Week 2
22nd February, 2019
Supplement to Week 1
at 21st January, 2019

Kazuya Yasuhara K. and
Huy Nguyen Ngoc

SELF INTRODUCTION OF LECTURERS: Duc DO MINH (born in Oct. 14, 1974)

Academic Career

- 1996 Graduated from Hanoi Uni. of Mining & Geology, Vietnam
- 2004: Obtained Ph. D. from the same university

Research Fields

- Geological & Geotechnical Engineering
- Geohazards
- Climate change adaptation

Professional Career

- 1996-1997: Engineer, TEDI, Vietnam
- 1998-: Lecturer of VNU University of Science, Vietnam
- 2000: Research Fellow of Osaka University, Japan
- 2001: Research Fellow, Institute for Sea Research (NIOZ), The Netherlands
- 2006-: Specially Appointed Assoc. Prof., Ibaraki University, Japan
- 2009-: Assoc. Professor of VNU University of Science, Vietnam
- 2010-: Vice-President, General Secretary of Vietnam Association of Engineering Geology & Environment

SELF INTRODUCTION OF LECTURERS: Nguyen Ngoc Huy (born in Feb. 10, 1979)

Academic Career

- 2010 Obtained Ph.D. from Kyoto University, Japan

Research Fields

- Climate change Adaptation
- Disaster Risk Redction
- Water recourse management

Professional Career

- 2002- 2006: Lecturer, Hue University
- 2010-2011: Post-doctoral Research Fellow at Kyoto University
- 2011-2012: DRR expert for UNESCO, UN-ISDR
- 2012-2017: ISET-USA
- 2017-: Lecturer at VJU
- 2008-2018: International consultant for IFAD, UNDP, WB, ADB, Winrock International, Tetra Tech, Engility, RTI-USA, Care International, Senior Advisor for Oxfam

SELF INTRODUCTION OF LECTURERS: Kazuya YASUHARA (born in Sept. 11, 1944)

Academic Career

- 1968 Graduated from Kyushu University, Japan
- 1978: Obtained Ph. D. from the same university

Research Fields

- Geotechnical adaptation to climate change events
- Earthquake-induced geo-disasters and responses

Professional Career

- 1968-: Research Assistant, Kyushu University, Japan
- 1979-: Post-doctoral Research Fellow of University of Illinois at U-C, USA
- 1984-: Research Associate of NGI, Norway
- 1991-: Professor of Ibaraki University, Japan
- 1992-: JICA Expert at UNAM, Mexico
- 2010-present: Professor Emeritus of Ibaraki University, Japan

SELF INTRODUCTION OF LECTURERS: Satoshi Murakami (born in May 7, 1968)

Academic Career

- 1992 Graduated from Kyushu University, Japan
- 1994 Master's Degree in Kyushu University
- 2003: Obtained Ph. D. from Kyushu university

Research Fields

- Prevention and Mitigation Geo-technology against Natural Geo-disaster
- Development of Application Software for Geotechnical Big Data

Professional Fields

Geotechnical Engineering, Geo-Disaster Engineering, Geo-informatics

Professional Career

●1994-: Associate Researcher Assistant, Ibaraki University, Japan
●2005-: Lecturer, Ibaraki University, Japan
●2008-: Associate Professor, Ibaraki University, Japan
●2016-: Professor, Fukuoka University, Japan

What Is Risk Management?-1

◆The plans, actions or policies for possible risks
- to reduce the likelihood and/or consequences of risks

or

- to respond to consequences.
{WGII, AR5, IPCC, 2014}

- ➢adaptation
- ➢proactive and reactive

What is risk assessment?-2

Risk identification – the process to find out, recognize and describe the risk

Risk analysis – the process to understand the characteristics and determine the risk level

Risk evaluation – the process to compare the risk level with the result of risk analysis for determining whether the risk and its scale be acceptable or allowable

For Reducing the Climate Risk

◆Increasing adaptive capacity
- necessary adaptation

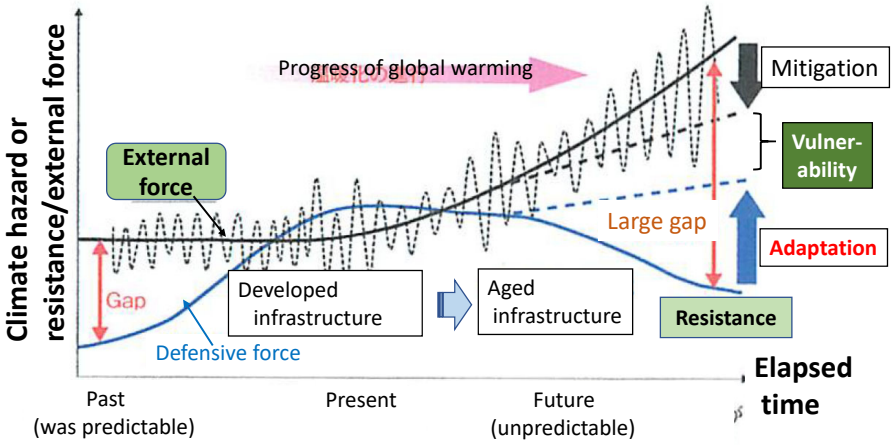
*Adaptive capacity
- The capacity of a system, community or society exposed to hazards to adapt to the climatic events (protection, accommodation and retreat/relocation)

◆Increasing resilience
- in humane, social and scientific/engineering aspects.

*Resilience
- The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management (UNISDR).

- ***"Resilience" is broader than "adaptive capacity"! Perhaps, "resilience" includes "adaptive capacity".***

Hazard, Vulnerability, Adaptation and Resilience



After Komatsu et al.（2014, 2015）

Resilience shrinks vulnerability

Risk Management

◆The plans, actions or policies for possible risks

- to reduce the likelihood and/or consequences of risks

or

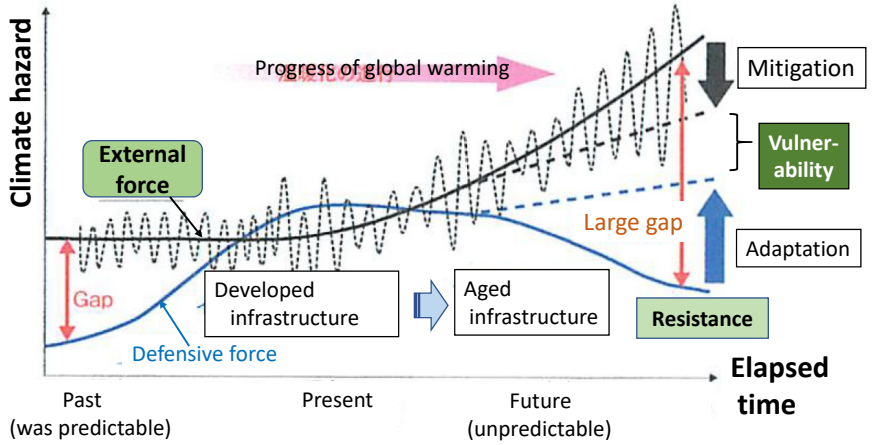
- to respond to consequences. {WGII}

- ➢adaptation
- ➢ proactive and reactive

Proactive and reactive adaptations: An example

		Proactive	Reactive
Natural			・Changes in growth period ・Chnages in species ・Migration of ecosystem
Human	Person-al	・Insurance ・Raising	・Changing farming ・Air Conditioning
	Public	・Early warning system ・Building codes ・Relocation	・Water mangement ・Raising dykes ・Beach nourishment ・Susides

Hazard, Vulnerability, Adaptation and Resilience



After Komatsu et al.（2014, 2015））

Resilience shrinks vulnerability

Management of the Risks and Extreme Events and Disasters (from SREX Report, 2014)

Introduction to the Course
(supplement to the Week 1)

Three Classes of Impacts

SREX presents three classes of impacts (IPCC, 2012a p.41):

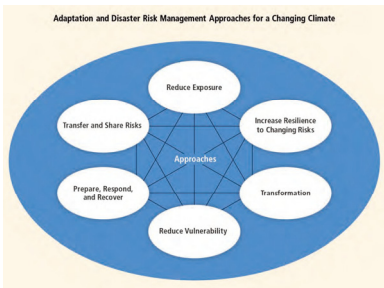
(1) changes in the natural physical environment, like beach erosion from storms and mudslides;

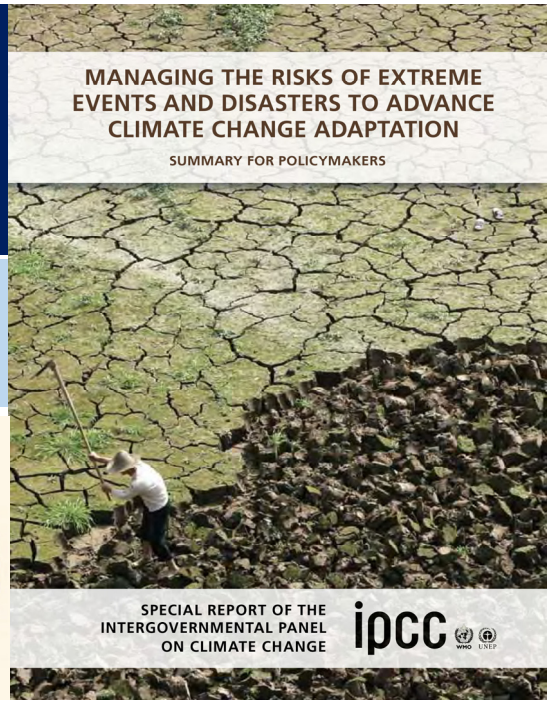
(2) changes in ecosystems, such as the blow-down of forests in hurricanes, and

(3) adverse effects on human or societal conditions and assets.

Management of the Risks of Extreme Events and Disasters

From The IPCC Special Report, 2012





A changing climate leads to changes in **extreme weather and climate events**

Flood | Fire | Cropping/agriculture | Heavy rain

Impacts from weather and climate events depend on:

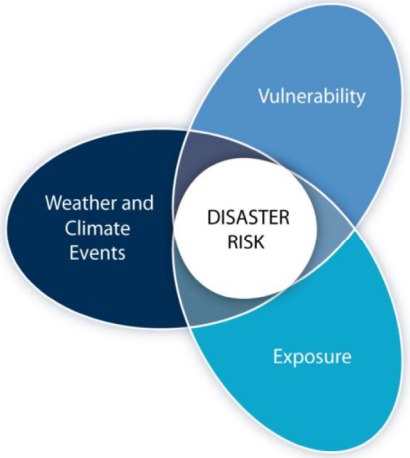
nature and severity of event

vulnerability

exposure

(the presence of people; livelihood; environmental services & resource; infrastructure; or economic, social, or cultural assets in places that could be adversely affected)

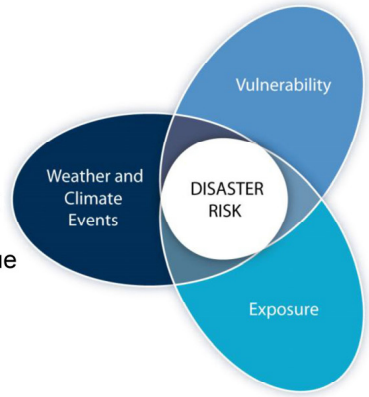
Socioeconomic development interacts with natural climate variations and human-caused climate change to influence disaster risk



Socioeconomic development interacts with natural climate variations and human-caused climate change to influence disaster risk-2

Disaster Risk:

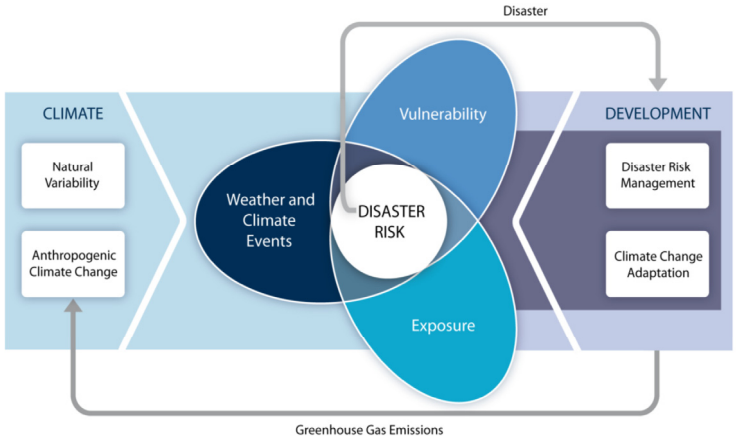
the likelihood of severe alterations in the normal functioning of a community or society due to weather or climate events interacting with vulnerable social conditions



Vulnerability:

the predisposition of a person or group to be adversely affected

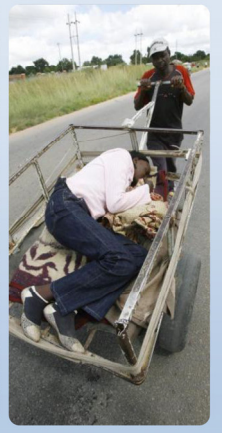
Increasing vulnerability, exposure, or severity and frequency of climate events increases disaster risk



Disaster risk management and climate change adaptation can influence the degree to which ***extreme events translate into impacts*** *and* ***disasters***

For exposed and vulnerable communities, even non-extreme weather and climate events can have extreme impacts

- Africa's largest recorded cholera outbreak
- over 90,000 affected
- over 4,000 killed
- began following onset of seasonal rains
- vulnerability and exposure increased risk

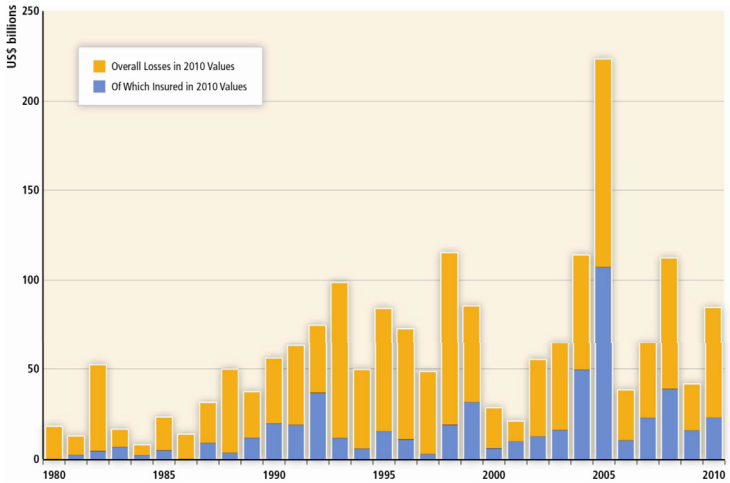


Case Study: Zimbabwe
2008

Impacts of climate extremes can be felt locally or regionally

AGRICULTURE	"Russia, Crippled by Drought, Bans Grain Exports" — *August 5, 2010, **The New York Times***
ENERGY	"Heatwave hits French power production" — *August 12, 2003, **The Guardian***
WATER	"Lake Mead is at Record Low Levels. Is the Southwest drying up?"' — *August 08, 2010, **The Independent***
PUBLIC HEALTH	"Pakistan floods: Aid trickles in for victims as cholera spreads in Pakistan's worst-ever floods" — *August 14, 2010, **The Guardian/Observer***
TOURISM	"Alpine resorts feel heat during record warm spell" — *December 08, 2006, **CNN***
TRANSPORTATION	"Flash flooding causes train to derail" — *July 30, 2001, **Chicago Sun Times***

Economic losses from climate-related disasters have increased, with large spatial and interannual variations



Data from Munich Re, 2011

Increasing exposure of people and assets has been the major cause of changes in disaster losses

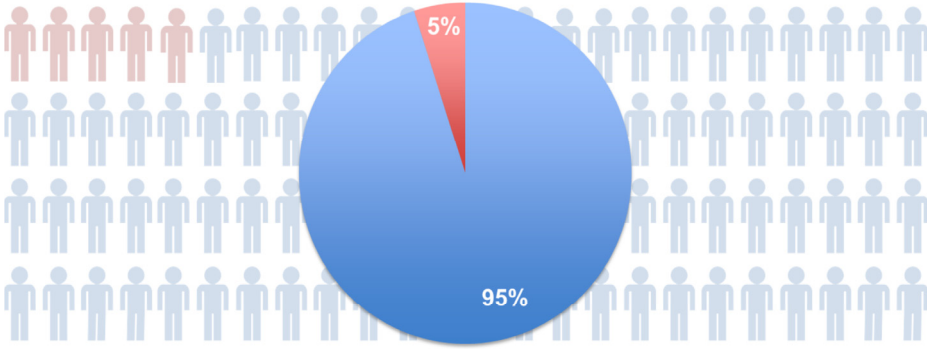
Pakistan floods, 2010
6 million left homeless

Economic disaster losses are higher in developed countries

Fire

Flood

Fatalities are higher in developing countries



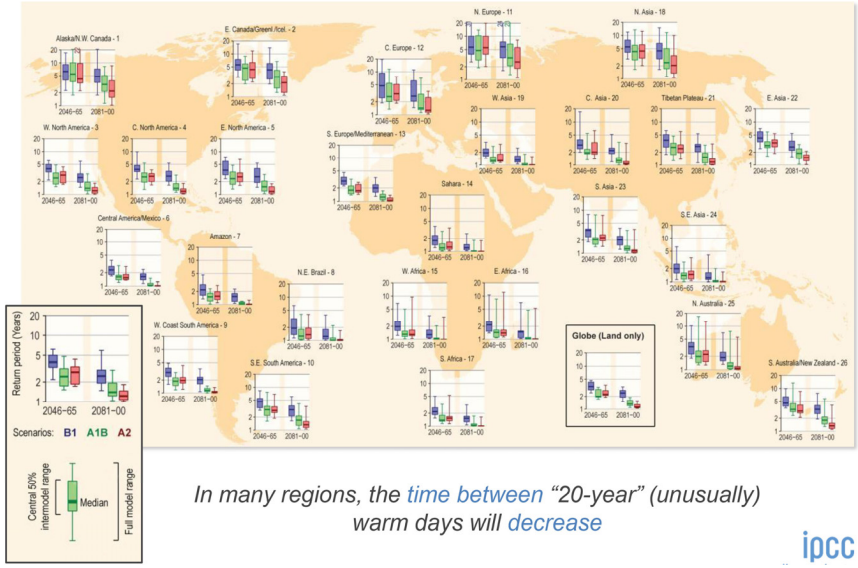
From 1970-2008, over **95%** of natural-disaster-related deaths occurred in developing countries

Since 1950, extreme hot days and heavy precipitation have become more common

Hot days

Heavy precipitation

Climate models project more frequent hot days throughout the 21st century



In many regions, the time between "20-year" (unusually) warm days will decrease

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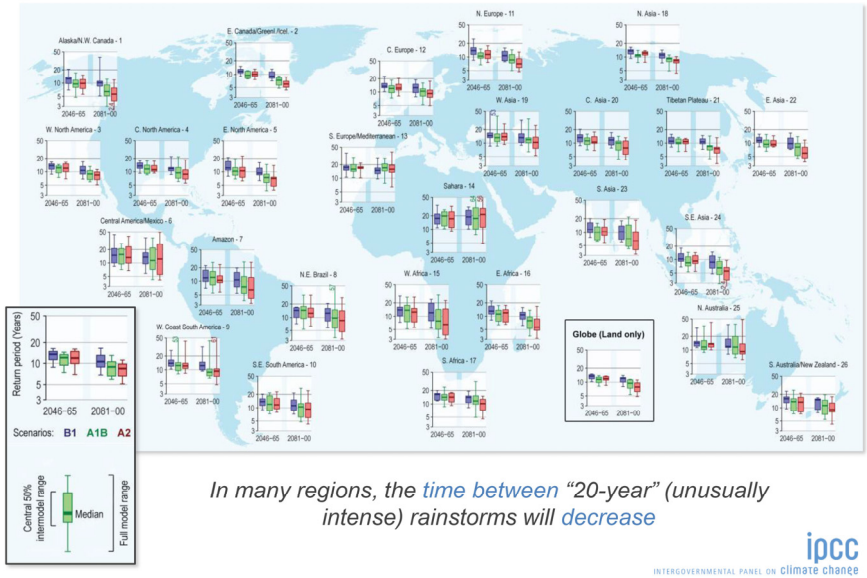
Climate models project there will be more heavy rain events throughout the 21st century



In many regions, the time between "20-year" (unusually intense) rainstorms will decrease

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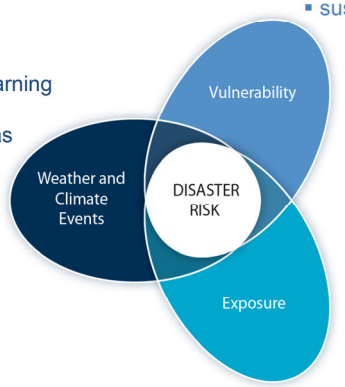
INTERGOVERNMENTAL PANEL ON climate change

Information on vulnerability, exposure, and changing climate extremes can together inform adaptation and disaster risk management

- poverty reduction
- better education and awarenes
- sustainable development

improved forecasting for warning systems
reduction of greenhouse gas emissions



- asset relocation
- weather-proofing assets
- early warning systems

Short-term actions don't always provide long term risk reduction

Permafrost thaw

- permafrost requires sub zero temperatures
- melt affects roads, building foundations, airport infrastructure
- infrastructure maintenance needed
- short-term risk reduction won't eliminate long-term melt risk

Effective risk management and adaptation are tailored to local and regional needs and circumstances

- changes in climate extremes vary across regions
- each region has unique vulnerabilities and exposure to hazards
- effective risk management and adaptation address the factors contributing to exposure and vulnerability

Managing the risks (1): heat waves in Europe

Risk Factors

- lack of access to cooling
- age
- pre-existing health problems
- poverty and isolation
- infrastructure

Risk Management/ Adaptation

- cooling in public facilities
- warning systems
- social care networks
- urban green space
- changes in urban infrastructure

Projected: *likely* increase heat wave frequency and *very likely* increase in warm days and nights across Europe

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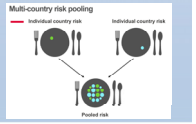
Managing the risks (2): hurricanes in the USA and Caribbean

Risk Factors

- population growth
- increasing property value
- higher storm surge with sea level rise

Risk Management/ Adaptation

- better forecasting
- warning systems
- stricter building codes
- regional risk pooling



Projected globally: *likely* increase in average maximum wind speed and associated heavy rainfall (although not in all regions)

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Managing the risks (3): flash floods in Nairobi, Kenya

Risk Factors

- rapid growth of informal settlements
- weak building construction
- settlements built near rivers and blocked drainage areas

Risk Management/ Adaptation

- reduce poverty
- strengthen buildings
- improve drainage and sewage
- early warning systems

Projected: *likely* increase in heavy precipitation in East Africa

Managing the risks (4) : sea level rise in tropical Small Island Developing States

Risk Factors

- shore erosion
- saltwater intrusion
- coastal populations
- tourism economies

Risk Management/ Adaptation

- early warning systems
- maintenance of drainage
- regional risk pooling
- relocation

Projected globally: *very likely* contribution of sea level rise to extreme coastal high water levels (such as storm surges)

ipcc

Managing the risks (5): drought in the context of food security in West Africa

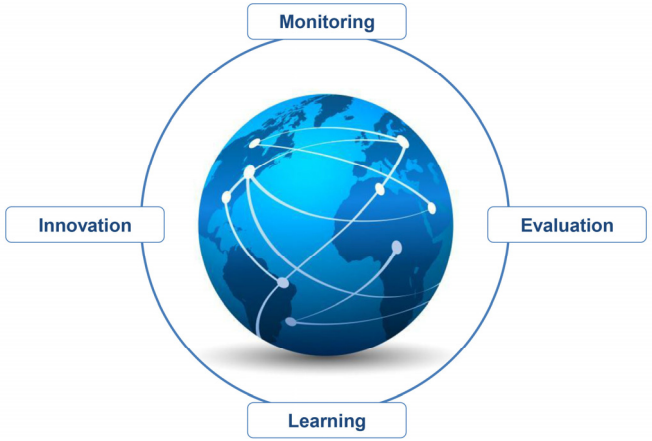
Risk Factors

- more variable rain
- population growth
- ecosystem degradation
- poor health and education systems

Risk Management/ Adaptation

- improved water management
- sustainable farming practice
- drought-resistant crops
- drought forecasting

Managing risks of disasters in a changing climate benefits from an iterative process



Learning-by-doing and low-regrets actions can help reduce risks now and also promote future adaptation

There are strategies that can help manage disaster risk now and also help improve people's livelihoods and well-being

The most effective strategies offer development benefits in the relatively near term and reduce vulnerability over the longer term

Quiz 2-1: What is your risk that you face at the present or faced with in the past?

(It does not matter whether or not your risk be associated with climate issues.)

Quiz 2-2 What are the factors causing your risk?

Quiz 2-3 How do you manage or did you manage?