Safeguarding the Ngwei forest areas (Cameroon) by increased oil palm productivity and production factors

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1. Background

- Oil palm is a perennial tree used to produce palm oil.
- Estimated annual production in Cameroon is 230,000 tons, making the country the 13th world largest and 3rd African largest producer.
- Current palm oil area 190,000 ha, distributed among supervised agro-industrial producers (93,860 ha) and smallholder farmers (100,000 ha).
- The country aims to double annual palm oil production to 450,000 tons by the year 2020.
- Notwithstanding the economic benefits of palm oil production, this represents a serious threat to forest landscapes and wildlife biodiversity.

2. Objectives

- Compare the output and inputs productivity between smallholder and supervised agro-industrial producers of oil palm.
- Evaluate the benefits and social welfare by producing oil palm and compare them with the opportunity cost of undertaking this activity at the detriment of forest.
- Determine the amount of forest land saved by offering more productive inputs to smallholder oil palm producers.

3. Methods

- Descriptive statistics, Cobb-Douglas production function (SPSS)
- Non-linear programming model (GAMS)

4. Selected results

Table 1: Share of land use between oil palm producers groups

	Smallholder producers (N=219)			Supervised agro-industrial producers (N=54)		
	Oil palm area	Forest trees area	Total	Oil palm area	Forest trees area	Total
Land covered with secondary forest and oil palm plantations (ha)	7.83 (90%)	0.83 (10%)	8.7 (100%)	37.59 (91%)	3.71 (9%)	41.3 (100%)
Land covered with primary forest (ha)	0 (0%)	3.8 (100%)	3.8 (100%)	0 (0%)	15.1 (100%)	15.1 (100%)
Total	7.83 (62.64%)	4.67 (37.36%)	12.5 (100%)	37.17 (65.90%)	19.23 (34.10%)	56.4 (100%)

Table 2: Inputs' intensity and production elasticity between oil palm producers groups

Inputs	Smallholder producers (N=219)		Supervised agro-industrial producers (N=54)	
	Intensity	Production elasticity	Intensity	Production elasticity
Labour (manday/ha)	145	1.017	483	0.098
Mineral fertilizer (kg/ha)	22	1.865	125	0.178
Pure seeds (plants/ha)	13	1.951	143	0.184
Pesticide (liter/ha)	0.03	1.330	4.59	0.106
Total: Oil palm yield (ton/ha)	5.0	∑elasticity=6.163	19.3	∑elasticity=0.566

Table 3: Non-linear programming baseline and simulated results (Sc.) by applying the inputs levels recommended by research stations

	Baseline solution	Simulated solution (Sc.)	Difference Sc. - Baseline
Oil palm area (ha)	7.871 ha (90.47%)	1.000 ha (11.49%)	-6.871ha (-78.98%)
Forest area (ha)	0.829 ha (5.53%)	7.700ha (88.51%)	+6.871ha (+78.98%)
Benefits (FCFA)	14,740,000	75,032,000	60,292,000
Opportunity costs (FCFA)	26,940,000	34,229,000	7,289,000
Social welfare (FCFA)	-12,220,000	+40,803,000	53,023,000

5. Conclusion: Social welfare becomes positive and smallholder farmers would save 78.98% of land area and earn higher returns while preserving the environment if they apply optimal inputs levels recommended by research stations.

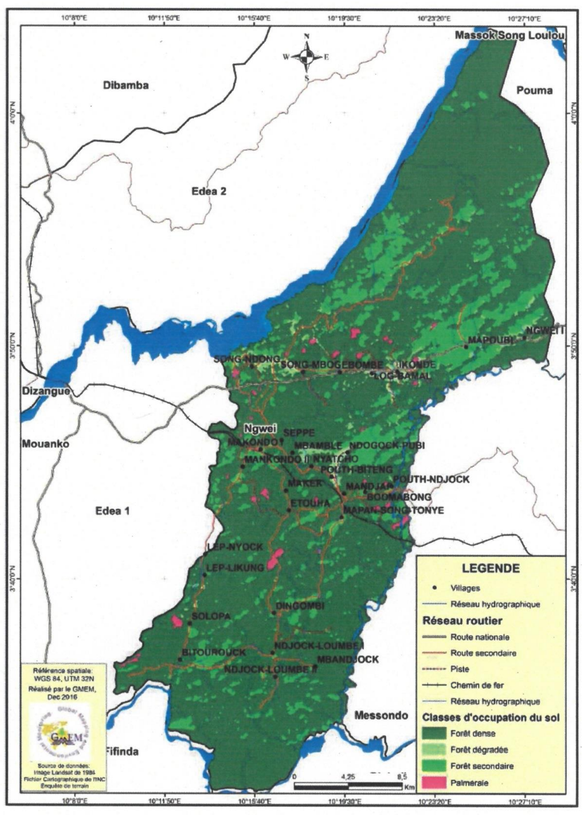

Figure 46 : occupation du sol à Ngwéi en 1984 à partir des images Landsat MSS

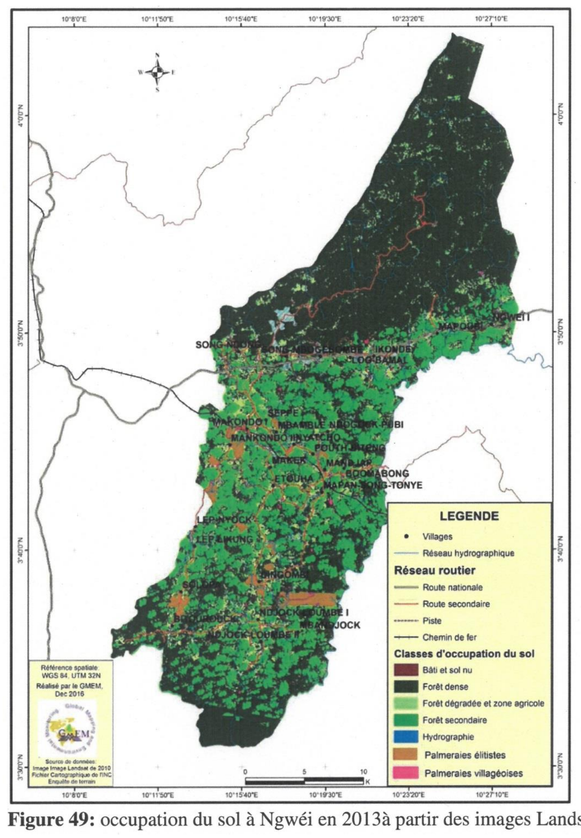

Figure 49: occupation du sol à Ngwéi en 2013à partir des images Landsat 8

Figure 1: Land Map of Ngwei in 1984 (left) and 2013 (right)

Figure 2 : Deforestation of Ngwei land areas

Figure 3: Oil palm trees (left) and bunches (right)

Figure 4 : Oil palm processing by smallholder farmers

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