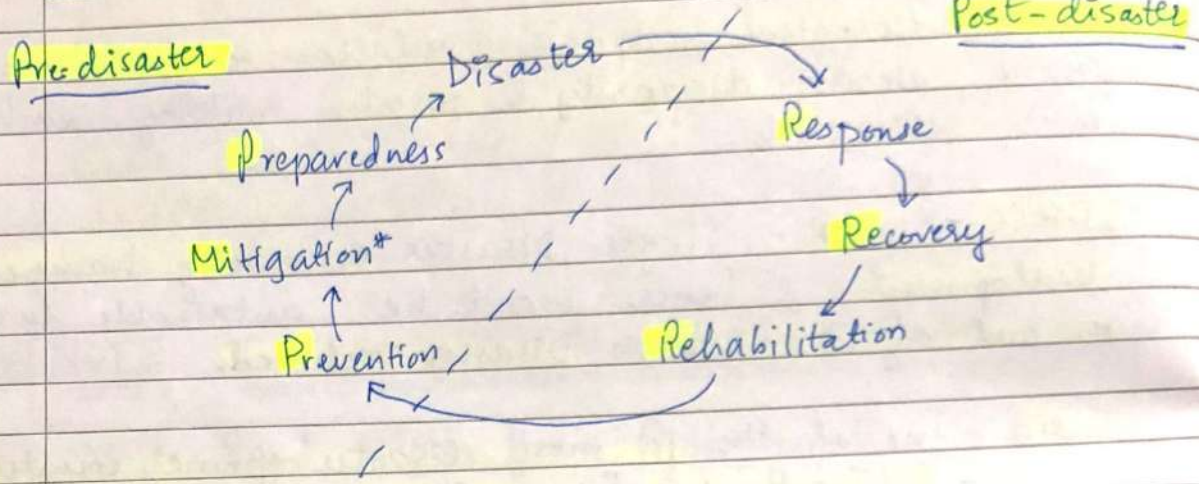
Yokohama Summit → Hyogo framework of Action → Sendai framework (2015-30)
Community based DM
CBD-RM (Community based disaster risk mgmt)

CBD-RM: - locals can respond in golden hours
- Knows local vulnerability better
- traditional wisdom & local solution
→ supercyclone 'Phallin' when 3mn. were

evacuated.
eg. tribals of Andaman could survive because their existing warning system could work well in comparison with our non-existent modern system.

* Disaster management battle is ^{already} half-won if attitudinal changes and regard for safety is instilled amongst people*

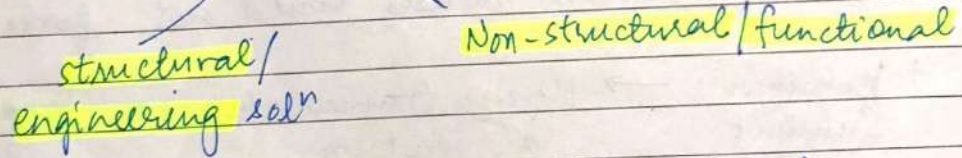
Disaster mgmt. cycle



Mitigation - addressing causal factors & minimising impact.

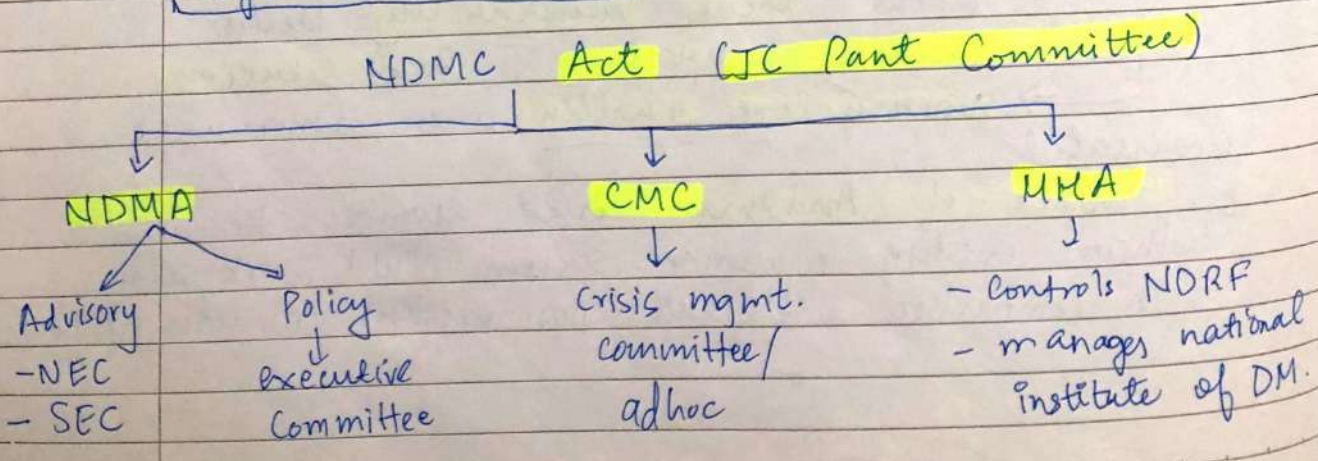
Acc. to UNISDR
 ↓
 There are no disasters, but natural hazards.

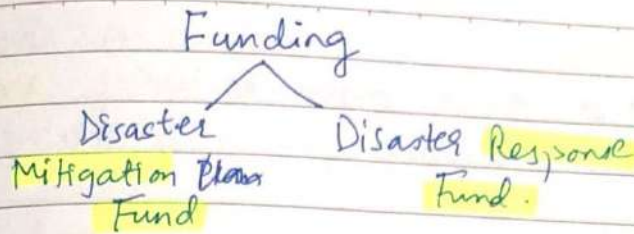
Disaster Risk Reduction strategy.



*** Importantly, disaster mgmt. is part of an attitude and regard for safety.

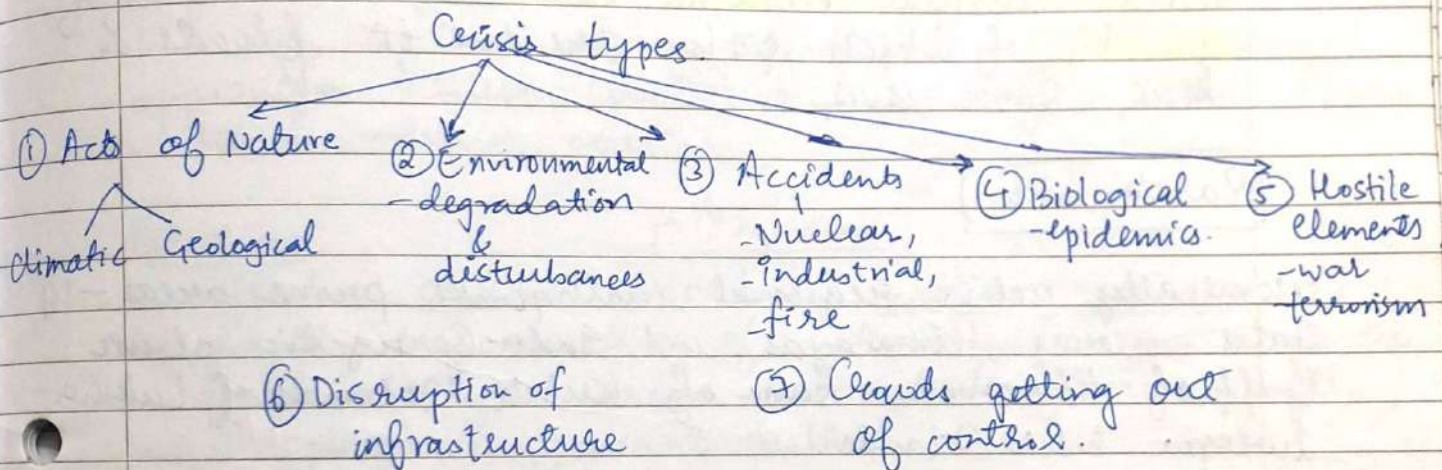
Legal framework





* 3rd Report of the 2nd ARC - Crisis Management

Disaster/Crisis: An emergency situation arising out of natural/human activity, poses threat to biodiversity, human life or property or leads to disruption of normal life.



• **Elements of crisis management:**

① **Risk reduction:**

- Use of knowledge: hazard & vulnerability analysis
- creating legal & institutional framework
- Planning for risk reduction (eg. EIA).
- capacity building of community & govt. agencies
- installing early warning systems → Supercomputer Mihir, NASA's JPSS.
- using financial instruments

② **Quick Response:**

- Use of trigger mechanisms and SOPs, technology (community and voluntary)
- coordinating roles of mechanism community & voluntary

organisations,

- local bodies and govt agencies
- rescue & relief team.

③ Recovery: (& Rehab)

- Planned recovery
- rehabilitation with sustainable livelihood
- focus on weaker sections
- monitoring, auditing & evaluation.

According to Global Assessment Report produced by UN Office for Disaster Risk Reduction 2015 - India's annual economic losses is to the tune of \$9.8 bn of which \$7bn are due to floods & 2000 lives.

Earthquake

> seismically active regional earthquake prone areas - 14 states across Himalayas and Indo-Gangetic plain
Gulf of Khambhat, Rann of Kutch, Islands of Lakshadweep, A&N Islands.

Now, Earthquakes cannot be prevented nor avoided, especially in terms of magnitude & place/time of occurrence.

Solution:

(a) Pre-disaster mitigation preparedness & preventive measures to reduce vulnerability of built environment.

+ (b) effective rescue & relief.

- Traditional knowledge - traditional houses of wood & stone survived the quake in Uttarakashi while modern buildings collapsed.

Cyclones

$\frac{3}{4}$ th of 7500 km coastline vulnerable to cyclone.

(Phalin which was moving 270-300 km/hr took more than 10000 human lives & lakhs of livestock)

- Regional vulnerability: are associated with storm surges and heavy rainfall, before & after monsoon. Over 55% of cyclonic storms developed in Bay of Bengal approaches eastern coasts, and 25% of cyclonic storms reach western coasts.

Solution:

→ Bagawani

- effective cyclone forecast & warning services
- rapid dissemination of warnings to govt. agencies, particularly marine interests (fisheries, ports, shipping) & general public

- construction of cyclone shelters in vulnerable areas.
-

2015:
oct/11

Tsunamis

- was uncommon in India till Dec 2004, which caused damage to the tune of ₹12000 crore, 12400 lives lost out of which 75% were women and children.

- Region: mainly east coast & Gujarat coast due to proximity to seismic zone.

- Lessons learned:

- SOPs need to be developed to minimise response time.

- Coordination mechanism

- post disaster health hazards can be avoided through timely immunization, sanitation & disinfection.

- Early warning system.

*
Japanese
total
preventive
maintenance
*

Case study Tribals of Andaman could survive Tsunami because their EWS worked well in comparison to our non-existent modern systems. ∴ Traditional knowledge needs to be incorporated into pre-disaster response.

Answer

Framework:

- Defn ✓

- Facts ✓

- Region ✓

- Reasons ✓

- Consequences ✓

- To Do ✓ ① Risk reduction

- Quick Response ✓

- & Relief ✓

- Recover & ✓

- Rehabilitation

- Sendai Framework ✓ + PM's 10-point agenda.

(Case study & CBDR)

Floods situation when water flowing in rivers, streams, and other bodies cannot be contained with natural/artificial banks.

Facts: Acc. to National Flood Commission, 40 million hectare land area is prone to floods. UN Global Assessment Report...

Region - Most flood prone areas are B'putra, Ganga and Meghana-Suena river basins. But in monsoon, all states are prone to floods including Rajasthan!

Reasons: • high intensity of rain and antecedent conditions of catchment areas
• manmade hindrances to free outflow/absorption of floodwater.
• unauthorised construction activities in flood plains & river beds.

Recommendations:

(1) Disaster Risk Reduction

- master plan for flood control and management for each flood prone basin
- Adequate flood cushion in water storage projects.
- Promoting non-structural measures to reduce recurring expenditure on flood relief (dredging of B'putra).
- Extending of range of Indian Remote sensing satellites across country to provide mapping changes of ~~into~~ rivercourse, riverbank erosion mapping, near real-time flood mapping & monitoring.

(2) Quick relief & response: ...

(3) Recovery: ...

Case study: Flood prone rural northeast has houses that allow flood water to flow under them rather than through or over.

(15)

Landslides & Avalanches

* Landslides are mass movements of rocks, debris down the mountain slopes or riverbanks. Often takes place in conjunction with earthquake floods, & volcanic eruption.

Region: hilly terrains of India, especially Himalayas & western Ghats.

Reasons: In Himalayas - due to instability & in western Ghats due to neo-tectonic activity of bed rock.

Consequences: Malpa landslide in 1998 buried entire village.

To do: • Microzonation to regulate settlements in hazard prone areas.

• non-interference with natural water channels.

• IRS & land mapping - R&D activities

* Avalanches are sliding down of snow cover

Indian
Regional
Satellite

Industrial Disasters

- methyl iso-cyanate gas leak in 1984 from the union carbide factory.



Environment Protection Act, 1966.

Nuclear Hazards

- Dept. of Atomic Energy is the nodal agency - adherence to international standards.

Desert

Droughts, Climate change Dust storms (2018/)

Epidemics

Waterborne

- cholera.
- typhoid
- Hepatitis A
- Hepatitis B

Airborne

- Influenza
- measles

Vector-borne

- J. Encephalitis

Person-to-person

- AIDS.

* Becomes real danger during floods & earthquakes.

* There is no clear consensus on precisely when an outbreak becomes an epidemic and an epidemic becomes a disaster.

Gender Issues & Vulnerability of weaker sections (Children, elderly, physically disabled):

- women have less literacy & have little role in decision making.
- this disadvantaged situation gets aggravated in crisis situation. As a result, whether it is in disaster preparedness plans or during relief and rescue operations, the special needs and concerns of women including their psychological & physical health and well being are not adequately addressed.

- Across all crisis situations -

- most ~~no~~ women cannot swim and often are unable to climb trees.
- many women died because they stayed behind for their children & relatives.

SENDAI FRAMEWORK

- (mitigating disaster)
NOT prevent.

"SUII"

- Understanding risk
- strengthening risk governance
- investing in disaster resilience
- improving capacity & recovery responses.

* Asian Ministerial Conference on Disaster Risk Reduction, New Delhi, 2016 -

- 10 point agenda of the P.M. to integrate all development projects with DR, **involvement & leadership of women**, network of disaster universities, utilising social media, and technologies lessons from disasters.

Manmade Disasters

- Chemical
- Biological
- Nuclear

Date

No.

* Chemical Disasters (related to industrial disaster):

- Indian chemical industry likely to grow to \$154bn by 2020.
- MoEF is the nodal authority based on NDMA guidelines.

Kaizen
TPM
TPM

• Reasons:

- Incomplete treatment of organic solvents/hazardous toxic substances
- Maintenance of equipments & non-compliance to SOP
- Inaccessibility to previous learnings
- Natural disasters (flood/earthquakes)

- Issues:
- Non-availability of accident investigation agency and exclusive chemical accident database
 - Non-availability of emergency response team.
 - ...

Prevention & Response:

(1) Industry



- Trained Human Resources
- Emergency preparedness through compliance to norms.
- Kaizen & TPM.

(2) Govt.



- Rules
- Agency or lines of "Chemical Safety Board" of USA
- Awareness & R&D

(3) Citizens



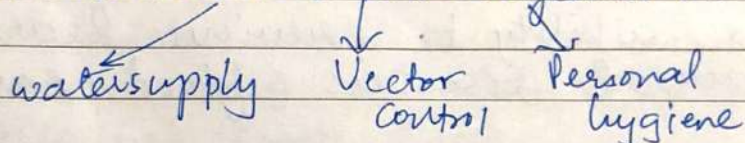
- Training
- Mutual aid groups.

Biological Disasters / Epidemiological

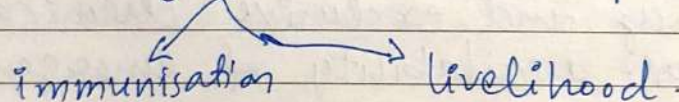
- outbreak → epidemics → disaster
(No consensus on this)
- consequences → infection, allergy, poisoning
- MOHFW is the nodal ministry for epidemics for disaster, it is respective state govt.
- legislation - Environment (Protection) Act, 1986

Prevention :

- Vulnerability analysis & risk assessment
- Environmental management.



- Prevention of post disaster epidemics.



- Training of personnel & public health education.

Recent

- School safety Policy
- Hospital Safety Policy

I (for
Econs-II also)

NITI Aayog Vision, Strategy & Three Year Action Agenda.

- India has still not abandoned the process of planning and the country still has planned development in action.
[from imperative planning to indicative planning].

→ "Eradication of Poverty"

VISION

(15-years)

- Encompasses overall goals & objectives.

STRATEGY

(7-years)

- Roadmap of development for next seven years dividing those goals and objectives into 2 parts

**3-YR. ACTION
AGENDA**

(3 years)

- states the tasks & targets to be accomplished in next 3 yrs, further dividing Strategy into two parts.

• Difference w.r.t. "old" plans:

- (1) Approach is more democratic and federalist. Chief Ministers are treated as equal partners.
- (2) The new approach has no "plan" and "non-plan" expenditures outlays imposed from the top - NITI Aayog works as a think tank and acts as a truly advisory body as there are no financial powers to NITI Aayog.
- (3) The new approach is flexible and suitable for liberalised environment.
- (4) Successive governments can carry forward the work of previous government - as the work of plan ~~previous~~ government only defines broader objectives which the incumbent govt. can execute as per their own strategies.

(5) Allow: "course correction" & "flexibility" - flexibility to adapt to changing circumstances and exogenous variables.

Realising the agenda:

① Separate parliamentary committee to meaningfully engage with NITI Aayog.

② State-level sub-institutions can be created (SU-NITI).

③ There is a need of taking states together & giving them a wider say.

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