FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

BUILDING BRIDGES BETWEEN REDD+ AND SUSTAINABLE AGRICULTURE: ADDRESSING AGRICULTURE'S ROLE AS A DRIVER OF DEFORESTATION

The potential role of forests in reducing of global greenhouse gas emissions is attracting considerable interest from the international community. Deforestation and forest degradation is largely being driven by forces outside the forestry sector. Many of these forces are closely tied to agriculture. For this reason, an isolated sectoral approach focusing solely on forests cannot succeed in implementing REDD+ policies. This paper suggests maximizing synergies between sustainable agriculture and REDD+ and ensuring that food production and forestry do not compete for natural resources. To accomplish this, the best way to move forward would be to adopt a cross-sectoral 'landscape approach'. This approach would promote high carbon stock land uses in forests and in agricultural areas, and would contribute to halting both deforestation and forest degradation while meeting future demands for food and nutrition.

Climate change will affect both the agriculture and forestry sectors and will have an impact on food security. Agriculture, which is essential to the livelihoods of around 75 percent of people living in rural areas, plays a significant role in meeting the challenges of safeguarding food security and coping with climate change. Farmers will need to feed a projected population of 9.1 billion by 2050. To meet this demand while coping with climate change and making more efficient use of natural resources, the agriculture sector, needs to be sustainably managed. Current negotiations to reach an international agreement on climate regime need to acknowledge the critical role that forests, crop and pasture land and other biomass play in the global carbon cycle.

The world's forests store more than 650 billion tonnes of carbon: 44 percent is stored in the biomass, 11 percent in dead wood and litter, and 45 percent in the soil. Forests also contain at least two-thirds of the world's terrestrial biodiversity. In addition, forests sequester carbon, contribute to watershed management, support the cycling of nutrients in the soil, play a regulatory role in the landscape and provide a broad range of other ecosystem services. The social function of forests is also important. They are central to culture and recreation and play a crucial role in supporting livelihoods and safeguarding food security. Sustainable forest management (SFM) should be seen

DEFORESTATION AND AGRICULTURE IN ECUADOR

In its UN-REDD National Programme Document, the Ministry of Environment (MAE) in Ecuador identified the drivers of deforestation in the country. Land use change, especially the expansion of agricultural and pasture land, is the primary cause of deforestation. In Ecuador, deforestation and land use change in general is linked to agricultural and livestock activities and structural problems in the agricultural sector. The banana boom and the shrimp industry on the coast and the agrarian reform in the Andean zone, which forced many smallholders to move into fragile mountainous areas, has led to deforestation, soil and forest degradation and the deterioration of vulnerable Andean páramos. Other drivers of deforestation are the oil, mining and energy sector. Another important cause of forest loss identified by the MAE has been insufficient cross-sector coordination. (PNC UN-REDD Ecuador, 2010).

as providing the overall framework for mitigating and adapting to climate change in an integrated way (FAO, 2008). The current debates on REDD+ have reinforced the importance of SFM in integrated land use policies.

Deforestation, mainly resulting from the conversion of tropical forest to agricultural land, is decreasing in several countries. However, in other countries it is continuing at a high rate. Over the last decade, around 13 million hectares of forests were converted annually to other uses or lost through natural causes (FAO 2010). Throughout the 1980s and 1990s, rainforests were the primary source for new agricultural land, with over 80 percent of new agricultural land coming from intact and disturbed forests rather than previously cleared land (Gibbs et al. 2010). At the same time, afforestation and natural expansion of forests in some parts of the world has reduced the net loss of forest area significantly at the global level. However, most of the loss of forest area has continued to take place in tropical regions,

The expansion of agricultural land is likely to continue. This is because population growth and changes in consumption patterns are expected to increase the demand for food by 70 percent. In developing countries, the expansion of arable land is expected to satisfy 20 percent of this increased demand, with the rest being met through increased yields (FAO, 2009). In addition, climate change is likely to have a significant negative impact on agricultural production, reducing farm output in ways that may significantly affect parts of the developing world. For this reason, simply restricting areas from agricultural use does not seem to be an appropriate strategy for meeting the twin challenges of reducing deforestation and ensuring global food security.

The need to decrease deforestation and forest degradation has been agreed upon at in various international conventions and agreements, such as the Convention on Biological Diversity (CBD) and the International Tropical Timber Agreement (ITTA) as well as in international processes, such as the United Nations Forum on Forests (UNFF). At its 16th Conference of the Parties (COP16) in Cancun, Parties to the United Nations Framework Convention on Climate Change (UNFCCC) agreed on a mechanism, known as REDD+ that provides a unique opportunity to reverse the ongoing trend of deforestation and degradation of forests and improve SFM implementation in developing countries. To implement these conventions, agreements and the REDD+ mechanism, agriculture must be taken into account.

If an appropriate set of safeguards is supported under the UNFCCC's 'Cancun Agreement', REDD+ also has the potential to strengthen the link between forestry and agriculture. This can be achieved by giving increased recognition to customary land rights (HLPE, 2011), encouraging the participation of local people in forest management and providing financial resources for continued development and poverty reduction. The Cancun Agreement clearly states that effective ways should be found to address the drivers of deforestation and reduce the human pressure on forests. More specifically the decision requests developing country parties, to address drivers of deforestation when developing and implementing their national strategies or action plans. Many countries involved in REDD+ programmes acknowledge the importance of these drivers of deforestation and greenhouse gas emissions. However, they are still in early phases of addressing these drivers in the preparation of their REDD+ readiness strategies. (Kissinger 2011).

DRIVERS OF DEFORESTATION

Deforestation is caused by combinations of multiple factors. At the global level, the most important direct drivers for deforestation are agricultural expansion (associated with 96 percent of deforestation[1]), followed by infrastructure development (72 percent) and wood extraction (67 percent) (Geist and Lambin 2002). A complex set of additional institutional and location-specific factors also contribute to deforestation as 'underpinning' or 'indirect' drivers The characteristics and magnitude of these various drivers vary widely across continents, regions and countries. Important categories of global indirect deforestation drivers are:

- economic growth and rising incomes that lead to, among other things, changes in consumption patterns and nutrition levels, increased urbanization and transformations in economic structures.
- demographic changes related to population growth, which is projected to increase from 6.4 billion in 2005 to 8.2 billion in 2030;
- alternative energy policies and economic considerations related to the profitability of various land uses (Rademaekers, K. et al 2010);
- competition for croplands that results in indirect land use changes (Lambin and Meyfroidt, 2011); and
- technological factors, such as changes in agricultural technology and the poor application of existing technologies.

At the local level, a range of political, cultural and socio-economic factors, including unsound policies and weak governance, corruption, landlessness and unclear allocation rights, migration, rural poverty, and a lack of investment and financial resources are indirect drivers of deforestation.

[1] Note multiple-factor causation!

However, strong regional differences exist, which make it difficult to draw general strategies and policies to address the different stakeholders involved. Drivers and impacts of deforestation change over time and location. Reforestation in one place could lead to displacement of land uses elsewhere (Meyfroidt e.al. 2010). For this reason, there are no simple solutions to curb deforestation.

AGRICULTURE AS A DRIVER FOR DEFORESTATION

Agricultural expansion is a complex issue and has many underpinning drivers: populations are growing and need more food; incomes in many countries are rising which creates a greater demand for meat, animal feed and other cash crops; urbanization is changing consumption patterns; fuelwood and charcoal consumption along with biofuel production are increasing as fossil fuels become less accessible or their costs rise.

From a global perspective, large-scale farming plays the most important role in the conversion of forest lands. With the cultivation of various agricultural commodities driving deforestation across the planet, and a larger and increasingly connected global market spurring the demand for these commodities, it is more important than ever that global and local solutions are reached to counteract the forces that are contributing to deforestation.

In Latin America, deforestation is driven primarily by extensive cattle production and cultivation of soy bean. In the Asia-Pacific region, the drivers of deforestation are more diverse. However, palm oil production, which has doubled in the last decade (UCS 2011), is particularly significant. In Africa, unsustainable land use practices of smallholders remains one of the key agricultural drivers of deforestation. The impacts of smallholder agriculture on clearing and degrading forests are largely tied to poverty, tenure insecurity, access rights and poor agricultural practices that lead to soil degradation.

Usually there is a different combination of agents and drivers of deforestation depending on the area and level of local development. Therefore, it is important to examine why and how agriculture contributes to deforestation on a case-by-case basis.

AGRICULTURE AS A DRIVER OF DEFORESTATION IN TANZANIA

In Tanzania, the underlying causes of deforestation are related to a growing population and the increasing expansion of agricultural lands. Another factor is the need expand the agriculture sector to earn foreign exchange to fund national development and debt repayments. As outlined in the UN-REDD National Joint Programme Document for Tanzania, the root causes for deforestation and forest degradation are smallholder agricultural expansion, the use of charcoal and firewood to meet domestic energy needs and the expansion of larger commercial agricultural plantations (UN-REDD Programme Tanzania, 2009).

LOOKING FORWARD

Successful REDD+ policies require tackling different drivers of deforestation in both the forestry and the agricultural sector. When designing national REDD+ strategies, policies, laws and action plans, it is necessary to consider agricultural and rural development goals and adopt an integrated landscape approach. This approach takes into account all land uses in a holistic way and works to lessen the competition for natural resources among different sectors. Such an approach ensures that the best possible balance is achieved among a range of different development objectives, including climate change mitigation and adaptation, environmental conservation, enhanced agricultural productivity and improved livelihoods.

Four principles for linking climate change adaptation and mitigation measures can be applied when implementing a landscape approach (Robledo et al, 2005). First, actions that help to reduce pressure on the natural resources should be prioritized. For example, in land used for grazing, a mitigation action could be the planting of trees to sequester carbon. Second, vulnerability to climate change, such as the possibility of soil erosion from more intense rainfall, should be included as one of the risks to be analyzed before interventions are carried out. Third, priority should be accorded to mitigation activities that enhance local adaptive capacity, for example by adopting agroforestry practices, such as using trees to create living barriers to support nutrient cycling and counter erosion. Fourth the sustainability of livelihoods, with particular consideration for the poor, should be increased through a range of activities, including building or improving infrastructure, protecting the soil and safeguarding food security.

In this regard, ‘climate-smart agriculture’ is emerging as an increasingly prominent concept. Climate-smart agriculture seeks to direct agricultural development along pathways that lead to sustainable increases in agricultural productivity; contribute to climate change adaptation by increasing social and ecological resilience; mitigate climate change by reducing and/or removing greenhouse gases; and support the achievement of national food security and development goals. This concept has been taken up by intergovernmental organizations and national governments as a way forward for making landscapes more resilient in the face of climate change and increase the adaptive capacity of agricultural communities. The Johannesburg Communiqué from the African Ministerial Conference in September 2011 (DAFF, 2011) underscores the need to put climate-smart agriculture high on the political agenda. Recently, the potential of agriculture to be part of the solution to climate change has received increasing attention in the UNFCCC negotiation process.

Global agriculture will be under significant pressure to meet the demands of rising populations using finite, often degraded, land and water resources. Climate change is expected to add to the pressures on these resources. Increasing food production and achieving food and energy security will remain the highest priority for individual households and national governments. Coherent national mitigation strategies encompassing all land uses could enable better management of synergies, trade-offs and leakages between different sectors. The following actions would help reconcile potential sector conflicts:

- At the global level, a future policy framework should recognize carbon stock and mitigation potential from all land uses, foster an integrated approach to resource management and build close linkages between REDD+ and agriculture.
- Intersectoral policies are needed at national and local levels to address climate change in both agriculture and forestry using a landscape approach. Strengthening the coordination and collaboration between the different ministries working on national adaptation and mitigation strategies and action plans can build close linkages between REDD+ and agriculture in policy frameworks. Policy formulation for landscape approaches can be supported through the development of tools and mechanisms for climate change mitigation and adaptation.
- Integrated landscape approaches should be included in the activities covered under different carbon finance funds and mechanisms, such as the Green Climate Fund, Programme of Activities (PoA) in the Clean Development Mechanism (CDM), as well as Nationally Appropriate Mitigation Actions (NAMAs) in developing countries.
- Tree cover outside of forests, which stores large carbon stocks, can bring additional social, economic and economic benefits. Trees outside of forests also minimize leakage effects between different land uses. The ecosystem services of carbon sequestration and biodiversity conservation provided by trees outside the forests are significant at the global level.
- 'Evergreen agriculture', which combines agroforestry with conservation farming, offers multiple livelihood benefits to farmers, improves soil quality, increases agricultural production and alleviates the pressure on forests.
- The low productivity of agriculture in many developing countries must be tackled by increasing yields per area on existing agricultural land. This could be done using sustainable agricultural intensification methods, especially on degraded lands. Increased support for research, technological development, extension services and capacity building to extend sustainable land use practices is needed.
- It is crucial to adopt sustainable farming practices that, among other things, improve water management, support conservation agriculture, enhance sustainable crop production, foster integrated crop-livestock systems, regenerate degraded pasturelands and silvo-pastoral systems, and support integrated feed, food and energy systems. These practices can improve productivity, increase resilience in the face of climate change, reduce emissions and sequestrate carbon. In all cases, these practices should also serve to increase incomes in local communities, enhance livelihoods and, if possible, provide opportunities for carbon payments.
- Integrated agriculture/REDD+ strategies and policies are likely to have an especially strong impact on forest-dependent communities and indigenous peoples. However, they will also have a wider impact on society. A reflection on tenure rights, governance and other potential socio-economic impacts should be a substantial part of cross-sectoral REDD + planning processes.
- Methods for landscape-level greenhouse gas quantifications of net emissions from different land uses need to be further developed. These methods can serve as important elements in national greenhouse gas accounting systems.

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