

GLOBAL FOREST RESOURCES ASSESSMENT 2015

COUNTRY REPORT

Ghana

Rome, 2014

FAO, at the request of its member countries, regularly monitors the world's forests and their management and uses through the Global Forest Resources Assessment (FRA). This country report is prepared as a contribution to the FAO publication, the Global Forest Resources Assessment 2015 (FRA 2015).

The content and the structure are in accordance with the recommendations and guidelines given by FAO in the document Guide for country reporting for FRA 2015 (<http://www.fao.org/3/a-au190e.pdf>). These reports were submitted to FAO as official government documents.

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N/A	N/A	N/A	N/A

Introductory Text

Place an introductory text on the content of this report

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Desk Study?

Check "yes" if this survey is a Desk Study, "no" otherwise	
Desk Study?	no

1. What is the area of forest and other wooded land and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

1.1 Categories and definitions

Category	Definition
Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.
Other wooded land	Land not classified as "Forest" spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of 5-10 percent or trees able to reach these thresholds ; or with a combined cover of shrubs bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.
Other land	All land that is not classified as "Forest" or "Other wooded land".
...of which with tree cover (<i>sub-category</i>)	Land considered as "Other land", that is predominantly agricultural or urban lands use and has patches of tree cover that span more than 0.5 hectares with a canopy cover of more than 10 percent of trees able to reach a height of 5 meters at maturity. It includes bothe forest and non-forest tree species.
Inland water bodies	Inland water bodies generally include major rivers, lakes and water reservoirs.
Forest expansion	Expansion of forest on land that, until then, was not defined as forest.
...of which afforestation (<i>sub-category</i>)	Establishment of forest through planting and/or deliberate seeding on land that, until then, was not defined as forest.
...of which natural expansion of forest (<i>sub-category</i>)	Expansion of forests through natural succession on land that, until then, was under another land use (e.g. forest succession on land previously used for agriculture).
Deforestation	The conversion of forest to other land use or the longterm reduction of the tree canopy cover below the minimum 10 percent threshold.
...of which human induced (<i>sub-category</i>)	Human induced conversion of forest to other land use or the permanent reduction of the tree canopy cover below the minimum 10 percent threshold.
Reforestation	Natural regeneration or re-establishment of forest through planting and/or deliberate seeding on land already in forest land use.
...of which artificial reforestation (<i>sub-category</i>)	Re-establishment of forest through planting and/or deliberate seeding on land already in forest land use.

1.2 National data

1.2.1 Data sources

References to sources of information	Variables	Years	Additional comments
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1	Reporting Progress, Ghana Forests, Timber Industry Development Board and Forestry Commission, 2002.	Forest cover change	1989	Provides secondary information on the growing stock and other general information about the forest of Ghana. Used for reference years 2000.
2	Kotey N.A, Francois J., Owusu JGK., Yeboah R., Amanor K.S. and Antwi L. 1998. Falling into place, Ghana, policy that works for forest and people. IIAD. United Kindom. IIAD 1996	Area of forests reserves and off forest reserves	1996	N/A
3	Report on mapping of forest cover and carbon stock in Ghana. Mapping Consultants Services, The Forest Preservation Programme, Under a Japanese Grant Aid to the Republic of Ghana, 2013	Forest Area, Forest Cover Change, Forest Carbon resource estimates	1990 to 2010	N/A
4	N/A	N/A	N/A	N/A

1.2.2 Classification and definitions

National class	Definition
Forest Reserve (FR)	Forest land within reserves and under protection
Off-Forest Reserve (OFR)	Any land area apart from permanent forest reserve in the High forest Zone or Forest lands within the HFZ outside reserves mainly made up of mosaic of agricultural fields, fallow lands, secondary forest patches, etc.
N/A	N/A
N/A	N/A

1.2.3 Original data

Data	1990	2000	2010
Forest Land	8,627,401.9	8,908,607.0	9,195,136.6

Source: Forest Preservation Program (FPP) 2013.

Forest Degradation according to the definition used in the FPP report is the conversion from closed forest where canopy cover is greater than 60% to open forest where the canopy cover is between 15% and 60%

Year	Closed Forest (ha)	Open Forest (ha)	Forest land (ha)
1990	2,704,422.1	5,922,979.8	8,627,401.9
2000	2,317,165.7	6,591,441.3	8,908,607.0
2010	1,785,801.6	7,409,335.0	9,195,136.6

Source: FPP Report

Thus since 1990, the forest degradation rate is 45,931.03 ha per annum.

Forest expansion, reforestation

Since 2000 the Forestry Commission of Ghana has embarked on a national plantation development programme with a target of 20 000 ha a year. It is estimated that by 2010, 200 000 ha of plantation would be established. The 2005 and 2010 Figures have been adjusted to take account of this.

1.3 Analysis and processing of national data

1.3.1 Adjustment

Years	Actual land Area	UN FAO stats	Calibration factor
1990	23 002 000	22 754 000	0.989218329

National Classes	Area in hectares	
	1989	1996
Forest reserve	1 681 671	1 634 100
Off-Forest reserve	5 901 578	5 001 385

TotalForestCover	7 583 249	6 635 485
Other land	15 170 751	16 118 515
TotalLandArea	22 754 000	22 754 000

1.3.2 Estimation and forecasting

Based on the new land cover map for Ghana using the 2013 FPP report, the revised land cover map is as follows

FRA 2010 Categories	1990	2000	2005	2010
Forest	8 627 401.9	8 908,607	9 053 360	9 195 137
Other Land	14 126 598.1	13 845 393	13 700 640	13 558 863
Water	1 100 000	1 100 000	1 100 000	1 100 000
Total	23 854 000	23 854 000	23 854 000	23 854 000

1.3.3 Reclassification

National Classes	Forest	OWL	OL
Forest reserve	100%		
Off-Forest reserve	100%		
TotalForestCover			
Other land			100%

1.4 Data

Table 1a

Categories	Area (000 hectares)
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		1990	2000	2005	2010	2015
	Forest	8627	8909	9053	9195	9337
	Other wooded land	0	0	0	0	0
	Other land	14127	13845	13701	13559	13417
	... of which with tree cover	N/A	N/A	N/A	N/A	N/A
	Inland water bodies	1100	1100	1100	1100	1100
	TOTAL	23854.00	23854.00	23854.00	23854.00	23854.00

Table 1b

Categories		Annual forest establishment / loss (000 hectares per year)				...of which of introduced species (000 hectares per year)			
		1990	2000	2005	2010	1990	2000	2005	2010
	Forest expansion	N/A	N/A	28	28	N/A	N/A	N/A	N/A
	... of which afforestation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	... of which natural expansion of forest	N/A	N/A	8	8	N/A	N/A	N/A	N/A
	Deforestation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	... of which human induced	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Reforestation	N/A	N/A	20	20	N/A	N/A	N/A	N/A
	... of which artificial	N/A	N/A	20	20	N/A	N/A	N/A	N/A

Tiers

Category	Tier for status	Tier for reported trend
Forest	Tier 2	Tier 2
Other wooded land	Tier 2	Tier 2
Forest expansion	Tier 2	Tier 1
Deforestation	N/A	N/A
Reforestation	Tier 2	Tier 1

Tier criteria

Category	Tier for status	Tier for reported trend
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<ul style="list-style-type: none"> • Forest • Other wooded land • Afforestation • Reforestation • Natural expansion of forest • Deforestation 	<p>Tier 3 : Data sources: Either recent (less than 10 years ago) National Forest Inventory or remote sensing, with ground truthing, or programme for repeated compatible NFIs Tier 2 : Data sources: Full cover mapping / remote sensing or old NFI (more than 10 years ago) Tier 1 : Other</p>	<p>Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other</p>
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1.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trends
Forest	<p>Under a Japanese grant to the republic of Ghana a programme called Forest Preservation Programme (FPP) was initiated in 2012 to conduct a wall to wall land cover assessment of Ghana. The assessment relied on 2006 IPCC classification in its land cover analysis. This is the first time that 2006 IPCC classification of land cover has been used in Ghana. The previous submissions on FRA relied heavily on forest within the high forest zone. Under the IPCC classification, some areas in the middle belt of Ghana i.e. the forest savannah woodland transition which were not regarded as forest qualified as forest. Again and this has greatly affected the total forest area compared with what was reported for FRA 2010, some areas within the cocoa landscape where trees other than cocoa crops are more than eighteen (18) per ha and have canopies exceeding 30% per ha were captured and interpreted as forest.</p>	N/A
Other wooded land	<p>Original data do not allow for identifying areas of other wooded land. Any such areas are included within the categories of forest and other land.</p>	N/A
Other land	N/A	N/A
Other land with tree cover	N/A	N/A
Inland water bodies	<p>Total inland water bodies were quoted from the FAO STAT with the assumption that there has not been any change since the year 2000.</p>	N/A
Forest expansion	N/A	N/A
Deforestation	N/A	N/A

Reforestation	N/A	Since 2000, the forestry commission of Ghana has embarked on a national plantation development programme with a target of 20 000 ha a year. Plantation development reduced from 20,000 ha per annum target to an average of 12, 944 ha per annum> This average has been used in estimating forest from 2010 to 2015
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Other general comments to the table

Under a Japanese grant to the republic of Ghana a programme called Forest Preservation Programme (FPP) was initiated in 2012 to conduct a wall to wall land cover assessment of Ghana. The assessment relied on 2006 IPCC classification in its land cover analysis. This is the first time that 2006 IPCC classification of land cover has been used in Ghana. The previous submissions on FRA relied heavily on forest within the high forest zone. Under the IPCC classification, some areas in the middle belt of Ghana i.e. the forest savannah woodland transition which were not regarded as forest qualified as forest. Again and this has greatly affected the total forest area compared with what was reported for FRA 2010, some areas within the cocoa landscape where trees other than cocoa crops are more than eighteen (18) per ha and have canopies exceeding 30% per ha were captured and interpreted as forest.

2. What is the area of natural and planted forest and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

2.1 Categories and definitions

Term	Definition
Naturally regenerated forest	Forest predominantly composed of trees established through natural regeneration.
Naturalized introduced species	Other naturally regenerated forest where the tree species are predominantly non-native and do not need human help to reproduce/maintain populations over time.
Introduced species	A species, subspecies or lower taxon occurring outside its natural range (past or present) and dispersal potential (i.e. outside the range it occupies naturally or could occupy without direct or indirect introduction or care by humans).
Category	Definition
Primary forest	Naturally regenerated forest of native species where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Other naturally regenerated forest	Naturally regenerated forest where there are clearly visible indications of human activities.
...of which of introduced species (<i>sub-category</i>)	Other naturally regenerated forest where the trees are predominantly of introduced species.
...of which naturalized (<i>sub-sub category</i>)	Other naturally regenerated forest where the trees are predominantly of naturalized introduced species.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.
...of which of introduced species (<i>sub-category</i>)	Planted forest where the planted/seeded trees are predominantly of introduced species.
Mangroves	Area of forest and other wooded land with mangrove vegetation.
...of which planted (<i>sub-category</i>)	Mangroves predominantly composed of trees established through planting.

2.2 National data

2.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	FAO The world's mangroves 1980-2005	Mangroves	1990, 2000, 2005 and 2010	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

2.2.2 Classification and definitions

National class	Definition
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

2.2.3 Original data

Data from Questions 4-5-6 was used as an input to generate data for the final Table.

National Classes (1)	Area in hectares			
	1990	2000	2005	2010
Production (1)	1 694 526	1 386 478	1 255 205	1 123 933
of which Production from natural forest	1 644 526	1 326 478	1 095 205	863 933
of which Plantations	50 000	60 000	160 000	260 00
Protection of soil and water	352 500	352 500	352 500	352 500
Conservation of biodiversity	42 700	42 700	42 700	42 700
Social	89 009	72 828	65 932	59 037
Unknown or no designation	6 448 666.9	7 056 919.6	7 336 943.1	7 616 966.6
TotalForestarea	8 627 401.9	8 911 425.6	9 053 280.1	9 195 136.6

Notes:

Reclassification for productive plantation and timber production was done on the bases of an assumption that 20 000 hectares of plantation is established each year from 2000 according to records. Therefore adding 60 000ha to (20 000 by 5) gives 160 000 and cumulatively to 260 000 in 2010.

2.3 Analysis and processing of national data

2.3.1 Adjustment

2.3.2 Estimation and forecasting

FRA 2010 Categories	Area in hectares			
	1990	2000	2005	2010
Primary Forest	395 200	395 200	395 200	395 200
Other naturally regenerated forests	7 040 341	6 538 046	6 291 899	6 045 752
Planted forest	50 000	60 000	160 000	260 000
Total	8 627 401.9	8 911 425.6	9 053 280.1	9 195 136.6

2.3.3 Reclassification

The following reclassification matrix was then applied:

National Classes	Primary	Other naturally regenerated forests	Planted forest
Production			
of which Production from natural forest		100%	

of which Plantations			100%
Protection of soil and water	100%		
Conservation of biodiversity	100%		
Social		100%	
Unknown or no designation		100%	

2.4 Data

Table 2a







Categories		Forest area (000 hectares)				
		1990	2000	2005	2010	2015
	Primary forest	395	395	395	395	395
	Other naturally regenerated forest	8182	8454	8498	8540	8617
	... of which of introduced species	0	0	0	0	0
	... of which naturalized	8182	8454	8498	8540	8617
	Planted forest	50	60	160	260	325
	... of which of introduced species	N/A	N/A	N/A	N/A	N/A
TOTAL		8627.00	8909.00	9053.00	9195.00	9337.00

Table 2b

Primary forest converted to (000 ha)								
1990-2000			2000-2010			2010-2015		
Other natural regeneration	Planted	Other land	Other natural regeneration	Planted	Other land	Other natural regeneration	Planted	Other land
0	0	0	0	0	0	0	0	0

Table 2c

Categories	Area (000 hectares)
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	1990	2000	2005	2010	2015
Mangroves (forest and OWL)	16.8	13.8	12.4	11	9.6
... of which planted	N/A	N/A	N/A	N/A	N/A

Tiers

Category	Tier for status	Tier for reported trend
Primary forest	Tier 2	Tier 2
Other naturally regenerated forest	Tier 2	Tier 2
Planted forest	Tier 3	Tier 3
Mangroves	Tier 2	Tier 2

Tier Criteria

Category	Tier for status	Tier for reported trend
Primary forest/Other naturally regenerated forest/Planted forest	<p>Tier 3 : Data sources: Recent (less than 10 years) National Forest Inventory or remote sensing with ground truthing or data provided by official agencies or programme for repeated compatible NFIs</p> <p>Tier 2 : Data sources: Full cover mapping/ remote sensing or old NFI (more than 10 years)</p> <p>Tier 1 : Other</p>	<p>Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status)</p> <p>Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status)</p> <p>Tier 1 : Other</p>

2.5 Comments

Category	Comments related to data definitions etc	Comments on reported trend
Primary forest	Ghana has some primary forest within the high forest zone such as Cape Three Points, Ebi Shelterbelt, and Dadieso Forest Reserves. These reserves are wholly protected and have been in its natural state for years now without much interference. They have virtually remained in that state for all these years and that accounts for that constant figure in our reports. Again the FPP also reported areas within forest reserves that have very intact with very closed canopy	N/A
Other naturally regenerating forest	N/A	N/A
Planted forest	N/A	N/A
Mangroves	N/A	N/A

Other general comments to the table
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N/A

3. What are the stocks and growth rates of the forests and how have they changed?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

3.1 Categories and definitions

Category	Definition
Growing stock	Volume over bark of all living trees with a minimum diameter of 10 cm at breast height (or above buttress if these are higher). Includes the stem from ground level up to a top diameter of 0 cm, excluding branches.
Net Annual Increment (NAI)	Average annual volume of gross increment over the given reference period less that of natural losses on all trees, measured to minimum diameters as defined for "Growing stock".
Above-ground biomass	All living biomass above the soil including stem stump branches bark seeds and foliage.
Below-ground biomass	All biomass of live roots. Fine roots of less than 2 mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead wood	All non-living woody biomass not contained in the litter either standing lying on the ground or in the soil. Dead wood includes wood lying on the surface dead roots and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in above-ground biomass	Carbon in all living biomass above the soil including stem stump branches bark seeds and foliage.
Carbon in below-ground biomass	Carbon in all biomass of live roots. Fine roots of less than 2 mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Carbon in dead wood	Carbon in all non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in litter	Carbon in all non-living biomass with a diameter less than the minimum diameter for dead wood (e.g. 10 cm) lying dead in various states of decomposition above the mineral or organic soil.
Soil carbon	Organic carbon in mineral and organic soils (including peat) to a soil depth of 30 cm.

3.2 National data

3.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Baytas A, Rezvani F, Forest Resource Accounting in Ghana, 1970-1987., Centre for Economic Research on Africa. School of Business, Montclair State University. Upper Montclair, New Jersey	Volume/ha	1980	N/A
2	Resource Management Support Centre Mensuration and Inventory Unit Kumasi Report of Multi Resource Inventory	Growing stock	1990 and 2001	N/A

3	Report on mapping of forest cover and carbon stock in Ghana, 2013. Mapping consultants Services, The Forest Preservation Programme (FPP).	Growing stock	1990, 2000 and 2010	N/A
4	N/A	N/A	N/A	N/A

3.2.2 Classification and definitions

National class	Definition
Closed Productive Forests	Managed or logged forests with 60% or more canopy cover that have some control of use such as harvesting regulations and/or silvicultural treatments
Closed Unproductive forest	Refers to those forests with 60% or more canopy cover used for protection (watershed management or soil stabilisation) or conservation in national parks
Open Productive forest	Mixed forest or grassland with at least canopy cover ranging between 15% and 60% that are managed or logged of its sparsely distributed trees
Open unproductive forest	Refers to forests stands with canopy cover between 15% to 60% that are not managed and have no control of use such as harvesting regulations and or silvicultural treatments
Other Closed Forest	Remnant closed forest outside the permanent managed forest estate
Plantations	refers to forests stands artificially established for harvest

3.2.3 Original data

Growing stock			
Original Data (Source, Forest Preservation Programme Report, 2013)			
Area in hectares			
Year	Closed Forest	Open Forest	Forest Land Combined
1990	2 704 422.1	5 922 979.8	8 627 401.9
2000	2 317 165.7	6 591 441.3	8 908 606.0
2010	1 785 801.6	7 409 335.0	9 195 136.6

National class	Area in ha				
	1990	2000	2005	2010	2015
Closed productive forest	1 694 526	1 386 478	1 155 205	923 933	731 285
Closed unproductive forest	551 000	551 000	551 000	551 000	551 000
Other closed forest	408 896	319 688	125 279	50 868	.0
Open productive forest	1 776 894	988 716	522 227	370 467	350 000
Open unproductive forest	4 146 086	5 602 725	6 440 803	7 038 868	7 372 064
Plantations	50 000	60 000	160 000	260 000	290 000
Total	8 627 402	8 908 606	8 954 514	9 195 136	9 294 349

Closed forest is depreciating at the rate of 192,648.25 ha per 5 years (Source FPP report 2012)

Forest plantation development has slowed down in the last three years. According to National forest plantation development programme 2012 Annual report, 11,248 ha and 8,980 ha were planted in 2011 and 2012 respectively. In 2013, no new plantations were established. The projection between 2010 to 2015 has been assumed to be 30,000 ha> This figure has been used for 2015.

3.2.4 National estimates

National Class	1990	2000	2005	2010	2015
Closed Forest	2 245 526	1 937 478	1 706 205	1 474 933	1 282 285
Open Forest	6 331 876	6 911 129	7 088 309	7 460 203	7 722 064
Plantations	50 000	60 000	160 000	260 000	290 000
Total	8 627 402	8 908 607	8 954 514	9 195 136	9 294 349

Summary of closed, open and plantaion forest

National Classes	Area	Growing Stock	Growing Stock
	1000 ha	1000 m3	m3/ha

Closed productive forest	1 694.5	1 386.5	1 123.9
Closed Unproductive forest	551	551	551
Open forests	458.8	379.7	110.9
Plantations	1 776.8	988.7	1 111.4
			7 083.8
TOTAL	8 768	428 310	48.8

Areas from Questions 4,5,6 were used as an input to the estimations for this table

National Classes	Area in hectares			
	1990	2000	2005	2010
Production	3 471 420	2 375 194	2 305 263	2 235 333
Protection of soil and water	352 500	352 500	352 500	352 500
Conservation of biodiversity	42 700	42 700	42 700	42 700
Social	89 009	72 828	65 932	59 037
Unknown or no designation	4 671 773	6 065 385	6 188 119	6 505 567
Total Forest area	8 627 402	8 908 607	8 954 514	9 195 137

Biomass stock

Since no original data exist, data on growing stock is used as input for the estimation of biomass stock.

		Growing stock (1000 m3)			
	m3/ha	1990	2000	2005	2010
Closed productive forest	136 (1)	230 456	188 561	170 708	152 855
Unproductive forests	117	41 243	41 243	41 243	41 243
Open forests	28	151 223	121 938	109 458	96 979
Total		422 921	351 741	321 409	291 077

Carbon stock

Since no national data exist, data from Question1 and data on biomass are used as an input for the estimation of carbon stock.

3.3 Analysis and processing of national data

3.3.1 Adjustment

3.3.2 Estimation and forecasting

Biomass stock					
National classes	m3/ha	1990	2000	2005	2010
Closed productive forest	136	230,455,536	188,561,008	170,707,880	152,854,880
Closed unproductive forest	136	74,936,000	74,936,000	74,936,000	74,936,000
Other closed forest	136	62,409,869.6	51,637,527.2	33,357,944	15,078,129.6
Open productive forest	28	49,753,032	27,684,048	29,401,629.6	10,373,076
Open unproductive forest	117	485,092,062	655,518,860	696,188,259	823,547,556
Total		902,646,500	998,337,443.2	1,004,591,713	1,076,789,642

FPP report (2013) was used in the generation of the data above.

Biomass Stock

National classes	stem vol. (m3/ha)	Density (ton/m3)	stem wood (ton/ha)	BEF	R/S
Closed productive forest	136	0.58	78.88	2.73	0.24
Closed unproductive forest	136	0.58	78.88	2.73	0.24
Other closed forest	136	0.58	78.88	2.73	0.24
Open productive forest	28	0.58	16.24	6.07	0.24
Open unproductive forest	117	0.58	67.86	2.94	0.24

Density= mass/volume

BEF= Biomass Expansion Factor= FAO forestry paper 134

FPP report (2013) was used to generate the data above.

Biomass stock

National classes	Above ground average (tons/ha)	Below ground average (tons/ha)	Carbon Stock Total
Closed forest	76.86	14.5	91.36
Open forest	21.67	4.29	25.96
soil carbon			70.25

The FPP report was used to deduce the averages of closed and open forest.

Growing stock

Assumptions:

1. Production (forests) = Close productive forest
2. Protection of soil and water = Unproductive forests
3. Conservation of biodiversity + Social + Unknown or no designation (forests) = Open Forests

National Classes	Area (hectares)			
	1990	2000	2005	2010
Close productive forest	1 694 526	1 386 478	1 255 205	1 123 933
Unproductive forests	352 500	352 500	352 500	352 500
Open Forests	5 400 828	4 354 928	3 909 226	3 463 525
Total Forest	7 447 854	6 093 906	5 516 932	4 939 958

As no other information is available, It is assumed that volume per ha did not change from 1980 to 2005.

Applying the above forest areas and multiplying these with the respective volume per hectare for each reporting year gives:

	m3/ha	Growing stock (1000 m3)			
		1990	2000	2005	2010
Closed productive forest	136 (1)	230 456	188 561	170 708	152 855
Unproductive forests	117	41 243	41 243	41 243	41 243
Open forests	28	151 223	121 938	109 458	96 979
Total		422 921	351 741	321 409	291 077

Note: 1. The figure 136 m3/ha is a weighted average for Close productive forest and Plantations

Biomass stock

The following conversion factors were applied:

National Classes	Stem Vol. m ³ /ha	Density ton/m ³	Stem wood ton/ha	BEF	R/S ratio
Closed productive forest	136	0.58	78.88	2.73	0.24
Unproductive forests	117	0.58	67.86	2.94	0.24
Open forests	28	0.58	16.24	6.07	0.24

Notes:

BEF calculated using formula from FAO forestry paper 134

Wood density: Average for Africa (FAO Forestry Paper 134)

R/S ratio: Appendix 5 of Guidelines

The following table is obtained from data on growing stock:

National Classes	Area (hectares)			
	1990	2000	2005	2010
Closed productive forest	1 694 526	1 386 478	1 255 205	1 123 933
Unproductive forests	352 500	352 500	352 500	352 500
Open Forests	5 400 828	4 354 928	3 909 226	3 463 525
Total Forest	7 447 854	6 093 906	5 516 932	4 939 958

Carbon stock

A/-The default conversion factor of 0.47 was used to convert from biomass to carbon

FRA 2005 Categories	Carbon in Million metric tonnes			
	1990	2000	2005	2010
Carbon in above – ground biomass	454.8	375.2	341.2	307.2
Carbon in below – ground biomass	109.2	90.1	81.9	73.7
Carbon in Total Living biomass	564.0	465.3	423.1	380.9

B/- Carbon in the litter has been estimated, based on the standard factor of 2.1 (tropical), and

- Soil carbon has been estimated, based on the factor of 47 (tropical, moist with LAC soils).

The biomass/ hectare values are then applied to the forest and other wooded land area values in table T1 to get the biomass for the reporting years.

Year	1990	2000	2005	2010
Total Forest (1000 ha)	7 448	6 094	5 517	4 940
Carbon in the litter (1000 C)	15 641	12 797	11 586	10 374
Soil carbon (1000 C)	350 056	286 418	259 299	232 180

3.3.3 Reclassification**BIOMASS (MILLION TONNES)**

Closed Productive Forest	1990	2000	2005	2010
1. Above Ground Biomass	485,651,152	397,364,595	359,741,753	322,119,198

2. Below Ground Biomass	112,685,979	92,200,787	83,471,133	74,741,545
3. Living Biomass	598,337,131	489,565,382	443,212,886	396,860,743
Closed Unproductive Forest				
1. Above Ground Biomass	157,916,600	157,916,600	157,916,600	157,916,600
2. Below Ground Biomass	36,641,500	36,641,500	36,641,500	36,641,500
3. Living Biomass	194,558,100	194,558,100	194,558,100	194,558,100
Other Closed Forests				
1. Above Ground Biomass	131,519,622	108,818,495	70,296,961	31,774,941
2. Below Ground Biomass	30,516,591	25,249,232	16,311,054	7,372,762
3. Living Biomass	162,036,213	134,067,727	86,608,015	39,147,703
Open Production Forests				
1. Above Ground Biomass	163,118,869	90,764,129	47,940,466	34,008,871
2. Below Ground Biomass	118,163,451	30,551,324	16,136,824	11,447,430
3. Living Biomass	281,282,320	121,315,453	64,077,290	45,4456,301
Open Unproductive Forest				
1. Above Ground Biomass	380,610,695	514,330,183	546,240,019	646,168,082
2. Below Ground Biomass	128,114,057	173,124,212	183,865,104	217,501,021
3. Living Biomass	508,724,752	687,454,395	730,105,123	863,669,103

FPP report (2013) was used to deduce the data above.

CARBON ESTIMATES

National Estimates	Closed Forest	Open Forest
WE	455	111
ME	511	146

MSSE	453	129
MSNW	148	64
DSDI	85	52
DSDF	56	44
UE	298	96
Average	286.6	91.8

National Estimates	Closed Forest	Open Forest
WE	29	-
ME	89	11
MSDE	85	28
MSNW	56	33
DSI	54	37
DSF	-	29
UE	86	47
Average	66.5	30.9

National Estimates	Closed Forest	Open Forest
WE	101	-
ME	2914	401
MSSE	205	209
MSNW	399	476
DSI	22	29
DSF	-	11
UE	915	54

Average	759.4	196.7	
National Estimates	Above ground (Tons/ha)	Below ground (Tons/ha)	Deadwood (Tons/ha)
Closed Productive Forest	286.6	66.5	759.4
Closed Unproductive Forest	286.6	66.5	759.4
Other Closed Forest	286.6	66.5	759.4
Open Productive Forest	91.8	30.9	197.6
Open Unproductive Forest	91.8	30.9	197.6

These estimations were obtained from the FPP report (2013)

National Estimates	Closed Forest (Tons/ha)	Open Forest (Tons/ha)
Above ground	286.6	91.8
Below ground	66.5	30.9
Deadwood	759.4	197.6

The data obtained was as a result of the FPP report (2013)

Biomass stock

The following procedure was applied for biomass estimation:

1. Multiply area of respective national classes by stem wood by biomass expansion factor = Above ground biomass
2. Multiplying above ground biomass by Root - Shoot ratio = below ground biomass
3. Multiplying living biomass by 0.14 = dead wood biomass

	Biomass (million tonnes)			
	1990	2000	2005	2010

Closed productive forest				
Above – ground biomass	364.9	298.6	270.3	242.0
Below – Ground biomass	87.6	71.7	64.9	58.08
Living biomass	452.5	370.2	335.2	300.1
Unproductive forests				
Above – ground biomass	70.3	70.3	70.3	70.3
Below – ground biomass	16.9	16.9	16.9	16.9
Living biomass	87.2	87.2	87.2	87.2
OpenForest				
Above – ground biomass	532.4	429.3	385.4	341.4
Below – ground biomass	127.8	103.0	92.5	81.9
Living biomass	660.2	532.3	477.9	423.3

Summing the three different classes generates the final table 3D

Table 3D

FRA 2015 category	Biomass (million metric tonnes oven dry weight)									
	Forest					Other wooded land				
	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
Above ground biomass	1,318.8	1,269.2	1,182.1	1,192.0	1,171.0	N/A	N/A	N/A	N/A	N/A

Below ground biomass	426.1	357.7	336.4	347.7	345.2	N/A	N/A	N/A	N/A	N/A
Dead wood	3,224.1	3,062.1	2,836.9	2,820.2	2,697.4	N/A	N/A	N/A	N/A	N/A
Total	4,969.1	4,689.1	4,355.4	4,359.9	4,213.6	N/A	N/A	N/A	N/A	N/A

National Estimates	Above ground carbon	Below round carbon	Carbon Dead wood	Carbon in Litter	Soil carbon
Closed Forest	76.85714	14.5	88	2.15	77.66667
Open Forest	24.85714	4.5	63.6	1.916667	59.16667

These national averages were generated from the results of the Forest Preservation Programme.

Table 3e

FRA 2015 Category	Carbon(million metric tonnes)									
	Forest					Other Wooded Land				
	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
Carbon in above-ground biomass	275.1	235.7	208.7	181.6	155.9	n/a	n/a	n/a	n/a	n/a
Carbon in below-ground biomass	78.4	67.2	59.5	51.8	44.4	n/a	n/a	n/a	n/a	n/a
Sub-total Living biomass	353.5	302.9	268.2	233.4	200.3	n/a	n/a	n/a	n/a	n/a

Carbon in dead wood	410.0	351.3	311.0	270.7	232.3	n/a	n/a	n/a	n/a	n/a
Carbon in Litter	11.6	10.0	8.8	7.7	6.6	n/a	n/a	n/a	n/a	n/a
Sub-total dead wood and Litter	421.6	361.2	319.8	278.4	238.9	n/a	n/a	n/a	n/a	n/a
Soil Carbon	370.1	317.1	280.7	244.4	209.7	n/a	n/a	n/a	n/a	n/a
Total	1145.2	981.2	868.7	756.2	648.8	n/a	n/a	n/a	n/a	n/a

3.4 Data

Table 3a




Category		Growing stock volume (million m ³ over bark)									
		Forest					Other wooded land				
		1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
	Total growing stock	434.1	405.6	397.1	388.7	378.1	N/A	N/A	N/A	N/A	N/A
	... of which coniferous	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	... of which broadleaved	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 3b

Category/Species name			Growing stock in forest (million cubic meters)			
Rank	Scientific name	Common name	1990	2000	2005	2010
1 st	Triplochiton scelroxylon	WAWA	15.94	18.35	N/A	N/A


2 nd	Celtis mildbraedii	ESA	N/A	17.73	N/A	N/A
3 rd	Piptadeniastrum africanum	DAHOMA	7.73	7.21	N/A	N/A
4 th	Ceiba pentandra	ONYINA	10.27	6.37	N/A	N/A
5 th	Terminalia superba	OFRAM	5.95	5.17	N/A	N/A
6 th	Celtis zenkeri	ESAKOKO	10.12	5.03	N/A	N/A
7 th	Petersianthus macrocarpus	ESIA	6.85	4.77	N/A	N/A
8 th	Nesogordonia papaverifera	DANTA	5.21	4.15	N/A	N/A
9 th	Psycanthus angolensis	OTIE	5.79	4.12	N/A	N/A
10 th	Antiaris toxicaria	KYENKYEN	9.17	3.85	N/A	N/A
Remaining			N/A	328.85	N/A	N/A
TOTAL			77.03	405.60	.00	.00

THE PRE-FILLED VALUES FOR GROWING STOCK REFER TO THE FOLLOWING THRESHOLD VALUES (SEE TABLE BELOW)

Item	Value	Complementary information
Minimum diameter (cm) at breast height of trees included in growing stock (X)	10 cm	N/A
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	5 cm	N/A
Minimum diameter (cm) of branches included in growing stock (W)	N/A	N/A
Volume refers to above ground (AG) or above stump (AS)	AG	N/A

PLEASE NOTE THAT THE DEFINITION OF GROWING STOCK HAS CHANGED AND SHOULD BE REPORTED AS GROWING STOCK DBH 10 CM INCLUDING THE STEM FROM GROUND LEVEL UP TO A DIAMETER OF 0 CM, EXCLUDING BRANCHES.

Table 3c

Category		Net annual increment (m ³ per hectare and year)				
		Forest				
		1990	2000	2005	2010	2015
	Net annual increment	4	N/A	N/A	N/A	N/A



	... of which coniferous	N/A	N/A	N/A	N/A	N/A
	... of which broadleaved	N/A	N/A	N/A	N/A	N/A

Table 3d











Category		Biomass (million metric tonnes oven-dry weight)									
		Forest					Other wooded land				
		1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
	Above ground biomass	1318.8	1269.2	1182.1	1192	1171	0	0	0	0	0
	Below ground biomass	426.1	357.8	336.4	347.7	345.2	0	0	0	0	0
	Dead wood	3224.1	3062.1	2836.8	2820.2	2697.4	0	0	0	0	0
TOTAL		4969.00	4689.10	4355.30	4359.90	4213.60	.00	.00	.00	.00	.00

Table 3e

Category		Carbon (Million metric tonnes)									
		Forest					Other wooded land				
		1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
	Carbon in above ground biomass	619.84	596.52	555.59	560.24	550.37	0	0	0	0	0
	Carbon in below ground biomass	200.27	168.17	158.11	163.42	162.24	0	0	0	0	0
	<i>Subtotal Living biomass</i>	820.1	764.69	713.7	723.66	712.61	0	0	0	0	0
	Carbon in dead wood	1515.33	1439.19	1333.3	1325.49	1267.78	0	0	0	0	0
	Carbon in litter	18.12	18.71	19.01	19.31	19.61	0	0	0	0	0
	<i>Subtotal Dead wood and litter</i>	1533.44	1457.9	1352.31	1344.8	1287.39	0	0	0	0	0

	Soil carbon	405.47	418.72	425.49	432.17	438.84	0	0	0	0	0
TOTAL		2759.03	2641.31	2491.50	2500.63	2438.84	.00	.00	.00	.00	.00

Tiers

Variable/category	Tier for status	Tier for trend
Total growing stock	Tier 2	Tier 1
Net annual increment	Tier 1	Tier 1
Above ground biomass	Tier 2	Tier 2
Below ground biomass	Tier 2	Tier 2
Dead wood	Tier 2	Tier 2
Carbon in above-ground biomass	Tier 2	Tier 2
Carbon in below ground biomass	Tier 2	Tier 2
Carbon in dead wood and litter	Tier 2	Tier 2
Soil carbon	Tier 2	Tier 2

Tier criteria

Category	Tier for status	Tier for reported trend
Total growing stock	Tier 3: Data sources Recent 10 years National Forest Inventory or remote sensing with ground truthing or programme for repeated compatible NFI 10 years Domestic volume functions Tier 2: Data sources/registers and statistics modelling or old NFI 10 years or partial field inventory Tier 1: Other data sources	Tier 3: Estimate based on repeated compatible tiers 3 (tier for status) Domestic growth functions Tier 2: Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 tier for status Tier 1: Other
Net annual increment	Tier 3: Scientifically tested national volume and growth functions Tier 2: Selection of volume and growth functions as relevant as possible Tier 1: Other	Tier 3: Confirmation/adjustment of functions used through scientific work Tier 2: Review work done to seek alternative functions Tier: 1 Other
Biomass	Tier 3: Country-specific national or sub-national biomass conversion expansion factors applied or other domestic or otherwise nationally relevant biomass studies Tier 2: Application of country specific national or sub-national biomass conversion factors from other country with similar climatic conditions and forest types Tier 1: International/regional default biomass expansion factors applied	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

<ul style="list-style-type: none"> • Carbon in above ground biomass • Carbon in below ground biomass • Carbon in dead wood and litter • Soil carbon 	<p>Tier 3: Country-specific national or sub-national biomass conversion expansion factors applied Tier 2: Application of country specific national or sub-national biomass conversion factors form from other country with similar climatic conditions and forest types Tier 1: International/regional default biomass expansion factors applied</p>	<p>Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other</p>
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3.5 Comments on growing stock biomass and carbon

Category	Comments related to data definitions etc	Comments on the reported trend
Total growing stock	N/A	N/A
Growing stock of broadleaved coniferous	N/A	N/A
Growing stock composition	Most of the common names of tree species were not known so local names were used in place.	N/A
Net annual increment	N/A	N/A
Above-ground biomass	N/A	N/A
Below-ground biomass	N/A	N/A
Dead wood	N/A	N/A
Carbon in above-ground biomass	N/A	N/A
Carbon in below-ground biomass	N/A	N/A
Carbon in dead wood	N/A	N/A
Carbon in litter	N/A	N/A
Soil carbon	N/A	N/A

Other general comments to the table

Biomass and carbon estimates were generated from a Forest Preservation Program (FPP) that was conducted in 2012 and the report released in 2013

4. What is the status of forest production and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

4.1 Categories and definitions

Term	Definition
Primary designated function	The primary function or management objective assigned to a management unit either by legal prescription documented decision of the landowner/manager or evidence provided by documented studies of forest management practices and customary use.
Non wood forest product (NWFP)	Goods derived from forests that are tangible and physical objects of biological origin other than wood.
Commercial value of NWFP	For the purpose of this table, value is defined as the commercial market value at the forest gate.
Category	Definition
Production forest	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Multiple use forest	Forest area designated for more than one purpose and where none of these alone is considered as the predominant designated function.
Total wood removals	The total of industrial round wood removals and woodfuel removals.
...of which woodfuel	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

4.2 National data

4.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Agyarko. T. Forestry Outlook Study for Africa. Ghana, Ministry of Land and Forestry	Forest designation	1995	Source of the information is Forest Service Division, 1995
2	Expert Opinion	Reclassification	N/A	N/A
3	Report on mapping of forest cover and carbon stock in Ghana Original Data, 2013. Forest Preservation Programme Report, submitted by PASCO Corporation Japan and supported by Forestry Commission of Ghana	N/A	N/A	N/A

4	Annual Report 2012. National forest plantation development programme. Forestry Commission Ghana	N/A	N/A	N/A
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4.2.2 Classification and definitions

National class	Definition
Production Areas	These are areas designated for removal of timber, which usually fall within the High Forest zone.
Conversion Areas	These are degraded areas (Basal Area #5m ² /ha), within Forest Reserves which require planting or reserved for plantation development.
N/A	N/A
N/A	N/A

4.2.3 Original data

The following data refer to year 1996 and updated using FPP Report 2013. This report estimated the actual forest cover from 1990 to 2010 which shows an underestimation of the forest cover especially the off reserve areas from 1990 to 2010. Thus data on forest reserve area remains unchanged but the off reserve area has been reviewed as follows

Foresttype	Area (ha)	%
Timber Production Area	762 400	47
Permanent Protection	352 500	22
Convalescence	122 000	7
Conversion	127 200	8
Not inventoried (conversion)	270 000	16
Total Reserve Area	1 634 100	100
Other off-forest reserves (1)	6 993 302	
....Of which timber production area (2)	374 000	7

Type	Area in hectares		
	1990	2000	2010
Forest	8,627,402	8,911,426	9,195,137

Source: Forest Preservation Programme, 2013 report

Notes :

- 1) Other forest reserve area information is from Question 1
- 2) Of which 374000 is timber production area is from Forest Service Division

4.3 Analysis and processing of national data

4.3.1 Adjustment

4.3.2 Estimation and forecasting

The area for forests for 1990, 2000, 2010 are directly taken from FPP report and projections for 2005 and 2015 are estimated from it

Type	Area in hectares				
	1990	2000	2005	2010	2015
Forest	8 627 402	8 911 426	9 053 360	9 195 137	9 337 071

Applying the above percentages per designation to the total forest areas for each year respectively generate the following table. Areas of protection of soil and water and conservation of biodiversity are maintained constant. This table will be used for the final table.

National Classes (1)	Area in hectares				
	1990	2000	2005	2010	2015
Production, natural forest on-reserve	1 109 000	715 000	715 000	715 000	715 000

Plantation on-reserve	50 000	60 000	160 000	260 000	325 000
Protection of soil and water (2)	352 500	352 500	352 500	352 000	353 500
Conservation of biodiversity (2)	42 700	42 700	42 700	42 700	43 700
Convalescence Protection (3)	0	400 181	307 077	213 972	152 344
Social	89 009	72 828	65 932	59 037	53 665
Unknown or no designation off-reserve	4 984 193	5 868 217	7 085 151	7 226 928	7 368 862
Production off-reserve	2 000 000	1 400 000	325 000	325 000	325 000
Total Forest area	8 627 402	8 911 426	9 053 360	9 195 137	9 337 071

Notes:

- 1). The above table was generated from percentages generated from original data from source 1.
- 2). Assumption is that the area under protection of soil and water plus the area under conservation of biodiversity will not change.
- 3). Convalescence Protection Area is a timber production area that has been temporary designated as protected area to allow the area to recover after extensive logging or wildfires. In 1990 there was no area designated as convalescence forest.

In 1995, large portions off-reserve were officially designated as timber production areas under the district felling quota regime for off-reserve as a way of regulating timber exploitation in off-reserve areas. The estimated area was 1 400 000.

4.3.3 Reclassification

The data in 4.3.2 under national classes (1) was used for the reclassification to align with FRA Categories as follows

Fra Categories	Area in ha				
	1990	2000	2005	2010	2015
Production	3 159 000	2 575 181	1 507 077	1 513 972	1 517 344

Protection of soil and water	352 500	352 500	352 500	352 500	352 500
Conservation of Biodiversity	42 700	42 700	42 700	42, 700	42 700
Social	89 009	72 828	65 932	59 037	53 665
Unknown or no designation	4 984 193	5 868 217	7 085 151	7 226 928	7 368 862
Total	8 627 402	98 911 426	9 053 360	9 195 137	9 335 071

The tables below should be deleted

National Class	Production	Protection of soil and water	Conservation of biodiversity	Social	Unknown designation
Timber Production Area	100%				
Permanent Protection		100%			
Convalescence (1)			35%	65%	
Conversion	100%				
Not inventoried (conversion)	100%				
Other off forest reserves (2)	7%				93%

Notes:

1. Expert opinion
2. 374 000 out of 5 001 385 ha of other off forest reserve area is designated for production.

Results after reclassification the 1996 data

National Classes	Production	Protection of soil and water	Conservation of biodiversity	Social	Unknown designation
Timber Production Area	762 400				
Convalescence	0		42 700	79 300	
Permanent Protection	0	352 500			
Conversion	127 200				
Not inventoried (conversion)	270 000				
Other off forest reserves	350 097			0	4 651 288
Total	1 509 697	352 500	42 700	79 300	4 651 288

The following table of the type of forests designation together with their respective proportion to the total forests area was generated: The respective proportion will be used to generate data for 1990, 2000, 2005 and 2010 since there was only one data set available.

FRA Categories	Area in ha	Proportion of the total
Production	1 509 697	23%
Protection of soil and water	352 500	5%
Conservation of biodiversity	42 700	1%
Social	79 300	1%

Unknown or no designation	4 651 288	70%
Total	6 635 485	100%

4.4 Data

Table 4a



Categories		Forest area (000 hectares)				
		1990	2000	2005	2010	2015
	Production forest	3159	2575	1507	1514	1517
	Multiple use forest	0	0	0	0	N/A

Table 4b

Rank	Name of product	Key species	Commercial value of NWFP removals 2010 (value 1000 local currency)	NWFP category
1 st	N/A	N/A	N/A	N/A
2 nd	N/A	N/A	N/A	N/A
3 rd	N/A	N/A	N/A	N/A
4 th	N/A	N/A	N/A	N/A
5 th	N/A	N/A	N/A	N/A
6 th	N/A	N/A	N/A	N/A
7 th	N/A	N/A	N/A	N/A
8 th	N/A	N/A	N/A	N/A
9 th	N/A	N/A	N/A	N/A
10 th	N/A	N/A	N/A	N/A
TOTAL			.00	

2010	
Name of local currency	Ghana Cedi

Category
Plant products / raw material
1 Food
2 Fodder
3 Raw material for medicine and aromatic products
4 Raw material for colorants and dyes
5 Raw material for utensils handicrafts construction
6 Ornamental plants
7 Exudates
8 Other plant products
Animal products / raw material
9 Living animals
10 Hides skins and trophies
11 Wild honey and beeswax
12 Wild meat
13 Raw material for medicine
14 Raw material for colorants
15 Other edible animal products
16 Other non-edible animal products

Table 4c Pre-filled data from FAOSTAT

Year	FRA 2015 category (1000 m ³ u.b.)	
	Total wood removals	...of which woodfuel
1990	14310	12870
1991	12379	11000
1992	16300	15000
1993	19932	18100
1994	22542	20678

1995	23519.2	22236.17
1996	24340.5	23085.53
1997	25235.8	23957.76
1998	26087.4	24860.36
1999	26883.9	25781.91
2000	21488	20489
2001	23686	22474
2002	23783	22679
2003	20092	18692
2004	19045	17695
2005	17420	16220
2006	15885	14580
2007	14368	13064
2008	13759	12367
2009	13373	11873
2010	12966	11716
2011	14159	12909

Tiers

Category	Tier for status	Tier for reported trend
Production forest	Tier 3	Tier 2
Multiple use forest	Tier 1	Tier 1

Tier Criteria

Category	Tier for status	Tier for reported trend
Production forest Multiple use forest	Tier 3: Updated including field verifications national forest maps including functions Tier 2: Forest maps older than 6 years including forest functions Tier 1: Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

4.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Production forest	N/A	N/A
Multiple use forest	N/A	N/A
Total wood removals	The FAOSTAT figures have been used from 1990 to 1999 because there were no figures available from Energy Commission of Ghana. Woodfuel removals in Kilotonnes were received from the Energy Commission of Ghana and converted to Volume (m3) using average wood density of 528.2kg/m3 and the figures obtained were used in filling from 2000 to 2011. Official Roundlogs for timber extaction figures were obtained from the Resource Management Support Centre of the Forestry Commission	N/A
Commercial value of NWFP	N/A	N/A

Other general comments to the table

According to the inventory reports (March 1995) only 15% of the area, which is protected on grounds of genetic diversity, is well stocked and accessible. The rest of the areas are either inaccessible or degraded

5. How much forest area is managed for protection of soil and water and ecosystem services?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

5.1 Categories and definitions

Category	Definition
Protection of soil and water	Forest area designated or managed for protection of soil and water
...of which production of clean water (<i>sub-category</i>)	Forest area primarily designated or managed for water production, where most human uses are excluded or heavily modified to protect water quality.
...of which coastal stabilization (<i>sub-category</i>)	Forest area primarily designated or managed for coastal stabilization.
...of which desertification control (<i>sub-category</i>)	Forest area primarily designated or managed for desertification control.
...of which avalanche control (<i>sub-category</i>)	Forest area primarily designated or managed to prevent the development or impact of avalanches on human life assets or infrastructure.
...of which erosion, flood protection or reducing flood risk (<i>sub-category</i>)	Forest area primarily designated or managed for protecting communities or assets from the impacts of erosion riparian floods and landslides or for providing flood plain services.
...of which other (<i>sub-category</i>)	Forest area primarily designated or managed for other protective functions.
Ecosystem services, cultural or spiritual values	Forest area primarily designated or managed for selected ecosystem services or cultural or spiritual values.
...of which public recreation (<i>sub-category</i>)	Forest area designated or managed for public recreation.
...of which carbon storage or sequestration (<i>sub-category</i>)	Forest area designated or managed for carbon storage or sequestration.
...of which spiritual or cultural services (<i>sub-category</i>)	Forest area designated or managed for spiritual or cultural services.
...of which other (<i>sub-category</i>)	Forest area designated or managed for other ecosystem services.

5.2 National data

5.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A

3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

5.2.2 Classification and definitions

National class	Definition
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

5.2.3 Original data

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5.3 Analysis and processing of national data

5.3.1 Adjustment

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5.3.2 Estimation and forecasting




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5.3.3 Reclassification

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5.4 Data

Table 5a

Categories		Forest area (1000 hectares)				
		1990	2000	2005	2010	2015
	Protection of soil and water	352.5	352.5	352.5	352.5	352.5
	... of which production of clean water	N/A	N/A	N/A	N/A	N/A
	... of which coastal stabilization	N/A	N/A	N/A	N/A	N/A

	... of which desertification control	N/A	N/A	N/A	N/A	N/A
	... of which avalanche control	N/A	N/A	N/A	N/A	N/A
	... of which erosion, flood protection or reducing flood risk	N/A	N/A	N/A	N/A	N/A
	... of which other (please specify in comments below the table)	N/A	N/A	N/A	N/A	N/A

Other

N/A

Table 5b

Categories	Forest area (1000 hectares)				
	1990	2000	2005	2010	2015
Ecosystem services, cultural or spiritual values	N/A	N/A	N/A	N/A	N/A
...of which public recreation	N/A	N/A	N/A	N/A	N/A
...of which carbon storage or sequestration	N/A	N/A	N/A	N/A	N/A
...of which spiritual or cultural services	N/A	N/A	N/A	N/A	N/A
...of which other (please specify in comments below the table)	N/A	N/A	N/A	N/A	N/A

Tiers

Category	Tier for reported trend	Tier for status
Protection of soil and water	Tier 1	Tier 1
Ecosystem services, cultural or spiritual values	N/A	N/A

Tier criteria

Category	Tier for status	Tier for reported trend
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Protection of soil and water	Tier 3: High reliability data derived either from high intensity sample survey or data obtained from national or state agencies responsible for regulations or legislation relating to soil and water protection. Tier 2: Approaches based on low intensity or incomplete sample-based surveys or studies that provide data for specific areas that is extrapolated through statistical analysis to national level estimates. Tier 1: Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other
<ul style="list-style-type: none"> • Cultural or spiritual values • Public recreation • Spiritual or cultural services • Other 	Tier 3: High reliability data derived either from high intensity sample survey or data obtained from national or state agencies responsible for regulations. Tier 2: Approaches based on low intensity or incomplete sample-based surveys or studies that provide data for specific areas that is extrapolated through statistical analysis to national level estimates. Tier 1: Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

5.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Protection of soil and water	N/A	N/A
Production of clean water	N/A	N/A
Coastal stabilization	N/A	N/A
Desertification control	N/A	N/A
Avalanche control	N/A	N/A
Erosion, flood protection or reducing flood risk	N/A	N/A
Other protective functions	N/A	N/A
Ecosystem services, cultural or spiritual values	N/A	N/A
Public recreation	N/A	N/A
Carbon storage or sequestration	N/A	N/A
Spiritual or cultural services	N/A	N/A
Other ecosystem services	N/A	N/A

Other general comments to the table

N/A

6. How much forest area is protected and designated for the conservation of biodiversity and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

6.1 Categories and definitions

Category	Definition
Conservation of biodiversity	Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.

6.2 National data

6.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Agyarko. T. Forestry Outlook Study for Africa. Ghana, Ministry of Land and Forestry	Forest designation	1995	Source of the information is Forest Service Division, 1995
2	Management Plans 2007-2011 for Globally Significant Biodiversity Areas (GSBAs)	N/A	2007	Source of the information is the Resource Management Support Centre of Forestry Commission
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

6.2.2 Classification and definitions

National class	Definition
Conversion Areas	These are degraded areas (Basal Area #5m ² /ha), within Forest Reserves which require planting or reserved for plantation development.
Convalescence	These are temporary protected areas usually 40 years within timber production areas of natural Forest Reserves with reduced stocking, primarily due to over exploitation and or bush fires but are capable of natural rehabilitation.
N/A	N/A
N/A	N/A

6.2.3 Original data

See 4.2.3.

6.3 Analysis and processing of national data

6.3.1 Adjustment

6.3.2 Estimation and forecasting



See 4.3.2.

6.3.3 Reclassification

See 4.3.3.

6.4 Data

Table 6

Categories		Forest area (000 hectares)				
		1990	2000	2005	2010	2015
	Conservation of biodiversity	43	43	130	130	130
	Forest area within protected areas	43	43	130	130	130

Tiers

Category	Tier for status	Tier for reported trend
Conservation of biodiversity	Tier 3	Tier 3
Forest area within protected areas	Tier 3	Tier 3

Tier criteria

Category	Tier for status	Tier for reported trend
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<ul style="list-style-type: none"> • Conservation of biodiversity • Forests within protected areas 	<p>Tier 3: Data obtained from national or state agencies responsible for conservation and protected area or legislation relating to area protection. Tier 2: Studies that provide data for specific areas that is extrapolated through statistical analysis to national level estimates Tier 1 Other</p>	<p>Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other</p>
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6.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Conservation of biodiversity	<p>In 2005, Under a support from the Global Environment Facility, the Forestry Commission converted 30 Forest Reserves in the high forest covering about 130,000 ha into a Globally Significant Biodiversity Areas (GSBAs). This figure represent either a whole forest reserve or part of a forest reserve. Most of the areas converted were originally in some form of protection or were timber production areas</p>	N/A
Forest area within protected areas	They area equal to Biodiversity conservation area.	N/A

Other general comments to the table

N/A

7. What is the area of forest affected by woody invasive species?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

7.1 Categories and definitions

Category	Definition
Invasive species	Species that are non-native to a particular ecosystem and whose introduction and spread cause, or are likely to cause, socio-cultural, economic or environmental harm or harm to human health.

7.2 National data

7.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Dr. P. Bosu Forest Research Institute Of Ghana (FORIG)	Disturbances affecting Forest Health and Vitality	2005	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

7.2.2 Classification and definitions

National class	Definition
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

7.2.3 Original data

Deductions made from Production and Mapping Departments of Resource Management Support Centre, Ghana Forestry Commission about forest reserves invaded by <i>Broussonetia papyrifera</i> and their extent in the off reserve areas since 1990						
		Area (ha)				
Reserve	Area (Ha)	1990	2000	2005	2010	2015

Amama Shelterbelt	4400	0	0	0	0	1100
Asukese	26500	0	0	0	6625	6625
Bosumkese	13830	0	0	2074.5	3457.5	3457.5
Aparapi	1920	384	384	384	480	480
Asubima	7870	1967.5	2754.5	3541.5	3541.5	0
Afremesu	7250	1812.5	2537.5	3262.5	3625	4350
Mankrang	8560	2140	2996	3852	4280	5136
Afram Headwaters	20120	12072	14084	12072	12072	15090
Opro River	12920	3230	4522	5814	6460	7752
Kwamisa	8290	829	2901.5	3730.5	4145	4974
Sub Total On Reserve	111660	22435	30180	34731	44686	48965
Off Reserve		1122	1509	3473	8937	12241
Grand Total		23557	31688	38204	53623	61206

Percentage spread in individual forest reserves by reporting year was arrived at using expert advice.

The spread has gone beyond the boundaries of forest reserves, expert advice suggest that the off reserve area spread is about half (55,830 ha) of the total spread in forest reserves.

7.3 Analysis and processing of national data

7.3.1 Adjustment

Species	Area ha				
	1990	2000	2005	2010	2015
Broussonetia papyverifera	23 557	31 688	38 204	53 625	61 206

7.3.2 Estimation and forecasting

7.3.3 Reclassification

7.4 Data

Table 7

Scientific name of woody invasive species	Forest area affected (000 ha)	
	2005	2010
Broussonetia papyrifera	38.2	53.6
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
Total	38.2	53.6

Tiers

Category	Tier for status	Tier for reported trend
Invasive species	Tier 1	Tier 1

Tier Criteria

Category	Tier for status	Tier for reported trend
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Invasive species	Tier 3: Systematic assessment in forest inventory or other survey (e.g. by conservation department) within the last 5 years) Tier 2: Systematic assessment in forest inventory or other survey (e.g. by conservation department conducted more than 5 years ago) Tier 1: Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other
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7.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Invasive species	N/A	The off reserve areas have been included in the spread of <i>Broussonetia papyverifera</i> invasion in the generation of the estimates

Other general comments to the table
N/A

8. How much forest area is damaged each year?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

8.1 Categories and definitions

Category	Definition
Number of fires	Number of fires per year
Burned area	Area burned per year
Outbreaks of insects	A detectable reduction in forest health caused by a sudden increase in numbers of harmful insects.
Outbreaks of diseases	A detectable reduction in forest health caused by a sudden increase in numbers of harmful pathogens, such as bacteria, fungi, phytoplasma or virus.
Severe weather events	Damage caused severe weather events, such as snow, storm, drought, etc.

8.2 National data

8.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	FAOSTAT	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

8.2.2 Classification and definitions

National class	Definition
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

8.2.3 Original data

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8.3 Analysis and processing of national data

8.3.1 Adjustment

8.3.2 Estimation and forecasting

8.3.3 Reclassification

8.4 Data

Table 8a

Category		000 ha, number of fires									
		2003		2004		2005		2006		2007	
		000 ha	#	000 ha	#	000 ha	#	000 ha	#	000 ha	#
	Total land area burned	5814.75	N/A	3421.11	N/A	6022.27	N/A	5882.63	N/A	4140.79	N/A
	... of which forest area burned	33.21	N/A	2.8	N/A	13.78	N/A	7.23	N/A	10.94	N/A
Category		2008		2009		2010		2011		2012	
		000 ha	#	000 ha	#	000 ha	#	000 ha	#	000 ha	#
	Total land area burned	5352.31	N/A	5623.09	N/A	4221.52	N/A	4666.39	N/A	3258.95	N/A
	... of which forest area burned	43.65	N/A	16.98	N/A	5.89	N/A	6.06	N/A	4.64	N/A

Table 8b

Outbreak category	Description/name	Year(s) of latest outbreak	Area damaged (000 hectares)
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Outbreak category

1 Insects

2 Diseases

3 Severe weather events

Tiers

Category	Tier for status	Tier for trend
Area affected by fire	Tier 2	Tier 2
<ul style="list-style-type: none"> • Insects • Diseases • Severe weather events 	Tier 1	Tier 1

Tier criteria

Category	Tier for status	Tier for reported trend
Burned area	Tier 3 : National fire monitoring routines Tier 2 : Remote sensing surveys Tier 1 : Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other
<ul style="list-style-type: none"> • Insects • Diseases • Severe weather events 	Tier 3 : Systematic survey (e.g. via inventory or aerial damage assessment) Tier 2 : Management records Tier 1 : Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

8.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
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Burned area	N/A	The estimates were obtained from FAO
Insects	N/A	N/A
Diseases	N/A	N/A
Severe weather events	N/A	N/A

Other general comments to the table

N/A

9. What is the forest area with reduced canopy cover?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

Category	Definition
Reduction in canopy cover	Forest that has undergone a reduction of canopy cover of more than 20% between the years 2000 and 2010 within the forest canopy cover range of 30-80% as detected by the MODIS VCF sensor.

Table 9

Category	Area of forest with reduced canopy cover (000 ha)
Reduction in canopy cover	531.4

Tiers

Category	Tier for reported trend
Reduction in canopy cover	Tier 3

Tier criteria

Category	Tier for reported trend
Reduction in canopy cover	Tier 3 : Remote sensing with ground truthing and/or Landsat imagery Tier 2 : Remote sensing using Modis (using pre-filled data provided by FAO) Tier 1 : Expert opinion

Comments

Category	Comments related to data definitions etc
Reduction in canopy cover	N/A

Other general comments

<p>Under the Forest Preservation Programme (FPP) in Ghana, the forestland was sub divided into two categories based on canopy cover. These</p> <ol style="list-style-type: none"> 1. Closed (Dense) Forest where the forest canopy cover is greater than 60% 2. Open Forest where the forest canopy cover is between 15% and 60% <p>Between 2000 and 2010, the closed forest reduced from 2,317,165.7 ha to 1,785,801.6 ha. This difference was used for the estimation of area reduced in canopy cover between the period.</p>

10. What forest policy and regulatory framework exists to support implementation of sustainable forest management SFM?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

10.1 Categories and definitions

Category	Definition
Policies supporting sustainable forest management	Policies or strategies that explicitly encourage sustainable forest management.
Legislation and regulations supporting sustainable forest management	Legislation and regulations that govern and guide sustainable forest management, operations and use.

10.2 National data

10.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Ghana Government Policy Document, Ministry of Lands and Natural Resources	Policy	1948 and Revised in 1955	Revised twice
2	Forest Lands of Ghana	Regislation	Since 1906	Variously amended
3	Forest Lands of Ghana	Regulation	1906	variously amended
4	Forest and Wildlife Policy	Policy	1994	N/A
5	Oduro et al, One hundred years of forestry in Ghana. Ghana journal on forestry, Vol 27 pp15-32	Paper	2011	N/A

10.2.2 Classification and definitions

National class	Definition
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

10.2.3 Original data

10.3 Data

Table 10

Category				
	National	Sub-national		
		Regional	Provincial/State	Local
Policies supporting sustainable forest management	yes	yes	yes	yes
... of which, in <u>publicly</u> owned forests	yes	yes	yes	yes
... of which, in <u>privately</u> owned forests	no	no	no	no
Legislation and regulations supporting sustainable forest management	yes	yes	yes	yes
... of which, in <u>publicly</u> owned forests	yes	yes	yes	yes
... of which, in <u>privately</u> owned forests	no		no	no

10.4 Comments

Variable / category	Comments related to data definitions etc
Policies supporting sustainable forest management	N/A
Legislation and regulations supporting sustainable forest management	N/A

Other general comments

11. Is there a national platform that promotes stakeholder participation in forest policy development?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

11.1 Categories and definitions

Category	Definition
National stakeholder platform	A recognized procedure that a broad range of stakeholders can use to provide opinions, suggestions, analysis, recommendations and other input into the development of national forest policy.

11.2 National data

11.2.1 Data sources

	References to sources of information	Years	Additional comments
1	Facilitating stakeholder structure and processes for Voluntary Partnership Agreement (VPA) implementation in Ghana	2013	It contributes to enhancing participation in community based interventions associated with forest management, timber harvesting, decision making process and more importantly the roles and responsibilities of stakeholders including forest fringe communities in the management of the forest resources
2	Capacity building of Civil Society Organisations and communities in VPA implementation	2013	It aims at expanding the knowledge of legal timber and sustainable management of the forest resources using experiences gained in FAO-ACP/ FLEGT projects to the informal sector
3	Guidelines for the establishment and management Modified Taungya Farmer Groups (MOTAG)	2011	It contributes to the understanding of participatory forestry and more importantly encouraging farmers to form groups for effective functioning process. It also protects social order based on principles of equality, gender balance and opportunities for all
4	Operational guidelines on Community Forest Management Committees	2000	It provides information on how to set up management structure for implementation of community forestry programmes

Table 11

Is there a national platform that promotes or allows for stakeholder participation in forest policy development?	yes
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11.3 Comments

Category	Comments related to data definitions etc
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National stakeholder platform	There is a national platform called, National Forestry Forum of Ghana (NFFG). The platform is for discussing critical issues identified in the management of forestry in Ghana, particularly from the regions, districts and the small communities with the aim of enhancing quality policy formulation, promoting good governance and sustainable forest management
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Other general comments

The NFF of Ghana facilitates access to information to other stakeholders such as Forest Fringe Communities, Farmers affected by logging operations etc. Information such as forest policies and decisions emanating from other stakeholders such as Forestry Commission, Loggers and Timber Companies associations, Land Owners, Ministries and Departments are sought and provided to the less privileged stakeholders.

They create an avenue for awareness on critical issues relating to the environment in general, and as a result reduce tension and conflicts among stakeholders

The forum over the years has also been actively involved in the identification of relevant actors to participate in formulation and development of policies and guidelines associated with forestry and the environment in general

12. What is the forest area intended to be in permanent forest land use and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

12.1 Categories and definitions

Category	Definition
Forest area intended to be in permanent forest land use	Forest area that is designated or expected to be retained as forest and is highly unlikely to be converted to other land use.
...of which permanent forest estate (<i>sub-category</i>)	Forest area that is designated by law or regulation to be retained as forest and may not be converted to other land use.

12.2 National data

12.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Agyarko. T. Forestry Outlook Study for Africa. Ghana, Ministry of Land and Forestry	Forest designation	N/A	N/A
2	Forest Reserves and National Parks of Ghana, GIS & Remote Sensing Unit, Resource Management Support Centre, Forestry Commission Kumasi Ghana	Forest and Wildlife Reserves	2013	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

12.2.2 Classification and definitions

National class	Definition
Forest Services Division (FSD) of Forestry Commission Forest Reserves	These are permanent government designated forest reserves controlled and managed by FSD of Forestry Commission of Ghana
Wildlife Division (WD) of Forestry Commission National Parks, Game Production Reserves and Strict Nature Reserves	These are permanent government designated National Parks, Game Production Reserves, Strict Nature Reserves and Animal Sanctuaries controlled and managed by WD of Forestry Commission of Ghana

Other Protected Forest Areas (Sacred Groves)	These are predominantly Sacred Groves made up of fragments of varying sizes which are communally protected and which usually have a significant religious connotation for the protecting community
N/A	N/A

12.2.3 Original data

Description	Total Numbers	Total Area (ha)
FSD Forest Reserves	291	2,570,406
WD Parks, Game and Sanctuaries	16	1,348,900
Other Protected Areas (Sacred Groves)		623,694
Total	307	4,543,000

Source, RMSC, Forestry Commission Kumasi Ghana

12.3 Analysis and processing of national data

12.3.1 Adjustment



All FSD and WD of Forestry Commission Forest Reserves, National Parks, Game Production Reserves and Animal Sanctuaries are permanent government protected areas backed by law are supposed to be maintained, managed for their various purposes that established it and preserved at all times. The Sacred Groves cannot be comparable to the Government lands and are not protected by any legislation. They are threatened because some of them are very close to settlements and depending on the pressure for infrastructural development may lose its protection.

12.3.2 Estimation and forecasting

12.3.3 Reclassification

12.4 Data

Table 12

Categories		Forest area 2010 (000 ha)
	Forest area intended to be in permanent forest land use	4543
	... of which permanent forest estate	3919.3

Tiers

Category	Tier for status
Forest area intended to be in permanent forest land use	Tier 3
Permanent forest estate	Tier 3

Tier Criteria

Category	Tier for status
Forest area intended to be in permanent forest land use	Tier 3 : National or sub-national land use plans strategy documents or other reports within the past 10 years Tier 2 : National or sub-national land use plans strategy documents or other reports within the past 20 years Tier 1 : Other
Permanent forest estate	Tier 3 : National or sub-national land use plans strategy documents or other reports within the past 10 years Tier 2 : National or sub-national land use plans strategy documents or other reports within the past 20 years Tier 1 : Other

12.5 Comments

Category	Comments related to data definitions etc
Forest area intended to be in permanent forest land use	N/A
Permanent forest estate	Apart from the Sacred Groves, the reserves under government control have remained permanent over the years

Other general comments

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13. How does your country measure and report progress towards SFM at the national level?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

13.1 Categories and definitions

Category	Definition
Forest area monitored under a national forest monitoring framework	Forest area monitored by a national monitoring framework or systems that provide measurement based periodic monitoring of forest extent and quality.
Forest reporting at national scale	National reporting of forest extent and characteristics that includes some measure of progress toward sustainable forest management.

13.2 National data

13.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Report on mapping of forest cover and carbon stock in Ghana. PASCO Corporation in collaboration with Forestry Commission Resource Management Support Centre, Forestry Research Institute of Ghana and Soil Research Institute of Ghana	Forest cover	2013	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

13.2.2 Classification and definitions

National class	Definition
Forest land	All land with woody vegetation spanning a minimum mapping unit of 1 ha with 15% minimum crown cover and the trees having a potential of reaching 5 m high or more at maturity
Closed Forest	All land with woody vegetation spanning a minimum mapping unit of 1 ha with 60% minimum crown cover and the trees having a potential of reaching 5 m high or more at maturity
Open Forest	All land with woody vegetation spanning a minimum mapping unit of 1 ha with crown cover between 15% and 60% and the trees having a potential of reaching 5 m high or more at maturity

N/A	N/A
-----	-----

13.3 Data

Table 13a

Category	% of total forest area	Most recent year	Check all boxes that apply					
			Continuous	Periodic	Permanent ground plots	Temporary ground plots	Aerial/remote sensing sample based	Aerial/remote sensing full coverage
Forest inventory	38.5	2013	no	no	yes	no	yes	no
Other field assessments	N/A	N/A						
Updates to other sources	N/A	N/A						
Expert estimate	N/A	N/A						

Table 13b

Type of forest reporting used at national scale	Check boxes that apply
1 Criteria and Indicators reporting	yes
2 Periodic national state of the forest report	
3 Other (please document)	
4 None	

Other type of forest reporting
N/A

13.4 Comments

Category	Comments
N/A	N/A
N/A	N/A
N/A	N/A

Other general comments

According to estimates generated from FPP report, the forest cover has been increasing even though forest degradation is going on in the closed forest areas as shown from the results in the Table below:

Year	Area In ha		
	Closed Forest	Open Forest	Combined Forest Land
1990	2,704,422	5,922,980	8,627,402
2000	2,317,166	6,591,441	8,908,607
2010	1,785,802	7,409,335	9,195,137

14. What is the area of forest under a forest management plan and how is this monitored?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

14.1 Categories and definitions

Category	Definition
Forest area with management plan	Forest area that has a long-term documented management plan, aiming at defined management goals which is periodically revised
...of which for production (<i>sub-category</i>)	Forest management plan mainly focused on production
...of which for conservation (<i>sub-category</i>)	Forest management plan mainly focused on conservation
Monitoring of forest management plans	Government monitoring of forest management plan implementation conducted through field visits or audits of forest management plan performance

14.2 National data

14.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Agyarko. T. Forestry Outlook Study for Africa. Ghana, Ministry of Land and Forestry	Forest designation	N/A	N/A
2	Reserve Management Plans for 30 Globally Significant Biodiversity Areas (GSBAs) in Ghana. Environmental Conservation Unit of Resource Management Support Centre, Forestry Commission	Forest Protection	2007	N/A
3	Report on Management Plans covering 20 priority Forest Reserves in Ghana. Resource Management Support Centre, Forestry Commission	Management Plans	2009	N/A
4	Management Plans for 10 Forest Reserves in the High Forest Zone of Ghana	Management Plans	2011	N/A

14.3 Data

Table 14a

Forest plan type	Forest area 2010 (000 ha)
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Forest area with management plan	896.9
... of which for production	766.6
... of which for conservation	130

Table 14b

Indicate which (if any) of the following are required in forest management plans in your country	
1 Soil and water management	yes
2 High conservation value forest delineation	yes
3 Social considerations community involvement	yes

Table 14c

Percent of area under forest management plan that is monitored annually	100
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Tiers

Category	Tier for status
Forest area with management plan	Tier 3
Percent of area under forest management plan that is monitored annually	Tier 1

Tier criteria

Category	Tier for status
Forest area with management plan	Tier 3 : Reports that describe national records 5 years old or less that contain long-term forest monitoring plans Tier 2 : Industry or other records indicating the presence of a long-term forest management plan Tier 1 : Other
Percent of area under forest management plan that is monitored annually	Tier 3 : Government documentation of monitoring extent Tier 2 : Reports from forest managers or other documental sources Tier 1 : Other

14.4 Comments

Category	Comments
Forest area with management plan	N/A
The management plans for all the 30 GSBA sites are about to expire. The plans have been earmarked for review in 2014	N/A
N/A	N/A

Other general comments

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15. How are stakeholders involved in the management decision making for publicly owned forests?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

15.1 Categories and definitions

Category	Definition
Stakeholder involvement	Stakeholder involvement is defined as significant inputs into at least one aspect of forest management at the operational scale

Table 15

Please indicate the type of stakeholder involvement in forest management decision making required in your country	
1. Planning phase	
2. Operations phase	
3. Review of operations	

Tiers

Category	Tier for status
Type of stakeholder inputs	N/A

Tier criteria

Category	Tier for status
Type of stakeholder inputs	Tier 3 : Government (national or sub-national) documentation of stakeholder inputs Tier 2 : Government (national or subnational) requirement but stakeholder inputs not documented Tier 1 : Other

15.2 Comments

Category	Comments
N/A	N/A
N/A	N/A
N/A	N/A

Other general comments

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16. What is the area of forest under an independently verified forest certification scheme?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

16.1 Categories and definitions

Category	Definition
FSC certification	Forest area certified under the Forest Stewardship Council certification scheme
PEFC certification	Forest area certified under the Programme for the Endorsement of Forest Certification scheme
Other international forest management certification	Forest area certified under an international forest management certification scheme with published standards and is independently verified by a third-party, excluding FSC and PEFC certification.
Certified forest area using a domestic forest management certification scheme	Area certified under a forest management certification scheme with published standards that are nationally recognized and independently verified by a thirdparty

16.2 Data

Table 16a













International forest management certification		Forest area (000 ha)						
		2000	2001	2002	2003	2004	2005	2006
	FSC	0	0	0	0	0	0	0
	PEFC	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0
		2007	2008	2009	2010	2011	2012	
	FSC	0	0	150.51	1.78	242.42	1.57	
	PEFC	0	0	0	0	0	0	
	Other	0	0	0	0	0	0	

Table 16b

Domestic forest management certification		Forest area (000 ha)						
		2000	2001	2002	2003	2004	2005	2006
	N/A	0	0	0	0	0	0	0
	N/A	0	0	0	0	0	0	0
	N/A	0	0	0	0	0	0	0

		2007	2008	2009	2010	2011	2012	
		0	0	0	0	0	0	
		0	0	0	0	0	0	
		0	0	0	0	0	0	

Tier criteria

Category	Tier for status
International forest management certification	Tier 3: International forest management scheme records maintained by the certifying organization for the reporting year Tier 2: International forest management scheme records reported by the certifying organization for a period 2 years prior to the reporting year Tier: 1 Other
Domestic forest management certification	Tier 3: National registry reports for domestic forest management certification maintained by the certifying organization for the reporting year Tier 2: Domestic forest management scheme records reported by the certifying organization for a period 2 years prior to the reporting year Tier: 1 Other

Tiers

Category	Tier for status
International forest management certification	Tier 3
Domestic forest management certification	N/A

16.3 Comments

Category	Comments related to data definitions etc
Certified forest area using an international forest management certification scheme	N/A
Domestic forest management certification	N/A

Other general comments

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17. How much money do governments collect from and spend on forests?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

17.1 Categories and definitions

Category	Definition
Forest revenue	All government revenue collected from the domestic production and trade of forest products and services. For this purpose revenue include: <ul style="list-style-type: none"> • <u>Goods</u> : roundwood; sawnwood; biomass; woodbased panels; pulp and paper and non-wood forest products. • <u>Services</u> : including concession fees and royalties, stumpage payments, public timber sales revenue taxes and charges based on forest area or yield, taxes on domestic trade and export of forest products, special levies on forestry activities and payments into forest related funds, other miscellaneous inspection, licence and administrative fees levied by forest administrations, permit and licence fees for recreation and other forest related activities.
Public expenditure on forestry	All government expenditure on forest related activities.

17.2 National data

17.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

17.3 Data

Table 17

Category	Revenues / expenditures (000 local currency)		
	2000	2005	2010
Forest revenue	N/A	N/A	N/A
Public expenditure on forestry	N/A	N/A	N/A
	2000	2005	2010
Name of Local Currency	Cedis	N/A	N/A

17.4 Comments

Category	Comments related to data definitions etc
Forest revenue	N/A
Public expenditure on forestry	N/A
Other general comments	N/A

Other general comments

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18. Who owns and manages the forests and how has this changed?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

18.1 Categories and definitions

Category	Definition
Public ownership	Forest owned by the State or administrative units of the public administration or by institutions or corporations owned by the public administration.
...of which owned by the state at national scale (<i>sub-category</i>)	Forest owned by the State at the national scale or administrative units of the public administration or by institutions or corporations owned by the public administration.
...of which owned by the state at the sub-national government scale (<i>sub-category</i>)	Forest owned by the State at the sub-national government scale or administrative units of the public administration or by institutions or corporations owned by the public administration.
Private ownership	Forest owned by individuals, families, communities, private cooperatives corporations and other business entities, private, religious and educational institutions, pension or investment funds, NGOs, nature conservation associations and other private institutions.
...of which individuals (<i>sub-category</i>)	Forest owned by individuals and families.
...of which private business entities and institutions (<i>sub-category</i>)	Forest owned by private corporations cooperatives companies and other business entities as well as private nonprofit organizations such as NGOs nature conservation associations, and private religious and educational institutions etc.
...of which local tribal and indigenous communities (<i>sub-category</i>)	Forest owned by a group of individuals belonging to the same community residing within or in the vicinity of a forest area or forest owned by communities of indigenous or tribal people The community members are coowners that share exclusive rights and duties and benefits contribute to the community development.
Unknown ownership	Forest area where ownership is unknown includes areas where ownership is unclear or disputed.
Categories related to management rights of public forests	Definition
Public Administration	The Public Administration (or institutions or corporations owned by the Public Administration) retains management rights and responsibilities within the limits specified by the legislation.
Individuals households	Forest management rights and responsibilities are transferred from the Public Administration to individuals or households through long-term leases or management agreements.
Private companies	Forest management rights and responsibilities are transferred from the Public Administration to corporations, other business entities private cooperatives, private nonprofit institutions and associations, etc., through long-term leases or management agreements.
Communities	Forest management rights and responsibilities are transferred from the Public Administration to local communities (including indigenous and tribal communities) through long-term leases or management agreements.
Other form of management rights	Forests for which the transfer of management rights does not belong to any of the categories mentioned above.

18.2 National data

18.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Article 267 of the Constitution of the Republic of Ghana	Ownership of Land	1992	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

18.2.2 Classification and definitions

National class	Definition
Communal / Customary Ownership	Land owned by communes under the traditional Social system, where all stool lands in practice belong to the paramount chiefs who are traditional heads of paramount stools or skins.
Public (Government) Ownership	Land belonging to the state, acquired by legislation and vested for the people of Ghana
Individual Ownership	Land owned by individuals purchased from Traditional rulers and government or state
N/A	N/A

18.2.3 Original data

There is one main type of land ownership in Ghana, which is the Communal or Customary Ownership. Lands in Ghana are owned by the traditional rulers and held in trust for them by the state. Article 267 of the Ghanaian constitution stipulates, “All stool lands in Ghana shall vest in the appropriate stool on behalf of and in trust for the subjects of the stool, in accordance with the customary law and usage”. All land is therefore considered to be under public ownership.

18.3 Analysis and processing of national data

18.3.1 Adjustment

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18.3.2 Estimation and forecasting

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18.3.3 Reclassification

18.4 Data

Table 18a

Categories		Forest area (1000 hectares)			
		1990	2000	2005	2010
	Public ownership	8627	8909	9053	9195
	... of which owned by the state at national scale	N/A	N/A	N/A	0
	... of which owned by the state at the sub-national government scale	N/A	N/A	N/A	0
	Private ownership	0	0	0	0
	... of which owned by individuals	0	0	0	0
	... of which owned by private business entities and institutions	0	0	0	0
	... of which owned by local, tribal and indigenous communities	0	0	0	0
	Unknown ownership	0	0	0	0
TOTAL		8627.00	8909.00	9053.00	9195.00

Tiers

Category	Tier for status	Tier for reported trend
Public ownership	Tier 3	Tier 3
Private ownership	Tier 2	Tier 2
Unknown ownership	Tier 1	Tier 1

Tier criteria

Category	Tier for status	Tier for reported trend
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Ownership	Tier 3: National forestry statistics registers of land titles or maps on land ownership or all forest area under one ownership category that is five years old or less. Tier 2: National forestry statistics registers of land titles or maps on land ownership or questionnaires that are more than five years old. Tier 1: Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other
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Table 18b - Holder of management rights of public forests

Categories	Forest area (000 hectares)			
	1990	2000	2005	2010
Public Administration	N/A	N/A	N/A	N/A
Individuals	N/A	N/A	N/A	N/A
Private companies	N/A	N/A	N/A	N/A
Communities	N/A	N/A	N/A	N/A
Other	N/A	N/A	N/A	N/A
TOTAL	.00	.00	.00	.00

Category	Tier for reported trend	Tier for status
Public Administration	N/A	N/A
Individuals	N/A	N/A
Private companies	N/A	N/A
Communities	N/A	N/A
Other	N/A	N/A

18.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Public ownership	In Ghana, Forest and Forest Lands are owned publicly.	N/A
Private ownership	N/A	N/A
Unknown ownership	N/A	N/A
Management rights	N/A	N/A

Other general comments to the table
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N/A

19. How many people are directly employed in forestry?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

19.1 Categories and definitions

Category	Definition
Full-time equivalents (FTE)	A measurement equal to one person working full-time during a specified reference period.
Employment in forestry	Employment in activities related to production of goods derived from forests. This category corresponds to the ISIC/NACE Rev. 4 activity A02 (Forestry and logging).

19.2 National data

19.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Ghana Timber Association (G.T.A)	1990 - 2005	N/A	N/A
2	Ghana Timber Millers Organization (G.T.M.O)	1990 - 2005	N/A	N/A
3	Forestry Commissions presentation to Ghana Fair Wages and Salaries Commission	Forestry Commission Workforce	2013	N/A
4	N/A	N/A	N/A	N/A

19.2.2 Classification and definitions

National class	Definition
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A



19.2.3 Original data

Sector	Total	Comments
Cooperate HeadOffice	91	

Forest Services Division	2316	
Wildlife Services Division	922	
Timber Industry Development Division	223	
Total	3552	

19.3 Data

Table 19

Category		Employment (000 years FTE)			
		1990	2000	2005	2010
	Employment in forestry	2.5	2	3	3.552
	... of which female	N/A	N/A	N/A	N/A

19.4 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Employment in forestry	Refers to Paid employment.	N/A

Other general comments to the table

According to the information obtained from FAO (Contribution of the forest sector to national economies, 1990-2006) forestry employment seems quite stable, since 1990, with an estimated 10 000 persons.

20. What is the contribution of forestry to Gross Domestic Product (GDP)?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

20.1 Categories and definitions

Category	Definition
Gross value added from forestry (at basic prices)	This category corresponds to the ISIC/NACE Rev. 4 activity A02 (Forestry and logging).

20.2 Data

Table 20 (Pre-filled data from UNdata/EUROSTAT)

Category	Million	Currency	Year for latest available information
Gross value added from forestry (at basic prices)	1549	Cedi (Third)	2011

20.3 Comments

Category	Comments
Gross value added from forestry (at basic prices)	N/A

Other general comments

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21. What is forest area likely to be in the future

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

21.1 Categories and definitions

Category	Definition
Government target/aspiration for forest area	Government target/aspiration for forest area for a specific year.
Forests earmarked for conversion	Forest area that is allocated/classified or scheduled to be converted into non-forest uses.

21.2 National data

21.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	National Forest Planatation Development Programme. Annual Report, Forestry Commission	Forest Area converted to Plantation	2012	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

21.3 Data

Table 21a

Category	Forest area (000 ha)	
	2020	2030
Government target/aspiration for forest area	9364.6	9534.1

Table 21b

Category	Forest area (000 ha)
	2013
Forests earmarked for conversion	14

21.4 Comments

Category	Comments
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<p>Government target/aspiration for forest area</p>	<p>Between 2002 and 2012, a total of 169,490 ha of plantations were established under a National Forest Plantation Development Programme (NFPDP). This means that an average of 16,949 ha were established each year. Now if this rate continues then original government target of 20000 ha per annum originally set can be reviewed to 16,949 ha. This has been used to estimate the 2020 and 2030 projection. The forest area as at 2010 (FPP 2012 source) is 9,195,137 ha as a baseline</p>
<p>Forests earmarked for conversion</p>	<p>Form Ghana a private plantation development company has earmarked to plant 14000 ha of Tain 11 Forest Reserve.</p>

Other general comments