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**"Livestock: Threat or Natural Resource for the Future?
– The Case of the Brazilian Amazon"**

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1. The process of deforestation in the Amazon and the relationship between deforestation and cattle production

The Brazilian Amazon forests cover ca. 400 million ha. Since the late 1960's, around 60 million ha – the equivalent of 15% of the total area have been deforested. Deforestation advances from south to north and from east to west in what is commonly known as the arc of deforestation. During the past years, widespread attention has been given to large scale farming (for example to soy cultivation) in the study of deforestation. However, recent studies point out that land use change in the Amazon is primarily a product of cattle ranching. In fact, estimates indicate that cattle ranching enterprises occupy more than 75% of the deforested areas in the Amazon and pasture lands have more than doubled in the past 10 years.

Brazil owns the largest commercial bovine herd and is the largest beef exporter in the world. Together with China, Brazil shares the top position as the global exporter of tanned leather. The total value of cattle trade for Brazil was 6.9 billion USD in 2008, leather representing more than a quarter of it. Around 40% of Brazilian's herd is located in the Amazon and this is the region where most of the growth of cattle-ranching takes place. From 2002 to 2006, 14.5 million of the total 20.5 million head of cattle added to Brazil herd were located in the Amazon. Mato Grosso, Pará and Rondônia are key regions for the expansion of cattle-ranching. Since 2004, direct exports (by weight) in Pará increased by 7.800%, in Rondônia by 1.350% and in Mato Grosso by 360%. The region's principal importers are Russia, Venezuela and Iran.

The cattle business has a large impact on Brazil's climate footprint. With at least 60% of the GHG Emissions being attributed to LULUCF, Brazil is considered to be the world's 4th biggest climate polluter and deforestation and the conversion of Amazonian forests to agricultural land are considered to be responsible for between 5-10% of the world's CO₂ emissions.

2. The expansion of cattle-ranching

Cheap land prices promote the expansion of cattle-ranching in the Amazon. In addition, areas outside the Amazon that were traditionally destined for cattle-ranching, have displaced it for the production of soya and sugar cane, encouraging cattle ranchers to seek for new areas. More importantly, deforestation for cattle ranching is also seen as a method to appropriate land at low cost in the Amazon frontier. When compared to agriculture, cattle-ranching is financially more interesting: it bears lower risks, requires lower investments and has a higher turnout rate. The investment can be easily adapted to the cash flow, buying as much animals you can afford and selling according to financial needs. Cattle are not only a production base but also capital investment, have no fixed harvest time and can walk for distances, so ranching does not need access to good roads.

Already in 2004, a World Bank study concluded that the financial viability of the medium and larger capitalized agents working in the consolidated frontier is the real motivating force behind deforestation. Smallholders, open the rain forest with the initial idea of making a living from smallholder agriculture. Frequently, these former smallholdings are bought by intermediaries that then sell the whole lot to capital investors for cattle ranching. Intermediaries' activities are viable because of their assurance that they will be able to sell the land in the future. Moreover, as a consequence of the vast availability of land and its low prices, cattle ranchers find it more attractive to keep buying land from the intermediaries than to intensify their cattle ranching systems. Land once cleared can be used for many purposes, not only for ranching and pastures can be (and are) converted into agricultural land as soon as prices for agricultural commodities justify this investment. The decision whether the land should be used for cattle ranching or agricultural commodities is based on market prices.

3. A problem of governance

The expansion of the cattle sector in the Amazon and the elevated deforestation rate that comes along with it are symptoms of poor governance and legal uncertainty. Based on the current economic rationality, individual actors have more incentive to clear cut new areas of forest and engage in cattle-ranching activities than to keep the forest standing. Some of the most important current incentives for deforestation are mentioned above.

Insecure property rights: The process of conceding property rights in the region is associated with violence and fraud and the legal status of roughly half the Amazon region is uncertain. The appropriation of public land is a common practice and the speculative gains surrounding land transactions are very significant.

Limited capacity of government authorities: Institutions lack an efficient land registration system that can facilitate the prosecution of illegal deforestation and have limited personal to monitor the area. Finally, the mechanisms to hold individual's accountable for illegal deforestation are complex and almost not taken into practice. Consequently, there are almost no mechanisms to hold individual's accountable for illegal deforestation (i.e. more than 20% of the individual landholding). Based on this definition of illegal deforestation, Greenpeace analysis of 2006-2007 satellite data and forest clearance permits reveals that more than 90% of current Amazon deforestation was illegal.

Insecure labor rights and forced labor in some regions: Based on information provided by the Ministry of Labor and Employment, more than 60% of the companies that have been convicted of keeping people in conditions of forced labor are Amazonian ranchers. On the February 2009 'Dirty List', Pará is the state with the greatest dependence on forced labor, followed by Mato Grosso.

Conflicting interests between environmental and economic policies: During the Climate Change Conference 2008, the Brazilian Government presented its National Climate Change Plan including a commitment to reduce the rate of Amazon deforestation by 72% by 2018. The plan also adopts a target of zero net deforestation by increasing the amount of planted forests in Brazil by 2015. If the entire climate change plan is successful, Brazil could keep 4.8 billion tons of CO₂ emissions out of the atmosphere. The government has set intermediate targets to measure progress towards the goal and has established an Amazon Fund to channel international funds into forest protection. However, the Brazilian government through its Development Bank (BNDES) has also played a dominant role in financing the agribusiness sector and forming strategic alliances with major players in the cattle sector in the Amazon. The 2008/2009 Agricultural and Livestock Plan presented in July 2008 made available 41 billion USD credits with the intent of boosting farm production, 85% from the total amount were designated for corporate agriculture. The government is interested in supporting the expansion of global beef

and leather exporters and forecasts a doubling of Brazil's share of global trade in beef products by 2018.

Other factors: The construction of roads is an important driver for deforestation in the Amazon, since it connects remote areas with external markets. Investing in road infrastructure in the Amazon has both positive and negative implications. By connecting previously isolated areas with bigger markets, there is a potential for improving the livelihoods of rural communities. However, satellite images have also demonstrated that deforestation increases along roads and that it is in these areas where slaughterhouses are concentrated. Finally commodity prices have been found to be directly correlated to the deforestation rates. In fact, some critics suspect that deforestation rates have been more affected by the international commodity fluctuations of soy and meat and more recently the financial crisis than by the measurements taken by the government.

4. Is there a way out?

The situation in the Amazonian frontier requires a governance system that promotes conservation by intensifying the existent grasslands and promoting sustainable silvo-pastoral systems. This system should be based on a mixture of enforcement and monitoring strategies, economic incentives and empowerment and participation of civil society.

Sustainable silvo-pastoral systems

There are many years of experience on silvo pastoral systems that are more or less sustainable. These systems can work by keeping part of the forest vegetation for shadow and protection against heavy rainfall. An alternative is the cultivation of timber wood in rows and the growing of pastures between rows. Pure grass pastures are easy to establish and to manage, but have to be reestablished every three to six years. Pastures with grass and legumes are more difficult to establish and to manage, but fix nitrogen and give better forage. The selection of pasture and of timber species depend on climatic and soil factors as well as on management objectives and knowledge available.

Examples from Brazil show that such silvo pastoral systems are economically viable and profitable. Examples have been found in Cerrado Brazil for eucalyptus and different legumes pastures and in the state of Para for teak-brachiaria systems. Small holders in the upper Amazon region in Puyo, Ecuador, use shadow trees and cushion building pastures to reduce erosion. This system works only with sufficient manpower as the animals have to be tethered and changed twice a day to make best use of pasture and avoid erosion. Available knowledge on technological alternatives for sustainable land use in different Amazonian ecosystems is not very wide spread. Moreover, silvo pastoral systems require knowledge, a long term investment and commitment to the land, which is not the norm for small holders or for big investors under the current conditions in the Amazon.

Enforcement and monitoring strategies

- Greater surveillance and enforcement capacity
- Development of a strategy of institutional cooperation to ensure more effective actions at the national level
- Improve efforts to clarify the property rights (Cadastre, Land register)

Economic Instruments

- Compensation mechanisms for avoided deforestation, such as REDD are promising economic incentives to change the rationality that promotes deforestation.
- Develop a colonization strategy that financially promotes the use of unused land instead of forest. This may require measures to colonize unused private properties and will be politically difficult to realize.

- Reorientation of the criteria for awarding credit subsidies linking such subsidies to promote sustainable activities and reviewing existing subsidized credits for unsustainable cattle ranching in Amazonia

Empowerment and participation – Civil Society

- Promotion of a negotiating process among economic agents and the government
- Work together with cattle ranchers to legalize their activities without incentives to appropriate more land
- Strengthen conservation initiatives through local institutions
- Enhance knowledge about sustainable silvo pastoral systems

An effective governance arrangement combines both incentives and sanctions with proper enforcement, and includes market, state and civil society regulation modes in a participatory and transparent way

5. Key messages

- Better enforcement of existing laws and the improvement of the governance system that promotes forest conservation for landlords and companies investing in forest land
- Support of projects to foster sustainable animal husbandry
- Better and more intensive use of already existing pastures
- New projects should be centered in the sustainable development of territories and the people living there

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