

Supplementary Materials:

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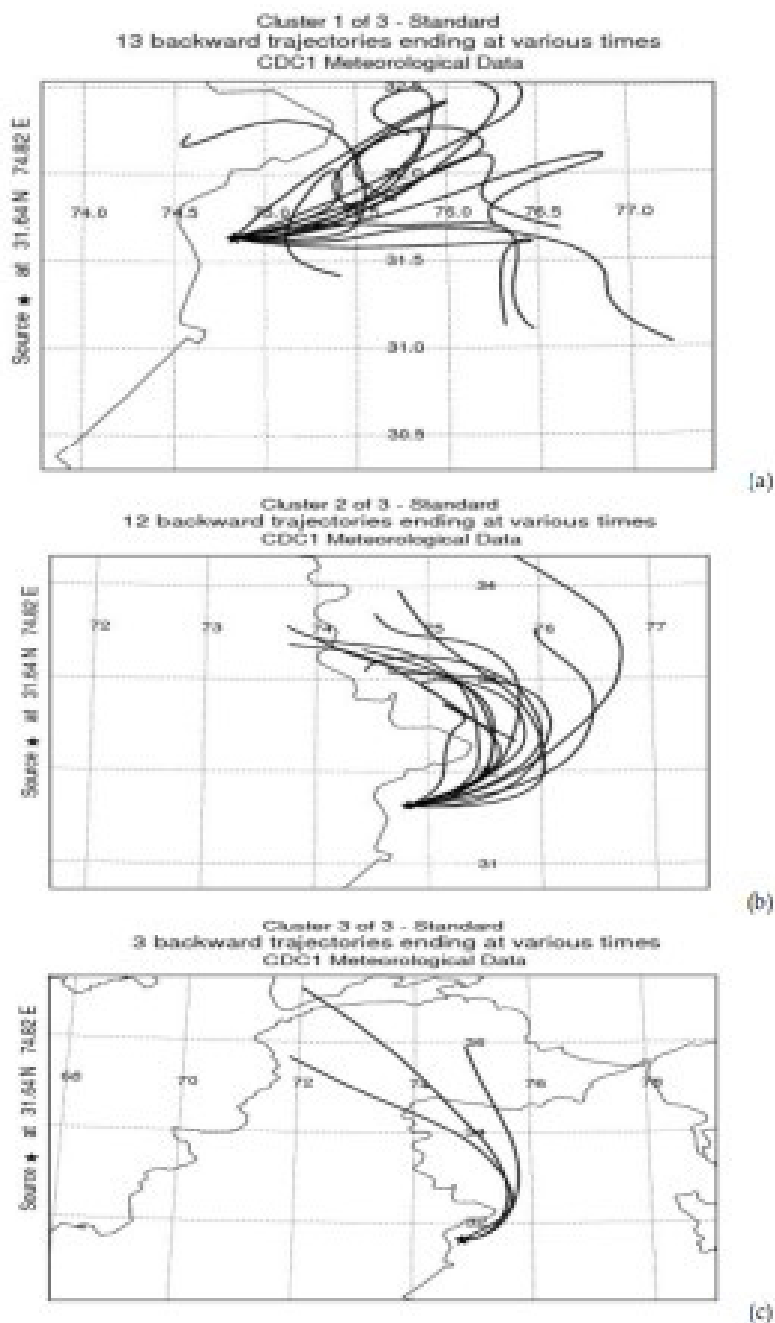


Figure S1. Sub-clusters of air mass back trajectories calculated at a height of 500 m above ground level for sampling days for (a) Cluster-1 (46% contribution) (b) Cluster-2 (43% contribution) and (c) Cluster-3 (11% contribution).

**Table S1.** Summary table of chemical composition of fog water samples along with anion-cation balance.

S.No	Sampling date	Sample volume	pH	Cond	Na	K	Ca	Mg	NO ₃	SO ₄	Cl
		ml		μS/cm	meq/L	meq/L	meq/L	meq/L	meq/L	meq/L	meq/L
1	29-12-2020	149	7.5	74	0.16	0.03	0.38	0.31	0.13	0.23	0.11
2	30-12-2020	110	7.3	184	0.15	0.06	0.67	0.49	0.10	1.01	0.34
3	31-12-2020	142	7.5	100	0.07	0.03	0.27	0.17	0.08	0.74	0.11
4	01-01-2021	55	6.22	365	0.11	0.05	0.70	0.22	0.13	4.08	0.45
5	06-01-2021	93	5.6	67.6	0.06	0.06	0.21	0.12	0.06	1.79	0.11
6	07-01-2021	57	4.6	85	0.06	0.04	0.37	0.18	0.11	0.66	0.06
7	12-01-2021	148	4.6	103	0.06	0.04	0.38	0.13	0.07	0.58	0.06
8	14-01-2021	156	6	102	0.05	0.03	0.36	0.10	0.13	0.82	0.11
9	15-01-2021	243	6.7	305	0.06	0.45	0.50	0.12	0.58	2.20	1.58
10	29-01-2021	72	5.9	81	0.09	0.03	0.30	0.16	0.11	1.62	0.11
11	31-01-2021	92	6.4	91	0.08	0.04	0.52	0.14	0.13	0.91	0.28
12	01-02-2021	73	6.4	70	0.06	0.02	0.28	0.06	0.08	1.48	0.11
13	06-02-2021	55	6.65	127	0.10	0.05	0.71	0.11	0.14	3.07	0.23
14	07-02-2020	33	6.8	128.66	0.16	0.05	0.70	0.29	0.88	3.60	0.90
15	08-02-2021	85	6.5	146	0.07	0.04	0.51	0.30	0.09	1.80	0.36
16	09-02-2021	129	6.59	118	0.06	0.03	0.57	0.19	0.12	0.98	0.17
17	10-02-2021	120	6.69	125	0.03	0.02	0.30	0.07	0.12	0.84	0.23
18	11-02-2021	80	6.2	261	0.07	0.04	0.58	0.13	0.14	3.77	0.23
19	12-02-2021	121	6.61	122	0.05	0.03	0.22	0.13	0.08	0.87	0.11
20	13-02-2021	130	6.4	105	0.04	0.03	0.28	0.09	0.09	0.56	0.11
21	14-02-2021	140	6.18	204	0.03	0.02	0.36	0.07	0.12	3.83	0.23
22	15-02-2021	127	6.13	187	0.03	0.02	0.30	0.06	0.11	3.55	0.45
23	16-02-2021	137	6.2	128	0.04	0.02	0.30	0.11	0.10	0.76	0.34
24	18-02-2021	110	6.8	63	0.06	0.03	0.25	0.27	0.07	0.93	0.11
25	19-01-2021	140	6.76	72	0.07	0.03	0.31	0.26	0.08	0.87	0.28
26	20-02-2021	153	6.41	99	0.03	0.01	0.17	0.07	0.05	0.42	0.06
	Minimum	33	5	63	0.03	0.01	0.17	0.06	0.05	0.23	0.06
	Maximum	243	8	365	0.16	0.45	0.71	0.49	0.88	4.08	1.58
	Average	113.5	6.4	135.1	0.1	0.1	0.4	0.2	0.2	1.6	0.3

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S.No	Pb	Al	Zn	Cation Sum	Anion Sum	Balance Check	NF of Ca ²⁺	NF of Mg ²⁺	NF of K ⁺
	ppb	ppb	ppb	meq/L	meq/L	meq/L	meq/L	meq/L	meq/L
1	10	20	50	0.88	0.47	30.5	1.06	0.87	0.09
2	10	10	100	1.37	1.45	2.6	0.60	0.45	0.05
3	10	90	60	0.55	0.94	26.1	0.33	0.20	0.04
4	10	40	520	1.07	4.67	62.6	0.17	0.05	0.01
5	10	20	90	0.44	1.96	63.4	0.11	0.06	0.03
6	10	20	70	0.65	0.83	11.9	0.48	0.23	0.06
7	10	20	150	0.61	0.70	7.5	0.59	0.21	0.06
8	0	10	110	0.54	1.06	32.8	0.38	0.11	0.03
9	10	20	290	1.13	4.36	58.8	0.18	0.04	0.16
10	10	50	50	0.59	1.84	51.7	0.17	0.09	0.02
11	10	70	120	0.78	1.32	26.1	0.50	0.14	0.04
12	0	20	40	0.42	1.67	60.1	0.18	0.04	0.01
13	10	150	100	0.97	3.43	56.0	0.22	0.03	0.01
14	20	120	70	1.19	5.38	63.7	0.16	0.06	0.01
15	10	50	240	0.92	2.26	42.0	0.27	0.16	0.02
16	10	40	180	0.85	1.27	19.9	0.51	0.18	0.03
17	0	40	220	0.43	1.18	46.9	0.32	0.07	0.03
18	10	120	750	0.82	4.13	67.0	0.15	0.03	0.01
19	10	50	400	0.43	1.07	42.7	0.23	0.13	0.03
20	20	60	220	0.44	0.76	26.6	0.43	0.14	0.04
21	10	200	790	0.48	4.17	79.2	0.09	0.02	0.01
22	10	130	500	0.41	4.11	81.9	0.08	0.02	0.01
23	10	80	380	0.48	1.20	43.2	0.35	0.13	0.03
24	10	60	40	0.61	1.11	29.3	0.25	0.27	0.03
25	0	70	90	0.66	1.22	29.8	0.33	0.27	0.04
26	0	20	50	0.28	0.52	29.8	0.36	0.15	0.03
Minimum	0	10	40	0.28	0.47	2.6	0.08	0.02	0.01
Maximum	20	200	790	1.3	5.3	81.9	1.06	0.87	0.16
Average	8.8	60.8	218.5	0.7	2.0	42.0	0.33	0.16	0.04

Table S2. Neutralization factor (NF) of different cations by the present study and their comparison with other studies related to fog, dew and rain samples.

S.N.	Country	City	Study period	Sample type	No. of Samples	Neutralizing Factors				Order of Neutralization factor	References
						NF _{NH4+}	NF _{Ca2+}	NF _{Mg2+}	NF _{K+}		
International studies											
1	China	Nanjing	Dec. 2006 to Dec. 2007	Fog	-	0.82	0.6	0.05	-	NH ₄ ⁺ > Ca ²⁺ > Mg ²⁺	Lu <i>et al.</i> , 2010 [43]
2	Bangladesh	Bhola Island	Dec. 2014 to Jan. 2015	Dew	10	-	1.42	0.42	0.28	Ca ²⁺ > Mg ²⁺ > K ⁺	Shohel <i>et al.</i> , 2017 [28]
3	Nepal	Lumbani	Dec. 2017 to Jan. 2018	Fog	-	0.64	0.59	0.14	0.07	NH ₄ ⁺ > Ca ²⁺ >Mg ²⁺ >K ⁺	Izhar <i>et al.</i> , 2019 [7]
4	Bangladesh	Coastal Island	Dec. 2017 to Feb. 2018	Fog	18	0.33	0.66	0.2	0.19	Ca ²⁺ > NH ₄ ⁺ > Mg ²⁺ > K ⁺	Nahar <i>et al.</i> , 2022 [21]
National studies (India)											
	State	City									
5	Delhi	Delhi	2000 to 2003 (winter)	Fog	17	1.45	0.45	0.04	-	NH ₄ ⁺ > Ca ²⁺ >Mg ²⁺	Ali <i>et al.</i> , 2004 [25]
6	Delhi	Delhi	Dec. 2014 to Mar. 2015	Fog	14	0.73	0.61	0.07	-	NH ₄ ⁺ > Ca ²⁺ >Mg ²⁺	Nath and Yadav, 2018 [39]
7	Delhi	Delhi	Dec.2011 to March 2012	Dew	25	1.1	0.55	0.05	-	NH ₄ ⁺ > Ca ²⁺ >Mg ²⁺	Yadav and Kumar, 2014 [57]
8	Delhi	Delhi	Dec.2014 to Mar. 2015	Dew	19	1.06	1.37	0.1	-	NH ₄ ⁺ > Ca ²⁺ >Mg ²⁺	Nath and Yadav, 2018 [39]
9	Delhi	Delhi	2010 to 2011 (winter)	Atmospheric condensate	50	2.1	0.81	0.09	-	NH ₄ ⁺ > Ca ²⁺ >Mg ⁺	Kumar and Yadav, 2013 [22]
10	Delhi	Delhi	2011 to 2013	Rain	106	0.17	1.4	0.49	0.04	Ca ²⁺ > Mg ⁺ > NH ₄ ⁺ > K ⁺	Rao <i>et al.</i> , 2016 [56]
11	Punjab	Amritsar	Dec. 2020 to Feb. 2021	Fog	30	-	0.33	0.16	0.04	Ca ²⁺ >Mg ²⁺ >K ⁺	<i>Present Study</i>
12	Uttaranchal	Nanital	June-Sept. 2012	Rain	55	0.37	4.94	1.21	-	Ca ²⁺ >Mg ²⁺ > NH ₄ ⁺	Bisht <i>et al.</i> ,2017 [27]
13	Uttar Pradesh	Lucknow	July 2005	Rain	-	0.35	1.36	0.43	-	Ca ²⁺ > Mg ²⁺ > NH ₄ ⁺	Singh <i>et al.</i> , 2007 [32]

**Table S3.** Enrichment factor with respect to (a) seawater and (b) crust in the present study.

	<i>(a) Enrichment factor for seawater</i>					<i>(b) Enrichment factor for the crust</i>		
	(1)	(2)	(3)	(4)		(5)	(6)	(7)
Ions	Sea water ratio $^1(X/Na)_{sea}$	Conc. (ppm)	Fog water ratio $(X/Na)_{sample}$	Enrichment factor (Sea) $(3) \div (1)$		Soil ratio $^2(X/Ca)_{crust}$	Fog water ratio $(X/Ca)_{crust}$	Enrichment factor (Crust) $(6) \div (5)$
SO ₄ ²⁻	0.125	77.5	47.9	379		0.0188	9.61	511 ^a
Cl ⁻	1.16	9.9	6.04	5.2		0.0031	1.22	395 ^a
K ⁺	0.0218	2	1.20	55		0.504	0.24	13.5 ^a
Mg ²⁺	0.227	2	1.24	5.5		0.561	0.25	0.45 ^b
Ca ²⁺	0.0439	8.1	4.93	112		1	1	1
Na ⁺	1	1.6	1	1		0.569	0.20	0.36 ^b
NO ₃ ⁻	-		-	-		0.0021	1.15	550 ^a

a=anthropogenic source

b=crustal source

¹ keene et al., 1986 [55]² Cao et al., 2009 [29]