Forest statistics in the FDES

Topics 1.2.3: Forests, 2.3.2: Use of forest land, 2.5.1: Timber resources, and 2.5.5: Other non-cultivated biological resources of the Basic Set of Environment Statistics of the FDES 2013



Taller Nacional de Estadísticas Ambientales y de Cambio Climático en Perú Lima, 13-15 Desembre 2022

Environment Statistics Section, United Nations Statistics Division



Forest statistics (4 Topic)



- 1. Objectives
- 2. Review of Level 0
- 3. Level 1 (Compilers)
 - Key statistical concepts
- 4. Level 2 (Data providers)
 - Data options, examples & issues
- 5. Closing Discussion



Environment Statistics Section, United Nations Statistics Division



'We can't live without forests'

Eight thousand years ago, half of the Earth's land surface was covered by forests or wooded areas. Today, these areas represent less than one third. Forests are home to 80% of the world's land-based biodiversity and billions of dollars worth of medicinal plants are harvested from tropical forests every year. In addition, **1.6 billion people** depend on them to some extent for their livelihoods.

FAO (http://www.fao.org/zhc/detail-events/en/c/262862/)

evel 0

'Forest is 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' FAO (2018) Global Forest Resources Assessment 2020: Terms and Definitions (FRA 2020) (http://www.fao.org/3/l8661EN/i8661en.pdf)



Level 0

- Policy context: global climate regulation, climate change mitigation, multiple ecosystem services, biodiversity, REDD+
- Uses: evidence to support policies, from local to global
- Needs: globally, the extent of the world's forests continues to decline as human populations continue to grow and demand for food and land increases
- Gaps: despite great advance in mapping/inventory technology, uncertainties and data gaps remain: e.g. on biomass, forest composition





SDGs on Forests



Indicator 2.3.1: Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size

Level 0

6 CLEAN WATER AND SANITATION



Indicator 6.6.1: Change in the extent of water-related ecosystems over time

15	life on land

- Indicator 15.1.1: Forest area as a proportion of total land area
- Indicator 15.2.1: Progress towards sustainable forest management
- Indicator 15.b.1: Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems

Statistics and Retaided Information Cemponet Reservented Reservented Reservented Reservented Reservented Subtect of finder reserves Subtect of finder reserves Volume - SEX Central natural of Colspan="2">- SEX Central natural of Colspa	Ø	Æ	11			Con Sub- Topi	nponent 2: Environmental Resou component 2.5: Biological Resources c 2.5.1: Timber resources	rces and their Us	ie				1.	evel (
Image: component 12: 12: 10: 10: 10: 10: 10: 10: 10: 10: 10: 10					Stati (Bole	stics and Related Information d Text - Core Set/Tier 1; Regular Text -	Category of Measurement	Potential Aggregations and	Method Guidano	ological :e	1:1-0			
Component Interest number esources Volume	9	$\langle \Phi \rangle$				lier	2; Italicized Text - Tier 3)		Scales	000	Control			
Component 1: Bailed growth Nature Sub-component Topic 2.3.2 Safe of surges Sub-component Sub-component Topic 2.3.2 Safe of surges Sub-component Sub-component (Bold Text) Topical Sub-component Sub-component (Bold Text) Topical Sub-component Sub-component (Bold Text) Topical Sub-component (Bold Text) Topical Sub-component Sub-component (Bold Text) Topical Sub-component (Bold	6		E	Con	anon	a.	1 Stocks of timber resources	Valuma	 By type (e.g., natural or 	 SEEA Eramow 	central ork (2012)			
Sub-component 1:: Sub-component 2:: Finitiage statistics and character is the national statistic and character is the national statistic and character is the national statistic and the number is thended information is thender is the national statistis and the num				COIL	npon		1.Stocks of timber resources	Volume	nlanted)		DIR (2012)			
Sub-component 1: Topic 2.3.2 Setting Setting Setting Sub-component 1: Ter 2; Itality Sub-component 1: Sub-component 1: Ter 2; Itality Sub-component 2: Sub-component 2: Su							2. Natural growth	Volume	National	 State 	of Europe's			
Topic 2.3.2 Schement Component 1: Biological indicators Topic 2.3.2 (Biol Text : Biological indicators Topic 2.3.2 (Biol Text : Biological (Biol Biol Biol indicators Topic 2.3.2 (Biol Text : Biological (Biol Biol indicators Topic 2.3.2 (Biol indicators Topic 2.3.2 (Biol Text : Topic 2.3.3: Biological Resources Topic 2.5: S: Other non-cultivated biological resources (Biold Text - Core Set7) Topic 2.3.3: Biological Resources Topic 2.3: S: Other non-cultivated biological resources (Biold Text - Core Set7) Topic 2.3.2: Biological Resources Topic 2.3: S: Other non-cultivated biological resources (Biold Text - Core Set7) Topic 2.3.2: D: Other non-cultivated biological resources (Biold Text - Core Set7) Topic 2.3.2: D: Other non-cultivated biological resources (Biold Text - Core Set7) Topic 2.3.2: D: Other non-cultivated biological resources (Biold Text - Core Set7) Topic 2.3.2: D: Other non-cultivated biological resources (Biold Text - Core Set7) Topic 3.2: Corbin Store (Biol Text - Core Set7) Discource (Biol Text - Core Set7) Discoure (Biol Text - Core Set7) Discource (Biol T			A	Sub-	compo		3. Fellings	Volume	 Sub-national 	Forests	Forest			
FDES tal Notice assess volume Volume Bold Text 2. Astronyforcitors 3. Astronyforcitors Volume Bold Text 3. Astronyforcitors Volume Volume Bold Text 3. Astronyforcitors Volume Volume Bold Text 3. Astronyforcitors Volume Volume Sub-component 1: 1: 1. Ar 2. Peticide; (also in 3.4.1.3) Area Mass; Volume Sub-component 1: 2:: 1. Ar 2. Peticide; (also in 3.4.1.3) Area Mass; Volume Sub-component 1: 2:: 1. Ar 2. Peticide; (also in 3.4.1.3) Area Mass; Volume Sub-component 1: 2:: 1. Ar 2. Peticide; (also in 3.4.1.3) Area Mass; Volume Sub-component 1: 2:: 1. Ar 2. Statistics and Related Sub-component 2:5: Sub-component 3:5: Sub-component 3:5: Statistics and Related Sub-component 4:5: <			1111	Topi	<u></u>		4. Relifiorals	Volume		Europe/	UNECE-FAO			
FDES Tal Statistics ar 2. Catastrophy losse Notional (Bold Text, 2 A mean used of: A mean used of: Notional (Bold Text, 2 A mean used of: A mean used of: Notional 3. Use 1. Fertilizer (also in 3.4.1.0) Area, Mass, 4 Sub-component 1.2: Listing the in 3.4.1.0) Area, Mass, 4 3. Use 1. Pertilizer (also in 3.4.1.0) Area, Mass, 4 Sub-component 1.2: Listing the in 3.4.1.0) Area, Mass, 4 3. Use 1. Pertilizer (also in 3.4.1.0) Area, Mass, 4 Sub-component 2.2: Environmental Resources FAO FRA Sub-component 1.2: Listics and Related Sub-component 2.5: Biological Resources Sub-component 3.5: B		E F		торі	C Z.3.Z	·	6 Natural losses	Volume	-	Forestry	and Timber			
Component 1: E 8. Reclassifications Values • National • URCEFAD Loint Working Party on Forest Statistics, Economics and Management and Distance Statistics, Economics and Management and Distance Statistics and Related Information • URCEFAD Loint Working Party on Forest Statistics, Economics and Management and Distance Statistics and Related Information • URCEFAD Loint Working Party on Forest Statistics, Economics and Management and Distance Statistics and Related Information • URCEFAD Loint Working Party on Forest Statistics, Economics and Management and Distance Statistics and Related Information • URCEFAD Loint Working Party on Forest Statistics, Economics and Management and Distance Statistics and Related Information • URCEFAD Loint Working Party on Forest Statistics, Economics and Management and Distance Statistics and Related Information • URCEFAD Loint Working Party on Forest Statistics, Economics and Methodological Context and Context and other • URCEFAD Loint Working Party on Forest Statistics, Economics and Methodological Context and Context and Other Mass, volume • URCEFAD Loint Working Party on Forest Statistics, Economics and Methodological Context and Context and Other Mass, volume • URCEFAD Loint Working Party on Forest Statistics, Economics and Management and Context an			JES tal	Stati	istics a	1	7 Catastrophic losses	Volume		Section)		1ethodolo	ogical	
Component 1: If er 2; Itality a. b. Amount used of: 1. Fertilizers (also in 3.4.1.a) Area, Mass, Volume Nutronal Sub-national Working Party on Forest Statistics Sub-mational Factors Sub-component 1:2: La Sub-component 1.2: La Sub-component 1.2: La Sub-component 2.5: Biological Resources and their Use Statistics and Related (Bold Text - Core Set/ - Topic 2.5.5: Other non-cultivated biological resources Statistics and Related I. Total Methodological Guidance Scales Methodological Guidance (Solo-mational Scales Methodological Guidance Scales Methodological Guidance Scales <t< td=""><td></td><td></td><td></td><td>(Bold</td><td>d Tovt</td><td></td><td>8. Reclassifications</td><td>Volume</td><td></td><td> UNEC </td><td>E/FAO Joint</td><td>uidance</td><td>-</td><td></td></t<>				(Bold	d Tovt		8. Reclassifications	Volume		 UNEC 	E/FAO Joint	uidance	-	
Ter 2; Italia a. Use to set of the set o						b.	Amount used of:		National	Working	g Party on	anddrice		
Component 1: E a. Use (Value Value Etodomics and Maragement Mass, Value FAO FRA UNSD: SDG Sub-component 1.2: La 1. Ar 2. Pesticides (also in 3.4.1b) Yes Face (also in 3.4.1b) Face (also i				Tier	2; Itali	(1. Fertilizers (also in 3.4.1.a)	Area, Mass.	 Sub-national 	Forest S	tatistics,			
Sub-component 1.2: La 2. Pestidades (also in 3.4.1.b) Area, Mass, Volume Wildingenent UNSD: SDG Topic 1.2.3: Forests Component 2: Environmental Resources Sub-component 2.5: Biological Resources Decision 02 Interview Decision 02 Statistics and Related Sub-component 2.5: Biological Resources Topic 1.2.3: Forest Topic 1.2.3: Forest Decision 02 Decision 02 Ter 2: Indicized Text Topic 2.5.5: Other non-cultivated biological resources Decision addition of the second other Potential Aggregations and Guidance the and cultivate of the second other 1. Total 1. Total f. Non-wood forest products and other plants Mass, volume National Sub-cation of the second other 0. Forest area a State of Europe's orest (Free dup forest products on dother plants National 1. Total 0. Forest biomass 1. Total 0. Forest biomass 0. Forest biomass 		Com	ponent 1: E	a.	Use	7		Volume		Econom	ics and	FAO FRA		
Sub-component 1.2: La 1. Ar Volume Indicator (Rev. d) section (Rev				и.	0.50		2. Pesticides (also in 3.4.1.b)	Area, Mass,			ment			
Topic 12.3: Forests Component 2: Environmental Resources and their Use Statistics and Related Sub-component 2.5: Biological Resources Topic 12.3: Forests Topic 2.5.5: Other non-cultivated biological resources Statistics and Related Information Ceegory of Measurement Aggregations and Guidance the and Guidance 1. Total f. Non-wood forest products and other plants Mass, volume Potential Aggregations and Guidance the and class 0230 of d 3. Planted f. Non-wood forest products and other plants Mass, volume Potential Aggregations and Guidance State of Europe's orests (Forest area a state of Europe's orests (Forest biomass i) b. Forest biomass i) State of Europe's orests (Forest function in the imports of forest products Volume • National State of Europe's orest(i) or state of Europe's orest(i) Forest biomass i) State of Europe's orest(i) Forest forest products Forest forest products If Potential Aggregations and Build in the imports of forest products Potential Aggregations and State of Europe's orest() Forest forest () State of Europe's orest() State of Europe's orest() Forest State () Forest () <td< td=""><td></td><td>Sub-co</td><td>omponent 1 2[.] La</td><td></td><td>1. A</td><td>r</td><td>, , , , , , , , , , , , , , , , , , ,</td><td>Volume</td><td></td><td> ISIC K A Divisi </td><td>ev. 4, section</td><td>UNSD: SD</td><td>G</td><td></td></td<>		Sub-co	omponent 1 2 [.] La		1. A	r	, , , , , , , , , , , , , , , , , , ,	Volume		 ISIC K A Divisi 	ev. 4, section	UNSD: SD	G	
Topic 1.2.3: Forests and Related Orgonoment 2.3: Biological Resources Sub-component 2.3: Biological Resources Sub-component 2.3: Biological resources Doess Doess <t< td=""><td>-</td><td></td><td>1 2 2. Ferente</td><td></td><td></td><td></td><td></td><td></td><td></td><td>A, DIVISI</td><td>011 02</td><td>11 1 4</td><td>f 1.1</td><td></td></t<>	-		1 2 2. Ferente							A, DIVISI	011 02	11 1 4	f 1.1	
Statistics and Related Sub-component 2.5: Biological Resources Tier 2; Italizized Text Total Potential Methodological Sub-component 2.5: Biological resources 1. Total Statistics and Related Information Category of Measurement Potential Aggregations and Scales Methodological Guidance the and the and class 0230 the and of d. 2. Natural f. Non-wood forest products and other plants Mass, volume • By type of sub-national ISIC Rev. 4, Section A, Class 0230 of d 5. Forest area a . . Non-wood forest products and other plants Mass, volume • By type of sub-national State of Europe's orests (Forest urope/UNECE-FAO orests tatistics, foronmics and maggrent State of Europe's orests (Forest urope/UNECE-FAO orests (Forest urope/UNECE-FAO orests forest urope/UNECE-FAO orests (Forest urope/UNECE-FAO orests (Forest urope/UNECE-FAO orests (Forest urope/UNECE-FAO orests (Forest urope/UNECE-FAO orests (Forest urope/UNECE-FAO orests (Forest urope/UNECE-FAO orests (Forest urope/UNECE-FAO orests (Forest Statistic orests (Forest S		горіс	1.2.3: Forests	Com	iponei	nt 2:	Environmental Resource	es and their l	Jse					
(Bold Text - Core Set/T - Tier 2; Italicized Text a. Forest area Statistics and Related Information Category of Measurement Potential Aggregations and Scales Methodological Guidance Jp on the and 1. Total f. Non-wood forest products and other plants Mass, volume • By type of product ISIC Rev. 4, Section A, class 0230 of d 5. Forest area a • Sub-national • State of Europe's orests (Forest urope/UNRCE+FAO forest y and Timber ection) State of Europe's orests (Forest urope/UNRCE+FAO forest y and Timber Section) State of forest products State of forest products b. Fore funct Imports of forest products Currency, Mass, Volume • National State of Europe's orests (Forest urope/UNRCE+FAO forest statistics State of Europe's orests (Forest urope/UNRCE+FAO forest statistics State of Europe's orests (Forest urope/UNRCE+FAO forest y and Timber Section) FAO FRA 3.		Statist	ics and Related	Sub-c	compor	nent 2	2.5: Biological Resources							
- Tier 2; Italicized Text - Tier		(Bold	Text - Core Set/T	Topic	255	Otho	r non-cultivated biological res						ocess	
Intel 2, number 2 read Statistics and Related Information Category of Measurement Potential Aggregations and Scales Methodological Guidance The number Guidance a. Forest area f. Non-wood forest products and other plants Mass, volume • By type of rotational ISIC Rev. 4, Section A, Class 0230 of d b. Forest biomass • • • • • • b. Forest biomass •		Tion	Litaliaizad Taut	TOPIC	JIC 2.5.5. Other non-cultivated biological resources								nogu	
a. Forest area Measurement Aggregations and Scales Guidance the 1. Total 1. Total f. Non-wood forest products and other plants Mass, volume • By type of product ISIC Rev. 4, Section A, Class 0230 and 4. Protected for 1.2.2.d) 5. Forest area a • National • Sub-national of d - 5. Forest area a • Forest biomass • Interference • National • Sub-national • State of Europe's orests faistics; Economics and Maagement • State of Europe's orests (Forest urope/UNECE-FAO orestry and Timber ection) • State of Europe's orests (Forest urope/UNECE-FAO orestry and Timber ection) b. Fore - - - Notional • National 1. Total - - - - - - b. Fore - - - - - - 1. Total - - - - - - - b. Fore - - - - - - - 1. Total - - - - - - - - 1. Total - - - - - - - 1. Total - <td< td=""><td>_</td><td>- Her 4</td><td>2; Italicizea Text -</td><td>Statis</td><td>stics an</td><td>d Rel</td><td>ated Information</td><td>Category of</td><td>Potential</td><td></td><td>Methodol</td><td>ogical</td><td></td><td></td></td<>	_	- Her 4	2; Italicizea Text -	Statis	stics an	d Rel	ated Information	Category of	Potential		Methodol	ogical		
1. Total Scales the and the plants 2. Natural f. Non-wood forest products and other plants Mass, volume • By type of product ISIC Rev. 4, Section A, Class 0230 of d 1.2.2.d) . . Sches b. Forest area a biomass .		a.	Forest area					Measurement	t Aggregation	ns and Guidance				
2. Natural f. Non-wood forest products and other plants Mass, volume • By type of product ISIC Rev. 4, Section A, Class 0230 and 3. Planted 4. Protected for 1.2.2.d) • National • Sub-national of d 5. Forest area a • Section Association association association and biomass • Sub-national • National • National b. Forest biomass • Into tal • Sic Rev. 4, Section A, Class 0230 State of Europe's orests (Forest urope's orests (Forest urope/Statistics, Economics and Management biomass of forest products • National • National State of Europe's orests (Forest urope/UNECE-FAO orest urope/UNE			1. Total		f New wood f			Mass volum	Scales				the	
2. Natural 1. Non-wood greet products and other Mass, volume - By type of product Iste Kev. 4, Section A, Class 0230 and of d 3. Planted 4. Protected for 1.2.2.d) - National - Sub-national of d 5. Forest area a b. 5. Forest biomass - - - - - State of Europe's orests (Forest urope/UNECE-FAO orestry and Timber ection) State of Europe's orests (Forest urope/UNECE-FAO orestry and Timber ection) State of Europe's orests (Forest urope/UNECE-FAO orestry and Timber ection) -	-		2. Natural	f			forest products and other		- By type o	of ICIC Dov. 4		and and		
3. Planted product Class 0230 of 4. Protected for National of 5. Forest area a i) State of Europe's 0. Forest biomass i) State of Europe's 1. Total isconstruct inports of forest products inports of forest products Stational b. Fore inports of forest products Volume inports of forest product Statistics b. Fore inports of forest products Currency, ispecification Volume inports of forest product inports of forest products inports of forest product inports of forest products inports of forest product inports of forest products inports of forest product inports of f			2. Natural	plants		von-wood forest products and other		iviass, volume	ву туре о	ISIC Rev. 4		, section A, and		
4. Protected for 1.2.2.d) • National • National of d 5. Forest area a • Forest biomass • UNECE/FAD Joint Working Party on Forest Statistics, biomass • Sub-national • UNECE/FAD Joint Working Party on Forest Statistics, Econometal es and Use • State of Europe's orests (Forest urope/UNECE-FAO orestry and Timber ection) • State of Europe's orests (Forest urope/UNECE-FAO orestry and Timber ection) • Sate of Europe's orests (Forest urope/UNECE-FAO orests (Forest urope/UNECE-FAO orestry and Timber ection) • Sate of Europe's orests (Forest urope/UNECE-FAO orests (Forest urope/UNECE-FAO orestry and Timber ection) • Sate of Europe's orests (Forest urope/UNECE-FAO orestry and Timber ection) 6. Fore func • Forest products • National • National • FAOSTAT database product • FAOSTAT database 7. Exports of forest products Currency, Mass, Volume • By type of product • State of Europe's Forests (Forest Statistics • State of Europe's Statistics • FAOSTAT database 8. * Exports of forest products Currency, Mass, Volume • By type of product • FAOSTAT database • FAOSTAT database 9. • State of Europe's Forests (Forest Forests (Forest Forests (Forest Forests (Protect-FAO Forest y and Timber Section) • HS 2012, Sections • HS 2012, Sections			Planted			S			product	Class 0230				
1.2.2.d) • Sub-national d 5. Forest area a			4. Protected for						 National 				of	
1.2.2.0) 5. Forest area a ;) b. Forest biomass ;) 1. Total			1 2 2 4						 Sub-nation 	onal			4	
5. Forest area a ;) b. Forest biomass 1. Total ;) 2. Carbon stora imports of forest production b. Fore d. Fuelwood production volume • National inter-secretariat inter-secretariat b. Fore d. Fuelwood production volume • National inter-secretariat inter-secretariat vorting Group on Forest forest products f. Exports of forest products Currency, mass, Volume • State of Europe's orestry and Timber State of forest f. Exports of forest products Currency, Mass, Volume • State of Europe's orestry and Timber Statistics orestry and Timber Statistics orest of forest products Currency, Mass, Volume • State of Europe's orests (Forest Forest forest f. Exports of forest products Currency, Mass, Volume • State of Europe's orest of Europe's			1.2.2.0)		<u> </u>								, u	
b. Forest biomass I. Total State of Europe's orests (Forest urope/UNECE-FAO joint Working Party on Forest State of Europe/s) State of Europe's orests (Forest urope/UNECE-FAO joint Working Party on Forest State of Europe/s) State of Europe's orests (Forest urope/UNECE-FAO joint Working Party on Forest State of Europe/s) b. Fore d. Fuelwood production Volume • National • FAO/ITTO/ b. Fore d. Fuelwood production Currency, Mass, Volume • By type of product • FAO/ITTO/ f. Exports of forest products Currency, Mass, Volume • By type of product • State of Europe's forest forest product • FAO/ITTO/ v. f. Exports of forest products Currency, Mass, Volume • By type of product • State of Europe's forest for			5. Forest area a			1	1	1	1	I COMMI	lee		;)	
1. Total 2. Carbon stora Working Party on Forest Statistics, Economics and Management • ISIC Rev. 4, Section A, Division 02 • FAOSTAT database orests (Forest urope/UNECE-FAO orestry and Timber ection) es and Use b. Fore func d. Fuelwood production Volume • National product • FAOSTAT database UNECE/Eurostat Inter-secretariat Working Group on Forest Sector Statistics • State of Europe's Forests (Forest Europe/UNECE-FAO product • FAO FRA 3.		b.	Forest biomass							 UNEC 	E/FAO Joint	State of	Europe's	onmental
1. Total 2. Carbon stora a Forest Statistics, Economics and Management Forest Statistics, Economics and Management urope/UNECE-FAO orestry and Timber ection) urope/UNECE-FAO orestry and Timber ection) b. Fore d. Fuelwood production Volume • National • FAOSTAT database FAO FRA b. Fuelwood production Volume • National • FAOSTAT database FAO FRA Samagement • FAOSTAT database FAO FRA i. Imports of forest products Currency, Mass, Volume • By type of product UNECE/Eurostat UNECE/Eurostat Inter-secretariat Norking Group on Forest Sector Statistics • State of Europe's Forest Sector Statistics • HS 2012, Sections		-	1 Total							Working	Party on	orosts (Eo	roct	es and
2. Carbon stora a Fullwood production Volume - National Fconomics and Management urope/UNECE-FAO orestry and Timber b. Fore d. Fuelwood production Volume - National -FAOSTAT database a FAO FRA b. Fore d. Fuelwood production Currency, Mass, Volume By type of product -FAOSTAT database FAO FRA -A	_		1. TOLAI							Forest S	tatistics,	Ulesis (FU	nest	Use
biomass Image: Sign of the second			2. Carbon stora							Econom	ics and	urope/UN	NECE-FAO	
b. Fore func Imports of forest products Currency, Mass, Volume Faysta database FAO/ITTO/ UNECE/Eurostat Inter-secretariat Working Group on Forest products Currency, Mass, Volume State of Europe's Forest (Forest Europe/UNECE-FAO Forest Section) HS 2012, Sections 3. Residuals			biomass							Manage	ment	orestry ar	nd Timber	
b. Fore func Imports of forest products Imports of forest products Currency, Mass, Volume Fore func Exports of forest products Currency, Mass, Volume Fore forest Sector State of Europe's Forests (Forest Europe/UNECE-FAO Forest Products Europe/UNECE-FAO Forest y and Timber Section) HS 2012, Sections HS 2012, Sections HS 2012, Sections HS 2012, Sections 										 ISIC R A Divisi 	ev. 4, Section	ention)		
b. Fore d. Fuelwood production Volume • National • FAO/INT database func e. Imports of forest products Currency, Mass, Volume • By type of product • FAO/INT database FAO/INTO/INTERCEPTION FAO/INTO/INTERCEPTION Statistics Statistics Statistics Statistics • State of Europe's Forest (NRECE-FAO Forest products • State of Europe's Forest Section • HS 2012, Sections • HS 2012, Sections • HS 2012, Sections • HS 2012, Sections						-				 EAOS 	TAT database	ection		
Image: Section in the individual production Image: Section in the individual product product in the individual product in the individual product prod				b.	Fore	b e	Evelwood production	Volume	National	 FA03 FA0/IT 		FAO FRA	A	
Imports of lotest products Currency, Mass, Volume Difference products Currency, Working Group on Forest Sector Statistics f. Exports of forest products Currency, Mass, Volume Forest Sector Statistics State of Europe's Forests (Forest Europe/UNECE-FAO Forestry and Timber Section) - State of Europe's Forests (Forest Europe/UNECE-FAO Forestry and Timber Section)					func	<u>u.</u>	Imports of forest products	Currency	 National By type of 	LINECE/	Furostat			3.
f. Exports of forest products Currency, Mass, Volume Working Group on Forest Sector Statistics • State of Europe's Forests (Forest Europe/UNECE-FAO Forestry and Timber Section) • • HS 2012, Sections						с.	imports of forest products	Mass. Volume	product	Inter-se	cretariat			Residuals
Mass, Volume Mass, Volume Forest Sector Statistics - State of Europe's Forests (Forest Europe/UNECE-FAO Forestry and Timber Section) - HS 2012, Sections						f.	Exports of forest products	Currency.	produce	Working	Group on			
Statistics • State of Europe's Forests (Forest Europe/UNECE-FAO Forestry and Timber Section) • HS 2012, Sections								Mass, Volume		Forest S	ector			
State of Europe's Forests (Forest Europe/UNECE-FAO Forestry and Timber Section) HS 2012, Sections										Statistic	S			
Forests (Forest Europe/UNECE-FAO Forestry and Timber Section) • HS 2012, Sections										 State 	of Europe's			
Europe/UNECE-FAO Forestry and Timber Section) • HS 2012, Sections										Forests	(Forest			
Forestry and Timber Section) • HS 2012, Sections										Europe/	UNECE-FAO			
Section) • HS 2012, Sections										Forestry	and Timber			
HS 2012, Sections										Section)	12.6.1			
										 HS 20 	12, Sections			



How do forest statistics look like?

Level 0

Basic table template

Topic 1.2.3: Forests

a.	Forest area (also ir	2005	2010	2015			
	1	Area	Area	Area			
	2	Natural	Area	Area	Area		
	3	Area	Area	Area			
	4	Protected forest area (also in 1.2.3.c)					
	5	Forest area affected by fire	Area	Area	Area		
b.	Forest biomass						
	1	Volume	Volume	Volume			
	2	Mass	Mass	Mass			



What do you need to compile forest statistics?

Level 0

- 1. NSDI, GIS platform
- 2. Expertise (EO, forests inventories)
- 3. Forest inventories data (from network of plots)
- 4. Classification(s) and units
- 5. Compilation templates





Level 1: Forest statistics





Level 1: objectives

Get familiar with:

- Key concepts on producing basic forest statistics
- Key definitions and classifications (from MS)
- Data needs and sources (Department of Forestry)
- Aggregation and disaggregation
- Data quality and validating statistics



Input data on forest

1. GIS platform: ArcGIS, qGIS, R, Python

2. EO instruments: ESA Sentinels, NASA MODIS, Landsat

3. Maps

Forest cover, forest composition, at least 2 points in time

Level 1

Forest use and ownership

Admin. units, boundaries

Other helpful spatial data: deforestation, protected areas, infrastructure

4. Ground data and statistics: forest plots



Definitions



- Total (forest area) (FDES 1.2.3.a.1): The total area of forest
- Natural (forest area) (FDES 1.2.3.a.2): Forest predominantly composed of trees established through natural regeneration
- Planted (forest area) (FDES 1.2.3.a.3): The area of forest predominantly composed of trees established through planting and/or deliberate seeding
- Total (forest biomass) (FDES 1.2.3.b.1): .. composed of above-ground, belowground and dead wood biomass = Carbon storage
- Area deforested (FDES 2.3.2.a.1): conversion of forest to other land use
- Area reforested (FDES 2.3.2.a.2): Area of re-establishment of forest through planting and/or deliberate seeding on land classified as forest
- Area afforested (FDES 2.3.2.a.3): Area of establishment of forest through planting and/or deliberate seeding on land that, until then, was under a different land use, implies a transformation of land use from non-forest to forest



Definitions

- Stocks of timber resources (FDES 2.5.1.a.1): The stock of timber resources is defined by the volume of trees, living or dead, and include all trees regardless of diameter, tops of stems, large branches and dead trees lying on the ground that can still be used for timber or fuel
- Forest production (FDES 2.5.1.c) and Fuelwood production (FDES 2.5.1.d): Wood forestry products cover removals of roundwood (including wood fuel and industrial roundwood) and production of wood products (e.g., sawnwood, wood pulp, veneer sheets etc.).
- Imports of forest products (FDES 2.5.1.e)
- Exports of forest products (FDES 2.5.1.f)
- Non-wood forest products and other plants (FDES 2.5.5.f): Goods derived from forests that are tangible and physical objects of biological origin other than wood



eve



Classifications

Level 1

Forest products (FAO/UNECE)

Group 1: Wood in the rough

Group 2: Residues of wood processing; recoverable wood products

Group 3: Wood chips and particles

Group 4: Wood simply worked or processed

Group 5: Wood sawn lengthwise: veneer sheets

Group 6: Wood-based panels (including similar par Table 11.1. Relative extents of different types of Indian forest.

Group 7: Pulp of wood or other ligna-cellulosic ma

Group 8: Paper and paperboard

Group 9: Waste paper

Group 10: Raw, semi-processed and worked cork

- Forest composition:
- Example India

(Champion and Seth (1968)

Forest type	Area (in million hectare)	Percent of total forest area			
Tropical moist evergreen	4.5	5.8			
Tropical moist semievergreen	1.9	2.5			
Tropical moist deciduous	23.3	30.3			
Littoral and Swamp	0.7	0.9			
Tropical dry evergreen	0.1	0,1			
Tropical dry deciduous	29.4	38.2			
Tropical Thorn	05.2	6.7			
Subtropical broad leaved montane wet forest	0.3	0.4			
Subtropical dry evergreen	0.2	0.2			
Subtropical pine	3.7	5.0			
Montane wet temperate	1.6	2.6			
Himalayan moist temperate	2.6	3.4			
Himalayan dry temperate	0.2	0.2			
Subalpine	3.3	4.3			
Moist alpine	-				
Dry alpine	220	<u>1011</u> 5			



From data to statistics

 Forest statistics are usually well developed, by respective National agencies/departments

Level 1

- Additional data processing may be needed to produce forest statistics/accounts using multiple inputs (from different departments)
 - Review and harmonizing definitions and classifications on forest
 - Spatial data corrections and harmonization of input data (common projections, extents, spatial resolution)
 - Conversions for biomass





Aggregation and disaggregation

- Units: parcels (properties); natural communities
- Spatial aspects: forest cover in spatially explicit way, products - national
- Temporal aspects: FRA every 5 years



Level 2: Forest statistics



•1

Level 2

Level 2: key points

1. More conceptual issues:

- Role of statistics in rapidly growing environmental challenges linked to forests: e.g. ecosystem services versus development policies
- Integration, impartiality and quality standards
- one official set of statistics, for multiple uses
- 2. Examples from other countries
- 3. Input data options and sources
 - International data
 - Multiple sources, new methods
 - Metadata
- 4. Data quality and uncertainty



International data sources

High-resolution global maps of 21st-century forest cover change



Source: Hansen, M. C., et al. (2013). "High-resolution global maps of 21stcentury forest cover change." <u>Science **342**(6160): 850-853.</u>



Global Forest Change Published by Hansen, Potapov, Moore, Hancher et al

South from these solves are back of 1 and at losses

Results from time-series analysis of Landsat images characterizing forest extent and change.

Trees are defined as vegetation taller than 5m in height and are expressed as a percentage per output grid cuit as '2000 Percent Tree Cover'. Forest Cover Loss' is defined as a stand-replacement disturbance, or a change from a forest to non-forest tabe, during the period 2000-2018. 'Forest Cover Gain' is defined as the inverse of loss, or a non-forest to forest change entirely within the period 2000–2012. 'Forest Loss Year' is a disaggregation of total 'Forest Loss' to annual time scales.

Reference 2000 and 2018 imagery are median observations from a set of quality assessmentpassed growing season observations.

Download the data.

Reset to default view

Data Products

Forest Loss Year (2018 Highlight)



Water or no data

Other Data Layers Primary Humid Tropical Forests

Background Imagery Year 2000 Bands 5/4/3 V

Example Locations

Forestry and Tornado in Alabama

Zoom to area



Forest inventory data



		(Tre	N es ha ⁻¹)			D (m)			H (m)			Basal area (m² ha ⁻¹)		
Study plot	Beech	Others	Total	Understory all species	Beech	Others	Total	Beech	Others	Total	Beech	Others	Total	
Lang-I ¹	312	17	329	323	0.240	0.536	0.255	20.5	32.6	21.2	21.01	3.97	24.99	
Lang-II ¹	246	17	263	414	0.296	0.357	0.301	22.9	27.9	23.3	23.07	1.93	25.00	
Lang-III	212	4	216	56	0.366	0.307	0.365	26.3	25.7	26.3	31.49	0.30	31.79	
Average "Lanugla"		269				0.307			23.6			27.26		
Hai-I	150	37	187	373	0.442	0.368	0.427	28.0	29.1	28.2	29.94	4.06	34.00	
Hai-II	220	88	308	440	0.274	0.428	0.318	19.3	27.3	21.6	21.31	13.62	34.94	
Hai-III	257	87	344	150	0.288	0.512	0.345	22.2	33.2	25.0	24.39	19.28	43.67	
Hai-T ²	271	63	334	189	0.272	0.461	0.308	21.4*	30.3*	23.1*	22.46	11.70	34.15	
Average "Hainich NP"		293				0.350			24.5			36.69		

1 Land Measurements

- selecting plots
- 2 Measuring Standing Trees
- tree diameters at breast height
- tree heights
- tree age
- 3 Volume Calculations
- using yield and volume tables

4 Estimating Site Stocking and Density

Source: https://forestrypedia.com/what-is-forest-inventory/

Mund, M. (2004). Carbon pools of European beech forests (Fagus sylvatica) under different silvicultural management, Citeseer.

Level 1

New data sources: SAR





Level 2

Discussion points

- 1. What national data and classifications for forests are available for your country?
- 2. What data could you use to create forest statistics?
- 3. What would be the priorities?
- 4. Discuss and report your results







Questions and comments?



Environment Statistics Section, United Nations Statistics Division



Thank you for your attention!

For more information please contact the Environment Statistics Section at the UN Statistics Division:

E-mail: envstats@un.org website: <u>http://unstats.un.org/unsd/ENVIRONMENT/</u>



Environment Statistics Section, United Nations Statistics Division