Supplementary Materials:

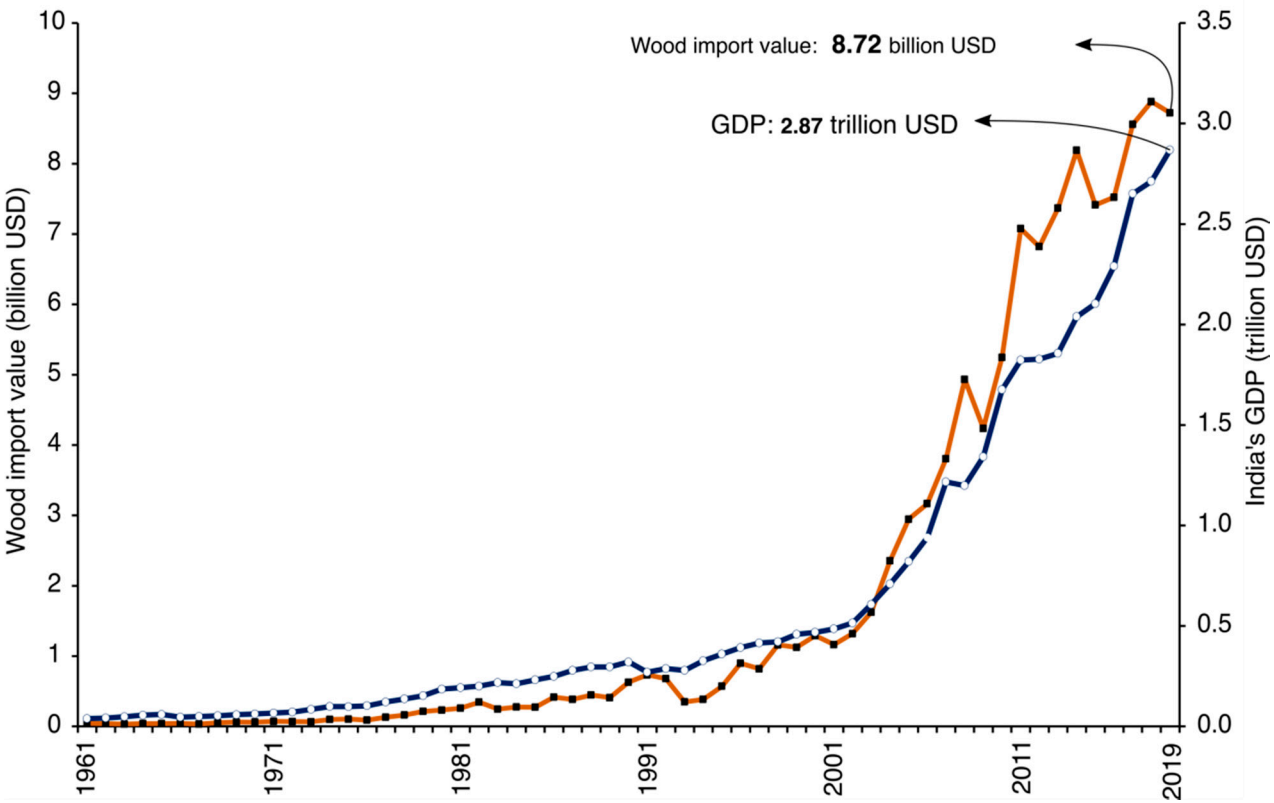

Figure S1. India's annual import value of forest products (blank circles with blue line) and gross domestic product (*GDP*) growth (black squares with orange line), from 1961 to 2019 [12,13].

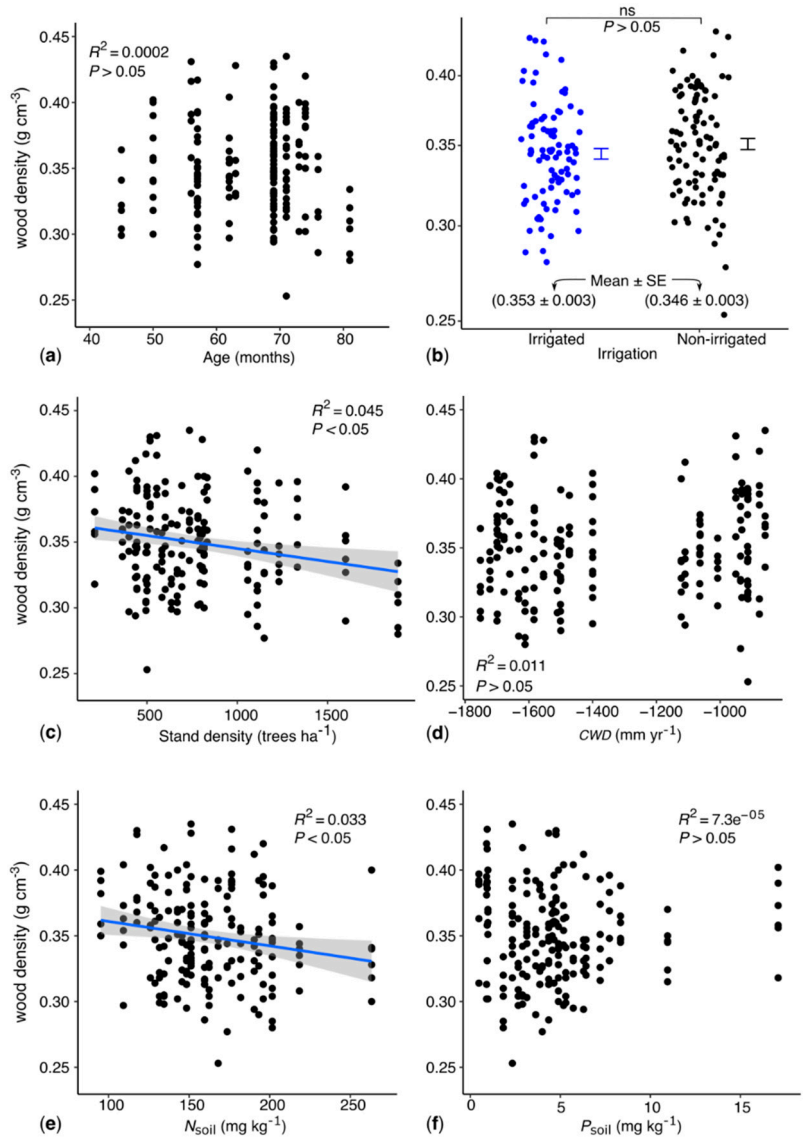

Figure S2. The influence of the key variables stand age (a), irrigation (b), stand density (c), climatological water deficit (*CWD*) (d), soil nitrogen (N_{soil}) (e) and soil phosphorus (P_{soil}) content (f) on wood density. Wood density was measured from cores extracted at breast height on 186 trees across a subset of 31 woodlots. Linear regression models were fitted and regression lines (blue) and standard error corridors (gray) are depicted for $P < 0.05$. The categorical variable irrigation was tested for significant differences ($P < 0.05$) among groups with the Wilcoxon rank sum test (with continuity correction).

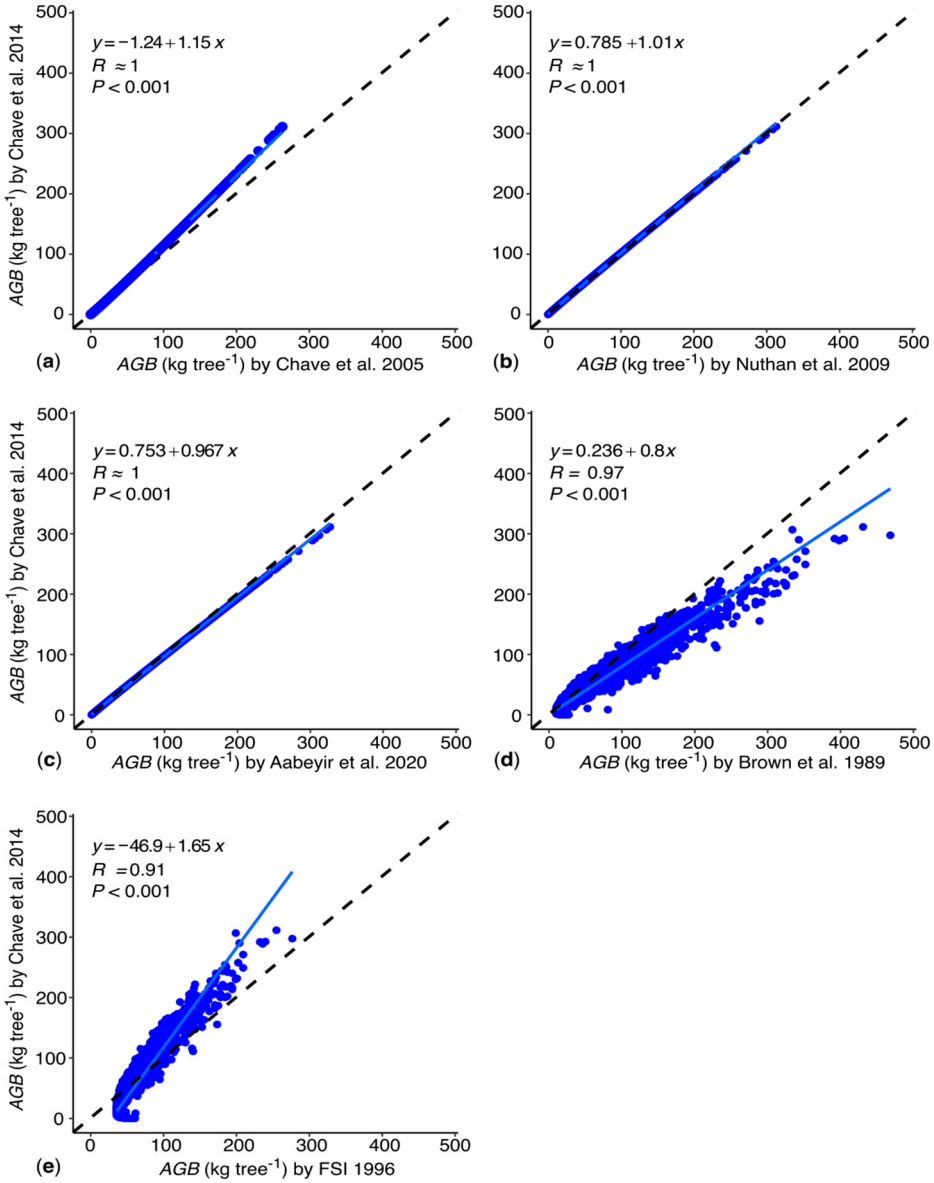

Figure S3. Comparison of tree-level aboveground biomass (*AGB*) estimates derived from the pantropical model applied in our study (Chave et al., 2014; [39]) to other *AGB* models. Data from all 6,898 studied trees are depicted (dots). The solid blue lines are the respective regression lines, the dashed black lines represent 1:1 lines.

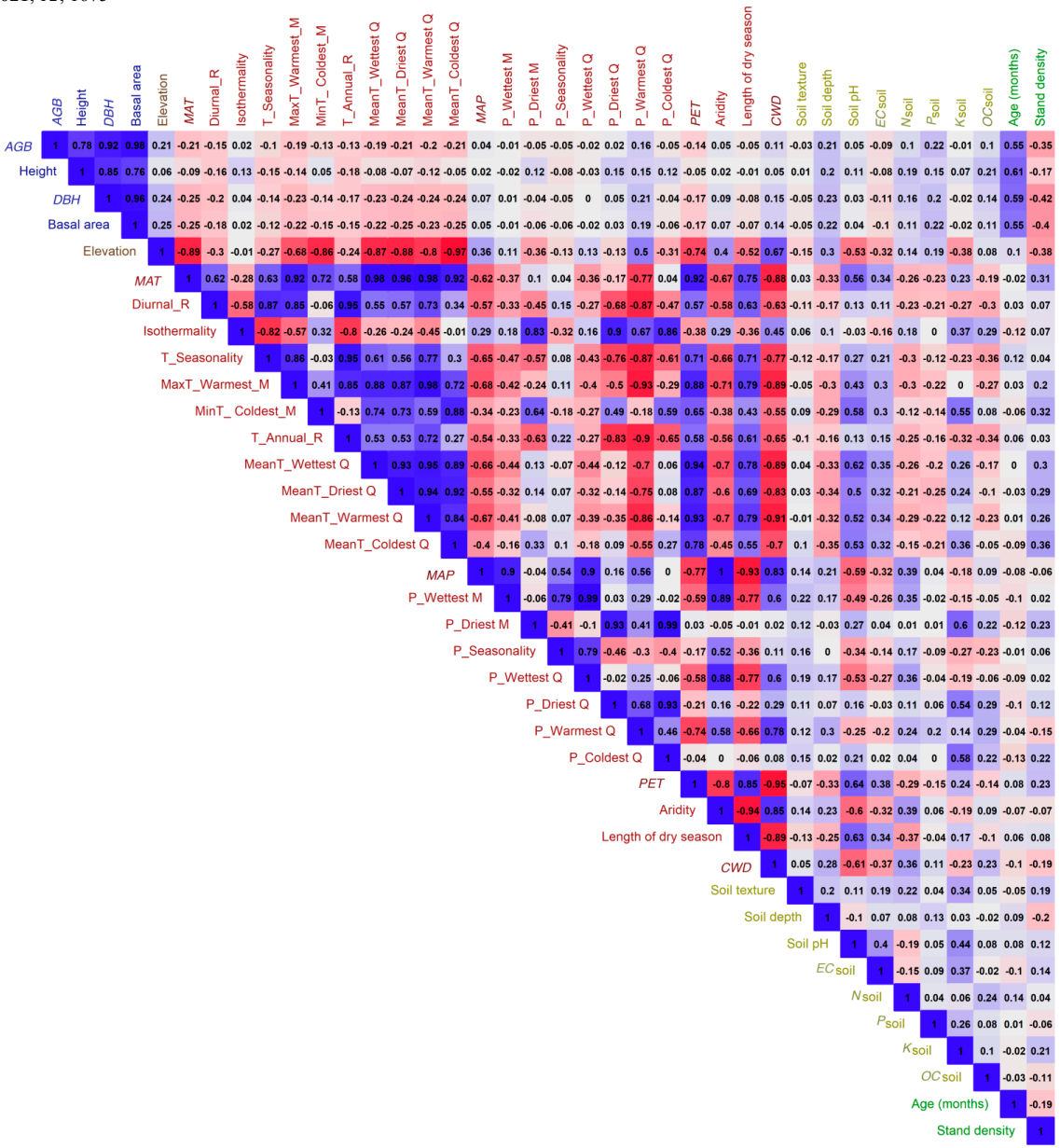

Figure S4. Correlation matrix of available growth, climate, soil and management variables. Units and descriptions for all variables are presented in Table S1.

Table S1. List of available growth, climate, soil and management variables. Given are the measurement units, means, standard deviations, standard errors, minimum and maximum values among the 186 studied woodlots.

S#	Variables	Unit	Mean	SD	SE	Minimum	Maximum
1	Aboveground biomass (*AGB*) at plot level	Mg ha^{-1}	29.63	25.28	1.85	0.29	110.36
2	Mean monthly *AGBI*	Mg ha^{-1} $month^{-1}$	0.73	0.55	0.04	0.03	2.75
3	Average annual *AGBI*	Mg ha^{-1} $year^{-1}$	8.76	6.64	0.49	0.42	32.95
4	Height	m	9.46	3.53	0.26	1.48	17.58
5	*DBH*	cm	12	5.13	0.38	2.53	26.46
6	Basal area	m^2 ha^{-1}	10.2	6.51	0.48	0.03	27.59
7	Altitude	m	675.46	157.9	11.6	328	951
8	Age	month	39.05	22.06	1.62	6	113
9	Age	Year	3.25	1.84	0.14	0.5	9.42
10	Stand density	Trees ha^{-1}	905.54	555.9	40.8	116	3086
11	Irrigation[a]	Category	--	--	--	--	--
12	Mean Annual Temperature (*MAT*)	ºC	24.95	1.42	0.1	22.5	27.4
13	Mean Diurnal Range (Mean of monthly	ºC	10.26	0.87	0.06	8.8	11.3
14	Isothermality (BIO2/BIO7) (* 100)	%	0.57	0.02	0	0.53	0.62
15	Temperature Seasonality (standard deviation *100)	%	187.68	32.51	2.38	142.2	247.3
16	Max Temperature of Warmest Month	ºC	34.57	2.19	0.16	31	37.8
17	Min Temperature of Coldest Month	ºC	16.56	1.05	0.08	14.6	19.4
18	Temperature Annual Range (BIO5-BIO6)	ºC	18.02	1.97	0.14	14.9	20.4
19	Mean Temperature of Wettest Quarter	ºC	24.54	1.24	0.09	21.7	27
20	Mean Temperature of Driest Quarter	ºC	24.65	1.44	0.11	21.8	26.7
21	Mean Temperature of Warmest Quarter	ºC	27.74	1.7	0.12	24.9	30.5
22	Mean Temperature of Coldest Quarter	ºC	22.77	1.06	0.08	21.1	24.9
23	Mean Annual Precipitation (*MAP*)	mm	874.94	351.2	25.8	421	2171
24	Precipitation of Wettest Month	mm	206.73	119	8.73	102	804
25	Precipitation of Driest Month	mm	1.48	2.39	0.18	0	9
26	Precipitation Seasonality (Coefficient of Variation)	%	0.9	0.11	0.01	0.78	1.42
27	Precipitation of Wettest Quarter	mm	436.69	210.3	15.4	227	1537

28	Precipitation of Driest Quarter	mm	10.62	9.31	0.68	1	34
29	Precipitation of Warmest Quarter	mm	151.83	58.18	4.27	74	263
30	Precipitation of Coldest Quarter	mm	57.48	36.97	2.71	19	169
31	Potential Evapotranspiration (*PET*)	mm	1991.7	129.5	9.49	1786	2289
32	Aridity Index (annual)	--	0.45	0.2	0.01	0.19	1.19
33	Length of dry season	month	10.26	1.43	0.1	7	12
34	Aridity Index in dry months	--	0.3	0.05	0	0.15	0.48
35	Climatological water deficit (*CWD*)	mm yr^{-1}	-1293	266.8	19.6	-1844	-824
36	Soil depth	cm	74.08	27.27	2	30.48	152.4
37	Soil texture[a]	Class	--	--	--	--	--
38	Soil pH	--	--	--	--	4.32	8.8
39	EC_{soil} (electrical conductivity)	dS m^{-1}	1.41	1.41	0.1	0.19	9.23
40	N_{soil} (nitrogen content)	mg kg^{-1}	155.64	35.96	2.64	75.6	266
41	P_{soil} (phosphorous content)	mg kg^{-1}	4	3.5	0.3	0.4	17.3
42	K_{soil} (potassium content)	mg kg^{-1}	31.9	21.1	1.6	7.6	130.5
43	OC_{soil} (organic carbon content)	% by mass	0.5	0.21	0.02	-0.21	0.87

AGBI: Aboveground biomass increment; [a] categorical variables: irrigated vs. non-irrigated; soil texture class (sand, silt, clay).

Table S2. Aboveground biomass (*AGB*), average annual *AGB* increment (*AGBI*), key characteristics (age, stand density, mean annual precipitation *MAP*, soil conditions) and further information on tropical tree plantations as cited for comparison to our study. NA: no data available.

Species	**Country**	**Age (year)**	**Plots or Replicates**	**Stand density (trees ha^{-1})**	***AGB* (Mg ha^{-1})**	***AGBI* (Mg $ha^{-1}yr^{-1}$)**	***MAP* (mm yr^{-1})**	**Soil conditions**	***AGB* estimation method**	**Reference**
Melia dubia	South India	9	186	905 ± 41 (Mean ± SE)	93.77[A]	10.41[A]	420-2170	Diverse	Chave et al. 2014 [39]	Present study
	India (Karnataka)[#]	4	3	2500	47.68	11.22	880	Black cotton soil	*AGB* estimates were derived in analogy to our study using *DBH* and height	[33]
			3	1666	40.58	9.55				
			3	1250	47.89	11.27				
			3	1000	45.83	10.78				
			3	833	54.16	12.74				
			3	714	50.98	12.00				
			3	625	40.90	9.62				

Acacia auriculiformis	India (Kerala)	8.8	3	1250	326.43	37.09	2569	Acidic oxisols	Harvest-calculated	[81]
Acacia melanoxylon	Chile	4	3	5000	2.60	0.65	1102	Sandy soils	Harvest-measured allometric	[90]
			3	5000	9.60	2.40	695	Dry, granitic soils		
Ailanthus triphysa	India (Kerala)	8.8	3	1250	40.54	4.61	2569	Acidic oxisols	Harvest-calculated	[81]
Albizia procera	Puerto Rico	5.5	6	2500	124.00	22.55	1100	Fraternidad clay	Harvest-calculated	[87]
Casuarina equisetifolia	India (Tamil Nadu)	2	3	6666	75.04	37.52	450-650	Sandy clay loam	Harvest-calculated	[84]
	Puerto Rico	5.5	6	2500	199.00	36.18	1100	Fraternidad Clay	Harvest-calculated	[87]
	India (Uttar Pradesh)	7	3	2500	205.10	29.30	1000	Silty clay loam,	Harvest-calculated	[83]
			3	2500	134.70	19.24		sodic soil		
			3	2500	176.60	25.23				
	India (Kerala)	8.8	3	1250	95.58	10.86	2569	Acidic oxisols	Harvest-calculated	[81]
Dalbergia sissoo	India (Karnataka)	3	24	2500	7.60	2.53	800	Deep lateritic	Harvest-calculated	[41]
	India (Uttar Pradesh)	6	3	1967	16.29	2.71	977	Sodic soil	Harvest-measured allometric	[82]
		9	3	1600	38.31	4.26				
	India (Uttarakhand)	10	3	1666	77.90	7.79	1364	Sandy loam	Harvest-calculated	[77]
Gmelina arborea	Nigeria	7	12	1736	85.6	12.2	1125	NA	Harvest-calculated	[88]
	India (Chhattisgarh)	4	5	2500	8.99	2.25	1250	Black deep clay	Harvest-calculated	[80]
			5	1750	3.88	0.97				
			5	1250	2.87	0.72				
			5	1000	2.19	0.55				
	India (Chhattisgarh)	6	5	737	41.12	6.85	1200	Red lateritic soil	Harvest-measured allometric	[79]
			5	724	39.30	6.55				
			5	740	51.20	8.53				
E. camadulensis	Chile	4	3	5000	14.90	3.73	695	Dry, granitic soils	Harvest-measured allometric	[90]
E. globulus	Chile		3	5000	22.50	5.63	1102	Sandy soils		
Eucalyptus nitens	Chile	4	3	5000	23.40	5.85	1048	Sandy soils	Harvest- allometric	[90]
			3		14.60	3.65	695	Dry, granitic soils		
Eucalyptus regnans	New Zealand	4	1	2050	68.5	17.12	1489[A]	Sandy loam	Harvest-calculated	[85]
		7	1	1850	198.00	28.29				
		17	1	1250	460.00	27.06				

Eucalyptus robusta	Puerto Rico	5.5	6	2500	67.00	12.18	1100	Fraternidad Clay	Harvest-calculated	[87]
Eucalyptus saligna	New Zealand	8	1	829	129.8	16.22	1662 [B]	OropiKaharoa	Harvest-calculated	[86]
E. tereticornis	India (Uttarakhand)	10	NA	992	126.1	12.61	1727	Alluvial and clay	NA	[20]
	India (Haryana)	10	1	6530	122.5	12.25	766	Silt-loam on	Harvest-calculated	[44]
			1	1993	261.5	26.15		improved sodic land		
			1	517	177.5	17.75				
			1	163	54.6	5.46				
*(*Boundary plantation*)*	India (Uttarakhand)	10		120	21.22	2.12	1364	Sandy loam	Harvest-calculated	[77]
Leucaena leucocephala	Puerto Rico	5.5	6	2500	47.00	8.55	1100	Fraternidad Clay	Harvest-calculated	[87]
(var. K8)										
var.P.R		5.5	6	2500	33.00	6.00	1100			
	India (Kerala)	8.8	3	1250	22.81	2.59	2569	Acidic oxisols	Harvest-calculated	[81]
Populus deltoides	India (Uttarakhand)	1	3	500	1.26	1.26	1364	Sandy clay loam	Harvest-calculated	[78]
		5	3	500	52.95	10.59				
		11	3	500	180.24	16.39				
	India (Uttarakhand)	8	3	500	50.10	6.26	1364	Sandy loam	Harvest-calculated	[75]
Pterocarpus marsupium	India (Kerala)	8.8	3	1250	66.11	7.51	2569	Acidic oxisols	Harvest-calculated	[81]
Tectona grandis	India (Uttar Pradesh)	4	10 trees	3490	25.40	6.35	900	Sandy loam	Harvest-calculated	[75]
		14	14 trees	1040	39.92	2.85	900			
		30	10 trees	474	76.95	2.57	900			
	India (Tamil Nadu)	20	NA	NA	320.00	16.00	1100	NA	Harvest-measured allometric	[76]
		47	NA	NA	410.00	8.72	1100	NA		

Mean tree diameter and height were used with a wood density of 0.35 g cm^{-3}; [A]model-estimated average *AGB* for nine year old *M. dubia* plantations as presented in our study; [B] precipitation (mm) was extracted from WorldClim database (Version 2, http://worldclim.org).