



# Risk Communication through Community-Based Society Organizations as People-Centered Actions in Disaster: *A Case of Bandung City, Indonesia*

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**Kyoto University**

*International Environment and Disaster Management  
Graduate School of Global Environmental Studies*



# Outline of Presentation



**Introduction**

**Research Location**

**Methodology**

**Resilience Assessment**

**Risk Communication at Community Level**

**Comprehensive Risk Communication Approach**

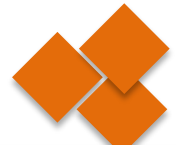
**Linking Risk Communication with Current Framework & Conclusion**



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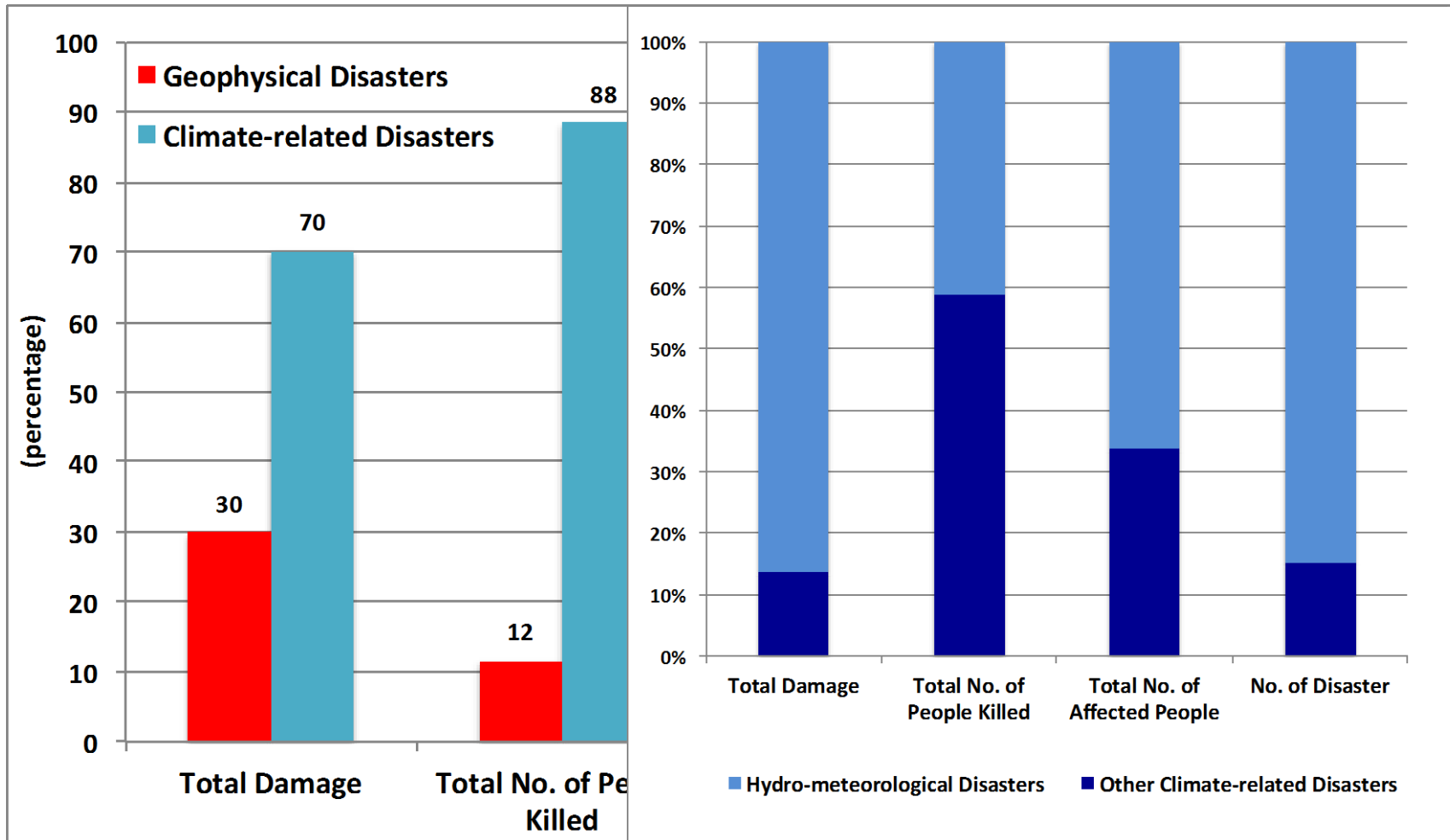
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# Introduction

- Increasing of climate-related trends, particularly on hydro-meteorological disasters (1900-2013)



Source: CRED / EM-DAT (2013) . Data analyzed and accessed on 30 December 2013





# Introduction

- Indonesia's high climate-related disaster risks

Type	Number of Disasters	Number of People Killed	Total Number of People Affected	Amount of Damage (000 USD)
Drought	9	9,329	4,804,220	160,200
Earthquake (seismic activity)	102	30,065	8,447,214	7,059,326
Tsunami	9	168,372	580,520	4,506,600
Flood	154	6,437	9,134,914	5,806,047
Mass movement dry	1	131	701	1,000
Mass movement wet	48	2,251	393,188	120,745
Storm	12	2,013	30,248	1,000
Volcano	52	18,271	1,176,026	344,390
Wildfire	9	300	3,034,478	9,329,000
<b>TOTAL</b>	<b>396</b>	<b>237,169</b>	<b>27,601,509</b>	<b>27,328,308</b>

*Number and types of disasters and their impacts in Indonesia 1900-2013*

*Source: CRED / EM-DAT (2013)*



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# Introduction

## ■ Jakarta Floods 2002, 2007, and 2013

Indicators	2002 Flood	2007 Flood	2013 Flood
Duration	5 days (29 Jan – 3 Feb)	7 days (2 – 8 Feb)	9 days (15 – 23 Jan)
Rainfall intensity	5288 mm	7065 mm	Continuous heavy rainfall occurred over Jakarta city for more than 8 hours (180-200 mm)
Death toll	32 people	48 people	34 people
Displaced people	40,000 people	316,825 people	4,599 internally displaced persons, 2,196 affected households
Damage on public utilities and facilities	132 electrical post	2140 electrical post, central telephone down, cellular and fix phone disrupted, clean water distribution disrupted	Transportation network disrupted, damages to residential areas
Loss	500 - 600 million USD	1-1.2 billion USD	1-2 billion USD
Inundated area	16,788 ha	45,000 ha	24,000 ha

Source: ADPC, 2009; UNOCHA, 2013, IRIDes,



Photo: Deutsche Welle, Oxfam America, StraitsTimes

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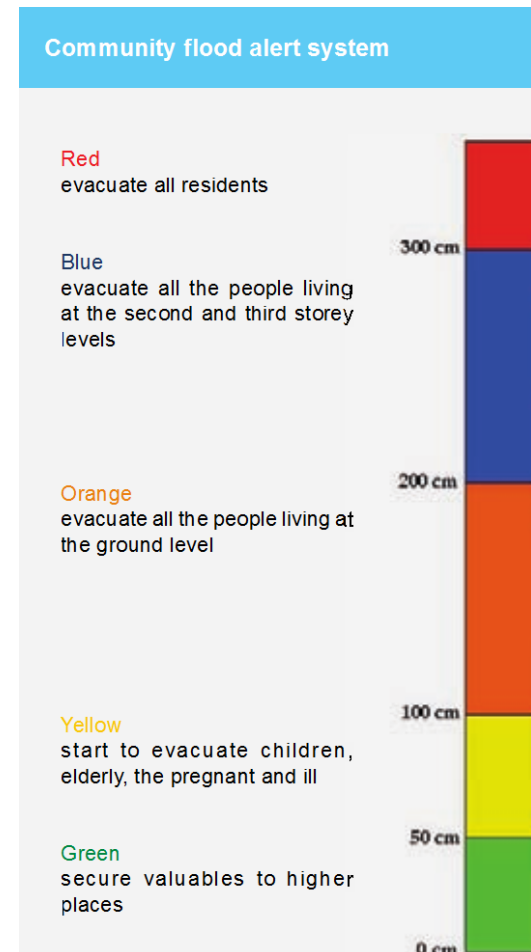


# Introduction

- **Example: Flood disaster preparedness initiatives of high-risk communities of Jakarta**  
*Program for Hydro-meteorological Disaster Mitigation in Secondary Cities in Asia (PROMISE Indonesia, 2010)*
  - Understanding their risks, disaster preparedness, and risk reduction action by improving the early warning of incoming inundation
  - Integrating the flood EWS at the ward disaster coordination unit
  - Increase the capacity of the community to understand the flood warning and act accordingly.



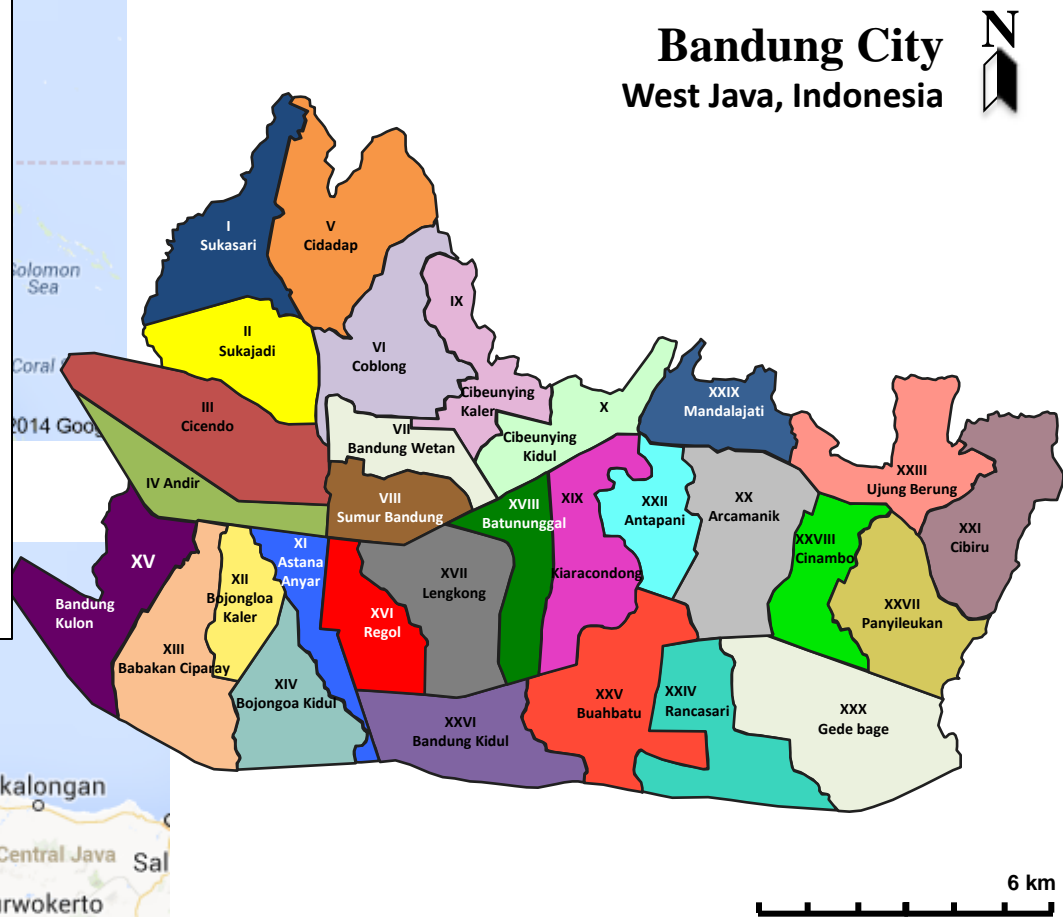
*Simple color-coded flood warning pole. The community generate common flood alert messages*



Source: ADPC, 2010

# Research Location

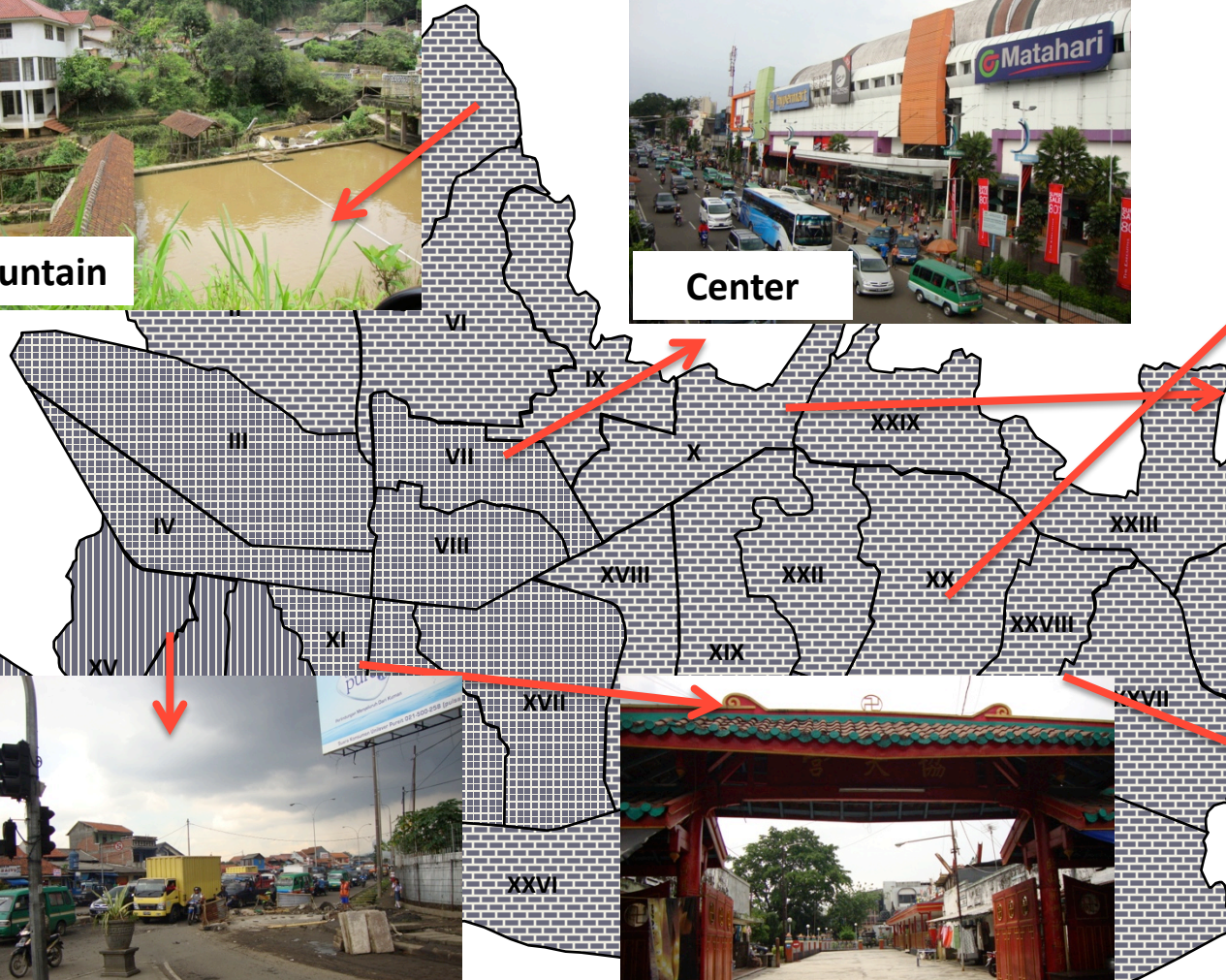
- Total area: 167.67 km<sup>2</sup>
- Population: 2,455,517 (2012)
- Population density: 14,676 people/km<sup>2</sup>
- City income: 302.5 million USD (2012)
- Economic activities: Service and Industries
- 30 sub-districts and 151 wards



Source: Development and Planning Agency, 2011



# Research Location

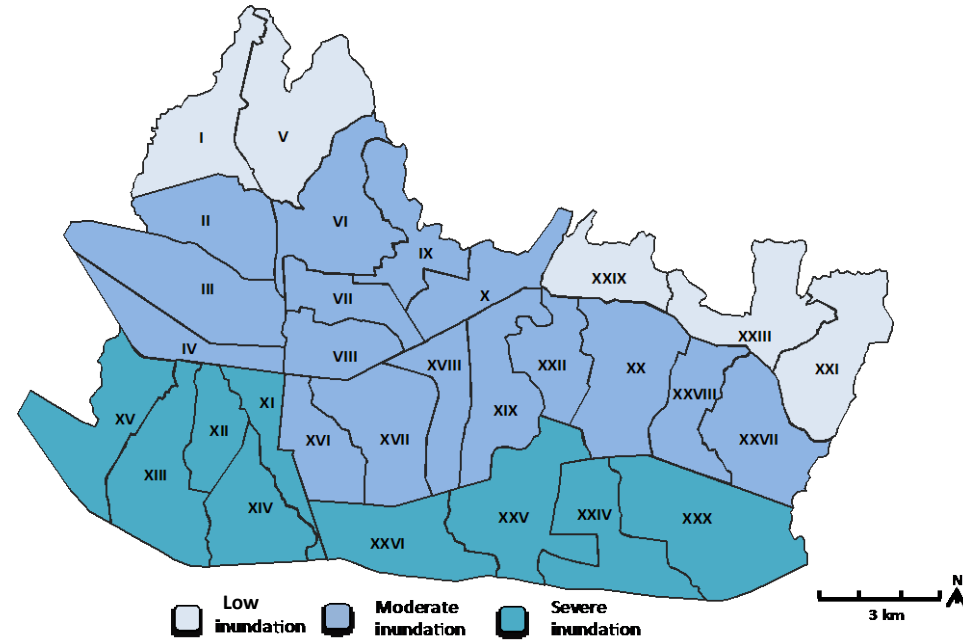






# Research Location

- Frequent climate-related hazards affect Bandung City and its communities
  - 2005, 2006, 2007, 2008: one major flood event
  - 2009: 17 floods events
  - 2010: 26 floods events
  - 2011: 35 floods events
- 25 out of 30 sub-districts inundated every year during the rainy season



Source: Bandung Construction and Water Service Agency, in Bandung City Infrastructure and Spatial Planning Information, 2011



Neighborhood in one sub-district in southern out fringes impacted by flood on 9<sup>th</sup> April 2013

Source:  
Tribun  
News, 2013



Flood on 9<sup>th</sup> January 2014 in one of major roads

Source: Pikiran Rakyat, 2014



# Methodology

Fieldwork	Methodology	Stakeholder
Resilience Assessment	Climate-related Disaster Resilience Index (CDRI) <ul style="list-style-type: none"><li>▪ Workshop</li><li>▪ Questionnaire Survey</li></ul>	<ul style="list-style-type: none"><li>▪ City Government (Bandung City Development and Planning Agency)</li><li>▪ Sub-district Government (N=30)</li></ul>
Risk Communication Approaches at Community Level	Social-Institutional-Economic Resilience Activities (SIERA) Approach <ul style="list-style-type: none"><li>▪ Questionnaire Survey</li><li>▪ Focus Group Discussion</li></ul>	Community-Based Society Organizations(CBSO) at wards <ul style="list-style-type: none"><li>▪ <b>Women Welfare Associations (N=119/151)</b></li></ul>
		Community-Based Society Organizations(CBSO) at wards <ul style="list-style-type: none"><li>▪ <b>Youth Unions (N=145/151)</b></li></ul>
		Community-Based Society Organizations(CBSO) at wards <ul style="list-style-type: none"><li>▪ <b>Faith-Based Organizations (N=151/151)</b></li></ul>
		<ul style="list-style-type: none"><li>▪ <b>Individual at wards (N=1510)</b></li></ul>





# Resilience Assessment

- **Baseline data on the resilience level of Bandung City utilizing CDRI**
  - City level (Development and Planning Agency)
  - Sub-City level (30 sub-district government)



*Workshop of Introduction of CDRI with Development and Planning Agency and 30 Sub-districts*



City Center

Questionnaire for

This study aims to measure the resilience level of the city against natural disasters, such as earthquakes, volcanic eruptions, and water scarcity, etc. This study is only for the purpose of academic research and not for the purpose of urban planning. It is expected that the dissemination of this study will help in understanding the resilience of the thirty sub-districts of Bandung.

Contact details of

Name of the Official:  
Designation:  
Contact address:  
Phone/Fax:  
E-mail:  
Date when questionnaire was filled out:

Photo representing



Sub-district Climate Disaster Resilience Index



Questionnaire for local Climate Disaster Resilience Index (CDRI) in Bandung

This study is jointly conducted by Kyoto University (Japan) and Center for Disaster Mitigation-ITB (Indonesia)

This study aims to develop a Climate Disaster Resilience Index (CDRI) for the thirty sub-districts of Bandung Municipality. The sub-district's resilience is assessed only against climate-related natural hazards, like flooding, rainfall-induced landslides, water scarcity, etc. Thus, earthquakes, volcanic eruptions, and other geological hazards are not considered as part of this study. All the information retrieved from this questionnaire will only be used for the purpose of academic research and not given to any other party, except research team members from Kyoto University. It is expected that the dissemination of this study will help in understanding the resilience of the thirty sub-districts of Bandung.

Contact details of the selected sub-district

Sub-district No. (filled up by surveyor)

Name of the Official:  
Designation:  
Contact address:  
Phone/Fax:  
E-mail:  
Date when questionnaire was filled out:

Photo representing the sub-district



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# Resilience Assessment

1. Physical	2. Social	3. Economic	4. Institutional	5. Natural	
Electricity	Population	Income	Mainstreaming DRR and CCA	Intensity / Severity of Hazards	<ul style="list-style-type: none"><li>▪ Literacy rate of people</li><li>▪ Knowledge of threat &amp; impacts of disasters</li><li>▪ Frequency of organizing public awareness program</li><li>▪ Information a accessibility</li><li>▪ Functionality of schools after disaster</li></ul>
Water	Health	Employment	Effectiveness of Crisis Management	Frequency of Hazards	
Sanitation and Solid Waste Disposal	Education and Awareness	Household Assets	Knowledge Dissemination and Management	Ecosystem Services	
Accessibility of Roads	Social Capital	Social Capital	Institutional Collaboration with other Stakeholders	Land Use in Natural Terms	<ul style="list-style-type: none"><li>▪ Integration &amp; enforcement of disaster risk management plans/policies</li><li>▪ Dissemination of disaster information</li><li>▪ Implementation of building codes</li><li>▪ Existence operation of early warning systems</li><li>▪ Frequency to run drills for disaster scenarios</li></ul>
Housing and Land Use	Community Preparedness	Budget and Subsidy	Good Governance	Environmental Policies	

Source: Joerin et al., 2011

Variables: 5 dimensions, 25 parameters, 125 measures

Analysis: weighted mean and correlation (coefficient of determination)



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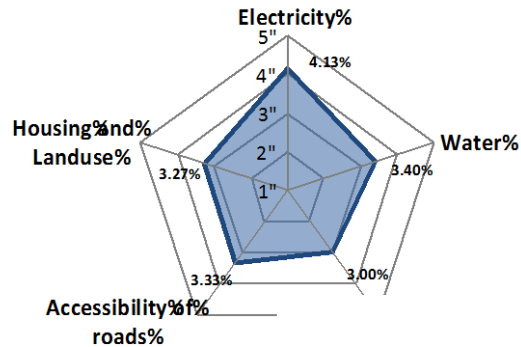


# Resilience Assessment

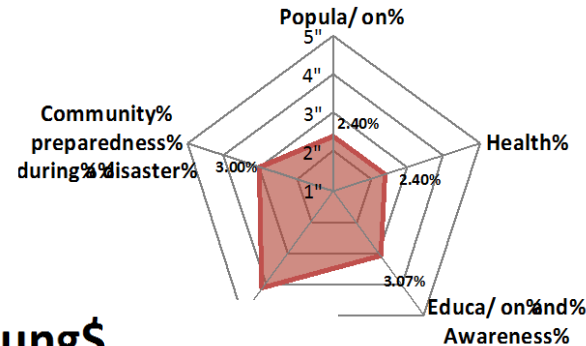
## City level assessment:

- The strengths (capacities) and weaknesses of Bandung City

### Physical%

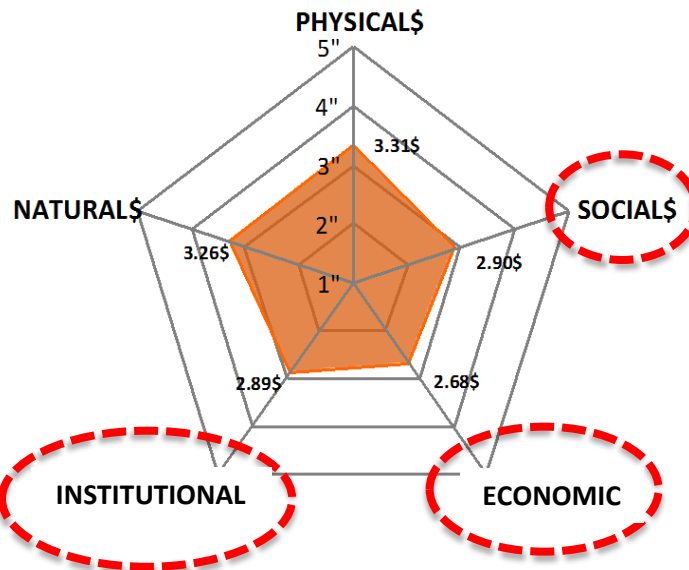
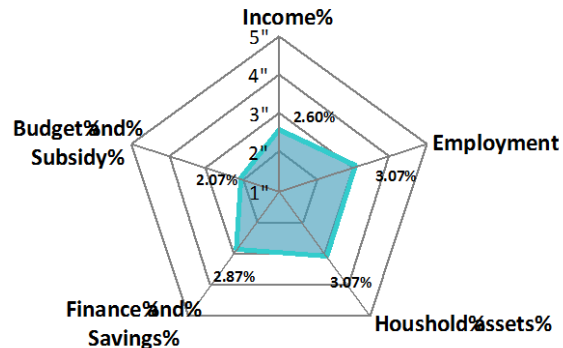


### Social%

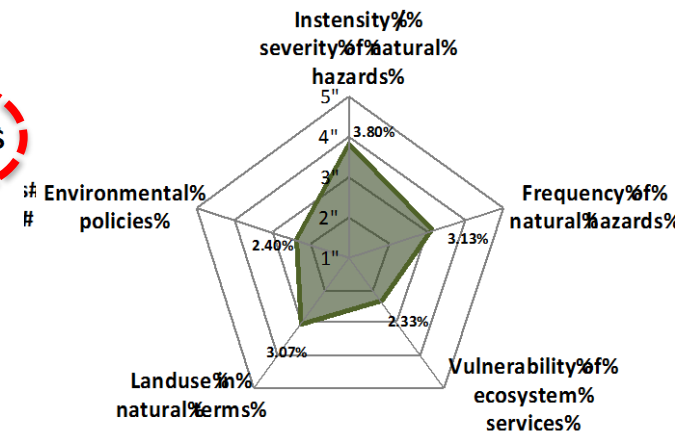


## Bandung\$

### Economic%



### Natural%



Scale: **Best:** 5 (3.75-5), **High:** 4 (3.25-3.74), **Medium:** 3 (2.75-3.24), **Low:** 2 (2.25-2.74), **Poor:** 1 (1-2.24)



# Resilience Assessment

## ■ Key Findings:

### ■ Resilience assessment at City vs. Sub-City:

- Resilience **assessment at the city level** supports the Government of Bandung City in **pointing out strong** (physical) and **weak** (social, institutional, and economic) sectors
- Resilient **assessment at the sub-city level** as city micro entities help to **contextualize specific DRR** and resilience activities → reveal local potentials in social, institutional, and economic sector

### ■ Spatial Analysis:

- gives the city government the information on which location and key areas they need to focus on (strengthen specific DRR and resilience)

Local actors are crucial in  
**communicating common risks**  
to wider communities





# Risk Communication at Community Level

## ■ Respondent for Risk Communication Approaches at Community Level

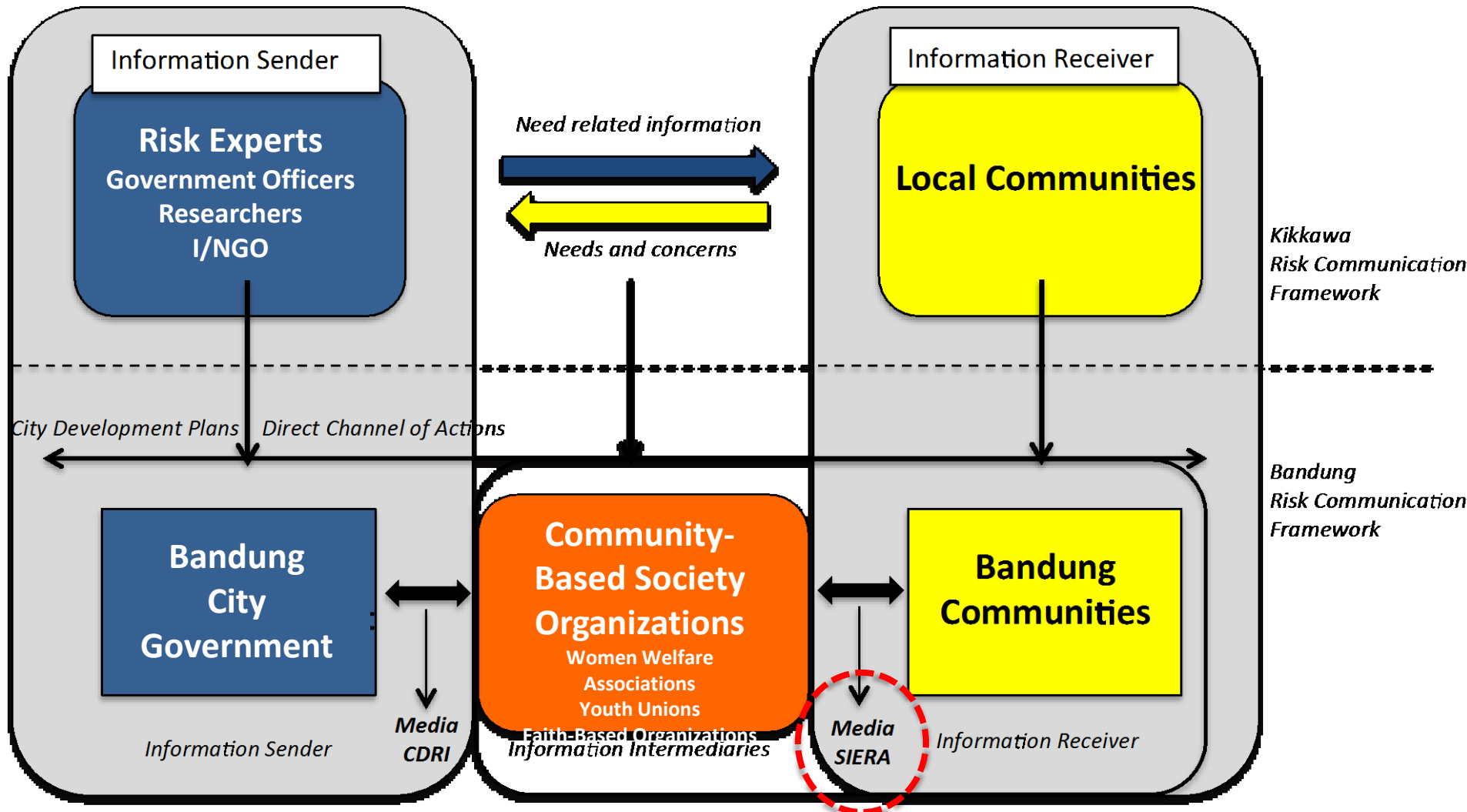
Target	Respondent	Where	Surveyed Wards	Specific Details
CBSOs	WWAs (Heads of WWAs)	WWAs at wards	N= 119 wards (78.8%)	No specific age limit
	Youth Unions (Leaders of YUs)	YUs at wards	N= 145 wards (96%)	17 – 45 years
	FBOs (Leaders of Mosque Councils)	FBOs at wards	N= 151 wards (100%)	No specific age limit, 1 mosque/ward, located within neighborhood
Individuals	Community members	People at wards	N= 1510 wards (10 persons/ward)	No specific gender From 15 years and above





# Risk Communication at Community Level

## ■ CBSOs Risk Communication Framework for Climate-related Disaster Resilience







# Risk Communication at Community Level

- **Social Institutional and Economic Resilience Activities (SIERA) Approach:**

- CBSOs Research Target:  
Women's Groups (Woman Welfare Associations/WWAs),  
Youth Groups (Youth Unions/YUs), and  
Religious Groups (Faith-Based Organizations/FBOs)
- SIERA derived from CDRI:  
DRR activities corresponding to three dimensions, 15 parameters, 45 DRR measures  
(before, during, after a disaster)





# Risk Communication at Community Level

- **Women Welfare Associations:**
  - Semi-formal women's organizations at city till ward level (under Ministry of Home Affairs)
  - Headed by spouses of appointed leaders of respected administrative unit leaders



*WWAs members participated in a disaster training and drill*

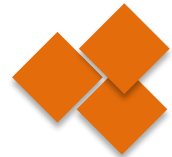
*Head of WWAs Bandung City launched "Bandung Green and Clean Campaign 2010-2012"*



*WWAs coordination meeting in a ward*



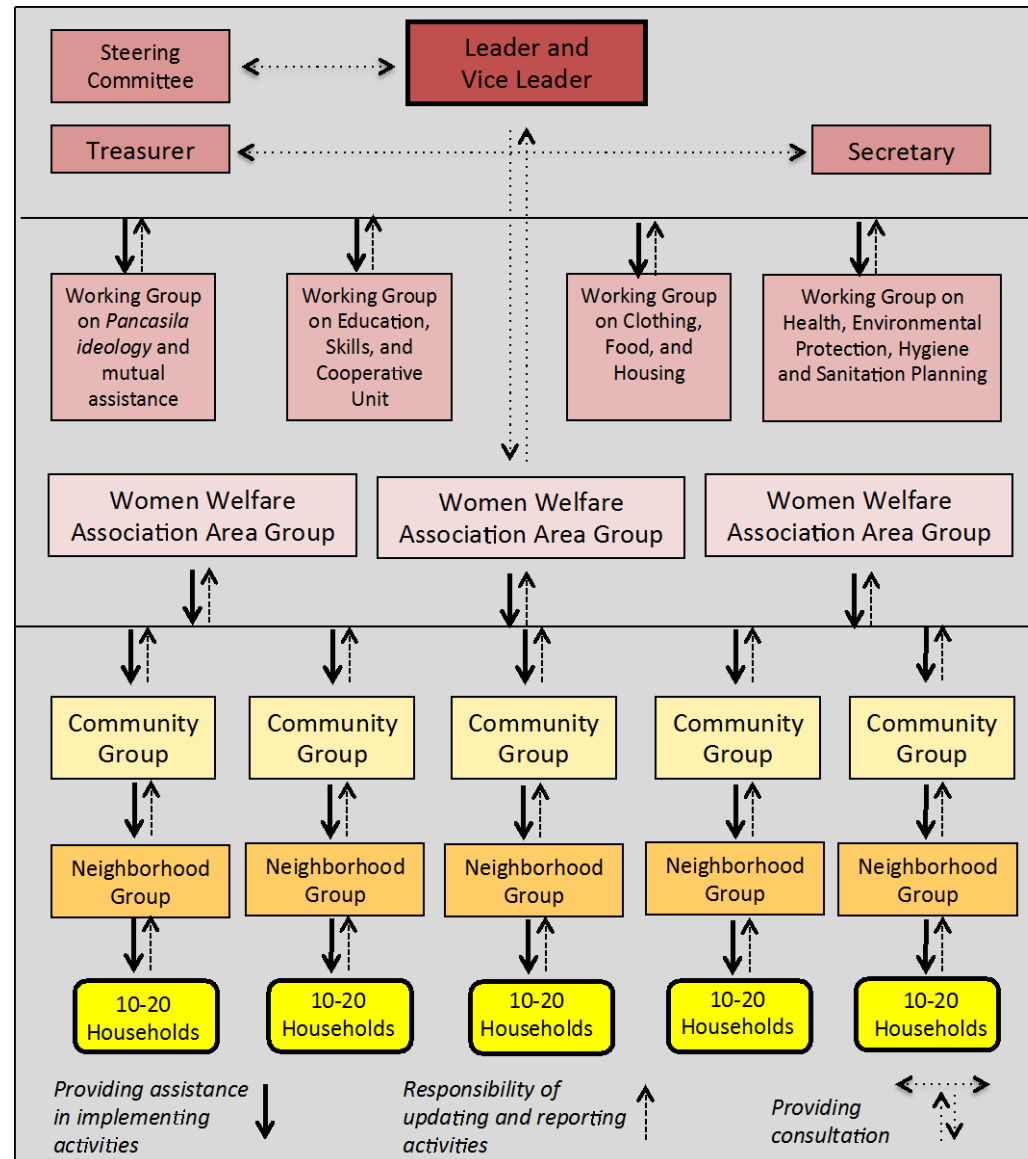
*Head of WWAs Bandung City opened one day seminar for WWAs members on Healthy Lifestyle*



# Risk Communication at Community Level

## ■ Structure of Organization of Women Welfare Associations at ward:

- Closely linked to women and other community members
- Provide assistance to women and other community members in implementation of activities



Source: TP PKK, 2006





# Risk Communication at Community Level

## WWAs current activities:

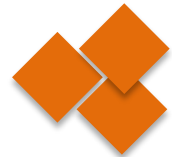


## Key Findings:

- Primary active in social issues (focusing in the health sector, e.g. women's & communities' health care)
- Institutionally: "close relationship" with local government, planned activities in short/medium/long term)
- Organizing and delivering training/skill workshops for empowering women economically (resilience in livelihoods)
- Collaboration with radio in broadcasting "Bandung Green and Clean Campaign" (2011-2012)







# Risk Communication at Community Level

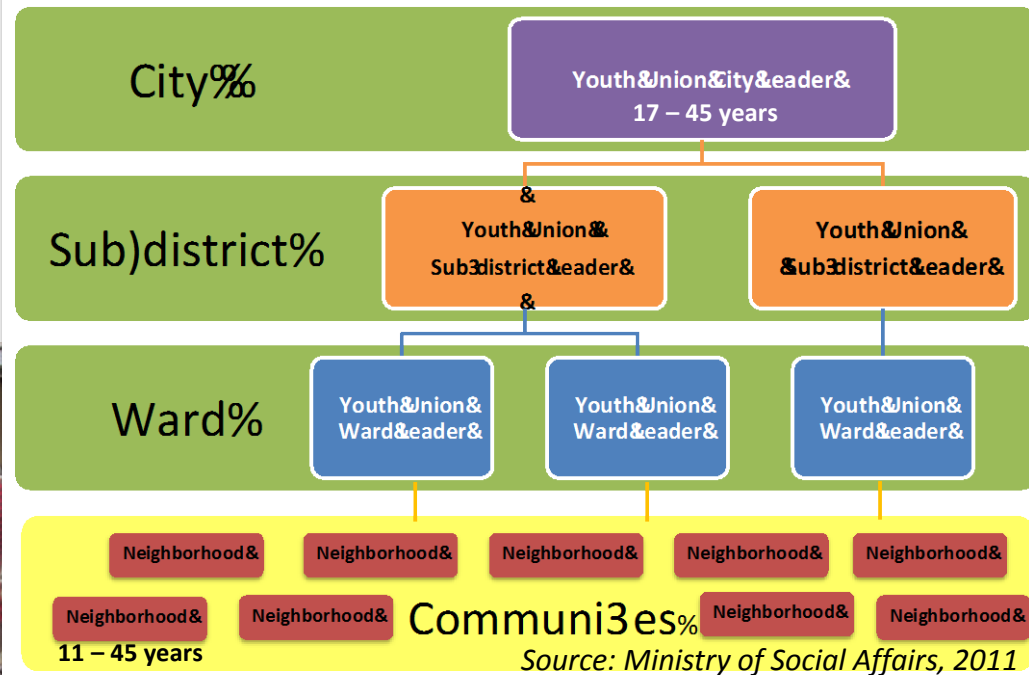
## ■ Youth Unions:

- Volunteer-type organization (under Ministry of Social Affairs)
- Headed by an appointed youth role model at city level and selected youth leaders in their respected administrative units
- Involvement of Youth Disaster Preparedness Unit (TAGANA)

*Youth Union in newly developed areas is distributing meat after a religious event to surrounding communities*



*Youth Union in outer fringes of city is constructing a venue for youth activities*



*Youth Union in newly developed residential areas is doing neighborhood cleaning*





# Risk Communication at Community Level

- Relationship between perceptions and on going of SIERA by youth unions leaders:

(sample (N) = 145 wards)		Coefficient of determination ( $r^2$ )		
Perceptions	On going activities			
	Before	During	After	
Before	0.13	0.01	0.01	
During	0.02	0.94	0.001	
After	0.21	0.14	0.0002	

## Key Findings:

**Highest degree of relationship between YUs' perceptions and current DRR during disaster:**

- DRR actions are most prioritized & active when a disaster occurs
- Irregular involvement in disaster drills with local television
- Need investment & strengthen DRR action in pre-disaster



*Pictures during YUs questionnaire survey in October-November 2011: Preparation meeting with Bandung Disaster Study Group (BDSG) as facilitators and 145 youth leaders participated in the survey*



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# Risk Communication at Community Level

Type of areas in Bandung City	Youth Population	Participation / Correlation				
		Awareness and Drill	Emergency Response and Early Warning	Data collection and communication to officials	Advocating local government in setting up Early Warning System	Information gathering and communicating losses to officials
Center	Low	Low / Strong	Low / Strong	Low / Strong	Low / Weak	Low / Strong
Old Part of City	Low	Low / Strong	Low / Strong	Low / Weak	Low / Weak	Low / Strong
Mountain	Medium	Medium / Weak	Medium / Weak	Medium / Weak	Medium / Strong	Medium / Strong
Valley	Low	Medium / Weak	Medium / Strong	Medium / Strong	Medium / Weak	Medium / Weak
Residential Areas	High	High/ Weak	High/ Weak	High/ Strong	High/ Weak	High/ Strong
Newly developed residential areas	High	High/ Weak	High/ Weak	High/ Weak	High/ Weak	High/ Strong
Out fringes of City	High	High/ Strong	High/ Strong	High/ Strong	High/ Weak	High/ Strong







# Risk Communication at Community Level

## ■ Faith-Based Organizations:

- Volunteer-type organization
- Headed by (elder) community leader



*Men participated in religious and community meeting*



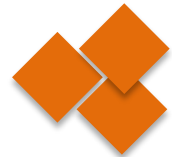
*Mosque in a neighborhood organized cheap bazar for women in a neighborhood*



*Mosque is the religious education center for youths and children*

*Source: IRI et al., 2011*





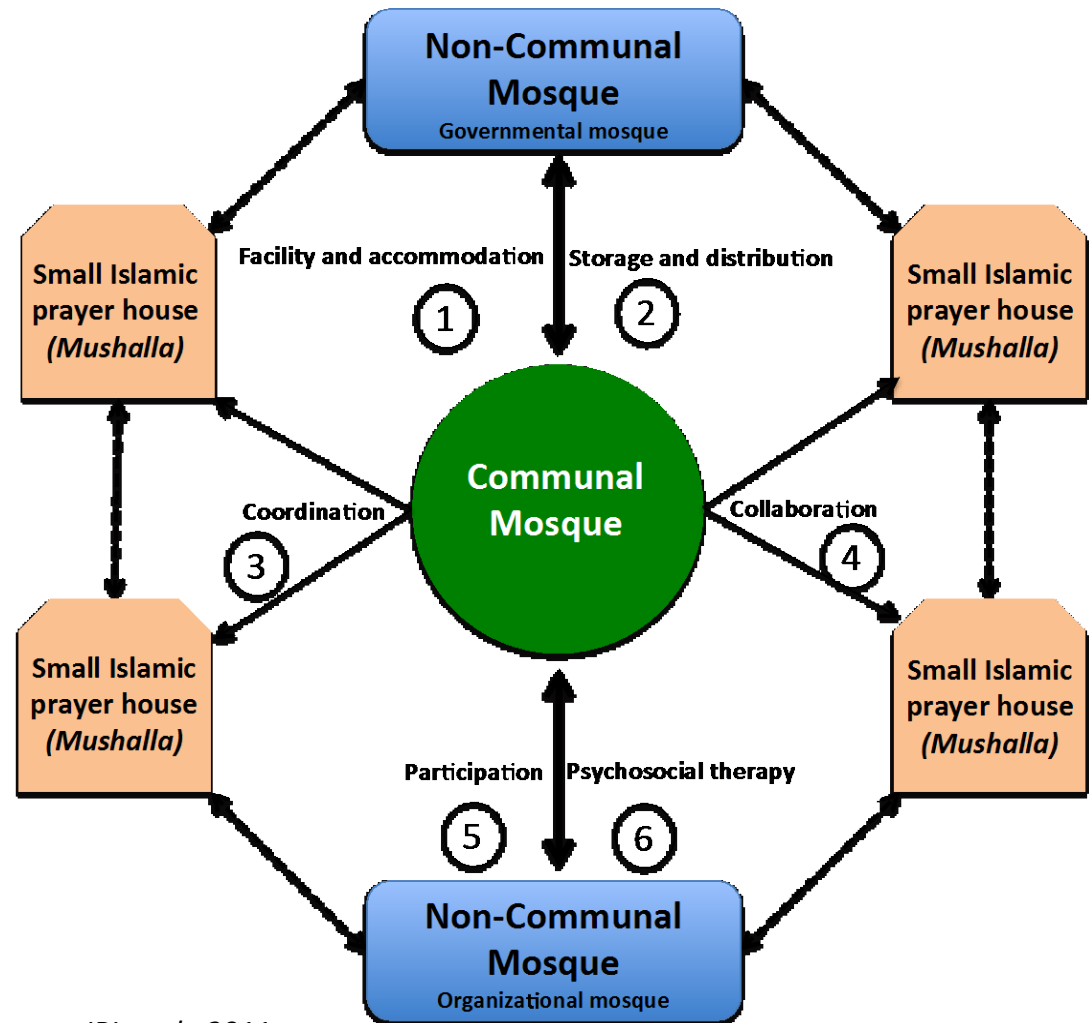
# Risk Communication at Community Level

## ■ Faith-Based Organizations:

- Communal mosque is selected for the survey:
  - \* role and function in disaster
  - \* relation with governmental and organizational mosques
  - \* located within communities



*Pictures during FBOs questionnaire*



Source: IRI et al., 2011





# Risk Communication at Community Level

## ■ Prioritization of FBOs SIERA by mosque leaders:



### Key Findings:

Mosque leaders prioritized most economic resilience activities:

- Pointing potential activities for risk communication platform

FBOs post-disaster activities:

- gather information & dissemination disaster losses
- Taken into consideration needs of impacted people
- Highlight FBOs' role as risk communication intermediaries between government & people

## ■ Relationship between FBOs Risk Communication SIERA by mosque leaders:

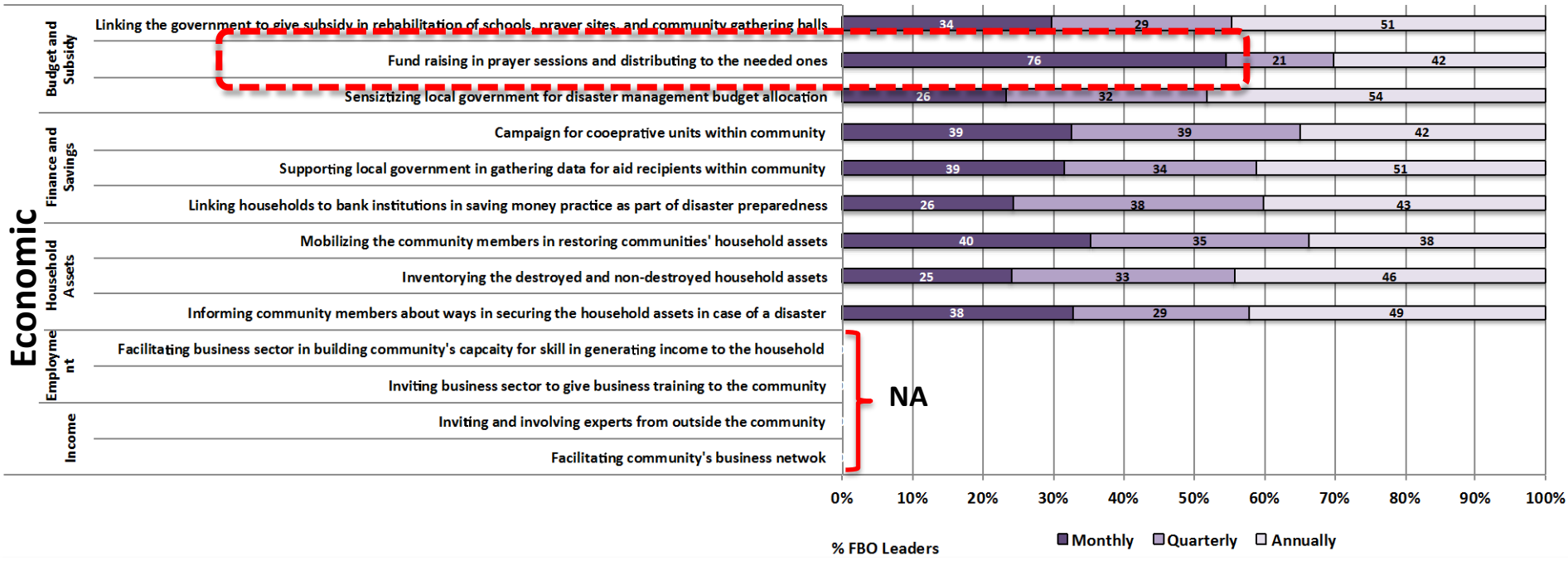
FBOs RC SIERA		Coefficient of determination ( $r^2$ )				
	RC SIERA	S3. B	S3. D	I2. A	I5. B	I5. D
Awareness and drills	S3. B		0.17	0.20	0.27	0.21
Emergency and early warnings	S3. D			0.60	0.40	0.71
Data collection and communication to officials	I2. A				0.54	0.86
Establishing early warning system with local government	I5. B					0.58
Informs and updates officials	I5. D					





# Risk Communication at Community Level

## FBOs current activities:



## Key Findings:

- Active in mobilizing communities in taking actions through religious & cultural meetings
- Utilization of printed media: dissemination of disaster risk & knowledge during event sessions in mosque
- Update and listing annually vulnerable groups & working closely with local government
- Strong in fund raising & charities





# Risk Communication at Community Level

Characteristic	Women Welfare Associations	Youth Unions	Faith-Based Organizations
Timing of Activities	Before Disaster	During Disaster (Emergency Response)	After Disaster
Strength of Activities	<b>SOCIAL</b> <ul style="list-style-type: none"><li>Planned actions</li><li>Strong network with women &amp; other community members</li></ul>	<b>INSTITUTIONAL</b> <ul style="list-style-type: none"><li>Ad-hoc type actions</li><li>Strong network &amp; linking with local agencies</li></ul>	<b>ECONOMIC</b> <ul style="list-style-type: none"><li>Frequent daily interaction with community members</li></ul>
Localized Communication	<ul style="list-style-type: none"><li>Awareness &amp; drill and emergency warnings (mountain areas)</li><li>Establishing EWS with government and updating disaster status (river side)</li></ul>	<ul style="list-style-type: none"><li>Awareness &amp; drill, emergency warnings, data collection and communication to officials, informing and updating disaster status (<b>new developed areas, &amp; out fringes</b>)</li></ul>	<ul style="list-style-type: none"><li>Data collection and communication to officials, informing and updating disaster status (<b>plain areas</b>)</li></ul>
Media for wider outreach communication	<ul style="list-style-type: none"><li>Radio</li><li>Local Newspaper</li></ul>	<ul style="list-style-type: none"><li>Television &amp; Radio</li><li>Community Newsletter, Pamphlet</li></ul>	<ul style="list-style-type: none"><li>Community Radio, SMS</li><li>Community Newsletter, pamphlet</li></ul>







# Risk Communication at Community Level

- Identify current risk communication approaches at community level

## Participant

- **Mountain:**  
(8 persons)
- **Center and Business district:**  
(8 persons)
- **New developed areas & Out fringes:**  
(8 persons)

## Group Composition:

### CBSOs

- Women Welfare Associations
- Youth Unions
- Faith-Based Organizations

## Community Information Group

## Government

- Development and Planning Agency
- Communication and Information Service
- Fire Department



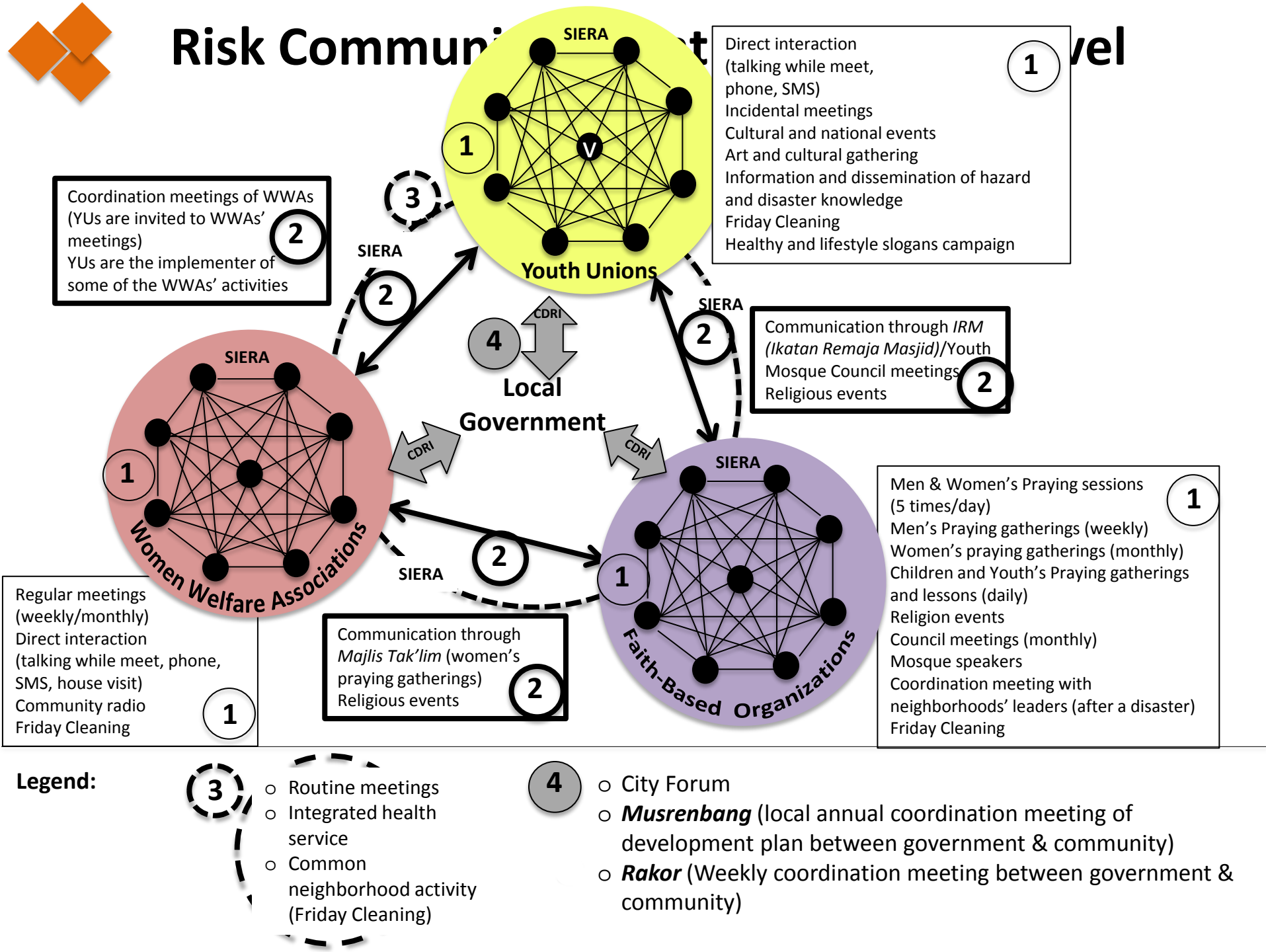
*Participants of the FGD, Bandung July 2013*

*Venue: Bandung and Development Planning Office*



# Risk Communication

Level





# Risk Communication at Community Level

- Identify risk perceptions and CBSOs risk communication process



Pictures during individual survey



Characteristic	Details	
Total sample (N ward=151)	1510 (10 persons/ward)	
Gender	Male (61%), Female (39%)	
Age Group	15-25	(17.75%)
	26-35	(23.67%)
	36-44	(26.06%)
	46-55	(18.75%)
	55 +	(13.76%)
Duration stay in Bandung	<5 years	(8.24%)
	5-15 years	(17.48%)
	>15 years	(74.29%)
Frequency of community participation	Once/month	(49.60%)
	3-4 times/year	(20.73%)
	Once/year	(17.53%)
	Special event only	(12.13%)
Major disaster risks in Bandung	Landslide	(49%)
	Flood	(63.60%)
	Earthquake	(6.87%)



# Risk Communication at Community Level

Activity	Women Welfare Association	Youth Union	Faith-Based Organization
1	Conducting health concerns campaign at the community level	Cleaning the debris/waste from rivers in setting-up healthy environment for community	Collecting used clothes, goods, foods for donation to refugees
2	Conducting campaign on family planning	Being attentive to emergency warnings and communicating the status effectively	Conducting disaster awareness campaign after praying sessions
3	Conducting courses and trainings for women and communities to have skills and abilities in generating income to the family	Disseminating disaster and risk awareness and conducting drills for youth and community	Organizing and engaging all community groups in participating in religion and cultural events
4	Conducting systematic information gathering and dissemination of disaster losses to be shared with officials	<b>Key Findings:</b> <ul style="list-style-type: none"><li>○ <b>Social resilience activities</b> of CBSOs <b>dominate risk communication</b> platform between CBSOs and people</li><li>○ Enhance and <b>strengthen institutional and economic resilience activities</b></li></ul>	
5	Organizing the meetings and forums within ward and inviting outside stakeholders for effective disaster management		





# Risk Communication at Community Level

## ■ Contribution of media in Bandung in risk communication:

### Pre-Disaster:

- Warning
- Preparedness information



### During Disaster

- Emergencies information purposes
- Charity



Commercial Radio announces fund

### Post-Disaster

- Post-disaster updates
- Reviewing the event

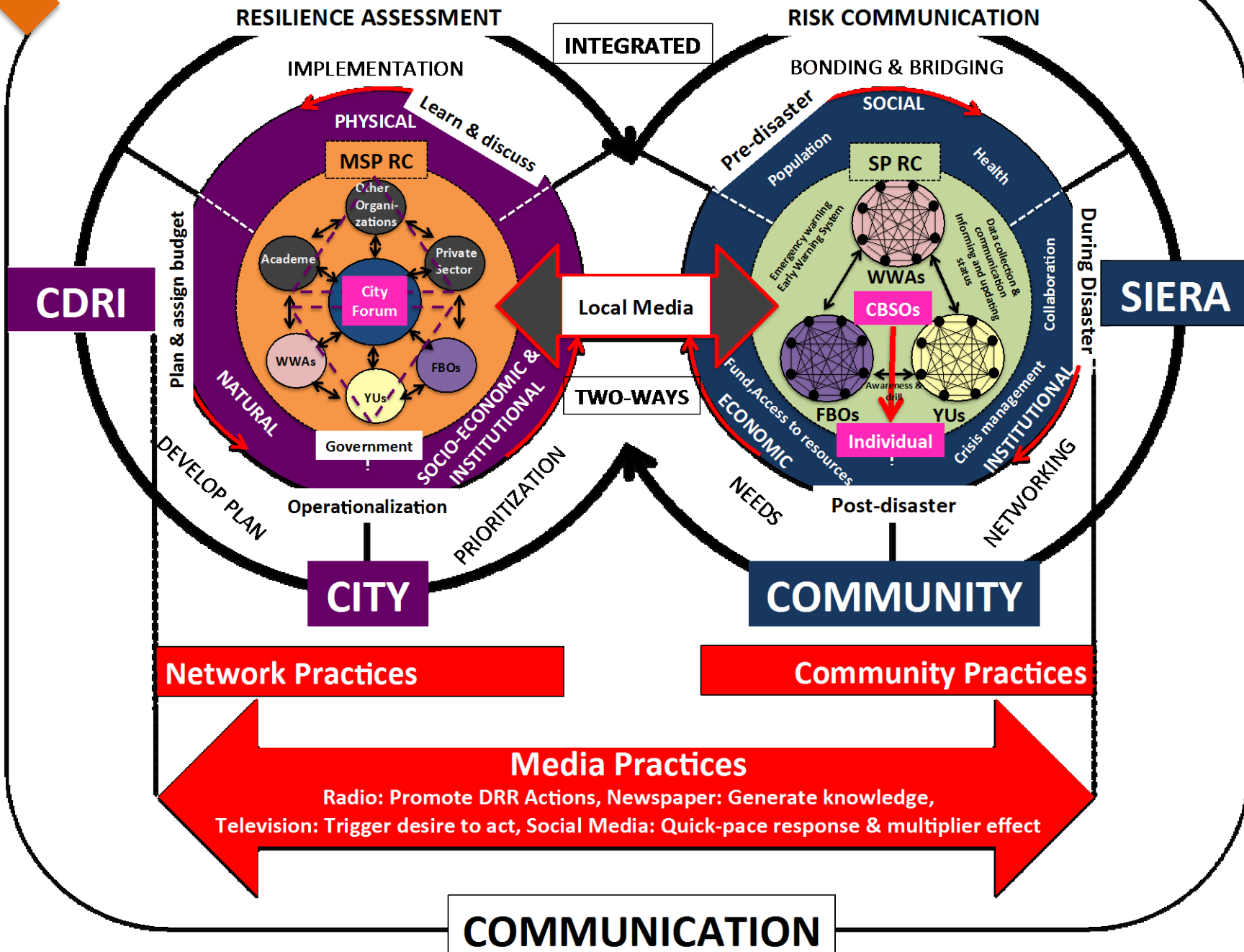


Television hold talk-show and  
discussion forums with experts,  
government, and  
community leaders

**Citizen Reporters**

Community Radio warns the  
impacts of improper solid waste  
management after Weekly Car  
Free Day in rainy season

# COMPREHENSIVE





# Comprehensive Risk Communication Approach

## ■ Comprehensive Risk Communication Approach for Disaster Resilience:

### Comprehensive:

- involves all actors (Government, CBSOs, community members & other stakeholders)
- Two approaches (CDRI & SIERA)
- sector-wise (physical, social, economic, institutional, natural)
- time-scale based (before, during, and after disaster)

### Integrated:

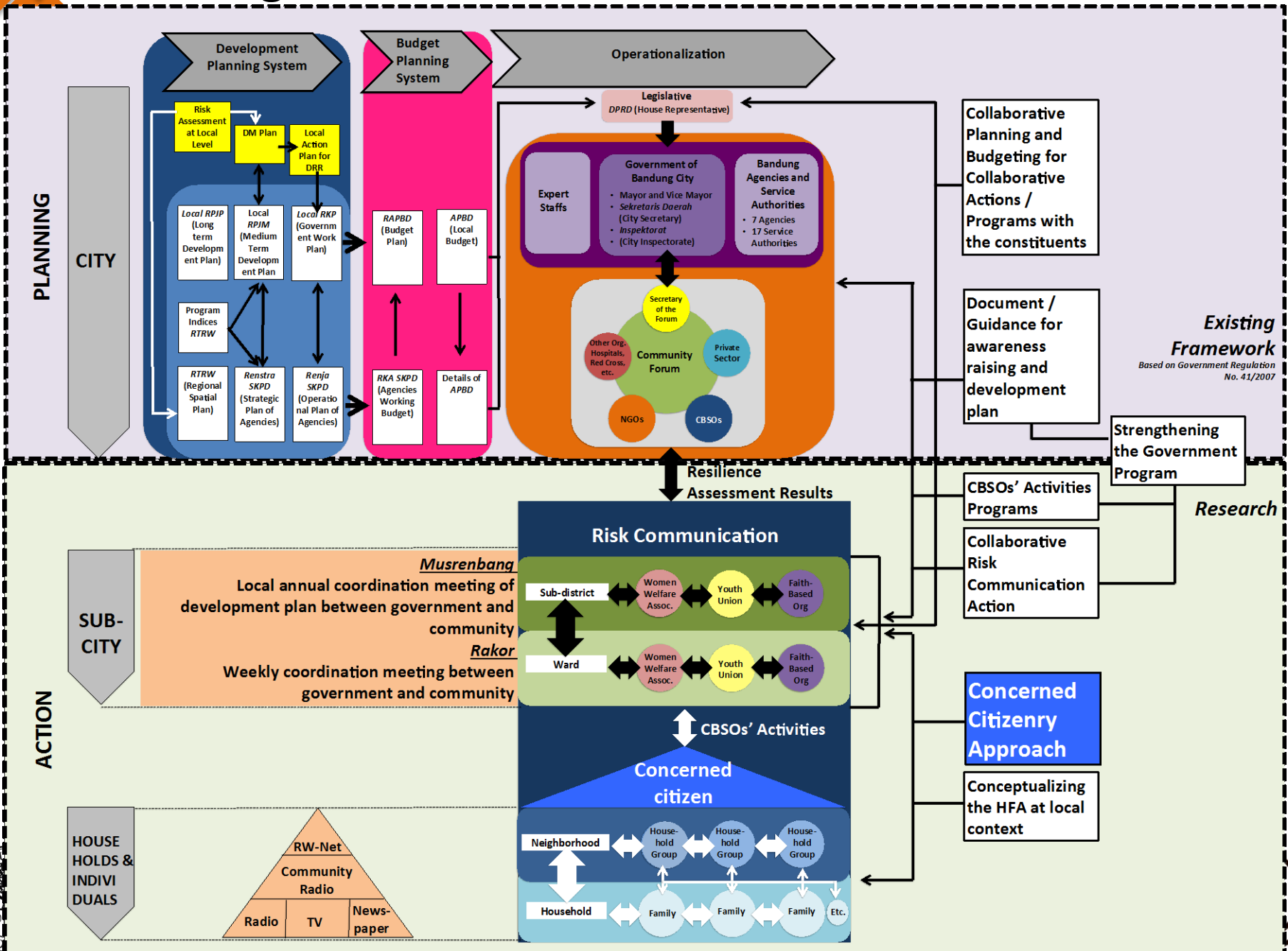
- assimilates two approaches (Resilience Assessment and Risk Communication process)
- blending local government and community effort
- media as connector and mediator in bringing gaps, issues, concerns, needs of both sides
- Multi-Stakeholder Platform for Risk Communication (MSP RC) collaborative key forum addressing issues following the resilience assessment
- Risk Communication through CBSOs (risks information, key messages, and DRR activities)

### Two-Way Communication:

- exchanging risk communication between city and community



# Linking Risk Communication with Current Framework







# Conclusion

## \* Implication of institutional framework of DM Law No.24/2007 at national to local context

- Contextualized local level actions in cities in Indonesia
  - (Local Government Units and CBSOs)

## \* Resilience Assessment and Risk Communication support Bandung City development and local governance

- Bandung City level assessment demonstrates low social, institutional, and economic resilience
  - while at sub-city level assessment shows high social, institutional, and economic resilience
- Contribution of CBSOs as local actors:
  - WWAAs effective in pre-disaster RC, strengthening the social sector
  - YUs strong during disaster RC, enhancing institutional sector
  - FBOs major contribution post-disaster RC, strong in socio-economic sector
  - People trust in FBOs as effective risk communicators and conventional media
- Media practices in risk communication promote citizen journalism





# Conclusion

## \* Effective Risk Communication in Bandung creates Concerned Community Approach

- Local comprehensive risk communication framework emphasizes concerned citizen approach (assimilation of risk assessment and communication)
- Ensure community participation through CBSOs risk communication processes (WWAs, YUs, and FBOs)



*One million Drainage Cleaning movement (RW-net, 2013)*



*One million Bio Pore Movement with WWAs (Tribunnews Bandung, 2013)*



*Annual disaster simulation, organized by Local Disaster Management Agency of West-Java Province in public open space (Gasibu field) (Photo courtesy: PJTV, 2013)*

***Thank you for your kind attention\*\*\****