

Winter rice production under changing rainfall pattern in Nadia district of West Bengal

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Background

- Intra seasonal variability of south–west (SW) monsoon affects rainfall rice production in New Gangetic plains of West Bengal.
- Availability of rainfall water at critical crop growing stages regulates the vegetative and reproductive growth.
- A regional level assessment is required for proper crop planning.

OBJECTIVES

- To characterize the distribution pattern of rainfall in the growing season of Kharif rice of Nadia district of WB
- To quantify the rainfall at critical phenophases of rice and its influence on the productivity of the crop

- ◆ Study period : 1985 -2004
- ◆ Survey area : Nadia district
- ◆ Phenophasic rainfall : July to October falling on 27th to 41st
Standard Met week
- ◆ Four developmental stages:
 - ▶ Transplanting to maximum tillering (P1)
 - ▶ Maximum tillering to panicle initiation (P2)
 - ▶ Panicle initiation to anthesis (P3)
 - ▶ anthesis to maturity (P4)

RESULTS

Fig 1: Year wise variation of total rainfall and yield

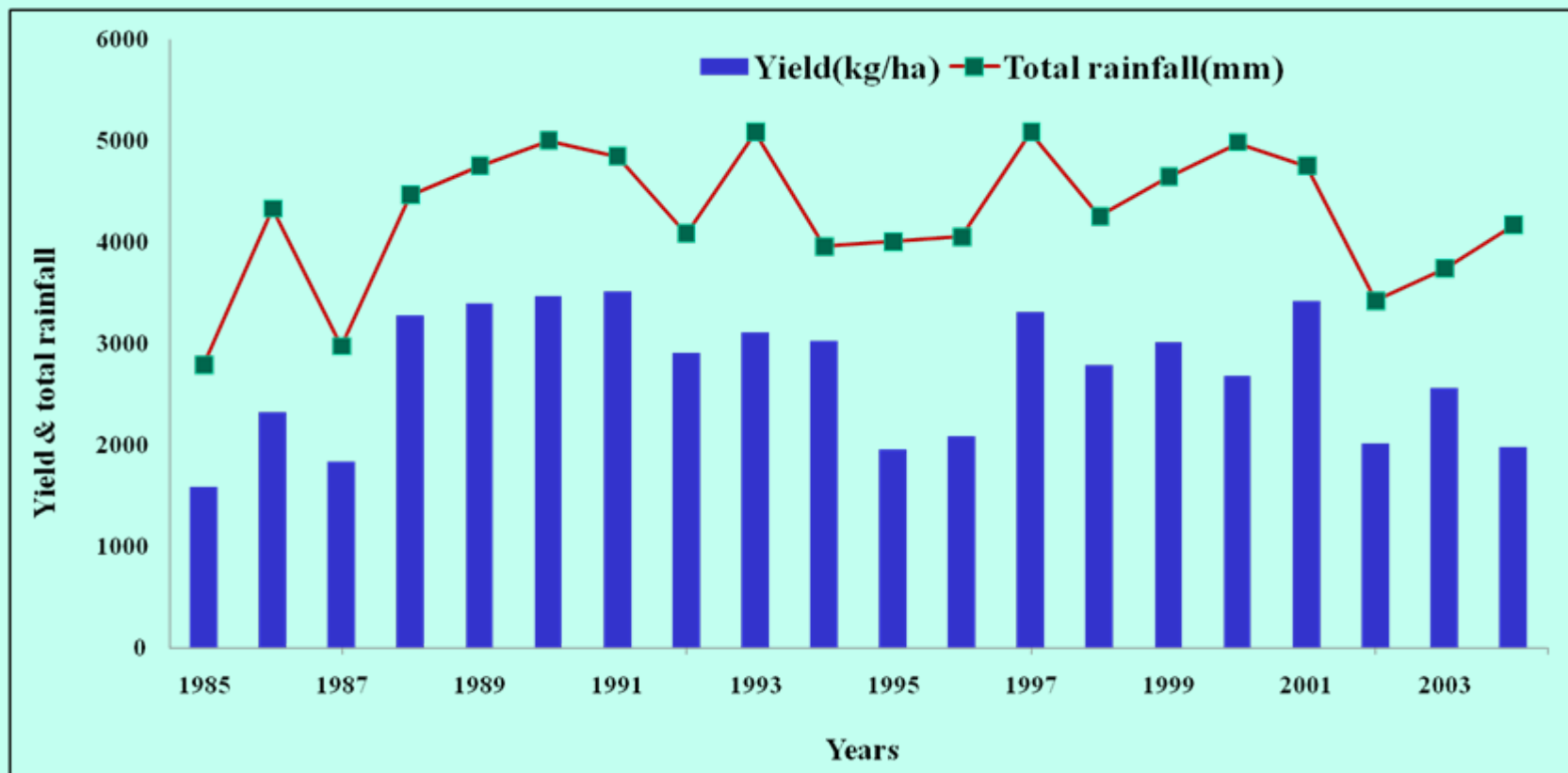


Fig 2: Variation in annual rainfall in Nadia during 1901-2000

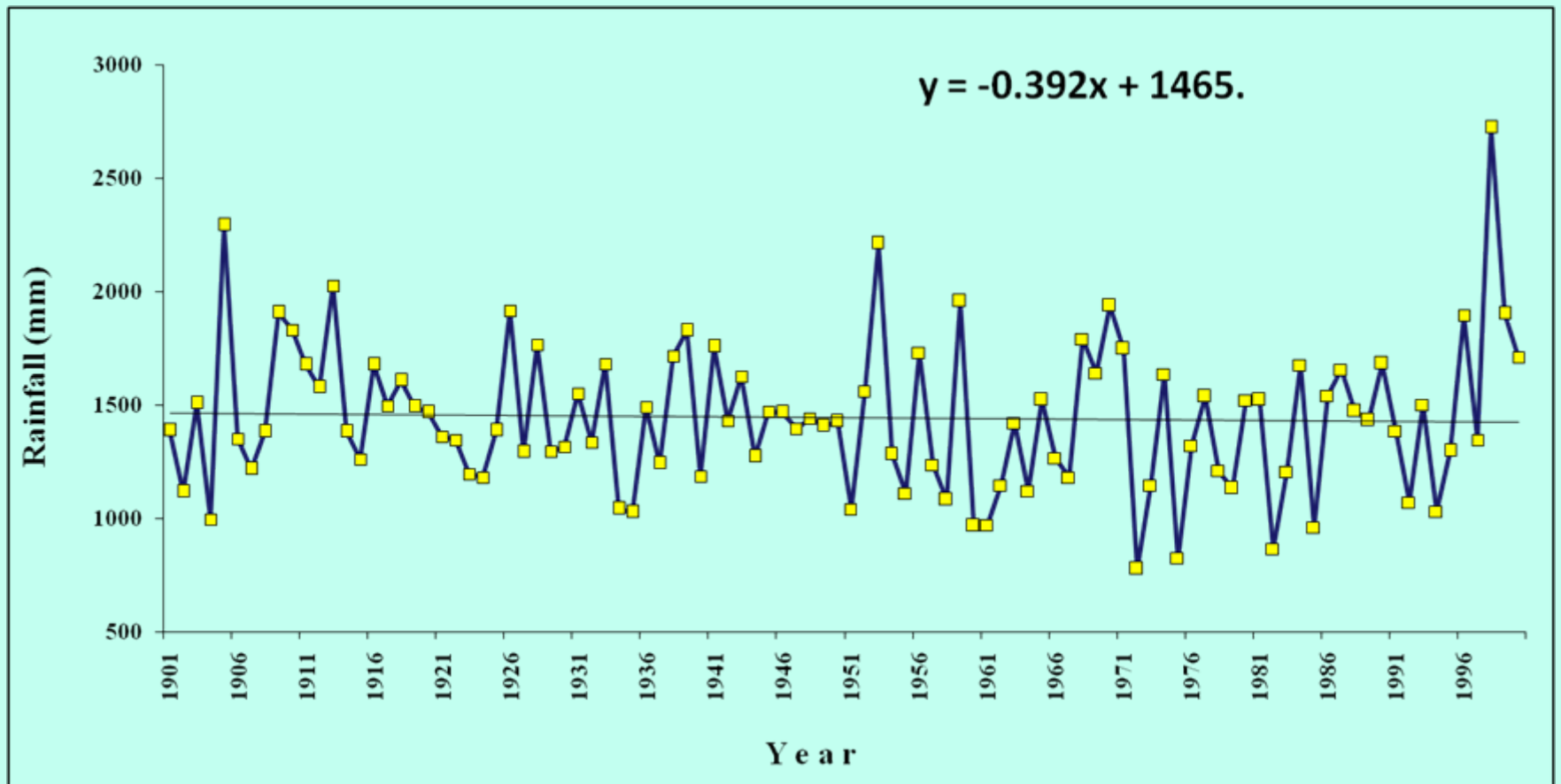


Fig 3: Seasonal rainfall during 1901-2000

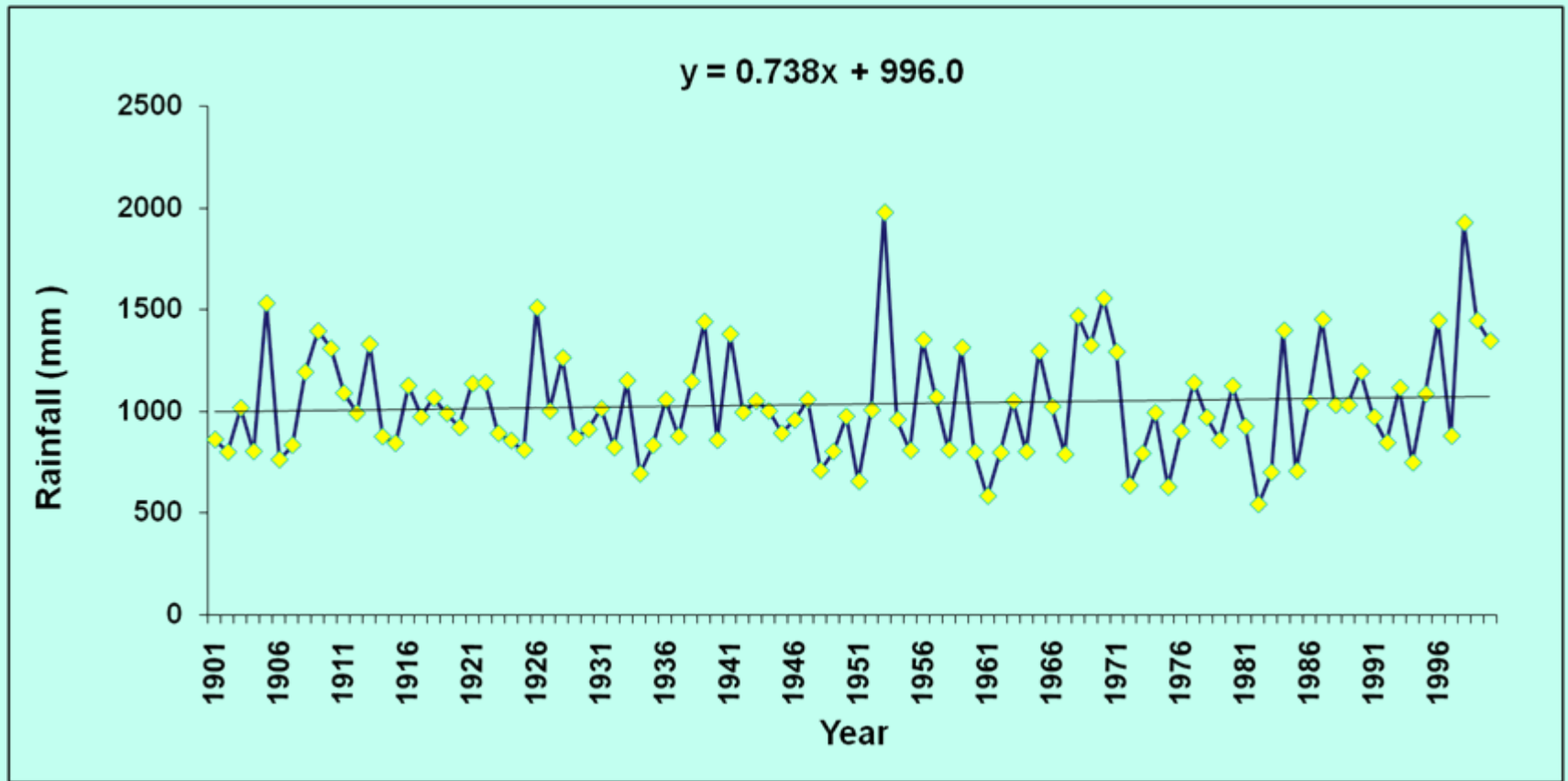


Fig 4 : Intra-seasonal rainfall during 1901-2000 in Nadia district

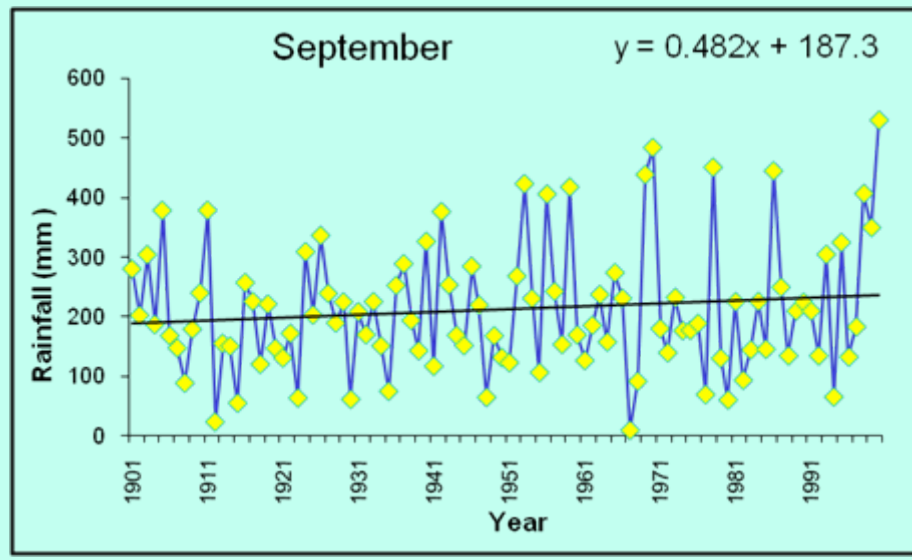
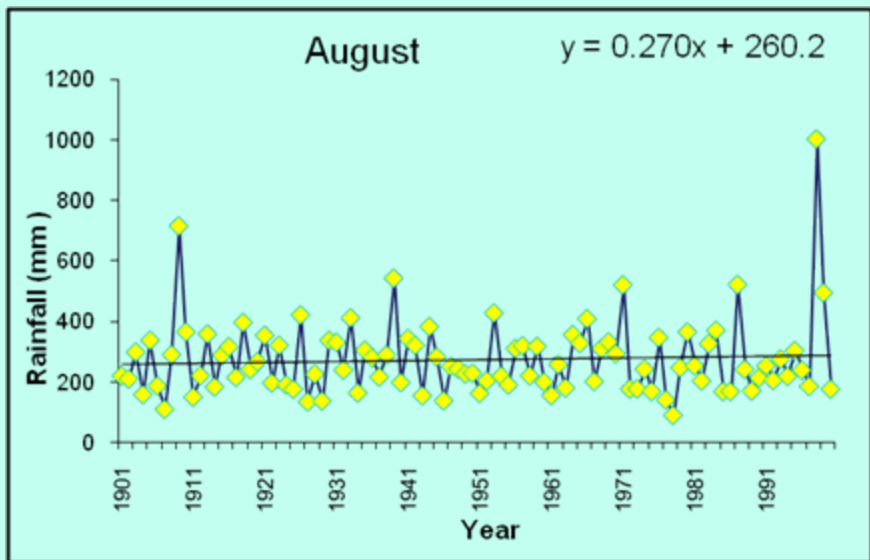
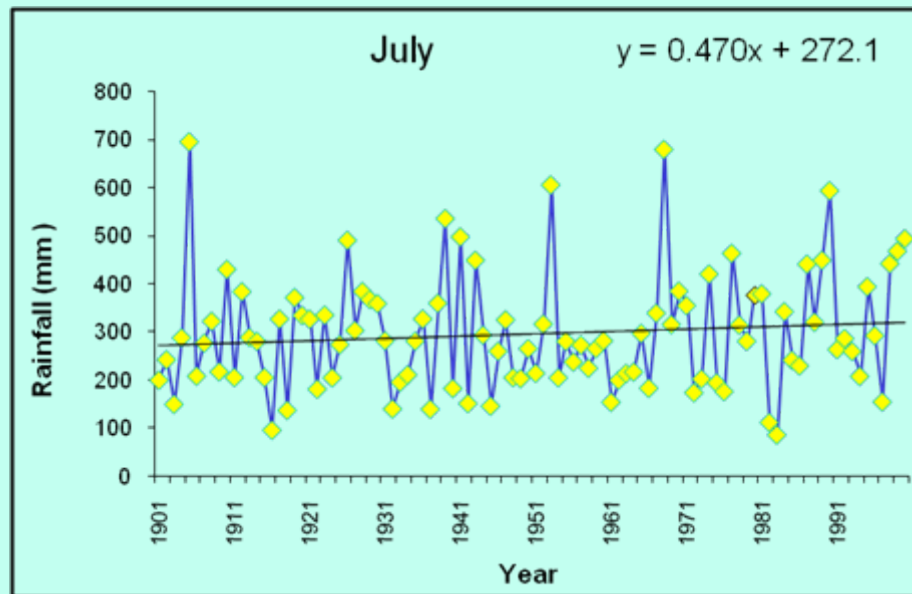
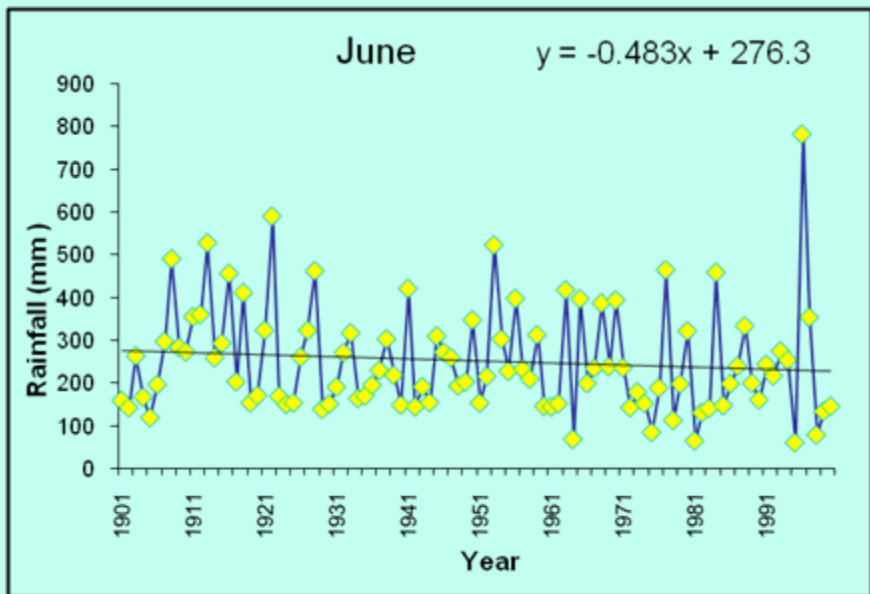


Table 1 : Phenophasic rainfall during kharif season of rice production in Nadia dist. Of WB (1985-2004)

	P1	P2	P1+P2	P3	P4	P3+P4	Total	Yield (Kg/ha)
Mean	224.18	71.27	295.45	254.84	226.62	481.46	1072.35	2716.30
St. Dev. (\pm)	75.44	72.18	100.40	98.64	127.15	171.31	266.79	625.45
CV (%)	33.65	101.28	33.98	38.71	56.11	35.58	24.88	23.03

The variability of total seasonal rainfall is less than the variability of phenophasic rainfall

Table 2. Correlation coefficient between phenophasic rainfall and rice yield

Phenophase	r	Std. Er.	Remarks
P1	0.354*	1.78	S
P2	-0.058	2.00	NS
P3	0.411*	1.33	S
P4	-0.177	1.11	NS
TRF	0.219	0.70	NS

- Yield is more related to rainfall during panicle to anthesis (P3)
- The next critical stage is P1 i.e., early vegetative stage

Salient Findings

- The total rainfall and the rainfall during kharif season did not show definite trend for last 100 years.
- The yield variation during last 20 years is not related with the total seasonal rainfall.
- The yield variation was found to be correlated with rainfall during two critical phases namely Transplanting to maximum tillering (P1) and Panicle initiation to anthesis (P3).

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