

INQUIRY 5: HOW WELL ARE WE MANAGING OUR FORESTS WORLDWIDE?

THE SITUATION: In the previous 4 Inquiries, you learned many new things about the world's forests.

- You learned how much of the world's land area is covered in forest according to 3 forest categories (Inquiry 1).
- You learned about biodiversity and the world's forests (Inquiry 2).
- You learned about the benefits provided by the world's forests (Inquiry 3).
- In Inquiry 4, you learned about the role of the world's forests in addressing climate change.

FAO and the National Correspondents collected all of this information to learn something important about the world's forests. They wanted to know how well the world's forests are being managed. They were interested in whether we are making

progress towards managing the world's forests **sustainably**.

As you know, forests provide many benefits to people and to the environment. For forests to provide these benefits into the future, however, they must be managed so that they remain healthy and sustainable.

Although there are many ways to identify what makes forests healthy and sustainable, FAO selected 7 **criteria** and 18 **indicators** (Table 7). The indicators were the **variables** that were measured by FAO and the National Correspondents. Up to three indicators per criterion were identified. (Criterion is the singular form of criteria.)

CRITERION	INDICATOR 1	INDICATOR 2	INDICATOR 3
Extent of Forest Resources	Area of forest in hectares	Volume of trees growing per hectare in cubic meters of wood (Figure 50).	Total carbon being held in the forest in Gt
Biological Diversity	Area of primary forest in hectares	Area of forests managed for the conservation of biological diversity in hectares	Area of forest in protected areas in hectares
Forest Health and Vitality	Area of forest damaged by fire in hectares	Area of forest affected by insect pests in hectares	
Productive Benefits	Area of forest being managed for productive purposes in hectares	Area of planted forests in hectares	Total wood removals in cubic meters (Figure 50)
Protective Benefits	Total area managed primarily for the protection of soil and water in hectares		
Social and Economic Benefits	Area of forest in private ownership in hectares	Employment in the primary production of forest goods and related services in numbers of full time jobs	Total value of wood removals in US dollars
Legal and Policy Framework	Area of forest with a management plan in hectares	Level of employment in public forest organizations in numbers of full time jobs	Number of university students graduating in forestry each year

Table 7. The 7 criteria and 18 indicators used by FAO to evaluate sustainable forest management.

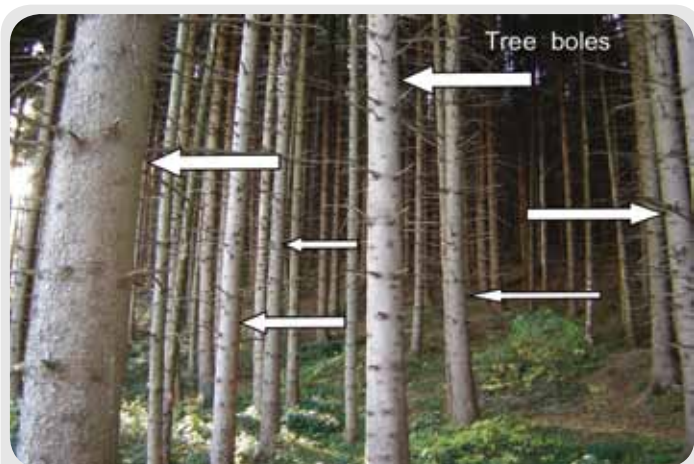


Figure 50. How are cubic meters of wood measured? A tree trunk is called a bole. A bole is essentially a long cylinder. When the volume of a tree is calculated, the branches and twigs are not included. Foresters estimate the amount of wood contained in the tree's bole using a formula based on the bole's diameter and length.

Do you think the volume of wood in a forest is estimated or is an exact figure? Why?

YOU DO THE MATH:

Let's say you are taking a walk in one of the world's forests. You have found a log that is 5 meters long with a diameter of 0.5 meter. What is the volume of the log in cubic meters?

The formula to calculate the volume of a cylinder is $V = \pi * r^2 * L$

where V =Volume, π is pi or 3.14, r =radius (which is one-half of the diameter), 2 = approximate calculation, 2 = squared ($r*r$), L = Length. (Note: * means to multiply.) You cannot calculate exactly how much wood is in this log. When you calculate the volume of a cylinder, it is close but not exact.

REFLECTION SECTION:

Look at the indicators in Table 7. What is similar about every one of the indicators?



Look at the last indicator of Social and Economic benefits. FAO calculated the value of wood removals in United States dollars. What did it have to do with the information from each country before it could report this figure?

WHAT FAO DISCOVERED: Progress toward sustainable forest management is different across the planet. In some regions and subregions, progress is positive; in others more work is necessary (Tables 8 and 9).

FAO and the National Correspondents are committed to collecting and reporting information about how the world's forests are being managed. The world's forests provide important benefits to Earth's citizens and its environment. With information, people can do a better job of sustainably managing the world's forests.

CRITERION	INDICATORS	HOW MUCH INFORMATION WAS AVAILABLE?***	1990 2000	2000 2010
Extent of Forest Resources	Area of forest in hectares	H	▲	▲
	Volume of trees growing per hectare in cubic meters of wood	H	▲	▲
	Total carbon being held in the forest in Gt	H	▲	▲
Biological Diversity	Area of primary forest in hectares	M	▲	▲
	Area of forests managed for the conservation of biological diversity in hectares	H	●	●
	Area of forest in protected areas in hectares	H	●	●
Forest Health and Vitality	Area of forest damaged by fire in hectares	M	●	●
	Area affected by insect pests in hectares	L	●	●
Productive Benefits	Area of forest being managed for productive purposes in hectares	H	▲	▲
	Area of planted forests in hectares	H	●	●
	Total wood removals in cubic meters	H	▲	●
Protective Benefits	Area of forest managed primarily for the protection of soil and water in hectares	H	●	●
Social and Economic Benefits	Level of private forest ownership in hectares	H	●	●
	Total value of wood removals in US\$	M	▲	●
	Employment in the primary production of forest goods and related services in numbers of full time jobs	M	●	▲
Legal and Policy Framework	Area of forest with a management plan in hectares	M	●	●
	Level of employment in public forest institutions in numbers of full time jobs	L	■	▲
	Number of university students graduating in forestry each year	L	●	●

Table 8. How well are we managing the world's forests? You can see that the indicators are made up of information collected by FAO and the National Correspondents. The third column tells whether there was a high, medium, or low amount of information available. The fourth and fifth columns tell whether the change has been positive (●), negative (■), or little change has occurred (▲).

***** HOW MUCH INFORMATION WAS AVAILABLE?**

H= High (Reporting countries represent 75-100 percent of total forest area)

M=Medium (Reporting countries represent 50-74 percent of total forest area)

L=Low (Reporting countries represent 25-49 percent of total forest area)

REFLECTION SECTION:

Look at Table 8. Find the column labeled, "HOW MUCH INFORMATION WAS AVAILABLE?" Why is this important? Compare and contrast the meaning of findings for which little information was available with the meaning of findings for which much information was available.

Look again at Table 8 Change in "Forest Health and Vitality," "Protective Benefits," and "Social and Economic Benefits" has been positive. If these positive trends continue, what might you predict for the future of the world's forests?



CRITERION/INDICATOR	Africa			Asia			Europe	North and Central America			Oceania	South America
	Eastern and Southern	Northern	Western and Central	East	South and Southeast	Western and Central		Caribbean	Central	North		

Extent of forest resources												
Area of forest in hectares	■	▲	▲	●	▲	▲	▲	●	■	▲	▲	▲
Volume of trees growing per hectare in cubic meters of wood	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	-	▲
Total carbon being held in the forest in Gt	■	▲	▲	●	■	●	▲	●	■	▲	-	▲
Biological diversity												
Area of primary forest in hectares	■	▲	■	▲	▲	▲	-	▲	■	▲	■	▲
Area of forests managed for the conservation of biological diversity in hectares	●	▲	●	●	●	●	●	●	■	●	-	●
Area of forest in protected areas in hectares	●	-	●	●	●	●	●	●	-	●	-	●
Forest health and vitality												
Area of forest damaged by fire in hectares	■	-	-	■	●	●	●	●	-	■	-	-
Area affected by insect pests in hectares	-	-	-	■	-	●	●	-	-	■	-	-
Productive benefits												
Area of forest being managed for productive purposes in hectares	■	▲	■	■	▲	▲	▲	●	■	●	▲	●
Area of planted forests in hectares	●	●	●	●	●	●	●	●	●	●	●	●
Total wood removals in cubic meters	●	●	●	▲	▲	▲	●	▲	▲	▲	●	●
Protective benefits												
Area of forest managed primarily for the protection of soil and water in hectares	■	▲	■	●	▲	▲	▲	●	■	●	-	▲
Social and economic benefits												
Level of private forest ownership in hectares	■	●	▲	●	▲	▲	●	■	■	▲	-	●
Total value of wood removals in US\$	-	●	●	●	●	●	-	●	-	●	-	●
Employment in the primary production of forest goods and related services in numbers of full time jobs	●	-	-	■	●	■	■	-	●	■	■	-
Legal and policy framework												
Area of forest with a management plan in hectares	●	-	●	●	●	●	▲	●	-	●	-	●
Level of employment in public forest institutions in numbers of full time jobs	●	●	●	▲	▲	●	-	-	-	-	-	-
Number of university students graduating in forestry each year	●	■	●	●	■	●	-	■	■	●	-	●

Table 9. Progress toward sustainable management by region and subregion, 1990-2010.

- Positive change (greater than 0.5% per year)
- ▲ No major change (between -0.5% and 0.5% per year)
- Negative change (less than -0.5% per year)
- Information not available



FACTIVITY:

You can use your own criteria and indicators to assess the health of your own school yard. First, you have to identify the size of the land area you will assess. If you know the size in acres, multiply that amount by 0.405 to calculate the number of hectares. Next, complete the table below. You will have to estimate the percentages. If you can count the number of trees in your school yard, you will be able to calculate exact percentages.

CRITERION	INDICATOR	SCORING	SCORE
Extent of forest resources	Number of hectares included in the school yard	1-2 hectares = 1 3-5 hectares = 2 6-10 hectares = 3 More than 10 hectares = 5	
Extent of forest resources	Percentage of school yard planted in trees	None = 0 1-10 percent = 1 11-20 percent = 3 21-30 percent = 5 More than 30 percent = 7	
Biological diversity	Percentage of native trees growing in school yard	None = 0 1-10 percent = 2 21-30 percent = 5 More than 30 percent = 8	
Forest health and vitality	Percentage of trees damaged by insects, lightning, diseases, or other visible damage	None = 7 1-10 percent = 3 More than 10 percent =	
Productive benefits	Percentage of trees used for productive purposes, such as for nuts, fruits, or other products	None = 0 1-5 percent = 1 More than 5 percent = 2	
Protective benefits	Percentage of trees with evidence of wildlife or for which the area around the trunk is protected from erosion	None = 0 1-10 percent = 2 11-20 percent = 5 21-30 percent = 8 More than 30 percent = 12	
Social and economic benefits	Percentage of trees included in play areas or recreation areas	None = 0 1-5 percent = 1 6-10 = 5 More than 10 percent = 7	
Legal and policy framework	Does your school have a plan for taking care of the trees?	No = 0 Yes = 2	

Total points:

Assessment:

Assessment:

40-50 points = [green circle]

25-40 points = [yellow triangle]

Under 25 = [red square]

As a class, discuss your findings. What can your class do to help make your school yard healthier? Write your planned actions with a time line and who will do which action.