How Can Science and Technology Contribute to the Reduction of Poverty and Inequality

Nation's Synthesis on Disaster Risk Reduction

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Council Member, Science Council of Japan Cabinet Office of Japan
Professor Emeritus, the University of Tokyo
Chair, River Council of Japan

United Nations Educational, Scientific and Cultural Organization
International Centre for Water Hazard and Risk Management under the auspices of UNESCO
Public Works Research Institute, National Research and Development Agency, Japan

Global Forum on Science & Technology for Disaster Resilience 2017, Tokyo

To pursue steady implementation of the four priorities for action of the Sendai Framework.

Global Forum on S & T for Disaster Resilience 2017

Outputs

Tokyo Statement 2017

Science and technology commits -Actions for a disaster-resilient world (*continued*)

To pursue steady implementation of these actions, we need to invite all stakeholders to develop and implement the following documents as a first step:

1) **Guidelines for strengthening national platforms for DRR and coordination mechanisms through enhanced contribution of science and technology.**

2) **Periodic synthesis reports on the state of science and technology for reducing disaster risk.**

How to implement?

Nation's Synthesis on Disaster Risk Reduction Supported by Science and Technology

What is "Nation's Synthesis"?

The national platform should

- develop a mechanism that allows all stakeholders to share information on science and technology for DRR in its own language.
- review the status and issues of the current DRR efforts that it has implemented based on scientific knowledge.
- discuss how DRR should be carried out for the country and design practical measures to be implemented from a holistic viewpoint.

This series of actions that should be taken by the national platform of each country

⬇

"Nation's Synthesis"

Proactive Planning and Action

Self-help and Mutual Support

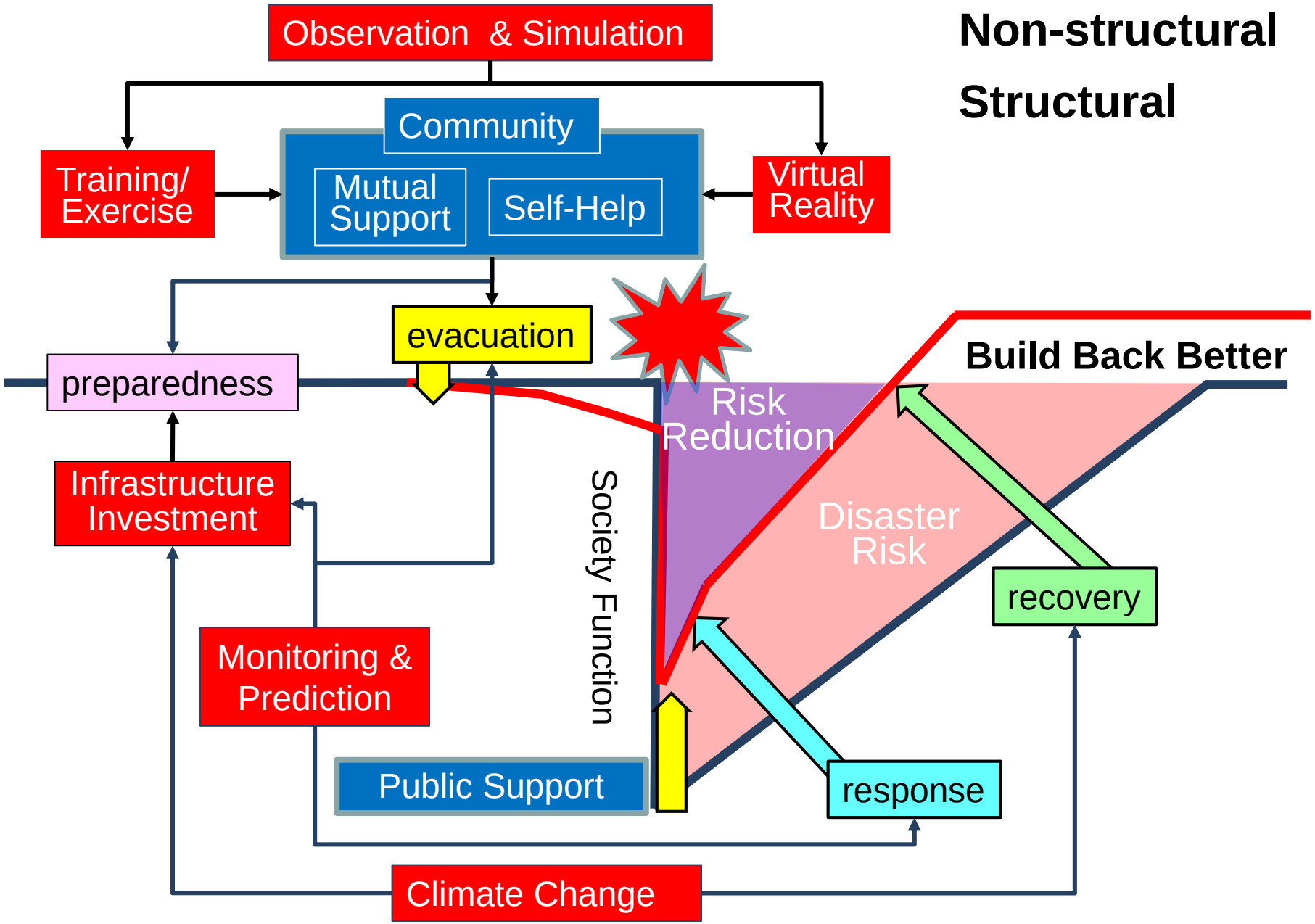
Multi-stakeholder Coordination

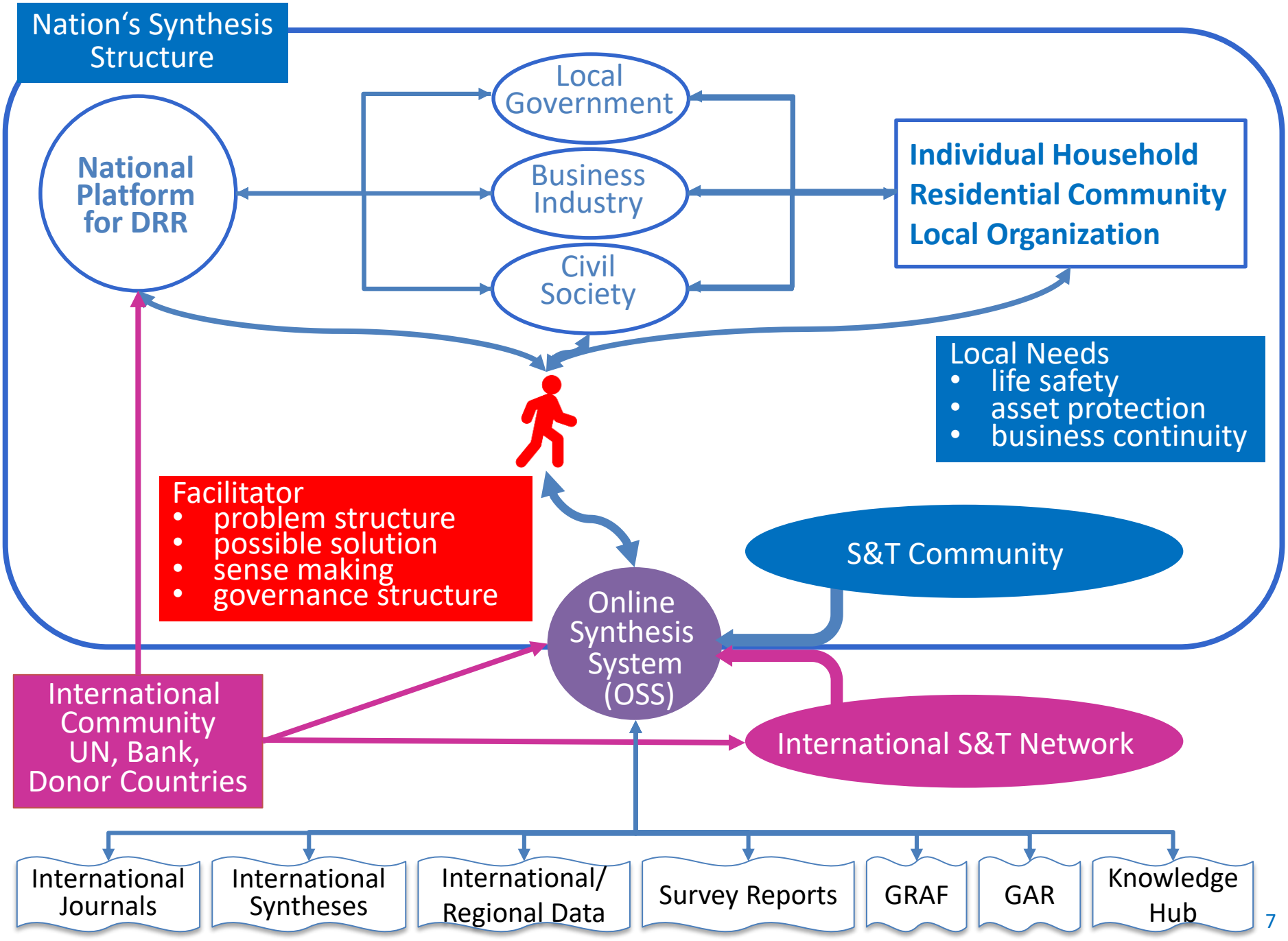
Public Support

Infrastructure

G. Jellinek: 『Allgemeine Staatslehre』,1900

Our Challenges

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Business Industry
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Individual Household
Residential Community
Local Organization
Local Needs
• life safety
• asset protection
• business continuity
Facilitator
• problem structure
• possible solution
• sense making
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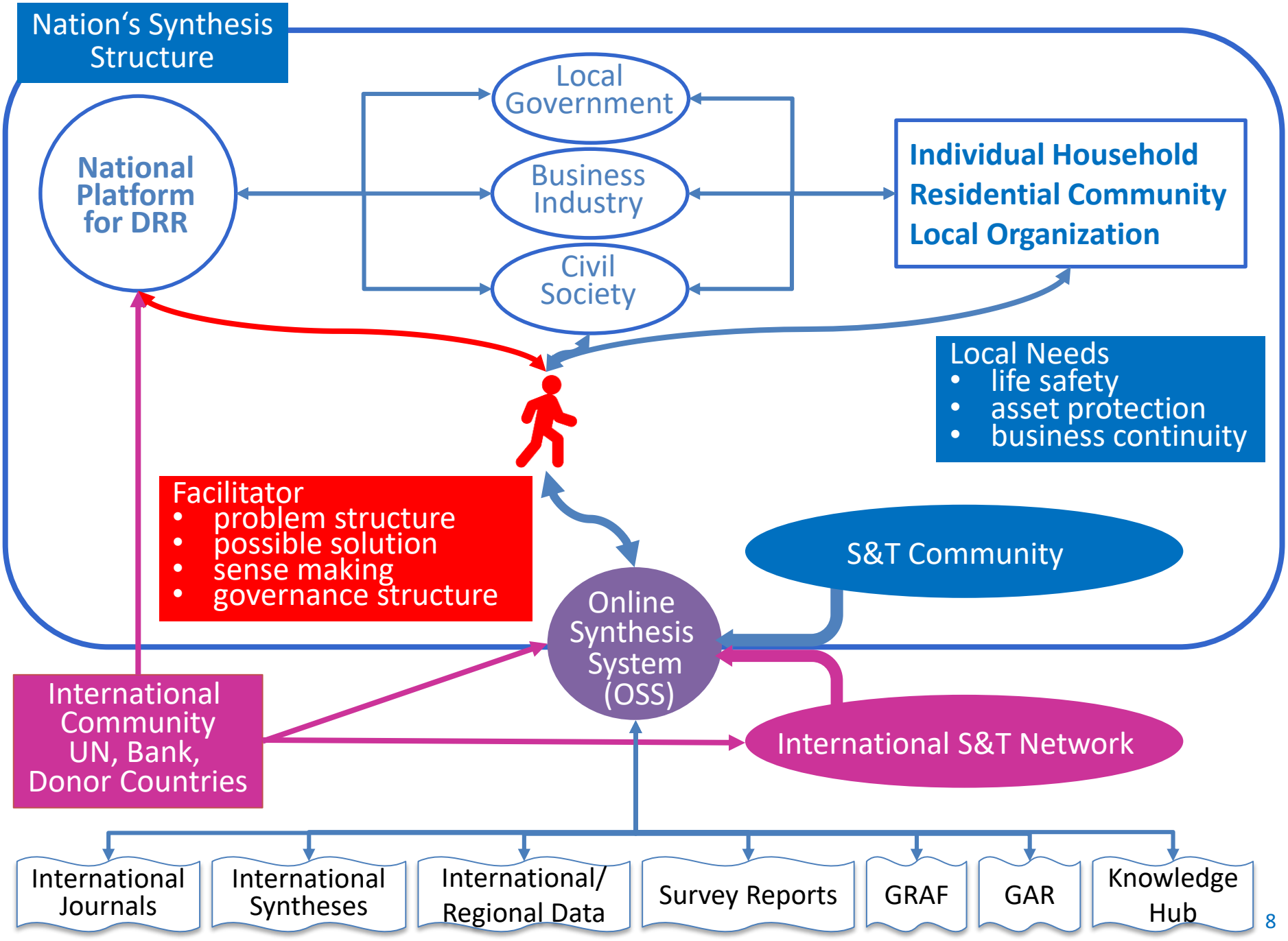
Knowledge Hub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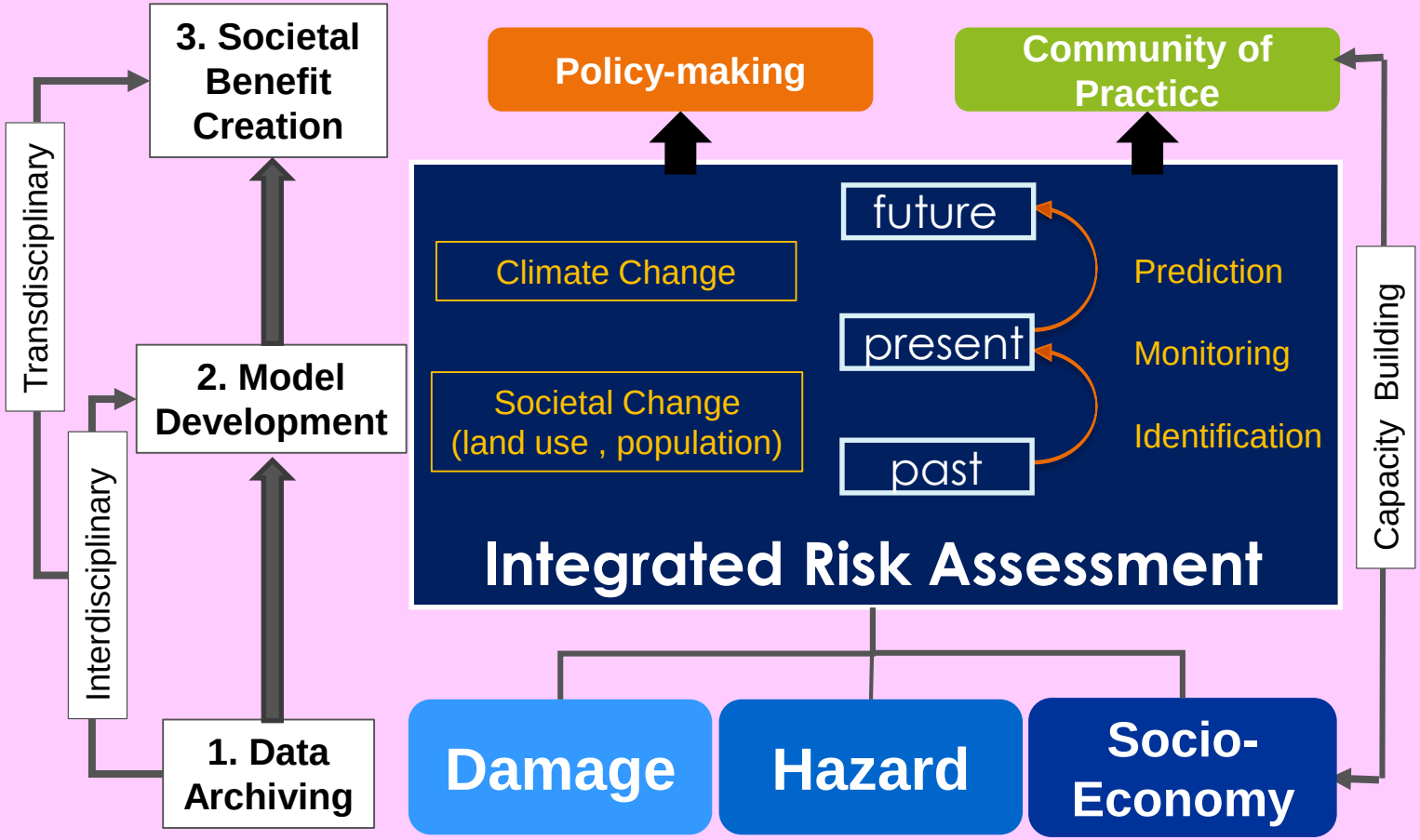
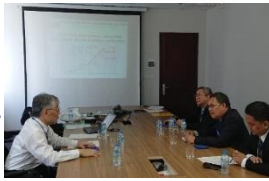
MULTI-STAKEHOLDER COORDINATION



International Cooperation

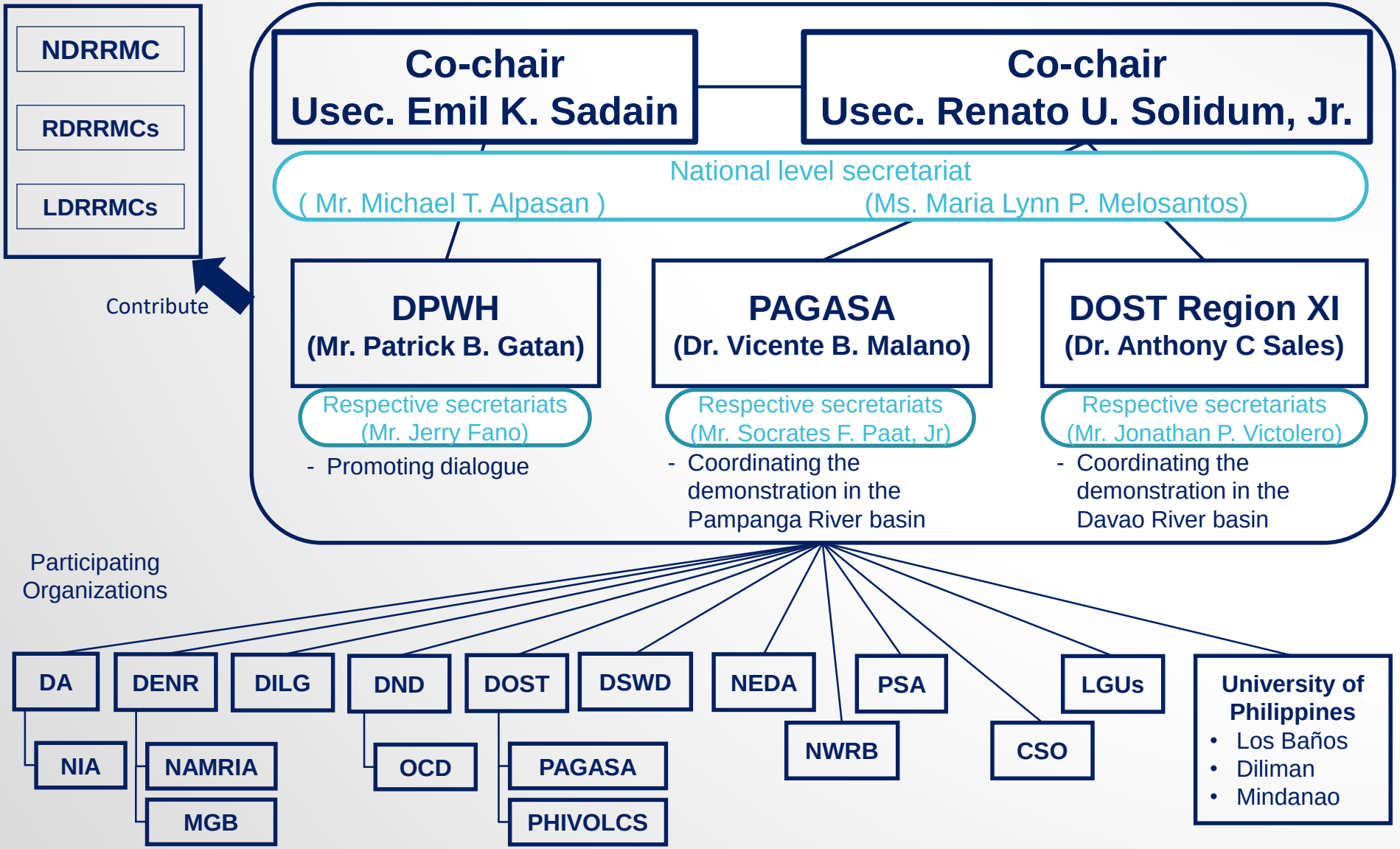
PROGRESS OF PLATFORM ACTIVITIES

- **1st Plenary Meeting** 13/3/2017, Metro Manila — Concept sharing, Platform formulation
- **2nd Plenary Meeting** 15/6/2017, Metro Manila — Platform framework, Data sharing guideline, Data list creation
- **Representative Meeting** (DPWH, DOST, PAGASA) 18/ — Data list confirmation



- **Individual Meeting** (DPWH, PAGASA) 7-9/2/2018, Metro Manila — Secretariat assignment, Data collection
- **Individual Meeting** (PAGASA, DOST, DPWH) 12-13/3/2018, Metro Manila — Secretariat assignment, HLPW outcome document
- **Stakeholders Meeting** 18/5/2018, Davao — Data upload
- **11th GEOSS Symposium** 24-26/10/2018, Kyoto — Regional coordination
- **3rd Plenary Meeting** 7/2/2019, Metro Manila

PLATFORM ON WATER RESILIENCE AND DISASTERS



DATA LIST

Damage

Data	Source of information
Casualties & missing person	OCD
Num. of affected people	OCD
Agricultural damage	DA
Housing damage	OCD
Damage to critical infrastructure	DPWH, LGU
Direct economic loss other than agricultural loss	LGU NEDA

Hazard

Data	Source of information
DEM (LiDAR)	UP Mindanao
DEM (ifSAR)	NAMRIA
Hydromet data	PAGASA, ASTI, DREAM
Inundation depth (LiDAR)	UP Diliman, UP Mindanao
Inundation depth (interview)	PAGASA
Rainfall	PAGASA
River flow	DPWH, UP Mindanao
River cross section	DPWH, UP Mindanao
Tidal level	NAMRIA

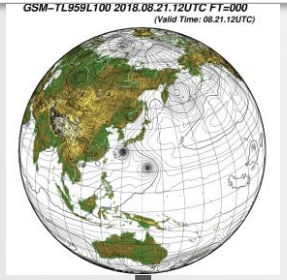
Socio-economic

Data	Source of information
Land use	LGU, DOST
Agriculture	PSA, DA
Population	PSA
Infrastructure	DPWH/LGU
Industry	DTI
Commerce	DTI
Drainage facility	DPWH/LGU
Information	PSA, NEDA
Sectoral Regional GDP	PSA
Sectoral employed population	PSA
Tax revenue	BIR
Land price	City Assessors Office

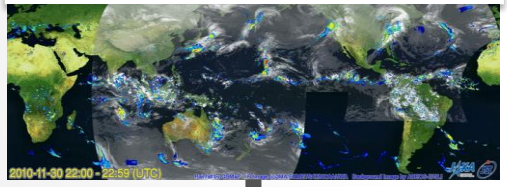
Collected

REALTIME SYSTEM DESIGN

Numerical Weather Prediction

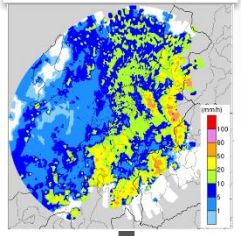


Satellite Rainfall
GSMaP

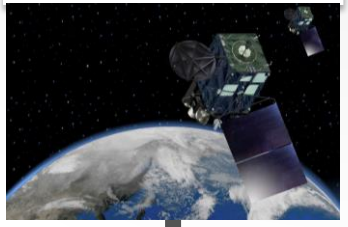


In-situ
Gauge

In-situ
Radar



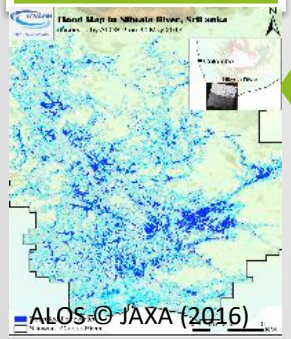
Cloud Image
HIMAWARI-8



Dam Operation

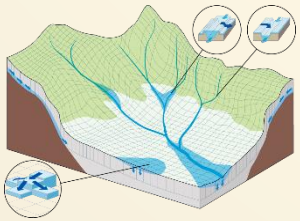
DIAS
Data Integration & Analysis System

Satellite Image
ALOS-2



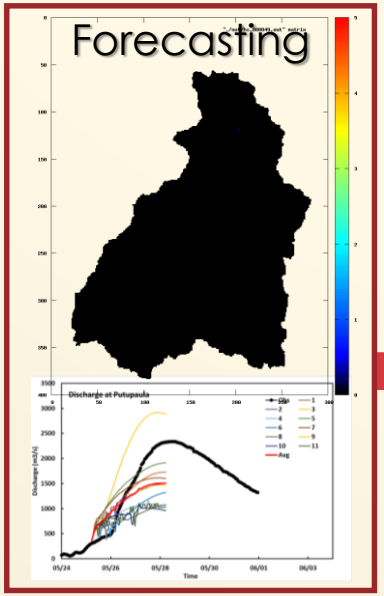
Monitoring

RRI Model Simulation



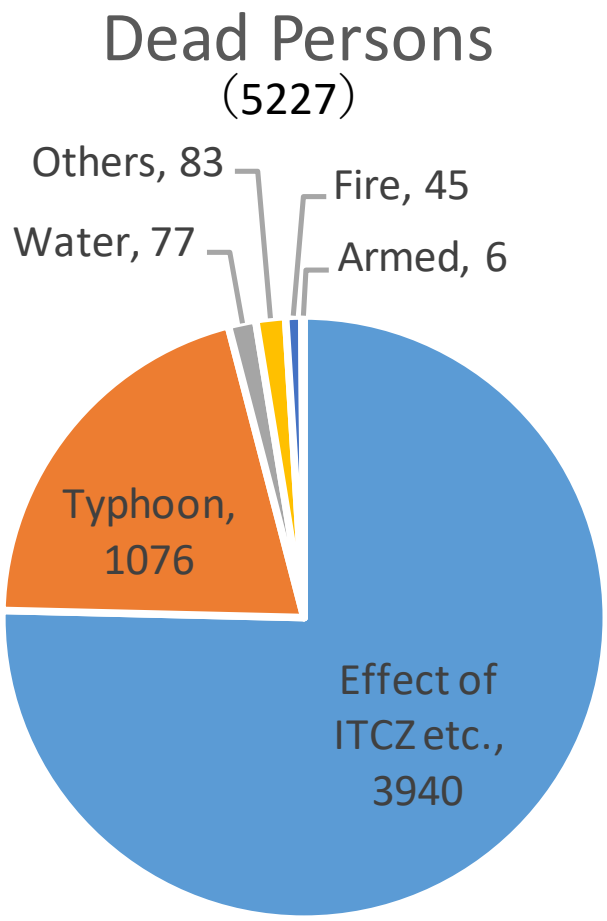
- Inundation extent
- Inundation depth
- River discharge

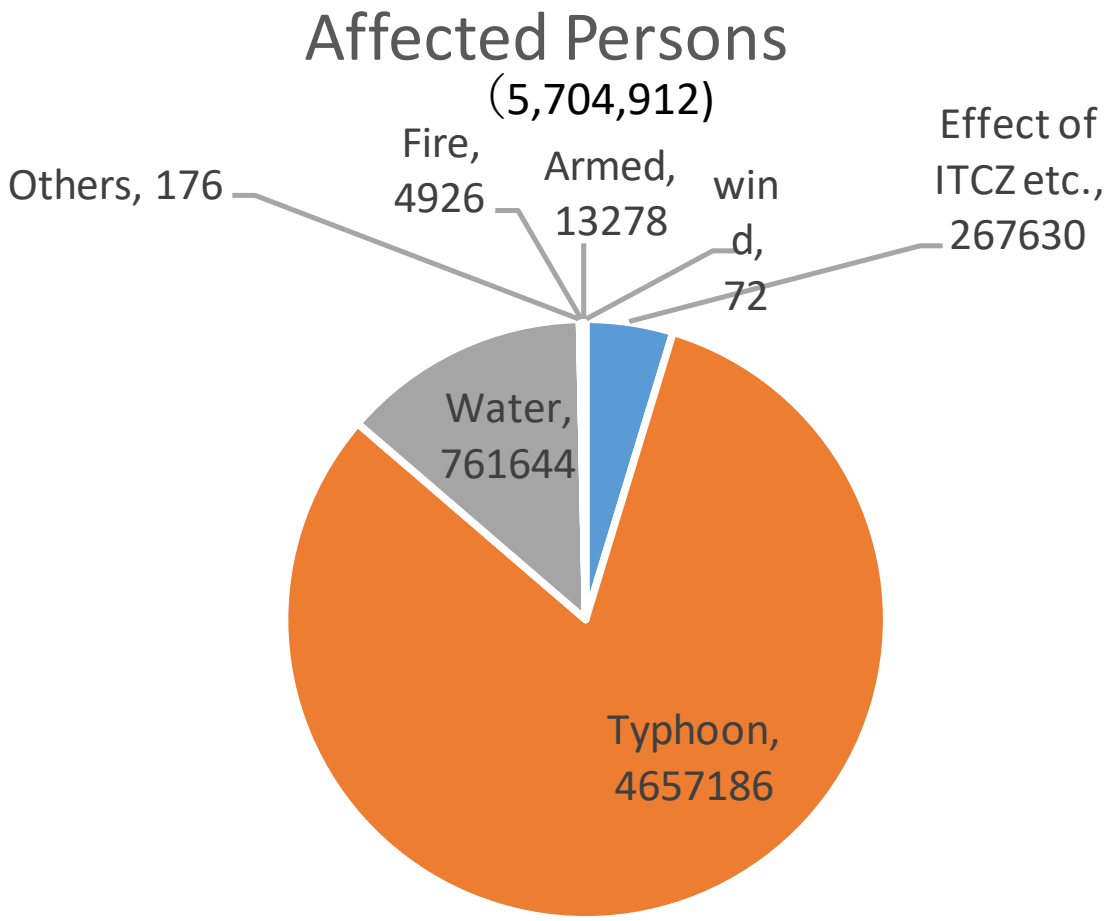
Forecasting



Flood prevention & evacuation

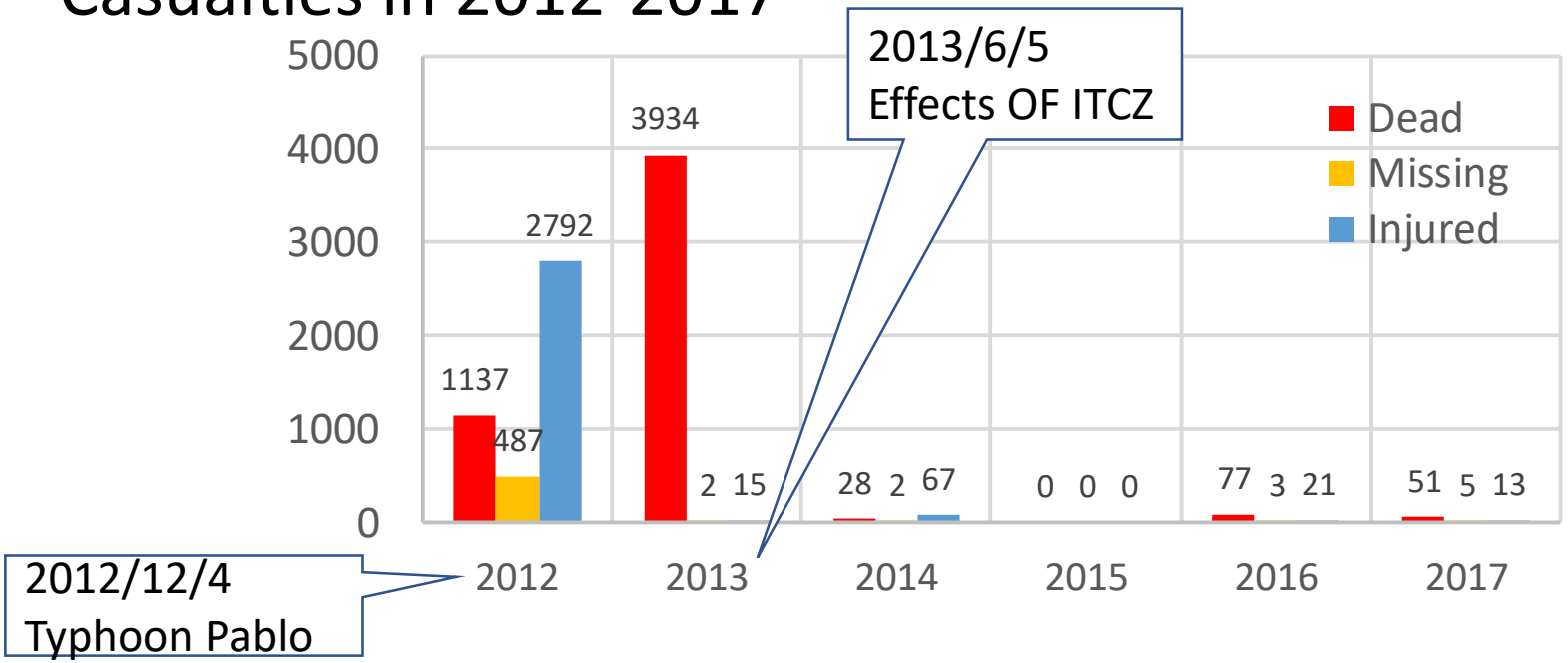
Casualties in 2012-2017



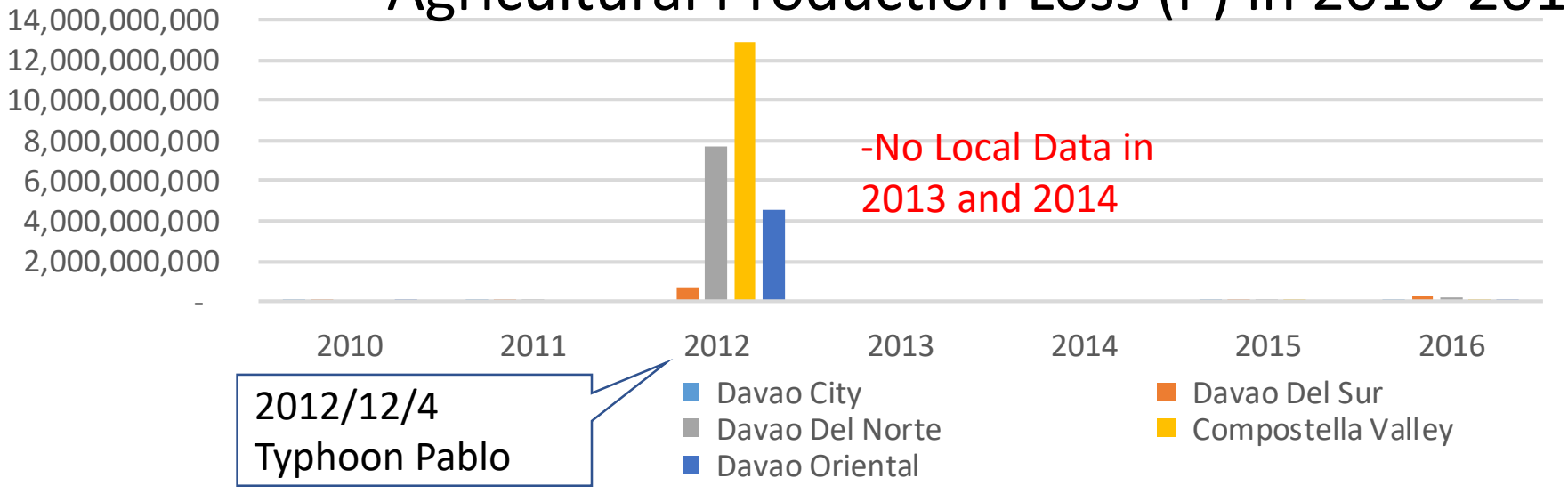


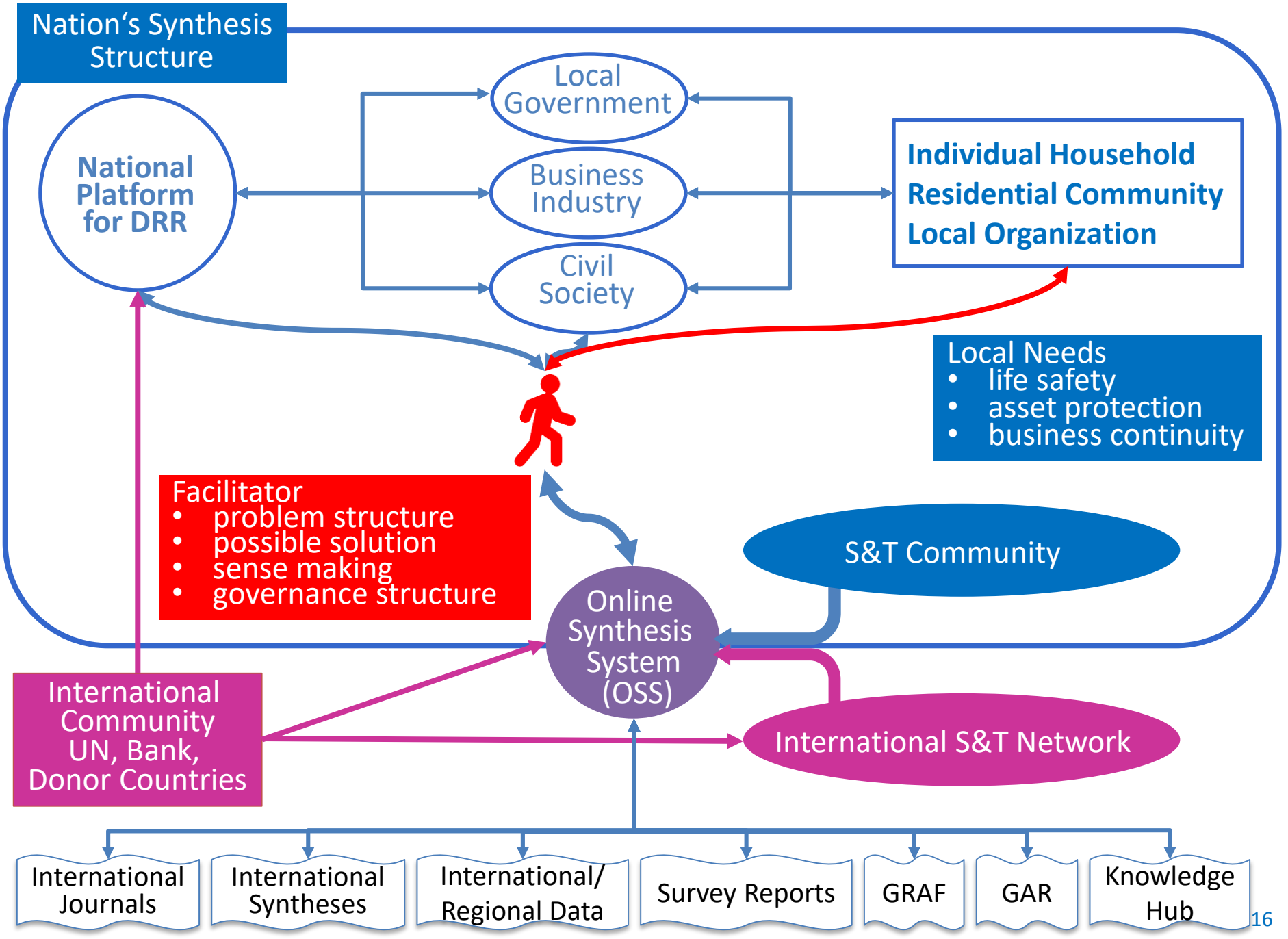
Effect of ITCZ etc.: Effect of ITCZ(Intertropical Convergence Zone),LPA, southwest
Water: Flood, Flooding, Flash Flood, Landslide, Strong waves, Drowning, Sea swell

Casualties in 2012-2017



Agricultural Production Loss (P) in 2010-2016

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Proposal of Evidence-based Contingency Planning

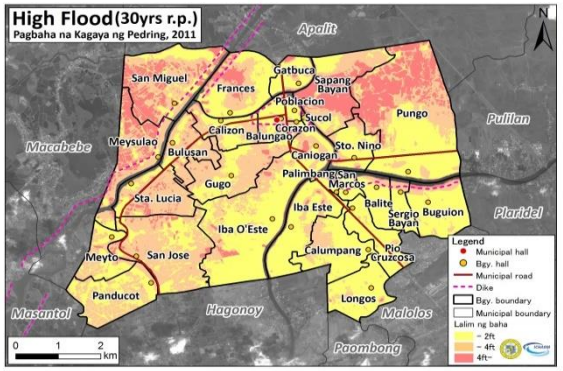
(Formulation of Plan)

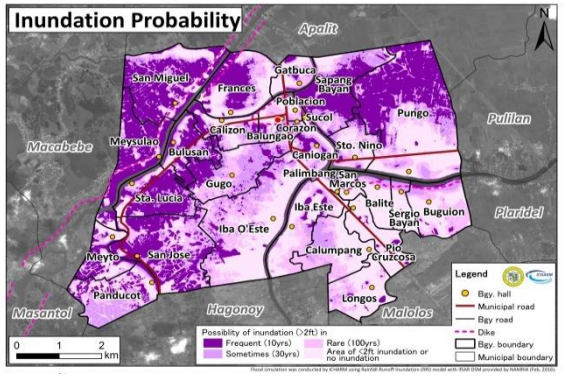
Step 1: Understanding current conditions

Step 2: Identifying risk

Step 3: Analyzing impact

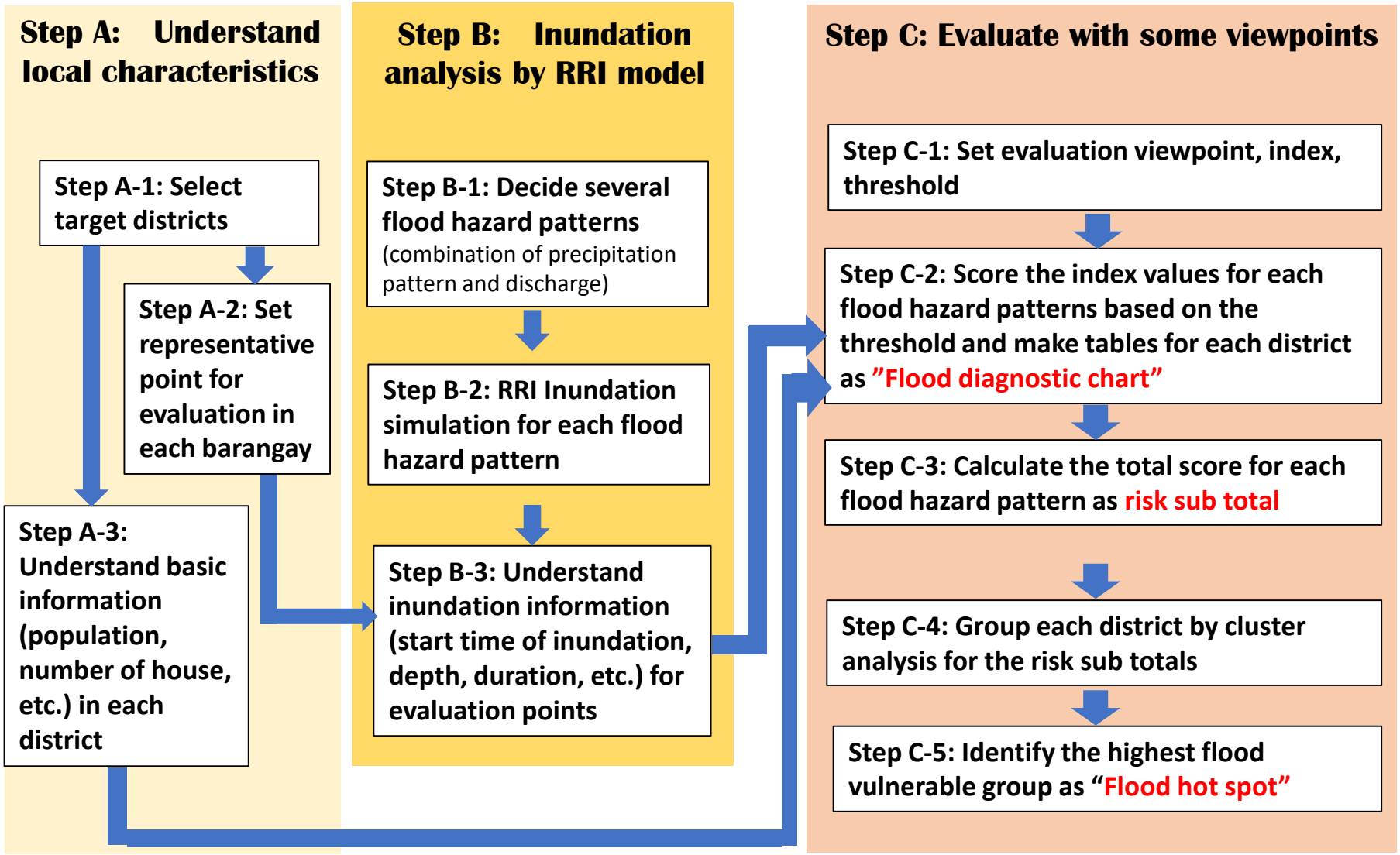
(Documentation and Sharing)





Flood Risk Diagnosis Method

A method of flood risk diagnosis developed in Aga Town in Niigata was applied to Calumpit.

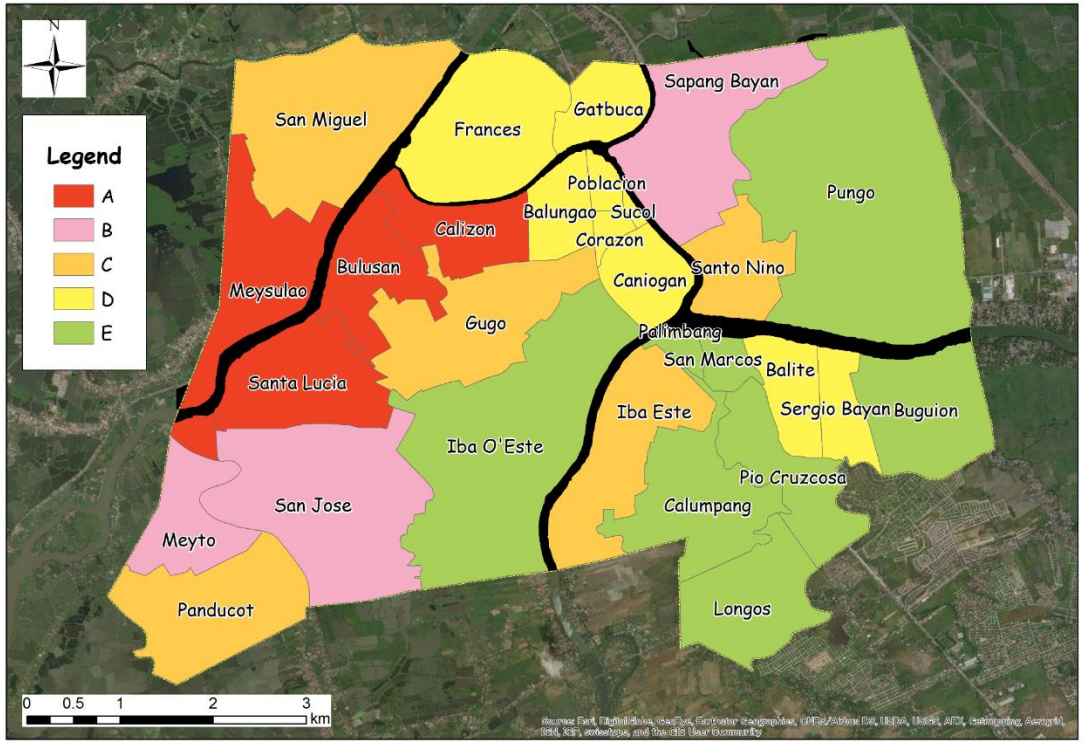


Step C-3: Calculate total score, Step C-5: Identify flood hot spot

Total Score (A:5, B:4, C:3, D:2, E:1)

ID	Location	Sub-total								Total	
		100yr		50yr		30yr		10yr			
01	Sapang Bayan	A	32	A	31	B	29	C	24	B	116
02	Gatbuca	B	25	C	24	C	23	D	16	D	88
03	Frances	B	28	C	24	C	23	C	20	D	95
04	Meysulao	A	31	A	32	A	30	B	28	A	121
05	San Miguel	B	29	B	28	B	25	C	20	C	102
06	Sto. Nino	B	29	B	29	B	27	C	24	C	109
07	Calizon	A	34	A	31	B	29	B	28	A	122
08	Caniogan	B	27	C	23	C	20	D	17	D	87
09	Bulusan	A	33	A	33	A	31	A	30	A	127
10	Sta. Lucia	A	34	A	31	A	31	B	27	A	123
11	Meyto	A	31	B	29	B	28	B	27	B	115
12	Panducot	B	29	B	27	B	25	C	21	C	102
13	San Jose	A	32	B	28	B	28	B	26	B	114
14	Gugo	A	30	B	28	C	23	C	20	C	101
15	Pungo	C	20	D	18	D	18	E	12	E	68
16	Iba O'Este	D	17	E	14	E	14	E	14	E	59
17	Iba Este	B	29	B	29	B	26	C	24	C	108
18	Corazon	B	26	B	25	C	24	D	18	D	93
19	Poblacion	B	26	B	25	C	24	C	20	D	95
20	Balungao	B	26	B	25	C	24	D	17	D	92
21	Sucol	B	27	B	26	B	25	C	21	D	99
22	Balite	B	26	C	24	C	24	D	16	D	90
23	Sergio Bayan	B	26	B	26	C	23	D	16	D	91
24	Buguion	B	27	C	23	C	20	E	12	E	82
25	Palimbang	B	25	C	23	D	18	E	13	E	79
26	Pio Cruzcosa	D	17	E	13	E	11	E	11	E	52
27	San Marcos	C	24	C	22	C	23	D	15	E	84
28	Calumpang	D	15	E	11	E	11	E	10	E	47
29	Longos	B	26	C	22	D	18	E	12	E	78

Identification of Flood Hot Spot (Area with rank A)



Proposal of Evidence-based Contingency Planning

(Formulation of Plan)

Step 1: Understanding current conditions

Step 2: Identifying risk

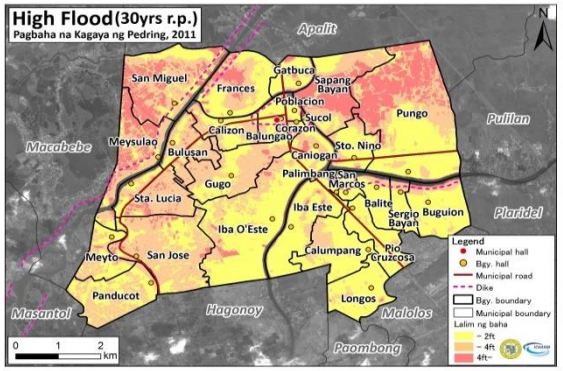
Step 3: Analyzing impact

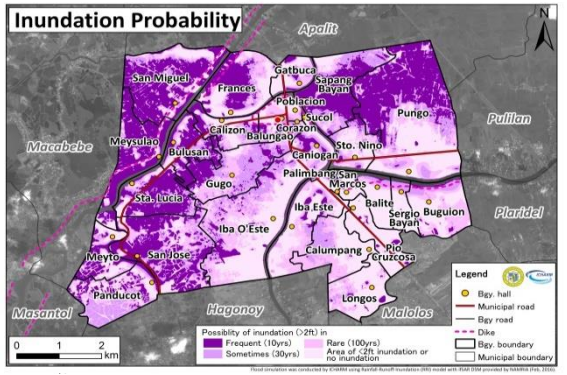
Step 4: Developing response strategies

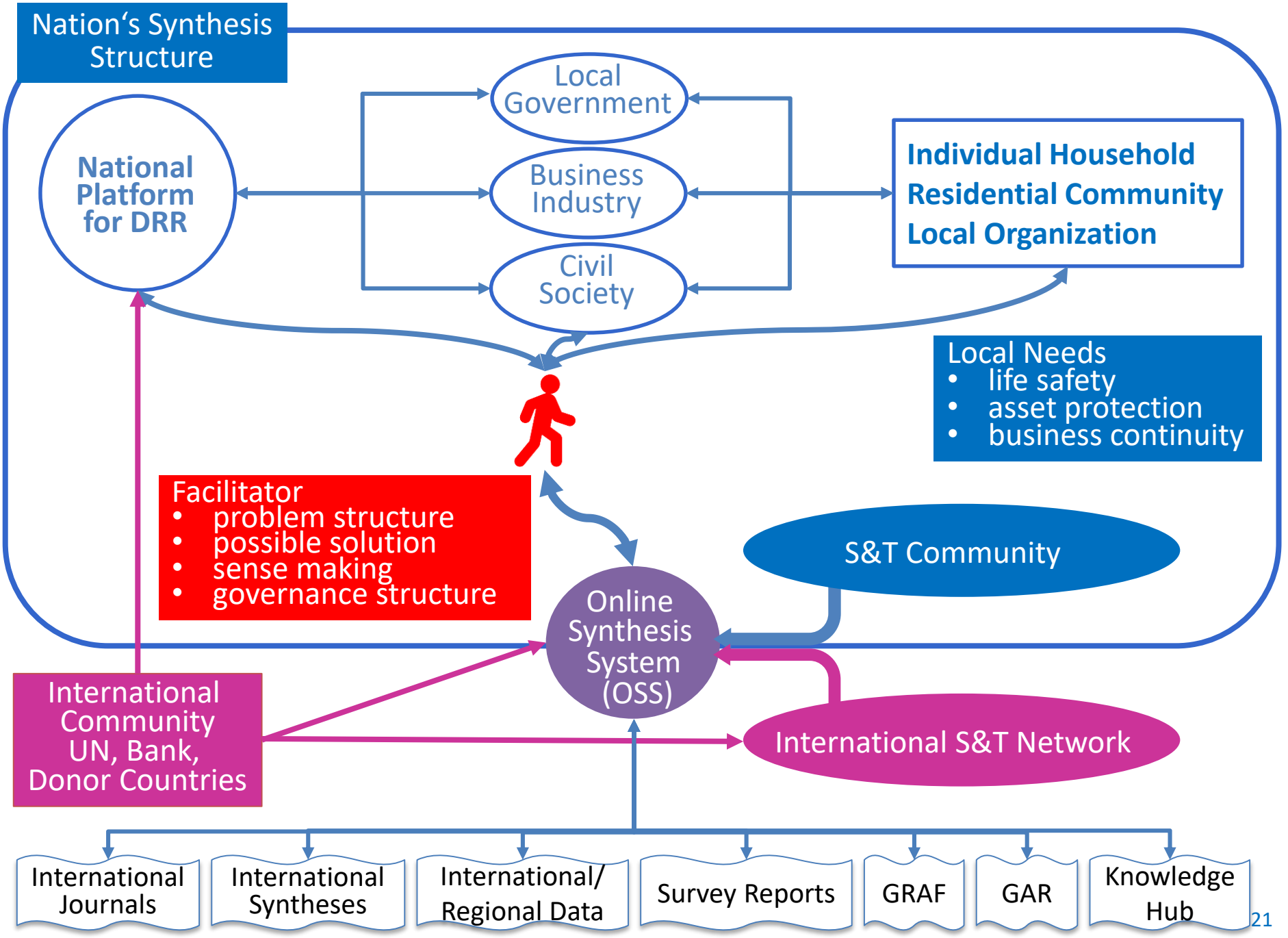
(Documentation and Sharing)

Step 5: Developing evidence-based contingency plans

Step 6: Sharing disaster contingency plans



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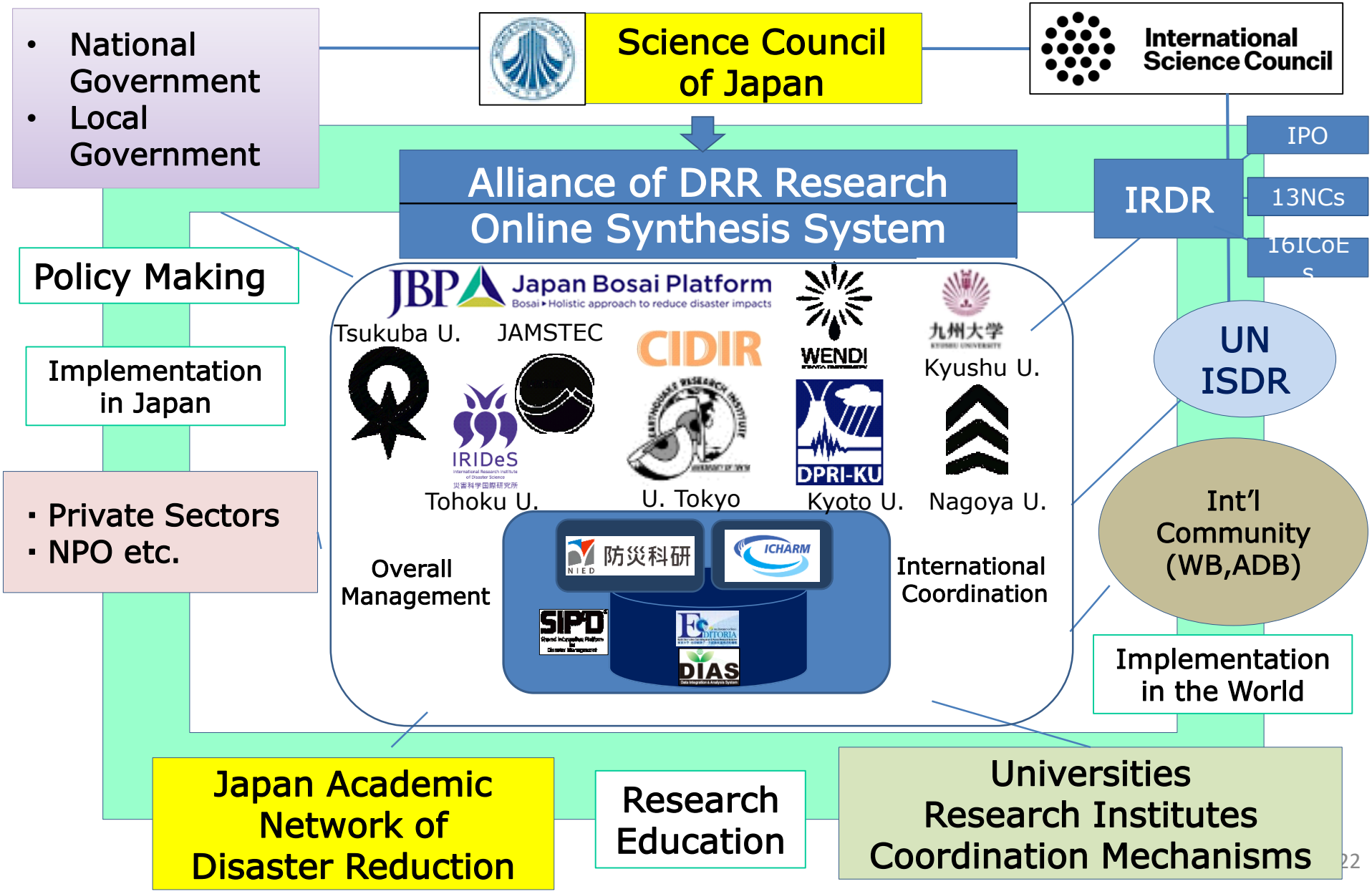
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Local Government
Science Council of Japan
International Science Council
IPO
IRDR
13NCs
16ICoEs
Alliance of DRR Research Online Synthesis System
Policy Making
Implementation in Japan
Private Sectors
NPO etc.
JBP Japan Bosai Platform
Bosai ▸ Holistic approach to reduce disaster impacts
Tsukuba U.
JAMSTEC
CIDIR
WENDI
九州大学
Kyushu U.
UN ISDR
IRIDeS
Tohoku U.
U. Tokyo
DPRI-KU
Kyoto U.
Nagoya U.
Int'l Community (WB,ADB)
Overall Management
防災科研
NIED
ICHARM
SIPD
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International Coordination
Implementation in the World
Japan Academic Network of Disaster Reduction
Research Education
Universities Research Institutes Coordination Mechanisms

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