INQUIRY 4: HOW WELL ARE WE MANAGING OUR FORESTS WORLDWIDE?

THE SITUATION: As you know, forests provide many benefits to people and other animals. For forests to provide these benefits, 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 6 *criteria* (Figure 27).

Extent of forest resources
Biological diversity
Forest health and vitality
Productive functions of forests
Protective functions of forests
Socioeconomic functions of forests

Figure 27. The 6 criteria of sustainable forest management used by FAO

For each of the 6 criteria, FAO identified information that served as indicators of sustainable forest management. Sustainable forest management is management that keeps forests healthy now and into the future. An *indicator* is a representation of something else. For example, when you complete a school assignment, you receive a grade or other assessment of your work. The grade or assessment is an indicator of your school achievement, but it is not the achievement itself. Indicators are the many ways a teacher has to assess how well you have done. In the same way, FAO identified ways to measure how well we are doing globally to manage our forests. Table 2 describes the indicators of sustainable forest management used by FAO in their study, according to the 6 criteria.

Fig 28. Forests that retain their biological diversity are more sustainable

GLOSSARY:

sustainable: The quality of surviving or being maintained over a specific time period.

criteria: Standards on which a judgment or decision may be based.

biological diversity: A measure of the differences between the types and numbers of living things in a natural area.

socioeconomic: Of, relating to, or involving a combination of social and economic factors.

indicator: Something that measures or shows something.

medicinal: Being or acting like a medicine.

social service: A process or service, usually sponsored by a government, that benefits humans.

fodder: Coarse food for cattle, horses, or sheep, etc., like straw or hay.

CRITERIA	INDICATORS
Extent of forest resources	Area of forest in hectares. Area of other wooded land in hectares. Total volume of wood in all trees of a minimum size. Measured from the ground to a particular diameter of the trunk. Amount of carbon in the living part of the forest in tonnes.
Biological diversity	Area of primary forest in hectares. Area of forest in hectares designated primarily for the conservation of biological diversity. Total forest area in hectares, excluding area of productive forest plantations.
Forest health and vitality	Area of forest in hectares affected by fire. Area of forest in hectares affected by insects, diseases, and other disturbances.
Productive functions of forests	Area of forest in hectares designated primarily for production. Area of productive forest plantations in hectares. How much wood is produced for wood products, measured by the total volume of trees and how much of that volume is designated for wood products. How much wood is harvested every year, measured by volume. How much of non-wood forest products is collected or harvested each year, measured by volume.
Protective functions of forests	Area of forest identified primarily for protection of soil and water in hectares. Area of protective forest plantations in hectares.
Socioeconomic functions of forests	Value of total wood removed, measured in United States dollars ($). Value of total non-wood forest products removed, measured in United States dollars ($). Total employment having to do with forest production, measured in number of people employed. Area of forest under private ownership measured in hectares. Area of forest designated primarily for *social services* measured in hectares.

Table 2. Criteria and indicators of sustainable forest management used by FAO

REFLECTION SECTION

What characteristic do all of the indicators listed in Table 2 have in common? Hint: The common characteristic has something to do with their ability to be compared across regions.

You learned about the extent of the world's forests in Inquiry 2. If forests are to be sustainable into the future, they must not continue to shrink in size. Therefore, the extent of the world's forests, at the subregional, regional, and global levels, is a measure of forest sustainability.

Biological diversity is a measure of the differences between the types and numbers

of living things in a natural area. For example, if an area has more types of plant species than another area, it is more biologically diverse in plant life. Areas that have kept their natural level of biological diversity are usually considered healthier and are better able to withstand threats now and into the future. Therefore, biological diversity is a measure of forest sustainability (Figure 28, page 21).

Forest health and vitality is also a measure of forest sustainability. This was measured by how much forests were negatively affected by fire, diseases, or insects (Figure 29).

If a forest is productive, it provides useful products to people. These products include timber, fuelwoods, foods (fruits, mushrooms, bushmeat), *medicinal* plants, *fodder*, and other products (glossary on page 21). If a forest is to provide these products now and into the future, it must be carefully managed so that it remains healthy. The amount of land that is managed to provide forest products over time provides a measure of its productivity and its sustainability.

If a forest is managed for protective benefits, it must be safe from a range of threats and uses. Protective benefits include environmental benefits, such as clean water, clean air, and healthy soil. The amount of land being managed for these benefits over time is another measure of forest sustainability (Figure 30).

Forests also provide financial and social benefits to people. One measure of sustainable forest management is the amount of employment provided by forests over time. This employment may be in or away from the forest. Social benefits include things like education, recreation, and inspiration. If a forest is managed for these benefits over time, FAO considered it to be a positive indicator of sustainable forest management (Figure 31).

Using these 6 criteria and 21 indicators of sustainable forest management, FAO scientists assessed the world's forests by

Figure 29. Forests negatively affected by fire are less sustainable

Figure 30. Forests managed to provide environmental benefits over time, such as clean water, are more sustainable

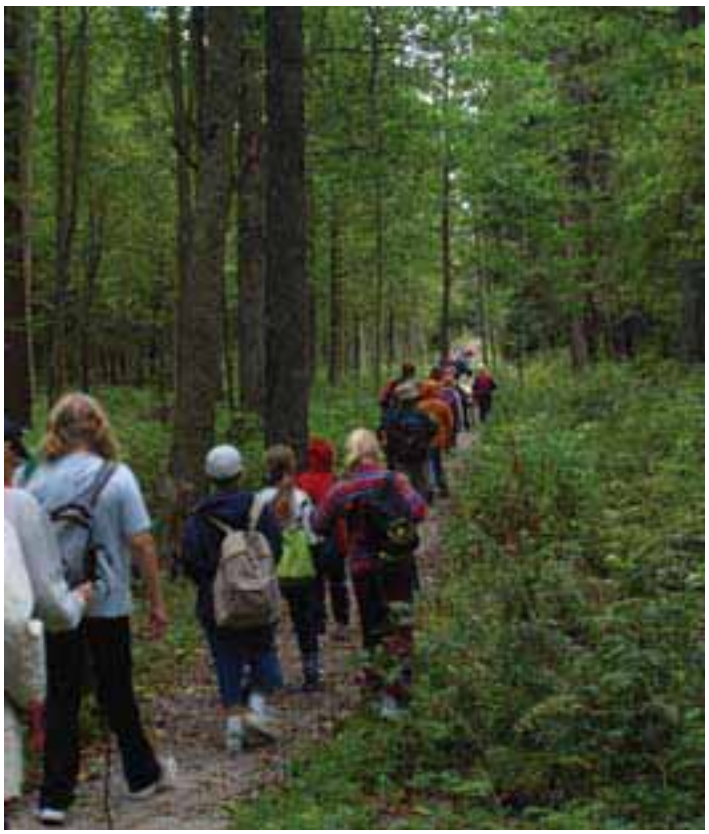

Figure 31. Forests that provide recreation for people over time are more sustainable

region and subregion. When they were finished, they had an idea of how well forests are being managed so they will be sustainable now and into the future.

REFLECTION SECTION

Think about a forest that is near you or that you have visited. Based on FAO's criteria and indicators, would you say this forest is sustainable? Why?

Themes and variables	Africa			Asia			Europe	North and Central America			Oceania	South America
● Positive change (greater than 0.5% per year)	Eastern and Southern	Northern	Western and Central	East	South and Southeast	Western and Central		Carribbean	Central	North		
▲ No major change (between -0.5% and 0.5% per year)												
■ Negative change (less than -0.5% per year)												
- Information not available												
NWFP = Non wood forest products												
Extent of forest resources												
Area of forest	■	■	■	●	■	●	▲	●	■	▲	▲	▲
Area of other wooded land	■	▲	▲	■	●	▲	▲	▲	●	▲	-	▲
Growing stock of forests	■	■	▲	●	■	▲	▲	●	■	▲	-	■
Carbon stock per hectare in forest biomass	▲	▲	▲	▲	▲	▲	▲	●	-	-	-	▲
Biological diversity												
Area of primary forest	▲	■	■	▲	■	●	▲	▲	■	▲	▲	■
Area of forest designated primarily for conservation of biological diversity	▲	■	●	●	●	●	●	●	●	●	-	●
Total forest area excluding area of productive forest plantations	■	■	■	●	■	▲	▲	●	■	▲	▲	▲
Forest health and vitality												
Area of forest affected by fire	-	-	-	■	■	■	■	■	-	▲	-	■
Area of forest affected by insects, diseases and other disturbances	-	-	-	▲	■	■	■	-	-	■	-	■
Productive functions of forest resources												
Area of forest designated primarily for production	▲	■	■	▲	■	▲	▲	●	■	▲	-	▲
Area of productive forest plantations	●	▲	●	●	●	●	●	●	●	●	●	●
Commercial growing stock	■	▲	▲	●	■	▲	■	●	■	▲	-	■
Total wood removals	●	●	●	■	■	■	■	▲	●	▲	●	■
Total NWFP removals	-	-	-	●	●	●	▲	●	-	-	-	■
Protective functions of forest resources												
Area of forest designated primarily for protection	■	▲	●	●	▲	●	●	●	■	●	-	▲
Area of protective forest plantations	▲	●	●	●	●	●	●	●	▲	●	●	●
Socio-economic functions												
Value of total wood removals	-	●	-	■	■	■	-	●	●	●	-	■
Value of total NWFP removals	-	●	-	-	●	■	●	■	-	●	-	■
Total employment	●	●	●	■	■	▲	■	●	●	▲	●	-
Area of forest under private ownership	■	▲	●	▲	●	▲	●	■	■	▲	-	-
Area of forest designated primarily for social services	▲	●	▲	●	●	■	■	▲	▲	▲	-	●

Table 3. Trends in progress toward sustainable forest management for regions and subregions of the world

WHAT THEY DISCOVERED: At first, FAO examined the information by regions. Then they looked at areas smaller than regions, called subregions. The researchers found that when they looked at subregions, the picture was sometimes different than when they looked at an entire region. For example, a national effort to plant trees in China showed an overall increase in forests in Asia, but not all subregions of Asia had an increase in forests. FAO wanted to know if subregions showed positive or negative trends in sustainable forest management. The scientists found both positive and negative trends across the world (Table 3, page 24).

FAO also compared trends in forest management in rural areas of the world experiencing the highest poverty levels. They found a higher proportion of negative trends in sustainable forest management for the poorest rural areas of the world.

As you can see, FAO found that the answer to their question is not clear. In some areas, progress is being made. In others, progress is not being made. Table 3 tells whether the trends are positive (●), negative (■), or about the same (▲) in each region or subregion of the world.

REFLECTION SECTION

Do you think it is important to consider subregions of the world when trying to understand progress toward sustainable forest management? Why or why not?

Using Table 3, consider the indicators of forest sustainability for your own subregion or region. For which indicator is your subregion or region doing well? What should it improve?