LOCAL METRIC VOLUME TABLES FOR THE CONIFEROUS SPECIES OF AZAD KASHMIR

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Volume tables for the commercially important coniferous species of Azad Kashmir i.e. deodar (*Cedrus deodara*) Kail (*Pinus wallichiana*), Chir (*P. roxburghii*) and fir (*Abies pindrow*) were originally prepared by Malik *et al.* (1971), based on the data collected from the forests of Azad Kashmir. As spruce (*picea smithiana*) forms a small percentage of the coniferous forest and has also a close relationship with fir (*Abies pindrow*) in height and form for the same diameter, it was considered advisiable to prepare volume table for fir and extend the same to spruce.

With the change over from British system of measurement to metric system, conversion of local volume table into metric system was considered imminent. The converted volume tables provided here in will help Forest Department of Azad Kashmir in speedy calculations of timber volume in the new system.

For the preparation of local metric volume tables, metric equations of height and volume for each of the four species were derived from the British equations adopted in the construction of original volume tables. Derivation of these equations involved replacement of variables of British equations with the corresponding expressions in metric system. Heights of deodar, kail and fir for 16 cm to 160 cms diameter at an interval of 2 cm were estimated from the newly derived height – diameter equations. Similarly heights for chir for the diameter of 8 centimetre to 160 centimetre were also calculated. These height estimates were then used in the relevent metric volume equations for obtaining volume estimates As a result of these calculations local volume tables for these species were constructed which are presented here in. These tables indicate height and volume estimates for diameter classes ranging from 6 cms to 160 cms in case of chir and from 16 cm to 160 cm in case of kail, deodar and fir. The estimates are provided for 2 cms diameter classes against 1" (2.54 cm) diameter classes of the original volume tables.

Metric equations for height and volume, on which these tables are based and their corresponding British equations are given at end of relevent table.

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LOCAL (TOTAL) VOLUME TABLE FOR DEODAR (*Cedrus deodara*) OF AZAD KASHMIR

Dia meter (cm)	Estimated height metre)	Estimated volume cubic (metre)	Dia- meter (cm)	Estimated height metre)	Estimated volume cubic (metre)
16	10.49	0.083	90	44.43	9.435
18	12.75	0.127	92	44.73	9.912
20	14.91	0.181	94	45.03	10.400
22	16.94	0.247	96	45.31	10.901
24	18.84	0.324	98	45.58	11.413
26	20.61	0.412	100	45.84	11.937
28	22.26	0.511	102	46.09	12.473
30	23.80	0.623	104	46.34	13.020
32	25.24	0.746	106	46.57	13.579
34	26.58	0.880	108	46.80	14.151
36	27.82	1.027	110	47.03	14.734
38	28.99	1.185	112	47.24	15.328
40	30.08	1.355	114	47.45	15.935
42	31.10	1.536	116	47.65	16.553
44	32.06	1.730	118	47.85	17.183
46	32.97	1.935	120	48.04	17.825
48	33.82	2.152	122	48.22	18.479
50	34.62	2.381	124	48.40	19.145
52	35.37	2.621	126	48.58	19.822
54	36.09	2.874	128	48.74	20.511
56	36.72	3.138	130	48.91	21.213
58	37.40	3.414	132	49.07	21.925
60	38.01	3.702	134	49.23	22.650
62	38.59	4.001	136	49.38	23.386
64	39.14	4.313	138	49.53	24.135
66	39.67	4.636	140	49.67	24.895
68	40.17	4.971	142	49.81	25.667
70	40.64	5.318	144	49.95	26.450
72	41.10	5.676	146	50.08	27.246
74	41.53	6.047	148	50.21	28.053
76	41.95	6.429	150	50.34	28.872
78	42.35	6.823	152	50.46	29.703
80	42.73	7.229	154	50.58	30.546
82	43.10	7.647	156	50.70	31.400
84	43.45	8.076	158	50.82	32.266
86	43.79	8.517	160	50.93	33.145
88	44.12	8.970			

Figures for Volume and Height were derived from Metric Equations.

$$V = \frac{D^2}{185.80+\frac{29780.70179}{H}+\frac{4567.365612}{H^2}}$$

$$\log H = 1.783215-\frac{12.197080}{D}$$

Based on British Equations.

$$V = \frac{D^2}{0.81549+\frac{428.84}{H}+\frac{215.78}{H^2}}$$

$$\log H = 2.2992-\frac{4.8020}{D}$$

LOCAL (TOTAL) VOLUME TABLE FOR KAIL (*Pinus wallichina*) OF AZAD KASHMIR

Diameter (cm)	Estimated height (Metre)	Estimated volume (cubic metre)	Diametre (cm)	Estimated height (metre)	Estimated volume (cubic metre)
16	14.88	.149	90	43.89	9.274
18	16.17	.194	92	44.42	9.782
20	17.40	.247	94	44.93	10.305
22	18.58	.308	96	45.44	10.845
24	19.71	.378	98	45.94	11.400
26	20.79	.457	100	46.43	11.971
28	21.83	.546	102	46.92	12.559
30	22.84	.644	104	47.40	13.163
32	23.82	.752	106	47.88	13.784
34	24.76	.871	108	48.34	14.421
36	25.67	.999	110	48.81	15.074
38	26.56	1.139	112	49.27	15.745
40	27.42	1.290	114	49.72	16.432
42	28.26	1.452	116	50.16	17.137
44	29.08	1.626	118	50.61	17.858
46	29.88	1.812	120	51.04	18.597
48	30.66	2.010	122	51.47	19.353
50	31.42	2.220	124	51.90	20.126
52	32.17	2.442	126	52.32	20.917
54	32.89	2.677	128	52.74	21.725
56	33.60	2.925	130	53.15	22.551
58	34.30	3.186	132	53.56	23.394
60	34.98	3.460	134	53.96	24.256
62	33.65	3.748	136	54.36	25.135
64	36.31	4.049	138	54.76	26.033
66	36.96	4.364	140	55.15	26.948
68	37.59	4.693	142	55.54	27.882
70	38.21	5.036	144	55.92	28.834
72	38.82	5.393	146	56.30	29.804
74	39.42	5.765	148	56.68	30.792
76	40.01	6.151	150	57.05	31.799
78	40.59	6.552	152	57.42	32.825
80	41.17	6.968	154	57.78	33.869
82	41.73	7.399	156	58.14	34.932
84	42.28	7.845	158	58.50	36.014
86	42.83	8.306	160	58.86	37.115
88	43.36	8.783			

Figures for volume and Height were drived from Metric Equations.

$$V = \frac{D^2}{53.769586+41708.53813\frac{}{H}-251609.3940\frac{}{H^2}}$$

$$\log H=0.144176+0.994326 \log D -0.1165 (\log D)^2$$

Based on British Equations.

$$V = \frac{D^2}{0.2360+600.00\frac{}{H}-11887.00\frac{}{H^2}}$$

$$\log H=1.0436+0.9000 \log D -0.1165 (\log D)^2$$

LOCAL (TOTAL) VOLUME TABLE FOR FIR (*Abies webbianas*) OF AZAD KASHMIR

Dia-meter (cm)	Estimated height (metre)	Estimated volume (cubic metre)	Dia-meter (cm)	Estimated height (metre)	Estimated volume (cubic metre)
16	14.99	0.139	90	47.27	9.751
18	16.21	0.185	92	47.96	10.293
20	17.39	0.241	94	48.65	10.852
22	18.53	0.304	96	49.34	11.429
24	19.63	0.377	98	50.02	12.024
26	20.70	0.459	100	50.70	12.637
28	21.75	0.551	102	51.37	13.268
30	22.77	0.653	104	52.04	13.917
32	23.77	0.765	106	52.70	14.586
34	24.75	0.889	108	53.36	15.272
36	25.71	1.023	110	54.01	15.978
38	26.65	1.168	112	54.67	16.702
40	27.57	1.325	114	55.31	17.446
42	28.48	1.494	116	55.96	18.218
44	29.37	1.676	118	56.60	18.991
46	30.25	1.869	120	57.23	19.793
48	31.12	2.076	122	57.86	20.614
50	31.98	2.295	124	58.49	21.456
52	32.82	2.528	126	59.12	22.317
54	33.66	2.774	128	59.74	23.199
56	34.48	3.034	130	60.36	24.101
58	35.30	3.307	132	60.97	25.024
60	36.10	3.595	134	61.59	25.967
62	36.89	3.897	136	62.20	26.932
64	37.68	4.214	138	62.80	27.917
66	38.46	4.545	140	63.41	28.923
68	39.23	4.892	142	64.01	29.950
70	39.99	5.254	144	64.61	30.999
72	40.75	5.631	146	65.20	32.069
74	41.50	6.024	148	65.79	33.161
76	42.24	6.432	150	66.38	34.275
78	42.98	6.856	152	66.97	35.410
80	43.71	7.298	154	67.55	36.568
82	44.43	7.755	156	68.14	37.748
84	45.15	8.239	158	68.72	38.949
86	45.86	8.719	160	69.29	40.174
88	46.57	9.227			

Figures for volume and Height were drived from Metric Equations

$\log V = -4\ 250407 + 1.6983 \log D + 1.1469 \log H.$

$\log H = 0.3754 + 0.6648 \log D$

Based on British Equations.

$\log V = -2.6067 + 1.6983 \log D + 1.1469 \log H.$

$\log H = 1.1605 + 0.6648 \log D$

LOCAL (TOTAL) VOLUME TABLE FOR CHIR (*Pinus roxburghii*) OF AZAD KASHMIR

Diameter (cm)	Estimated height (metre)	Estimated volume (cubic metre)	D-a-meter (cm)	Estimated height (metre)	Estimated volume (cubic metre)
8	9.42	0.032	86	31.55	6.901
10	11.50	0.042	88	31.76	7.262
12	13.20	0.068	90	31.97	7.632
14	14.64	0.101	92	32.18	8.011
16	15.88	0.141	94	32.38	8.401
18	16.98	0.188	96	32.57	8.800
20	17.96	0.242	98	32.77	9.209
22	18.85	0.305	100	32.95	9.629
24	19.66	0.375	102	33.14	10.058
26	20.40	0.453	104	33.32	10.497
28	21.09	0.539	106	33.50	10.946
30	21.74	0.634	108	33.67	11.406
32	22.34	0.737	110	33.84	11.875
34	22.90	0.848	112	34.01	12.354
36	23.44	0.968	114	34.17	12.843
38	23.94	1.097	116	34.34	13.342
40	24.42	1.234	118	34.50	13.852
42	24.87	1.379	120	34.65	14.371
44	25.31	1.534	122	34.81	14.901
46	25.72	1.697	124	34.96	15.441
48	26.12	1.869	126	35.11	15.991
50	26.50	2.051	128	35.25	16.551
52	26.86	2.241	130	35.40	17.122
54	27.21	2.440	132	35.54	17.703
56	27.55	2.648	134	35.68	18.294
58	27.88	2.866	136	35.82	18.895
60	28.20	3.093	138	35.95	19.507
62	28.50	3.329	140	36.09	20.129
64	28.80	3.575	142	36.22	20.761
66	29.08	3.829	144	36.35	21.403
68	29.36	4.094	146	36.48	22.056
70	29.63	4.368	148	36.61	22.719
72	29.89	4.651	150	36.73	23.394
74	30.15	4.944	152	36.86	24.078
76	30.40	5.246	154	36.98	24.772
78	30.64	5.558	156	37.10	25.477
80	30.88	5.879	158	37.22	26.193
82	31.11	6.210	160	37.33	26.919
84	31.33	6.551			

Figures tor volume and Height were derived from Metric Equations.

$\log V = -4.274506 + 1.9497 \log D + 0.8951 \log H$

$H = -9.947774 + 21.451519 \log D$

Based on British Equations.

$\log V = -2.3991 + 1.9497 \log D + 0.8951 \log H$

$H = -4.1452 + 70.3790 \log D$

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