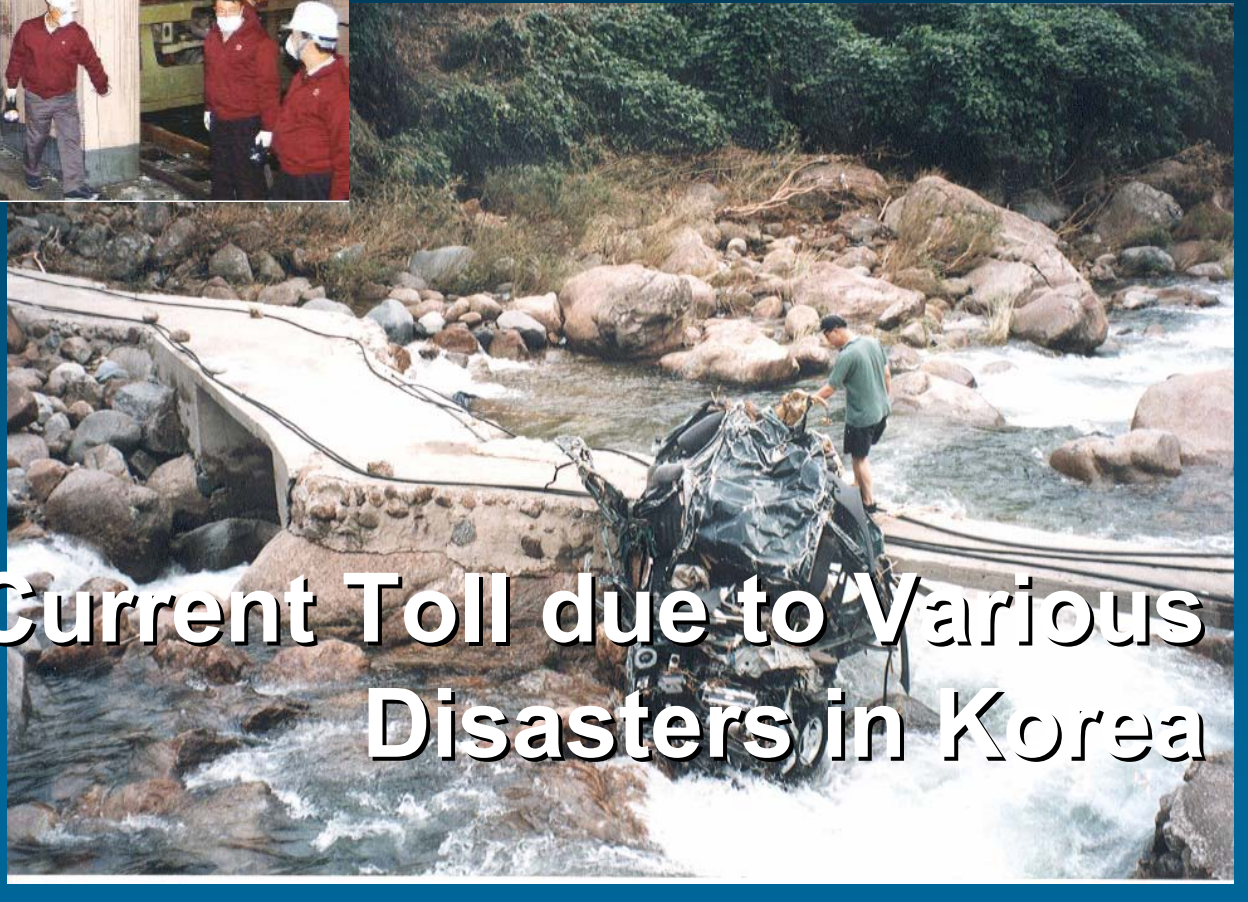
Activation of National R & D Programs for the Advanced Polices & Technologies in Disaster Management

Shim, Jae-hyun, Oh, Keum-ho, & Lee, Cheol-kyu
National Institute for Disaster Prevention (NIDP)
Ministry of Government Administration & Home Affairs

CONTENTS



The Current Toll due to Various Disasters in Korea

Average Damages per Annum during the Last 10 Years in Korea

(Unit : person, million W

Natural Disasters		Traffic Accidents		Fire Damage	
Life	Properties	Life	Properties	Life	Properties
106	681,056	10,345	488,239	546	136,604

Historical Records in Flood Disasters in Korea

Rank	1	2	3	4	5	6	7	8	9	10
Year	2002	2003	1987	1998	1999	2001	1990	1989	1995	2000
Damages (billion Won)	6,115	5,210	1,669	1,637	1,288	1,276	944	833	748	668

Casualties of Large Scale Disasters during the Last 10 Years

- Derailed Accident at Gupo (Mar. 22, ’93): 78 deaths
- Shipwreck at the Yellow Sea (Oct. 10, ’93): 292 deaths
- Seongsu Bridge Collapse (Oct. 21, ’94): 32 deaths
- Gas Explosion at Ahyeon-Dong (Dec. 7, ’94): 12 deaths
- Gas Explosion at Daegu Subway Construction

Cases of Natural Disasters during the Last 5 Years

- Typhoon MAEMI (Sept. 11~13, ’03): 132 Deaths
- Typhoon RUSA (Aug. 30~Sept. 1, ’02): 246 Deaths
- Heavy Rain (July 5~7, ’01): 66 Deaths
- Heavy Rain & Typhoon PRAPIROON (Aug. 23 ~Sept. 1, ’00): 28 Deaths

- Heavy Rain & Typhoon OLGA (July 23 ~Aug.

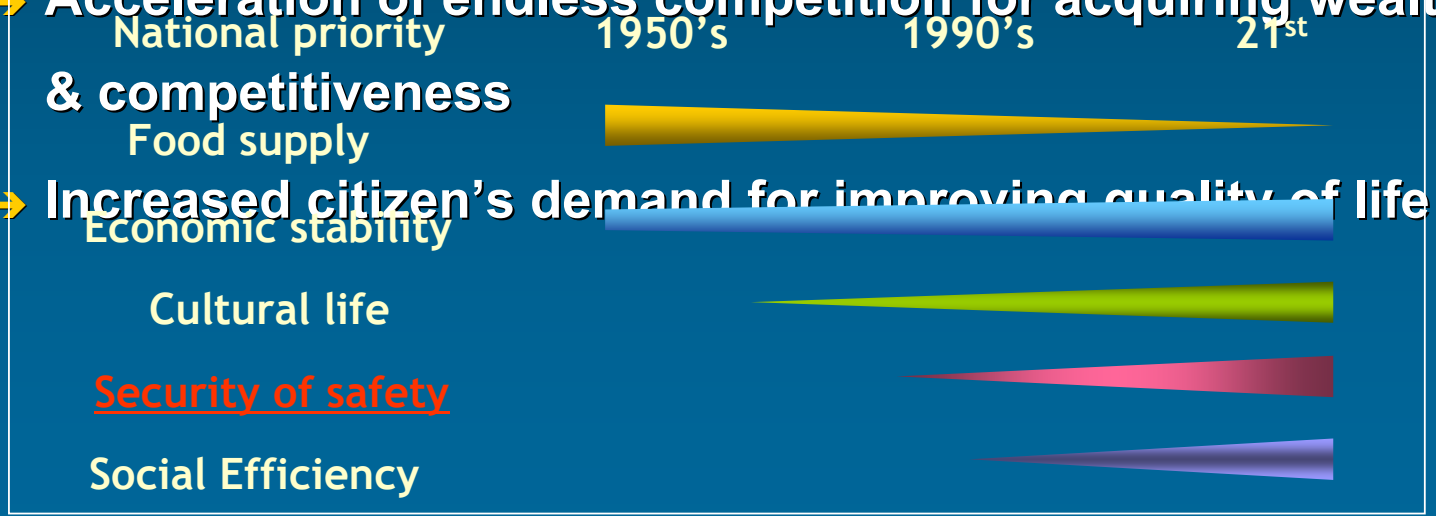
Paradigm Change of National Disaster Management System in Korea

Disaster Management in the 20th Century

- Intending only to reduce the damage scale & blames
- It is their problems, not mine
- Ignoring fundame for disaster mana

Social Conditions in the 21st Century

- The Innovative & Qualitative Changes in Social Paradigms
  - → Knowledge & Information oriented-changes as a resources of nationwide welfare
  - → Acceleration of endless competition for acquiring wealth & competitiveness
  - → Increased citizen's demand for improving quality of life



Changes in Social Paradigms

Two Faces of Modernization

- **Positive Aspects : Compressive Modernization**

  → The 12th Economic Growth Level in the world

- **Negative Aspects : Compressive Huge Disasters = The Risk**

  → 3,000 casualties during the last 10 years

Karl Polanyi : The Great Transformation (1944)

The capitalism is a historical anomaly because while previous economic arrangements were "embedded" in social relations, in capitalism, the situations was reversed - social relations were defined by economic relations.

- **It needs to concern the reflexive for sustainable development, modernization, and safer future**

Reflection of Modern Society

- **In modernized societies, for the economic development, vulnerabilities and risks have been considered as unavoidable**

RISK

Navigation Terminology originated from Spanish,

Something have to be overcome to reach a target

- Risk Society : Ulrich Beck

→ Need for Establishment of Reflexive Modernity

→ Modern society can not achieve "the something" of its targets without active responses to the risks

National R & D Programs

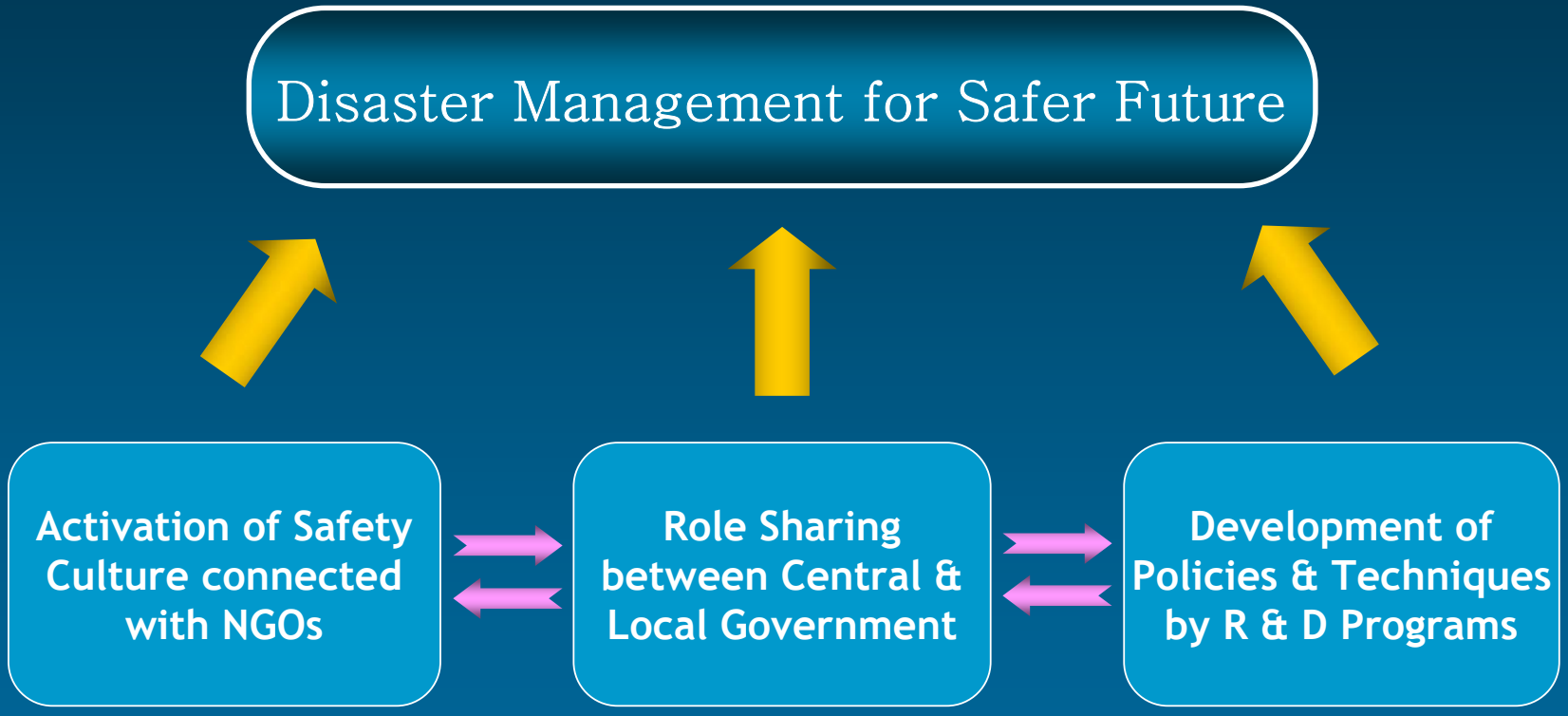
- Shortage of Safety Mind

  → Regarding safety as secondary problems not primary ones

  → Revealing the limits by the deficient of interdisciplinary researches

We need to coordinate interdisciplinary researches for safety management

The New Paradigm for Safer Future



Trinity for Safer Future

- Activation of Safety Culture connected with NGOs
  - ➔ Preparedness based Culture by volunteer participation
  - ➔ Accept people's opinion to Policy
- Role Sharing between Central & Local Government
  - ➔ Improve on-site response Capacity by Local Government
  - ➔ Propel the Mitigation Policy by Central Government
- Development of Policies & Techniques by R &

Current Status of R & D Programs in Korea

Trend of Investment on National R & D

- Except the duration of IMF surveillance program in 19 97 & 1998, R & D

  investment in Korea have an increasing trend

- President Roh declared, during his inaugural speech, the budget

  of National R & D will be increased upto 7%

  of government budget (estimated as 6.4 billion dollars)

  until his term of presidency

The Comparison of R & D budget for Disaster Management between Korea & Japan

Year	Korea		Japan	
	Budget (mil. Won)	Ratio of Disaster Management (%)	Budget (mil. Yen)	Ratio of Disaster Management (%)
1992	872	0.1	36,302	1.108
1993	1,373	0.1	43,152	0.927
1994	3,952	0.2	40,460	1.021
1995	12,758	0.5	105,845	1.404
1996	4,406	0.2	52,385	1.245
1997	70,784	1.7	49,128	1.206
1998	14,775	0.2	62,435	1.134
1999	35,722	0.5	78,134	1.712
2000	34,166	0.5	73,502	1.771
2001	31,798	0.4	-	-
2002	53,512	0.3	-	-

➔ Less than 1% budget of Total National R & D

Lack of Legal Basis for R & D Programs for Comprehensive Disaster Management

- No Basis for R & D Programs on the highest Laws, "Natural Disaster Countermeasures Act" and "Disaster Management Act", etc

Ministry-based R & D Programs without Comprehensive Coordination with separate Law

- MOE (Ministry of Environment)
  : The Development & Activation of Environment Technology Act
- MOCT (Ministry of Construction & Transportation)
  : The Construction Technology Management Act
- MOST (Ministry of Science & Technology)
  : The Basic Law of Science & Technology
- MOICE (Ministry of Commerce, Industry, and Energy)
  : The Construction of Industrial Technologies Act

NIDP's Plan for Activating R & D Budgets

R & D Projects for Disaster Prevention Technology

- **Background**

- Due to the severe atmospheric variation in the Korean Peninsula, the Natural Disaster has been occurred continuously and the damages have ranked as history breaking records every year
- Due to the complexity and variety of societal development, the causes of disasters exist everywhere in the society
- By using advanced frontier technology, upgrading of disaster management capacity is the primal need in the society

R & D Projects for Disaster Prevention Technology (Cont'd)

- **Basic Concepts & Contents of the Projects**

- Development of Core Technology for Disaster Preparedness
- Development of Applied Technology for Urgent Response
- Development of Frontier Technology for Disaster Recovery

- Plan & Scale : 3 Unit Projects, 9 Main Technologies

R & D Projects for Disaster Prevention Technology (Cont'd)

- **Objectives**

- To upgrade capacity of on-site working officials by using frontier technologies & equipments
- To maximize effectiveness of investment, various experts participate in these projects in national & international level
- To propel the National R & D Pro
  safer future in the 21st century

R & D Projects for Disaster Prevention Technology (Cont'd)

- **Main Contents of the Projects**

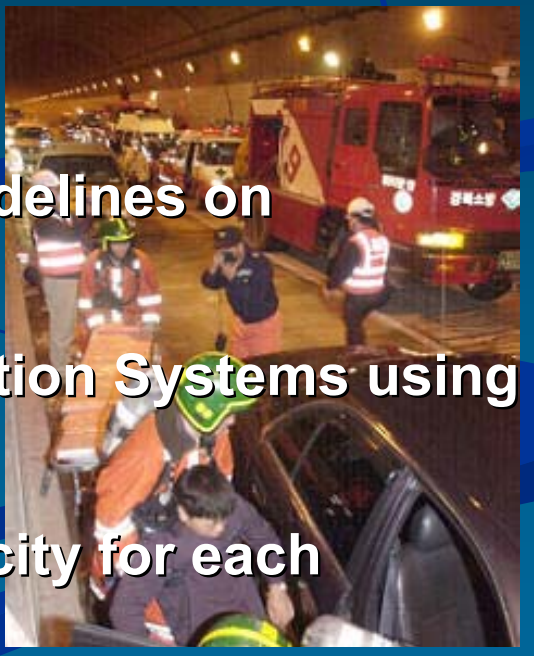
1. Development of Core Technology for Disaster Preparedness

- Goal & Contents
- Development of Assessment Techniques of Vulnerabilities on Social Infrastructures
- Development of Equipment for Disaster Preparedness
- Development of Design Criteria & Priority of each Structures for Repairing
- Construction of Data Base on the Disaster Management using advanced information systems
- Development of Computer Software (simulations, games, etc.) for

R & D Projects for Disaster Prevention Technology (Cont'd)

- **Main Contents of the Projects**

2. Development of Applied Technology for Urgent Response

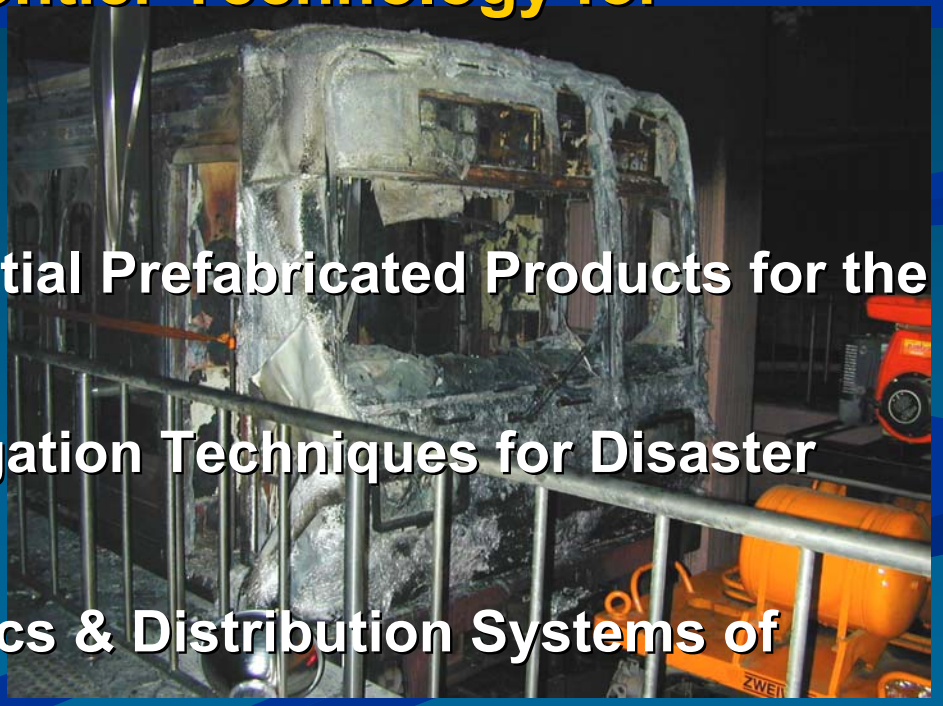


- **Goal & Contents**
- Development & Dissemination of Guidelines on responding Disasters for citizens
- Construction of Real Time dissemination Systems using Information Technologies
- Improvement of Risk Detection Capacity for each Disaster
  - Development of Sensors, Equipment, and S/W

R & D Projects for Disaster Prevention Technology (Cont'd)

- **Main Contents of the Projects**

3. Development of Frontier Technology for Disaster Recovery



- Goal & Contents
- Development of Essential Prefabricated Products for the Sufferers
- Automation of Investigation Techniques for Disaster Damages
- Introduction of Logistics & Distribution Systems of Relief Supplies

Policy Direction on the Disaster Management Syst em Intensification

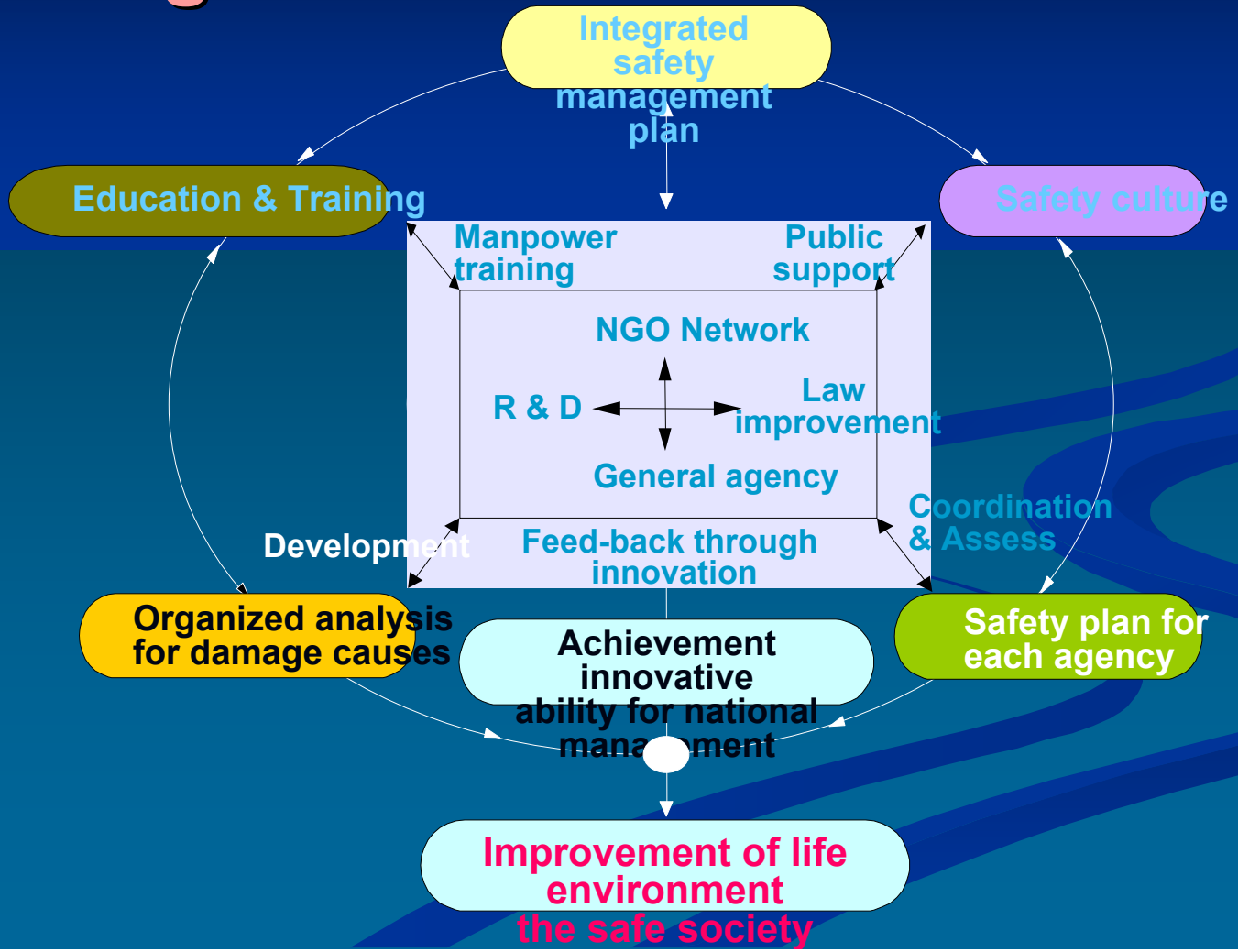
The Technology Transform the Society

- To make the Science and Technology respond quickly on versatile social needs

- Upgrade the effectiveness of R & D through continuous investments

- Change the R & D systems into the Global Networking systems

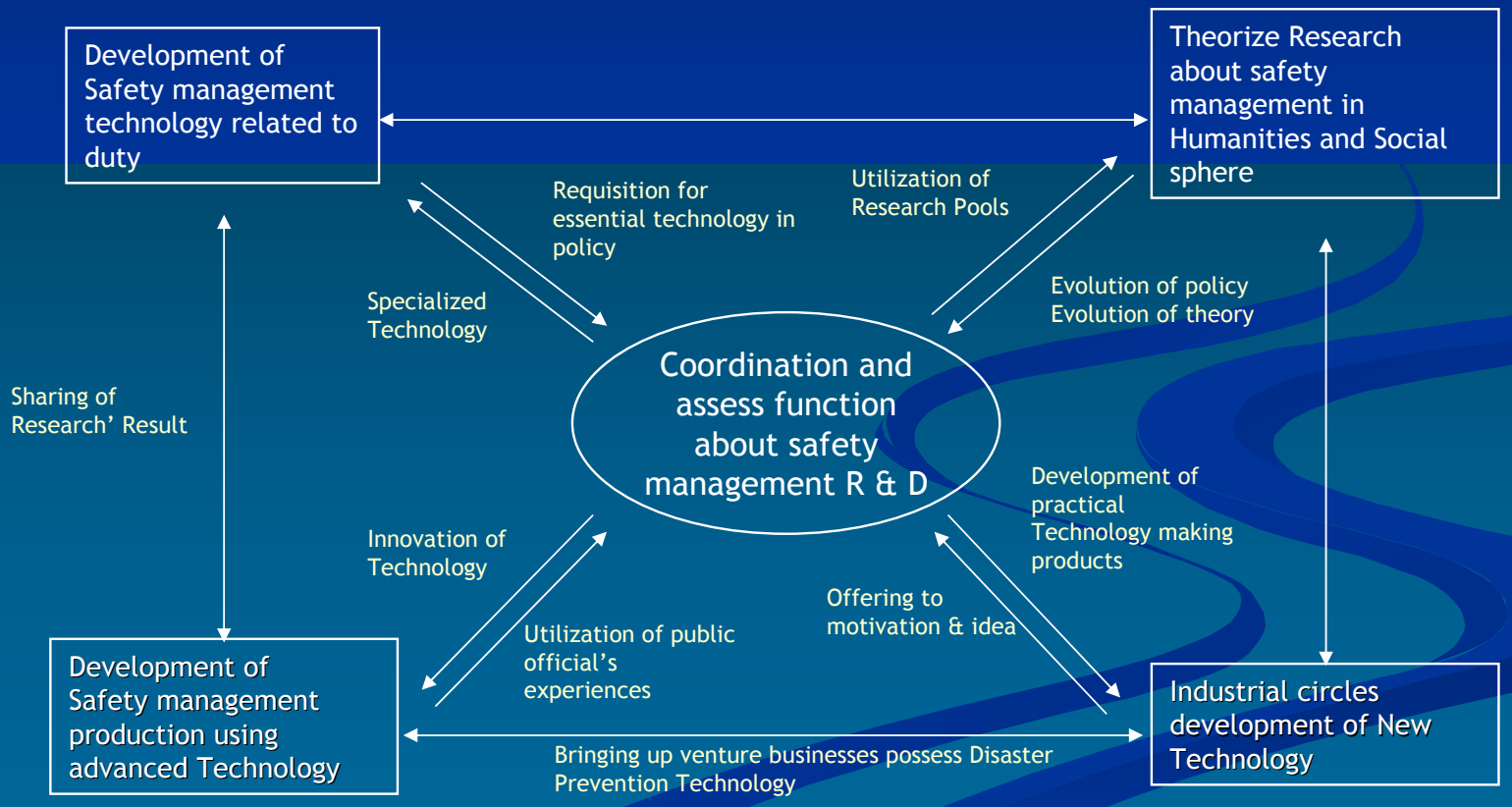
Role of R & D in the Disaster Management



Disaster Management Researches as an Object-oriented & Interdisciplinary Study

- The Establishment of the Disaster Management Systems using Information & Communication Technologies
- The Improvement of the Man power capacity by the Advanced Equipment Developments
- The Total Participation & Response Systems on the Cultural Basis

Foundation of Establishment for National Disaster Innovative system in the 21st century



The Intensification of Networking between Related Global Research Institutes

- Disaster Management needs interdisciplinary approaches

- Each Research Institute has its own special characteristics

- Disaster affects whole social environment when it happens

➔ Need for the Cooperation and Exchange of

The Introduction of the Legal Basis for R & D

- The Basic Law of Science & Technology (MOST): 2001
- The Disaster & Safety Management Act (MOGAHA): 2003

The Establishment of Basis on the Experts

- R & D is the most fundamental basis in the Disaster Management
- The Disaster &Safety Management Act (MOGAHA): 2003
- It is necessary to strengthen NIDP's functions, structure, and budgets

Thank you