

Gap between preparedness and awareness for flood disaster risk

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What is Gap?

By the ordinary proverb:

People agree in the general, but disagree in the particular.

However, in the case of disaster:

People agree in the general and agree in the particular, but do not practice.

(by Prof. Norio Okada)

This is called **“Perceptual discord”**.

That is **“Gap”** between preparedness and awareness.



Purpose

There are many kinds of preparedness for mitigating “**flood**” disaster risk.

1. What kind of preparedness do not people practice?
2. How are people aware?
3. How much is **Gap**?
4. Which measure improves their preparedness?



Targets are 15 kinds of preparedness

1. To hold a flood hazard map
2. To check evacuation centers
3. To check evacuation routes
4. To understand evacuation standards
5. To know hints on evacuating
6. To prepare goods on evacuating
7. To prepare foods for emergency
8. To know flooded records
9. To do a family meeting
10. To know how to contact at emergency
11. To help each other in community
12. To participate an emergency drill
13. To devise how to build a house
14. To devise how to place furniture
15. To insure against flood



Procedure

15 kinds of preparedness

Characteristics of people and community

Number of household members
Vulnerable person for disaster
Property in house
Disaster experience
Collection of information for disaster mitigation
Knowledge for disaster mitigation
Activity for disaster mitigation in community
Connection in community

Questionnaire

Model based on Fuzzy reasoning

Preparedness

Awareness

Gap

Analysis

Improvement



Model for estimating awareness

Rule 1 If CDI is VPB and DE is VPB then ADR is VVB Rule 29 If KDM is PS and NHM is PM then ADR is S
Rule 2 If CDI is PS and DE is VPS then ADR is VS Rule 30 If KDM is VPS and NHM is PM then ADR is M

Fuzzy reasoning:

If A is about B and C is about D, then X is about Y.

Rule 8 If CDI is VPB and KDM is VPB then ADR is VB Rule 36 If KDM is VPS and CC is VPS then ADR is VB
Rule 9 If CDI is PB and KDM is VPS then ADR is S Rule 37 If KDM is PB and CC is PS then ADR is VB
Rule 10 If KDM is VPB and DE is VPS then ADR is M CC is PM then ADR is M
Rule 11 If KDM is PB and DE is VPS then ADR is S CC is VPB then ADR is S
Rule 12 If KDM is PM and DE is VPS then ADR is S CC is VPB then ADR is S
Rule 13 If KDM is PS and DE is PM then ADR is S Rule 41 If CC is PB and DE is VPS then ADR is S
Rule 14 If KDM is VPS and DE is PB then ADR is VVB Rule 42 If CC is PM and DE is PS then ADR is S

Model has 55 rules.

For example,

Rule 1: If collecting information for disaster mitigation is very positive big and disaster experience is very positive big, then awareness of disaster risk is very very big.

Where NHM is number of household members, VPB is vulnerable person, PPH is property in house, DE is disaster experience, CDM is community disaster mitigation, CC is connection in community, CDI is collecting information for disaster mitigation, KDM is knowledge of disaster mitigation, ADR is awareness of disaster risk, VPB: Very Positive Big, PB: Positive Big, PM: Positive Medium, PS: Positive Small, VPS: Very Positive Small, VVB: Very Very Big, VB: Very Big, B: Big, M: Middle, S: Small, VS: Very Small.

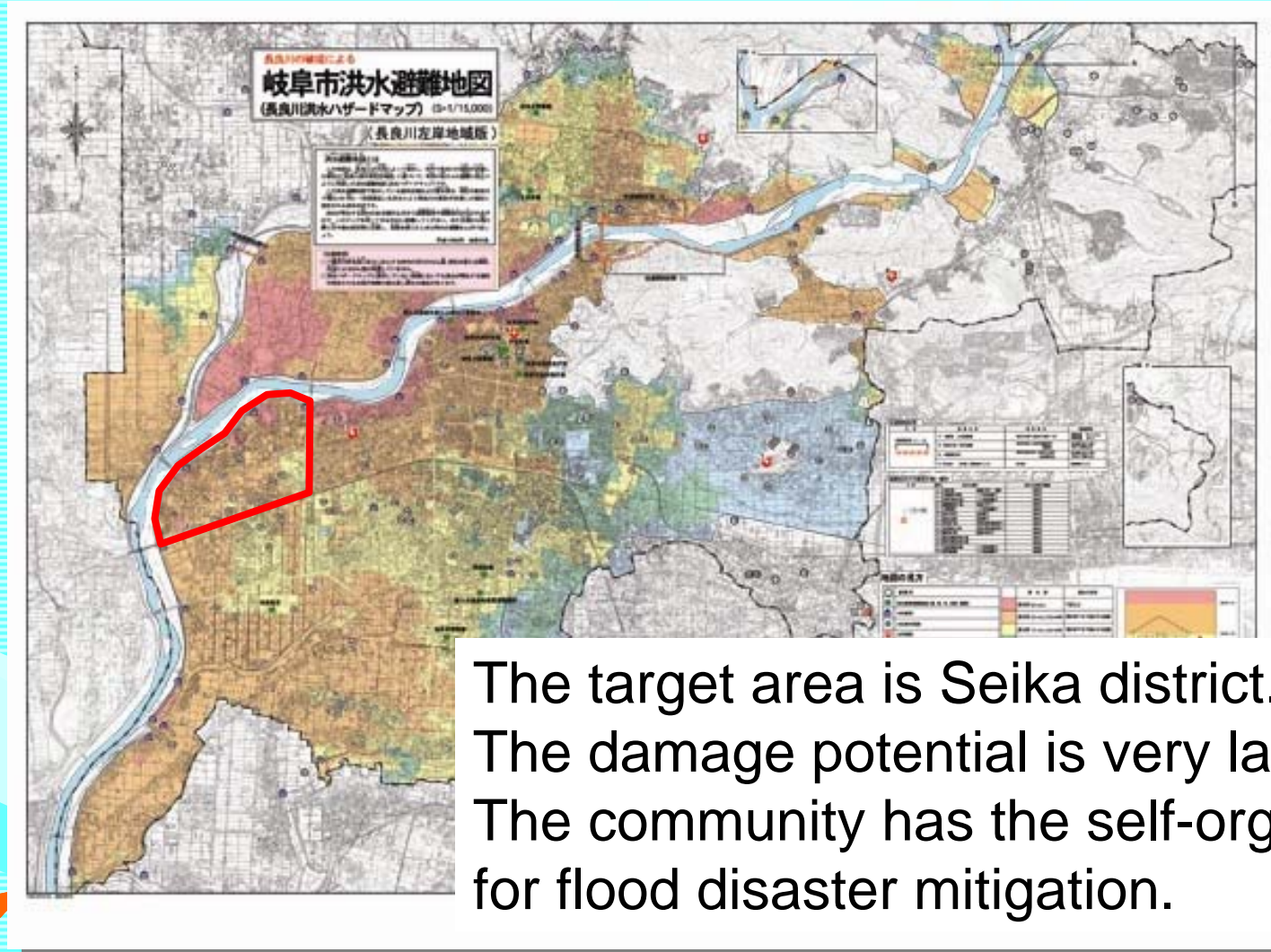
My Field Campus is Gifu City



My Field Campus is Gifu City



Local government distributed the Flood hazard map among all Gifu citizen in 2002.

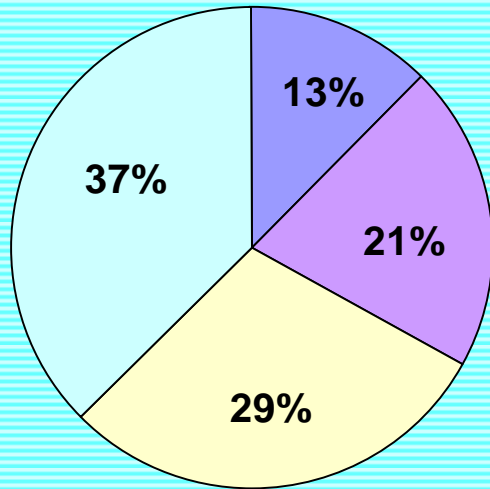


The target area is Seika district.
The damage potential is very large.
The community has the self-organization
for flood disaster mitigation.



Questionnaire

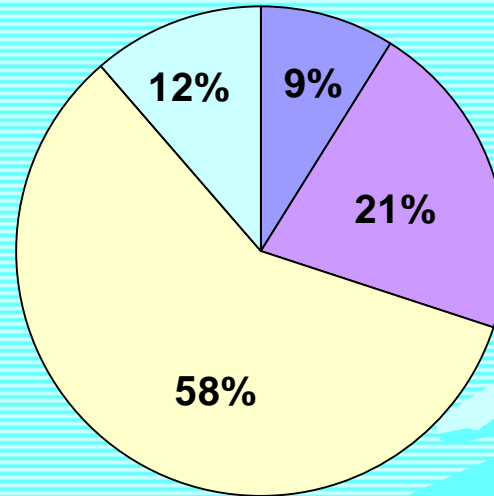
Have you checked your evacuation routes?



- I have passed.
- I have checked.
- I have not checked well.
- I have not checked.

preparedness

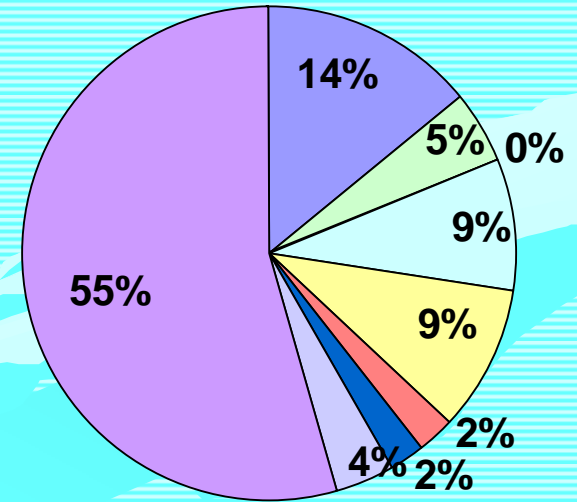
What do you think of your preparedness?



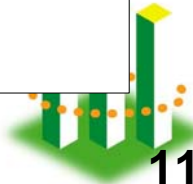
- enough
- not so bad
- not enough
- I do not know

self-evaluated preparedness

By which information source do you acquire the knowledge?

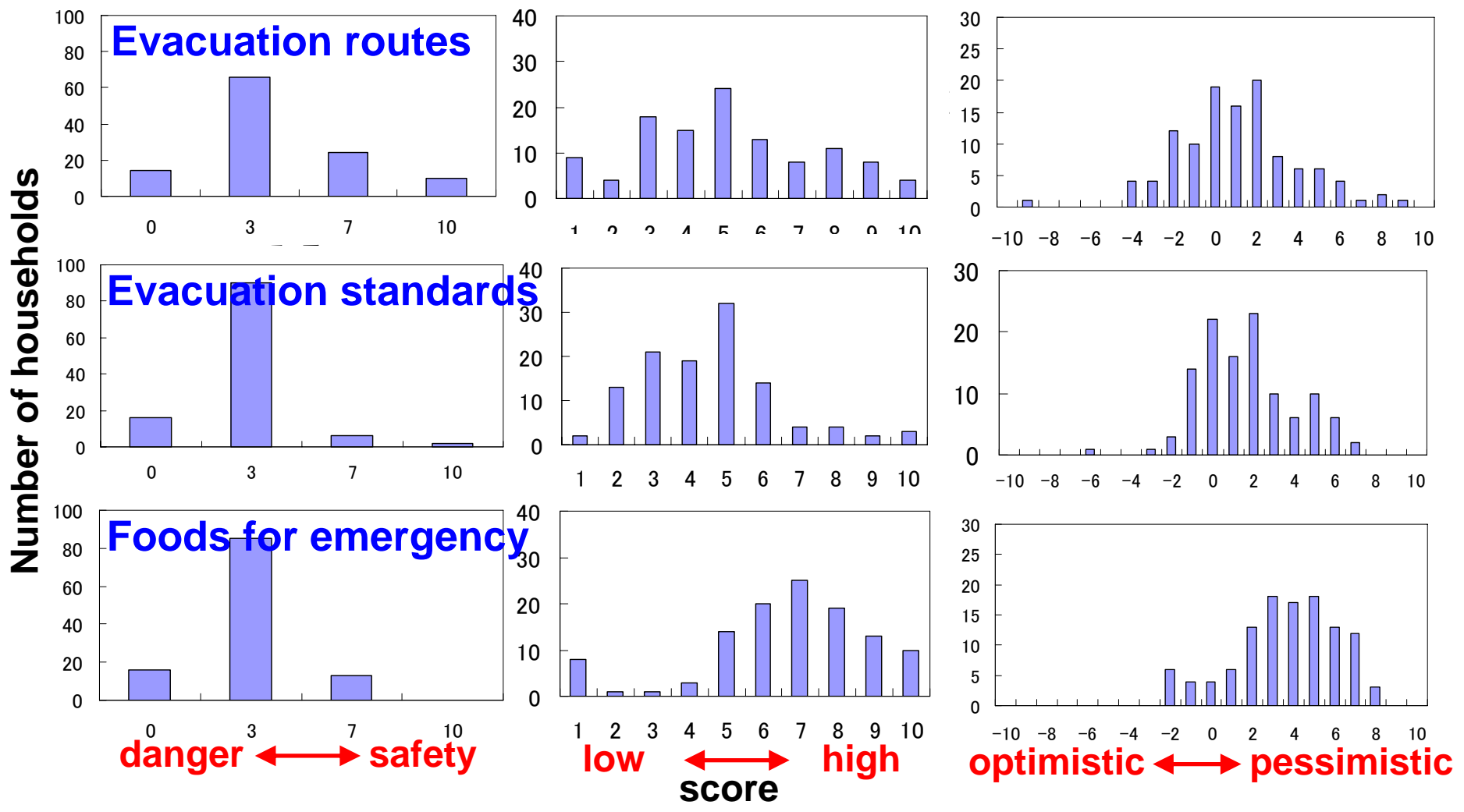


- hazard map
- person
- school
- event
- TV, radio
- newspaper, magazine
- internet
- the others
- I do not know

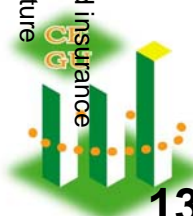
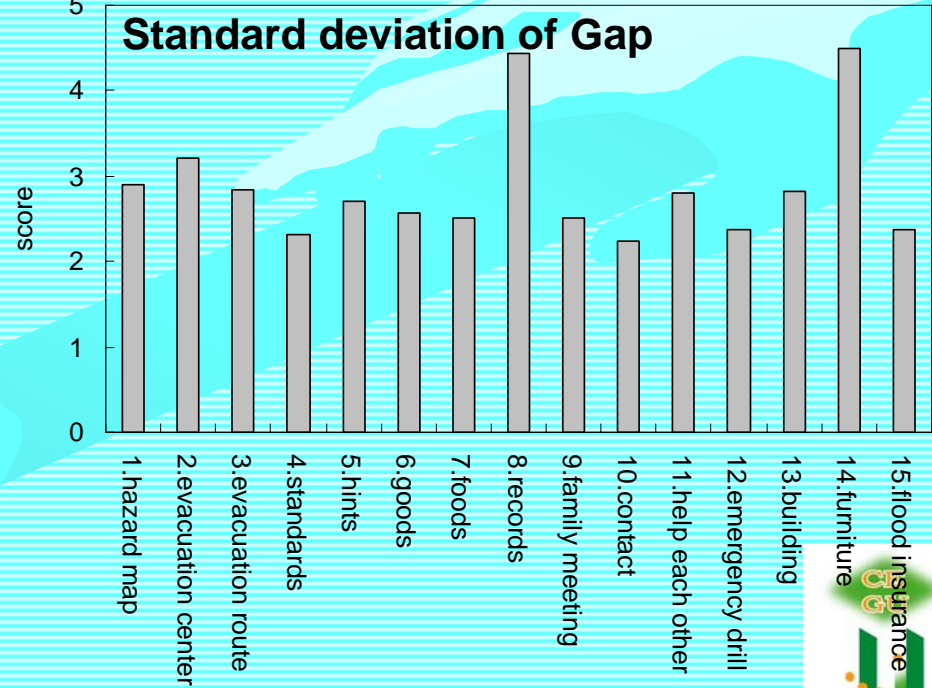
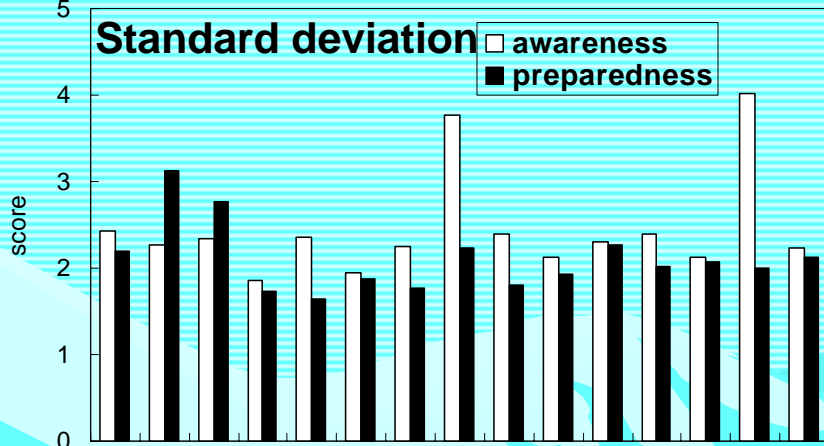
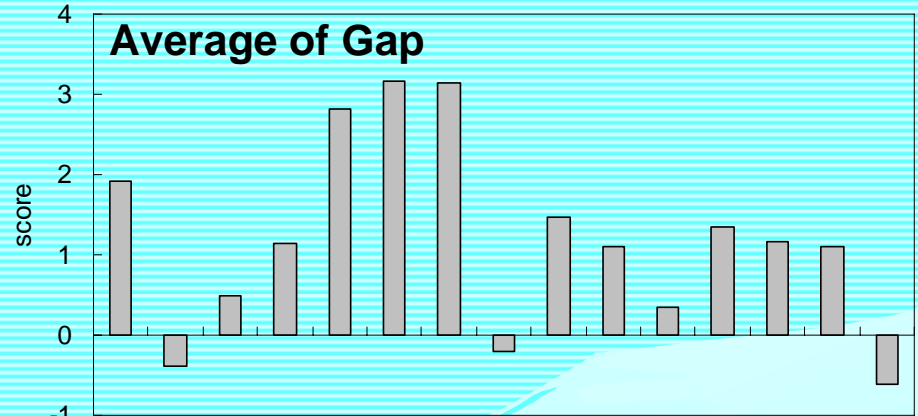
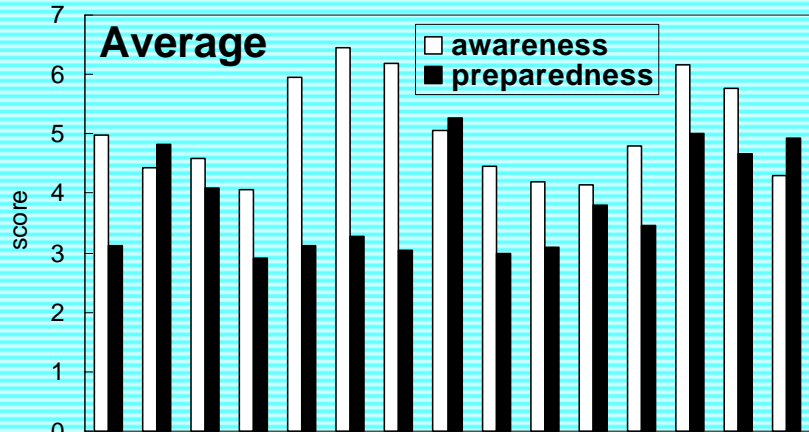


Gap between preparedness and awareness

Self-evaluated preparedness
 -
 Awareness estimated by model
 =
 Gap



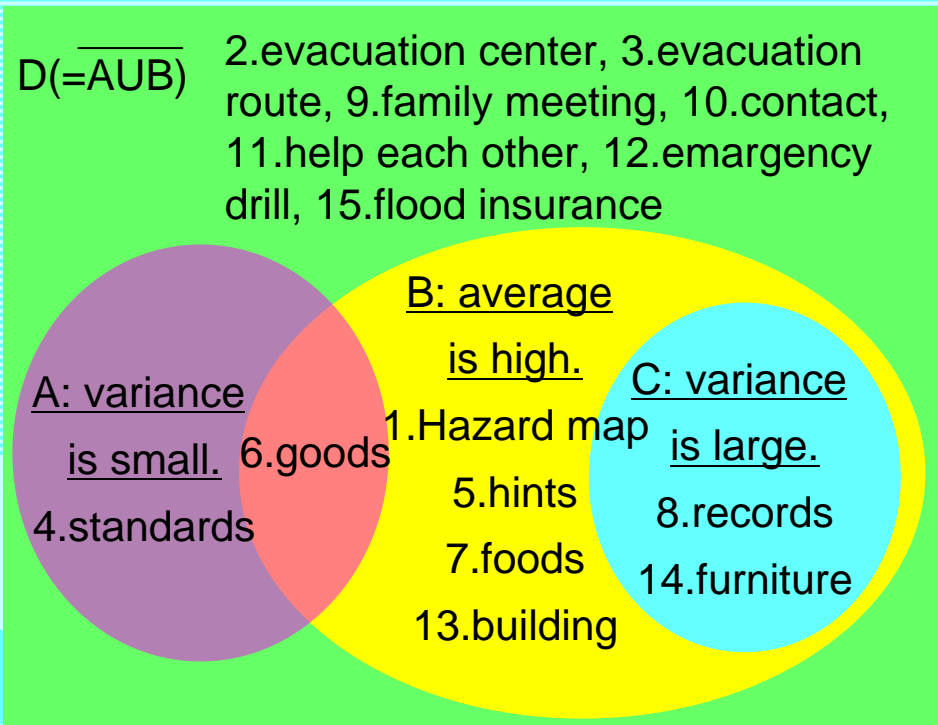
Average and variance of preparedness, awareness and Gap



Classification of preparedness

Classification by average and variance of awareness

Classification by Gap



Type I	8.records, 13.building, 14.furniture
Type II	2.evacuation center, 15.flood insurance
Type III	1.hazard map, 3.evacuation route, 4.standards, 5.hints, 6.goods, 7.foods, 9.family meeting, 10.contact, 11.help each other, 12.emergency drill

Type I: awareness is low and Gap varies.
 Type II: awareness is high and Gap varies.
 Type III: awareness is high and Gap is large.



Problems about preparedness

Problem	Type	Preparedness
Perceptual discord is very strong.	$A \cap B$ -III	6.goods on evacuating
Perceptual discord is strong.	B-III	1.hazard map, 5.hints on evacuating, 7.foods for emergency
Perceptual discord exists.	D-III	3.evacuation route, 9.family meeting, 10.contact at emergency, 11.help each other, 12.emergency drill,
Individual difference of awareness is large.	C-I, B-I	8.flooded records, 13.how to build a house, 14.how to place furniture
Individual difference of awareness is large. A part of people are not going to prepare.	D-II	2.evacuation center, 15.flood insurance
Awareness is low.	A-III	4.evacuation standards

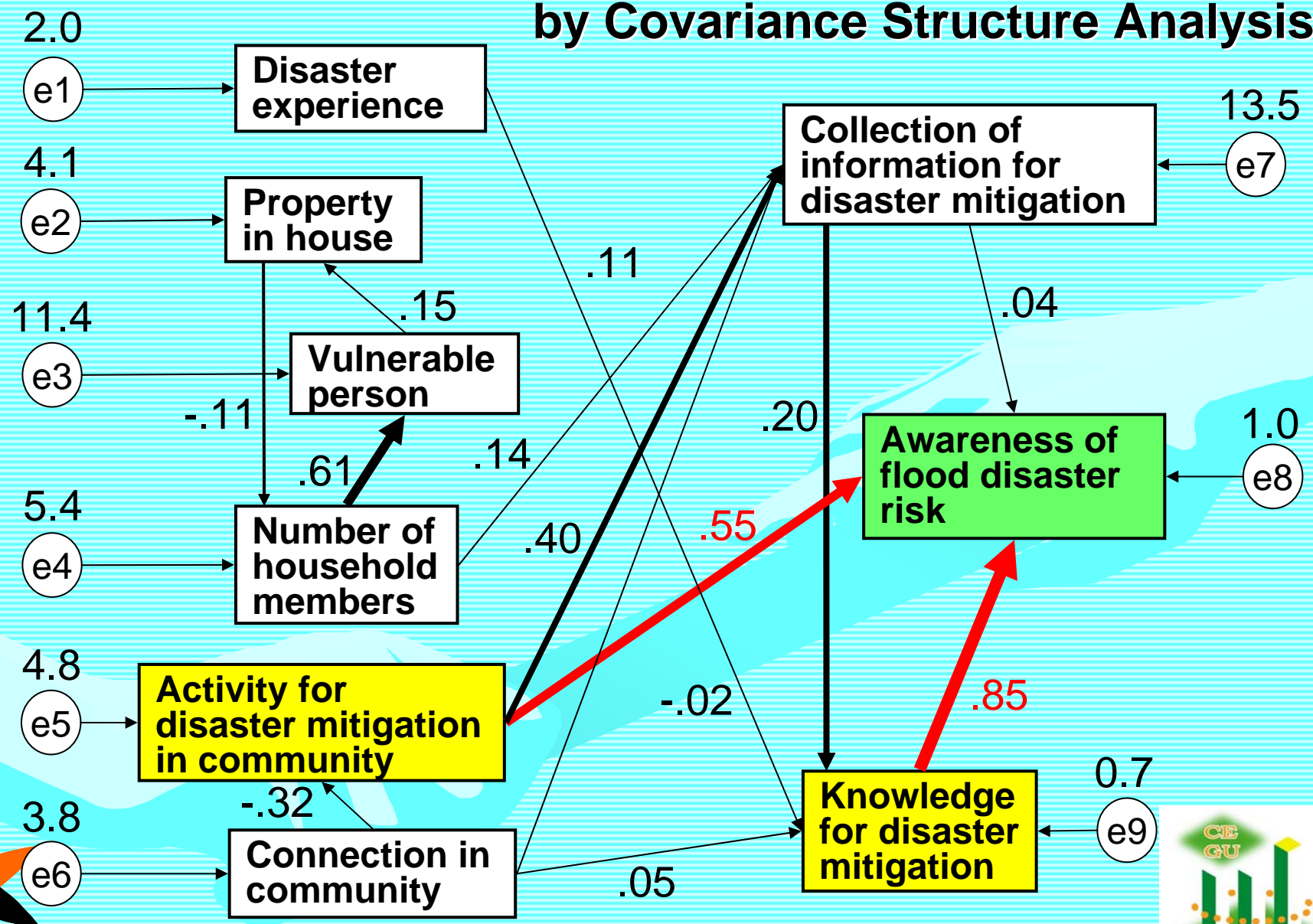
In order to improve preparedness

1. The awareness is not enough as a whole.
→ **The improvement of awareness is required in the whole community.**
 - 2.evacuation center, 3.evacuation route, 4.evacuation standards, 9.family meeting, 10.contact at emergency, 11.help each other, 15.flood insurance
2. Individual difference of awareness is large.
→ **The improvement of awareness is required to people whose awareness is not enough.**
 - 8.flooded records, 14.place furniture
3. People are not going to prepare. =People think that it's enough.
 - 2.evacuation center, 15.flood insurance
 - These are contained in 1 or 2 above.→ **First of all, the improvement of awareness is required.**
 - It is not sure whether their behaviors change or not.
4. **People are going to prepare, but have not prepared yet.**
 - **People agree in the general and particular, but do not practice. = perceptual discord**→ **I should try in my field campus. Ex. work shop or education, etc.**



Structure of awareness of flood disaster risk

by Covariance Structure Analysis



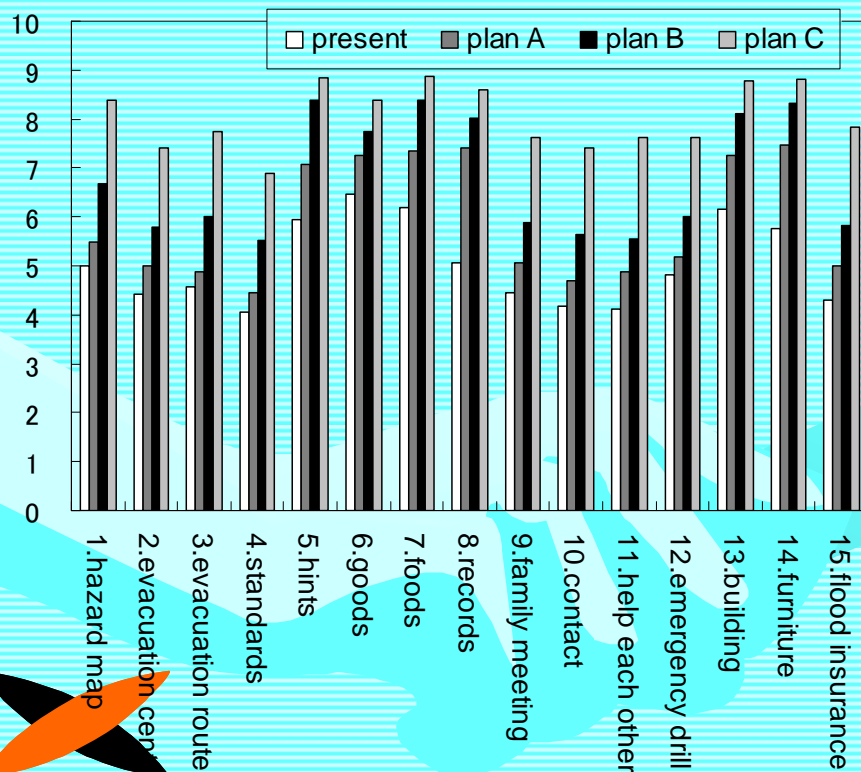
Measures for improving awareness

Plan A: to participate the emergency drill in community

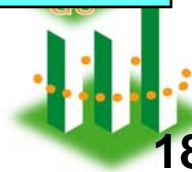
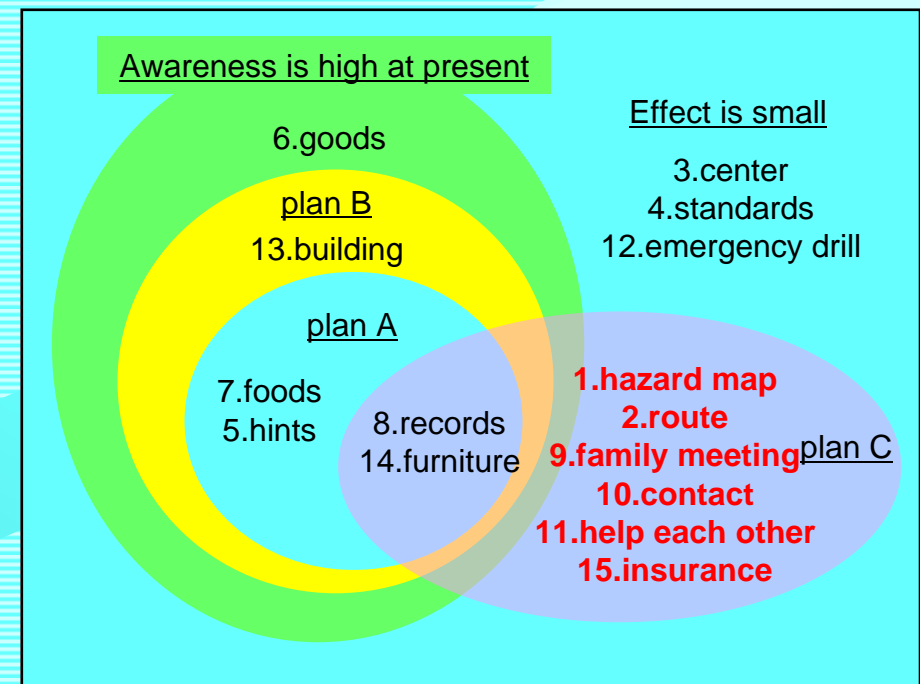
Plan B: to inform how to prepare flood disaster

Plan C: Plan A + Plan B

Evaluation of measures



Efficiency of measures



Concluding remarks

- 1. The actual conditions of preparedness, awareness and Gap in 15 kinds of preparedness for mitigating flood disaster risk were investigated and estimated by questionnaire and the fuzzy reasoning model in Gifu city.**
- 2. The preparedness and those problems were classified and arranged by preparedness, awareness and Gap.**
- 3. The necessity of improving awareness was shown in order to improve preparedness. And the measures for improving awareness were evaluated.**



Thank you for your attention

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Awareness

