

CHAPTER-3

DATA COLLECTION

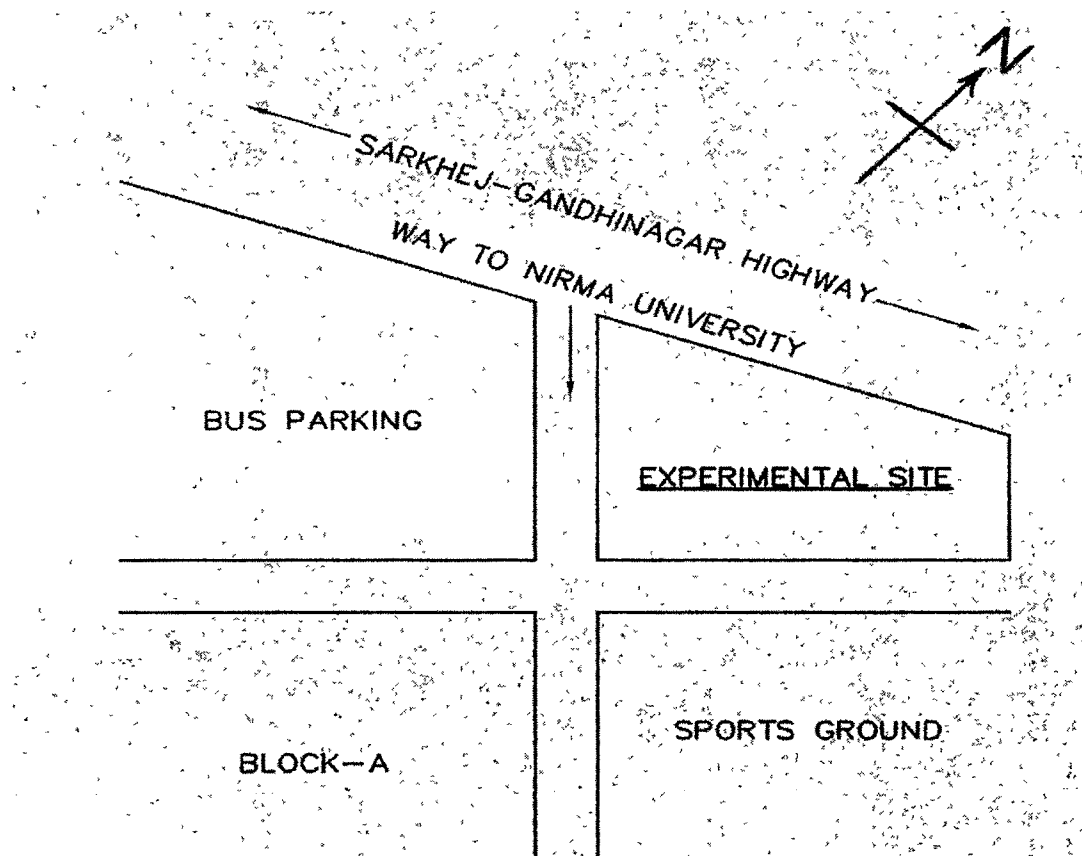
3.1 Location of Experimental Site

Experiments were carried out at campus of Nirma University of Science and Technology, Chharodi, Sarkhej – Gandhinagar Highway, Ahmedabad. Fig 3.1 shows location of experimental site

Latitude $23^{\circ} 04' N$

Longitude $72^{\circ} 38' E$

Height above mean sea level. 55 m



**FIG. 3.1 LOCATION OF
EXPERIMENTAL LAYOUT**

3.2 Soil Data

The physical and chemical properties of soil before conducting the experiments are mentioned in Table 3 1 and Table 3 2 respectively.

Table 3.1 Physical Properties of Soil

Sr. No.	Parameter	Analytical value
1	Sand	49 %
2	Silt	26.4 %
3	Clay	24.6 %
4	Soil textural type	Sandy Clay Loam
5	FC (i.e. Field Capacity)	43.49 %
6	PWP (i.e. Permanent Wilting Point)	19.74 %
7	Field density (Wet bulk density)	1.6 gm/cm ³
8	Dry bulk density	1.27 gm/cm ³
9	Sp. Gr. of particles passing 75 micron sieve	2.8
10	WHC (i.e. Water Holding Capacity)	30.1625 cm/m
11	Average infiltration rate	10.3 cm/hr

Table 3.2 Chemical Properties of Soil

Sr. No.	Parameter	Analytical value
1	Total N (OC)	0.27 %
2	Available P ₂ O ₅	266.76 kg/ha
3	Available K ₂ O	1012.7 kg/ha
4	PH	7.9
5	EC	0.39 mmhos/cm
6	S	7.1 ppm
7	Zn	0.90 ppm
8	Fe	8.36 ppm
9	Mn	8.40 ppm
10	Cu	0.47 ppm
11	Pb	3.76 ppm

3.3 Irrigation Water Quality Data

The characteristics of irrigation water (Sewage Water, Ground Water and Surface Water) are given in Table 3.3.

Table 3.3 Characteristics of Irrigation Water

Particulars	Sewage Water	Ground Water	Surface Water	Limit as per MOEF standards
Colour, Hazen Unit	Light black	Colourless	Colourless	-
Odour	Odorous	Odourless	Odourless	-
Turbidity, NTU	53.70	0.3	0.6	-
pH	7.83	8.06	7.97	5.5-9.0
EC (mmhos/cm)	1130	1410	340	-
Total Hardness (as CaCO ₃) mg/l	192	232	120	-
TSS (mg/l)	176	98	65	200
TDS (mg/l)	873	1138	168	2100
TS (mg/l)	1049	1236	233	2300
Oil & Grease (mg/l)	2.1	BDL	BDL	10
BOD (5 days 20° C), mg/l	29	NA	NA	100
COD, (mg/l)	104	NA	NA	-
As (mg/l)	BDL	BDL	BDL	0.2
B (mg/l)	BDL	BDL	BDL	2
Ca (mg/l)	36	43.2	28	-
Mg (mg/l)	24.48	29.76	12	-
Na, (mg/l)	157	208	20	-
CO ₃ , (mg/l)	19.20	24	26.4	-
HCO ₃ , (mg/l)	429.44	348.92	120.78	-
% Na	56.74	58.62	26.6	60
RSC (mg/l)	3.52	1.48	0.02	5

Particulars	Sewage Water	Ground Water	Surface Water	Limit as per MOEF standards
SAR	5.24	6.28	0.79	-
CN (mg/l)	BDL	BDL	BDL	0.2
Cl (mg/l)	120	216	20	600
NO ₃ , (mg/l)	28.09	7.99	5.09	-
SO ₄ (mg/l)	77.6	156.2	8.58	1000
F (mg/l)	0.93	1.06	0.48	-
Total Alkalinity (as CaCO ₃) mg/l	344	307.6	128.8	-
Mn (mg/l)	0.12	BDL	BDL	2
Pesticides (mg/l) :	BDL	BDL	BDL	Ref. Table 2.2
Detergents, (mg/l)	BDL	BDL	BDL	-
Phenolic compounds, (mg/l)	BDL	BDL	BDL	-
Ammonia Nitrogen, (mg/l)	0.8	BDL	BDL	-
Cu, (mg/l)	0.2	BDL	BDL	-
Fe, (mg/l)	BDL	BDL	BDL	-
Zn, (mg/l)	0.04	BDL	BDL	-
Pb, (mg/l)	BDL	BDL	BDL	-
Fecal Coliform (MPN/ml)	P	NA	NA	-
Total Coliform (MPN/ml)	24	NA	NA	-

Note:

P=Present

BDL=Below Detectable Limit

NA=Not Applicable

MPN=Most Probable Number

RSC=Residual Sodium Carbonate

MOEF= Ministry of Environment and Forests

3.4 Meteorological Data

3.3.1 Evaporation

Evaporation data (daily i.e , 24 hours ending) for the last 10 years (i e. 1992 to 2001) were collected from Meteorological Observatory (Mausam Kendra), Ahmedabad and shown in Table 3 4 to Table 3 13. These data refers to concerned months during which experiments were undertaken

Table 3.4 Evaporation in mm (Year-1992)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	4.2	3.5	6.7	6.0	6.8	7.5	7.8	7.2	5.0
2	3.8	3.4	6.0	7.5	6.4	7.8	7.0	7.3	4.9
3	4.2	3.7	5.4	6.4	6.5	7.4	7.5	6.5	5.0
4	4.0	4.0	5.5	7.0	6.7	8.0	8.2	5.8	5.7
5	4.1	4.0	5.5	6.2	6.6	8.6	8.2	6.4	4.5
6	4.1	3.5	5.4	6.4	6.2	9.0	7.0	5.8	5.7
7	4.0	4.6	5.4	6.2	7.0	9.0	6.8	5.0	5.4
8	3.5	3.9	5.0	6.6	7.1	11.2	7.5	5.0	5.0
9	4.3	3.5	5.1	6.0	6.6	11.1	9.2	5.0	4.5
10	3.9	3.5	5.0	6.1	6.4	13.0	8.0	5.0	4.4
11	4.2	4.3	5.0	6.2	7.0	12.4	4.2	5.0	5.0
12	3.5	4.7	5.5	6.0	8.0	9.6	7.4	5.1	4.8
13	3.4	5.5	NA	6.2	7.9	9.3	7.2	5.4	5.0
14	4.0	5.6	5.5	6.8	7.8	9.6	6.0	5.0	5.2
15	4.2	5.6	5.0	7.1	7.1	12.4	6.0	5.0	4.8
16	4.0	5.2	5.2	7.0	7.3	10.0	6.0	5.0	4.5
17	4.1	5.5	6.0	6.5	6.7	9.0	6.0	5.6	4.5
18	4.3	5.3	6.1	6.3	7.2	12.8	6.5	5.5	5.0
19	4.4	5.6	6.2	6.4	7.0	7.2	6.2	3.8	5.5
20	4.0	7.2	6.0	7.0	5.6	8.5	6.2	5.0	4.8
21	4.4	5.5	5.9	6.5	7.0	7.0	7.2	4.8	5.2
22	4.5	5.0	6.0	6.1	7.2	5.9	7.0	5.2	5.2
23	5.5	5.3	6.8	6.3	8.0	8.8	7.2	5.5	4.8
24	4.5	5.6	6.0	6.2	7.7	7.5	7.2	5.0	5.1
25	6.0	5.5	5.7	7.0	7.8	6.8	7.4	5.0	5.0
26	5.5	6.2	5.8	7.4	8.6	6.8	7.5	4.8	4.3
27	5.0	6.3	6.2	7.6	8.6	6.3	7.5	5.5	4.2
28	3.5	6.0	6.5	6.8	8.5	8.0	10.2	5.9	5.0
29	4.0	6.5	6.3	6.5	9.2	5.5	6.0	5.4	5.2
30	4.0	-	6.3	6.5	8.2	9.5	7.5	5.3	5.0
31	4.0	-	6.2	-	7.0	-	7.0	-	5.0

Note: NA – Not Available

Table 3.5 Evaporation in mm (Year-1993)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	5.0	4.8	4.0	4.8	9.9	11.0	8.0	5.2	6.5
2	5.2	4.5	4.4	5.7	9.5	10.4	8.6	5.5	5.8
3	4.6	5.0	4.5	6.0	9.8	10.5	8.7	4.3	5.5
4	5.6	5.0	4.7	7.5	9.7	10.2	8.6	5.6	5.5
5	4.9	5.2	5.6	6.8	9.8	10.6	7.5	6.8	6.0
6	4.0	5.3	5.9	7.7	9.0	11.0	10.0	5.5	5.0
7	1.6	5.0	5.5	8.4	8.8	11.0	10.6	5.8	6.1
8	4.2	5.7	5.8	8.0	9.4	11.0	9.0	6.0	6.0
9	4.3	5.6	6.4	8.0	8.5	11.3	8.5	5.5	6.0
10	4.0	6.1	6.7	8.3	8.5	11.5	9.0	6.0	6.2
11	5.0	5.2	7.0	8.0	8.5	11.0	9.0	6.3	6.0
12	5.0	6.0	7.5	8.0	9.5	11.6	9.0	6.0	6.0
13	4.5	6.2	8.0	7.2	9.4	12.1	7.5	5.0	5.0
14	4.5	7.0	7.8	7.5	9.5	12.0	7.5	6.0	4.4
15	4.5	7.0	7.0	8.0	9.9	10.0	7.6	6.2	4.5
16	5.0	7.0	7.0	8.5	9.5	8.5	8.2	6.4	4.0
17	4.8	7.0	7.0	9.0	10.1	8.8	8.5	5.0	4.6
18	4.5	6.6	7.4	10.0	9.8	8.0	7.5	6.0	4.6
19	NA	6.0	6.5	9.5	10.3	10.0	8.0	6.6	4.1
20	NA	6.2	6.2	8.5	10.1	10.0	8.4	6.2	4.5
21	NA	9.6	7.2	9.5	10.5	11.0	5.0	6.4	4.3
22	NA	3.2	6.8	10.2	10.0	11.0	6.2	6.0	4.8
23	NA	3.0	7.5	10.0	9.5	10.5	6.4	6.0	4.8
24	3.8	3.0	8.0	9.7	10.4	10.3	6.8	7.5	3.9
25	3.7	6.2	6.6	9.4	10.6	10.8	5.7	6.0	3.6
26	4.0	4.2	6.2	9.0	10.5	9.0	4.5	6.2	4.0
27	5.0	3.0	7.5	9.7	11.0	10.0	5.5	5.6	3.7
28	4.6	5.0	6.5	9.5	11.0	9.0	5.8	6.4	3.4
29	4.5	-	7.0	9.4	11.0	9.4	6.0	6.0	4.6
30	5.0	-	7.2	10.5	10.5	10.0	6.0	6.4	4.2
31	4.5	-	7.5	-	10.5	-	6.6	-	4.8

Note: NA – Not Available

Table 3.6 Evaporation in mm (Year-1994)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	3.5	4.1	5.6	9.3	9.0	10.0	6.4	5.3	4.6
2	3.8	4.0	5.5	6.5	8.0	9.5	6.6	5.3	4.4
3	3.5	3.8	5.7	8.0	8.3	9.0	7.6	5.5	4.0
4	3.8	4.1	6.5	8.0	8.4	9.0	7.3	4.5	4.1
5	4.0	4.4	6.6	9.3	8.5	8.5	7.4	4.2	4.0
6	3.9	4.5	5.8	9.4	8.4	8.5	6.8	4.4	4.0
7	4.4	5.0	5.6	7.0	8.5	9.5	7.3	5.4	4.0
8	4.0	4.9	5.5	8.5	8.4	9.5	8.0	5.2	3.6
9	4.3	4.8	6.0	9.5	8.5	9.6	7.8	5.3	4.1
10	4.0	4.5	6.0	9.2	9.0	9.0	7.6	5.5	3.4
11	3.2	4.5	7.0	8.0	9.3	8.8	8.7	5.8	3.5
12	2.0	5.2	7.8	9.0	9.2	9.5	7.0	6.2	2.8
13	3.0	5.4	8.3	8.5	8.5	5.4	6.7	5.5	3.8
14	2.8	4.8	8.5	9.4	8.4	3.1	6.6	5.3	3.8
15	3.0	5.0	8.3	8.5	10.0	3.7	7.2	4.1	3.0
16	3.2	4.8	9.8	8.7	9.1	4.3	7.3	4.7	4.0
17	2.6	4.8	10.7	8.0	9.8	4.0	7.6	5.0	3.8
18	2.8	5.5	9.0	7.9	9.7	7.5	7.6	4.5	4.0
19	3.2	5.2	9.5	9.0	9.0	6.5	7.6	5.0	3.0
20	3.4	5.6	9.8	9.0	10.0	7.0	7.8	3.3	3.7
21	3.5	4.5	9.8	8.5	9.5	8.0	7.8	4.5	3.0
22	3.2	3.9	9.0	9.8	10.0	7.0	8.7	4.5	3.4
23	4.0	4.7	8.5	9.0	10.0	7.6	8.7	4.8	3.2
24	4.0	5.0	9.3	9.4	9.3	6.5	8.3	3.8	2.6
25	5.0	5.8	9.5	7.8	9.0	3.2	8.6	4.5	2.7
26	4.0	5.0	9.5	9.0	9.5	6.5	7.0	4.0	2.8
27	4.2	6.0	10.6	8.5	10.0	4.0	7.0	4.6	3.0
28	3.8	5.5	9.3	8.8	10.2	4.0	4.8	4.0	3.2
29	4.4	-	13.0	9.0	9.0	2.6	5.2	4.5	3.0
30	5.0	-	10.8	8.8	9.7	3.0	6.0	4.5	2.6
31	4.1	-	10.0	-	9.5	-	5.6	-	2.5

Table 3.7 Evaporation in mm (Year-1995)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	3.4	3.5	4.7	7.0	7.5	8.5	5.5	6.0	3.5
2	3.0	3.2	4.5	7.0	10.0	11.5	7.0	5.5	3.5
3	3.1	3.2	4.5	7.2	7.5	13.2	6.5	6.5	3.0
4	3.3	2.8	4.6	7.5	7.4	12.5	7.0	4.5	3.0
5	3.0	3.7	5.0	7.0	10.1	11.0	6.5	5.5	3.8
6	3.3	3.5	4.0	10.0	10.2	12.0	6.0	6.0	3.0
7	3.7	3.5	4.0	7.5	11.2	10.2	5.0	5.0	3.8
8	3.5	4.1	4.5	8.5	12.5	10.4	7.0	2.8	4.0
9	3.1	4.5	4.5	9.7	12.8	9.5	6.5	5.5	3.8
10	3.5	4.2	4.0	9.5	12.6	10.5	6.0	6.0	3.4
11	2.7	4.2	4.0	7.5	13.5	9.7	5.5	4.0	3.5
12	2.8	4.8	4.2	8.2	10.5	10.2	6.0	4.0	3.5
13	2.3	5.0	4.0	9.0	12.0	11.0	7.0	4.8	4.0
14	2.8	4.5	6.0	10.0	11.4	11.5	6.5	NA	4.0
15	3.5	4.0	8.0	10.5	10.5	12.5	4.0	4.0	3.8
16	2.8	4.2	8.7	7.6	10.0	12.0	6.5	3.5	4.0
17	3.0	4.5	6.5	8.2	9.0	10.0	4.5	4.8	4.5
18	3.0	4.6	5.5	7.8	11.0	10.0	6.0	3.8	3.7
19	3.0	4.5	5.0	8.6	11.5	8.0	5.0	4.0	3.8
20	3.0	4.4	7.7	7.8	11.0	8.6	6.5	3.8	4.0
21	3.2	4.5	5.5	8.8	9.2	9.0	6.0	4.5	3.8
22	3.0	4.0	6.0	9.5	11.6	8.5	5.5	5.0	4.0
23	3.2	4.0	6.0	7.0	9.0	7.8	5.5	4.0	4.5
24	3.0	3.9	6.2	7.6	10.0	9.0	6.0	3.0	4.8
25	3.5	4.7	6.0	9.0	12.0	9.5	6.0	4.3	4.7
26	3.0	9.4	5.2	8.5	10.0	9.5	6.0	4.5	4.8
27	3.6	4.5	6.4	9.5	10.8	8.8	6.0	3.5	4.5
28	3.5	5.3	6.7	9.2	11.2	9.0	5.5	3.0	4.5
29	3.0	-	6.0	9.5	11.2	9.5	6.0	4.0	3.5
30	3.0	-	5.5	8.2	10.6	7.5	5.5	3.7	2.6
31	3.0	-	7.0	-	NA	-	5.0	NA	3.6

Note: NA – Not Available

Table 3.8 Evaporation in mm (Year-1996)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	3.8	3.3	4.5	9.5	10.0	10.5	6.2	4.4	4.6
2	4.0	3.7	5.2	9.0	8.0	11.5	6.0	5.2	4.0
3	3.0	4.1	4.4	8.5	7.8	11.0	4.0	3.0	3.0
4	3.8	5.0	5.0	9.8	8.5	11.0	4.2	4.2	3.0
5	3.6	4.3	5.5	8.0	9.2	11.8	5.6	4.0	2.2
6	3.5	4.8	5.2	9.5	10.2	11.5	5.6	3.8	2.2
7	2.6	6.0	4.8	9.2	10.4	10.0	4.4	4.6	2.8
8	4.5	5.2	6.2	10.4	10.0	9.9	3.5	4.0	2.9
9	3.4	4.8	6.0	9.0	10.4	10.1	5.0	5.8	3.0
10	3.7	5.7	5.2	9.0	10.4	10.0	7.4	5.4	3.9
11	3.2	5.6	9.4	9.6	11.4	8.0	5.4	6.0	4.0
12	4.5	5.4	8.2	9.0	10.0	9.4	5.6	4.0	3.9
13	4.5	4.2	7.0	7.3	10.0	6.6	6.5	4.0	4.2
14	4.0	4.5	6.2	8.8	8.8	6.6	6.2	4.0	4.7
15	3.7	4.6	7.6	9.0	8.6	2.4	6.0	4.5	3.4
16	3.0	3.8	8.0	5.8	8.7	3.6	7.0	5.0	3.7
17	3.7	3.8	7.5	6.9	9.8	5.4	7.2	5.0	3.0
18	3.8	4.0	5.6	7.5	8.2	6.0	7.2	5.9	3.3
19	4.2	4.4	6.0	7.2	9.6	8.2	7.6	5.2	4.0
20	4.5	6.2	9.0	7.7	9.8	3.3	5.4	2.2	4.2
21	4.4	4.2	7.0	7.7	9.5	2.2	6.2	3.0	3.6
22	4.0	5.8	6.5	8.8	9.8	6.0	6.5	3.8	4.0
23	NA	5.5	7.8	9.8	9.0	8.0	3.0	3.2	3.0
24	3.8	5.8	8.0	9.2	9.7	6.0	5.0	3.0	2.2
25	4.3	4.1	8.5	NA	9.3	8.0	3.1	2.0	2.2
26	4.4	3.9	7.8	9.0	10.4	7.3	1.1	3.6	3.2
27	3.8	4.6	10.3	9.2	9.4	10.0	3.3	3.8	2.4
28	4.3	4.8	10.6	7.2	9.5	6.5	4.0	3.6	2.6
29	4.6	5.2	9.0	9.8	11.0	7.5	5.6	4.0	3.8
30	5.0	-	11.2	9.5	10.0	8.0	5.6	4.4	4.6
31	3.8	-	9.8	-	9.8	-	5.4	-	4.2

Note: NA – Not Available

Table 3.9 Evaporation in mm (Year-1997)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	5.0	4.2	5.6	5.5	4.6	5.0	3.8	3.0	2.2
2	5.8	1.8	5.2	3.2	5.5	2.8	4.0	3.5	2.8
3	5.0	1.5	4.0	6.0	4.8	4.5	4.5	3.8	1.8
4	5.2	3.8	5.4	3.8	3.7	3.0	3.8	3.0	3.0
5	4.8	3.7	5.5	4.2	4.0	4.5	4.3	5.0	2.0
6	4.0	2.5	3.0	5.0	5.3	4.4	3.0	4.5	2.5
7	3.8	4.0	2.3	5.2	6.0	6.0	3.4	3.2	2.0
8	2.5	4.2	1.5	6.4	6.5	6.7	4.4	3.0	2.2
9	2.8	4.0	3.8	6.6	3.8	5.5	4.0	2.6	2.2
10	3.6	2.6	3.4	6.3	5.5	4.6	4.0	3.0	2.5
11	3.0	3.0	4.0	5.6	6.0	5.5	4.0	3.0	1.4
12	3.0	4.2	4.6	6.5	6.2	6.7	4.4	2.0	3.0
13	2.8	4.0	5.4	6.6	6.0	6.5	4.5	3.2	2.8
14	4.0	2.6	4.6	6.0	6.4	5.6	5.2	3.0	2.6
15	3.8	4.0	5.2	6.0	7.0	7.5	4.4	3.0	2.4
16	4.0	4.2	4.8	6.0	6.5	7.8	4.8	2.2	2.3
17	3.7	4.2	4.7	5.2	NA	6.5	3.9	2.4	2.3
18	4.4	3.8	3.8	5.5	NA	1.5	NA	3.2	3.5
19	3.9	4.6	4.0	5.8	9.0	6.5	4.0	2.5	1.8
20	1.8	4.5	4.2	6.4	7.5	6.0	4.6	2.8	1.8
21	3.8	4.5	3.8	6.6	4.6	4.9	4.0	2.6	3.0
22	2.2	3.6	2.0	6.7	5.5	4.6	4.2	1.0	2.7
23	3.0	4.4	3.2	7.3	6.7	4.0	3.4	2.1	1.6
24	3.0	4.6	4.0	7.9	6.6	1.6	4.6	3.0	2.0
25	3.0	5.0	4.3	8.3	7.0	1.0	4.3	3.0	2.0
26	3.4	5.7	6.3	9.0	7.5	NA	4.0	2.5	2.3
27	2.8	5.0	4.5	5.2	7.8	1.2	3.0	2.7	1.0
28	3.2	5.0	5.5	4.1	8.0	1.6	3.6	2.8	1.6
29	2.4	-	5.3	4.4	8.2	3.1	3.8	3.0	1.9
30	3.5	-	5.0	6.1	9.0	2.0	3.2	2.0	1.6
31	3.8	-	5.6	-	6.3	-	4.0	-	1.8

Note: NA – Not Available

Table 3.10 Evaporation in mm (Year-1998)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	18	26	20	72	7.0	58	4.1	40	26
2	3.0	48	35	6.0	80	70	3.0	50	3.0
3	38	40	38	6.4	7.0	7.5	3.4	32	30
4	20	40	50	80	64	7.0	3.4	52	36
5	16	2.6	40	55	7.1	7.8	40	40	3.6
6	20	40	4.0	62	70	80	3.0	40	22
7	30	32	4.4	8.0	8.0	8.0	5.0	4.0	3.0
8	24	3.2	4.0	6.8	80	4.5	4.0	4.4	3.0
9	22	4.8	42	8.5	7.8	9.0	3.5	3.0	3.0
10	2.8	3.3	4.5	6.4	7.8	51	5.0	3.0	2.9
11	35	3.2	48	6.2	45	63	3.0	3.0	30
12	2.2	2.5	50	8.4	3.2	7.0	4.0	4.0	3.0
13	26	2.7	4.2	7.0	6.5	42	4.8	4.0	40
14	23	32	4.5	6.6	6.8	5.5	3.5	3.0	2.6
15	24	3.0	40	7.0	6.0	6.3	3.2	3.0	3.2
16	2.6	40	5.0	5.8	90	60	3.8	2.8	36
17	21	38	22	6.4	70	26	2.0	3.0	30
18	20	3.5	37	52	80	NA	33	3.0	2.4
19	38	3.4	55	68	6.5	45	36	3.0	25
20	44	35	5.9	58	76	9.0	35	2.6	2.8
21	26	2.4	4.8	6.5	60	7.2	26	3.0	30
22	30	3.5	50	72	70	7.0	4.5	30	2.0
23	32	36	50	8.6	50	8.6	3.0	3.4	30
24	3.2	40	8.0	66	8.8	7.0	3.0	2.8	2.8
25	28	40	60	100	9.1	6.2	2.5	3.0	4.0
26	28	40	4.5	5.6	81	6.2	3.2	3.0	2.6
27	4.5	20	80	80	55	6.8	4.2	3.0	32
28	24	3.0	95	110	82	6.3	4.0	30	28
29	30	-	8.2	60	8.0	33	3.0	3.0	30
30	32	-	60	62	7.8	37	42	3.0	18
31	3.0	-	6.0	-	60	-	4.0	-	25

Note: NA – Not Available

Table 3.11 Evaporation in mm (Year-1999)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	2.8	3.5	3.5	7.0	8.0	6.2	3.4	4.0	4.0
2	4.0	4.0	4.5	6.0	8.0	8.0	1.7	3.0	3.4
3	3.6	3.2	4.5	6.0	5.8	7.6	4.6	4.6	3.2
4	2.8	3.2	3.8	6.0	5.2	10.2	3.0	3.4	3.0
5	2.8	2.8	4.5	7.8	10.0	7.6	4.0	3.5	4.0
6	3.0	3.0	4.5	7.0	10.0	8.4	3.6	4.0	4.0
7	4.0	4.0	4.5	6.0	6.2	7.0	3.6	3.8	3.2
8	2.2	3.8	5.0	7.0	8.0	NA	4.8	4.0	3.4
9	2.8	3.2	4.0	7.6	8.0	6.7	3.3	3.4	3.4
10	2.6	3.8	4.0	7.0	6.5	7.6	3.2	3.6	3.0
11	2.9	4.0	5.0	10.0	6.8	NA	3.8	4.0	3.4
12	2.5	4.2	5.2	6.0	6.0	7.0	3.7	3.0	3.6
13	3.0	5.0	4.0	6.4	8.0	7.0	2.0	3.2	3.8
14	3.0	3.0	4.8	6.4	7.0	7.5	3.8	3.8	4.0
15	3.0	4.0	4.5	5.0	5.8	8.0	5.0	4.0	3.8
16	2.8	4.0	5.0	5.6	9.0	5.2	3.2	3.8	4.0
17	2.8	2.9	4.5	5.4	9.0	7.2	4.0	3.6	4.0
18	3.0	4.0	3.5	5.0	10.0	8.0	4.2	3.0	3.4
19	3.6	4.0	4.5	8.0	6.0	6.1	3.7	4.2	3.8
20	3.2	4.5	5.8	7.5	6.0	2.5	4.0	3.4	3.0
21	3.0	3.0	4.0	5.2	9.0	3.3	3.0	3.2	4.6
22	3.6	3.2	4.0	9.0	6.6	1.4	3.8	3.0	3.6
23	5.0	4.5	5.0	7.0	4.4	5.1	4.0	3.4	4.2
24	3.0	4.3	6.0	7.5	6.4	3.0	3.2	3.2	4.0
25	3.0	3.5	5.5	10.4	6.0	5.7	2.2	3.2	4.1
26	4.0	4.0	5.3	11.0	6.0	5.7	3.4	3.0	3.2
27	4.0	5.0	5.3	10.0	8.0	6.0	4.5	3.6	3.2
28	3.5	4.3	6.2	7.4	8.0	6.2	3.6	3.5	3.6
29	3.4	-	6.0	5.2	8.0	6.2	3.4	3.5	4.6
30	4.0	-	7.2	10.0	9.0	6.2	4.4	3.4	3.4
31	4.0	-	6.0	-	5.6	-	4.4	-	3.0

Note: NA – Not Available

Table 3.12 Evaporation in mm (Year-2000)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	4.0	4.5	6.0	6.7	8.0	8.0	6.8	4.6	3.7
2	4.6	5.5	6.0	6.9	9.6	6.8	6.0	5.0	3.8
3	3.7	4.0	7.0	7.6	9.5	7.0	6.3	4.8	4.0
4	3.0	4.0	6.0	7.0	8.5	7.5	5.0	4.2	3.6
5	3.4	4.3	6.0	6.6	8.2	6.5	5.7	4.4	3.4
6	4.0	4.0	2.6	7.3	10.2	5.2	6.0	4.6	3.4
7	3.2	5.0	6.0	7.0	9.0	11.0	5.7	4.4	3.0
8	4.0	4.0	5.0	8.5	7.0	7.2	6.1	4.8	3.8
9	3.7	4.0	5.0	7.2	5.8	6.8	5.1	4.6	3.8
10	2.0	4.0	4.6	8.0	8.0	5.8	4.9	4.5	3.7
11	2.5	4.2	6.0	6.0	8.5	5.3	5.3	4.0	3.6
12	3.0	4.2	6.5	8.0	6.5	6.2	4.6	4.2	4.0
13	4.0	3.7	6.4	7.0	4.5	6.0	8.2	4.4	3.6
14	3.5	4.5	4.2	7.0	6.0	5.2	4.9	4.2	3.4
15	3.2	4.8	4.2	6.8	6.5	4.2	4.0	4.0	3.0
16	3.2	5.5	4.5	7.4	6.5	4.5	3.9	4.4	3.5
17	4.5	5.0	4.5	7.0	5.0	5.0	4.0	4.6	4.0
18	4.6	4.8	3.4	6.8	4.8	8.0	4.0	4.7	3.8
19	4.0	2.8	9.0	6.2	4.5	7.5	3.8	4.4	3.0
20	4.0	5.2	5.4	6.5	4.3	7.0	6.0	4.1	3.2
21	4.6	4.0	6.0	6.4	5.3	6.2	4.8	5.0	3.8
22	4.4	4.8	4.4	6.0	5.8	6.0	4.6	4.2	3.8
23	3.5	5.6	3.5	8.4	7.2	7.1	4.4	4.8	2.6
24	3.4	5.1	4.4	8.0	7.5	6.5	6.0	4.1	3.6
25	4.7	5.2	5.0	8.0	6.4	6.3	5.4	4.4	3.7
26	4.4	6.0	5.0	9.0	5.5	6.0	5.0	4.0	4.0
27	4.5	5.0	6.0	9.8	7.2	6.6	5.2	4.0	2.6
28	4.7	6.0	6.5	9.0	7.8	6.5	5.2	3.8	3.1
29	5.0	6.0	7.0	8.5	7.0	6.0	4.4	3.4	2.8
30	5.0	-	5.4	9.0	8.5	5.4	4.4	3.8	3.6
31	4.6	-	9.4	-	8.5	-	4.3	-	1.4

Table 3.13 Evaporation in mm (Year-2001)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	2.6	5.2	5.6	7.8	8.5	7.4	6.2	4.0	3.2
2	3.4	5.0	6.3	7.6	8.6	7.1	6.0	4.0	3.4
3	3.4	6.8	5.3	7.0	8.8	6.8	5.0	4.6	5.0
4	3.0	5.8	6.6	7.0	9.6	7.0	5.5	4.6	4.8
5	2.8	7.0	6.0	7.0	9.5	5.2	5.0	3.4	4.0
6	2.6	4.9	6.0	6.8	10.6	8.0	5.2	3.0	4.2
7	3.4	5.6	6.2	8.0	10.8	8.2	6.4	4.0	3.3
8	4.0	5.6	6.4	6.7	10.2	8.8	6.0	4.4	1.5
9	3.3	6.0	6.2	8.0	9.2	NA	5.0	4.0	2.8
10	2.4	5.5	6.0	NA	9.2	4.7	5.4	4.0	3.2
11	2.8	5.6	6.0	NA	8.8	8.6	1.4	3.8	3.5
12	3.6	5.6	5.6	NA	8.4	7.4	4.5	5.6	4.5
13	4.2	5.7	5.8	NA	10.0	8.2	4.5	4.0	3.2
14	4.0	5.6	7.8	6.0	10.0	7.5	5.8	4.5	3.8
15	3.8	5.4	8.0	6.0	10.0	7.2	5.5	5.0	4.0
16	3.8	5.6	7.8	7.0	8.4	7.0	5.5	5.0	3.5
17	4.4	6.0	7.0	6.4	9.5	NA	5.0	5.2	3.6
18	5.0	6.0	6.6	6.6	9.2	5.6	5.6	5.1	3.9
19	5.2	5.6	7.2	7.6	8.7	6.2	5.6	5.0	3.5
20	4.2	6.4	7.6	6.2	8.0	6.8	5.0	4.8	3.8
21	4.8	NA	7.0	6.6	8.5	5.8	4.0	5.4	3.6
22	4.8	NA	7.6	6.8	8.0	7.0	4.8	3.0	4.6
23	4.0	NA	7.0	8.0	8.4	7.4	5.0	2.0	4.0
24	4.8	NA	7.4	8.5	7.2	NA	4.7	4.2	3.0
25	4.4	5.9	7.2	8.8	7.2	5.7	4.0	5.5	3.6
26	3.7	5.0	7.2	8.2	9.2	7.6	4.8	2.0	3.2
27	4.2	5.4	8.0	8.4	8.6	7.0	4.8	2.8	3.5
28	3.0	5.8	8.0	8.4	8.0	7.6	4.5	3.8	3.0
29	4.9	-	7.8	8.7	8.0	7.8	4.0	3.8	3.4
30	5.9	-	7.0	8.2	4.0	6.4	4.6	4.0	3.5
31	4.2	-	6.4	-	3.0	-	3.7	-	4.0

Note: NA – Not Available

Average evaporation was worked out by averaging over ten years of data mentioned in above Table 3.4 to Table 3.13. Table 3.14 shows average evaporation

Table 3.14 Mean Daily Pan Evaporation (Epan) averaged over last ten years

Month	Epan in mm
Oct	5.45
Nov	4.31
Dec	3.64
Jan	3.68
Feb	4.58
Mar	5.98
Apr	7.56
May	8.27
Jun	7.46

3.3.2 Wind Speed

Wind speed data (daily averaged over 24 hours ending at 8.30 a.m.) for last ten years (i.e. 1992 to 2001) were collected from Meteorological Observatory (Mausam Kendra), Near Airport, Ahmedabad and shown in Table 3.15 to Table 3.24. These data refers to concerned months during which experiments were undertaken.

Table 3.15 Wind speed in Kmph (Year-1992)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	3	6	5	1	6	7	3	4	6
2	7	5	4	1	7	8	4	4	7
3	8	2	3	2	7	8	6	4	5
4	6	5	2	8	14	12	5	6	4
5	4	2	5	8	7	8	5	5	5
6	2	2	4	10	3	9	4	6	5
7	2	2	6	6	5	9	7	6	5
8	3	7	5	9	7	13	5	4	4
9	2	2	3	6	9	10	6	5	4
10	4	4	4	7	8	10	8	6	5
11	6	4	3	5	4	11	12	6	5
12	6	6	4	5	6	13	5	5	3
13	9	4	4	3	9	16	4	6	5
14	6	9	6	2	12	13	4	4	7
15	5	5	10	5	10	14	4	5	6
16	7	2	3	5	6	12	8	7	8
17	5	9	2	4	11	13	5	8	7
18	8	6	5	7	11	13	5	8	4
19	3	2	8	6	12	12	4	8	5
20	3	6	7	7	15	15	3	4	7
21	3	5	3	12	12	12	3	5	6
22	2	3	4	9	13	9	6	6	6
23	3	3	5	6	13	7	8	6	6
24	5	4	5	4	11	17	6	8	7
25	3	9	7	2	13	19	8	8	3
26	2	3	3	3	15	21	4	6	3
27	2	1	10	5	15	20	2	3	2
28	1	3	12	7	11	18	3	4	10
29	3	5	9	10	9	13	5	5	5
30	6	-	7	9	10	10	4	6	4
31	7	-	5	-	12	-	4	-	2

Table 3.16 Wind speed in Kmph (Year-1993)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	3	8	8	8	11	14	6	4	3
2	5	9	7	8	14	14	5	6	5
3	3	8	10	6	13	12	8	5	5
4	7	7	7	9	9	13	7	4	5
5	5	7	7	5	9	10	6	2	8
6	4	5	8	6	13	13	5	2	9
7	9	4	7	8	12	13	3	2	7
8	5	7	8	15	12	13	4	3	7
9	1	4	6	10	13	13	3	2	3
10	5	5	4	8	14	12	3	4	5
11	7	9	6	10	14	13	3	6	5
12	6	6	8	13	10	15	4	7	3
13	6	5	9	12	11	15	6	9	4
14	3	3	12	7	7	14	5	6	6
15	2	2	12	7	11	11	4	5	5
16	13	4	6	9	12	7	4	4	4
17	7	8	6	8	14	5	2	4	6
18	6	16	6	7	15	8	4	4	7
19	7	9	9	8	15	14	4	5	5
20	4	12	7	7	11	15	5	4	5
21	7	4	6	7	13	16	3	6	5
22	6	4	8	5	10	15	2	7	5
23	7	2	10	8	8	15	3	6	7
24	5	4	11	9	8	15	4	5	6
25	6	8	18	9	11	13	5	6	7
26	6	9	11	10	10	13	4	4	10
27	5	6	6	10	10	11	2	4	8
28	4	7	4	12	15	10	2	5	7
29	5	-	5	11	16	10	3	6	5
30	5	-	5	11	17	2	2	6	4
31	7	-	9	-	18	-	1	-	7

Table 3.17 Wind speed in Kmph (Year-1994)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	4	6	8	10	9	15	5	4	1
2	5	7	7	11	9	17	4	7	2
3	6	10	5	8	9	17	4	2	3
4	7	6	5	9	12	18	3	7	4
5	6	5	4	10	12	19	3	9	4
6	5	5	6	8	16	7	1	7	5
7	6	5	7	14	15	17	4	8	3
8	5	7	6	9	27	22	4	5	3
9	4	9	6	10	34	19	NA	7	4
10	5	4	7	8	27	17	NA	9	10
11	5	5	7	11	18	18	NA	6	11
12	7	8	5	11	19	18	NA	5	8
13	6	7	5	9	12	9	NA	7	8
14	6	6	9	8	14	8	NA	6	6
15	5	5	6	8	11	6	NA	11	5
16	4	5	6	9	12	8	NA	7	7
17	5	8	8	11	10	12	NA	7	5
18	8	9	8	10	16	11	NA	7	5
19	6	11	5	9	18	18	8	9	8
20	9	7	6	16	16	17	9	7	8
21	9	18	10	9	13	17	6	9	9
22	13	16	8	13	24	17	7	6	7
23	7	4	8	12	22	10	8	6	4
24	6	6	7	8	29	13	4	9	2
25	5	7	9	11	19	8	2	7	4
26	5	6	12	11	16	8	3	5	6
27	7	3	8	12	15	12	4	3	2
28	9	9	6	9	16	12	1	2	5
29	9	-	7	9	13	10	7	4	11
30	9	-	8	10	19	5	2	1	8
31	9	-	10	-	13	-	7	-	8

Note: NA – Not Available

Table 3.18 Wind speed in Kmph (Year-1995)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	3	9	10	8	10	19	6	19	10
2	4	9	7	2	10	7	16	11	8
3	4	8	9	10	8	19	11	6	8
4	8	7	9	9	5	13	17	4	7
5	8	10	9	5	8	17	12	5	9
6	12	11	8	7	12	17	10	5	6
7	11	13	7	12	13	15	11	7	8
8	11	11	6	15	13	18	24	8	8
9	7	6	6	15	14	22	19	9	8
10	4	4	13	15	14	18	12	9	7
11	7	5	18	9	16	22	13	5	8
12	7	7	14	4	16	21	16	5	10
13	9	10	17	8	14	18	15	8	10
14	10	16	15	7	12	10	12	8	6
15	9	9	7	11	17	9	9	5	5
16	13	7	10	13	21	15	16	5	7
17	12	4	9	16	25	19	8	4	10
18	8	8	7	10	29	18	8	8	7
19	10	6	7	9	25	17	9	6	4
20	8	9	8	9	18	17	3	5	5
21	6	7	10	7	18	19	9	8	7
22	6	9	5	7	20	19	10	8	7
23	8	12	15	11	20	19	9	8	9
24	6	6	10	5	16	13	9	12	9
25	2	10	5	15	10	16	7	11	12
26	3	9	12	14	10	16	6	8	14
27	10	7	5	12	11	21	7	6	17
28	9	9	8	10	10	16	5	4	13
29	9	-	11	11	17	18	4	7	9
30	6	-	18	10	13	19	5	10	12
31	8	-	8	-	15	-	10	-	8

Table 3.19 Wind speed in Kmph (Year-1996)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	12	5	12	13	24	21	15	6	8
2	10	13	9	8	27	31	16	6	9
3	11	13	17	9	20	33	13	7	8
4	16	19	8	12	17	28	9	9	10
5	15	9	8	11	13	37	24	11	8
6	10	12	7	18	14	44	19	13	10
7	8	12	6	17	10	32	20	9	9
8	12	7	6	17	13	29	5	15	11
9	12	9	9	18	19	13	6	15	13
10	10	7	7	13	27	23	9	18	12
11	12	13	7	10	33	29	8	10	9
12	8	13	12	8	38	23	6	25	9
13	9	11	13	9	35	17	5	20	7
14	4	8	14	8	41	10	9	7	6
15	9	11	14	9	39	13	5	12	6
16	9	8	16	5	32	7	7	27	4
17	7	11	13	17	19	9	10	8	5
18	8	15	13	15	14	6	7	9	8
19	9	11	14	27	32	10	6	5	8
20	9	8	17	15	30	31	7	4	9
21	7	4	9	23	21	23	5	5	9
22	5	14	11	22	25	22	11	7	6
23	6	9	17	18	28	36	16	5	5
24	12	12	12	10	27	23	41	6	5
25	12	13	26	14	22	27	38	6	5
26	8	23	10	18	16	26	19	4	6
27	8	8	24	28	15	30	12	6	10
28	11	11	20	22	38	34	9	8	7
29	14	14	27	19	30	38	6	9	8
30	14	-	18	14	28	38	10	6	7
31	11	-	12	-	26	-	4	-	8

Table 3.20 Wind speed in Kmph (Year-1997)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	9	4	1	7	9	13	11	4	NA
2	6	4	7	7	8	11	18	4	NA
3	4	10	3	7	8	14	9	2	NA
4	6	7	6	5	9	10	11	1	NA
5	6	6	4	4	7	11	12	3	NA
6	3	7	3	4	11	10	4	1	NA
7	14	5	3	5	9	13	10	1	NA
8	11	3	7	5	14	13	4	1	NA
9	10	10	6	14	8	17	3	1	NA
10	12	4	6	13	7	16	3	NA	NA
11	5	5	6	12	9	19	2	NA	NA
12	2	7	6	10	12	17	1	NA	NA
13	2	8	10	14	12	15	2	NA	NA
14	4	4	7	13	9	12	3	NA	NA
15	5	3	10	19	7	13	6	NA	NA
16	5	13	5	9	10	12	6	NA	NA
17	7	4	8	5	6	12	4	NA	NA
18	8	6	5	2	9	11	3	NA	NA
19	9	6	5	9	15	19	1	NA	NA
20	7	9	12	9	17	13	3	NA	NA
21	2	7	18	6	17	13	4	NA	NA
22	4	5	18	4	13	12	3	NA	NA
23	8	3	8	5	16	14	3	NA	NA
24	5	3	6	9	17	10	8	NA	NA
25	6	2	9	10	16	20	2	NA	NA
26	6	6	8	14	19	20	2	NA	NA
27	5	5	5	10	22	14	2	NA	NA
28	8	4	8	8	23	9	2	NA	NA
29	7	-	13	4	26	10	3	NA	NA
30	6	-	11	6	27	12	9	NA	NA
31	8	-	8	-	15	-	NA	-	NA

Note: NA – Not Available

Table 3.21 Wind speed in Kmph (Year-1998)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	NA	6	6	4	8	14	3	7	3
2	NA	6	7	6	8	11	4	8	4
3	NA	8	7	1	7	14	3	4	4
4	NA	6	4	8	9	12	5	3	6
5	NA	6	7	4	8	7	4	3	4
6	NA	3	10	3	8	16	9	5	4
7	NA	5	10	7	7	12	5	6	4
8	NA	7	7	9	6	10	4	6	5
9	NA	6	3	16	8	15	4	6	4
10	NA	6	7	8	7	18	3	5	4
11	NA	5	3	5	1	10	5	7	5
12	NA	5	10	5	3	11	7	7	7
13	NA	3	1	1	5	11	7	5	8
14	NA	3	6	6	7	8	4	4	9
15	NA	8	7	7	7	6	5	4	9
16	NA	7	6	4	9	7	6	6	7
17	NA	8	5	8	9	10	8	5	4
18	NA	7	4	9	9	10	7	3	4
19	NA	11	6	5	8	11	6	2	4
20	NA	6	6	6	9	12	4	3	2
21	NA	5	4	5	12	13	2	5	4
22	NA	6	7	12	10	13	2	5	4
23	NA	4	13	11	10	12	4	3	2
24	6	5	9	12	13	12	4	4	5
25	9	16	7	10	11	10	2	3	6
26	6	NA	4	11	11	10	4	3	7
27	7	4	3	8	11	9	5	3	6
28	5	5	3	5	13	6	5	4	4
29	5	-	7	6	14	6	5	5	4
30	7	-	6	10	15	4	6	5	3
31	8	-	4	-	14	-	5	-	4

Note: NA – Not Available

Table 3.22 Wind speed in Kmph (Year-1999)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	7	6	8	7	10	12	6	4	5
2	7	1	6	5	11	13	3	5	6
3	4	7	6	7	10	15	3	3	5
4	3	9	5	4	6	14	2	2	4
5	3	10	4	4	8	13	1	2	3
6	6	8	7	5	5	11	2	3	2
7	6	6	6	5	11	14	2	4	2
8	5	6	7	5	11	14	3	3	5
9	6	7	9	5	12	13	4	4	7
10	5	10	6	6	11	12	6	4	6
11	6	8	7	9	15	10	5	5	7
12	6	7	3	7	8	11	5	3	5
13	7	7	7	10	9	13	2	6	6
14	7	7	7	8	2	11	3	3	5
15	8	6	9	6	6	10	7	3	4
16	7	11	6	6	8	13	5	3	5
17	6	7	9	5	9	13	2	3	5
18	8	4	9	6	10	8	2	3	4
19	7	5	8	6	4	11	2	3	5
20	4	6	8	7	12	13	4	2	5
21	3	6	9	8	16	8	4	4	7
22	6	5	6	8	15	8	4	4	7
23	5	3	6	8	12	9	3	6	7
24	4	7	4	9	13	11	3	7	6
25	6	6	8	9	10	13	3	7	6
26	5	5	9	9	11	13	3	5	6
27	5	6	5	9	10	13	5	7	5
28	5	3	6	9	10	14	3	6	6
29	8	-	4	8	9	14	4	4	8
30	6	-	7	14	15	15	6	5	5
31	7	-	6	-	15	-	6	-	3

Table 3.23 Wind speed in Kmph (Year-2000)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	5	10	3	9	11	12	7	5	7
2	7	5	11	7	7	12	6	4	8
3	7	6	7	5	8	12	5	6	10
4	4	5	11	4	10	11	3	5	8
5	3	8	11	5	10	9	3	4	4
6	4	6	5	5	7	7	3	2	4
7	3	7	8	5	11	8	4	3	4
8	3	5	7	5	8	8	6	3	6
9	3	6	6	9	10	8	5	4	3
10	2	4	5	6	10	12	5	4	3
11	3	11	10	2	4	10	5	5	2
12	7	6	11	5	11	15	3	5	5
13	6	6	16	5	14	16	5	3	3
14	6	8	7	8	12	9	4	5	3
15	6	10	3	11	12	20	5	5	1
16	7	7	5	8	14	20	6	3	2
17	7	6	8	8	14	12	3	3	3
18	13	4	7	8	11	15	3	3	5
19	6	4	6	10	8	13	3	3	5
20	5	4	5	7	12	13	3	5	5
21	5	5	4	8	10	12	4	3	6
22	7	7	9	11	13	14	4	4	5
23	5	7	7	13	13	17	4	1	4
24	3	13	7	15	13	14	4	3	3
25	3	10	10	15	14	16	3	5	5
26	4	7	8	18	15	17	3	6	4
27	6	4	5	16	15	14	3	3	6
28	8	4	5	13	13	15	3	6	4
29	9	3	6	14	10	9	2	6	4
30	6	-	5	14	13	10	3	7	3
31	3	-	6	-	14	-	5	-	NA

Note: NA – Not Available

Table 3.24 Wind speed in Kmph (Year-2001)

Day	Jan	Feb	Mar	Apr	May	Jun	Oct	Nov	Dec
1	NA	6	6	4	7	13	6	3	3
2	5	7	10	6	7	12	5	3	2
3	NA	7	11	6	10	15	6	3	1
4	3	6	8	6	12	12	6	4	1
5	8	5	6	3	9	14	7	3	1
6	8	6	7	5	9	11	6	4	1
7	5	3	5	4	11	10	5	4	1
8	7	4	6	4	13	7	2	6	1
9	4	4	5	5	12	7	4	8	5
10	8	3	7	12	12	5	4	6	1
11	7	4	6	10	14	7	4	5	3
12	6	3	6	6	12	4	8	6	2
13	6	4	6	7	11	10	5	6	2
14	6	4	7	6	13	11	3	4	4
15	7	7	6	10	14	7	4	5	3
16	6	10	6	11	4	10	3	4	5
17	9	5	8	11	14	6	3	4	2
18	8	4	6	9	14	9	6	5	2
19	5	4	5	10	13	11	4	6	1
20	5	6	7	9	10	11	2	5	3
21	6	6	9	6	15	17	4	5	7
22	5	4	6	4	12	17	3	2	7
23	6	3	7	8	7	16	5	2	5
24	8	6	4	7	7	14	6	3	3
25	5	10	7	8	17	13	3	3	3
26	6	6	9	8	15	14	3	4	1
27	6	3	9	10	14	13	4	3	2
28	6	4	12	9	15	14	5	3	3
29	3	-	12	13	16	14	6	4	5
30	5	-	12	9	4	10	3	4	4
31	8	-	6	-	11	-	3	-	4

Note: NA – Not Available

Average wind speed was worked out by averaging over ten years of data mentioned in above Table 3.15 to Table 3.24 Table 3.25 shows average wind speed

Table 3.25 Mean Daily Wind speed (averaged over last ten years)

Month	Mean Daily Wind speed	
	(Kmph)	(m/sec)
Oct	5.84	1.62
Nov	5.32	1.48
Dec	5.62	1.56
Jan	6.43	1.79
Feb	6.77	1.88
Mar	7.8	2.17
Apr	8.84	2.46
May	13.31	3.70
Jun	13.97	3.88

3.3.3 Relative Humidity

Minimum Relative Humidity at experimental site was observed to be less than 20%

Mean Relative Humidity at experimental site was 40 to 70%

3.4 Socio economic survey

A field survey for the study on socio economic impacts of waste water utilization in agriculture was conducted in area where treated sewage water (discharged after secondary treatment from Sewage Treatment Plant, Jaspur, Gandhinagar) is available to farmers (beneficiaries) for irrigation and also in area adjoining to said area where such water is not available to farmers (non-beneficiaries) for irrigation. The survey was carried out by collecting the necessary information on socioeconomic aspects from the respondents through personal interview. The respondents were interviewed either in the field or at their residence. To develop good rapport, the respondents were explained with the aims and objectives of the study. An effort was also made to clear all doubts from the minds of the respondents that this information has no concern with the government scheme and it is purely confidential. Such interview was conducted in frank and friendly atmosphere. All the respondents were contacted and the information was collected.

The following independent variables which were having relevance with the study were considered

3.4.1 Education

The information regarding formal education was collected according to their level of education and respondents were categorized into four categories as under

- (a) Illiterate
- (b) 1 to 7 standard
- (c) 8 to 12 standard
- (d) Above 12 standard

3.4.2 Land holdings

Size of land holdings was operationalised on the basis of total land possessed by respondents. The respondents were categorized into four size of land holdings as under

- (a) < 0.4 ha
- (b) 0.4 to 1 ha
- (c) 1 to 2 ha
- (d) > 2 ha

3.4.3 Paddy production

Production was operationalised as output gained by respondents on paddy crop as main crop. The data regarding production of respondents were collected and categorized into four categories as under.

- (a) < 2000 kg/ha
- (b) 2001 to 3000 kg/ha
- (c) 3001 to 4000 kg/ha
- (d) > 4000 kg/ha

3.4.4 Cropping intensity

The operational definition of the term cropping intensity used in the study was the proportion of total annual cropped area to the size of operational holding, expressed in percentage. The cropping intensity was categorized for individual respondent as under.

- (a) < 100 %
- (b) 101 to 150 %
- (c) 151 to 200 %
- (d) 201 to 250 %
- (e) > 250 %

3.4.5 Herd milk production

It is operationalised on the basis of milk produced per buffalo (averaged over numbers of buffalos owned by respondents) and respondents were classified into four categories as under

- (a) < 4 lit/day
- (b) 4 1 to 7 lit/ day
- (c) 7 1 to 10 lit/day
- (d) > 10 lit/day

3.4.6 Public health

The information regarding public health in terms of sickness was ascertained with the help of direct questioning and categorized into four categories as under

- (a) 1 attack of sickness / month
- (b) 2-4 attacks of sickness / month
- (c) 4-6 attacks of sickness / month
- (d) >6 attacks of sickness / month