



Tropentag, October 7-9, 2008, Hohenheim

“Competition for Resources in a Changing World:  
New Drive for Rural Development”

## Towards a Sustainable Landuse Option in the Bamenda Highlands, Cameroon: Implications for Sustainable Food Supply, Income Generation and Climate Change Mitigation

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### Abstract

A land use option that can contribute to climate change mitigation and welfare improvement of poor smallholder farmers who cannot integrate traditional markets, but need alternatives for income generation, remains a challenge for researchers and policy makers in the Bamenda highlands. In a degrading agricultural landscape as such, where traditional cultivations and pasture have released quantities of greenhouse gases that are today significant in terms of their current impact and potential for long-term contribution to global warming, carbon sequestration projects, like agro forestry, can be an alternative. To verify this hypothesis, cost benefit analysis was employed. To estimate opportunity cost of land use change, the net present value of agroforestry was compared with those of pasture and traditional cultivations. Some indicators of profitability and cash flow viability (net present value, pay back, etc.) were used. Sensitivity analysis was used to simulate some salient conditions like interest rates, establishment costs and carbon prices. To complement these results, a rapid ecological services assessment was undertaken. This was to determine the relative contributions of the different options to environmental “viability”. All the options were found to be economically viable. However, agro forestry (NPV = USD 1361 ha<sup>-1</sup>, IRR=30%, payback 4.5 years), though not as profitable as the pasture (NPV = USD 6829 ha<sup>-1</sup>, IRR=63%, payback 2 years), appears to be the only option that can meet up with the current challenges. Opportunity cost is least (USD 2.09 ha<sup>-1</sup>) for a change from traditional cultivations to agroforestry than from pasture to agroforestry (USD 12.16 ha<sup>-1</sup>). However, land suitability analysis, education and precise silvicultural practices would be an asset.

**Keywords:** Cost benefit analysis, environmental viability, opportunity cost