

WATER-RELATED HAZARDS AND DISASTER RISK IN CAGAYAN RIVER BASIN, PHILIPPINES

Orlando F. Balderama

PWRI-ICHARM Meeting
November 16, 2018



FURUMAI LABORATORY

One dead in Isabela town flood during 'Rosita'

ABS-CBN News

<https://news.abs-cbn.com/news/10/31/18/1-dead-in-isabela-town-flood-during-rosita>

Posted at Oct 31 2018 04:20 PM |

Updated as of Nov 02 2018 03:38 PM

Roxas flood aftermath |

CAPTION: Floods in Roxas, Isabela left thick mud in major roads, streets, and houses. ABS-CBN News



Swollen rivers threaten Isabela, Cagayan with flash floods

Magat Dam continues to release water from its reservoir, triggering floods

Published 11:53 PM, October 30, 2018

Updated 12:02 AM, October 31, 2018

<https://www.rappler.com/nation/215606-swollen-rivers-threaten-isabela-cagayan-flashfloods-october-30-2018>



FTJoint Meeting Summer 2018, June 26



The Siffu Bridge in Roxas, Isabela collapsed during the onslaught of Rosita. *ABS-CBN News*

The ISABELA STATE UNIVERSITY and WATER RESEARCH AND DEVELOPMENT CENTER



A university-based inter-disciplinary water research center to undertake **R&D, Education and Capacity Building programs** on water resources development, water environmental management, **water related disaster risk reduction** and institutional development in the water sector

Mandate

1. Promotion and conduct of R&D;
2. Support to the current responsibilities of water-related agencies;
3. Support to education (BS, MS, Ph.D), capacity building, planning and policy formulation
4. Enhance collaboration with local and international partners

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Background: *The Philippine Rivers*

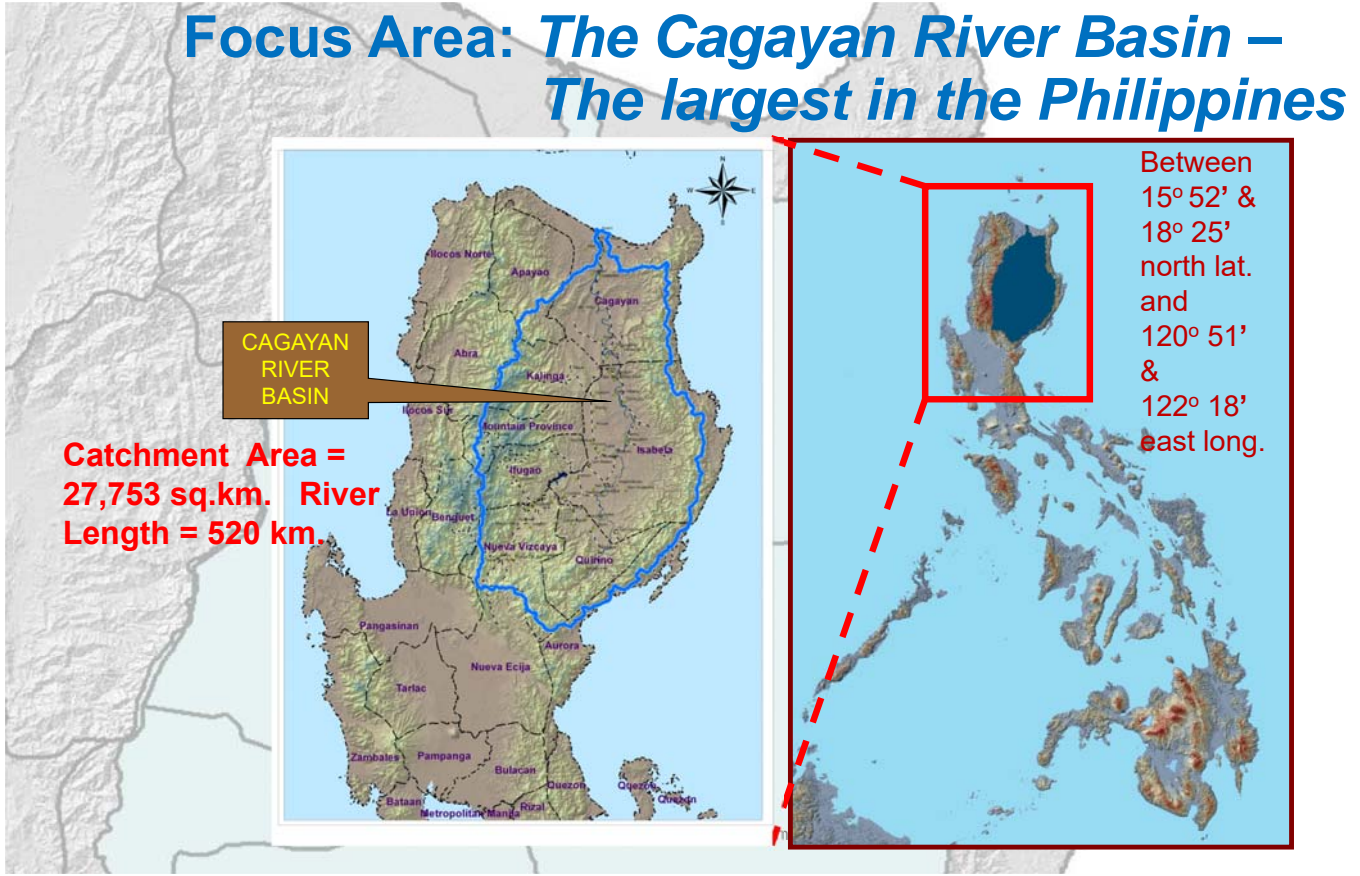
- Total of 421 principal rivers
- Of these, 18 are considered major rivers with a total drainage area of more than 1400 sq.km. comprising 36% of the total land area of the Philippines
- **Uses:** domestic, agriculture, energy, industry
- **Major concern:** sustainable water supply and security
- **Major issues:**
 - a) erosion – due to indiscriminate human activities with rapid land use changes
 - b) flooding & drought
 - c) climate change impacts
 - d) water quality



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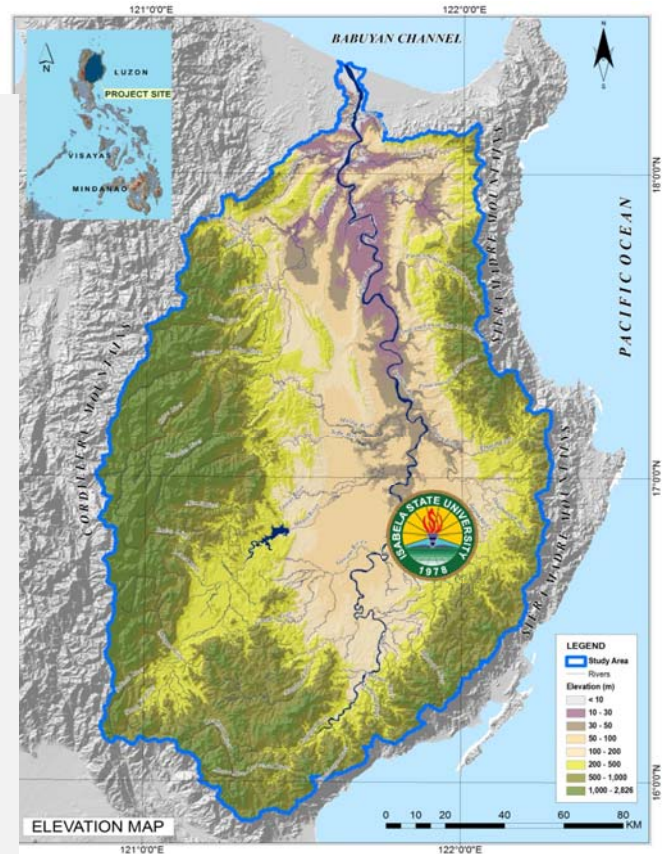


River Basin	Region	Catchment Area (km ²)
Cagayan	Region 2, CAR, Region 3	27,753
Mindanao	Region 10, 12	23,169
Agusan	Region 13, 11	10,921
Pampanga	Region III	9,759
Agno	Region III, I	5,952
Abra	Region I and CAR	5,042
Pasig-Laguna de Bay	NCR, Region IV-A	4,678
Bicol	Region V	3,771
Abulog	Region II	3,372
Tagum-Libuganon	Region XI	3,064
Ilog-Hilabangan	Region VI and VII	1,945
Panay	Region VI	1,843
Tagoloan	Region X	1,704
Agus	ARMM and Region X	1,645
Davao	Region XI	1,623
Cagayan De Oro	Region X	1,521
Jalaur	Region VI	1,503
Buayan-Malungan	Region XI	1,434



Cagayan River Basin: *Fast Facts*

- Basin Area is 2.7 million hectares, 600,000 arable land;
- Consistent top corn and rice producer in the country producing more than 25% of national production
- Largest Groundnut and Mungbean production areas;
- Has inland lakes and reservoir of about 10,000 hectares for aquaculture production;
- Other Industrial Crops: Sugar cane, cassava;
- Hydropower production
- Host to largest natural park in the country



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River Basin Condition

The Philippines now has the second lowest supply of water per capita in the ASEAN region despite abundant rainfall due to poor infrastructure and management (NEDA-PIDS, 2015);

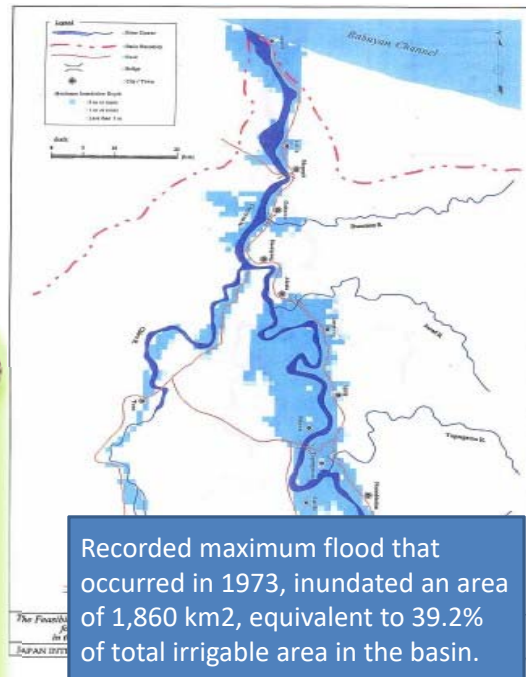
The quality of water resources has been increasingly subjected to pollution from untreated sewage, industrial wastes, livestock wastes, agro-chemicals, and sediments that end up in water bodies and aquatic ecosystems, (JICA Report, 2004);

The two main causes why Cagayan Valley remains underdeveloped are: 1) inundations at the tributaries and flood; 2) water inadequacies in irrigation and domestic water supply (Basin Master Plan, 2013)

Lack of collaborative participation among institutions (River Basin Office, 2011). Since 2015, a 63 agency-member River Basin Council is now operational to oversee the development and management of the Cagayan River Basin



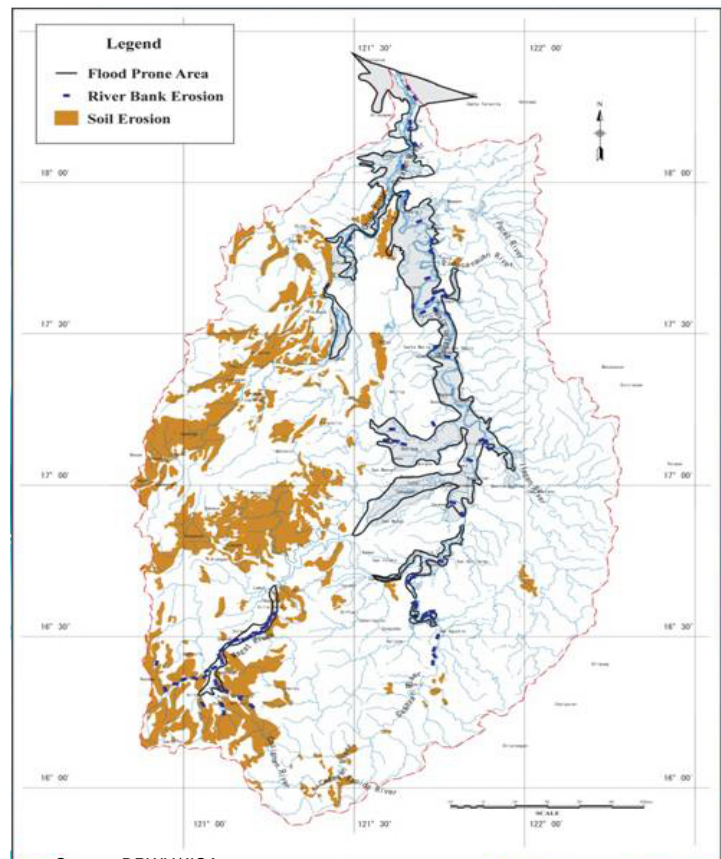
A result of GIS analysis showed that 43% or 13 million hectares of the country will be under dry environment as a consequence of climate change (Obien, 2008). *Cagayan Valley* is the most affected region with more than 1 million hectares under threat.



Flood inundation and Drought are the major causes of the low regional economic development.

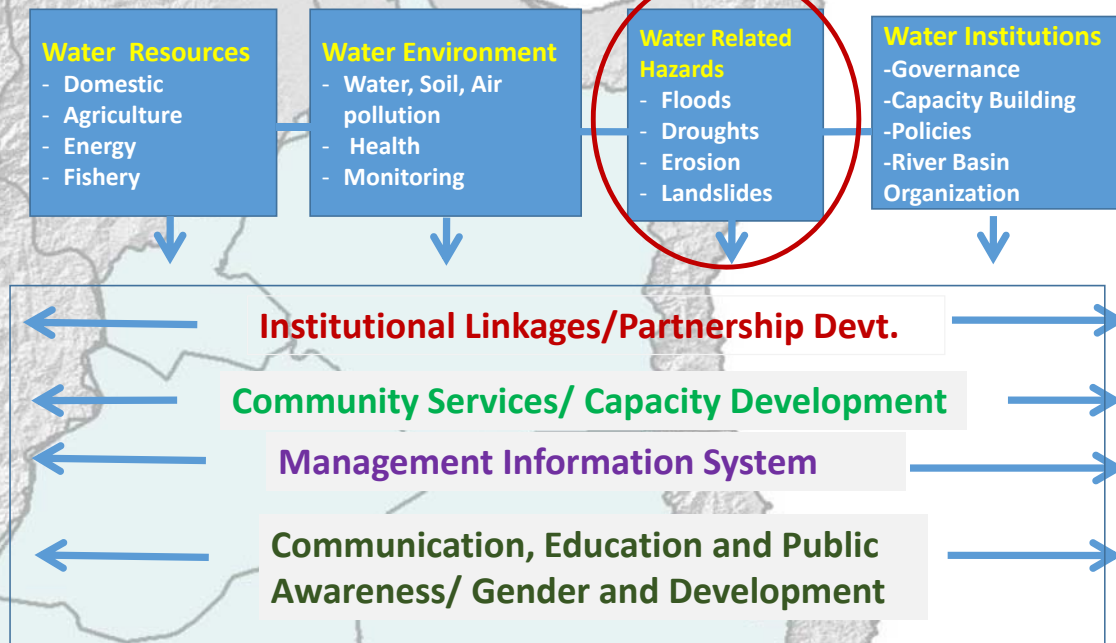
Geo-Hazard Map

- One of the current major disasters in Region 2 indicated that Typhoon Juan in 2010 is one of the worst in terms of damages.
- Typhoon Juan casualties include 11 dead, 147 injured and one missing, while the estimated damages to agriculture is about P 1.57 billion, P 475.85 M damages to infrastructure, P 60.03 M damages to fisheries, and P 21.99 M damages to livestock.



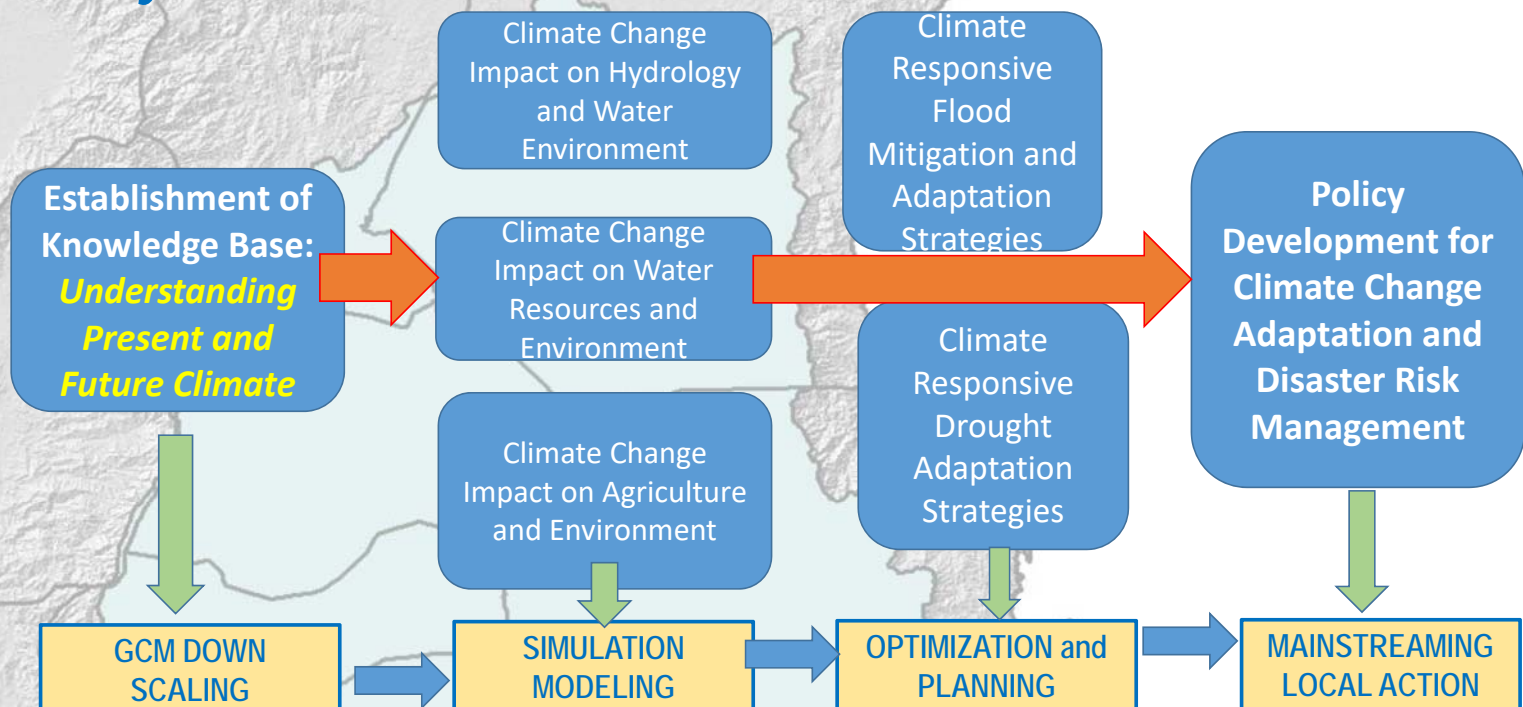
Source: DPWH/JICA

IWRM-Based Cagayan River Basin Program Framework



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R&D Framework: *The Integrated Decision Support System Model for CCA-DRM*



Japan-Philippines Partnership in Education, R&D and Knowledge Sharing ON CCA-DRRM

Collaborating Institutions	Program	Other Collaborating agencies as source of funds/ tech support
Isabela State University	Water Research and Devt. Center	<ul style="list-style-type: none"> Asia Pacific Network Phil. DOST-JSPS NARBO
The University of Tokyo	Research Center for Water Environment and Technology (RECWET)/ IR3S	
Ibaraki University	Institute of Global Change Adaptation Science (ICAS)	
Yamanashi University	Interdisciplinary Center for River Basin Environment (ICRE)	
Japan Water Agency	Network of Asian River Basin Organization (NARBO)	

DAY 3		
9:00-9:00	Lecture 10:	IWRM Planning and Practice in Australia DR. EVA ABAL CEO International River Foundation
9:00-12:00	Workshop	<ul style="list-style-type: none"> Issues and Concerns on Water Security Institutional Collaborations Research Needs Capacity Building Needs <p>Facilitator: Approx. 3 persons per group</p>
12:00-1:00	Lunch	
1:00-3:00	Presentation of Outputs	Group Representative
3:00-3:00	Closing Ceremony	
	Synthesis	DR. AGNES RAMOS Isabela State University
	Impressions	Selected Participants
	Awarding	ISU, NARBO, RECO
	Closing Message	DR. WILLIAM C. MEDRANO VP-ISU

ORGANIZERS AND SPONSORS

Network of Asian River Basin Organizations (NARBO)

Isabela State University (ISU)
City of Cauayan
Japan Water Agency (JWA)
Japan International Cooperation Agency (JICA)
Department of Environment and Natural Resources-River Basin Control Office (DENR-RECO)
Cagayan River Basin Management Council (CREMC)
National Irrigation Administration-Magat River Irrigation System (NIA-MARIIS)
Asian Development Bank (ADB)
International River Foundation (IRF)
Oceana Gold Philippines

TECHNICAL TOUR

MAGAT DAM

The Magat Dam is the first largest multipurpose dam in Southeast Asia. Magat Dam was built in 1975 to provide dependable water supply primarily for irrigation for its firm up service area of 86,887 hectares, and for hydro-power, contributing to the power supply of the country. The project area includes the service area of the two existing irrigation systems, namely MARIS and SIFRIS, and these, together with all the appurtenant facilities and structures, brought the present firm-up service area to 86,887 hectares.

TRAINING COST *

LOCAL PARTICIPANT	Php 7,000.00
FOREIGN PARTICIPANT	USD 200.00

* This cost will cover hotel accommodation (twin sharing for local participants and single room for international participants) meals, training kit, and local field trip (Payable to Isabela State University)

For further information:

Please visit NARBO website: www.narbo.jp or contact

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INTERNATIONAL TRAINING-WORKSHOP ON INTEGRATED WATER RESOURCES MANAGEMENT (IWRM) IN RIVER BASINS FOR SUSTAINABLE DEVELOPMENT

JAPI Hotel, City of Cauayan
Isabela, Philippines
February 5-7, 2018

Keynote Speaker:

Dr. Thomas Panella
Head of Water Group
Asian Development Bank
Manila, Philippines



RATIONALE

The world community has recognized the importance of managing water resources in a more integrated manner. Over the past decades, a series of regional and global water conferences, including the World Water Forums in 1997, 2000, and 2003, have underlined the need to adopt and operationalize the approach of Integrated Water Resources Management (IWRM), which is defined by the Global Water Partnership as "a process to improve the planning, conservation, development, and management of water, forest, land, and aquatic resources in a river basin context, to maximize economic benefits and social welfare in an equitable manner without compromising the sustainability of vital environmental systems."

By focusing on the management of water and related resources in a river basin context, it is implied that IWRM will be undertaken at basin level with the involvement of stakeholders at the basin level. The water conference in Dublin in 1992 referred to the need to manage water resources at the lowest appropriate level. This has become one of the basic principles underpinning the IWRM approach, and it has led to increased recognition that River Basin Organizations (RBOs) can realize IWRM at the basin level.

Recognizing the need for networking and capacity development in the implementation of IWRM, the Asian Development Bank, the Asian Development Bank Institute, and the Japan Water Agency decided at the 3rd World Water Forum in March 2003 in Kyoto, Japan, to collaborate in establishing a Network of Asian River Basin Organizations (NARBO).

In the Philippines, River Basins and Watersheds are identified as strategic platform in the implementation of the Republic Act 10121 (Disaster Risk Reduction Management Act), Republic Act 9729 (Climate Change Act) and Republic Act 10174 (The People's Survival Fund). Using the River Basin Masterplans approved by Regional Development Councils (RDC) as guide, it is expected that regional and local climate and disaster risk reduction and management plans, programs and activities should be formulated and implemented. As required by law, there is a need for institutionalizing Climate Change Adaptation/Disaster Risk Reduction Management (CCA/DRRM) policies, structures, coordination mechanisms, plans, programs, projects and activities with continuing budget appropriation from all levels of governance.

The River Basin Control Office of the Department of Environment (RCBO-DENR) and Natural Resources spearheads the implementation of The Philippine National Integrated Water Resources Management Framework Plan in river basins. This plan provides directions for mainstreaming IWRM and for preparation of river basin masterplans.

There is a growing sense of urgency around to improve our ability to recognize the necessity to sustain effective implementation of IWRM in River Basin and the need to capacitate those agencies responsible in River Basin governance, hence this proposal.

THEME: Mainstreaming Climate Change Adaptation and Disaster Risk Management in Integrated Water Resources Management of River Basins in Monsoon Asia

PROGRAMME

DAY 1

8:00-8:30	Registration	Secretariat
8:30-10:00	Opening Program	Facilitator
	Prayer	ISU Cagayan City
	National Anthem	ISU Cagayan City
	Welcome Remarks	HON. BERNARD DY Mayor, Cagayan City
	Introduction of Participants/ Objectives of Training - Workshop	DR. RICMAR P. AGUIÑO President, ISU
	Keynote Speech	DR. ORLANDO F. BALDERAMA Director, Water Research Center, ISU
	Topic: Importance of Integrated Water Resources Management to Sustainable Development and Food Security in Asia	DR. TOMAS PANELA Head, Water Group Asian Development Bank (ADB) Manila, Philippines
10:00-10:30	Coffee Break and Photo Session	
10:30-11:15	Lecture 1:	Implementation of IWRM in Philippine River Basins for Water Security and Rural Development DR. ANTONIO DANO Director, DENR-RECO, Philippines
11:15-12:00	Lecture 2:	Implementation of IWRM in Cagayan River Basin for Water Security and Rural Development ATTY. GIL AROMIN Regional Director, DENR, Phil.
12:00-01:00	Lunch Break	

1:00-1:45	Lecture 3:	Introduction to NARBO and Frameworks of IWRM in Relation to Sustainable Development DR. MASAHIRO SUGIURA ADB
1:45-2:30	Lecture 4:	IWRM for Water Supply and Disaster management MR. JUN UTSUNOMIYA NARBO Secretariat/ JWA
2:30-5:00	Country/ River Basin Report	By Country/ River Basin
2:30-5:00	Welcome Dinner	

DAY 2

8:00-9:00	Lecture 5:	IWRM Analytical Tools DR. ORLANDO F. BALDERAMA Isabela State University Philippines
9:00-10:00	Lecture 6:	Climate Change Adaption/ Disaster Risk Reduction management (CCA/DRRM) in Japan's Rural Areas DR. YASUYUKI HIRAI Director, Civil Engineering Research Institute for Cold Region Hokkaido, Japan
10:00-12:00	Trip to Magat Dam and MARIIS	
12:00-1:00	Lunch at Magat Dam	
12:00-1:00	Tour to Magat Dam and MARIIS	
1:00-4:00	Lecture 7:	Dam and Reservoir Management of MARIIS ENGR. EDUARDO RAMOS Manager, NIA-DRD
	Lecture 8:	Lecture on Dam and Reservoir Management in Japan MR. JUN UTSUNOMIYA NARBO Secretariat/ JWA
	Lecture 9:	Flood Management for Public Works and Infrastructure MR. TAKAFUMI NAKUI, JICA Expert to DPWH, Philippines
4:00-5:00	Travel to Home	



Orlando F. Balderama
Visiting professor
Isabela State University

Hiroaki Furumai
Supervising/ Host Professor
The University of Tokyo

