

# ECCA team, Nepal



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# Climate

- Influenced by Himalayan Mountain range and South Asia Monsoon.
- Average PPT 1530
- Temperature increases from North to South

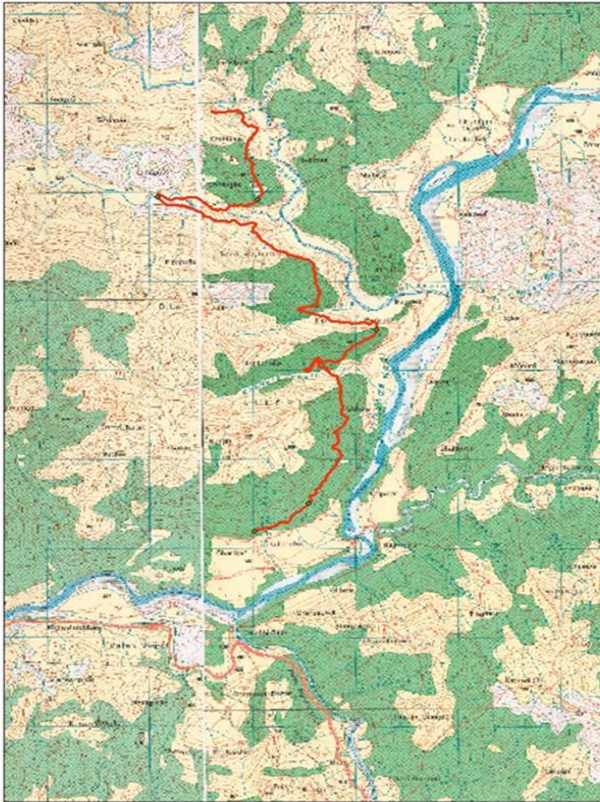
# Evidence of Climate Change

- NAPA: 0.04 to 0.06 Degree Celsius Annually;
- Change in Rainfall pattern:
- Snow retreat in Himalaya;

# 1. Water Project Analysis (Irrigation)



# Kalleritar Irrigation Project

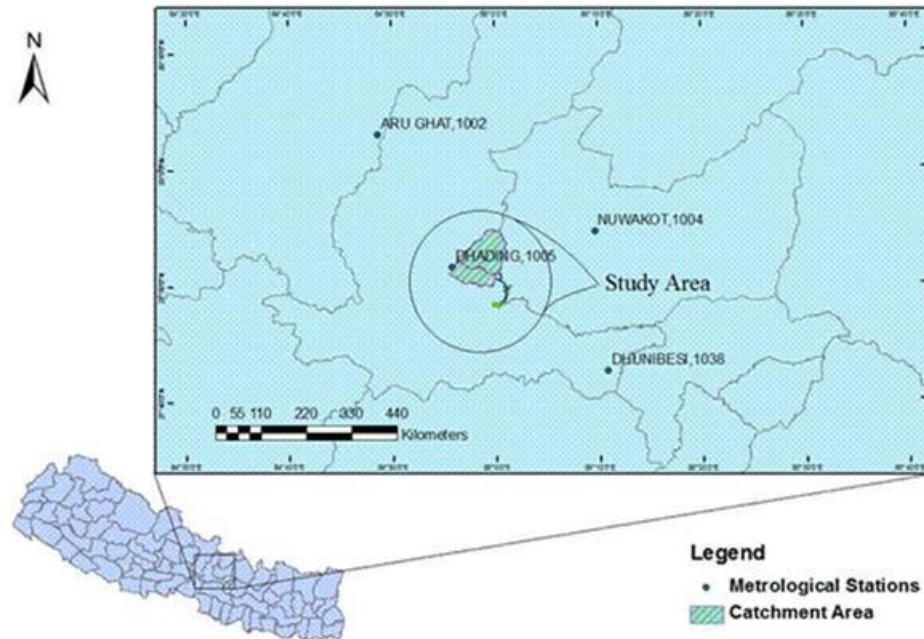


# Salient Feature

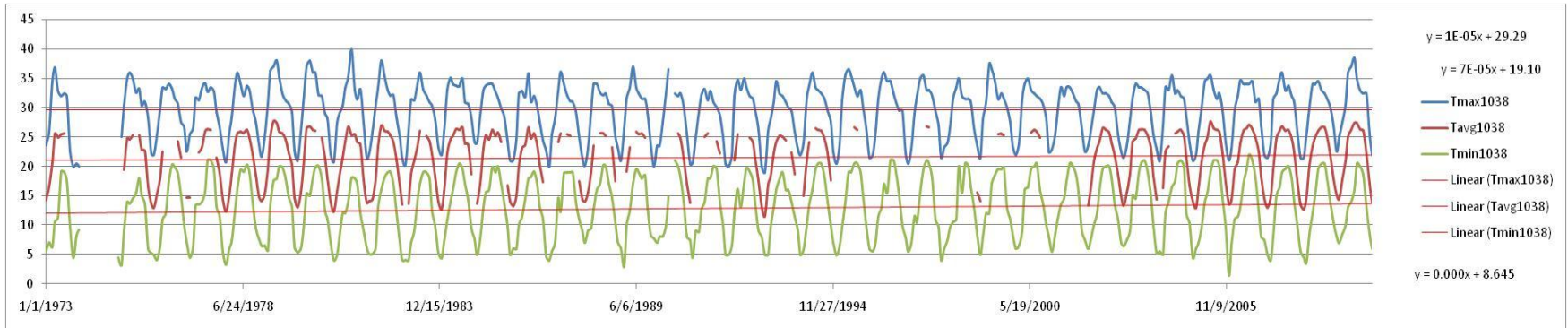
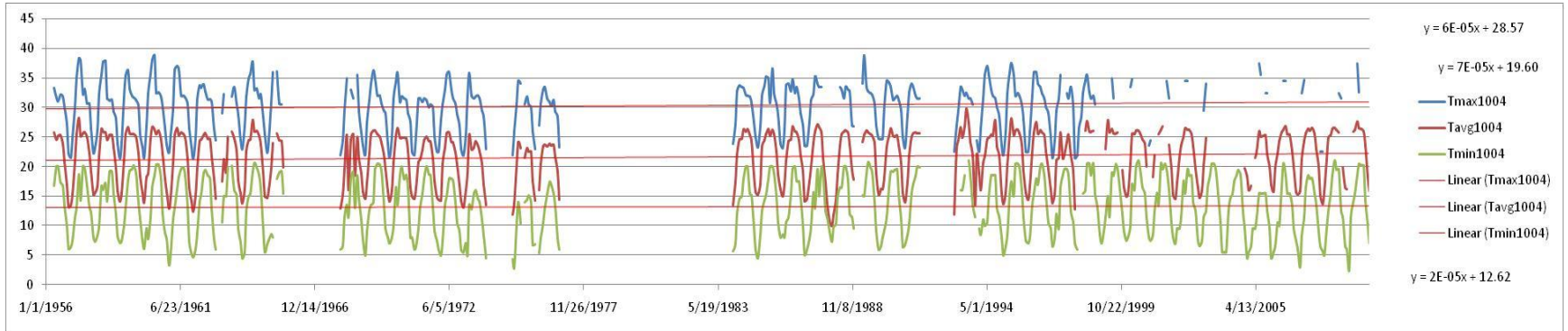
- Kalleritar Irrigation System
- 50 Km west from Kathmandu at 480 amsl
- Built in 1988
- Command area= 200 ha
- Canal length= 11 Km
- Population = 2000

# Meteorological Data Analysis

S.No.	Station No.	Station Name	Latitude	Longitude	Elevation
1	1002	ARUGHAT	28.05	84.81	518
2	1004	NUWAKOT	27.91	85.16	1003
3	1005	DHADING	27.86	84.93	1420
4	1038	DHUNIBESI	27.71	85.18	1085

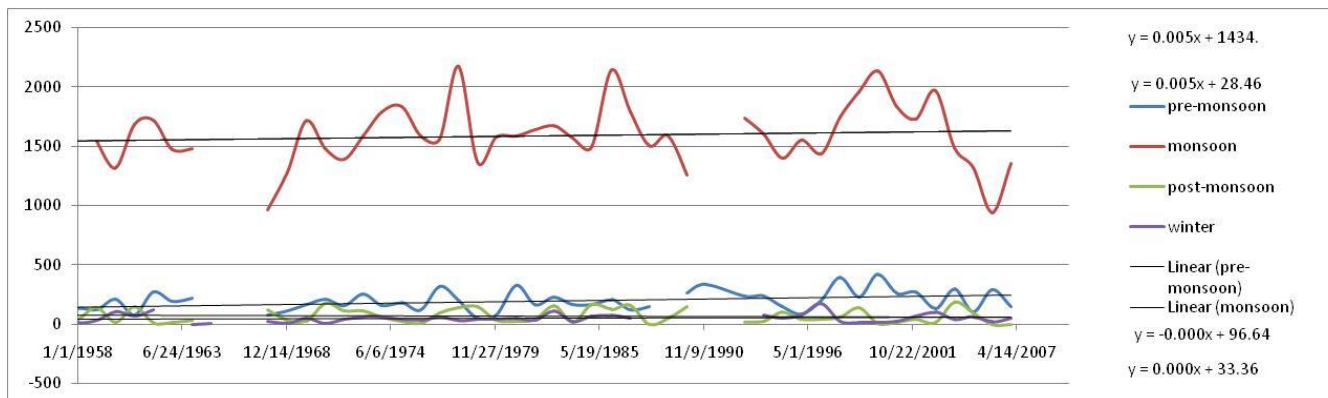
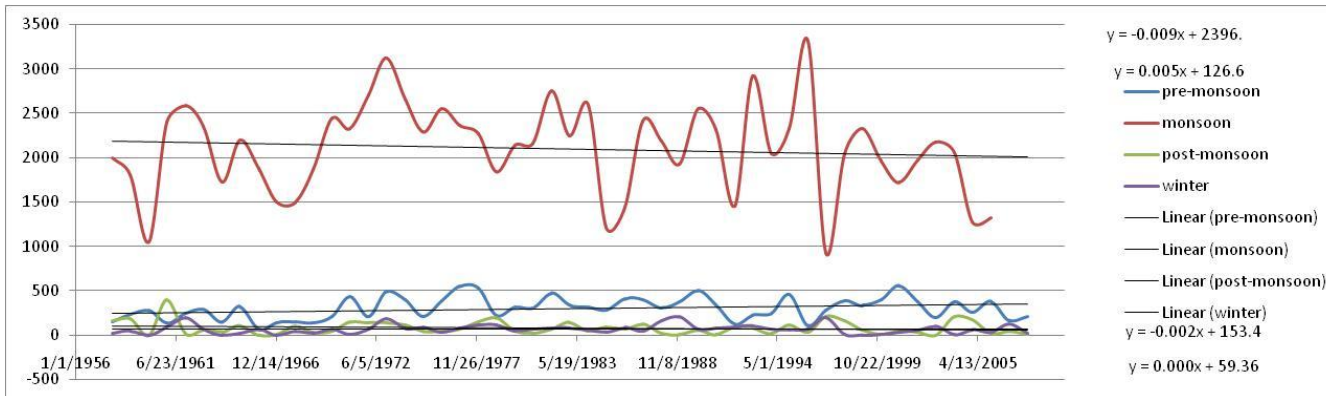


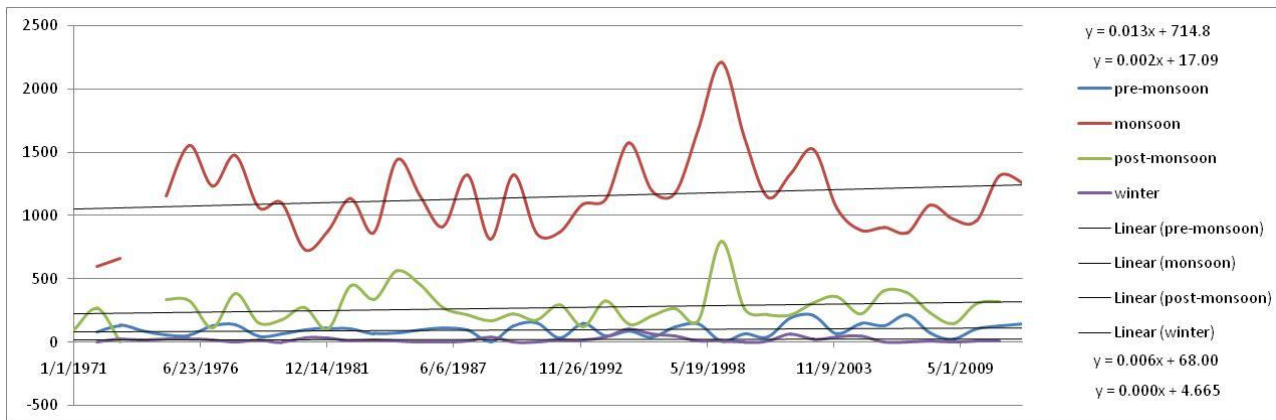
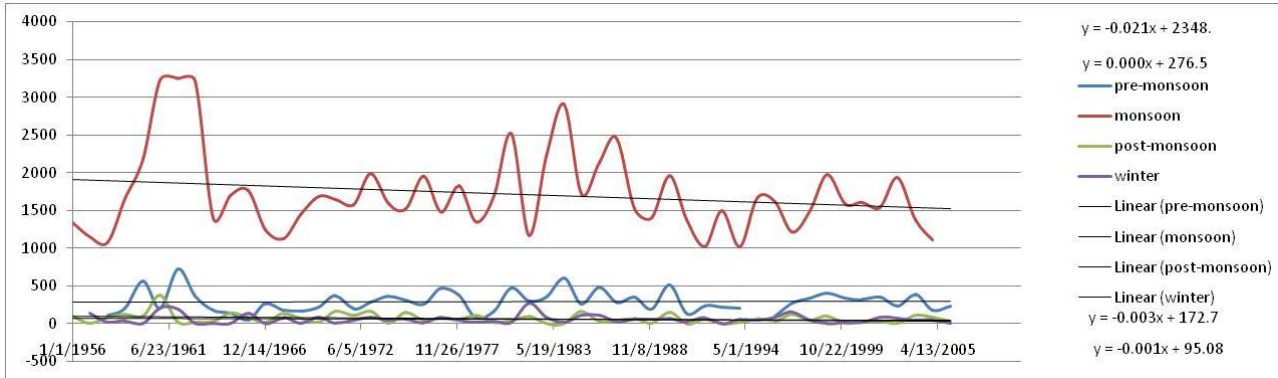
# Temp of 1004 and 1038



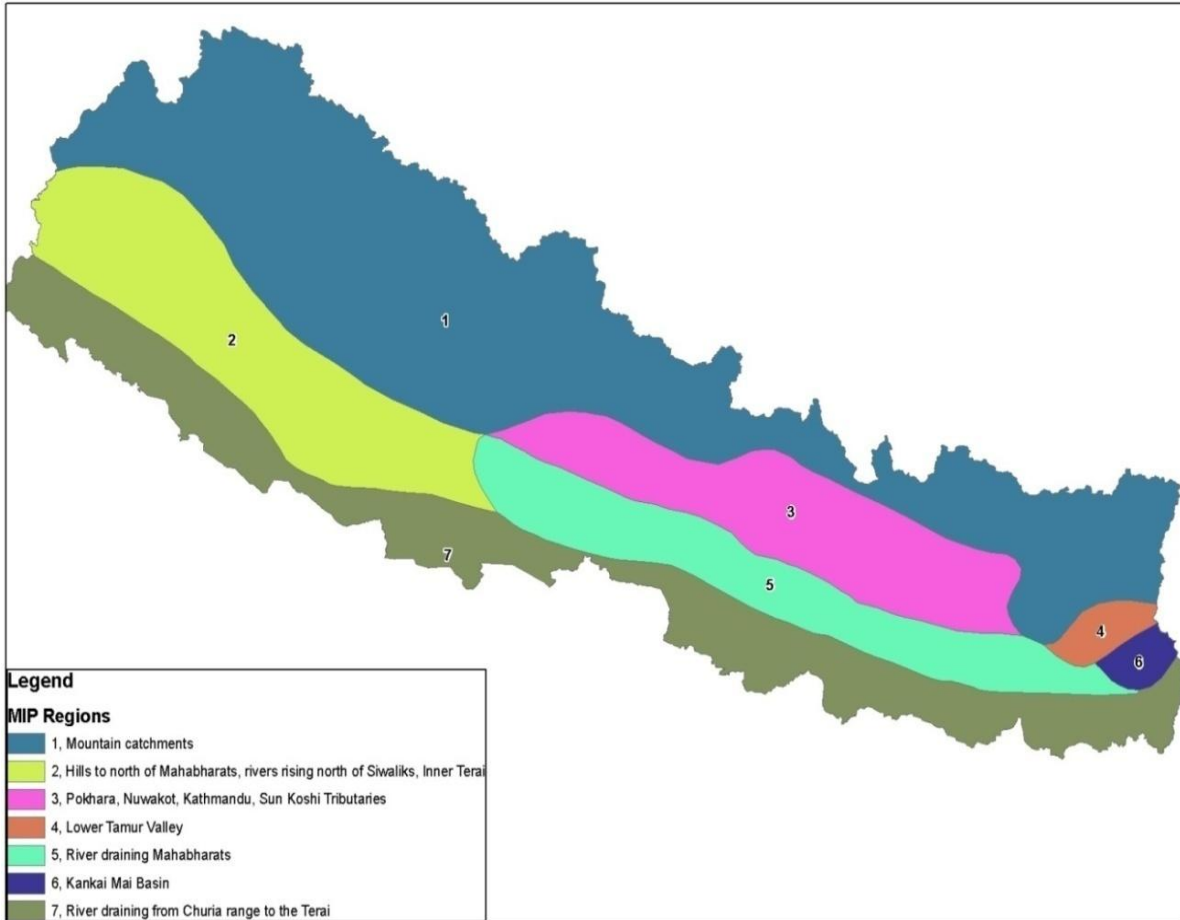


# Ppt of all stations

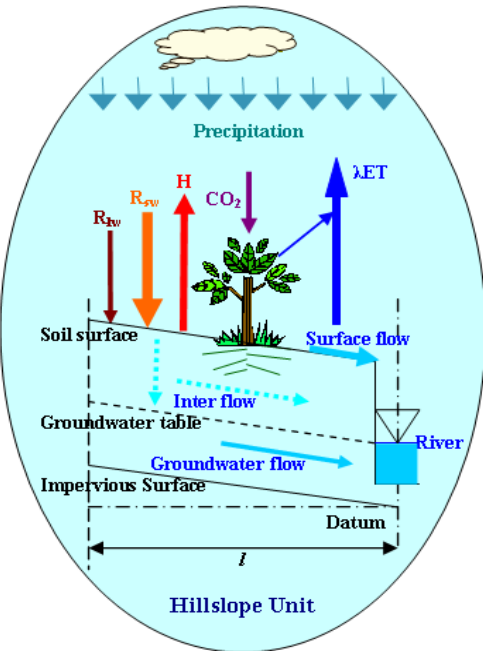




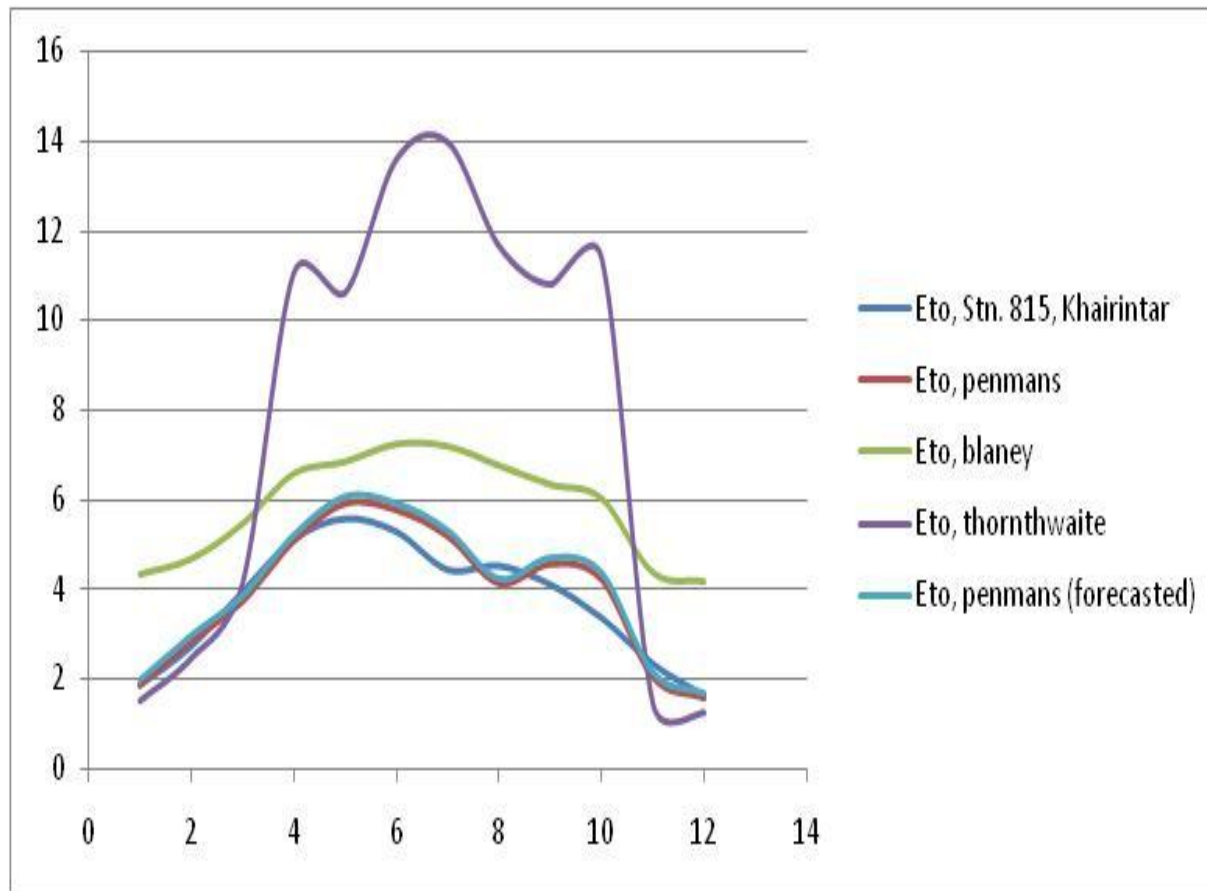
# Water Availability



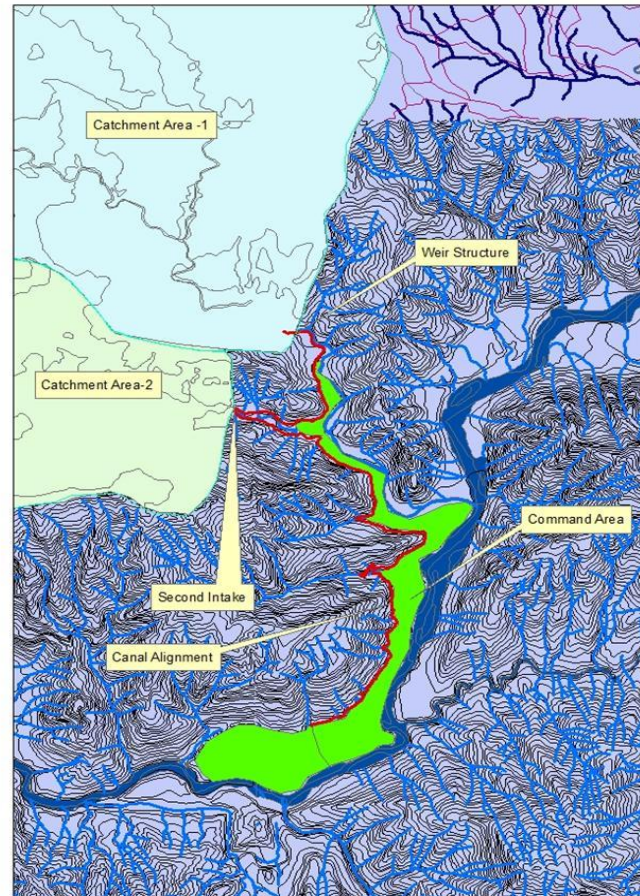
# Design Water Discharge with change in ETo



S.No.	Description	Discharge	Unit	Remarks
1	Originally Designed	540	lps	designed in 1983 A.D.
2	Rehabilitation Design	400	lps	designed in 1998 (319.68 lps) 25% contingency discharge added (800lps in salent feature)
3	Design Discharge calculated now	505	lps	calculated using evapotranspiration data taken from PDSP manual table D2, Station Khairinitar (Index No. 815)
4	Design Discharge calculated for present evapotranspiration	520	lps	Interpolation of station 815 to the Kalleritar system by PDSP manual method.
5	Design Discharge calculated for forecasted evapotranspiration	540	lps	Projected discharge by using new Eto for 2043

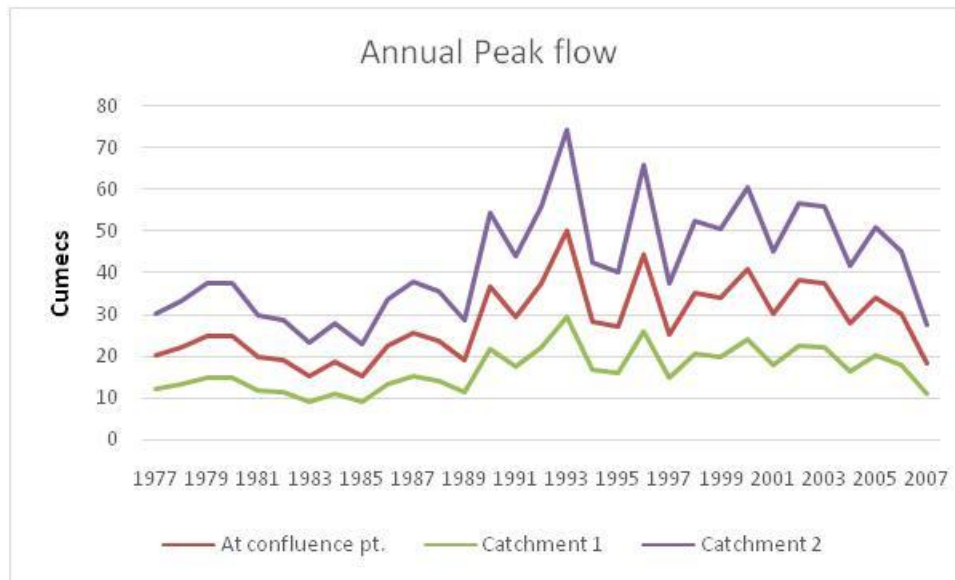


# Watershed Analysis



# Gumble Method

Return Period T	Catch 1, Km <sup>2</sup>	Catch 2 Km <sup>2</sup>	At confluence with Trishuli Km <sup>2</sup>
		33.61	16.53
Flood discharge in cumecs			
30	50	29	74
50	54	32	80
100	59	35	88
1000	77	45	114



# Total cost for Rehabilitation

SN	Description of Work	Quantity	Unit	Amount, NRs	Remarks
1	Construction of Lined Canals & Covered Canal	170	m.	3,077,467.57	
2	Construction of Retaining Wall	45	m.	12,315,452.32	
3	Construction of Foot Bridge	11	nos.	497,646.82	
4	Hume Pipe	10.00	m.	176,407.32	
5	Construction of Cascade Drop	1.00	nos.	129,580.30	
	Sub Total			<b>16,196,554.00</b>	
	Government payable Construction Cost (Contract) (A)			<b>16,196,554.00</b>	
	WUA Contribution Cost (B)			-	
	Sub-total (A+B)			<b>16,196,554.00</b>	
	Environmental Protection work @2%			323,931.08	
	Sub Total			<b>16,520,485.08</b>	
	Work Charge Staff @2.5%			413,012.13	
	Small Expenditures @2.5%			413,012.13	
	Contingencies for Price Escalation @10%			1,652,048.50	
	Contingencies for Physical Variation @10%			1,652,048.50	
	VAT @13%			2,147,663.06	
	Insurance @0.45%			74,342.19	
	Total (A+B+C+D+E)			<b>22,872,610.00</b>	



# Summary



# Nepalese Agriculture

- **Nepalese agriculture is central to national economy**
- **It contributes 35% to GDP**
- **Agriculture growth rate lies between 2.5 to 3.0% per annum which is far below the targeted 4.1%**
- **Composition of AGDP:**
  - **Total Crop 62%**
  - **Livestock 28%**
  - **Fish 1%**
  - **Forest 9%**

# Nepalese Agriculture ...

- **Agricultural land use: 75-80% of total cultivated land covered by cereals**
- **Irrigation covers 41% of total cultivated area**
- **Average yield of major crops in Terai**
  - **Rice: 3.3 mt/ha**
  - **Wheat : 2.4 mt/ha**
  - **Maize: 2.5 mt/ha**
- **Food consumption share in family expenditure: 61%**

# Nepalese Agriculture ...

- **Average landholding: 0.7 ha/HH**
- **Price information for agricultural products is mainly from middle men**
- **AFSDR <1 in 36 out of 75 districts**
- **Year round food sufficiency from own production is 55% HH even in Terai**
- **About 66% HHs have labor shortage in the country & 80% HHs in Terai have labor shortage in peak seasons**
- **Country is more or less on track to meet its MDG1 targets**

# Nepalese Agriculture ...

- Nepalese agriculture is thought to be highly affected by the climate change and will affect more in future, thus makes;
- Country more vulnerable to food insecurity, natural disastrous
- The mitigation and adaptation measures are essential and the cost benefit of adaptation needs to be calculated
- As UNDP/ADAPT Asia Pacific Program on Economics of Climate Change has started capacity building program the case study for calculating CBA in agriculture was conducted in Daltar Bhaltar irrigation System of Dhading district of Nepal
- The progress of the study are presented hereunder

# Progress of case study

- Name of the project : Agriculture sector in community managed irrigated agriculture sector project
- Geographical location : The proposed Daltar Bhaltar Irrigation Project is located in the south-east part of Dhading District in Bagmati Zone of Central Development Region. The project area is located in between the latitude and longitude of  $27^{\circ}45' 00''\text{N}$  to  $27^{\circ}47' 40''\text{N}$  and  $85^{\circ} 00' 00''\text{E}$  to  $85^{\circ} 1' 27.5''\text{E}$ , respectively. The head works lie in ward No 8 of Baireni VDC. The elevation of the area is about 584.00 m from MSL. The project area is easily accessible, located at ward no 8 of Baireni VDC in Dhading district, Bagmati zone, Nepal The command area of the sub project extends to Galchhi Bazar, which is a regular bus stop at Prithivi Highway. Its take about fifteen minutes walk to reach the project site from the Galchhi. Gajuri is the nearest Agricultural Service Center, which is at a 14 km distance to the sub project.

# Progress of case study

- Project goal : Overall project goal is to reduce poverty and increase agriculture production with a view to promote the economic condition of farmers in the Eastern and Central Development Regions of Nepal. The project covers 19 districts of the Central Development Region and 16 districts of the Eastern Development Region. There are altogether 210 sub projects and this is one of the sub project of the CMIASP. The project was started in 2007/2008.

# Project components

- 1) Agriculture Component for development of participatory irrigated agriculture
- 2) Irrigation Component for maintenance of the damaged irrigation infrastructure and Institutional strengthening and project management.



# Project Details

- Initially it was supposed to cover 187 ha of command area in ADB proposal, later on reduced to 120 ha
- In fact it has 60 ha of command area now
- Some 6.5 km of canal have already been constructed by the ADB project (CMIASP) and now the project has been terminated and additional 3.3 km of canal needs to be constructed

# Project Details

- There are about 20km of sub-canals too. The project need to maintain the main canal and sub canals too
- Total household of the project area are 200 with 40 HH located in upper end, 80 HH in middle end and 80 HH at tail end

# Production and productivity of major crops

<b>Crops</b>	<b>Total area per year (ha)</b>	<b>Productivity (mt/ha)</b>	<b>Total production (mt)</b>	
Rice	60	6	360	
Wheat	3	3	9	
Potato	15	14	210	
Tomato	40	20	800	
Maize	10	3	30	

# Proposed project activities

- Maintenance of the damaged irrigation infrastructure and institutional strengthening and project management.
- Trainings
- Seed multiplication for cereal crops
- Improved seed distribution for vegetables
- Increased use of organic fertilizer
- Use of integrated pest management techniques

# Progress

- Focus group discussion with multidisciplinary team has been conducted to assess the benefits and costs of the proposed activities
- FGD reveals likely 30% loss of agriculture land due to i) 5 % loss in housing by share of properties and ii) 25% reduction due to unavailability of irrigation ( in 10 years if the project will not be launched)
- Further 20% productivity will be declined in the present state in 10 years due to pest out burst, temperature rise and irrigation canal damaged, low irrigation water available (impact of climate change)

*Thank you*

