

WHY AGRICULTURAL INTENSIFICATION IS ESSENTIAL FOR THE DEVELOPMENT OF THE TREE CROP SECTOR AND THE CONSERVATION OF FOREST RESOURCES IN WEST AND CENTRAL AFRICA

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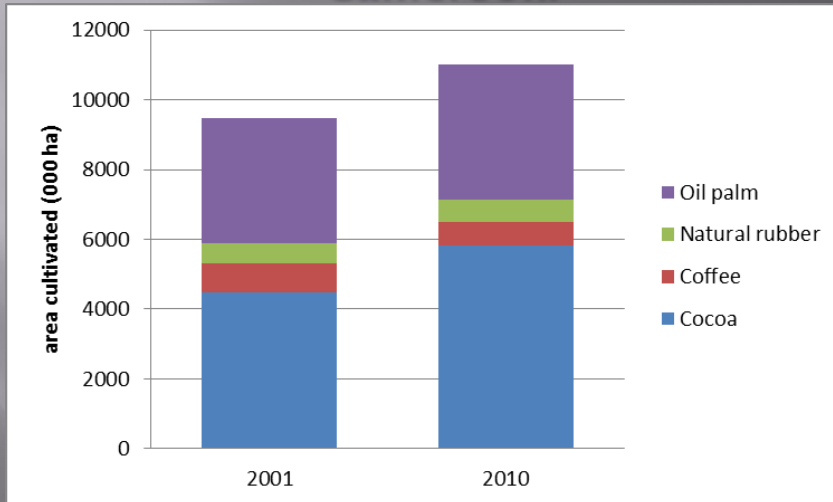
IFA AFRICA FORUM

Meeting on 24 May 2012 in Doha, Qatar

Major Questions

1. What role has the smallholder tree crop sector played in land use change in West and Central Africa?
2. Is there a green revolution underway in the Ghana cocoa sector?
3. What has been the impact in Ghana of cocoa intensification on deforestation and farmer income?
4. Are the institutions supporting agricultural intensification in the Ghana cocoa sector sustainable in the long run?
5. What lessons can be drawn for achieving similar results in both cocoa and other tree crop sectors in the rest of the subregion?

Tree crops and land-use change in Côte d'Ivoire, Ghana, Nigeria and Cameroon.



Tree crops and land-use change in Côte d'Ivoire, Ghana, Nigeria and Cameroon from 2001 to 2010.

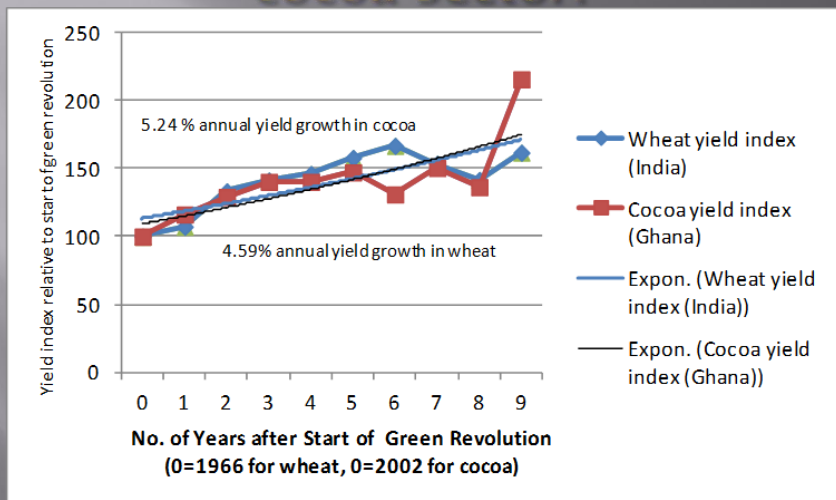
	Percentage change in		
	Area	Yield	Production
Cocoa	31%	-5%	25%
Coffee	-21%	-43%	-55%
Natural rubber	11%	9%	21%
Oil palm	8%	7%	15%

Source: derived from FAOSTAT production statistics accessed online February 16, 2012.

A green revolution in the Ghana cocoa sector?

- In South Asian green revolution, yield grew at 4.6% p.a. due to strong government commitment for :
 - modern high yielding varieties
 - increased use of fertilizers and pesticides
 - Irrigation investment
 - increased farmer knowledge.
- In Ghana, yield has grown at 5.2% p.a. due to:
 - policy led interventions of the COCOBOD specifically
 - Hi Tech and CODAPEC programs of fertilizer and pesticide subsidy combined with improved price incentives

A green revolution in the Ghana cocoa sector?

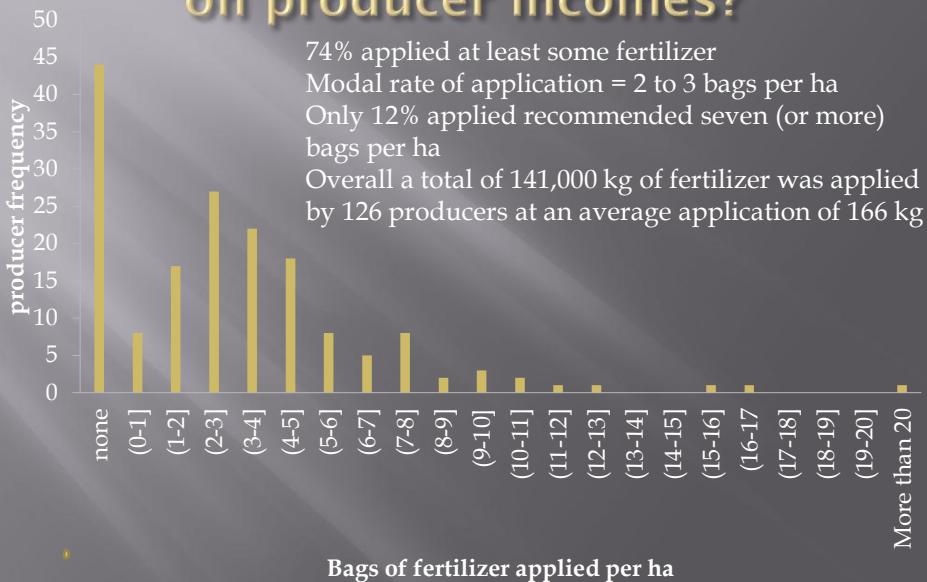


Source: derived from FAOSTAT production statistics accessed online February 16, 2012.

Impact of cocoa intensification on producer incomes?

- ▣ A 2011 field study interviewed a cross-section of 170 cocoa producing households and estimated a multiple regression model of their 2010 cocoa production as a function of:
 - The quantity of fertilizer, fungicide and insecticide applied,
 - quantities of labor, land and capital employed,
 - demographic and educational measures of the household head,
 - the effect of farmer field school training,
 - residual measures of fertilizers applied,
 - varietal composition of farmers' tree stocks, and
 - the number of shade trees

Impact of cocoa intensification on producer incomes?

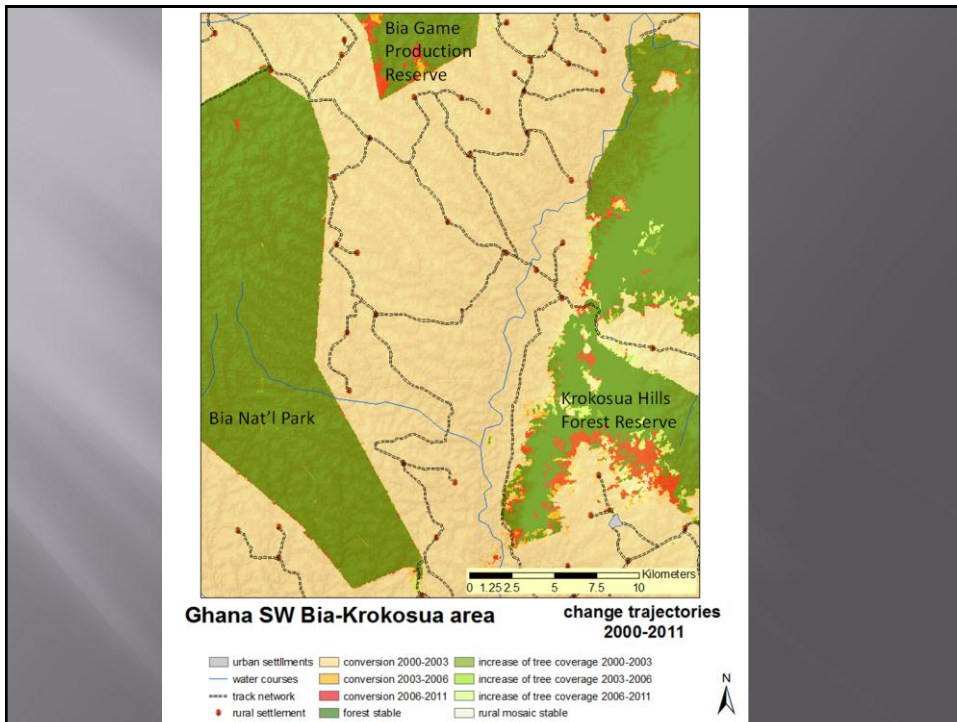


Impact of cocoa intensification on producer incomes?

- ▣ Model $R^2=0.704$
- ▣ 1 kg of cocoa granular fertilizer was estimated to increase cocoa output by 1.4 kg ($P <.001$).
- ▣ Cost of subsidized fertilizer was GHc 0.5 per kilogram. Price of cocoa was GHc 3.2 per kilogram. Benefit cost ratio of 9:1 is congruent with the observed excess demand in Western region.
- ▣ On average, producer income increased by twofold while yields increase threefold as a result of the intensification.

Impact of cocoa intensification on avoided deforestation?

- ▣ Using historical data from a 2002 baseline survey of cocoa producers, the regression model was estimated with the levels of fertilizer and pesticide prevailing in 2000/01.
- ▣ The cocoa yields at 534 kg ha in 2010 were three times greater than the predicted yield at 2000 input levels.
- ▣ Land-use change observations using remote sensing imagery found that deforestation in the last 10 years into cocoa averaged about 150 hectares per year. Whereas in the decade of the 70s and 80s the annual area in cocoa was expanding at approximately 2000 ha per year.



Institutional sustainability of ag intensification programs?

- ❑ Public sector subsidy programs characterized by bureaucratic delays and rent seeking.
- ❑ No institutional incentive for cost reductions,
- ❑ Private sector entrepreneurship and investment is often crowded out.
- ❑ However, the capacity of COCOBOD to bring things to scale is unmatched and has had an important demonstration effect.

Lessons learned?

- ❑ Smallholders will adopt intensified production systems if the technology works and is profitable. For cocoa, a price ratio of 3:1 maintained profitability.
- ❑ Marketing infrastructure such as buying stations, warehouses and vehicle fleets can be effectively employed in the provision of inputs.
- ❑ Credit facilities for small holders that are linked to output markets have proven effective in supplying input credit e.g. licensed buying companies in Ghana supplying fertilizers and exporters in Nigeria and Cameroon supplying fungicides.

Lessons learned?

- ❑ Extensive tree crop farming has often been a means of staking claim to the land. There is a tendency for farmers with smaller land holdings to adopt intensive farming methods more rapidly than farmers with large land holdings.
- ❑ Laborsaving innovations may encourage intensified farming among farmers with labor constraints and large land holdings.
- ❑ Fertilizer technologies in low shade cocoa production systems are profitable even though most farmers do not use improved planting materials.
- ❑ In net terms, shaded low yielding cocoa and coffee system probably account for more environmental degradation per monetary unit of output than higher yielding low shade systems.