

Translating Locally-led Resilience into Action
in the Age of Complex Risk and Digital Transformation

복합위험과 디지털 전환시대, 지역주도 복원력의 실행

The 5th



International Disaster Resilience
Leaders Forum **Incheon 2026**

인천 국제재난복원력 지도자 포럼



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송도컨벤시아 그랜드볼룸 A
Songdo Covensia, Grand Ballroom A

From National R&D to Community-Based Smart Disaster Management

Japan's SIP-Bosai : Development of a Resilient Smart
Network System against Natural Disasters

TAGUCHI, Yasushi

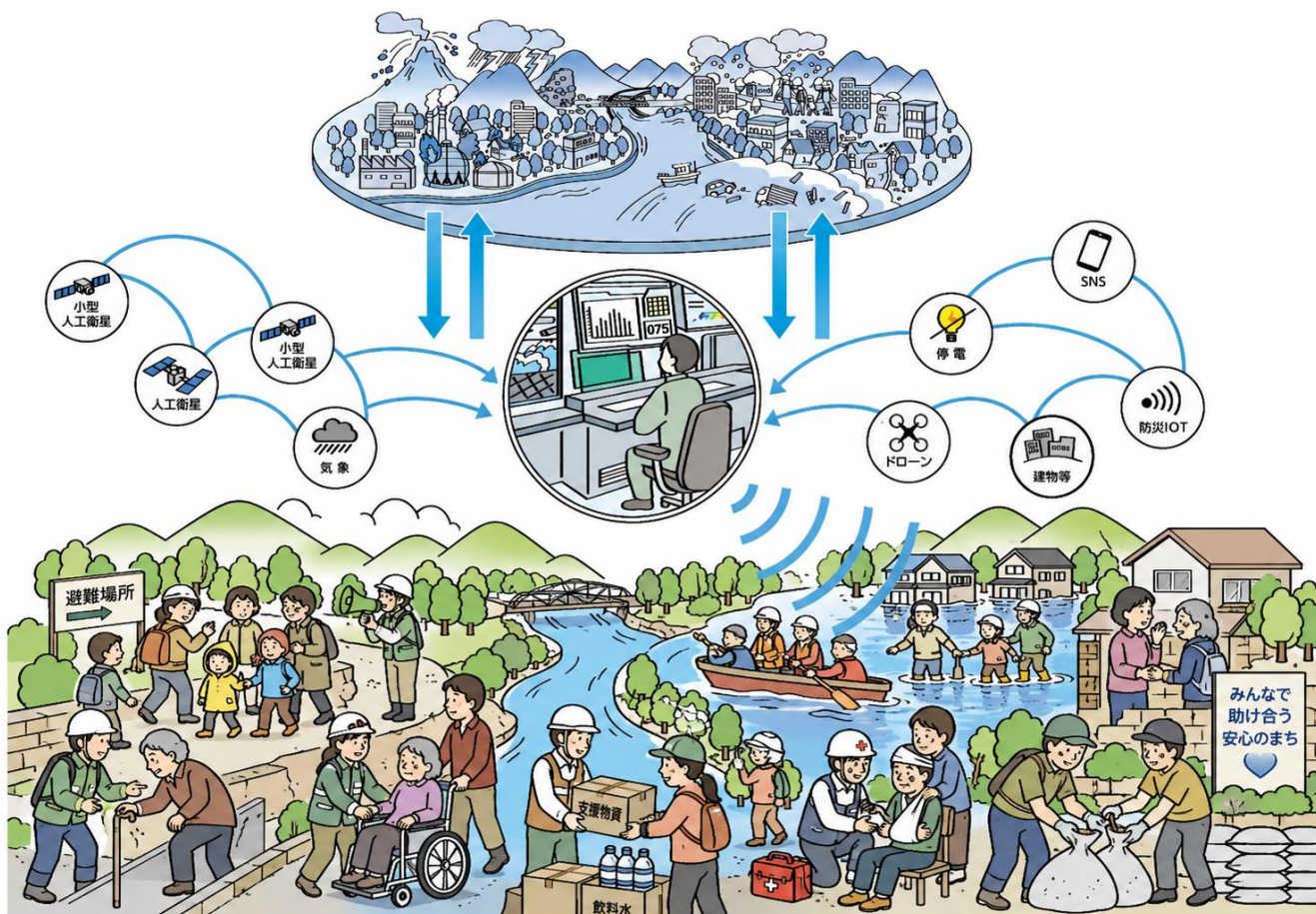
Executive Director,

Promotion Office of SIP for Disaster Risk Reduction, Japan

Session 5 | IDRLF Incheon 2026

How technology empowers communities ?

We are implementing the “SIP-Bosai” not merely as a research and development program, but as a roadmap for building a comprehensive, community-rooted smart disaster management system.



Technology
⇒ Practical Local Operation

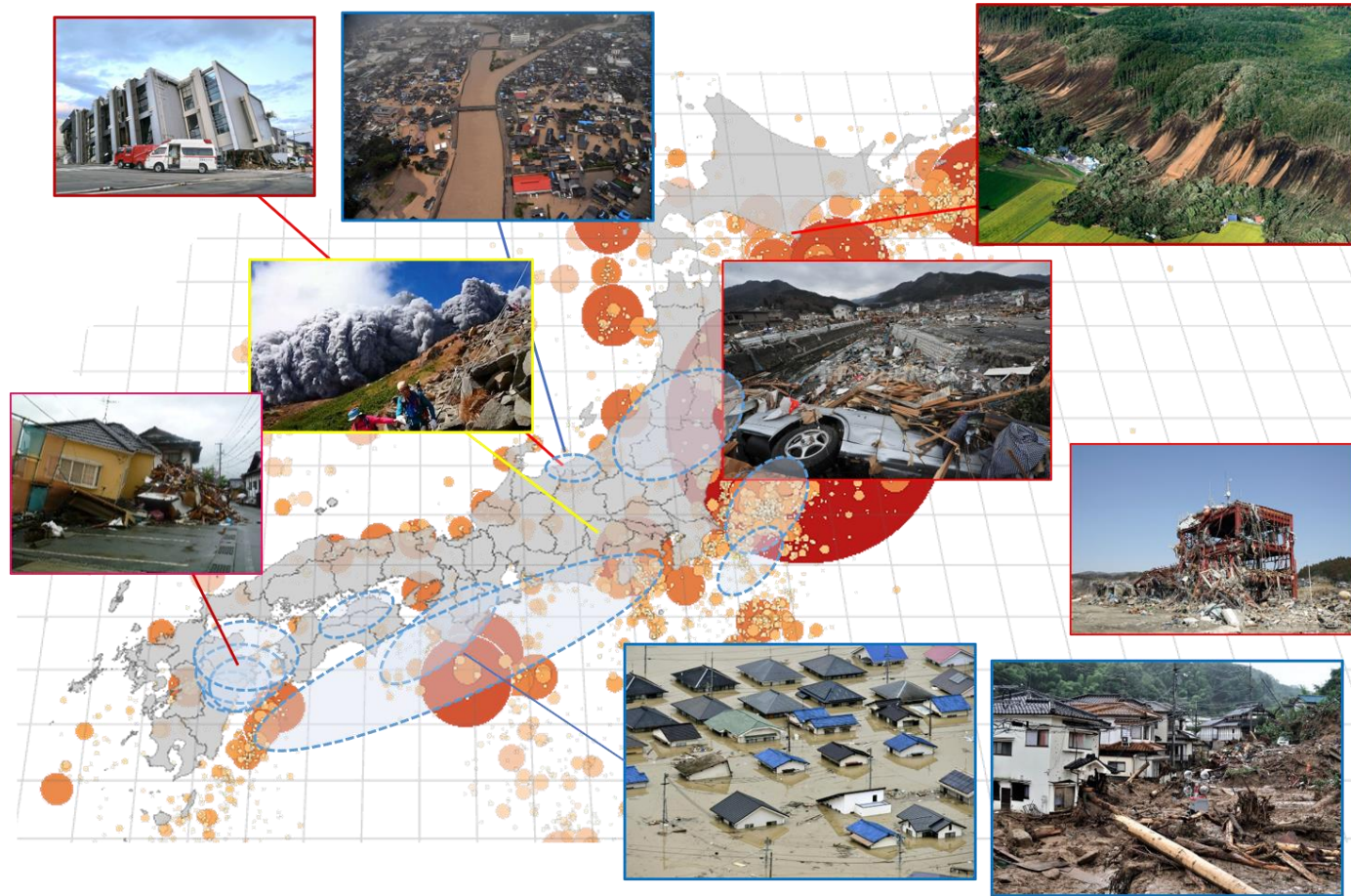
Warning
⇒ Risk Communication and Action

Segmented Response
⇒ Collaboration among Government,
Citizens and Private sector

Background :Intensifying Natural Disasters in Japan

Complex risk must be converted into local decisions and action

Japan's challenge is increasingly systemic:



- ◆ Earthquakes, tsunamis, floods, typhoons, landslides and volcanic hazards occur across the country
- ◆ Impacts cascade across infrastructure, logistics, care services and local livelihoods
- ◆ Municipal staff and communities must make decisions with limited time and incomplete information
- ◆ The critical gap is not only data collection: it is turning risk information into shared action

Risk information → decision → community action

“SIP” as a Social Implementation Program

Toward the Social Implementation of Cutting-Edge Technologies

Society 5.0 defines the future society;
SIP works backward to programs, implementation
and community action

Society 5.0: Cabinet Office vision (2016)

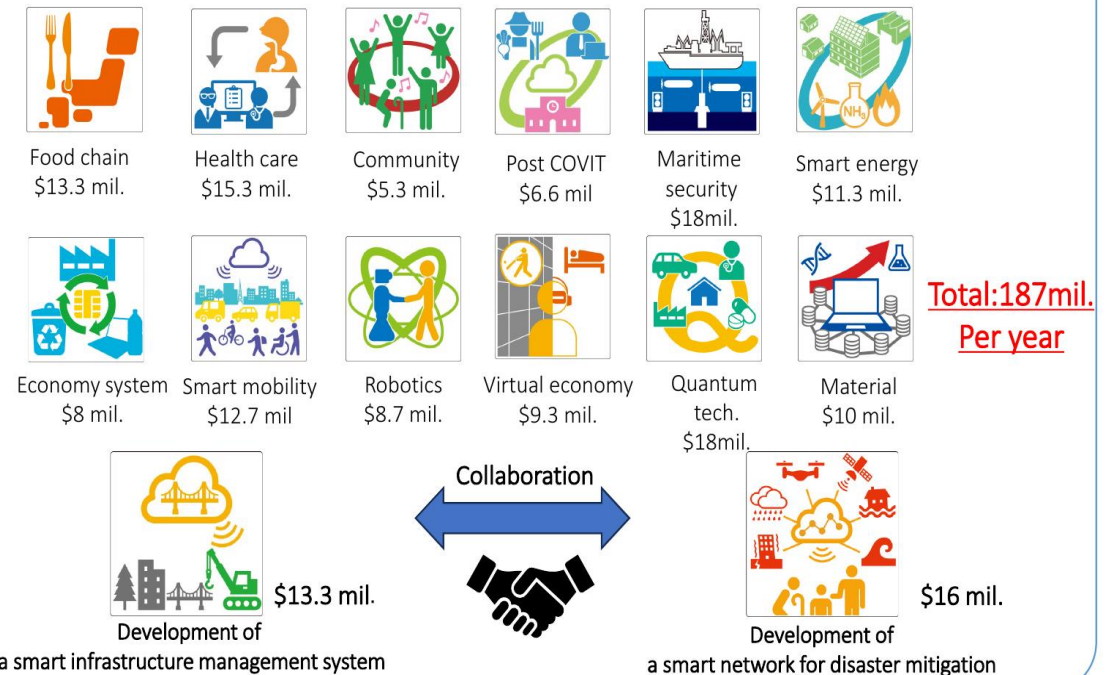
Human-centered society that balances economic advancement and solving social issues through a highly integrated system of cyberspace and physical space

Back casting

- Address critical societal issues through science and technology
- Advance industry–academia–government partnerships
Connect R&D to systems that municipalities, responders, companies and communities can actually use

The Overview of SIP (SIP: Cross-ministerial Strategic Innovation Program)

SIP Phase 3 (2023-2027)



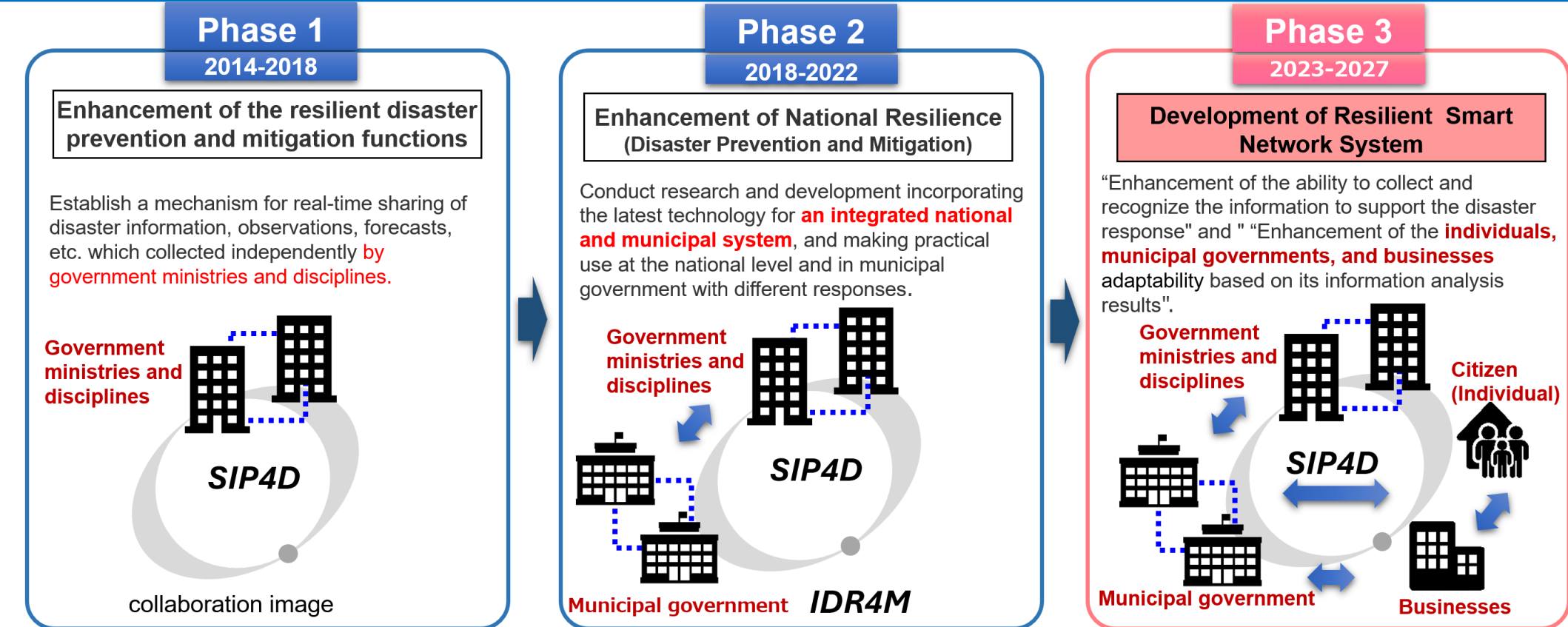
\$1=¥150

“SIP-Bosai” Development : from Sharing to Adaptive Action

The target scope has expanded from institutions to municipalities, businesses and individuals

■ Future Vision of Disaster Prevention and Mitigation in Society 5.0

As disasters become more frequent and severe due to climate change and other factors, accurate and detailed prediction, collection, and sharing of disaster information will be essential for the future of disaster management. Tailored to regional characteristics throughout the disaster cycle, this comprehensive, data-driven approach will enable individualized disaster prevention and evacuation support, prompt governmental rescue, supply, and coordinated business responses.



Change in targets scopes from Phase 1 to Phase 3

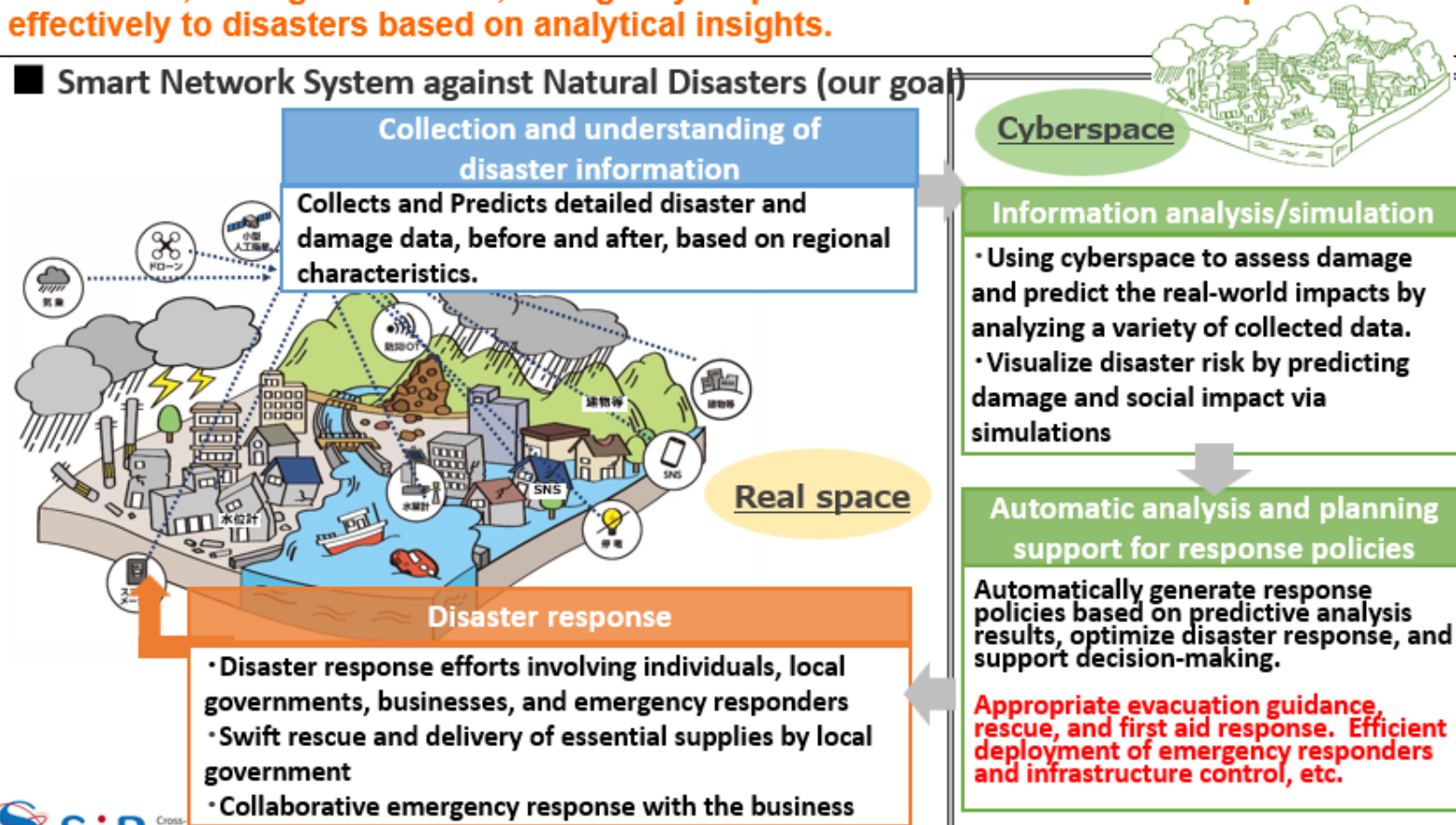
The Outline of the Project : Cyber-Physical Loop

Observe in real space, analyze in cyberspace, act in communities

■ Outline

By seamlessly integrating real space and cyberspace, we aim to develop **advanced technology for collecting and understanding disaster information**, thereby **enabling individuals, local governments, emergency responders and businesses to respond more effectively to disasters based on analytical insights**.

■ Smart Network System against Natural Disasters (our goal)



How the Smart Network works

- ◆ Collect and predict detailed disaster and damage data before, during and after events
- ◆ Assess damage and social impacts through simulations
- ◆ Automatically support response-policy planning and decision-making
- ◆ Enable evacuation guidance, rescue, first aid, infrastructure control and business collaboration

Smart means usable under real disaster conditions

DIGITAL TWIN × GENERATIVE AI

A future direction: from simulation to trusted human-in-the-loop decision support

Digital Twin provides the operational backbone

1. Real-time Data Acquisition from Physical Space



2. Visualize disaster risk by predicting damage and social impact through various disaster simulations.

Generative AI can strengthen the Digital Twin

- integrate real-time data
- → improve prediction and simulation
- → support faster human decisions.

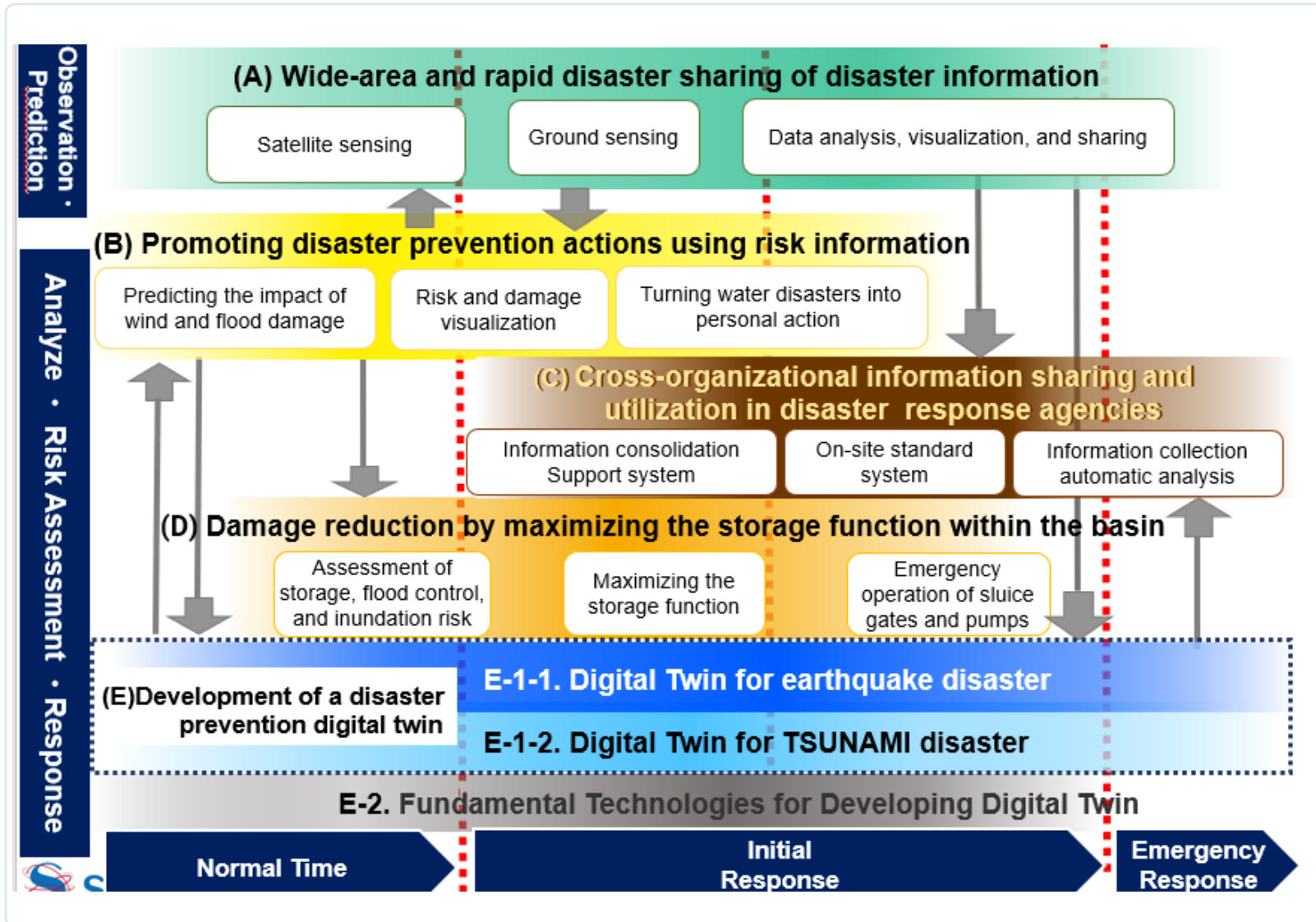
Key Directions for Future R&D

3. Provide Information that contributes to disaster response optimization and decision-making support

based on the results of forecast analysis.

SYSTEM DESIGN : Five Connected Subprojects

End-to-end coverage across observation, analysis, response and learning



Subproject A–E are not isolated tools

A: wide-area rapid sharing of disaster information

B: risk information for community and business action

C: cross-organizational information sharing among response agencies

D: basin-scale damage reduction

E: disaster prevention digital twins

COMMUNITY-BASED SMART MANAGEMENT

Turning risk information into learning, preparedness and evacuation action

B: Promoting disaster prevention actions using risk information

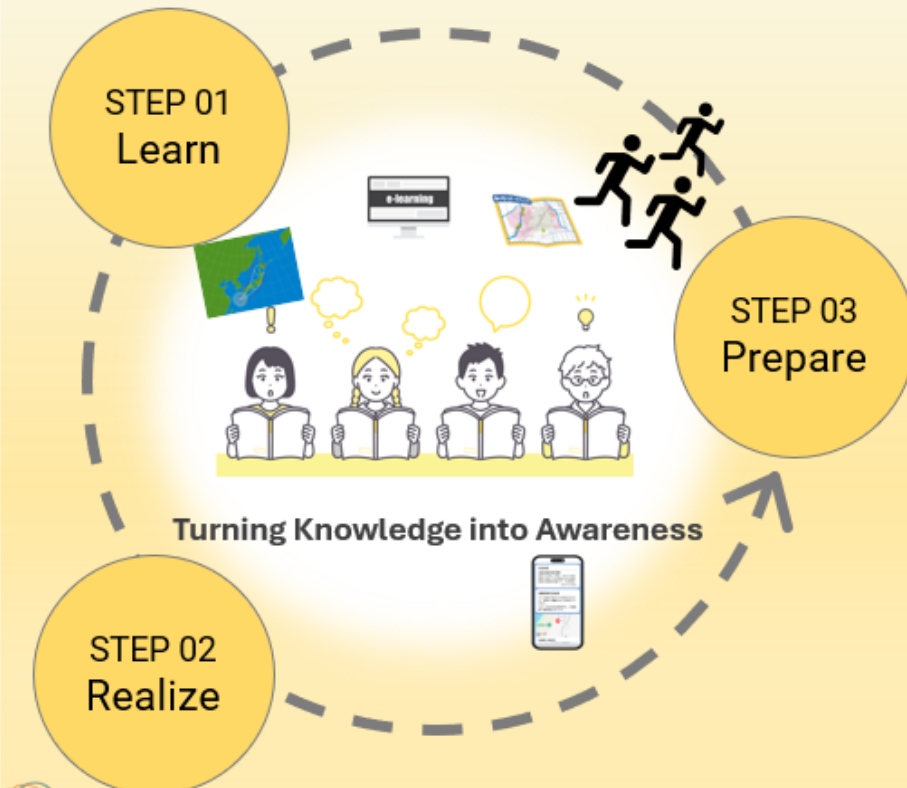
To empower communities and businesses in effective disaster preparedness and response by delivering training and timely risk communication.

◆ Overview ◆

Provide clear, timely evacuation guidance to help residents and businesses act safely and with confidence.

Disaster risks are visualized using rainfall, river, and past-impact data, incorporating updated flood and typhoon risks under climate change.

Through personalized flood simulations and community-designed disaster drills, we aim to improve real-world evacuation behavior.



Subproject B ⇒ Regional Community

- Clear, timely evacuation guidance for residents and businesses
- Risk visualization using rainfall, river and past-impact data
- Personalized flood simulations and community-designed drills
- Knowledge → awareness → preparedness → real behavior change

This is where advanced science meets residents' daily decisions.

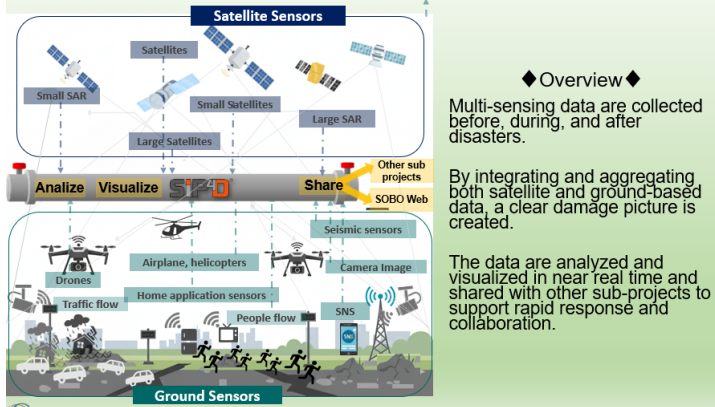
OPERATING THE SYSTEM : Lessons and Enabling Factors

A practical system must work across organizations under stress

Subproject A

A: Wide-area and rapid sharing of disaster information

Gathering information from all available sources and share it instantly.



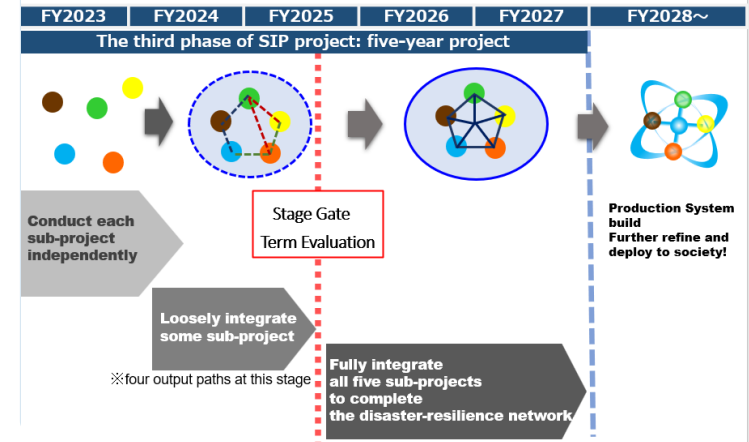
Subproject C

C: Cross-organizational information sharing and utilization in disaster response agencies

To strengthen responders' ability—such as firefighters, police, and the Self-Defense Forces—to grasp situations quickly, decide fast, and coordinate effectively.



Implementation Roadmap



Key lessons for community-based operation

- ◆ Use simple tools and common standards so local actors can share information quickly
- ◆ Design training and drills together with municipalities, residents, businesses and responders
- ◆ Maintain human oversight, explainability, audit logs, privacy protection and public trust
- ◆ Move from prototypes to production systems and sustainable local operation

SIP Phase 3 roadmap

FY2023–2027: integrate the five subprojects
FY2028 onward: build, refine and deploy production systems

Technology + governance + training + local ownership

Getting Together on the Road to APMCDRR

- SIP's international initiative for
cross-ministerial smart bosai collaboration-

Invitation: Please Join "APSBC" as a partner, speaker, or co-creator.

Contact : sip3_resilience@bosai.go.jp

Asia-Pacific Smart Bosai Conference (APSBC)

- ◆ Organized under SIP as part of the Resilient Smart Network System project.
- ◆ A platform for international cooperation and practical disaster risk reduction.
- ◆ Open dialogue among governments, international organizations, researchers and partner countries.

1st APSBC Tokyo, July 1–2, 2026 ~110 participants from 6+ countries/organizations

2nd APSBC Tokyo, Dec. 1–2, 2026 Cross-ministerial collaboration and implementation

APSTCDRR TS10 Smart Bosai Network — Cross-Ministerial Digital Solutions
(3rd APSBC) Sendai, March 9-11, 2027

4th APSBC Tokyo, around July 1-2, 2027 Sustaining partner dialogue toward APMCDRR

APMCDRR Partner Event Sendai, autumn 2027 Partner event at the ministerial conference

*Thank you for
your attention !*

