A Disaster Technology Continuum:

Technology Ecosystems for Disaster Risk Reduction

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What is a “Technology”?

Technology as a “way of doing things ...”

We need to take a broader meaning of ‘technology’ as ‘ways of doing things’ and include both hard and soft issues and aspects related to the environment.

A Broader Meaning of “Technology”

- Techniques
- Skills
- Information
- Management systems
- Policies and strategies
- Decision-support Systems
A technology ecosystem is an interconnected and interdependent network of diverse entities coming together to spur innovation in a sustainable manner.

A wide variety of stakeholders undertaking different roles and responsibilities need to come together to develop and deploy appropriate technologies for disaster risk reduction.
The Three Aims of Disaster Technologies

There are essentially three aims of technologies for disaster management. These look at the human and environmental dimensions, and the overlapping area of sustainable development.
For each stage of the disaster cycle, the cause-effect issues to be taken into consideration include both human and environmental aspects.
Examples of Disaster Technology Categories

Environmental technologies can cover a number of issues and sub-issues, including infrastructure, information, assessment, preparedness etc. They cover both the natural environment as well as the built environments.
In understanding the role of environmental technologies available for disaster management, we can look at it as a framework of hard and soft technologies, for pre-disaster (prevention and preparedness) and post-disaster (response, rehabilitation and reconstruction) phases.
Developing technologies for disaster risk reduction requires us to understand who uses the technologies and at what level – from single households and communities to city wards, local governments and national governments.
The kind of technology needed changes as along the stakeholder(s) – from preparedness and preventive technologies to response and restorative technologies.
Preparedness Technologies

Technologies and techniques (both products and skills to use those products) that help us prepare for a disaster

- Building design
- Lifestyle changes
- Survival kits
Preparedness Technologies

Examples of technologies for disaster preparedness (developed by private companies in Japan):

- Strong Wind Warning System along railway lines, developed by Japan Railways
- Vibration sensors for rockfall, landslides, earthquakes etc. by Fujikura Co.
- ICT tools on smartphone for disaster preparedness by Fujitsu Corp.
- High Fidelity smart radio (“PASOLINK”) by NEC Corp.
- Emergency mobile radio network, by NEC Corp.
Preventive Technologies

Technologies and techniques that help us *prevent* damage before, during or after a disaster

- Building Construction
- Infrastructure
- Reforesting
Preventive Technologies

Examples of technologies for disaster prevention (developed by private companies in Japan):

- Integrated flood model simulation for river networks, by IBM Japan
- QCAST consumer terminals for early warning systems, by Meisei Electric
- Sensors for sewerage systems to prevent damage, by Nippon Koei
- Storm surge and tsunami analysis model (NKSTAM), by Nippon Koei
- Technologies for landslide, debris flow and rockfall sensing, by Nippom Koei
Response Technologies

Technologies and techniques that help us respond to disaster events.

- ICTs and IoTs
- Space technologies
- Transportation / S&R

Preparedness Technologies

Preventive Technologies

Response Technologies

Restorative Technologies
Response Technologies

Examples of technologies for disaster response (developed by private companies in Japan):

- Radiation monitoring systems, by Fuji Electric
- Integrated disaster information management system, by IBM Japan
- Portable mobile data center, by IBM Japan
- New congestion estimation system, by NEC Corp.
- Crowd behavior analysis technology, by NEC Corp.
- Imaging technologies for search and rescue operations, by NEC Corp.
Restorative Technologies

Technologies and techniques that help us restore neighbourhoods and local environments after a disaster

• Sensors and measures
• Cleanup and repair
• Removal and extraction
Restorative Technologies

Examples of technologies for restoration after disasters (developed by private companies in Japan):

- Reinforcement of slopes and revetments for landslides/earthquake, by Nippon Kooei
- PP Reinforced PP Net lining metho, by Nishimatsu Corp.
- Sheerreinforcing method for existing buildings and structures, by Nishimatsu Corp.
- Integrated traffic control system in disaster-hit areas, by Sumitomo Electric
- In-situ retrofitting for liquified soils, Taisei Corp.
- TOMSY – Total Utility Mapping System, by Tokyo Gas
- District-level sensors for gas supply disruption and restoration, by Tokyo Gas
- Smart/intelligent gas meters detecting abnormal gas flow/Eqs, by Tokyo Gas
A grandmother needs
Not a mobile app
But a total solution
To restore her life
Thank you!

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