

**Workshop on “Meta-Guidelines”  
for Climate Change Adaptation,  
the University of Tokyo, Japan, 1<sup>st</sup> – 2<sup>nd</sup> October 2012**

# **How to Synergize IWRM and Climate Change Adaptation**

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## Climate Change and Water

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- Water is the first sector to be affected by changes in climatic conditions. We do need to adapt to this unavoidable impacts of change.
- Thanks to ADB and JICA to their continues support to Brantas and Bg. Solo RB in promoting TA on CC Projection, Vulnerability Assessment and Formulating Adaptation Strategies at this Basin.
- It was really long and difficult process to accept this TA. In General, there is still a **debate** among people, between scientist, policy makers, and business sector, that GCC has already come to the basin.
- Need to **increase better understanding and awareness** on climate change mitigation and adaptation measures.

## Climate Change and Water

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- Climate change **leads to intensification** of the hydrological cycle and subsequently it has serious effects on the frequency and intensity of extreme events.
- **Sea level rise**, increased evaporation, **unpredictable precipitation** and prolonged droughts are just a few manifestations of climate variability directly impacting on availability and quality of water.
- Observational records **provide evidence** that water resources are vulnerable and have the potential to be strongly impacted by climate change, with wide-ranging consequences for human societies and ecosystems”
- **Need the guidance to evaluate** the experienced extreme conditions is caused by GCC or by Local Climate and Non Climate Change. This guidance is used to select basins priority, to convince the policy makers and to get support the stakeholders for CCA Program among others priority programs.

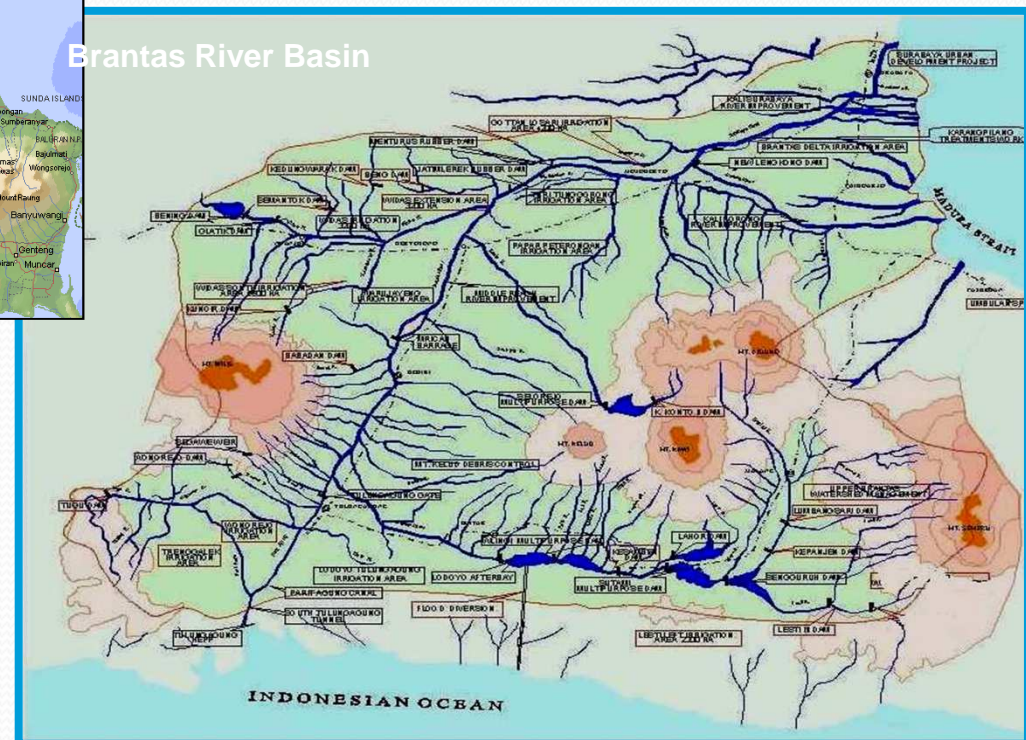
# Description of Brantas River Basin



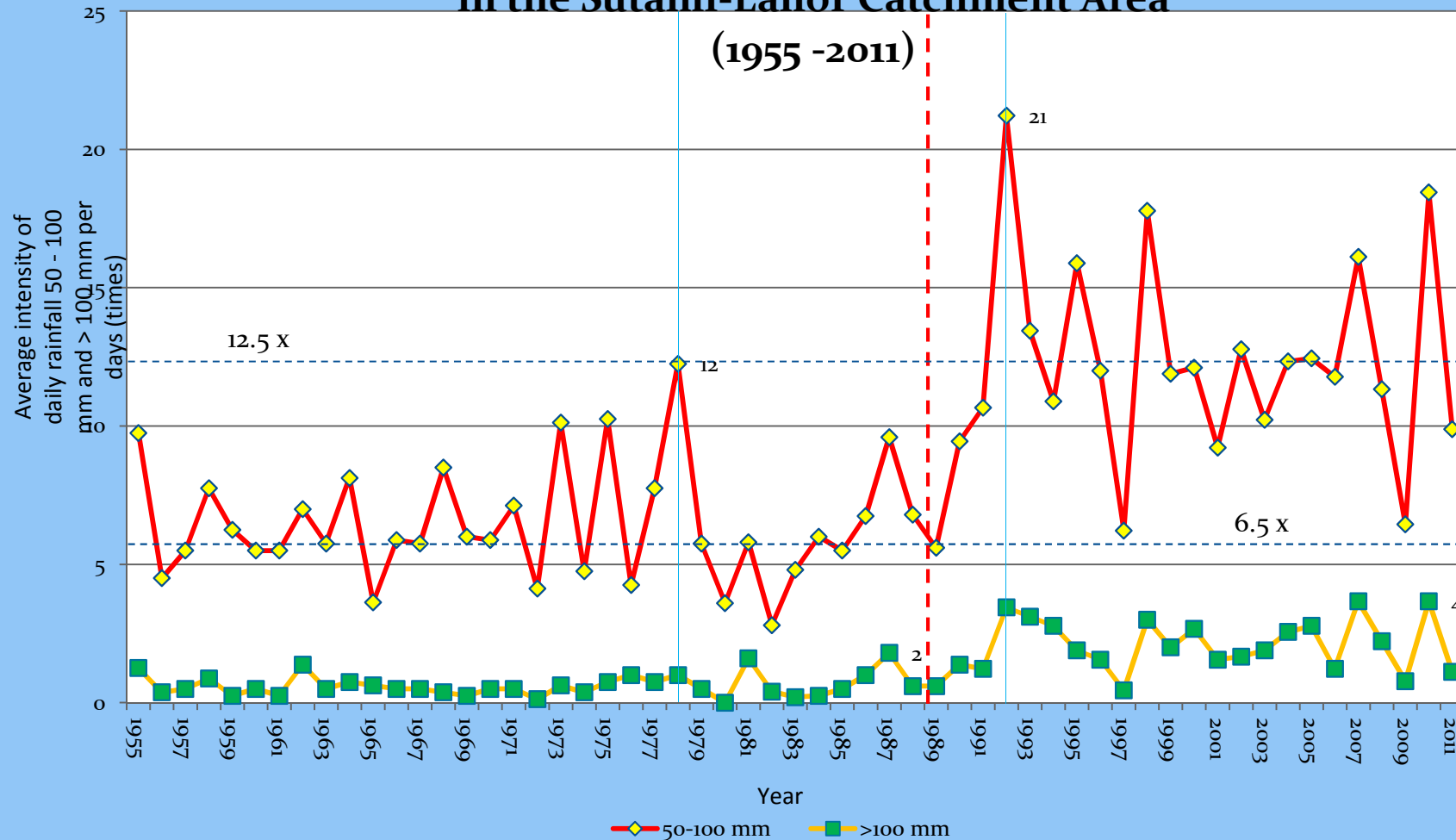
- Basin Area : 11,800 km<sup>2</sup> (25% of E. Java)
- Population (2007) : 16.2 million (43% of E. Java)
- Average Rainfall : 2,000 mm/year
- Water Potentials : 12 billion m<sup>3</sup>/year
- River Length : 320 km

- Active volcanoes: Mt. Kelud & Mt. Semeru
- Land Use (2005) :
 

- paddy field	26.1%
- dry land	5.9%
- plantation	42.6%
- forest	7.3%
- settlements	15.2%
- others	2.9%

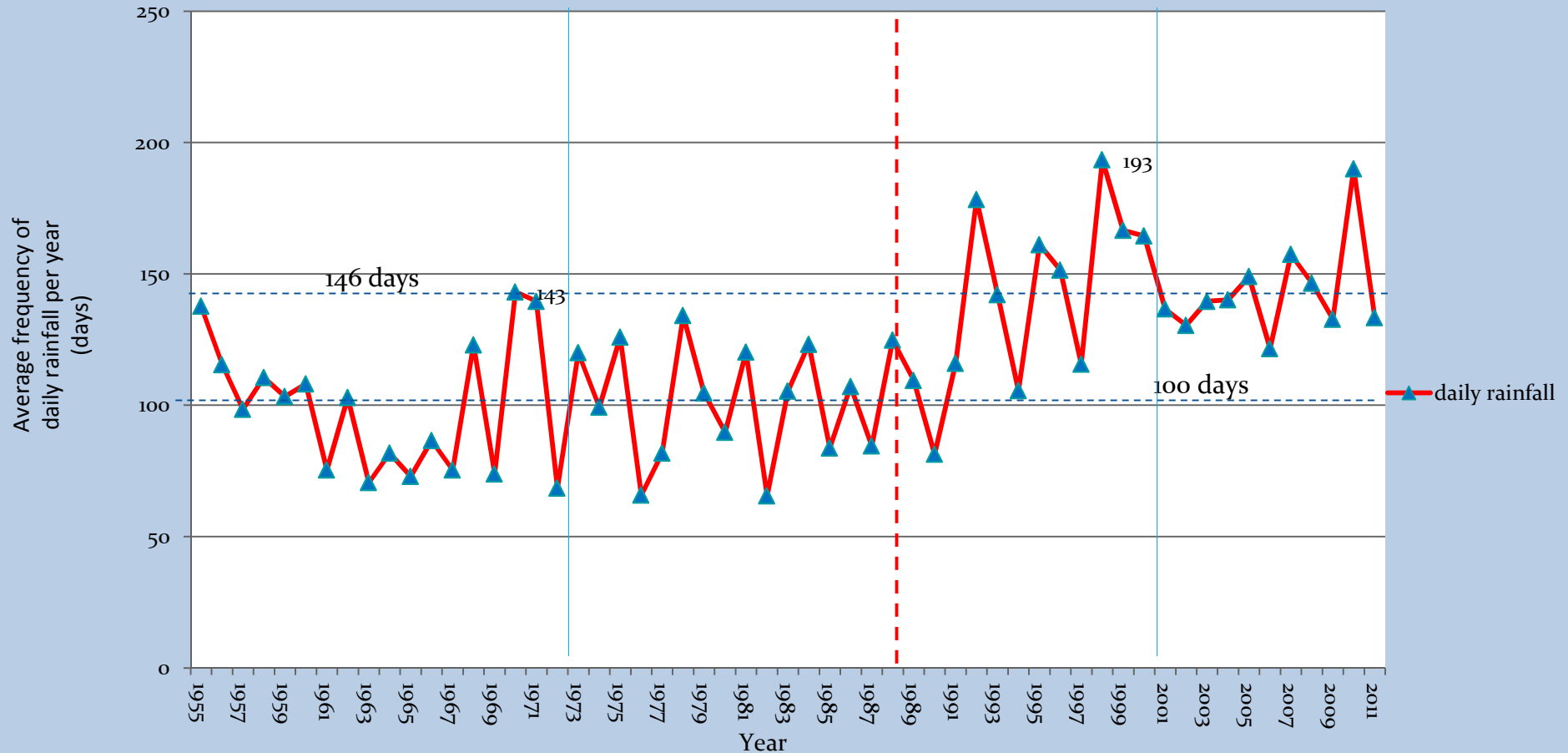


## The average intensity of daily rainfall 50 -100 mm and > 100 mm per days in the Sutami-Lahor Catchment Area (1955 -2011)



The average intensity of daily rainfall (50-100 mm) during 1955 – 1989 is 6.5 times, with maximum of 12 in 1978, during 1990 – 2011, the average become increase with 12.5 times with maximum of 21 in 1992. For average intensity of daily rainfall > 100 mm during 1955 – 1989 is 0.6, with maximum of 2 in 1987, during 1990 – 2011, is 2.1 with maximum of 4 in 2010.

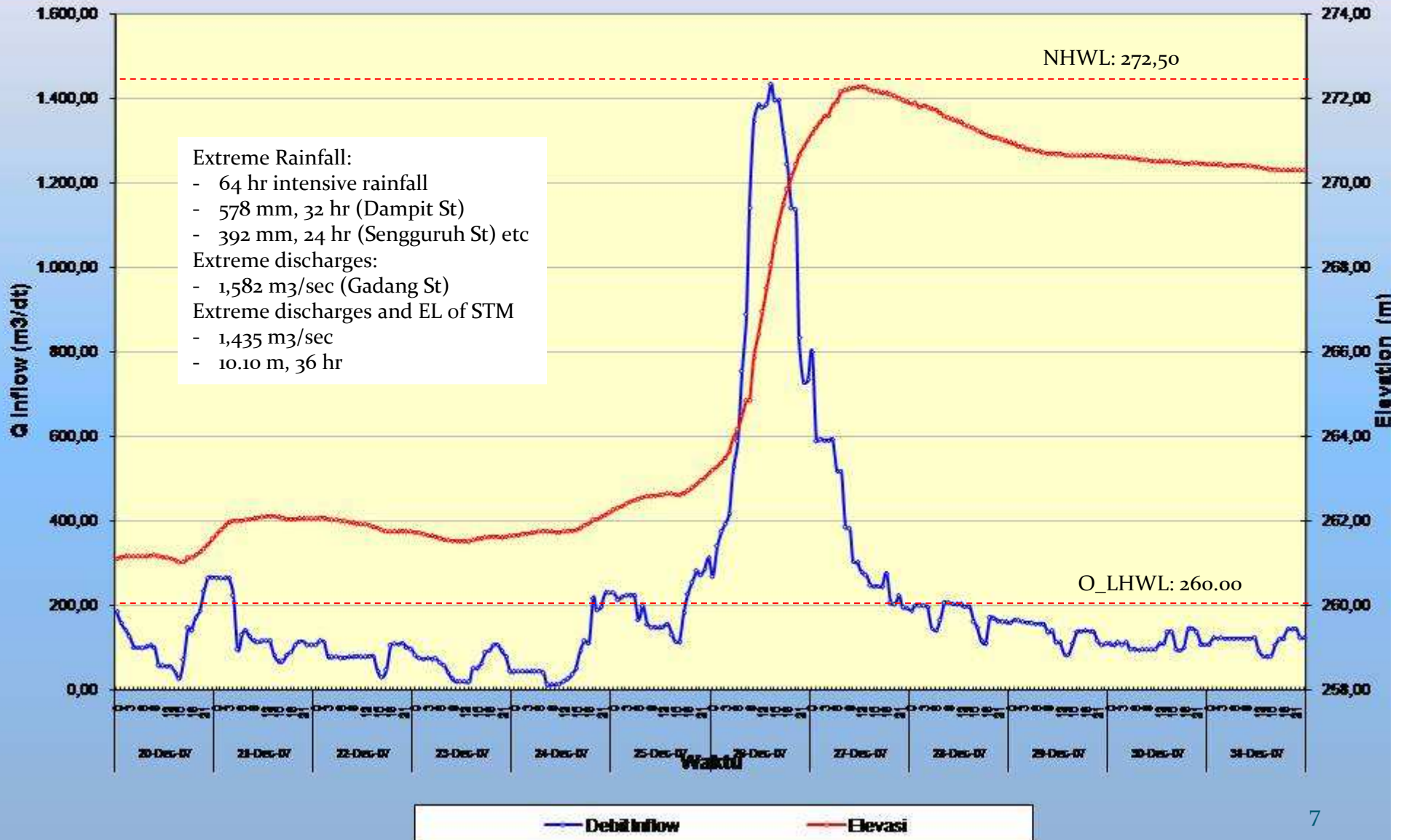
## The frequency of daily rainfall in the Sutami-Lahor Catchment Area (1955 -2011)



The frequency of daily rainfall during 1955 – 1989 average is 100 days daily rainfall per year, with maximum of 143 days in 1970. During 1990 – 2011, the average become increase with 146 days daily rainfall per year, with maximum of 193 days in 1998. Therefore, it can be concluded there is a significant changing of hydrological pattern in Brantas River Basin

# Q inflow & Elevation of Sutami Reservoir

## Periode : 20 - 31 December 2007



# The importance to adapt to climate change

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- Climate change is a process characterized by a number of **uncertainties and risks** relative in particular to the magnitude, timing and nature of the changes.
- **It is real.** We do need to adapt to the unavoidable impacts of climate change. Water is a finite and vulnerable resources. **Higher priority should be taken** to sustain this precious resources to support social, economic and environmental development
- The **precautionary principle** should be applied and preventive actions should be taken even if some cause-and-effect relationships are not yet fully understandable, even by policy makers, scientists and by peoples.
- **Need the guidance to evaluate** the experienced extreme conditions is caused by GCC or Local Variability HC Change before we got the support from the stakeholders to agreed the CCA program.
- ***Preliminary assessment before entering study of GCP → to have understanding the existing WR conditions → decide basin priorities to develop CC Adaptation***



# The importance to adapt to climate change

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- Stakeholder's should have understanding and concern on the issues of CC. We need to educate stakeholders: policy makers, politician, scientist, academia, and people in general.
- Some questions usually raised:
  - What is GCC and what is the indicators (especially local indicators)
  - Why and how GCC has impact to hydrological pattern in regional, national and local level?
  - Why it is uncertainty?
  - What are the possible impact will be and who will have the most affected?
  - Why we should take action now?
  - What kind of actions should be taken? In short-term, medium term and long term period?
  - Why the policy maker (incl. politician) should take initiative of this action?
  - Etc
- Better understanding, support and commitment from the stakeholders is the **key success** to develop and implement the adaptation of the CC.

# How do the IWRM principles and process help adaptation?

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## Adaptation?

- A process by which **strategies to moderate, cope with and to take advantage** of the consequences of climate events are enhanced, developed and implemented (UNDP, 2005)
- Each **basin has geographical and hydrological as well as social, economical and environmental characteristics**. They will have their own adaptive capacity due to climate change.
- It requires the development of CC projection at the **basin level**, the capacity to identify and quantify the social, economical and environmental impact of the change, the improvement of capacity in managing the risks incl. to make decision under climate uncertainty.
- CC Adaptation need **reliable knowledge & technologies**, take long-term period (2100), and need **huge amount of budget**. It requires to **convince the policy makers and support all stakeholders**.
- The adaptation in water sector should be **developed and implemented at the lowest appropriate level** of WR Management, i.e. River Basins.

# How do the IWRM principles and process help adaptation?

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## IWRM Principles and processes:

- IWRM has to be adopted in response on the **increasing pressure on water resources** from competition amongst various users for a limited resources and declining water availability due to environmental degradation and more specifically due to climate change.
- IWRM Principles and processes could be adopted in simple words:  
**“One River – one Plan – one Management”**
  - One River – one river basin as the lowest appropriate level of WRDM
  - One Plan – one integrated plan for water, land and other related resources, upstream and downstream, water and related sectors, short - medium and longterm horizon.
  - One Management – one coordinated system of management as participatory approach involving all stakeholders (incl. women roles) in decision making process and implementation of agreed plan and program.
- IWRM offers **various tools and instruments** that deal with access to water and protecting the integrity of the ecosystem, thus safeguarding water quality for future generations.

## How do the IWRM principles and process help adaptation?

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- IWRM framework are **instrumental for capacitating organizations and communities** to cope with climate variability. For example:
  - In basin planning, risk assessment and adaptation measures can be incorporated.
  - In monitoring water quantity and quality developments, management can proactively take action towards adaptation.
  - Management of floods and droughts, as a key function of WRM, allows for direct intervention in cases of extreme events.
  - Water can be allocated to the most efficient and effective use to react to climate variability in a flexible manner.
- In brief, IWRM makes it **easier to respond** to changes in water availability. Risks can be better identified and mitigated in the process of basin planning. When action is needed, stakeholder participation helps to mobilize communities and generate action.
- CC Adaptation should be as **integral part of IWRM**. Any existing and planned WRDM process and program should be **reviewed to incorporated** the CC Adaptation program.

## How do adaptation processes and resources help IWRM?

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- As an integral part of IWRM, **adaptation will help IWRM to achieved the IWRM goals**, i.e to support sustainability of social, economical and environmental development.
- Adaptation in short-term climate variability and extreme events is a basis for reducing vulnerability to **longer-term of climate change**;
- Following the principles of sustainable development, adaptation policy and measures take social, economic and environmental concerns into consideration and ensure that the needs of the present generations are met without compromising the needs of future generations; and
- Adaptation policies/strategies are elaborated at different levels in society, including local level.
- Since all of the adaptation and resources taken into consideration, it is believed that in the IWRM process had already taking into account all of the measures to reduce the climate change impact.

## How to work across boundaries for the water-food-energy-nexus?

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- Water, food and energy are **closely linked**. Alterations in basin hydrology lead to unfavorable changes in seasonal discharge patterns, reducing irrigation productivity, reducing the capacity and reliability of run-of-river HP generation.
- Water-food-energy **are in crisis condition** in many parts of the nation.
  - **Increasing demand vs limiting water resources** availability in appropriate quantity, quality, time and span
  - **Increasing demand on food vs declining land rice productivity**
  - Moving from **non renewable energy resources to green energy policy** using renewable energy resources
- We have to manage the water-food-energy nexus for sustainable development. The importance of cross-sectoral links for **increasing efficiency uses** of overall resources are challenging

## How to work across boundaries for the water-food-energy-nexus?

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- Water security, is the objective and framework for adaptation to secure food and energy security. Therefore, it lies at the **heart of adaptation to climate change** for food and energy security.
- Water security, defined as *‘the reliable availability of an acceptable quantity and quality of water for health, livelihoods and production, coupled with an acceptable level of water-related risks,’* is a minimum but realistic package.
- To effectively adapt to climate change, better water management will have to include a **combination of ‘hard’ (infrastructural) and ‘soft’ (institutional) measures.**
- Critically, climate change adaptation strategies may **require major changes** in the way of WR, agriculture, energy, industry and human settlements in general are managed.

## How to leverage financing to better results?

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- Adaptation program **need secured and sustainable financial sources**. The financial sources could be from local level, basin level, private sector, Local and National Governments and from international level.
- At the local level, many communities have been **resourcesful in operationg village funds** and other possible mechanisms to provide access to credit. Local Government and financing institution at local level have to **build the capacity of communities** on how to develop the scheme, to collect the funds, etc.
- At basin level, the River Basin Organizations (RBOs) should allocate **more budget to finance actions** related to adapation such as watershed management, reservoir sedimentation management, etc.
- Private sector finance markets can **play important role in financing investment** by larger enterprises, e.g. for large-holder farmers to diversify farm operations, adopt new seed varieties, implement modern irrigation system and provide insurance againts losses. Incentive to PPP should be developed.



## How to leverage financing to better results?

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- National Government should play the central role to **provide sufficient fund for adaptation**. National Government can assist with direct financial payments and with subsidized credit and insurance. It is needed to ensure the policy makers at National Government as well as the Parliament members that CC Adaptation program should have **high priority in budget allocation**.
- At the international level, financial assistance should be increased continuously. The international funding can act **as catalyst for raising awareness, building capacity**, advancing understanding of risks and response actions, and engaging developing country governments in prioritizing and assessing options.
- Domestic financial sources should be **promoted and later on to be main part of financial sources** to implement the CCA program. Need ownership of stakeholders for CCA Program

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**Thank you very much**