

Annex Table A-1 Default values of biomass expansion factors (BEF)

TABLE 3A.1.10 DEFAULT VALUES OF BIOMASS EXPANSION FACTORS (BEFs) (BEF ₂ to be used in connection with growing stock biomass data in Equation 3.2.3; and BEF ₁ to be used in connection with increment data in Equation 3.2.5)				
Climatic zone	Forest type	Minimum dbh (cm)	BEF ₂ (overbark) to be used in connection to growing stock biomass data (Equation 3.2.3)	BEF ₁ (overbark) to be used in connection to increment data (Equation 3.2.5)
Boreal	Conifers	0-8.0	1.35 (1.15-3.8)	1.15 (1-1.3)
	Broadleaf	0-8.0	1.3 (1.15-4.2)	1.1 (1-1.3)
Temperate	Conifers: Spruce-fir	0-12.5	1.3 (1.15-4.2)	1.15 (1-1.3)
	Pines	0-12.5	1.3 (1.15-3.4)	1.05 (1-1.2)
	Broadleaf	0-12.5	1.4 (1.15-3.2)	1.2 (1.1-1.3)
Tropical	Pines	10.0	1.3 (1.2-4.0)	1.2 (1.1-1.3)
	Broadleaf	10.0	3.4 (2.0-9.0)	1.5 (1.3-1.7)
Note: BEF _s given here represent averages for average growing stock or age, the upper limit of the range represents young forests or forests with low growing stock; lower limits of the range approximate mature forests or those with high growing stock. The values apply to growing stock biomass (dry weight) including bark and for given minimum diameter at breast height; Minimum top diameters and treatment of branches is unspecified. Result is above-ground tree biomass. Sources: Isaev <i>et al.</i> , 1993; Brown, 1997; Brown and Schroeder, 1999; Schoene, 1999; ECE/FAO TBFRA, 2000; Lowe <i>et al.</i> , 2000; please also refer to FRA Working Paper 68 and 69 for average values for developing countries (http://www.fao.org/forestry/index.jsp)				

Source : IPCC Good Practice Guidance for Land Use, Land Use Change, and Forestry (LULUCF) Table3A.1.10, 2003¹¹ IPCC: http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf_files/Chp3/Anx_3A_1_Data_Tables.pdf

Annex Table A-2 Basic wood densities of stemwood WD (1) (t-dry matter/m³)

TABLE 3A.1.9-1 BASIC WOOD DENSITIES OF STEMWOOD (tonnes dry matter/m³ fresh volume) FOR BOREAL AND TEMPERATE SPECIES (To be used for D in Equations 3.2.3., 3.2.5, 3.2.7, 3.2.8)		
Species or genus	Basic wood density m ₀ /V _{wet}	Source
Abies	0.40	1
Acer	0.52	1
Alnus	0.45	1
Betula	0.51	1
Carpinus betulus	0.63	3
Castanea sativa	0.48	3
Fagus sylvatica	0.58	1
Fraxinus	0.57	1
Juglans	0.53	3
Larix decidua	0.46	1
Larix kaempferi	0.49	3
Picea abies	0.40	1
Picea sitchensis	0.40	2
Pinus pinaster	0.44	5
Pinus strobus	0.32	1
Pinus sylvestris	0.42	1
Populus	0.35	1
Prunus	0.49	1
Pseudotsuga menziesii	0.45	1
Quercus	0.58	1
Salix	0.45	1
Thuja plicata	0.31	4
Tilia	0.43	1
Tsuga	0.42	4
Source: 1. Dietz, P. 1975: Dichte und Rindengehalt von Industrieholz. Holz Roh- Werkstoff 33: 135-141 2. Knigge, W.; Schulz, H. 1966: Grundriss der Forstbenutzung. Verlag Paul Parey, Hamburg, Berlin 3. EN 350-2 (1994): Durability of wood and wood products - Natural durability of solid wood - Part 2: Guide to the natural durability and treatability of selected wood species of importance in Europe 4. Forest Products Laboratory: Handbook of wood and wood-based materials. Hemisphere Publishing Corporation, New York, London 5. Rijdsdijk, J.F.; Laming, P.B. 1994: Physical and related properties of 145 timbers. Kluwer Academic Publishers, Dordrecht, Boston, London 6. Kollmann, F.F.P.; Côté, W.A. 1968: Principles of wood science and technology. Springer Verlag, Berlin, New York		

Source : IPCC Good Practice Guidance for LULUCF , Table3A.1.9, 2003²² IPCC: http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf_files/Chp3/Anx_3A_1_Data_Tables.pdf

Annex Table A-2 Basic wood densities of stemwood WD (2) (t-dry matter/m³)

TABLE 3A.1.9-2 BASIC WOOD DENSITIES (D) OF STEMWOOD (tonnes dry matter/m ³ fresh volume) FOR TROPICAL TREE SPECIES (To be used for D in Equations 3.2.3., 3.2.5, 3.2.7, 3.2.8)					
TROPICAL ASIA	D	TROPICAL AMERICA	D	TROPICAL AFRICA	D
<i>Acacia leucophloea</i>	0.76	<i>Albizia</i> spp.	0.52	<i>Afzelia</i> spp.	0.67
<i>Adina cordifolia</i>	0.58, 0.59+	<i>Alcornea</i> spp.	0.34	<i>Aidia ochroleuca</i>	0.78*
<i>Aegle marmelo</i>	0.75	<i>Alexa grandiflora</i>	0.6	<i>Albizia</i> spp.	0.52
<i>Agathis</i> spp.	0.44	<i>Alnus ferruginea</i>	0.38	<i>Allanblackia floribunda</i>	0.63*
<i>Aglaia ilanosiana</i>	0.89	<i>Anacardium excelsum</i>	0.41	<i>Allophylus africanus</i> f. <i>acuminatus</i>	0.45
<i>Alangium longiflorum</i>	0.65	<i>Anadenanthera macrocarpa</i>	0.86	<i>Alstonia congensis</i>	0.33
<i>Albizzia amara</i>	0.70*	<i>Andira retusa</i>	0.67	<i>Amphimas pterocarpoides</i>	0.63*
<i>Albizzia falcata</i>	0.25	<i>Aniba riparia lduckeii</i>	0.62	<i>Anisophyllea obtusifolia</i>	0.63*
<i>Aleurites trisperma</i>	0.43	<i>Antiaris africana</i>	0.38	<i>Annonidium mannii</i>	0.29*
<i>Alnus japonica</i>	0.43	<i>Apeiba echinata</i>	0.36	<i>Anopyxis klaineana</i>	0.74*
<i>Alphitonia zizyphoides</i>	0.5	<i>Artocarpus comunis</i>	0.7	<i>Anthocleista keniensis</i>	0.50*
<i>Alphonsea arborea</i>	0.69	<i>Aspidosperma</i> spp. (aracanga group)	0.75	<i>Anthonotha macrophylla</i>	0.78*
<i>Alseodaphne longipes</i>	0.49	<i>Astronium lecointei</i>	0.73	<i>Anthostemma aubryanum</i>	0.32*
<i>Alstonia</i> spp.	0.37	<i>Bagassa guianensis</i>	0.68, 0.69+	<i>Antiaris</i> spp.	0.38
<i>Amoora</i> spp.	0.6	<i>Banara guianensis</i>	0.61	<i>Antrocaryon klaincanum</i>	0.50*
<i>Anisophyllea zeylanica</i>	0.46*	<i>Basioxylon excelsum</i>	0.58	<i>Aucoumea klaineana</i>	0.37
<i>Anisoptera</i> spp.	0.54	<i>Beilschmiedia</i> sp.	0.61	<i>Austranella congolensis</i>	0.78
<i>Anogeissus latifolia</i>	0.78, 0.79+	<i>Bertholletia excelsa</i>	0.59, 0.63+	<i>Baillonella toxisperma</i>	0.71
<i>Anthocephalus chinensis</i>	0.36, 0.33+	<i>Bixa arborea</i>	0.32	<i>Balanites aegyptiaca</i>	0.63*
<i>Antidesma pleuricum</i>	0.59	<i>Bombacopsis sepium</i>	0.39	<i>Baphia kirkii</i>	0.93*
<i>Aphanamiris perrottetiana</i>	0.52	<i>Borojoa patinoi</i>	0.52	<i>Beilschmiedia louisii</i>	0.70*
<i>Araucaria bidwillii</i>	0.43	<i>Bowdichia</i> spp.	0.74	<i>Beilschmiedia nitida</i>	0.50*
<i>Artocarpus</i> spp.	0.58	<i>Brosimum</i> spp. (alicastrum group)	0.64, 0.66+	<i>Berlinia</i> spp.	0.58
<i>Azadirachta</i> spp.	0.52	<i>Brosimum utile</i>	0.41, 0.46+	<i>Blighia welwitschii</i>	0.74*
<i>Balanocarpus</i> spp.	0.76	<i>Brysenia adenophylla</i>	0.54	<i>Bombax</i> spp.	0.4
<i>Barringtonia edulis</i> *	0.48	<i>Buchenavia capitata</i>	0.61, 0.63+	<i>Brachystegia</i> spp.	0.52
<i>Bauhinia</i> spp.	0.67	<i>Bucida buceras</i>	0.93	<i>Bridelia micrantha</i>	0.47*
<i>Beilschmiedia tawa</i>	0.58	<i>Bulnesia arborea</i>	1	<i>Calpocalyx klainei</i>	0.63*
<i>Berrya cordifolia</i>	0.78*	<i>Bursera simaruba</i>	0.29, 0.34+	<i>Canarium schweinfurthii</i>	0.40*
<i>Bischofia javanica</i>	0.54, 0.58, 0.62+	<i>Byrsonima coriacea</i>	0.64	<i>Canthium rubrostratum</i>	0.63*
<i>Bleasdalea vitiensis</i>	0.43	<i>Cabralea eangerana</i>	0.55	<i>Carapa procera</i>	0.59
<i>Bombax ceiba</i>	0.33	<i>Caesalpinia</i> spp.	1.05	<i>Casearia battiscombei</i>	0.5
<i>Bombycidendron vidalianum</i>	0.53	<i>Calophyllum</i> sp.	0.65	<i>Cassipourea curyoides</i>	0.70*
<i>Boswellia serrata</i>	0.5	<i>Campnosperma panamensis</i>	0.33, 0.50+	<i>Cassipourea malosana</i>	0.59*
<i>Bridelia squamosa</i>	0.5	<i>Carapa</i> sp.	0.47	<i>Ceiba pentandra</i>	0.26
<i>Buchanania latifolia</i>	0.45	<i>Caryocar</i> spp.	0.69, 0.72+	<i>Celtis</i> spp.	0.59
<i>Bursera serrata</i>	0.59	<i>Casearia</i> sp.	0.62	<i>Chlorophora excelsa</i>	0.55
<i>Butea monosperma</i>	0.48	<i>Cassia moschata</i>	0.71	<i>Chrysophyllum albidum</i>	0.56*
<i>Calophyllum</i> spp.	0.53	<i>Casuarina equisetifolia</i>	0.81	<i>Cleistanthus mildbraedii</i>	0.87*
<i>Calycarpa arborea</i>	0.53	<i>Catostemma</i> spp.	0.55	<i>Cleistopholis patens</i>	0.36*
<i>Cananga odorata</i>	0.29	<i>Cecropia</i> spp.	0.36	<i>Coelocaryon preussii</i>	0.56''
<i>Canarium</i> spp.	0.44	<i>Cedrela</i> spp.	0.40, 0.46+	<i>Cola</i> sp.	0.70''
<i>Canthium monstrosum</i>	0.42	<i>Cedrelinga catenaeformis</i>	0.41, 0.53+	<i>Combretodendron macrocarpum</i>	0.7
<i>Carallia calycina</i>	0.66*	<i>Ceiba pentandra</i>	0.23, 0.24, 0.25, 0.29†	<i>Conopharyngia holstii</i>	0.50*

† The wood densities specified pertain to more than one bibliographic source.

* Wood density value is derived from the regression equation in Reyes *et al.* (1992).

Source: Reyes, Giscl; Brown, Sandra; Chapman, Jonathan; Lugo, Ariel E. 1992. Wood densities of tropical tree species. Gen. Tech. Rep. SO-88 New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 15pp.

Annex Table A-2 Basic wood densities of stemwood WD (3) (t-dry matter/m³)

TABLE 3A.1.9-2 (CONTINUED) BASIC WOOD DENSITIES (D) OF STEMWOOD (tonnes dry matter/m ³ fresh volume) FOR TROPICAL TREE SPECIES (To be used for D in Equations 3.2.3., 3.2.5, 3.2.7, 3.2.8)					
TROPICAL ASIA	D	TROPICAL AMERICA	D	TROPICAL AFRICA	D
<i>Cassia javanica</i>	0.69	<i>Centrolobium</i> spp.	0.65	<i>Copaifera religiosa</i>	0.50"
<i>Castanopsis philippensis</i>	0.51	<i>Cespedesia macrophylla</i>	0.63	<i>Cordia millenii</i>	0.34
<i>Casuarina equisetifolia</i>	0.83	<i>Chaetocarpus schomburgkianus</i>	0.8	<i>Cordia platythyrsa</i>	0.36"
<i>Casuarina nodiflora</i>	0.85	<i>Chlorophora tinctoria</i>	0.71, 0.75+	<i>Corynanthe pachyceras</i>	0.63"
<i>Cedrela odorata</i>	0.38	<i>Clarisia racemosa</i>	0.53, 0.57+	<i>Coda edulis</i>	0.78*
<i>Cedrela</i> spp.	0.42	<i>Clusia rosea</i>	0.67	<i>Croton megalocarpus</i>	0.57
<i>Cedrela toona</i>	0.43	<i>Cochlospermum orinocensis</i>	0.26	<i>Cryptosepalum staudtii</i>	0.70*
<i>Ceiba pentandra</i>	0.23	<i>Copaifera</i> spp.	0.46, 0.55+	<i>Ctenolophon englerianus</i>	0.78*
<i>Celtis luzonica</i>	0.49	<i>Cordia</i> spp. (<i>gercanthus</i> group)	0.74	<i>Cylicodiscus gabonensis</i>	0.8
<i>Chisocheton pentandrus</i>	0.52	<i>Cordia</i> spp. (<i>alliodora</i> group)	0.48	<i>Cynometra alexandri</i>	0.74
<i>Chloroxylon swietenia</i>	0.76, 0.79, 0.80+	<i>Couepia</i> sp.	0.7	<i>Dacryodes</i> spp.	0.61
<i>Chukrasia tabularis</i>	0.57	<i>Couma macrocarpa</i>	0.50, 0.53+	<i>Daniellia ogea</i>	0.40*
<i>Citrus grandis</i>	0.59	<i>Couratari</i> spp.	0.5	<i>Desbordesia pierreana</i>	0.87"
<i>Cleidion speciflorum</i>	0.5	<i>Croton xanthochloros</i>	0.48	<i>Detarium senegalensis</i>	0.63*
<i>Cleistanthus collinus</i>	0.88	<i>Cupressus lusitanica</i>	0.43, 0.44+	<i>Dialium excelsum</i>	0.78*
<i>Cleistocalyx</i> spp.	0.76	<i>Cyrilla racemiflora</i>	0.53	<i>Didelotia africana</i>	0.78"
<i>Cochlospermum gossypium-religiosum</i>	0.27	<i>Dactyodes colombiana</i>	0.51	<i>Didelotia letouzeyi</i>	0.5
<i>Cocos nucifera</i>	0.5	<i>Dacryodes excelsa</i>	0.52, 0.53+	<i>Diospyros</i> spp.	0.82
<i>Colona serratifolia</i>	0.33	<i>Dalbergia retusa</i>	0.89	<i>Discoglypsemna caloneura</i>	0.32*
<i>Combretodendron quadrialatum</i>	0.57	<i>Dalbergia stevensonii</i>	0.82	<i>Distemonanthus benthamianus</i>	0.58
<i>Cordia</i> spp.	0.53	<i>Declinanona calycina</i>	0.47	<i>Drypetes</i> sp.	0.63*
<i>Cotylelobium</i> spp.	0.69	<i>Dialium guianensis</i>	0.87	<i>Ehretia acuminata</i>	0.51*
<i>Crataeva religiosa</i>	0.53*	<i>Dialyanthera</i> spp.	0.36, 0.48+	<i>Enantia chlorantha</i>	0.42"
<i>Cratogeomys arborecens</i>	0.4	<i>Dicorynia paraensis</i>	0.6	<i>Endodermia calophylloides</i>	0.66"
<i>Cryptocarya</i> spp.	0.59	<i>Didymopanax</i> sp.	0.74	<i>Entandrophragma utile</i>	0.53
<i>Cubilia cubili</i>	0.49	<i>Dimorphandra mora</i>	0.99*	<i>Eriobroma oblongum</i>	0.60*
<i>Cullenia excelsa</i>	0.53	<i>Diploporis purpurea</i>	0.76, 0.77, 0.78+	<i>Eriocaulum microspermum</i>	0.50"
<i>Cynometra</i> spp.	0.8	<i>Dipterix odorata</i>	0.81, 0.86, 0.89+	<i>Erismadelphus ensul</i>	0.56*
<i>Dacrycarpus imbricatus</i>	0.45, 0.47+	<i>Drypetes variabilis</i>	0.69	<i>Erythrina vogelii</i>	0.25"
<i>Dacrydium</i> spp.	0.46	<i>Dussia lehmannii</i>	0.59	<i>Erythrophloeum ivorense</i>	0.72
<i>Dacryodes</i> spp.	0.61	<i>Ecelinusa guianensis</i>	0.63	<i>Erythroxylum manni</i>	0.5
<i>Dalbergia paniculata</i>	0.64	<i>Endlicheria coevirey</i>	0.39	<i>Fagara macrophylla</i>	0.69
<i>Decussocarpus vitensis</i>	0.37	<i>Enterolobium schomburgkii</i>	0.82	<i>Ficus iteophylla</i>	0.40"
<i>Degeneria vitensis</i>	0.35	<i>Eperua</i> spp.	0.78	<i>Funtumia latifolia</i>	0.45*
<i>Dehaasia triandra</i>	0.64	<i>Eriotheca</i> sp.	0.4	<i>Gambeya</i> spp.	0.56*
<i>Dialium</i> spp.	0.8	<i>Erismia uncinatum</i>	0.42, 0.48+	<i>Garcinia punctata</i>	0.78"
<i>Dillenia</i> spp.	0.59	<i>Erythrina</i> sp.	0.23	<i>Gilletiodendron mildbraedii</i>	0.87"
<i>Diospyros</i> spp.	0.7	<i>Eschweilera</i> spp.	0.71, 0.79, 0.95+	<i>Gossweileroendron balsamiferum</i>	0.4
<i>Diplodiscus paniculatus</i>	0.63	<i>Eucalyptus robusta</i>	0.51	<i>Guarea thompsonii</i>	0.55"
<i>Dipterocarpus caudatus</i>	0.61	<i>Eugenia stahlia</i>	0.73	<i>Guibourtia</i> spp.	0.72
<i>Dipterocarpus eurychelus</i>	0.56	<i>Euxylophora paraensis</i>	0.68, 0.70+	<i>Hannoa klaineana</i>	0.28"
<i>Dipterocarpus gracilis</i>	0.61	<i>Fagara</i> spp.	0.69	<i>Harungana madagascariensis</i>	0.45"
<i>Dipterocarpus grandiflorus</i>	0.62	<i>Ficus</i> sp.	0.32	<i>Hexalobus crispiflorus</i>	0.48"
<i>Dipterocarpus kerrii</i>	0.56	<i>Genipa</i> spp.	0.75	<i>Holoptelea grandis</i>	0.59"

+ The wood densities specified pertain to more than one bibliographic source.

* Wood density value is derived from the regression equation in Reyes *et al.* (1992).

Source: Reyes, Gisel; Brown, Sandra; Chapman, Jonathan; Lugo, Ariel E. 1992. Wood densities of tropical tree species. Gen. Tech. Rep. SO-88 New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 15pp.

Annex Table A-2 Basic wood densities of stemwood WD (4) (t-dry matter/m³)

TABLE 3A.1.9-2 (CONTINUED) BASIC WOOD DENSITIES (D) OF STEMWOOD (tonnes dry matter/m ³ fresh volume) FOR TROPICAL TREE SPECIES (To be used for D in Equations 3.2.3., 3.2.5, 3.2.7, 3.2.8)					
TROPICAL ASIA	D	TROPICAL AMERICA	D	TROPICAL AFRICA	D
Dipterocarpus kunstlerii	0.57	Goupia glabra	0.67, 0.72+	Homalium spp.	0.7
Dipterocarpus spp.	0.61	Guarea chalde	0.52	Hyiodendron gabonense.	0.78"
Dipterocarpus warburgii	0.52	Guarea spp.	0.52	Hymenostegia pellegrini	0.78"
Dracontomelon spp.	0.5	Guatteria spp.	0.36	Irvingia grandifolia	0.78"
Dryobalanops spp.	0.61	Guazuma ulmifolia	0.52, 0.50+	Julbernardia globiflora	0.78
Dtyptes bordenii	0.75	Guettarda scabra	0.65	Khaya ivorensis	0.44
Durio spp.	0.53	Guilicima gasipac	0.95, 1.25+	Klainedoxa gabonensis	0.87
Dyera costulata	0.36	Gwtavia sp.	0.56	Lannea welwitschii	0.45"
Dysoxylum quercifolium	0.49	Helicostylis tomentosa	0.68, 0.72+	Lecomtedoxa klainenna	0.78"
Elaeocarpus serratus	0.40*	Hernandia Sonora	0.29	Letestua durissima	0.87"
Emblia officinalis	0.8	Hevea brasiliense	0.49	Lophira alata	0.87"
Endiandra laxiflora	0.54	Himatanthus articulata	0.40, 0.54+	Lovoa trichilioides	0.45"
Endospermum spp.	0.38	Hirtella davisii	0.74	Macaranga kilimandscharica	0.40*
Enterolobium cyclocarpum	0.35	Humiria balsamifera	0.66, 0.67+	Maesopsis eminii	0.41
Epichearis cumingiana	0.73	Humirastrium procera	0.7	Malacantha sp. aff. alnifolia	0.45"
Erythrina subumbrans	0.24	Hura crepitans	0.36, 0.37, 0.38+	Mammea africana	0.62
Erythrophloeum densiflorum	0.65	Hyeronima alchomeoides	0.60, 0.64+	Manilkara lacera	0.78"
Eucalyptus citriodora	0.64	Hyeronima laxiflora	0.59	Markhamia platycalyx	0.45*
Eucalyptus deglupta	0.34	Hymenaea davisii	0.67	Memecylon capitellatum	0.77"
Eugenia spp.	0.65	Hymenolobium sp.	0.64	Microberlinia brazzavillensis	0.7
Fagraea spp.	0.73	Inga sp.	0.49, 0.52, 0.58, 0.64+	Microcos coriaceous	0.42"
Ficus benamina	0.65	Iryanthera spp.	0.46	Milletia spp.	0.72
Ficus spp.	0.39	Jacaranda sp.	0.55	Mitragyna stipulosa	0.47
Ganua obovatifolia	0.59	Joannesia heveoides	0.39	Monopetalanthus pellegrinii	0.47"
Garcinia myrtifolia	0.65	Lachmellea speciosa	0.73	Musanga cecropioides	0.23
Garcinia spp.	0.75	Lactia procera	0.68	Nauclea diderichii	0.63
Gardenia turgida	0.64	Lecythis spp.	0.77	Neopoutonia macrocalyx	0.32"
Garuga pinnata	0.51	Licania spp.	0.78	Nesogordonia papaverifera	0.65
Gluta spp.	0.63	Licaria spp.	0.82	Ochtocosmus africanus	0.78"
Gmelina arborea	0.41, 0.45+	Lindackeria sp.	0.41	Odyndea spp.	0.32
Gmelina vitiensis	0.54	Linociera domingensis	0.81	Oldfieldia africana	0.78*
Gonocaryum calleryanum	0.64	Lonchocarpus spp.	0.69	Ongokea gore	0.72
Gonystylus punctatus	0.57	Loxopterygium sagotii	0.56	Oxystigma oxyphyllum	0.53
Grewia tiliacifolia	0.68	Lucuma spp.	0.79	Pachelasma tessmannii	0.70"
Hardwickia binata	0.73	Luehea spp.	0.5	Pachypodanthium staudtii	0.58"
Harpullia arborea	0.62	Lueheopsis ducleana	0.64	Paraberlinia bifoliolata	0.56"
Heritiera spp.	0.56	Mabea piriri	0.59	Parinari glabra	0.87"
Hevea brasiliensis	0.53	Machaerium spp.	0.7	Parkia bicolor	0.36"
Hibiscus tiliaceus	0.57	Macoubeca guianensis	0.40*	Pausinystalia brachythyrza	0.56"
Homalanthus populneus	0.38	Magnolia spp.	0.52	Pausinystalia cf. talbotii	0.56"
Homalium spp.	0.76	Maguira sclerophylla	0.57	Pentaclethra macrophylla	0.78"
Hopea acuminata	0.62	Mammea americana	0.62	Pentadesma butyracea	0.78"
Hopea spp.	0.64	Mangifera indica	0.55	Phyllanthus discoideus	0.76"
Intsia palembanica	0.68	Manilkara sp.	0.89	Piercedendron africanum	0.70;"
Kayea garciac	0.53	Marila sp.	0.63	Piptadeniastrum africanum	0.56

+ The wood densities specified pertain to more than one bibliographic source.

* Wood density value is derived from the regression equation in Reyes *et al.* (1992).

Source: Reyes, Gisel; Brown, Sandra; Chapman, Jonathan; Lugo, Ariel E. 1992. Wood densities of tropical tree species. Gen. Tech. Rep. SO-88 New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 15pp.

Annex Table A-2 Basic wood densities of stemwood WD (5) (t-dry matter/m³)

TABLE 3A.1.9-2 (CONTINUED) BASIC WOOD DENSITIES (D) OF STEMWOOD (tonnes dry matter/m ³ fresh volume) FOR TROPICAL TREE SPECIES (To be used for D in Equations 3.2.3., 3.2.5, 3.2.7, 3.2.8)					
TROPICAL ASIA	D	TROPICAL AMERICA	D	TROPICAL AFRICA	D
<i>Kingiodendron alternifolium</i>	0.48	<i>Mannaroxylon racemosum</i>	0.78*	<i>Plagiostyles africana</i>	0.70''
<i>Klinciovicia hospita</i>	0.36	<i>Matayba domingensis</i>	0.7	<i>Poga oleosa</i>	0.36
<i>Knema</i> spp.	0.53	<i>Matisia hirta</i>	0.61	<i>Polyalthia suaveolens</i>	0.66''
<i>Koompassia excelsa</i>	0.63	<i>Maytenus</i> spp.	0.71	<i>Pretina angolensis</i>	0.63''
<i>Koordersiodendron pinnatum</i>	0.65, 0.69+	<i>Mezilaurus lindaviana</i>	0.68	<i>Pteleopsis hyloendron</i>	0.63*
<i>Kydia calycina</i>	0.72	<i>Michropholis</i> spp.	0.61	<i>Pterocarpus soyauxii</i>	0.61
<i>Lagerstroemia</i> spp.	0.55	<i>Minquartia guianensis</i>	0.76, 0.79+	<i>Pterygota</i> spp.	0.52
<i>Lanea grandis</i>	0.5	<i>Mora</i> sp.	0.71	<i>Pycnanthus angolensis</i>	0.4
<i>Leucaena leucocephala</i>	0.64	<i>Mouriria sideroxylon</i>	0.88	<i>Randia cladantha</i>	0.78*
<i>Litchi chinensis</i> ssp. <i>philippinensis</i>	0.88	<i>Myrciaria floribunda</i>	0.73	<i>Rauwolfia macrophylla</i>	0.47*
<i>Lithocarpus soleriana</i>	0.63	<i>Myristica</i> spp.	0.46	<i>Ricinodendron heudelotii</i>	0.2
<i>Litsea</i> spp.	0.4	<i>Myroxylon balsamum</i>	0.74, 0.76, 0.78+	<i>Saccoglottis gabonensis</i>	0.74''
<i>Lophopetalum</i> spp.	0.46	<i>Nectandra</i> spp.	0.52	<i>Santiria trimera</i>	0.53*
<i>Macaranga denticulata</i>	0.53	<i>Ocotea</i> spp.	0.51	<i>Sapium ellipticum</i>	0.50*
<i>Madhuca oblongifolia</i>	0.53	<i>Onychopetalum amazonicum</i>	0.64	<i>Schrebera arborea</i>	0.63*
<i>Mallotus philippensis</i>	0.64	<i>Ormosia</i> spp.	0.59	<i>Sclerodaphne zenkeri</i>	0.68*
<i>Mangifera</i> spp.	0.52	<i>Ouratea</i> sp.	0.66	<i>Scottellia coriacea</i>	0.56
<i>Maniltoa minor</i>	0.76	<i>Pachira acutata</i>	0.43	<i>Scyphocephalum ochocoo</i>	0.48
<i>Mastixia philippinensis</i>	0.47	<i>Paratecoma peroba</i>	0.6	<i>Scyttopetalum tieghemii</i>	0.56''
<i>Melanorrhoea</i> spp.	0.63	<i>Parinari</i> spp.	0.68	<i>Sindoropsis lesteui</i>	0.56*
<i>Melia dubia</i>	0.4	<i>Parkia</i> spp.	0.39	<i>Staudtia stipitata</i>	0.75
<i>Melicope triphylla</i>	0.37	<i>Peltogyne</i> spp.	0.79	<i>Stemonocoleus micranthus</i>	0.56''
<i>Meliosma macrophylla</i>	0.27	<i>Pentaclethra macroloba</i>	0.65, 0.68+	<i>Sterculia rhinopetala</i>	0.64
<i>Melochia umbellata</i>	0.25	<i>Peru glabrata</i>	0.65	<i>Strephonema pseudocola</i>	0.56*
<i>Meia ferrea</i>	0.83, 0.85+	<i>Peru schomburgkiana</i>	0.59	<i>Strombosiaopsis tetrandra</i>	0.63''
<i>Metrosideros collina</i>	0.70, 0.76+	<i>Persea</i> spp.	0.40, 0.47, 0.52+	<i>Swartzia fistuloides</i>	0.82
<i>Michelia</i> spp.	0.43	<i>Petitita domingensis</i>	0.66	<i>Symphonia globulifera</i>	0.58''
<i>Microcos styloarpa</i>	0.4	<i>Pinus caribaea</i>	0.51	<i>Syzygium cordatum</i>	0.59*
<i>Micromelum compressum</i>	0.64	<i>Pinus oocarpa</i>	0.55	<i>Terminalia superba</i>	0.45
<i>Milhusa velutina</i>	0.63	<i>Pinus patula</i>	0.45	<i>Tessmania africana</i>	0.85''
<i>Mimusops elengi</i>	0.72*	<i>Piptadenia</i> sp.	0.58	<i>Testulea gabonensis</i>	0.6
<i>Mitragyna parviflora</i>	0.56	<i>Piranhea longepedunculata</i>	0.9	<i>Tetraberlinia tubmaniana</i>	0.60''
<i>Myristica</i> spp.	0.53	<i>Piratinera guianensis</i>	0.96	<i>Tetrapleura tetraptera</i>	0.50''
<i>Neesia</i> spp.	0.53	<i>Pithecellobium guachapele</i> (syn. <i>Pseudosamea</i>)	0.56	<i>Tieghemella heckelii</i>	0.55''
<i>Neonauclea bernardoi</i>	0.62	<i>Platonia insignis</i>	0.70'	<i>Trema</i> sp.	0.40*
<i>Neotrewia cumingii</i>	0.55	<i>Platymiscium</i> spp.	0.71, 0.84+	<i>Trichilia prieureana</i>	0.63''
<i>Oelma foxworthyi</i>	0.86	<i>Podocarpus</i> spp.	0.46	<i>Trichoseyphia arborea</i>	0.59''
<i>Ochroma pyramidale</i>	0.3	<i>Pourouma aff. melinonii</i>	0.32	<i>Triplochiton scleroxylon</i>	0.32
<i>Octomeles sumatrana</i>	0.27, 0.32+	<i>Pouteria</i> spp.	0.64, 0.67+	<i>Uapaca</i> spp.	0.6
<i>Oroxylon indicum</i>	0.32	<i>Prioria copaifera</i>	0.40, 0.41+	<i>Vepris undulata</i>	0.70''
<i>Ougenia dalbergioides</i>	0.7	<i>Protium</i> spp.	0.53, 0.64+	<i>Vitex doniana</i>	0.4
<i>Palaquium</i> spp.	0.55	<i>Pseudolmedia laevigata</i>	0.64	<i>Xylopia staudtii</i>	0.36*
<i>Pangium edule</i>	0.5	<i>Pterocarpus</i> spp.	0.44		
<i>Parashorea malaanonan</i>	0.51	<i>Pterogyne nitens</i>	0.66		
<i>Parashorea stellata</i>	0.59	<i>Qualca albiflora</i>	0.5		
<i>Paratrophis glabra</i>	0.77	<i>Qualea cf. lancifolia</i>	0.58		
<i>Parinari</i> spp.	0.68	<i>Qualea dimizii</i>	0.58		

+ The wood densities specified pertain to more than one bibliographic source.

* Wood density value is derived from the regression equation in Reyes *et al.* (1992).

Source: Reyes, Gisela; Brown, Sandra; Chapman, Jonathan; Lugo, Ariel E. 1992. Wood densities of tropical tree species. Gen. Tech. Rep.

SO-88 New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 15pp.

Annex Table A-2 Basic wood densities of stemwood WD (6) (t-dry matter/m³)

TABLE 3A.1.9-2 (CONTINUED)					
BASIC WOOD DENSITIES (D) OF STEMWOOD (tonnes dry matter/m ³ fresh volume) FOR TROPICAL TREE SPECIES (To be used for D in Equations 3.2.3., 3.2.5, 3.2.7, 3.2.8)					
TROPICAL ASIA	D	TROPICAL AMERICA	D	TROPICAL AFRICA	D
<i>Parkia roxburghii</i>	0.34	<i>Qualea</i> spp.	0.55		
<i>Payena</i> spp.	0.55	<i>Quararibaca guianensis</i>	0.54		
<i>Peltophorum pterocarpum</i>	0.62	<i>Quercus alata</i>	0.71		
<i>Pentace</i> spp.	0.56	<i>Quercus costaricensis</i>	0.61		
<i>Phaeanthus ebracteolatus</i>	0.56	<i>Quercus eugeniaefolia</i>	0.67		
<i>Phyllocladus hypophyllus</i>	0.53	<i>Quercus</i> spp.	0.7		
<i>Pinus caribaea</i>	0.48	<i>Raputia</i> sp.	0.55		
<i>Pinus insularis</i>	0.47, 0.48+	<i>Rheedia</i> spp.	0.72		
<i>Pinus merkusii</i>	0.54	<i>Rollinia</i> spp.	0.36		
<i>Pisonia umbellifera</i>	0.21	<i>Saccoglottis cydonioides</i>	0.72		
<i>Pittosporum pentandrum</i>	0.51	<i>Sapium</i> ssp.	0.47, 0.72+		
<i>Planchonia</i> spp.	0.59	<i>Schinopsis</i> spp.	1		
<i>Podocarpus</i> spp.	0.43	<i>Sclerobium</i> spp.	0.47		
<i>Polyalthia flava</i>	0.51	<i>Sickingia</i> spp.	0.52		
<i>Polyscias nodosa</i>	0.38	<i>Simaba multiflora</i>	0.51		
<i>Pometia</i> spp.	0.54	<i>Simarouba amara</i>	0.32, 0.34, 0.38+		
<i>Pouteria villamilii</i>	0.47	<i>Sloanea guianensis</i>	0.79		
<i>Premna tomentosa</i>	0.96	<i>Spondias mombin</i>	0.30, 0.40, 0.41+		
<i>Pterocarpus marsipium</i>	0.67	<i>Sterculia</i> spp.	0.55		
<i>Pterocymbium tinctorium</i>	0.28	<i>Stylogyne</i> spp.	0.69		
<i>Pygeum vulgare</i>	0.57	<i>Swartzia</i> spp.	0.95		
<i>Quercus</i> spp.	0.7	<i>Swietenia macrophylla</i>	0.42, 0.45, 0.46, 0.54+		
<i>Radermachera pinnata</i>	0.51	<i>Symphonia globulifera</i>	0.68		
<i>Salmaia malabarica</i>	0.32, 0.33+	<i>Tabebuia</i> spp. (lapacho group)	0.91		
<i>Samanea saman</i>	0.45, 0.46+	<i>Tabebuia</i> spp. (roble)	0.52		
<i>Sandoricum vidalii</i>	0.43	<i>Tabebuia</i> spp. (white cedar)	0.57		
<i>Sapindus saponaria</i>	0.58	<i>Tabebuia stenocalyx</i>	0.55, 0.57+		
<i>Sapium luzontum</i>	0.4	<i>Tachigalia myrmecophylla</i>	0.56		
<i>Schleichera oleosa</i>	0.96	<i>Talisia</i> sp.	0.84		
<i>Schrebera swietenoides</i>	0.82	<i>Tapirira guianensis</i>	0.47*		
<i>Semicarpus anacardium</i>	0.64	<i>Terminalia</i> sp.	0.50, 0.51, 0.58+		
<i>Serianthes acle</i>	0.57	<i>Tetragastris altissima</i>	0.61		
<i>Serianthes melanescica</i>	0.48	<i>Toluifera balsamum</i>	0.74		
<i>Sesbania grandiflora</i>	0.4	<i>Tourubia</i> sp.	0.52		
<i>Shorea assamica forma philippinensis</i>	0.41	<i>Touficia pulvinata</i>	0.63		
<i>Shorea astylosa</i>	0.73	<i>Tovomita guianensis</i>	0.6		
<i>Shorea ciliata</i>	0.75	<i>Tratinickia</i> sp.	0.38		
<i>Shorea contorta</i>	0.44	<i>Trichilia propingua</i>	0.58		
<i>Shorea gisok</i>	0.76	<i>Trichosperma mexicanum</i>	0.41		
<i>Shorea guiso</i>	0.68	<i>Triplaris</i> spp.	0.56		
<i>Shorea hopeifolia</i>	0.44	<i>Trophis</i> sp.	0.54		
<i>Shorea malibato</i>	0.78	<i>Vatairea</i> spp.	0.6		
<i>Shorea negrosensis</i>	0.44	<i>Virola</i> spp.	0.40, 0.44, 0.48+		
<i>Shorea palosapis</i>	0.39	<i>Vismia</i> spp.	0.41		
<i>Shorea plagata</i>	0.7	<i>Vitex</i> spp.	0.52, 0.56, 0.57+		

+ The wood densities specified pertain to more than one bibliographic source.
 * Wood density value is derived from the regression equation in Reyes *et al.* (1992).
 Source: Reyes, Gisel; Brown, Sandra; Chapman, Jonathan; Lugo, Ariel E. 1992. Wood densities of tropical tree species. Gen. Tech. Rep. SO-88 New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 15pp.

Annex Table A-2 Basic wood densities of stemwood WD (7) (t-dry matter/m³)

TABLE 3A.1.9-2 (CONTINUED) BASIC WOOD DENSITIES (D) OF STEMWOOD (tonnes dry matter/m ³ fresh volume) FOR TROPICAL TREE SPECIES (To be used for D in Equations 3.2.3., 3.2.5, 3.2.7, 3.2.8)					
TROPICAL ASIA	D	TROPICAL AMERICA	D	TROPICAL AFRICA	D
<i>Shorea polita</i>	0.47	<i>Vitex stahelii</i>	0.6		
<i>Shorea polysperma</i>	0.47	<i>Vochysia</i> spp.	0.40, 0.47, 0.79+		
<i>Shorea robusta</i>	0.72	<i>Vouacapoua americana</i>	0.79		
<i>Shorea</i> spp. balau group	0.7	<i>Warszewicia coccinea</i>	0.56		
<i>Shorea</i> spp. dark red meranti	0.55	<i>Xanthoxylum martinicensis</i>	0.46		
<i>Shorea</i> spp. light red meranti	0.4	<i>Xanthoxylum</i> spp.	0.44		
<i>Shorea</i> spp. white meranti	0.48	<i>Xylopia frutescens</i>	0.64"		
<i>Shorea</i> spp. yellow meranti	0.46				
<i>Shorea virescens</i>	0.42				
<i>Sloanea javanica</i>	0.53				
<i>Soyimida febrifuga</i>	0.97				
<i>Spathodea campanulata</i>	0.25				
<i>Stemonurus luzoniensis</i>	0.37				
<i>Sterculia vitiensis</i>	0.31				
<i>Stereospermum suaveolens</i>	0.62				
<i>Strombosia philippinensis</i>	0.71				
<i>Strychnos potatorum</i>	0.88				
<i>Swietenia macrophylla</i>	0.49, 0.53+				
<i>Swintonia foxworthyi</i>	0.62				
<i>Swintonia</i> spp.	0.61				
<i>Sycopsis dunni</i>	0.63				
<i>Syzygium</i> spp.	0.69, 0.76+				
<i>Tamarindus indica</i>	0.75				
<i>Tectona grandis</i>	0.50, 0.55+				
<i>Teijsmanniodendron ahernianum</i>	0.9				
<i>Terminalia citrina</i>	0.71				
<i>Terminalia copelandii</i>	0.46				
<i>Terminalia foetidissima</i>	0.55				
<i>Terminalia microcarpa</i>	0.53				
<i>Terminalia nitens</i>	0.58				
<i>Terminalia pterocarpa</i>	0.48				
<i>Terminalia tomentosa</i>	0.73, 0.76, 0.77+				
<i>Temstroemia megacarpa</i>	0.53				
<i>Tetrameles nudiflora</i>	0.3				
<i>Tetramerista glabra</i>	0.61				
<i>Thespesia populnea</i>	0.52				
<i>Toona calantas</i>	0.29				
<i>Trema orientalis</i>	0.31				

+ The wood densities specified pertain to more than one bibliographic source.
 * Wood density value is derived from the regression equation in Reyes *et al.* (1992).
 Source: Reyes, Giscl; Brown, Sandra; Chapman, Jonathan; Lugo, Ariel E. 1992. Wood densities of tropical tree species. Gen. Tech. Rep. SO-88 New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 15pp.

Annex Table A-3 Carbon fraction of aboveground forest biomass (CF)

TABLE 4.3 CARBON FRACTION OF ABOVEGROUND FOREST BIOMASS			
Domain	Part of tree	Carbon fraction, (CF) [tonne C (tonne d.m.) ⁻¹]	References
Default value	All	0.47	McGroddy <i>et al.</i> , 2004
Tropical and Subtropical	All	0.47 (0.44 - 0.49)	Andreae and Merlet, 2001; Chambers <i>et al.</i> , 2001; McGroddy <i>et al.</i> , 2004; Lasco and Pulhin, 2003
	wood	0.49	Feldpausch <i>et al.</i> , 2004
	wood, tree d < 10 cm	0.46	Hughes <i>et al.</i> , 2000
	wood, tree d ≥ 10 cm	0.49	Hughes <i>et al.</i> , 2000
	foliage	0.47	Feldpausch <i>et al.</i> , 2004
	foliage, tree d < 10 cm	0.43	Hughes <i>et al.</i> , 2000
	foliage, tree d ≥ 10 cm	0.46	Hughes <i>et al.</i> , 2000
Temperate and Boreal	All	0.47 (0.47 - 0.49)	Andreae and Merlet, 2001; Gayoso <i>et al.</i> , 2002; Matthews, 1993; McGroddy <i>et al.</i> , 2004
	broad-leaved	0.48 (0.46 - 0.50)	Lamlom and Savidge, 2003
	conifers	0.51 (0.47 - 0.55)	Lamlom and Savidge, 2003

Source : IPCC Guidelines for National Greenhouse Gas Inventories (GNGGI), Volume4. Agriculture, Forestry, and Other Land Use, Table 4.3, 2006³

³ IPCC: http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_04_Ch4_Forest_Land.pdf

Annex Table A-4 Annual average aboveground biomass increment in plantations by broad category

(t/ha)

	Age Class	Wet	Moist with Short Dry Season	Moist with Long Dry Season	Dry	Montane Moist	Montane Dry
		R >2000	2000>R>1000		R<1000	R>1000	R<1000
Africa							
Eucalyptus spp	≤20 years	-	20.0	12.6	5.1 (3.0-7.0)	-	-
	>20 years	-	25.0	-	8.0 (4.9-13.6)	-	-
Pinus sp	≤20 years	18.0	12.0	8.0	3.3 (0.5-6.0)	-	-
	>20 years		15.0	11.0	2.5	-	-
others	≤20 years	6.5 (5.0-8.0)	9.0 (3.0-15.0)	10.0 (4.0-16.0)	15.0	11.0	-
	>20 years	-	-	-	11.0	-	-
Asia							
Eucalyptus spp	All	5.0 (3.6-8.0)	8.0	15.0 (5.0-25.0)	-	3.1	-
other species	-	5.2 (2.4-8.0)	7.8 (2.0-13.5)	7.1 (1.6-12.6)	6.45 (1.2-11.7)	5.0 (1.3-10.0)	-
America							
Pinus	-	18.0	14.5 (5.0 – 19.0)	7.0 (4.0 - 10.3)	5.0	14.0	-
Eucalyptus	-	21.0 (6.4 - 38.4)	16.0 (6.4 - 32.0)	16.0 (6.4 - 32.0)	16.0	13.0 (8.5 - 17.5)	-
Tectona	-	15.0	8.0 (3.8 - 11.5)	8.0 (3.8 - 11.5)	-	2.2	-
other broadleaved	-	17.0 (5.0 - 35.0)	18.0 (8.0 – 40.0)	10.5 (3.2 - 11.8)	-	4.0	-
Note 1 : R= annual rainfall in mm/yr							
Note 2 : Data are given as mean value and as the range of possible values.							
Note 3 : Some Boreal data were calculated from original values in Zakharov <i>et al.</i> (1962), Zagreev <i>et al.</i> (1993), Isaev <i>et al.</i> (1993) using 0.23 as belowground/aboveground biomass ratio and assuming a linear increase in annual increment from 0 to 20 years.							
Note 4 : For plantations in temperate and boreal zones, it is good practice to use stemwood volume increment data (I_v in Equation 3.2.5) instead of above ground biomass increment as given in above table.							

Source : IPCC Good Practice Guidance for LULUCF Annex 3A.1, Table 3A.1.6⁴⁴ IPCC: http://www.ipcc-nggip.iges.or.jp/public/gpplulucf/gpplulucf_files/Chp3/Anx_3A_1_Data_Tables.pdf

Annex Table A-5 Average belowground to aboveground biomass ratio (Root-Shoot ratio, R) in natural regeneration by broad category (R)

	Vegetation type	Aboveground biomass (t/ha)	Mean	SD	lower range	upper range	References
Tropical/sub-tropical forest	Secondary tropical/sub-tropical forest	<125	0.42	0.22	0.14	0.83	5, 7, 13, 25, 28, 31, 48, 71
	Primary tropical/sub-tropical moist forest	NS	0.24	0.03	0.22	0.33	33, 57, 63, 67, 69
	Tropical/sub-tropical dry forest	NS	0.27	0.01	0.27	0.28	65
Conifer forest/plantation	Conifer forest/plantation	<50	0.46	0.21	0.21	1.06	2, 8, 43, 44, 54, 61, 75
	Conifer forest/plantation	50-150	0.32	0.08	0.24	0.50	6, 36, 54, 55, 58, 61
	Conifer forest/plantation	>150	0.23	0.09	0.12	0.49	1, 6, 20, 40, 53, 61, 67, 77, 79
Temperate broadleaf forest/plantation	Oak forest	>70	0.35	0.25	0.20	1.16	15, 60, 64, 67
	Eucalypt plantation	<50	0.45	0.15	0.29	0.81	9, 51, 59
	Eucalypt plantation	50-150	0.35	0.23	0.15	0.81	4, 9, 59, 66, 76
	Eucalypt forest/plantation	>150	0.20	0.08	0.10	0.33	4, 9, 16, 66
	Other broadleaf forest	<75	0.43	0.24	0.12	0.93	30, 45, 46, 62
	Other broadleaf forest	75-150	0.26	0.10	0.13	0.52	30, 36, 45, 46, 62, 77, 78, 81
	Other broadleaf forest	>150	0.24	0.05	0.17	0.30	3, 26, 30, 37, 67, 78, 81
Grassland	Steppe/tundra/prairie grassland	NS	3.95	2.97	1.92	10.51	50, 56, 70, 72
	Temperate/sub-tropical/ tropical grassland	NS	1.58	1.02	0.59	3.11	22, 23, 32, 52
	Semi-arid grassland	NS	2.80	1.33	1.43	4.92	17-19, 34
Other	Woodland/savanna	NS	0.48	0.19	0.26	1.01	10-12, 21, 27, 49, 65, 73, 74
	Shrubland	NS	2.83	2.04	0.34	6.49	14, 29, 35, 38, 41, 42, 47, 67
	Tidal marsh	NS	1.04	0.21	0.74	1.23	24, 39, 68, 80
NS = Not specified							

Source : IPCC Good Practice Guidance for LULUCF Annex 3A.1, Table 3A.1.8⁵⁵ IPCC: http://www.ipcc-nggip.iges.or.jp/public/gpگلulucf/gpگلulucf_files/Chp3/Anx_3A_1_Data_Tables.pdf

Annex Table A-6 CO₂ emissions from fertilizer, leakages and effects of GHG emissions reduction⁶

Project	Host Parties	fertilizer (tonnes of CO ₂ e)	Estimation of baseline net GHG removals by sinks (tonnes of CO ₂ e)	Estimation of actual net GHG removals by sinks (tonnes of CO ₂ e)	Estimation of leakage (tonnes of CO ₂ e) [A]	Estimation of net anthropogenic GHG removals by sinks (tonnes of CO ₂ e) [B]	Ratio of leakage [A]/[B]
CARBON SEQUESTRATION THROUGH REFORESTATION IN THE BOLIVIAN TROPICS BY SMALLHOLDERS OF "The Federación de Comunidades Agropecuarias de Rurrenabaque (FECAR)"	Bolivia	zero	0	11,529	24,124	91,165	26%
Reforestation of croplands and grasslands in low income communities of Paraguari Department, Paraguay	Paraguay	3	8,737	58,188	18,983	30,468	62%
Facilitating Reforestation for Guangxi Watershed Management in Pearl River Basin	China	zero	531	794,225	19,852	773,842	3%
The International Small Group and Tree Planting Program (TIST), Tamil Nadu, India	India	zero	0	107,810	0	107,810	0%
Moldova Soil Conservation Project	Moldova	zero	109,962	3,702,513	7,705	3,584,846	0%
Southern Nicaragua CDM Reforestation Project	Nicaragua	zero	0	237,448	0	237,448	0%
Uganda Nile Basin Reforestation Project No 3	Uganda	zero	0	111,798	0	111,798	0%
Reforestation, sustainable production and carbon sequestration project in José Ignacio Távara's dry forest, Piura, Peru	Peru	zero	171,545	1,145,332	0	973,788	0%
Reforestation on Degraded Lands in Northwest Guangxi	China	zero	15,394	1,761,552	0	1,746,158	0%
Reforestation of grazing Lands in Santo Domingo, Argentina	Argentina	zero	21,366	1,342,140	0	1,320,775	0%
Assisted Natural Regeneration of Degraded Lands in Albania	Albania	zero	6,250	465,537	0	459,287	0%
„Posco Uruguay" afforestation on degraded extensive grazing land	Uruguay	zero	0	659	0	659	0%
Forestry Project for the Basin of the Chinchiná River, an Environmental and Productive Alternative for the City and the Region	Columbia	zero	0	755,678	0	755,678	0%
Ibi Batéké degraded savannah afforestation project for fuelwood production (Democratic Republic of Congo)	Congo	zero	0	1,635,338	0	1,635,338	0%
AES Tietê Afforestation/Reforestation Project in the State of São Paulo, Brazil	Brasil	—	59,257	4,788,332	0	4,729,074	0%
Humbo Ethiopia Assisted Natural Regeneration Project	Ethiopia	zero	0	880,296	0	880,296	0%
Gao Phong Reforestation Project	Vietnam	22	0	53,735	11,090	42,645	26%
India: Himachal Pradesh Reforestation Project – Improving Livelihoods and Watersheds	India	zero	0	828,016	0	828,016	0%
Improving Rural Livelihoods Through Carbon Sequestration By Adopting Environment Friendly Technology based Agroforestry Practices	India	—	0	146,888	0	146,888	0%
Reforestation as Renewable Source of Wood Supplies for Industrial Use in Brazil	Brasil	—	751,894	30,409,091	15,522	2,273,493	1%
Argos CO ₂ Offset Project, through reforestation activities for commercial use.	Columbia	—	133,021	1,079,384	23,100	923,263	3%
Small Scale Cooperative Afforestation CDM Pilot Project Activity on Private Lands Affected by Shifting Sand Dunes in Sirsa, Haryana.	India	zero	43	29,785	0	231,920	0%
Nerquihue Small-Scale CDM Afforestation Project using Mycorrhizal Inoculation in Chile	Chile	zero	0	185,836	0	185,836	0%
Forestry Project in Strategic Ecological Areas of the Colombian Caribbean Savannas	Columbia	zero	279	1,999,849	0	1,999,571	0%

⁶ UNFCCC CDM <http://cdm.unfccc.int/Projects/projsearch.html>

Annex Table A-7 Examples of stratum (CDM Project) ⁷

Country : Paraguay
 Project participants : Japan International Research Center for Agricultural Sciences
 Instituto Forestal Nacional (Public entity)
 Title : Reforestation of croplands and grasslands in low income communities of Paraguari
 Department, Paraguay
 CDM registered 2009

Stratum	Tree species	Tree spacing(m)	Plant age	Forested area (ha)
S1	Eucalyptus grandis	3.0×2.5	2007	30.05
S2	Eucalyptus grandis	3.0×2.5	2008	31.17
S3	Eucalyptus camaldulensis	3.0×2.5	2007	16.36
S4	Eucalyptus camaldulensis	3.0×2.5	2008	64.48
S5	Grevillea robusta	3.0×2.5	2007	5.59
S6	Grevillea robusta	3.0×2.5	2008	15.16
S7	Grevillea robusta	5.0×4.0	2007	14.05
S8	Grevillea robusta	5.0×4.0	2008	38.30
Total				215.16

Country : Chile
 Project participants : Mikro-Tek Inc. , Natsource Europe Limited
 Title : Nerquihue Small-Scale CDM Afforestation Project using Mycorrhizal Inoculation in
 Chile
 CDM registered 2009

Stratum	Tree species	Tree spacing(m)	Plant age	Forested area (ha)
S1	Eucalyptus grandis	3.0×2.5	2007	30.05
S2	Eucalyptus grandis	3.0×2.5	2008	31.17
Total				215.16

Country : India
 Project participants : Haryana CDM Variksh Kisan Samiti, Ellenabad, Sirsa
 Title : Small Scale Cooperative Afforestation CDM Pilot Project Activity on Private Lands
 Affected by Shifting Sand Dunes in Sirsa, Haryana.
 CDM registered 2008

Stratum	Tree species	Tree spacing(m)	Plant age	Forested area (ha)
S1	<i>Eucalyptus hybrid</i>		2007	26.30
S2	<i>Ailanthus excelsa</i>		2007	57.86
S3	<i>Acacia tortilis</i>		2007	61.65
S4	<i>Dalbergia sissoo</i>		2007	53.65
S5	<i>Acacia nilotica</i>		2007	60.75
S6	<i>Prosopis cineraria</i>		2007	74.20
S7	<i>Zizyphus mauritiana</i>		2007	35.46
Total				369.87

⁷ UNFCCC: <http://cdm.unfccc.int/Projects/projsearch.html>

Forest and Natural Resources Conservation/ Annex Table

Country : Vietnam
 Project participants : Forest Development Fund
 Title : Cao Phong Reforestation Project
 CDM registered 2009

Stratum	Tree species	Tree spacing(m)	Plant age	Forested area (ha)
S1	<i>A.mangium</i>	2.5×2.5	2008	166.65
S2	<i>A.mangium</i>	2.5×2.5	2009	166.65
S3	<i>A.auriculiformis</i>	2.0×2.0	2009	31.96
Total				365.26

Country : India
 Project participants : ITC Limited, Paperboards and Specialty Papers Division (PSPD), Unit: Bhadrachalam
 Title : Reforestation of severely degraded landmass in Khammam District of Andhra Pradesh,
 India under ITC Social Forestry Project
 CDM registered 2007

Stratum	Tree species	Tree spacing(m)	Plant age	Forested area (ha)
S1	<i>Eucalyptus tereticornis</i> <i>Smith and Eucalyptus</i> <i>camaldulensis Dhen</i> <i>1 year old tree</i>	—	2001	979.79
S2	<i>Eucalyptus tereticornis</i> <i>Smith and Eucalyptus</i> <i>camaldulensis Dhen</i> <i>2 yearsr old tree</i>	—	2002	556.65
S3	<i>Eucalyptus tereticornis</i> <i>Smith and Eucalyptus</i> <i>camaldulensis Dhen</i> <i>3 yearsr old tree</i>	—	2003	971.33
S4	<i>Eucalyptus tereticornis</i> <i>Smith and Eucalyptus</i> <i>camaldulensis Dhen</i> <i>4 yearsr old tree</i>	—	2004	562.42
Total				3070.19

Forest and Natural Resources Conservation/ Annex Table

Country : Bolivia

Project participants : FECAR (community organization), (Private entity)
 Foundation Centro Tecnico Forestal (CETEFOR) (Private entity)
 Asociación Accidental Cetefor-Sicirec (Private entity)
 Vlaams Gewest (Public entry)

Title : CARBON SEQUESTRATION THROUGH REFORESTATION IN THE BOLIVIAN TROPICS BY SMALLHOLDERS OF “The Federación de Comunidades Agropecuarias de Rurrenabaque (FECAR)” Version 2.03

CDM registered 2009

Stratum	Tree species	Tree spacing(m)	Plant age	Forested area (ha)
S1	<i>Fast growing/ plantation</i>	—	—	—
S2	<i>Fast growing/Agroforestry System</i>	—	—	—
S3	<i>Fast growing/ Silvipastoral System</i>	—	—	—
S4	<i>Midium growing/ plantation</i>	—	—	—
S5	<i>Midiumgrowing/AgroforestrySystem</i>	—	—	—
S6	<i>Midium growing/ Silvipastoral System</i>	—	—	—
S7	<i>Slow growing/ plantation</i>	—	—	—
S8	<i>Slow growing/Agroforestry System</i>	—	—	—
S9	<i>Slow growing/ Silvipastoral System</i>	—	—	—
Total				317ha

Country : Uganda

Project participants : National Forest Authority (NFA)
 International Bank for Reconstruction and Development as trustee of the BioCarbon Fund

Title : Uganda Nile Basin Reforestation Project No 3

CDM registered 2009

Stratum	Tree species	Tree spacing(m)	Plant age	Forested area (ha)
S1	<i>Pine /Maesopsis (&Prunus)</i>	—	—	—
S2	<i>Pine /Maesopsis (&Prunus)</i>	—	—	—
S3	<i>Pine /Maesopsis (&Prunus)</i>	—	—	—
S4	<i>Pine /Maesopsis (&Prunus)</i>	—	—	—
S5	<i>Pine /Maesopsis (&Prunus)</i>	—	—	—
Total				2014ha