SUITABILITY MODEL

RISK INFORMED DECISIONS FOR PLANNING AND INVESTMENT

Demystifying the Global Agenda Frameworks into Practice Forum

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Disasters Can Have Devastating Impacts

1.4

People

Disasters from natural hazards affected 1.4 **billion people***

500

Lives

Disasters from natural hazards claimed 500 **thousand lives***

523

Economy

Disasters from natural hazards caused $523 **billion in economic losses***

*Asia-Pacific, 2005-2014

"If [a plan] is not risk-informed, it [can't lead to] sustainable development"

– United Nations Development Programme –

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Is Your Plan Risk-Informed?

DOES YOUR DEVELOPMENT PLAN TAKE HAZARDS AND VULNERABILITIES INTO ACCOUNT?

IS YOUR METHOD CONSIDERING CLIMATE CHANGE PROJECTIONS?

YET YOU ARE UNAWARE ABOUT THE ECONOMIC RISKS A DISASTER CAN PUT ON YOUR COMMUNITY?

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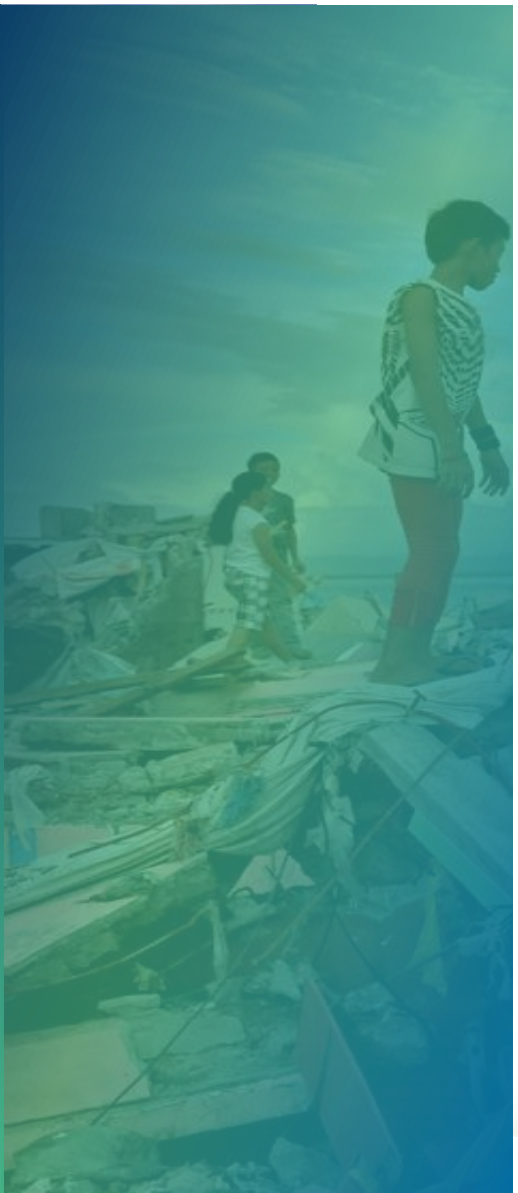
What Is The Issue At Hand?

Standard hazard mapping methods only depict risk categories for different hazards in a pre-defined area

No information about the expected damages or **monetary losses from risks** associated with different hazards

The **Financial Liabilities** of Disaster?

and climate risks are difficult to predict



We Support You to Reveal The Financial Liabilities of Risks

The **Suitability Model** seeks to deliver **easy-to-understand** and **ready-to-process** land use planning and investment directions

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Provides context-specific **quantifications of risks** from potential hazards for land use or investment plans in a predefined area of land

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Methodology follows a **simple step-by-step guideline** so users only need to have basic knowledge of the processes involved

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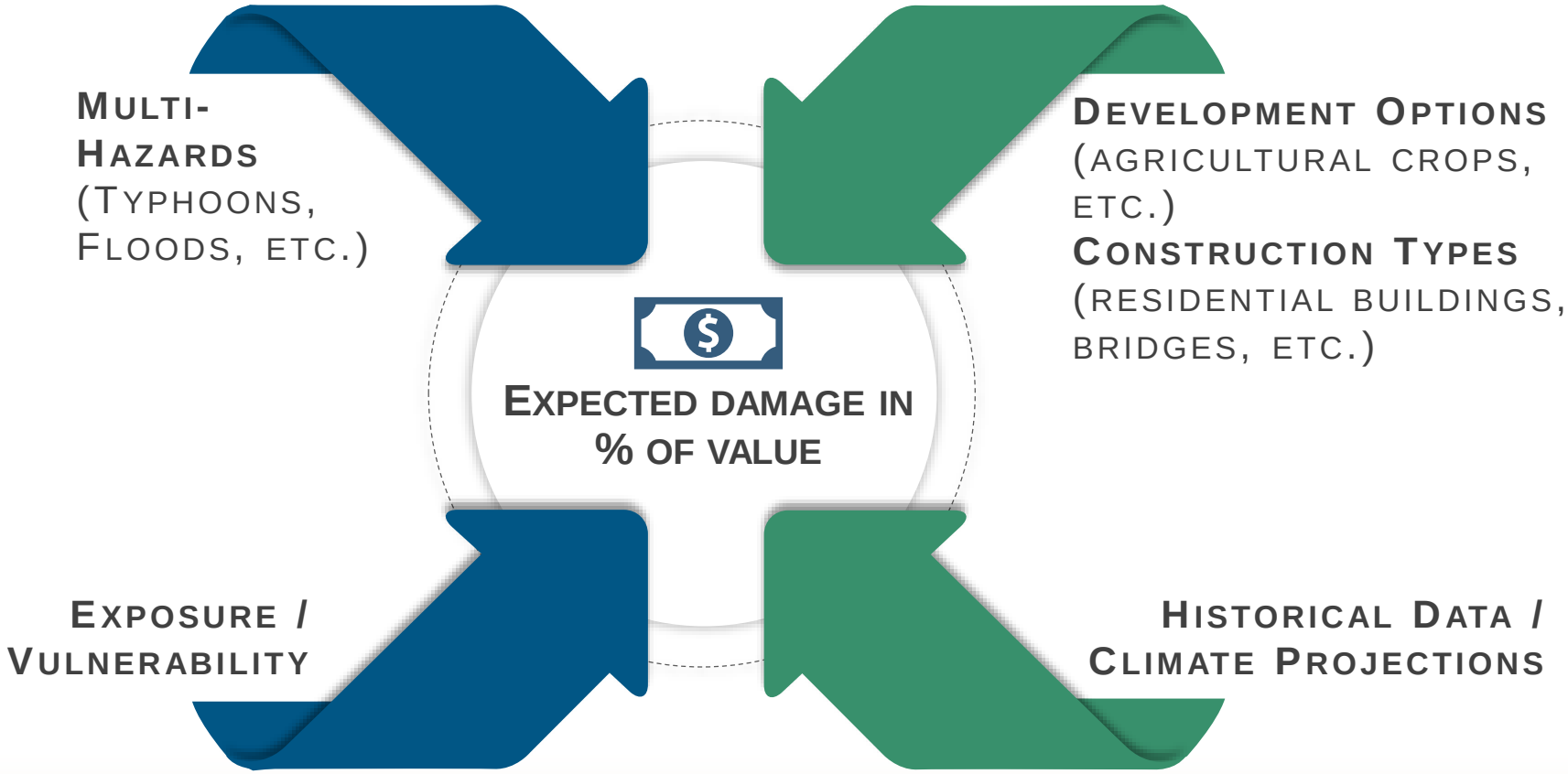


The Process of the Suitability modelling

STEP 1

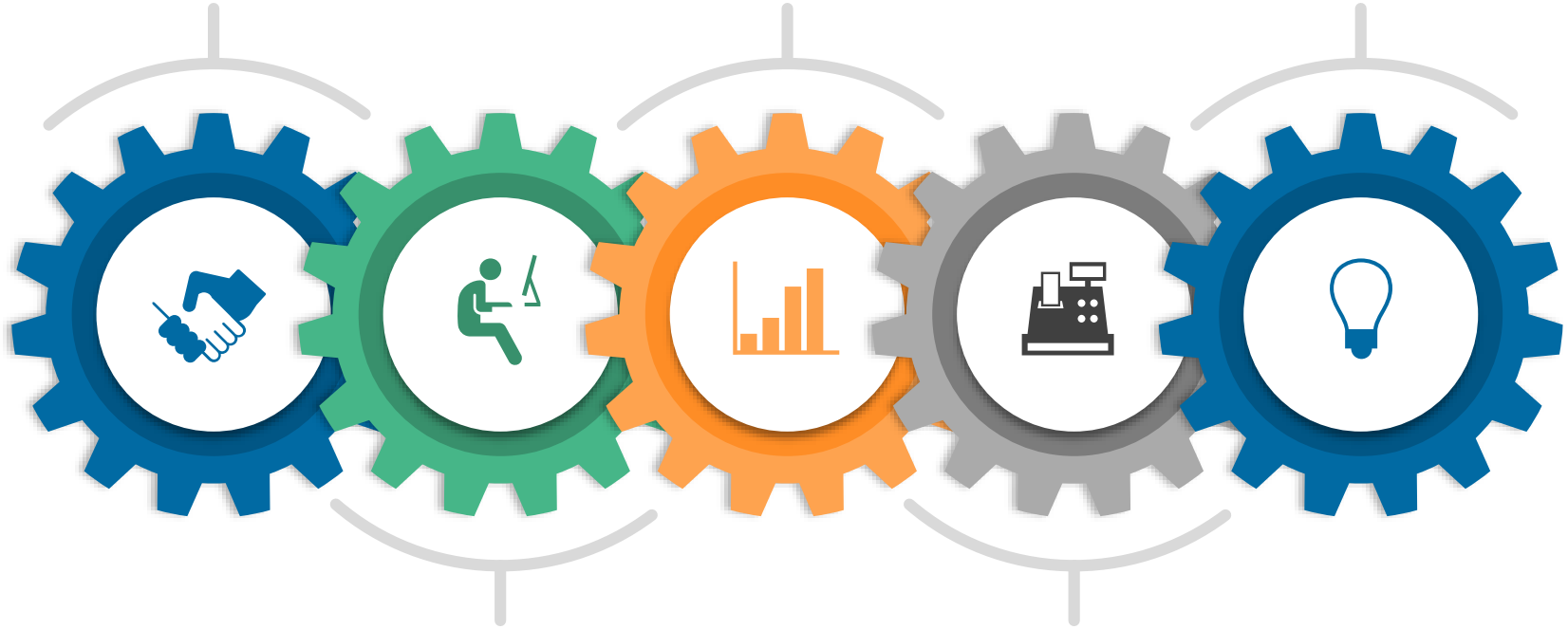
Consulting process to define expectations and priority areas.

STEP 3

Adding risk probabilities, factor in historical and future climate data.

STEP 5

Evaluating the results and providing a brief recommendation guide.



STEP 2

Analysing and Reflecting on existing Multi-Hazard Exposure Maps.

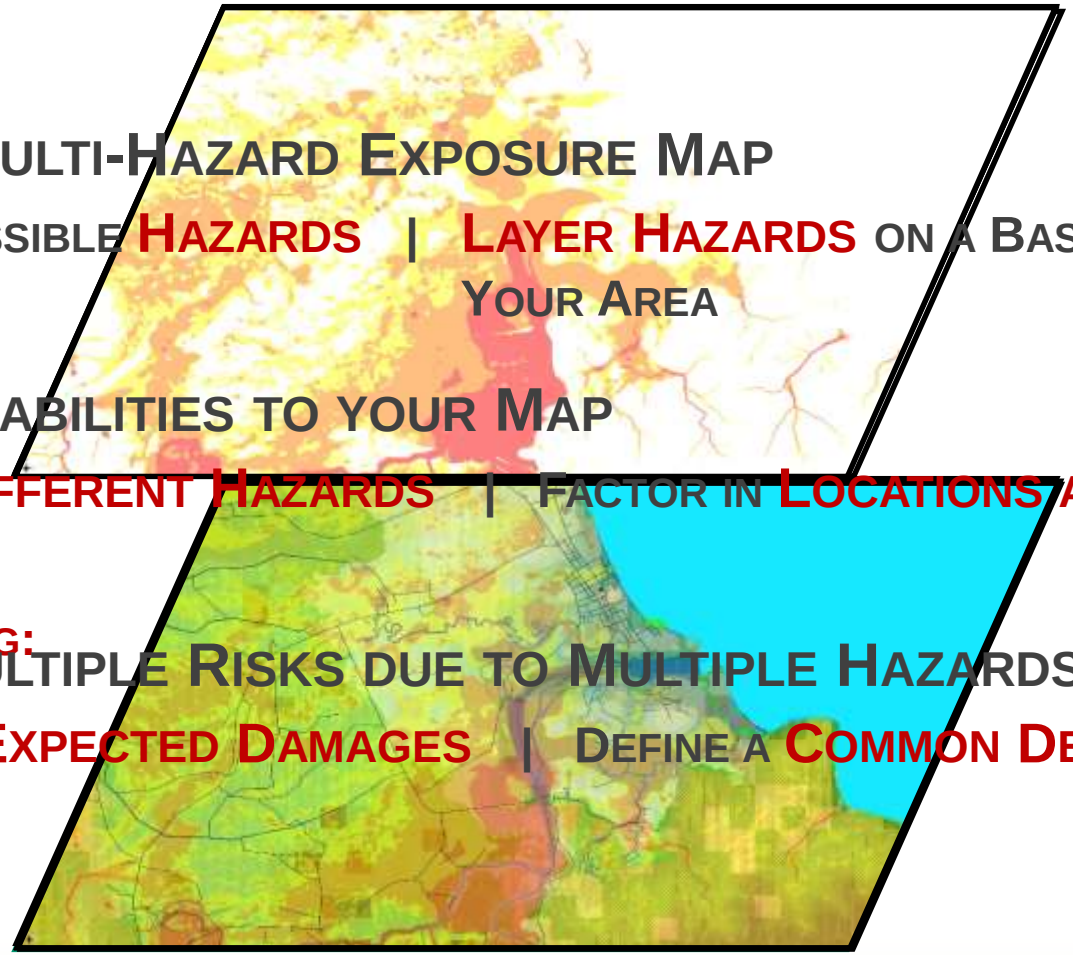
STEP 4

Calculating the expected damages and define a common denominator (percent, currency, etc.).

TECHNICAL METHODOLOGY – How does the Suitability Model work?

- ✓ **Building a Multi-Hazard Exposure Map**
  - **Identify Possible Hazards** | **Layer Hazards on a Baseline Map of Your Area**
- ✓ **Adding Risk Probabilities to your Map**
  - **Add Risks by Different Hazards** | **Factor in Locations and Return Periods**
- ✓ **Harmonise for Multiple Risks due to Multiple Hazards**
  - **Calculate the Expected Damages** | **Define a Common Denominator**

METHOD – How does the Suitability Model work?



✓ **Building a Multi-Hazard Exposure Map**

Identify Possible Hazards | Layer Hazards on a Baseline Map of Your Area

Floods
Storm Surges
Typhoons
Earthquakes
Tsunami
Landslides

✓ **Adding Risk Probabilities to your Map**

Add Risks by Different Hazards | Factor in Locations and Return Periods

Layered Hazard Map, including:

Base Map, including:

✓ **Harmonise for Multiple Risks due to Multiple Hazards**

Calculate the Expected Damages | Define a Common Denominator

- Altitude
- Roads
- Rivers

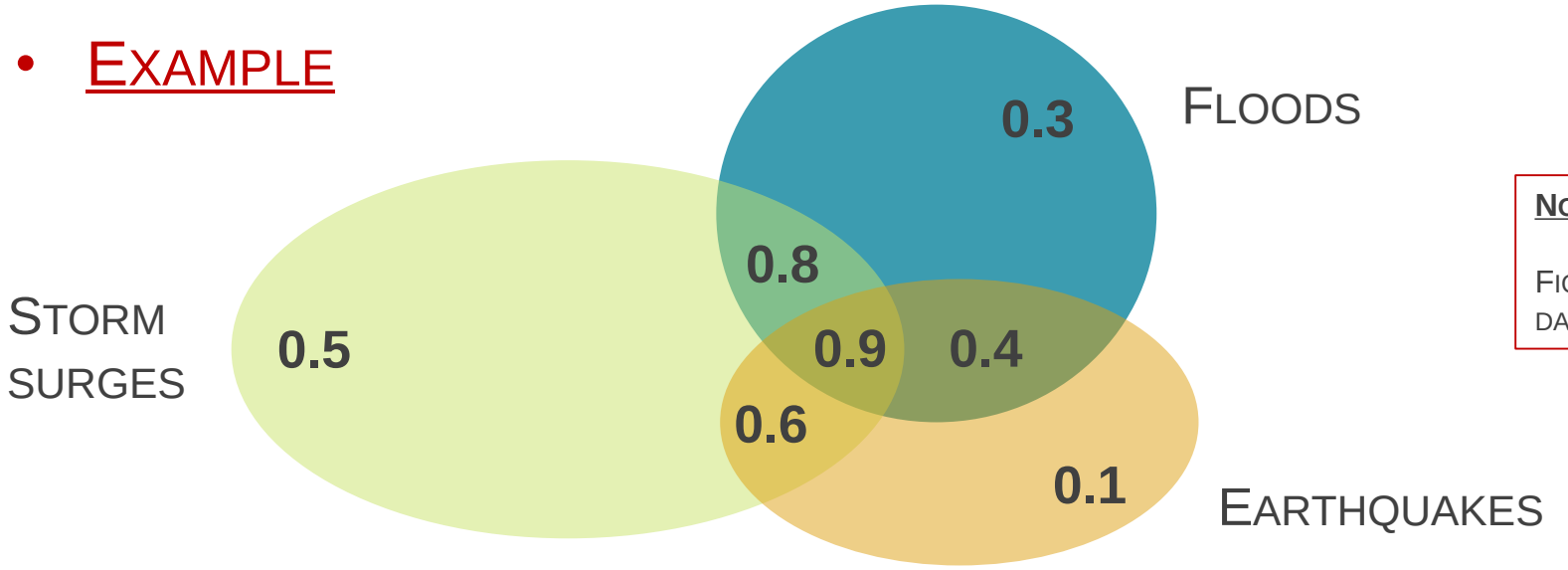
✓ Adding Risk Probabilities to your Map

Add Risks by Different Hazards | Factor in Locations and Return Periods

- Generally

  Adding risks caused by different hazards gives a Multi-Hazard Risk Map

- Example



Note:

Figures in expected % damage per year

✓ Adding Risk Probabilities to your Map

Add Risks by Different Hazards | Factor in Locations and Return Periods

! **But**

Some areas of land are less, others are more exposed and vulnerable to natural hazards

! **Likewise**

Different return periods of specific hazards need to be accounted for

✓ Adding Risk Probabilities to your Map

Add Risks by Different Hazards | Factor in Locations and Return Periods

- Example

Decreasing Impact of Storm surges and Tsunami

- Example

Height at Shore	Expected damage according to water height				
5m	5%	10%	40%	60%	80%
4m		5%	10%	40%	60%
3m			5%	10%	40%
2m				5%	10%
1m					5%

- ADDITIONALLY

TAKING INTO ACCOUNT DIFFERENT RETURN PERIODS

HEIGHT AT SHORE	RETURN PERIOD	PROBABILITY	EXPECTED ANNUAL DAMAGE PER WATER HEIGHT				
5M	500 YEARS	0.002	0.01%	0.02%	0.08%	0.12%	0.16%
4M	300 YEARS	0.003		0.02%	0.03%	0.13%	0.20%
3M	200 YEARS	0.005			0.03%	0.05%	0.20%
2M	100 YEARS	0.010				0.05%	0.10%
1M	50 YEARS	0.025					0.10%
		TOTAL	**0.01%**	**0.04%**	**0.14%**	**0.35%**	**0.76%**

✓ HARMONISE FOR MULTIPLE RISKS DUE TO MULTIPLE HAZARDS

CALCULATE THE EXPECTED DAMAGES | DEFINE A COMMON DENOMINATOR

- QUANTIFYING the EXPECTED DAMAGES caused by hazards in PERCENT OF VALUE PER YEAR

- 'Expected Damages' CAN therefore EASILY BE TRANSLATED into any OTHER VALUE according to user requirements

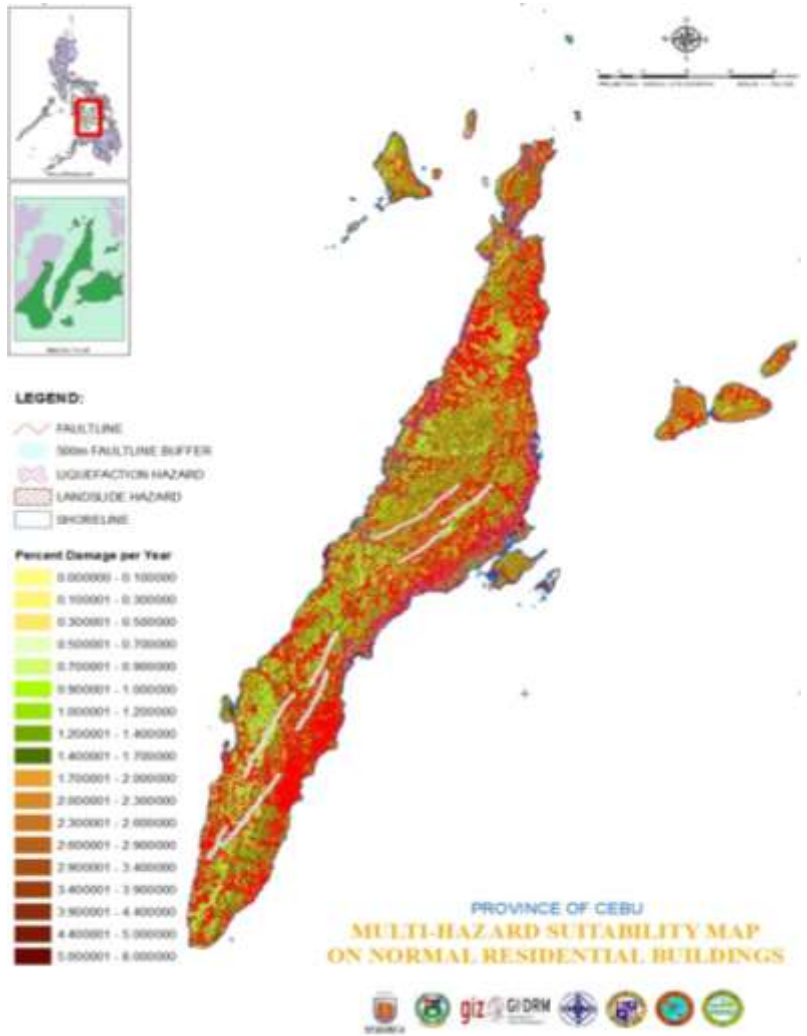
OUTCOME – WHAT DOES THE SUITABILITY MAP LOOK LIKE?

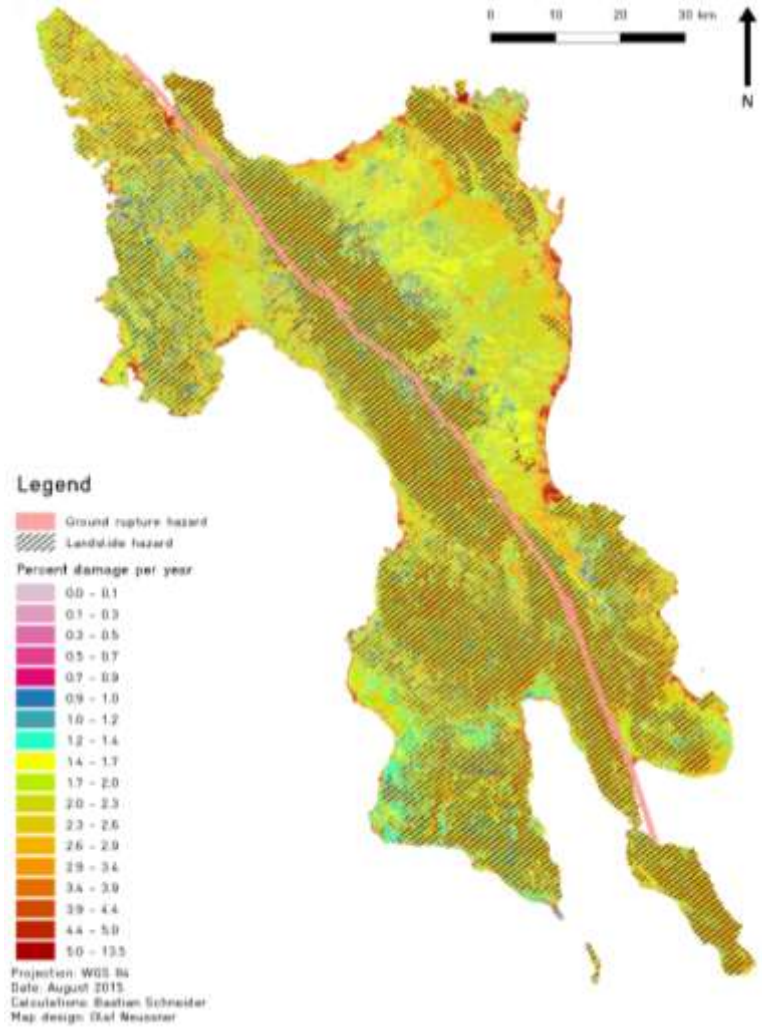
- At first glance, a Suitability Map looks similar to a classic hazard map
- But
  COLOUR-CODED INFORMATION provides EXPECTED DAMAGES IN % per year
- EXAMPLE

THE FINAL PRODUCT

MULTI-HAZARD SUITABILITY MAPS FOR RESIDENTIAL BUILDINGS IN THE PHILIPPINES

- EXAMPLE

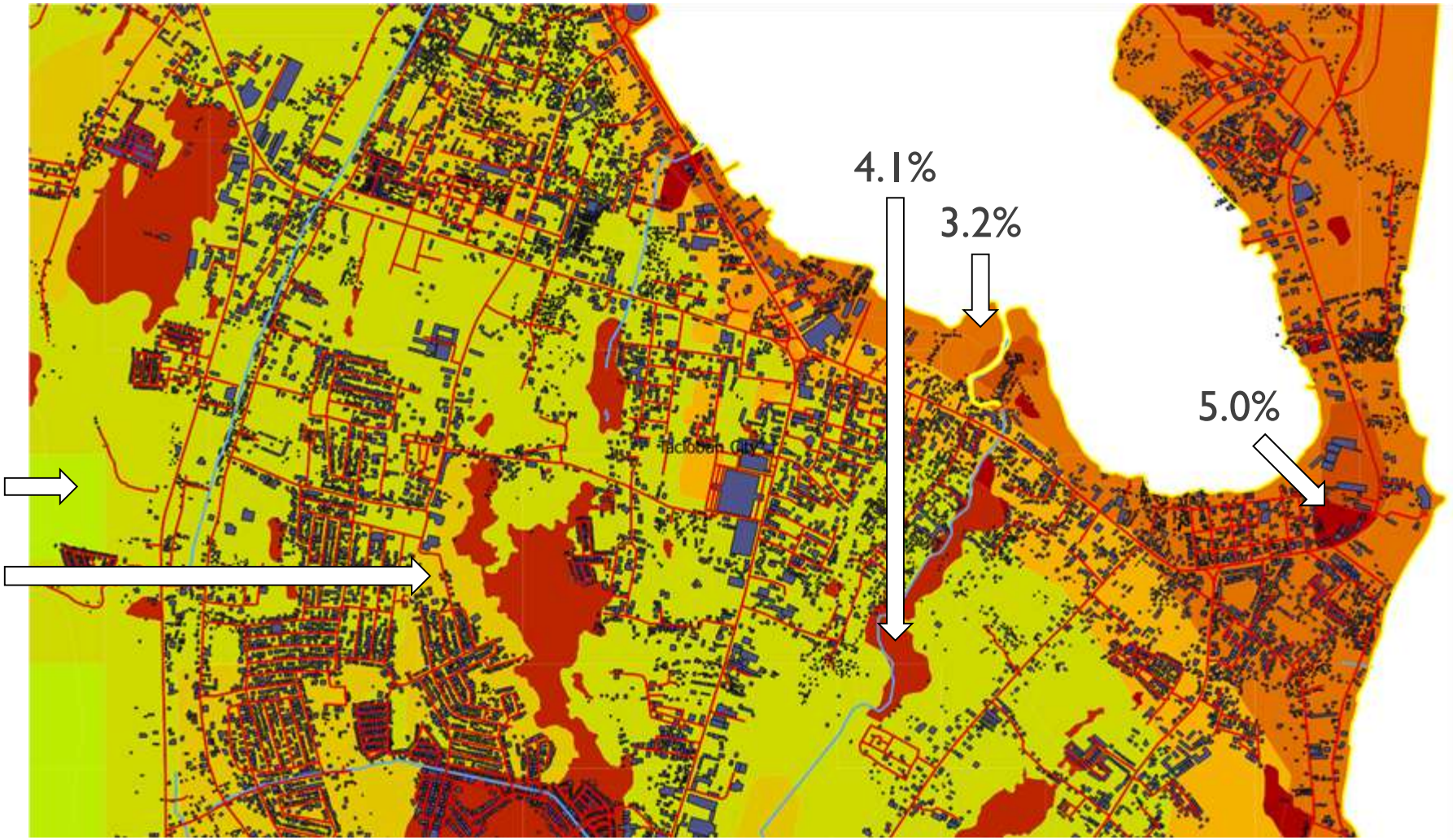




EXAMPLE 2

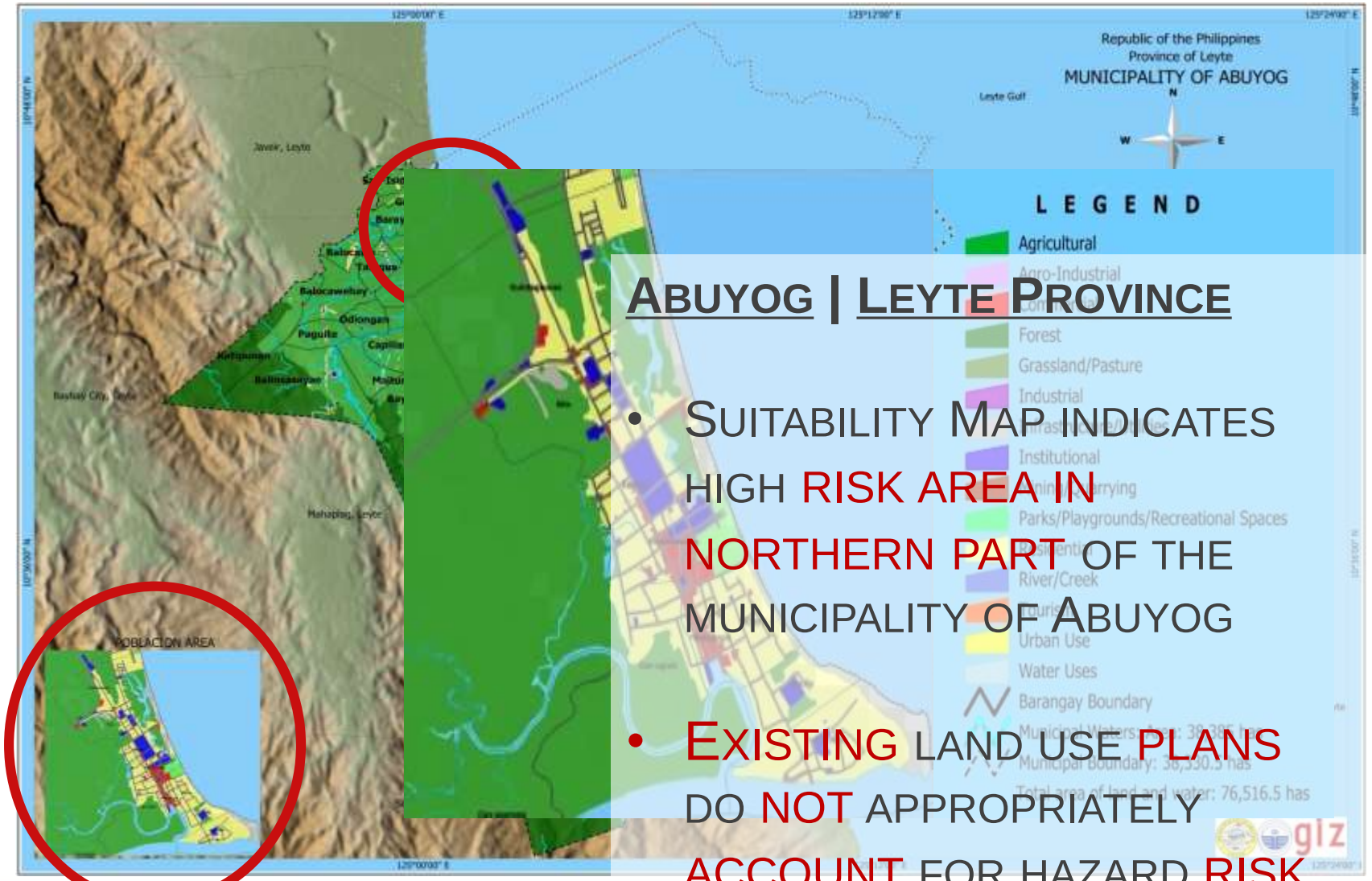
ZOOMED-IN PERSPECTIVE

EXPECTED % DAMAGE PER YEAR



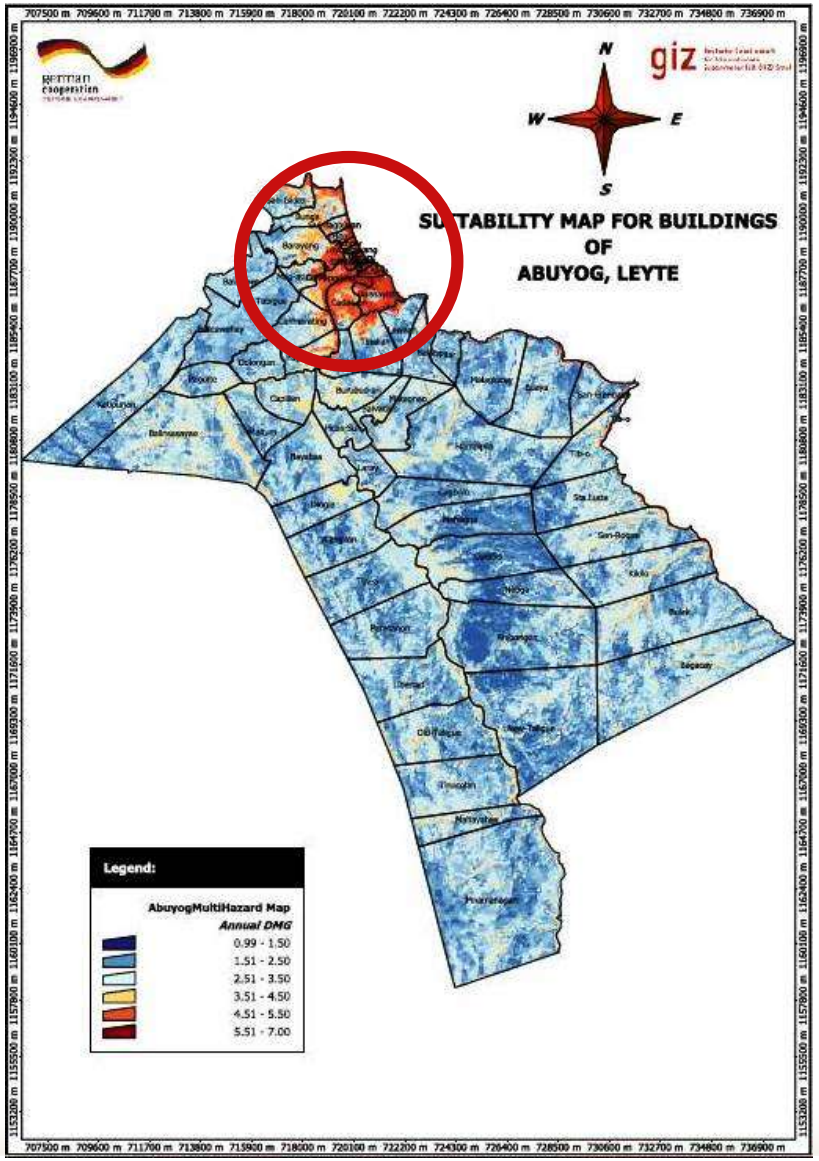
APPLICATION – HOW WILL DATA DERIVED FROM THE MODEL BENEFIT YOU?

- Allows for STRATEGIC DECISION-MAKING
- Allows for climate change and hazard RISK INFORMED land use PLANNING decisions
- Entails PRECISE INFORMATION regarding area-specific hazards, vulnerabilities, exposure and climate change projections AND the IMPACT ON specific types of INFRASTRUCTURES
- EXAMPLE 1



ABUYOG | LEYTE PROVINCE

- SUITABILITY MAP INDICATES HIGH RISK AREA IN NORTHERN PART OF THE MUNICIPALITY OF ABUYOG
- EXISTING LAND USE PLANS DO NOT APPROPRIATELY ACCOUNT FOR HAZARD RISK



EXAMPLE 1

Re-classifcation of Land-use

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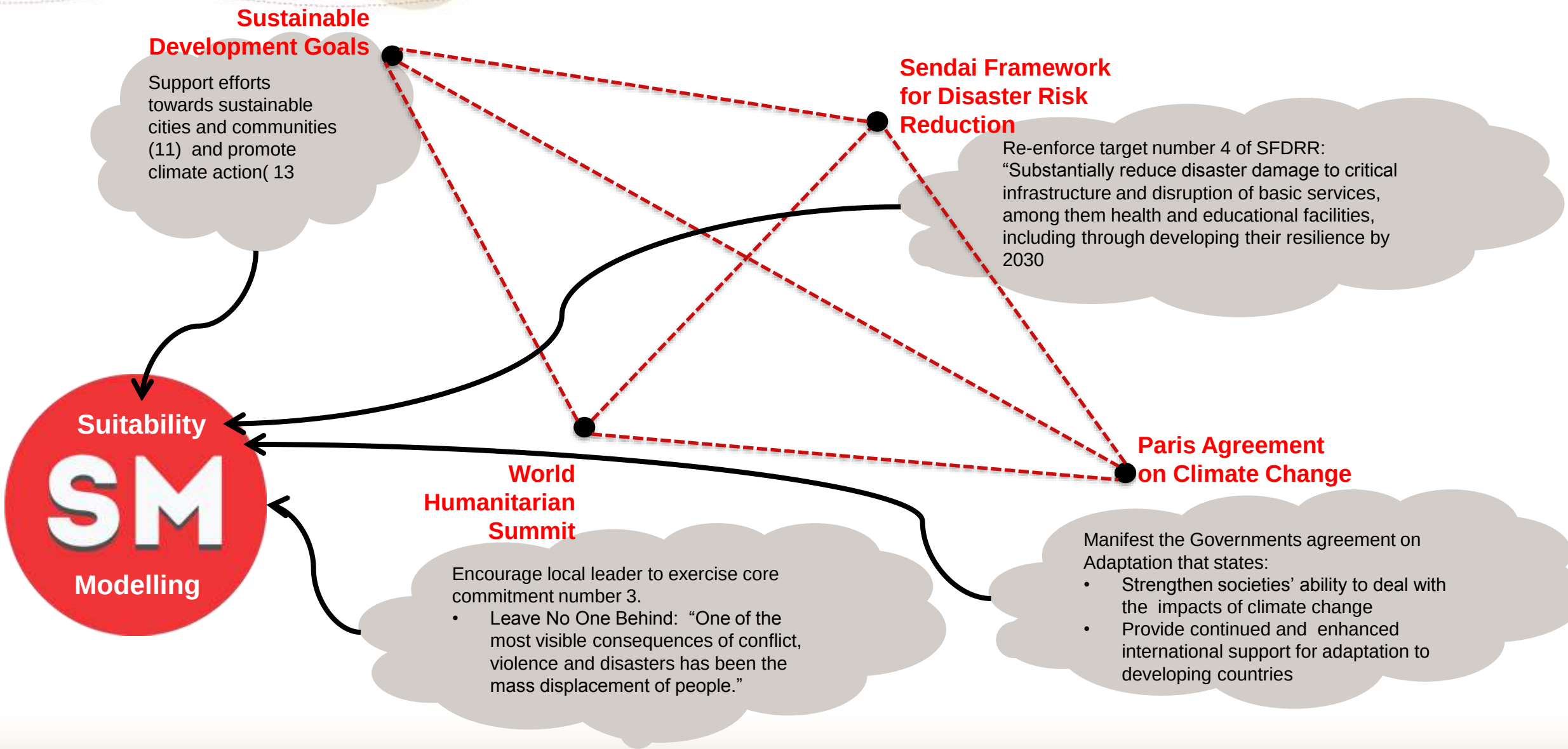
Because of risk-informed CLUPS, the LGU, explore the potential of their territorial jurisdiction with long term disaster resiliency perspective

Open the mind set of local stakeholders to build LGU alliances based watershed configuration

- **EXAMPLE 2 | CEBU PROVINCE**

  - Provincial LGUs in Cebu applied to ACCESS FUNDS through the PEOPLE'S SURVIVAL FUND of the Philippine Government

  - Knowledge and application results from the SUITABILITY MODEL significantly INCREASED CHANCE to access 2 billion PHP or 40 MILLION US$


Sustainable Development Goals
Support efforts towards sustainable cities and communities (11) and promote climate action(13
Sendai Framework for Disaster Risk Reduction
Re-enforce target number 4 of SFDRR: "Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030
Suitability
SM
Modelling
World Humanitarian Summit
Encourage local leader to exercise core commitment number 3.
• Leave No One Behind: "One of the most visible consequences of conflict, violence and disasters has been the mass displacement of people."
Paris Agreement on Climate Change
Manifest the Governments agreement on Adaptation that states:
• Strengthen societies' ability to deal with the impacts of climate change
• Provide continued and enhanced international support for adaptation to developing countries

THANK YOU FOR YOUR INTEREST

CONTACT INFORMATION

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CONCLUSION

- There is no safe place on earth and also no place with infinite risk. What risk is acceptable, is up to people and their political representatives, but this might be considered;
- Especially vital installations (e.g. hospitals, rescue service, fire brigade, administrative building, etc.) should be in the safer places within a given area;
- Zoning ordinances can show where the safer area are located;
- Suitability map inform zoning ordinances;
- Suitability maps summarize and visualize the results of a risk assessment independent of the specific environment

I WILL FLASH WORDS IN THE SCREEN, ONCE YOU SEE IT, IMMEDIATELY SHOUT THE COLOR OF THE WORD.

I REPEAT SHOUT THE COLOR AND NOT THE WORD.

IT IS CLEAR?

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RED

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BLUE

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YELLOW