Rainfall Analysis for Crop Planning

M.Tech Geoinformatics
Course: Resources Evaluation (P)
Weekly Rainfall Analysis

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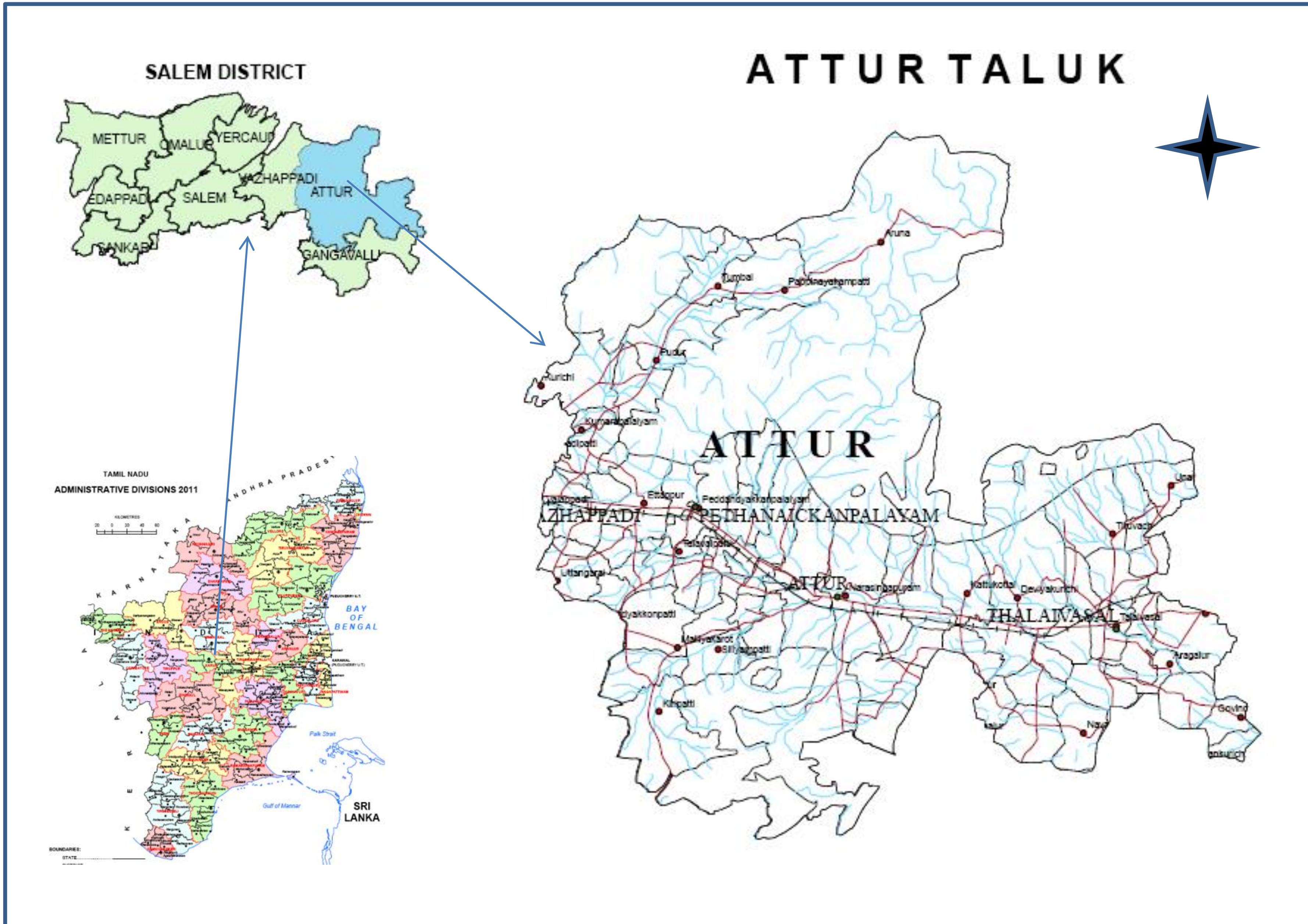


SALEM DISTRICT
METTUR
OMALUR
YERCAUD
VAZHAPPADI
ATTUR
EDAPPADI
SALEM
SANKARI
GANGAVALLI
TAMIL NADU
ADMINISTRATIVE DIVISIONS 2011
BAY OF BENGAL
SRI LANKA
ATTUR TALUK
ATTUR
PETHANAICKANPALAYAM
THALAIVASAL

Initial Probability

Initial probability indicates the minimum quantity of rainfall to expected for a particular time series data .

IP = n x p / 100

n = No.of years of rainfall data
p = probability level required (50 per cent)

Data input: Daily Rainfall → Week Tabulation (IMD)
Calculate : Mean | SD | MAI
Software Required: Ms. Excel and ArcGIS for mapping

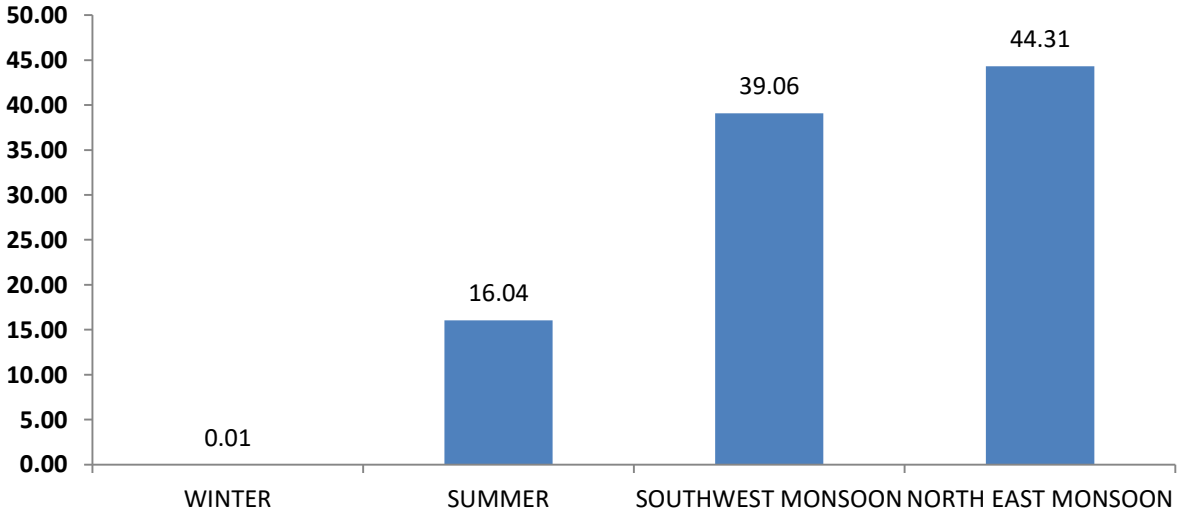
Brief about the Study Area

- 102 Villages
- 3 Blocks
- Area 1162 sqkm

Data Period 1980 - 2010

Data Source: Department of Economic and Statistics (GoTN)

Agro Climatc Research Centre (TNAU)



ATTUR TALUK

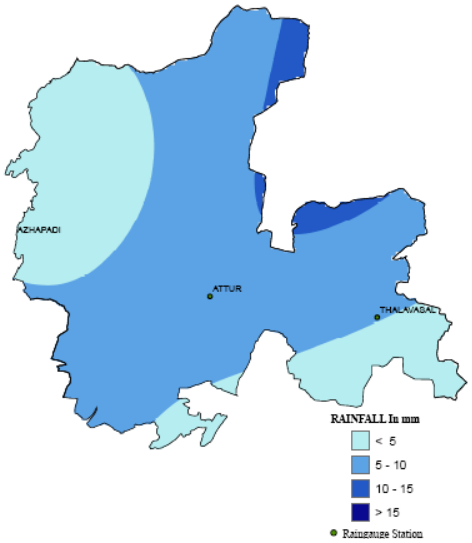
SALEM DISTRICT

Elevation in M

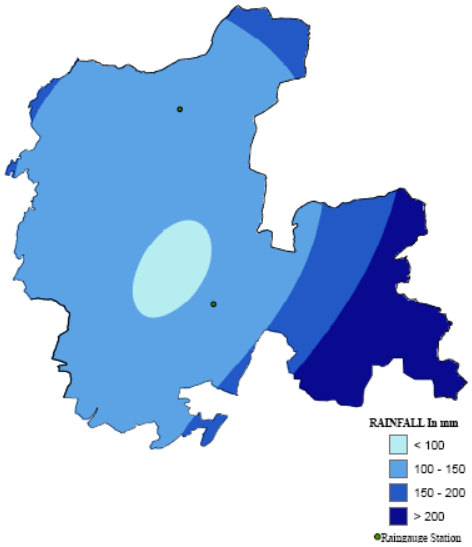
- 1136 - 1265
- 1007 - 1136
- 878 - 1007
- 749 - 878
- 620 - 749
- 491 - 620
- 362 - 491
- 233 - 362
- 104 - 233

ATTUR TALUK - SALEM DISTRICT

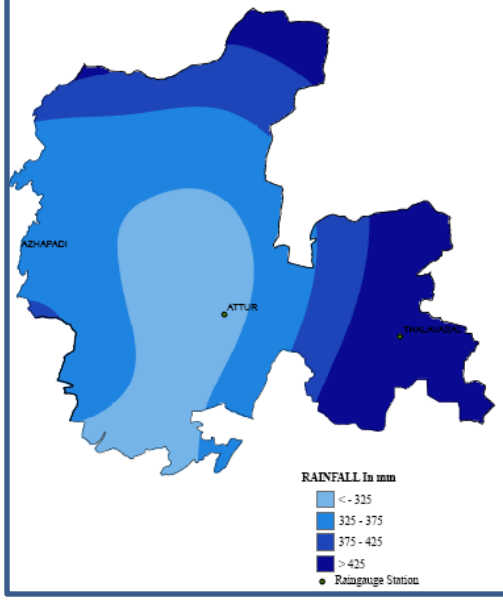
WINTER SEASON



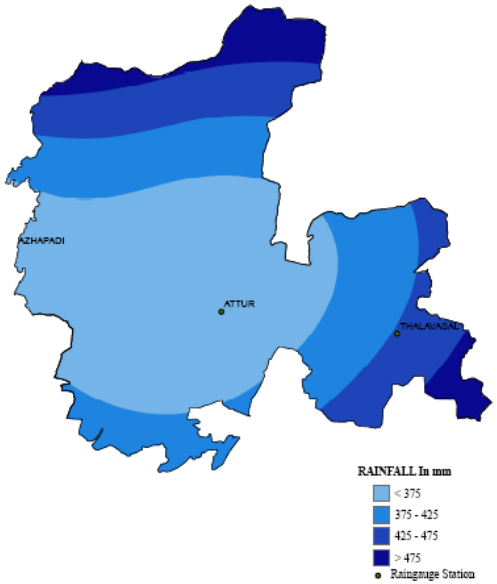
SUMMER SEASON



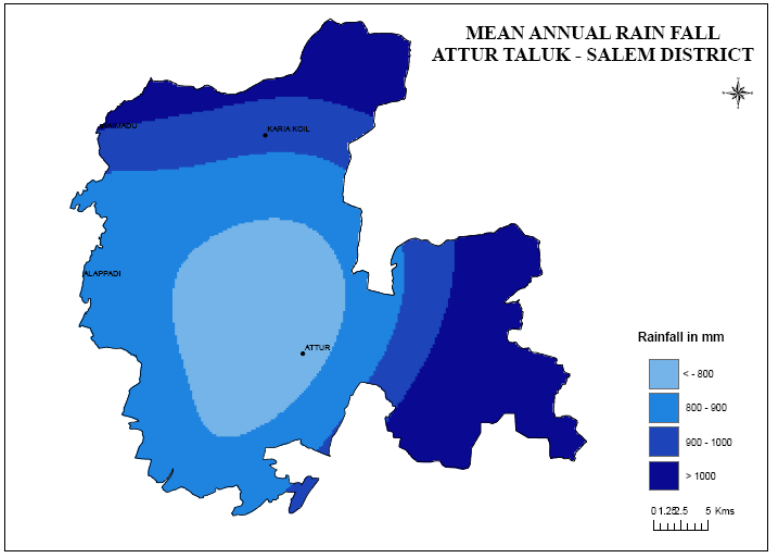
SOUTHWEST SEASON



NORTHEAST SEASON

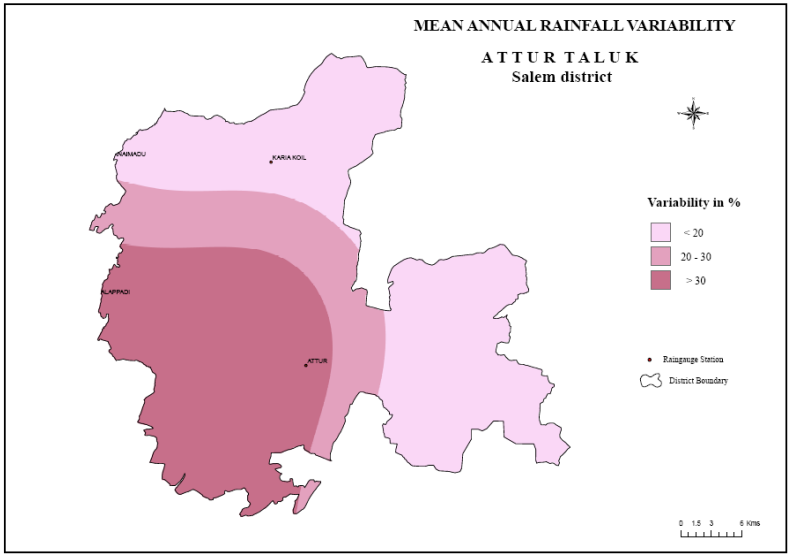


MEAN ANNUAL RAIN FALL ATTUR TALUK - SALEM DISTRICT



MEAN ANNUAL RAINFALL VARIABILITY

ATTUR TALUK
Salem district

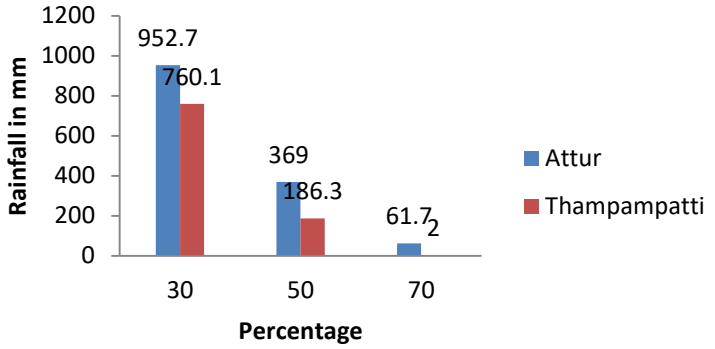


0 5 10 20 Kms

Initial Probability

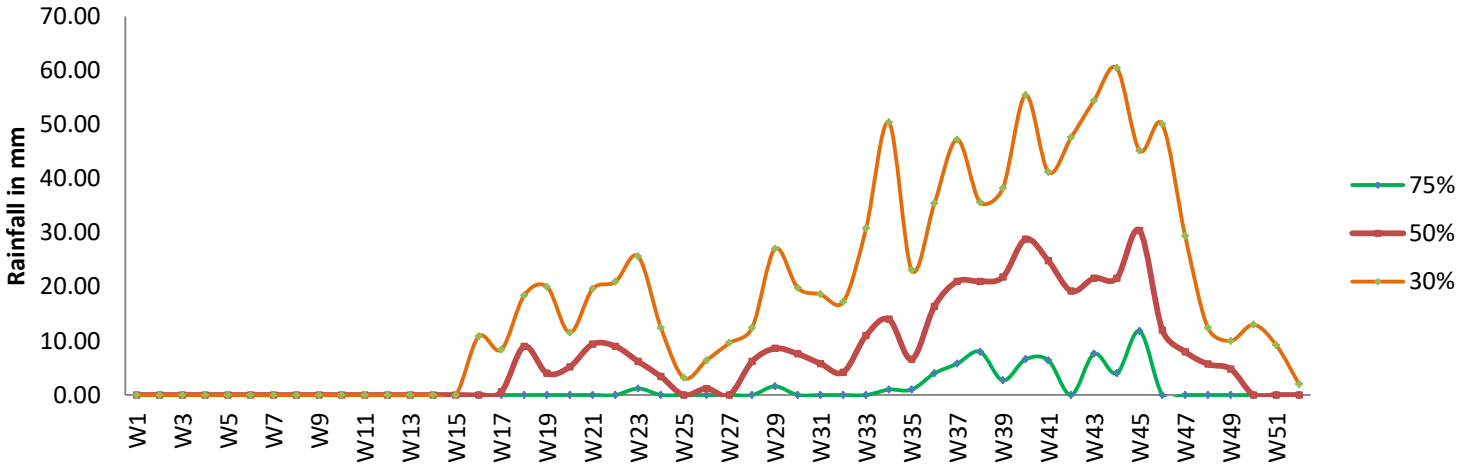
	Attur			Thampampatti		
WEEK/%	75	50	30	75	50	30
W1	0.00	0.00	0.00	0.00	0.00	0.00
W2	0.00	0.00	0.00	0.00	0.00	0.00
W3	0.00	0.00	0.00	0.00	0.00	0.00
W4	0.00	0.00	0.00	0.00	0.00	0.00
W5	0.00	0.00	0.00	0.00	0.00	0.00
W6	0.00	0.00	0.00	0.00	0.00	0.00
W7	0.00	0.00	0.00	0.00	0.00	0.00
W8	0.00	0.00	0.00	0.00	0.00	0.00
W9	0.00	0.00	0.00	0.00	0.00	0.00
W10	0.00	0.00	0.00	0.00	0.00	0.00
W11	0.00	0.00	0.00	0.00	0.00	0.00
W12	0.00	0.00	0.00	0.00	0.00	0.00
W13	0.00	0.00	0.00	0.00	0.00	0.00
W14	0.00	0.00	0.00	0.00	0.00	0.00
W15	0.00	0.00	0.00	0.00	0.00	0.00
W16	0.00	0.00	10.80	0.00	0.00	0.00
W17	0.00	0.60	8.40	0.00	0.00	0.00
W18	0.00	9.00	18.40	0.00	0.00	26.80
W19	0.00	4.00	20.00	0.00	2.00	13.00
W20	0.00	5.20	11.50	0.00	0.00	12.50
W21	0.00	9.40	19.60	0.00	2.20	12.80
W22	0.00	9.00	20.90	0.00	8.80	21.20
W23	1.20	6.20	25.60	0.00	0.00	12.00
W24	0.00	3.40	12.40	0.00	0.00	11.00
W25	0.00	0.00	3.20	0.00	0.00	0.00
W26	0.00	1.20	6.40	0.00	0.00	2.00
W27	0.00	0.00	9.60	0.00	0.00	10.00
W28	0.00	6.20	12.40	0.00	0.00	8.00
W29	1.60	8.60	27.00	0.00	0.00	2.60
W30	0.00	7.60	19.80	0.00	0.00	0.00
W31	0.00	5.80	18.60	0.00	0.00	7.00
W32	0.00	4.20	17.20	0.00	0.00	6.60

	Attur			Thampampatti		
WEEK/%	75	50	30	75	50	30
W33	0.00	11.00	30.80	0.00	2.40	30.00
W34	1.00	14.00	50.40	0.00	0.00	18.20
W35	1.00	6.60	23.10	0.00	7.00	13.20
W36	4.00	16.40	35.40	0.00	4.20	28.60
W37	5.80	21.00	47.20	0.00	16.40	45.00
W38	8.00	21.00	35.60	0.00	5.00	43.00
W39	2.70	21.80	38.20	0.00	23.60	38.00
W40	6.60	28.80	55.40	0.00	17.20	38.60
W41	6.40	24.80	41.20	2.00	19.20	39.00
W42	0.00	19.20	47.60	0.00	4.00	31.00
W43	7.60	21.60	54.40	0.00	33.10	47.00
W44	4.00	21.60	60.40	0.00	9.00	67.00
W45	11.80	30.40	45.20	0.00	22.00	68.00
W46	0.00	12.00	50.00	0.00	0.00	28.00
W47	0.00	8.00	29.40	0.00	10.20	39.20
W48	0.00	5.70	12.40	0.00	0.00	0.00
W49	0.00	4.80	10.00	0.00	0.00	18.00
W50	0.00	0.00	13.00	0.00	0.00	14.80
W51	0.00	0.00	9.20	0.00	0.00	8.00
W52	0.00	0.00	2.00	0.00	0.00	0.00
TOTAL	61.70	369.10	952.70	2.00	186.30	760.10



Initial Probability

Attur



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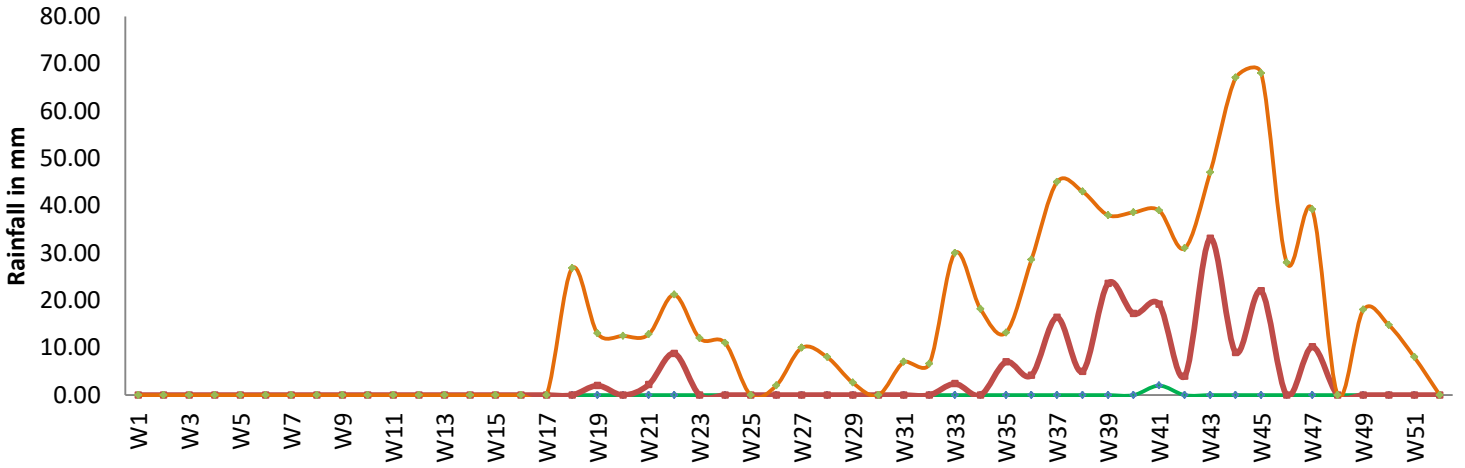


Conditional Probability

Conditional probability (CP) Indicates the probability level at which a particular amount of rainfall is anticipated for a particular place over specified time

$$CP = [\overline{X} – X / SD] \times 100$$

X = Mean rainfall for a particular period
X = Required probability
SD = Standard Deviation

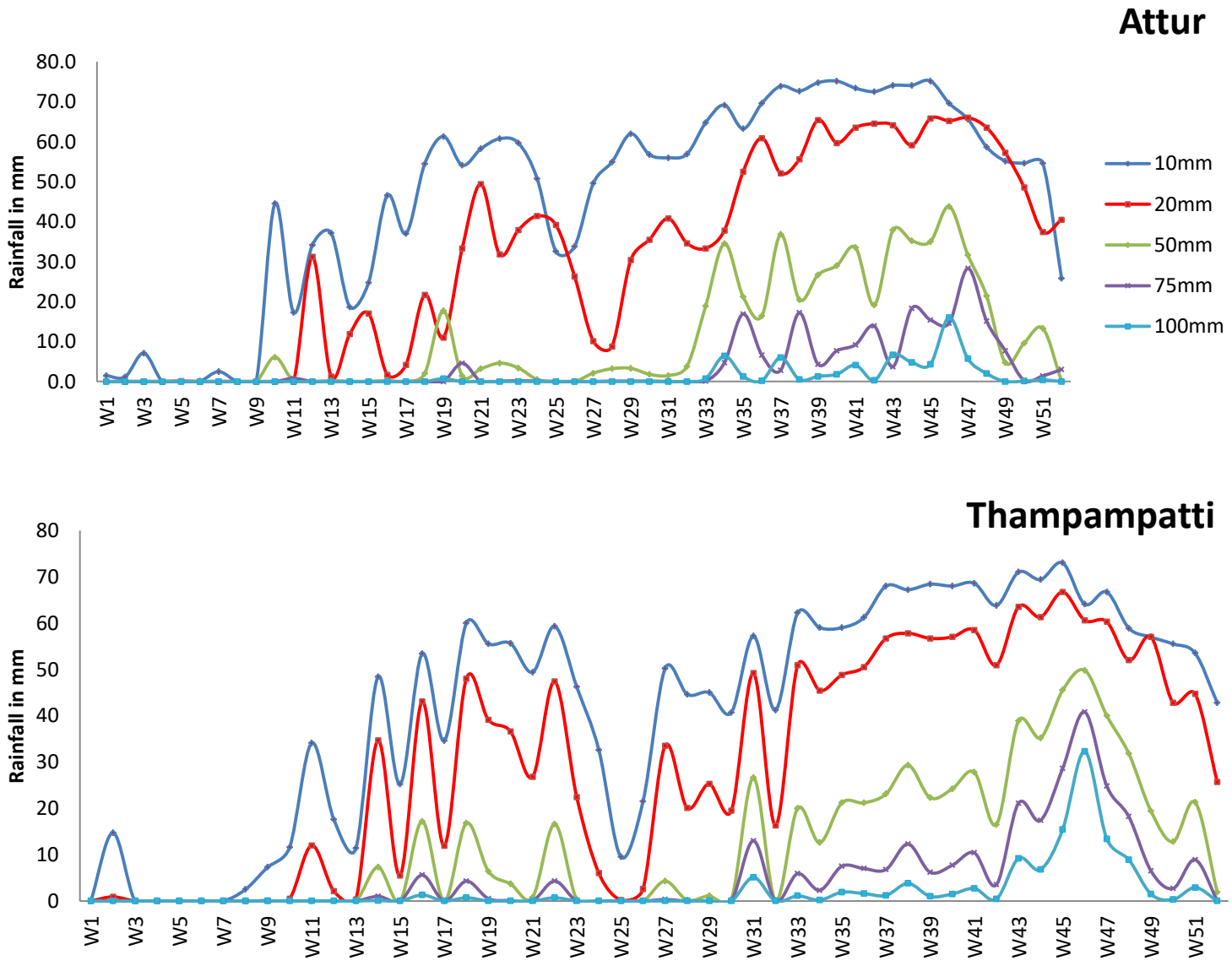
* **The value ==➔ Z table (Probability of Normal Distribution)**

Conditional Probability

ATTUR					
	10mm	20mm	50mm	75mm	100mm
W1	1.5	0	0	0	0
W2	1.2	0	0	0	0
W3	7.1	0.1	0	0	0
W4	0.0	0	0	0	0
W5	0.0	0	0	0	0
W6	0.1	0	0	0	0
W7	2.5	0	0	0	0
W8	0.0	0	0	0	0
W9	0.0	0	0	0	0
W10	44.5	31.2	6.1	0.8	0
W11	17.3	1.3	0	0	0
W12	34.1	11.9	0	0	0
W13	37.2	17	0.2	0	0
W14	18.7	1.7	0	0	0
W15	24.7	4.2	0	0	0
W16	46.6	21.7	0.2	0	0
W17	37.0	11	0	0	0
W18	54.5	33.3	2	0	0
W19	61.3	49.4	17.7	4.6	0.7
W20	54.1	31.8	1.4	0	0
W21	58.2	37.9	3.2	0.1	0
W22	60.7	41.4	4.6	0.2	0
W23	59.6	39.2	3.4	0.1	0
W24	50.8	26.3	0.5	0	0
W25	32.6	10.1	0	0	0
W26	33.8	8.8	0	0	0
W27	49.6	30.4	2.1	0.1	0
W28	54.9	35.5	3.2	0.1	0
W29	62.0	40.8	3.3	0.1	0
W30	56.7	34.6	1.8	0	0
W31	56.0	33.3	1.5	0	0
W32	56.9	37.8	3.8	0.1	0
W33	64.7	52.5	18.9	4.7	0.7
W34	69.2	60.9	34.5	16.9	6.4
W35	63.2	52.1	21.2	6.6	1.3
W36	69.6	55.6	16.4	2.8	0.2
W37	73.9	65.4	36.8	17.2	6
W38	72.6	59.7	20.5	4.3	0.5
W39	74.7	63.5	26.7	7.7	1.3
W40	75.1	64.5	29	9.2	1.8
W41	73.4	64.1	33.5	13.9	4.1
W42	72.5	59.1	19.1	3.7	0.3
W43	74.1	65.8	37.9	18.3	6.7
W44	74.1	65.2	35.2	15.4	4.8
W45	75.2	66	35	14.6	4.3
W46	69.6	63.5	43.8	28.3	16
W47	65.6	57.2	31.6	15.1	5.7
W48	58.7	48.6	21.4	7.7	2
W49	55.2	37.4	4.7	0.3	0
W50	54.6	40.5	9.6	1.4	0.1
W51	54.6	42.4	13.3	3	0.4
W52	25.8	2	0.1	0	0

THAMPAMPATTI					
	10mm	20mm	50mm	75mm	100mm
W1	0	0	0	0	0
W2	14.7	0.9	0	0	0
W3	0	0	0	0	0
W4	0	0	0	0	0
W5	0	0	0	0	0
W6	0	0	0	0	0
W7	0	0	0	0	0
W8	2.5	0	0	0	0
W9	7.3	0.1	0	0	0
W10	11.6	0.5	0	0	0
W11	34.1	12	0	0	0
W12	17.6	2.1	0	0	0
W13	11.4	0.3	0	0	0
W14	48.4	34.7	7.3	1	0.1
W15	25.2	5.5	0	0	0
W16	53.4	43.1	17.2	5.6	1.3
W17	34.6	11.9	0	0	0
W18	60	48	16.8	4.3	0.7
W19	55.5	39.1	6.4	0.5	0
W20	55.6	36.6	3.7	0.1	0
W21	49.4	26.8	0.8	0	0
W22	59.3	47.4	16.6	4.3	0.7
W23	46.2	22.4	0.3	0	0
W24	32.6	6	0	0	0
W25	9.5	0.2	0	0	0
W26	21.5	2.6	0	0	0
W27	50.2	33.5	4.3	0.3	0
W28	44.6	20.1	0.2	0	0
W29	45	25.3	1.1	0	0
W30	40.7	19.5	0.3	0	0
W31	57.2	49.2	26.6	13	5.1
W32	41.2	16.3	0.1	0	0
W33	62.2	50.9	20	5.9	1.1
W34	59	45.4	12.6	2.3	0.2
W35	59	48.8	21.2	7.5	1.9
W36	61.2	50.5	21.2	7	1.6
W37	68	56.7	23.1	6.8	1.2
W38	67.2	57.8	29.3	12.3	3.8
W39	68.4	56.7	22.3	6.2	1
W40	68	57	24.2	7.7	1.5
W41	68.6	58.5	27.8	10.4	2.7
W42	63.8	50.9	16.5	3.5	0.4
W43	71	63.5	38.9	21.1	9.2
W44	69.4	61.3	35.2	17.4	6.8
W45	73	66.7	45.5	28.6	15.4
W46	64.1	60.6	49.8	40.8	32.3
W47	66.7	60.3	40	24.8	13.4
W48	58.9	52	31.8	18.2	8.9
W49	57	57	19.4	6.5	1.5
W50	55.5	42.8	12.8	2.7	0.3
W51	53.5	44.7	21.3	8.9	2.9
W52	42.8	25.7	1.9	0.1	0

Conditional Probability



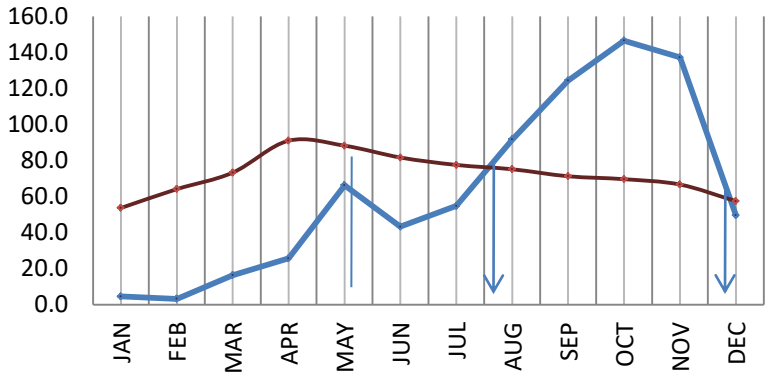
Standard Weakly Mean > 7.5mm

	Attur	Thampampatti
W1	1.03	0.55
W2	1.18	2.13
W3	1.47	0
W4	0.45	0
W5	0.20	0.42
W6	0.86	0
W7	1.47	0.21
W8	0.10	1.15
W9	0.26	1.1
W10	6.09	1.4
W11	2.61	4.66
W12	4.68	1.62
W13	4.78	2.08
W14	2.72	8.85
W15	3.46	2.85
W16	8.76	13.28
W17	6.29	4.97
W18	12.07	18.35
W19	19.48	13.35
W20	11.79	12.91
W21	14.02	9.77
W22	15.57	17.81
W23	14.71	8.55
W24	10.29	5.91
W25	4.50	1.73

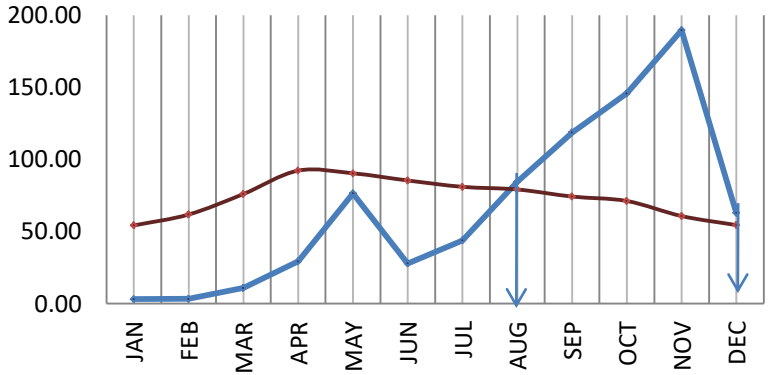
	Attur	Thampampatti
W26	5.54	3.18
W27	9.79	10.1
W28	12.49	8.06
W29	15.68	7.7
W30	13.00	6.24
W31	12.59	18.99
W32	13.58	7.08
W33	22.00	20.8
W34	32.28	16.62
W35	21.89	18.85
W36	23.76	20.49
W37	36.19	25.57
W38	26.89	27.98
W39	30.71	25.47
W40	32.02	26.03
W41	33.75	28.04
W42	26.26	20.65
W43	37.05	36.51
W44	35.20	32.87
W45	35.50	43.8
W46	40.64	49.57
W47	28.25	35.24
W48	18.65	22.91
W49	12.88	16.76
W50	13.25	14.32
W51	13.75	13.95
W52	6.08	6.17

Length of Growing Period (LGP)

Attur



Thampampatti



Moisture Adequacy Index (MAI)

		Attur		Thampampatti		
	PE	50	MAI	50	PET	MAI
W1	26.84	0.00	0.00	0.00	27.10	0.00
W2	26.84	0.00	0.00	0.00	27.10	0.00
W3	26.84	0.00	0.00	0.00	27.10	0.00
W4	26.84	0.00	0.00	0.00	27.10	0.00
W5	32.00	0.00	0.00	0.00	30.89	0.00
W6	32.00	0.00	0.00	0.00	30.89	0.00
W7	32.00	0.00	0.00	0.00	30.89	0.00
W8	32.00	0.00	0.00	0.00	30.89	0.00
W9	29.30	0.00	0.00	0.00	30.39	0.00
W10	29.30	0.00	0.00	0.00	30.39	0.00
W11	29.30	0.00	0.00	0.00	30.39	0.00
W12	29.30	0.00	0.00	0.00	30.39	0.00
W13	29.30	0.00	0.00	0.00	30.39	0.00
W14	45.49	0.00	0.00	0.00	46.10	0.00
W15	45.49	0.00	0.00	0.00	46.10	0.00
W16	45.49	0.00	0.00	0.00	46.10	0.00
W17	45.49	0.60	0.01	0.00	46.10	0.00
W18	35.29	9.00	0.26	0.00	36.13	0.00
W19	35.29	4.00	0.11	2.00	36.13	0.06
W20	35.29	5.20	0.15	0.00	36.13	0.00
W21	35.29	9.40	0.27	2.20	36.13	0.06
W22	35.29	9.00	0.26	8.80	36.13	0.24
W23	40.83	6.20	0.15	0.00	42.68	0.00
W24	40.83	3.40	0.08	0.00	42.68	0.00
W25	40.83	0.00	0.00	0.00	42.68	0.00
W26	40.83	1.20	0.03	0.00	42.68	0.00
W27	38.78	0.00	0.00	0.00	40.48	0.00
W28	38.78	6.20	0.16	0.00	40.48	0.00
W29	38.78	8.60	0.22	0.00	40.48	0.00
W30	38.78	7.60	0.20	0.00	40.48	0.00
W31	30.00	5.80	0.19	0.00	31.65	0.00
W32	30.00	4.20	0.14	0.00	31.65	0.00
W33	30.00	11.00	0.37	2.40	31.65	0.08
W34	30.00	14.00	0.47	0.00	31.65	0.00
W35	30.00	6.60	0.22	7.00	31.65	0.22
W36	35.64	16.40	0.46	4.20	37.11	0.11
W37	35.64	21.00	0.59	16.40	37.11	0.44
W38	35.64	21.00	0.59	5.00	37.11	0.13
W39	35.64	21.80	0.61	23.60	37.11	0.64
W40	34.83	28.80	0.83	17.20	35.56	0.48
W41	34.83	24.80	0.71	19.20	35.56	0.54
W42	34.83	19.20	0.55	4.00	35.56	0.11
W43	34.83	21.60	0.62	33.10	35.56	0.93
W44	33.34	21.60	0.65	9.00	30.34	0.30
W45	33.34	30.40	0.91	22.00	30.34	0.73
W46	33.34	12.00	0.36	0.00	30.34	0.00
W47	33.34	8.00	0.24	10.20	30.34	0.34
W48	22.99	5.70	0.25	0.00	30.34	0.00
W49	22.99	4.80	0.21	0.00	21.77	0.00
W50	22.99	0.00	0.00	0.00	21.77	0.00
W51	22.99	0.00	0.00	0.00	21.77	0.00
W52	22.99	0.00	0.00	0.00	21.77	0.00

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Moisture availability index (MAI) was worked out using the following MAI equation as suggested by Sarkar and Biswas (1988) and Balasubramanian *et al*. (1996).

MAI = Weekly assured rainfall 50% / PET (Potential Evapotranspiration)

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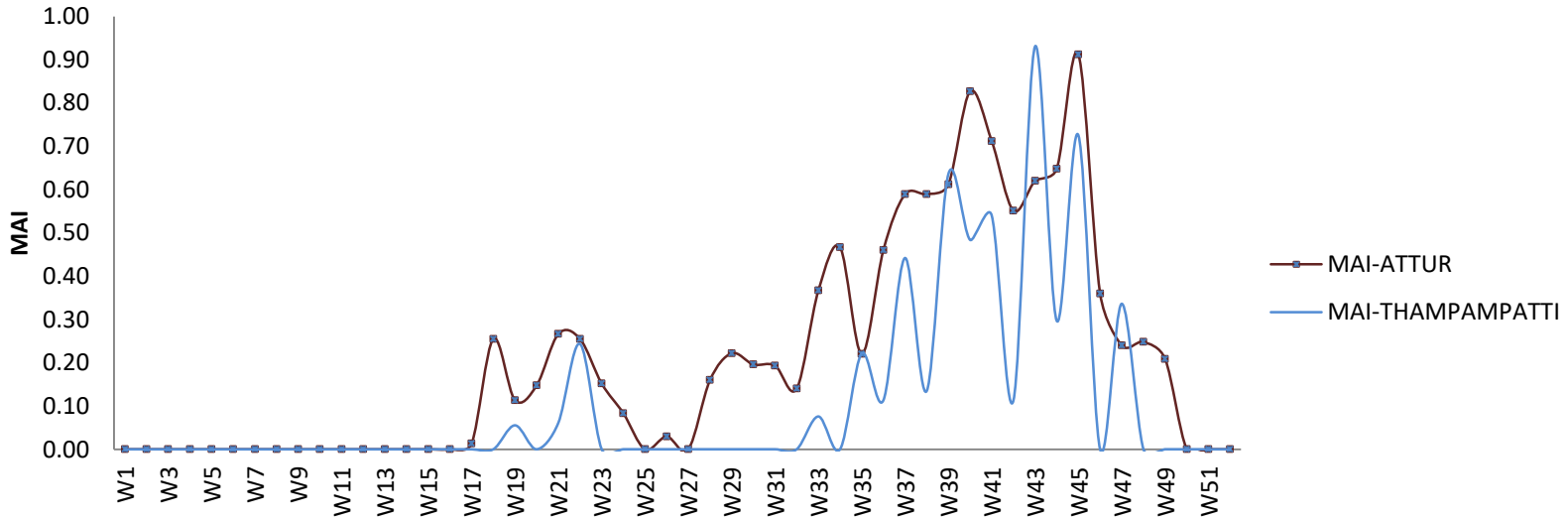
Attur and Thampampatti



Thank You