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THE AGRICULTURE – FOREST INTERFACE

INTRODUCTION

1. Throughout human history, forests have been converted to agricultural land to grow food crops, raise cattle and build settlements. These processes continue today, especially in the tropics. Conversion of land from forest to agricultural uses has taken place in virtually every country in the world, and without this there would be no modern civilization. The timber that has been cleared has helped to fuel economic development, and the resulting agriculture has provided food, animal feed and incomes.
2. However, the conversion of forest land to agricultural uses often produces benefits which are only short-term. It may result in loss of plant and animal diversity, degradation of soil and water resources, and the release of carbon into the atmosphere. In many instances, the land is marginal for agricultural purposes, and the gains from the conversion are not sustainable.
3. This information note is a joint product of the FAO Forestry Department and the Agriculture, Biosecurity, Nutrition and Consumer Protection Department and is being distributed at both the 18th Session of the Committee on Forestry (COFO) and the 20th Session of the Committee on Agriculture (COAG).

ISSUES AT STAKE

Food crop and livestock production systems replace forests

4. About 13 million hectares¹ of the world's forests are converted to other uses each year, mostly in the tropics. The majority of forest losses in the tropics is the result of land conversion

¹ FAO 2006: Global Forest Resources Assessment 2005, Progress towards sustainable forest management; FAO Forestry Paper 147, Rome.

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from forest to agriculture, mainly to grow crops such as soybean, oil palm or hevea, or to provide pasture for cattle. In northern temperate regions, an opposite process can be observed, and marginal agricultural lands are being re-converted to forests. These two conversion processes result in an annual net loss of 7.3 million hectares of forests a year – or 200 km² per day.

5. Different factors lead to conversion of forests to agriculture and pasture. Poverty drives the landless poor into the forest to slash and burn it to grow crops and keep livestock. An estimated 60% of forest area change in Africa is caused by the conversion of forests into small scale (less than 25 ha), permanent agriculture². In Central America the usual pattern is that after three to four harvests of agricultural crops the soils are depleted, and the farmer sells “improved” land (*mejora*) to a cattle farmer.

6. In some countries, commercial interests play a major role in converting forests. While commercial timber harvesting with valuable selected tropical timber species is profitable, the main driver for forest conversion is the potential gain from cattle farming or high-value crops such as oil palm or soybean. The timber harvested provides a “windfall profit.” In addition, government policy (or the lack of it) sometimes provides incentives for unsustainable land-use practices. An estimated half of the forest changes in Latin America is due to conversion of forests into large-scale, permanent agriculture, especially pasture land³.

7. On some sites, agricultural production thrives on formerly forested sites, often with high inputs of fertilizers and pesticides. However, on many nutrient-poor forest sites in the tropics, soils are too fragile to sustain agricultural production, and the land is exhausted after several years. With declining crop yields, or reduced capacity to support a cattle herd, farmers let the converted land fall fallow and they move on to the next forest lot.

Forests replace agriculture

8. In some countries, particularly in the northern hemisphere, forests are increasing through the conversion of crop or pasture land to forests, either by planting trees or by natural expansion of forests on abandoned land. This trend usually occurs in countries with a *per capita* income of more than US\$ 4000⁴. With economic development, deforestation becomes less of an issue. In North America and Europe, it is no coincidence that in the 20th century the stabilization of forest area coincided with economic development, including advances in agricultural productivity and food distribution.

Deforestation and climate change

9. Land-use changes account for an estimated 18% of global greenhouse gas emissions, constituting one of the major causes of climate change. This has led to discussion within the climate change negotiations for mechanisms to help reduce greenhouse gas emissions from deforestation in developing countries.

² FAO 2001: Global Forest Resources Assessment 2000, Main report; FAO Forestry Paper 140, Rome.

³ Steinfeld, H., et.al. 2006: Livestock’s long shadow - Environmental issues and options. FAO, Rome, in press.

⁴ Kauppi et al. 2006: Returning forests analyzed with the forest identity; Proceedings of the National Academy of Sciences, 103/46.

Energy crops replace food and feed crops

10. Increasing oil prices and the quest to reduce burning fossil fuels have renewed global interest in bioenergy, in particular biofuels including biodiesel and bioethanol. Countries in temperate and tropical regions alike are planning large scale bioenergy crop schemes. The demand for these is likely to put additional pressure on forests, either by converting cellulose to biofuels, or by converting forest land to grow crops for biofuels.

11. The replacement of food crops by energy crops seems problematic when more than 800 million people still suffer from hunger. A rational approach is to consider each country and its level of food supply, the level of technology and infrastructure, and the type of food and energy crops in question. In most food-deficient countries, this replacement seems unlikely but may be more likely in food-stable or food-affluent countries.

Energy crops replace forests

12. In many countries, forests are still considered as a land reserve to be tapped if new demands for land emerge. If a decision is made to grow biofuel crops, the conversion of forests seems appealing, since it avoids an infringement on food crops. However, in the case of forest conversion for the production of biofuel crops, countries may be confronted with two goals that may be conflicting: climate change mitigation through fossil fuel substitution and the conservation of biological diversity.

CONCLUSIONS

13. Policy makers face an array of economic, environmental, cultural and technological options for the use of land. Decisions need to consider existing land and forest tenure systems.

14. Sustainable management of forests is often less profitable in the short-term than large-scale production of food, feed or energy crops. Forest conversion is likely to increase if conversion processes are left unregulated, particularly in developing countries. The achievement of the Millennium Development Goals will require balance among economic, social and environmental aspects in decision-making, and achieving synergies between forest, agricultural and energy land uses.

15. Integrated approaches to national land use and resource policies will help to balance food, feed and biofuel production with the conservation of forests and biological diversity.

16. Member countries are encouraged to consider the policy implications of these issues.