

The Impacts of Farmer Cooperatives on the Standard of Living Of Cocoa Producing Villages in Côte d'Ivoire and Ghana



Peter Calkins and Anh-Thu Ngo



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SOCODEVI, Québec

Mario Boivin, Expert in Farmer Organisations

Maxime Prudhomme, Programme Officer, Africa

Côte d'Ivoire team

Principal Counterpart

Amoakon Mian, MBA, Sociologist and Head of Office, SOCODEVI, Abidjan

Village enumerators

Amoakon Mian, MBA, Sociologist and Head of Office, SOCODEVI, Abidjan

Bonhoro Douama, M.Sc, Economic cooperation, SOCODEVI, Abidjan

Zouza Zahiri Alexandre, Agricultural economist

Kodjo Ambroise, Accountant and economic analyst

Sadia Tao, Agronomist and pesticide specialist

Koffi Kouadio, Financial and information specialist

Ghana team

Principal Counterpart

Isaac Gyamfi, Director, IITA, Ghana

General Supervisor of Sampling and Data Collection

Christopher Asamoah, M.Sc. candidate

Regional Supervisors of Questionnaire Quality

Alexander Tano Appiah, Research and Development Officer, Kuapa Kokoo

Mabel Addy Tagoe, Research and Development Officer, Kuapa Kokoo

Patrick Kobbiah, Research and Development Officer, Kuapa Kokoo

Village enumerators

Francis Annoi (BSc., agriculture)

Matilda Annor (student)

Rita Abrokwah(student)

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EXECUTIVE SUMMARY

World cocoa price has fallen by some 48% over the past three years, with direct impacts on the incomes, health and nutrition of cocoa producers and their family in the two major producing countries: Côte d'Ivoire and Ghana, with some 41% and 22% of world output, respectively. The impact of the price drop has been far different in the two countries because of the greater age of plantations, market liberalisation, presence of free agents in the marketing channel, and much greater socio-political instability in one country: Côte d'Ivoire. A final differentiating factor is the impact of cocoa producer cooperatives, which have chosen different strategies and manifested different strengths in the two countries. This study sought to quantitatively measure and qualitatively evaluate those producer organisations as an essential component of the Sustainable Tree Crops Program in four West African cocoa-producing nations, (the others are Nigeria and Cameroon); to distinguish those impacts from the independent evolution of incomes and living conditions in control groups in each country, as well as from the three other programmatic components of the STCP project (technology, marketing, and government policy); to determine the spill over of cooperative benefits to non-member households, including share-croppers; and to recommend ways in which to enhance the relevance, efficiency, and effectiveness of the cooperative movement as it affects cocoa producer incomes and living standards. The underlying thesis of the study is that cooperatives, based upon seven participatory principles, represent a unique third way of social organisation that enhances and complements, as needed, technology development and extension, market information and organisation, and government policy. It is particularly useful in cases of simultaneous market and government failure to assure adequate credit, input delivery, technology training, output delivery and social development in poor areas of Africa.

A multi-pronged methodology was employed to test this thesis in a scientifically rigorous manner. First, quantitative surveys of 229 households in three distinct cocoa regions of Côte d'Ivoire and 224 households in three distinct regions of Ghana were conducted using an 8-page questionnaire. In addition to direct observation of roofing, living area and sanitation in those households; a total of 1257 children were weighed and measured to detect the percentages of stunting, wasting, and low body mass in cooperative vs. non-cooperative and control-village households. The variables generated from this survey were then used to elaborate descriptive statistics and head- and tail-group comparisons for key parameters; and to test ten hypotheses using both ANOVA treatment tests for the overall significance of regional area and membership status and Student-t tests for the significance of means. These hypotheses sought to sort out the role of cooperatives as possible determinants of productivity, marketing efficiency, essential service delivery, social development, child nutritional status, incomes and well-being. To complement the quantitative data, qualitative focus groups and semi-structured interviews with cooperative leaders, cooperative members, non-members, and control village producers were then conducted to explore in depth the reasons underlying the statistical results and to generate strategic recommendations for the future.

The hypothesis testing led to significantly positive results for the role of cooperatives for nine out of ten hypotheses.

In terms of production technology (*hypothesis 1*), it was found that a more judicious (but no greater) use of "modern" inputs (fertilisers, pesticides, mechanical implements) led to 19% (42 kg) higher per hectare yields for cooperative members than for non-members, and especially control-village producers. The results were highly significant in Ghana, but less so in Côte d'Ivoire because of the differential stages in the cocoa cycle by regional area and the differential use of free markets by members and non-members.

Cooperatives were also found to be highly beneficial in terms of cocoa marketing. Members receive fairer weight and quality evaluations of their beans (*hypothesis 2*), superior marketing and transportation services (*hypothesis 3*), and higher revenues both per bag (prices including bonuses paid by the coops to their members for yield, weight and grade accorded) and per hectare (*hypothesis 4*) than non-members or control farmers.

This result had also been demonstrated in 2003 (table 1). At that time, a study was done involving eight local farmer-run cooperatives in Côte d'Ivoire. In the 2002/03 cocoa harvest season, seven cooperatives worked through a cooperative union call COMKA on three unique ways to boost the local prices paid to the cooperative for cocoa. A total of 18,700 metric T of cocoa were sold using these strategies, impacting 10,900 member farmers. Comparisons were made between the prices available to individual farmers not selling cocoa through the cooperative to those who sold through the three ways programs.

The first system related to times of sale. If a truck load of cocoa can be sold at the right time, either in the evening or early the following day, better prices will be paid by exporter. This system relies on knowledge of the variation of the world prices paid at the London and New York Boards of Trade. Using this method, 18,467 T of cocoa were sold at an average price of US\$ 1,180.00 per metric T, 2.5% increase in price, or US\$28.73 per metric T compared to selling cocoa without this marketing method. The total increase in returns was US\$530,700 or an average of US\$49.10 per farmer.

A second method saw COMKA negotiating with exporters a premium basis on the perspective of receiving a higher volume. Such group negotiation added US\$16.42 per metric T on top of the daily fluctuating buying price, a 1.4% improvement over prices paid to non members of COMKA. The total increase in returns was US\$302,900 or an average of US\$28.00 per farmer.

The third method bypassed the local buyer (exporters based in Côte d'Ivoire) to sell cocoa directly to importers located outside of the country. Under that method, 402 metric T of cocoa were sold at an average increase in price of US\$133 per metric T. This system increased total price by \$53,650 (9.5%).

Table 1: Ways to improve local price

	Quantity	Price increase/farm gate price	Increase/Ton	Total increase	Income increase/farmer
	Tons	%	US \$	US \$	US \$
Time of sale	18 467	2,5%	28,73	530 700	48,69
Premium on volume	18 467	1,4%	16,42	302 900	27,79
Export	402	9,5%	133,00	53 650	4,92
TOTAL	18 870			887 250	81,40
Mean per ton			47,00		

In the 2002/03 cocoa season, the combined efforts of these three programs increased the price paid for cocoa by US\$887,250 or an average of US\$47.00 per metric T. For benefiting farmers this represents an added income exceeding US\$81.00.

In addition, results from a parallel study in Cameroon show that coop members receive 6kg (10%) higher weight per bag compared to those selling to local buyers.

These results indicate that there are multiple ways to improve the efficiency of cocoa marketed in West Africa. Similar marketing systems are also being used to increase the prices paid to farmers for coffee and other commodity crops grown in the region.

Another key area of cooperative strength was found to lie in the provision of essential services: in technical training in production, marketing and management; cash advances and credit-based sale of inputs; marketing services; household loans; medical services, infrastructural and social investments, and group-based consumption purchases (*hypothesis 5*). A composite satisfaction scale proved conclusively that cooperative members are significantly more satisfied with the services they receive through the cooperative than non-members and control farmers respectively are with services from alternative suppliers. In a related hypothesis, it was also found that cocoa cooperatives are highly instrumental in giving production, marketing, and management training (*hypothesis 6*) not only to their members, but also to their share-croppers and non-member neighbours (figure 1 and table 2). In this and other areas, the spill-over benefits flowing from members to non-members were found to be substantial.

Table 2: Cooperative training performance

	Sources of advice for cocoa producers					% of training share by COOP	% difference from members
	Coop	STCP	Government	Private company	Total (times)		
Whole sample	349	376	331	44	1100	31,73%	
Members	282	322	142	15	761	37,06%	
Non-members	60	54	100	19	233	25,75%	-69,38%
Control	7	0	89	10	106	6,60%	-86,07%
Côte d'Ivoire	90	366	55	12	523	17,21%	
Members	71	320	22	3	416	17,07%	
Non-members	19	46	19	6	90	21,11%	-78,37%
Control	0	0	14	3	17	0,00%	-95,91%
Ghana	258	8	276	31	573	45,03%	
Members	212	1	121	13	347	61,10%	
Non-members	40	7	81	13	141	28,37%	-59,37%
Control	7	0	74	7	88	7,95%	-74,64%

The results on social and community development (*hypothesis 7*) were also positive. Direct experience with cooperatives led members to award significantly more positive evaluation (3.07 out of 5) to the role of cooperatives in the socio-economic development of their village than non members (2.44) or control farmers (1.6). Household re-organisation (*hypothesis 8*) also allows member women spend almost 6% more of their time in “productive” (income-generating) vs. “reproductive” (cooking, cleaning, fetching) activities, as compared to control farmer women. Yet traditional gender roles and cultural values still resist the democratizing winds of the cooperative movement. This effect was even seen to extend to school age children in one region: Tiassalé, in Côte d'Ivoire. There, bad harvest and resulting cash-flow problems in the school-return period have made member families, those most dependent upon cocoa revenues, unable to send all their children to school. They choose to keep the girls, rather than the boys, home.

In terms of standard of living and quality of life (*hypothesis 9*) one fact is that most of members live farther away to clinics and markets meaning they are in real need of collective transportation to get the sick to hospital and themselves and their products to market.

Members have larger living areas and total possession value than non-members but generally not as large as the control groups since they live in different villages, often in more favourable environments closer to markets.

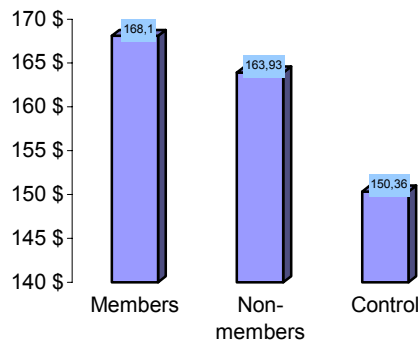
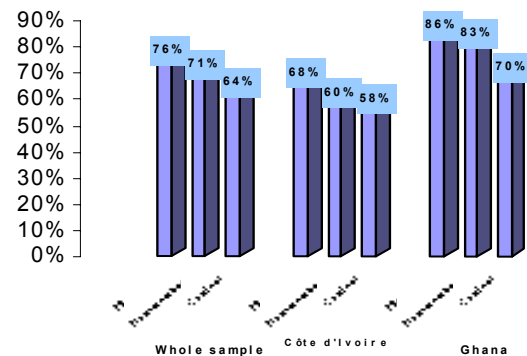
In Côte d'Ivoire, members have significantly higher habitat quality (roof and wall quality, electricity source, drinking water, bathing and bathroom facilities) than non-members. The results although in Ghana are the opposite where both control and non-members have significantly higher score than members. It is surprising, however, it stems from a conscious decision on the part of Kuapa Kokoo leaders to implant their new cooperatives amidst the very poorest and most desperate populations in rural areas. There has not yet enough time for those disadvantaged areas (the three distinct areas identified) to build up the long-run components of habitat quality.

There are no significant differences in health status among members, non-members and the control group. Although non-significant, non-members do seem to have marginally higher percentages of sickness than members in all regions, even though they live in same villages. Control farmers are, on the other hand, slightly less sick than members, probably because of their greater proximity to clinics, roads and markets.

In terms of child well-being more generally, there is a severe and generalised problem of stunting, wasting, and low body mass throughout the region that the cooperative movement, in concert with government organisations and NGOs, must make every effort to combat. In Côte d'Ivoire, one in six boys and girls under five years of age are severely malnourished; that is, their height and weight for age are more than three standard deviations below the WHO standards. In Ghana, the corresponding figures are one in 14 boys and one in 12 girls. As children age (6 to 14 years) the situation gets worse: one in every four boys and girls in Côte d'Ivoire and in Ghana are severely stunted, wasted, or both. Against this background, cooperative members' children are generally taller and more filled out than non-member children. Although farmer associations, government and NGOs may all be valued partners in the struggle to improve living standards and health care in rural Africa, no single actor can improve the livelihood alone. All actors, with their unique strengths, should be involved in an integrated strategy to combat ill health and malnutrition in the entire region.

Taken together, these results lead us to reject hypothesis 9 as written: *The quality of life is not significantly lower for members than for control-village producers despite the significantly shorter distances that separate the latter from clinics and markets.* However, on the other hand it is recognized the important achievements of the cooperative in housing, habitat, health and nutrition they have made compared to their within-village neighbours.

Finally, incomes per capita (*hypothesis 10*) are 2.6% and 12% higher for members vs non-members and control farmers (figure 2); because cooperatives have allowed farmers (figure 3) to specialize in (achieve 5% and 12% higher percentage of their revenues from) cocoa as an income source in both countries. Results have demonstrated that members of cooperatives do have higher income than control farmers in all areas, except in Tiassalé (Côte d'Ivoire). As a result, the quality of life (as captured in living area per capita) is higher for members.

Figure 2: Income per capita (USD) of producer groups, (Whole sample)**Figure 3: Cocoa incomes as % of total income**

Given these unique contributions to productivity, marketing, essential service provision, social development, and income, the concluding strategic section of the report outlines three fundamental suggestions for enhancing and expanding that contribution in the future. First, it is essential that cooperatives be actively involved as one of several component thrusts within an overall strategic plan. Cooperatives cannot do all of the work alone. If cooperatives are to help extend technology, those must be generated by well-financed and qualified agronomists. If cooperatives are to improve marketing power, promote vertical integration and equitable pricing, others must be working to generate up-to-date market information as well as the tangible and intangible scaffolding of efficient markets. If cooperatives are to implement, and in some cases even inform, government policy, that policy must take to heart to what extent the development needs of the nation depend upon improving well-being in each courtyard.

Second, we recommend exchange visits between farmers with similar problems – or complementary solutions – to help to seek common strategies for cocoa production, marketing and well-being improvement at the household and community levels. The five-point radar diagrams in the last section of the report suggest which sites in Côte d'Ivoire and Ghana would likely most profit from such exchanges. Of particular interest are cases where the successes of one region may provide the answers to another, and vice versa.

Third, we encourage continuation and expanded funding for the STCP platform and similar initiatives in Africa as a whole. The issue of well-being is not limited to the six regions selected for this report, nor to cocoa as a crop. It has to do with the sustainable improvement in the levels and inter-household distribution of income, dignified employment, health and nutrition throughout the entire developing world, not least in West Africa. Sustainable tree crops of all types and sustainable social institutions including cooperatives must therefore be given much greater financial and policy importance in the future. In the specific context of the STCP, the positive results of this study suggest that the scope and reach of all four components should be considerably expanded in the next phase of the project.

LIST OF ABBREVIATIONS

COMKA

FCFA The FCFA franc, monetary unit used in French-speaking West Africa

FO Farmers' organisations

ICCO International Cocoa Organization

IITA International Institute for Tropical Agriculture

K Potassium fertiliser

KK Kuapa Kokoo, a major cocoa producer cooperative in Ghana

LBC Licensed Buying Company, private and cooperative enterprises legally
allowed to purchase cocoa beans in Ghana

N Nitrogen fertiliser

P Phosphorus fertiliser

QCO Quality Control Officer (in Ghana)

SOCODEVI Société pour la coopération et le développement international

SPSS Statistical Package for the Social Sciences spreadsheet

STCP Sustainable Tree Crops Program

WHO World Health Organisation

FDPCC Fonds de développement et de promotion du café et du cacao

BNETD Bureau National d'Études Techniques pour Développement

FAO Food and Agriculture Organisation of the United Nations

MPs Members of parlement

FGCC Fonds de garantie des coopératives café-cacao

USAID United State Agency for International Development

JSS Junior secondary highschool

PPP Public Private Partnership

PPPP Public Private participation Partnership

c.i.f. Charges insurance and freight

f.o.b. Free on board

I. Introduction

I.1 The real-world problem

World cocoa markets are in crisis. Global production of cocoa beans in the 2003-2004 and 2004-2005¹ crop years reached 3.21 million tonnes, some three percent higher than in 2002-2003. This would seem to signal steady progress in world production and yields. But since chocolate bars, chocolate cakes, chocolate ice cream, and hot chocolate are the mainstay of desserts in many countries; the derived demand for cocoa beans is highly inelastic: a slight increase in production brings about an enormous fall in price. Between 2002-3 and 2003-4 the world price for cocoa dropped a full 48% on world markets, from some 3000 dollars US per ton to about 1560 dollars in 2003-4² and 1580 dollars as of April, 2005³. Given relatively fixed margins for marketing intermediaries (exporters, middlemen, and assemblers), the largest bite of the price shrink was taken out of prices paid to producers. This of course had a direct impact on their incomes and food security. Malnutrition and diseases rose without the revenues to pay for health care or even health centres to go to.

According to a Dow Jones newswire on August 9, 2005, *“low prices have crushed farmers willingness to invest in fertiliser, pesticide and insecticide to boost and protect their crop”*. But the impact of world market conditions on cocoa producers may have quite different effects depending upon national policies, production and marketing conditions, and social development, notably that of farmer organisations (FO). First, Agricultural Structural Adjustment policies promoted by the World Bank and the International Monetary Fund have induced most cocoa-producing countries, like Côte d’Ivoire, to liberalise internal cocoa markets and prices, making international price fluctuations surge through their markets like a direct electric current. Ghana, exceptionally, has not, preferring to maintain a government-established base price fixed at some 72% of c.i.f. world price as opposed to only 41% in Côte d’Ivoire⁴. This fact explains why much cocoa production has leaked from Eastern Côte d’Ivoire across the border into Ghana, helping to equilibrate the impacts on farmers in the two countries.

Second, given the relatively young age of plantations and the higher prices received, cocoa producers in Ghana continued their steady increase in output levels (perhaps the single most important cause of the fall in world prices!) The 46% upsurge in cocoa output in each of the past two years (Table I.1), has brought Ghana to a level of production that is 22.3% of total world output, and more than half of that of Côte d’Ivoire for the first time in history. It is a matter of some debate how much cocoa output is erroneously deducted

¹ Estimates of the FAO, *Food Outlook*, No. 2, June 2005.

² This statistic and much of the information in this section are drawn from BNETD/Observatoires Café-cacao – *Commercialisation due cacao. Rapport annuel 2003/2004*.

³ FAO, *ibid*. Reuters attributes the slight increase in prices to both surplus demand on world markets and political unrest in Côte d’Ivoire.

⁴ BNETD/Observatoire Café-cacao – *Commercialisation du cacao. Rapport annuel 2003/2004*, pp. 4 and 20.

from the statistics of Côte d'Ivoire and attributed to those of Ghana due to cross-border leakages, but the trends seem clear.

Table 1: Trends in cocoa production in Côte d'Ivoire, Ghana, and the world (tonnes)

	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005 ⁵
<i>Ghana</i>	437,000		341,000	497,000	720,000	580,000
<i>Côte d'Ivoire</i>	1,400,000	1,212,000	1,265,000	1,320,000	1,340,000	1,330,000
<i>World</i>	3,007,600	2,853,400	2,851,300	3,102,000	3,200,000 ⁶	3,200,000

Third, the presence, roles, and impact of cooperatives in the two countries may also differ substantially, even though it is widely recognised that technology-led increases in yield must be married with cooperative-led improvements in price⁷ and community organisation. In April 2005, for example, the Ghanaian cooperative association Kuapa Kokoo sent two of its representatives⁸ to London to meet Prime Minister Tony Blair, Treasury Minister Gordon Brown and several MPs in order to promote the fair trade of “equitable” chocolate, which seeks to give a higher share of the final consumer pound sterling directly to farmers. Meanwhile, during the 2003/2004 crop year in Côte d'Ivoire, producers not associated in cooperatives were forced by low prices to sell off their beans earlier than usual at harvest time (October through January, with a peak in December). Cooperatives in contrast were able to spread out sales much more evenly over the year because of better storage facilities and market management. This is a vital role, because historical patterns over the past ten years (Figure 1) show that average prices have been highest (red line) and least volatile (blue line) in March. Holding off part of sales till that month is thus one way to increase the value added accruing to struggling producers and to have a strong regularising effect on the prices received by both members and non-members. A key requisite of such a strategy was the 25 to 30% of financing, an increase of between 5 and ten percentage over the previous year, that came from the cooperative itself. This is because cooperative financing coming from other funds (loans and subsidies of the FDPCC, exporters, and the FFGCCC) had fallen. Partly has a result, cooperatives continued their trend of paying their members (and non-member sellers) increasingly in cash.

Fourth, the structure of the marketing chains in the two countries also diverges substantially. The prices to producers in Ghana are fixed, but vary by region in Côte d'Ivoire, from a low of 334 FCFA per tonne in the Southwest to a high of 378 FCFA per tonne in the East, where the present study was conducted. This discrepancy is largely due to the weak presence of cocoa FOs in the former zone, forcing producers to sell the virtual totality of their crop to *pisteurs* backed by Lebanese exporters. Meanwhile, the export margin in Côte d'Ivoire has grown substantially, from 265 FCFA per kg in 1999/2000 to 435 in 2003/2004, despite the drop in world prices and become increasingly erratic over time and place. This may be attributed to the licensing fees, fuel, driver salaries, formal

⁵ Reuters estimate

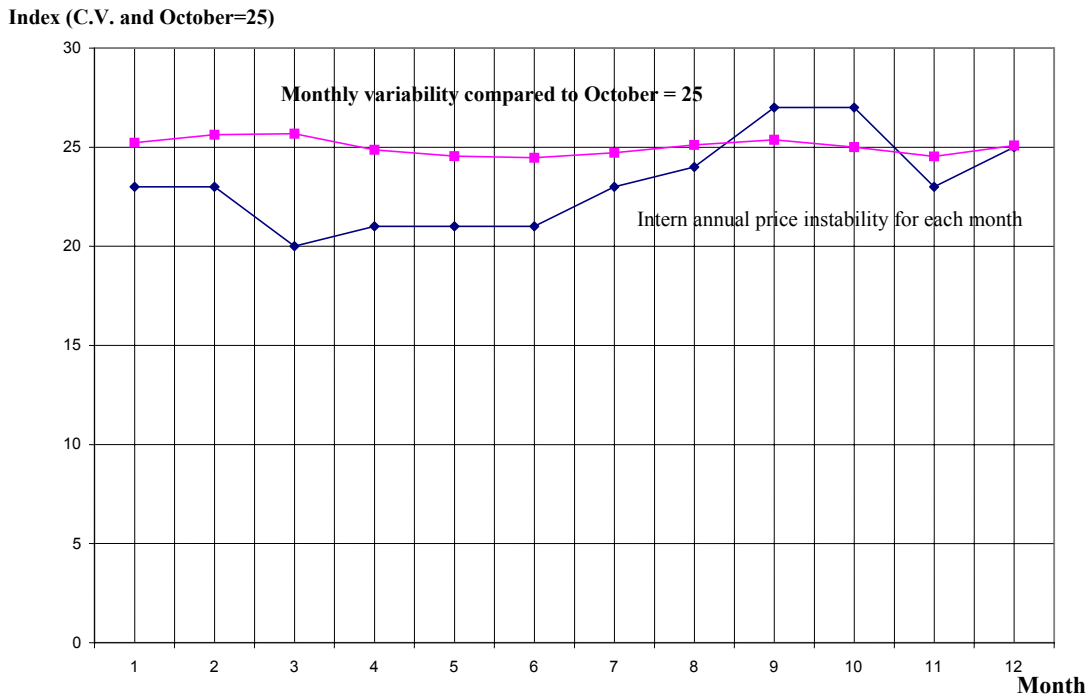
⁶ The FAO reports 3,400,000.

⁷ See for example, STCP Impact *Brief issue no. 2*, april 2005.

⁸ Including Ms. Veronica Mintal, Treasurer of the Regional Area in Konongo, one the research sites selected for the present study.

tolls and informal extortions, labour, and other costs beyond the control of the *pisteur*; but the end result is to squeeze down the share of export price received by the non-cooperative producer, from 53% in 2001/2002 to a mere 41% in 2003/2004. Despite the long-term advantages of liberalisation, a standardisation and regulation of marketing margins in the short run would seem an urgent priority.

Figure I.1: Indices of seasonal price and inter-annual variability for cocoa, 1995-2005



Source: Our calculations from International Cocoa Organisation, ICCO Monthly and Annual Average of Daily Prices of Cocoa Beans, 1960-2003; daily prices 2004-2005. www.icco.org/prices

Finally, the socio-political situation in the two countries differs markedly. Ghana, while by no means a prosperous nation, is blessed with unusually stable social and political conditions. Meanwhile, Côte d'Ivoire is beset by mounting unrest between the local population and burkinabé immigrants over land rights, generalized tension in the north of the country due to increasing poverty, and occasionally violent jockeying for power between the current ruling party and hopefuls in the upcoming elections in October. Although on April 6, 2005, government and leaders of rebel forces agreed to end hostilities, continued unrest, including the assassination of nine gendarmes in July, has left roads in serious disrepair and made deliveries of inputs and cocoa beans precarious and expensive. Indeed, the surveys upon which the present study are based had to be interrupted for ten days after the assassination of the gendarmes. An agreement is needed between President Laurent Bgagbo and rebels in the North on disarmament and political reforms before one can prepare election lists or reduce tensions and promote free commodity flows within the country.

This study will explore the relative weight of all the conditioning variables upon the most important result of swings in international prices and internal marketing margins: the incomes, health, and education of cocoa producers and their children. It will seek to determine whether, as compared to purely market-based policies or direct government intervention, the voluntarist approach associated with cocoa cooperatives freely set up and joined, seems an essential component of a strategy to improve productivity, incomes and well-being in the long run.

I.2. Purpose of the study

More specifically, the mandate for this study includes five objectives of vital importance for the sustainable development of the cocoa industry in West Africa:

-) To measure quantitatively and evaluate qualitatively the roles, impacts, and relative importance of cocoa farmer organisations in the improvement of the productivity, market power, management ability and socioeconomic well-being of member households in Côte d'Ivoire and Ghana.
-) To distinguish those impacts from the independent evolution of living conditions on the part of non-members within the same villages, as well as cocoa producers in control villages.
-) To evaluate to what extent the impacts of cocoa cooperatives flow over as positive externalities to share-croppers and other non-member neighbours, as distinct from cocoa producers in control villages
-) To measure the degree of positive reinforcement between the presence of cooperatives on the one hand, and the impacts of agronomic research and dissemination; marketing infrastructure, information, and integration; and appropriate government interventions and policies on the other.
-) To recommend ways in which the relevance, efficiency and effectiveness of FOs may be further enhanced in the short and long runs as a component of a complete socioeconomic development strategy for the troubled cocoa sector in Côte d'Ivoire and Ghana.

I.3 Testable hypotheses

To realise these objectives, this study combined quantitative and qualitative techniques of data collection and analysis. The former employed descriptive statistics, cross-tabulations, head- and tail-group comparisons, ANOVA tests of regional area- and membership status treatment, and Student t-value tests of means to validate the following ten hypotheses to detect significant differences in productivity and standards of living associated with by the presence of FOs:

Production

*Hypothesis 1: The **intensity of “modern” input use** (fertilisers, pesticides,, mechanical implements) and hence **per hectare yields** of members are significantly higher than those of non-members, especially control-village producers.*

Marketing

*Hypothesis 2: Cooperative members receive fairer **weight and quality evaluations** of their beans from cooperatives than non-member and control farmers received from the private sector.*

*Hypothesis 3: Cooperative members receive better **marketing and transportation services** from the cooperative than non-members or control group farmers obtain from other sources, if any .*

*Hypothesis 4 : The **cocoa revenues of members** (prices including bonuses paid by the coops to their members for yield, weight and grade accorded) are significantly higher per household and per hectare than those of non-members, especially control-village producers.*

Services

*Hypothesis 5: The **services** (technical training in production, marketing and management; cash advances and credit-based sale of inputs; marketing services; household loans; medical services, infrastructural and social investments, and group-based consumption purchases) received by members are significantly more numerous and of greater quality than for non-members, especially control-village producers.*

*Hypothesis 6: Cocoa cooperatives are highly instrumental in giving **production, marketing, and management training** to their members, as well as share-croppers and neighbours.*

Social development

*Hypothesis 7: Through their direct experience with cooperatives, members award more positive evaluation to the role of cooperatives in the **socioeconomic development** of their village.*

*Hypothesis 8 : The decision-making role and the **“productivity” ratio**⁹ of member household women are significantly higher than for non-member women, especially those in control villages.*

Well-being

*Hypothesis 9 : The **quality of life** (living area per capita, total value of possessions, habitat quality, health, and child nutritional status) is not significantly*

⁹ The productivity ratio is defined as the percentage of productive work (income generation, child education, self-education, decision-making) to reproductive work (house-cleaning, child-care, cooking, water- and wood-gathering).

lower for members than for control-village producers despite the significantly shorter distances that separate the latter from clinics and markets.

*Hypothesis 10: **Incomes per capita** are higher in member households than non-member households, especially those in control villages.*

I.4 Research questions

To complement these quantitative data, we also conducted qualitative focus groups of farmers and semi-structured interviews of village- and cooperative leaders as additional sources of information on the activities and perceptions of cooperative members vs. other cocoa producers. We were particularly interested in the causes lying behind any significant contributions that might appear in the statistical analyses. We therefore sought to provide clear and objective answers to the five following questions:

Production

1. What factors, if any, have permitted member farmers to learn about and finance appropriate technical changes more effectively than non-members or control farmers?

Marketing

2. What equipment and practices, if any, have allowed cooperatives to award higher prices, fairer quality grades, and heavier scale weights to beans sold to them by member farmers, non-member and control farmers, and share-croppers?

Services

3. What criteria and procedures, if any, have made cooperatives a more accessible and advantageous source of credit, input purchase, household- and school loans to cocoa farmers?

Social development

4. What direct or indirect contributions by cooperatives, if any, have helped them to bring about greater social organisation, socioeconomic development, educational and health infrastructure, and child well-being in villages where they are installed, as compared to control villages?

Well-being

5. What factors and practices, if any, have led cooperative member households to enjoy higher incomes, healthier surroundings, and better nutrition than other cocoa-producing households?

I.5 Context of the study¹⁰

A cocoa cooperative is like a cocoa tree: to survive, it must be managed sustainably, kept clear both of market imperfections at its base and the choking mistletoe of excessive regulation at the top. That is why the Quebec-based non-governmental cooperative agency SOCODEVI (*Société de coopération pour le développement international*) began collaborating even before the current world cocoa crisis, with the STCP (Sustainable Tree Crop Program) of the IITA (International Institute for Tropical Agriculture). It was in 1998 that the first contacts were made with the program, then in its infancy. SOCODEVI, whose expertise has been principally recognized in terms of strengthening FOs, was given a short-term mandate in the start-up phase in Côte d'Ivoire. This mandate involved setting up an information management system and improving the quality of cocoa beans in the two target cooperatives. Because this first collaboration was judged fruitful; it led to expanded involvement by SOCODEVI in the "pilot experiment phase" which lasted two years and ended with the conduct of an external review in January 2005.

During this second phase, STCP awarded SOCODEVI the role of piloting one of the program's four components: the reinforcement of farmer organisations in the four target countries (Côte d'Ivoire, Ghana, Cameroon et Nigeria). To do so, a technical adviser from SOCODEVI was assigned to Yaoundé. His role was to help coordinate national STCP programs in each of the countries in support of cocoa producers.

The external review in January 2005, while recommending that the STCP continue in a subsequent phase of between five and 10 years, questioned the relevance of FOs as a key component of the project. Notably, the external reviewers were not convinced by arguments that had been advanced by several institutional actors involved with, in favour of the positive impacts of cooperatives on the producers themselves.

The STCP program is ambitious and complex, not only in terms of its objectives but also in terms of the partnerships upon which it is based. Given the number of institutional actors with interests that do not always converge, the STCP chose to address the cocoa sector by uniting around the same table such diverse organisations as:

- International aid agencies (notably USAID);
- The chocolate industry;
- FOs;
- Research institutions;
- NGOs
- Governments (it is eventually hoped).

Up till now, budgets have remained relatively limited compared to the ambitions of the program. The initial agenda was also influenced by the emerging program priorities of certain actors. For instance, the sensitive question of the use of child labour on cocoa plantations became a priority after such cases were reported in 2001 in American and British newspapers. The possibly dangerous or abusive work done by children in the

¹⁰ This section has been translated and adapted from the French terms of reference for this study.

production cycle of cocoa also corresponded to a priority of industrialists who continue to exercise a considerable influence on the program.

In its collaboration with the program, SOCODEVI major preoccupation always remains to promote the long term interests of cocoa producers and the improvement of their living conditions. SOCODEVI always tried to reconcile that goal while collaborating with the industry. In fact, through this collaboration, SOCODEVI worked not only to reinforce the farmers organisation but also to strengthen the economic tied between the farmers organisation and some of their foreign clients. This role has not always been well understood among some of the STCP stakeholders.

Following the external review of the STCP of January 2005, a one-year “transition phase” was projected in order to plan the second phase of the program (2006-2010). Financial support was allocated by industry and USAID to continue the “Research and Dissemination” and “Impact Assessment” components. The “Farmer Organisation” component went un-financed. The industry limited its financing to the sole component it considers most relevant in terms of child labour – the Farmer Field School – because it seemed to yield good results. Nor did USAID wish to commit itself financially to the budget SOCODEVI submitted.

Faced with this situation, SOCODEVI made a financial contribution out of its program fund, which it had already done during the 2-year pilot phase. This new contribution was approved on June 3, 2005. However, the refusal of the other STCP partners to support financially the FO component has cast doubt upon SOCODEVI’s future involvement in this program despite the fact that the Program Manager and national coordinators of the STCP support the idea of maintaining aid to FOs.

Before moving forward with any new involvement within the STCP, SOCODEVI decided to conduct a socioeconomic impact study to verify whether FOs bring positive impacts to the cooperative members, their household and their community. SOCODEVI wanted to be able to go beyond anecdotic evidence, guts feelings, personal opinion, or short term “success story” to decide where to go on investing to better support the farmers and have the highest return with its investment.

II. Conceptual framework

II.1 Four thrusts of well-being improvement in cocoa producing regions

As noted, phase I of the STCP-PPP project to improve living standards in four cocoa producing countries was based on four major thrusts: a) improvements in marketing and market information, b) research and extension into new varieties and production techniques, c) government price and extension policies, and d) multiplication and deepening of farmer cooperations (Figure II.1). The first of these thrusts (a) sees the cocoa producer as a profit maximiser, the second (b) as a yield maximiser, the third (c) as a passive subject, and the fourth (d) as a pro-active citizen. The combination of these roles is at the origin of the expression PPP: Public-Private Partnership. The objective of this report is to evaluate to what extent a fourth “P” – Participation -- is essential to the success of the first three.

II.2 The unique functions of cooperative organisations

Why do co-operatives exist?

Cooperatives represent a unique third way of social organisation that springs to life when the two other forms – markets and governments – fail to provide inputs, outputs, and social goods or services efficiently. For example, where the private sector and markets function well, there is no demand for farmer organisations at the community level. However, in the case of “*market failure*”, such as the absence of markets or the presence of monopoly, it is normally first up to the government to correct the problem, either with construction projects or with appropriate legislation.

Similarly, when government is able to provide schools, health centers, and drinking water, there is no demand for farmer organisations at the community level. However, in the case of “*government failure*”, such as the absence of jobs or the presence of inefficiency, it is first up to the market to correct the problem, either with private entrepreneurial investment or with profit-linked incentives.

It is therefore particularly in cases of simultaneous market and government failure that cooperatives and other forms of voluntary participation become the natural, and only, recourse. In many countries, particularly those in economically underdeveloped or politically over-managed context, they may provide important functions within the overall process of social development. Cooperatives will therefore seek out and assign themselves to relatively difficult and disfavoured areas.

Once installed, cooperatives have unique strengths that allow them to survive and continue to perform vital services even after initial failures have been solved. That is why Asia is going through a renaissance of the cooperative movement to development market-savvy but socially responsible “new-style” cooperatives in Vietnam, Cambodia, China. Indeed, the objective observer of the world today will note that such new-style cooperatives are one of the rare successful examples of applied socialism. But it should be noted that many

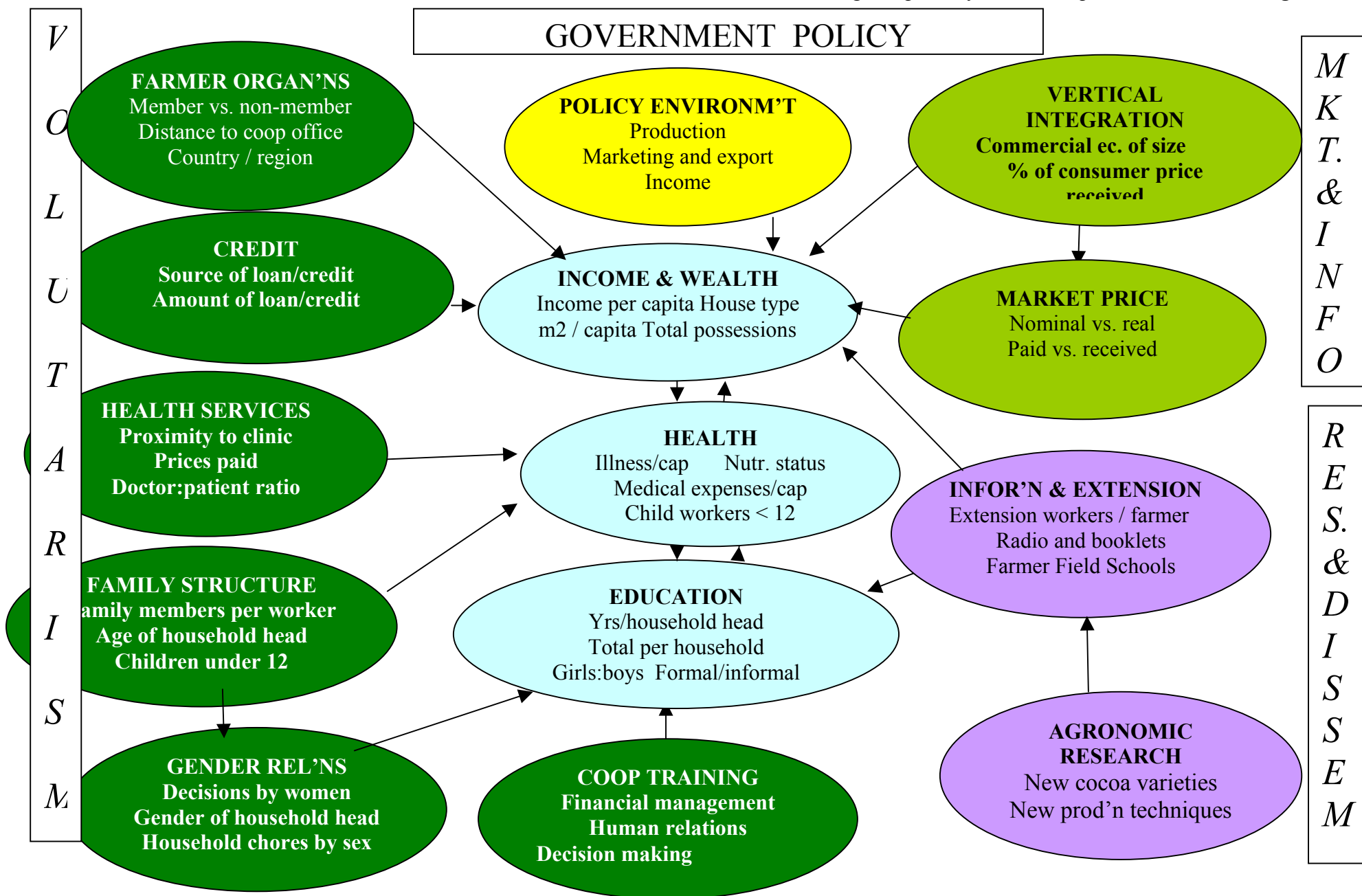


Figure II.1: The place and key roles of Farmers Organisations in the improvement of living standards

countries, even Canada, are semi-socialist in their vision of social programs, free health-care, and subsidised education. Cooperatives may also serve other vital functions of community development. For example, in Vietnam, cooperatives serves as an important extension arm of the government; in Ghana or in Cameroon, to organise vaccinations and implement social investments at the base level.

Cooperative organisations may be vital to the African cocoa sector because they are directed by the producers they serve and because they are guided by a set of seven principles that reflect the best interests of those producers. Indeed, all FOs should adhere to seven cardinal principles¹¹:

1. **Voluntary and Open Membership** — Cooperatives are voluntary organisations, open to all persons able to use their services and willing to accept the responsibilities of membership, without gender, social, racial, political, or religious discrimination.
2. **Democratic Member Control** — Cooperatives are democratic organisations controlled by their members, who actively participate in setting policies and making decisions. The elected representatives are accountable to the membership. In primary cooperatives, members have equal voting rights (one member, one vote) and cooperatives at other levels are organized in a democratic manner.
3. **Members' Economic Participation** — Members contribute equitably to, and democratically control, the capital of their cooperative. At least part of that capital is usually the common property of the cooperative. Members usually receive limited compensation, if any, on capital subscribed as a condition of membership. Members allocate surpluses for any or all of the following purposes: developing the cooperative, possibly by setting up reserves, part of which at least would be indivisible; benefiting members in proportion to their transactions with the cooperative; and supporting other activities approved by the membership.
4. **Autonomy and Independence** — Cooperatives are autonomous, self-help organisations controlled by their members. If they enter into agreements with other organisations, including governments, or raise capital from external sources, they do so on terms that ensure democratic control by their members and maintain their cooperative autonomy.
5. **Education, Training, and Information** — Cooperatives provide education and training for their members, elected representatives, managers, and employees so they can contribute effectively to the development of their cooperatives. They inform the general public, particularly young people and opinion leaders, about the nature and benefits of cooperation.
6. **Cooperation among Cooperatives** — Cooperatives serve their members most effectively and strengthen the cooperative movement by working together through local, national, regional, and international structures.
7. **Concern for Community** — While focusing on member needs, cooperatives work for the sustainable development of their communities through policies accepted by their members.

¹¹ This particular formulation is drawn from the National Rural Electric Cooperative Association, USA.

III. Methods of sampling, data collection and analysis

III. 1 Sample selection

As noted, Phase I of the STCP-PPP project has been active in four countries: Côte d'Ivoire, Ghana, Nigeria, and Cameroon. For this study, we decided to concentrate on the two most important producers, to include one French and one English-speaking nation and to compare one country with free-market policies and the other with a state-controlled marketing board. Côte d'Ivoire and Ghana became the obvious choices as countries of study.

We then selected three major cocoa producing zones in each country in order to capture important differences in agroclimate, age of plantations and proximity to markets. In Côte d'Ivoire, we selected three regional areas in the Eastern zone, which has supplied 50%, 74% and 59%¹² of national cocoa production over the past three years and therefore between a fifth and a third of world production! These regional areas were Tiassale, Adzopé and Abengourou. These zones were selected to reflect, respectively, below-average, average, and above-average conditions of **climate** (rainfall, lack of heat waves), **market access** (proximity, roads, infrastructure development), **soil** (fertility, irrigation, lack of erosion), **management** (by society leaders) and **socio-economic conditions** (income, gender, social relations). Notably, Abengourou lies quite close to Ghana, both geographically and linguistically; and is therefore in a position to sell cocoa beans across the border if prices in Côte d'Ivoire fell to low.

Similarly in Ghana, we selected as the central point the city of Kumasi, home base of Ghana's most important cocoa cooperative: Kuapa Kokoo. We then choose three regional areas within approximately 100 km of Kumasi: one on the Kumasi-Cape Coast highway (New Edubiase); one on the Kumasi-Accra highway (Konongo); and one on the Kumasi - Sunyani highway (Tepah). These areas also reflect, in the order named, descending levels of cooperative experience and cocoa yield.

In each of these six regional areas, we drew a random sample¹³ of 75 producer households: 35 who were members of cooperatives, 20 non-members who were immediate neighbours of the members selected and might therefore benefit from spill-over effects of cooperative membership, and 20 control-group producers who lived in villages with similar climate and marketing conditions to the first two groups, but which had never had a cooperative established in the community. That at least was our intention. Under actual field conditions, it was problematic finding control villages that were as far from markets and as poor as FO villages and yet were still producing cocoa. Villages closer to roads felt less need for cooperatives while those farther away had switched to other

¹² BNETD, p. 7.

¹³ To select the households to be surveyed, we start with the complete list of member households for the target society or societies. We then divide by 35 to find the "selection interval" defined as total members/35. For example, if there are 700 member households in the societ(ies), the selection interval = 700/35 = 20. Every twentieth house-hold on the list will be selected, starting with a household number selected from one to 12 by the roll of two dice.

agricultural products (fish, livestock, oil palm, etc.). While sources of income (off-farm work, remittances from migrants, etc.) while comparison between member and non-member households should remain scientifically valid, therefore, the presence or absence of farmer organisations is only one of many factors that determined the standards of living or income in the study villages. We had no choice but to study such control villages however, because no baseline study had been done in the area at the beginning of phase I which could be used to compare progress of member and non-member households to date. We strongly recommend that an identical methodology be used in 2010 as was used in 2005 to make accurate variable-by-variable, region-by-region and group by group comparison of impacts. The final sample selection of the 450 (six times 75) households sampled therefore took the form of Table III.1.

In addition, twelve households in each country were selected for the pilot phase of the interview, during which the questionnaire was improved and the training of the enumerators was completed. In each country, six enumerators were selected and trained. All had either extensive experience in cooperative management and rural development (Côte d'Ivoire) or in conducting village interviews (Ghana).

Table III.1 : Sampling structure for SCTP – PPP, Phase I Evaluation

Côte d'Ivoire	Members	Non-members	Control	Total by region
Abangourou	35	20	21	76
Adzope	36	20	20	76
Tiassale	36	20	21	77
<i>Total Côte d'Ivoire</i>	<i>107</i>	<i>60</i>	<i>62</i>	<i>229</i>
Ghana				
Tepah	35	19	20	74
Konongo	35	20	20	75
New Edubiase	35	20	20	75
<i>Total Ghana</i>	<i>105</i>	<i>59</i>	<i>60</i>	<i>224</i>
Total by membership	212	119	122	453

III.2 Techniques of data collection and analysis

Household surveys

To create the data needed for the quantitative analyses of this study, each household was visited by one of the enumerators. An 8-page questionnaire (Appendix I) was completed in approximately one hour of time per household. All children present were weighed and measured to detect possible wasting (abnormally thin), stunting (abnormally short) or subnormal body mass (abnormally under-weight even for their height) in some regional areas or membership categories (member, non-member, control).

A total of 622 children in Côte d'Ivoire and 635 children in Ghana were weighed and measured. Table III.2 shows the breakdown by gender and age of those children by

country. Because interviewers were instructed to weigh and measure all children under 15 present in and belonging to the household at the time of the interview, the number of boys and girls, as well as their breakdown by age, is somewhat uneven. On the basis of membership status, some 587 member children, 365 non-member children, and 305 control children were included in the sample. The large total size of the sample supplies a clear basis for comparing the levels of wellness or nutritional deficiency by country and membership.

Table III.2: Sampling structure for anthropometric measures of children, break down by country

	Côte d'Ivoire (N=229)			Ghana (N=225)			Grand total
	Boy	Girl	Category Total	Boy	Girl	Category Total	
0 to 5	117	120	237	97	104	201	438
6 to 14	189	196	385	230	204	434	819
Total	306	316	622	327	308	635	1257

Reference tables used by the World Health Organisation (WHO) served to categorise each child into one of four possible categories of height compared to a common international standard. If the child is shorter than the mean minus three standard deviations, he or she is considered to be *severely deficient* in height. If the child measures between 2 and 3 standard deviations below the mean, he or she is scored *moderately deficient*. Between 2 and 1 standard deviations below the mean puts the child at *mild deficiency*. Finally, any child who is taller than the mean minus 1 standard deviation is considered *healthy*. Classifying children this way allows one to sum across age and sex categories for a given country or membership status.

The same procedure as used for height was then applied to weight and weight-for-height. For the last, a new standard, the body mass index (BMI), has been developed during the past decade for international studies of child health status. This index is calculated as the weight divided by the square of the height. Less than 2 standard deviations below the mean is considered *severe* deficiency, less than 1.5: *moderate*, and less than 1: *mild*.

All these data were then coded into an SPSS (Statistical Package for the Social Sciences spreadsheet) in order to calculate **ANOVA tests of regional area and membership status treatment** for the entire set of variables in the set, as well as **tests for differences in mean** by country, regional area and membership category. As a first step in the statistical analysis of the quantitative survey results (Appendix table I), complete ANOVA tables (Appendices III and IV) were first studied to isolate the subset of variables in which the cooperative, and or the regional area, might lead to significant conclusions. In some cases, cooperative membership vs. non-membership, while significant, could be dominated by simple differences in climatic and marketing conditions by region. Therefore, we compared significant differences by regional area (Appendix III) vs. membership status (Appendix IV) within the data set. In each row of those appendices, the

first column displays, after the variable name, the probability that the variable does not significantly differ by "treatment" (region in Appendix III; membership in Appendix IV); in other words, the closer that value is to zero, the more significant the treatment effect. Any variable with a probability of greater than 0.10 is judged non-significant. Column 2 names the subsample and column 3 the number of households who responded to the variable in question. Column 4 then reports the "mean value" of such responses; and column 5 the absolute variability in the form of the "standard deviation" around that mean.

Given the wide range of units in which the mean is expressed (persons per household, tons per hectare), column 6 then divides column 5 by column 4 to yield the "coefficient of variation", a measure of relative variability expressed as a percent. This coefficient reflects for each variable as a whole and for each subsample, the intensity of household-to-household fluctuations between the highest and lowest subgroups.

Finally, the last two columns (maximum and the minimum for the whole sample and each subsample) allowed us to both a) detect/correct errors in the data set associated with improbable values ("outliers") and b) understand the spread in remaining values for the variable in question.

Once the ANOVA tables were analysed, a Student t-value was calculated to test for specific differences between pairs of regions or membership statuses. Throughout the analyses, a system of *a* = significant difference in means at the 0.01 level, *b* = significant difference at the 0.05 level and *c* = significance difference at the 0.10 level was used to detect the presence and level of significance of differences.

Many of the questions contained in the interview form asked the respondent to rank responses on a **five-point scale**: *Strongly disagree* = **1**, *Disagree* = **2**, *Fairly Agree* = **3**, *Agree* = **4** and *Strongly Agree* = **5**. Such data may be subject to t-test analysis, but the robustness of the results is improved if five or 10 individual questions are combined into a **composite score**, which yields a truly continuous variable. This report will present t-tests for both individual and composite scales. But it will also use **cross-tabulations** of the percentage breakdown of responses by country, regional area of membership category where appropriate.

A final analytical technique applied to the quantitative data was **head- and tail-group analysis** for key dependent variables. This nonparametric approach involves sorting the households by descending order with respect to, say, yield per hectare or cooperative satisfaction score, and selecting the top 50 as the "head group" and the bottom 50 as the "tail group". All other households are eliminated from the analysis. Differences in mean are then computed and once again sorted by descending order of importance. The top twenty positive factors which explain why the head group excels over the tail group are presented in a first table, and the twenty negative factors which explain why the tail group lags behind the head group are presented in a separate table. Such tables can be extremely helpful for strategic planning for the future (section VII of this report).

Focus groups

To generate the qualitative analyses used in this report, focus groups were conducted with two sample populations in each of the six regional areas of study. Figure III.1 illustrates the logical relationships among the six focus-group populations consulted in each country:

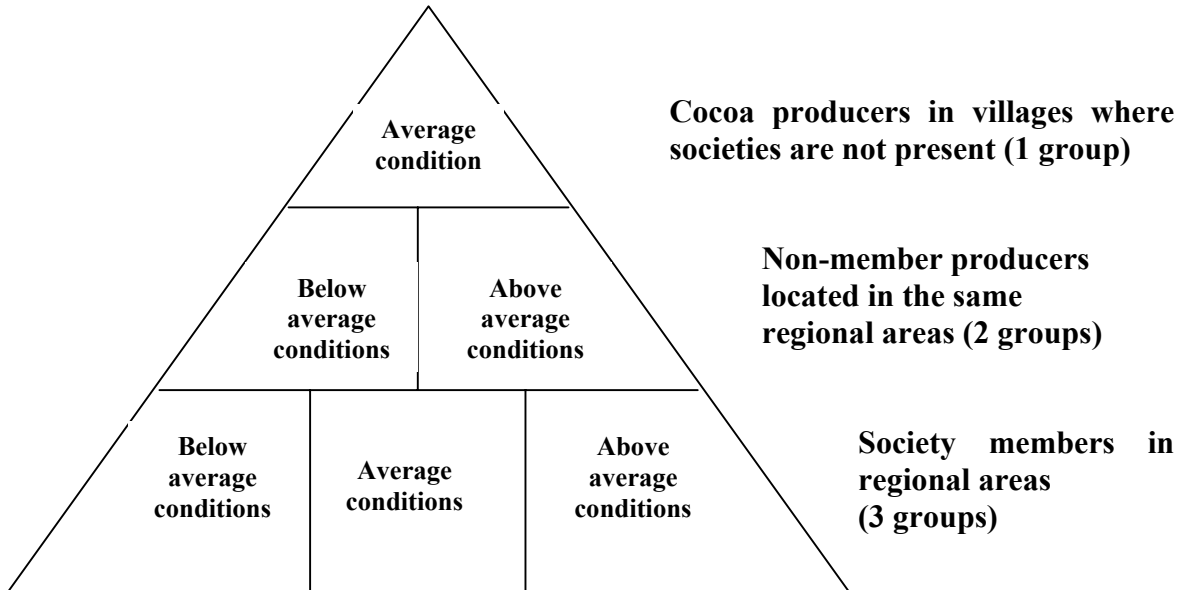


Figure III.2 : the sample selection structure of the six focus groups per country

Each focus-group¹⁴ involved a sample of between ten and fifteen people, who were invited to sit around a table or under a tree together and to participate in a democratic manner. In the case of *society* members, the fifteen people were selected to reflect, to the extent possible, four (4) women, two (2) local leaders elected by their society, three (3) farmers with above average cocoa holdings, three (3) farmers with average holdings and three (3) farmers with below average holdings.

In the case of *non-society members* of both types, the fifteen people were selected at random as follows: four (4) women, two (2) local leaders other than society leaders, three (3) farmers with above average holdings, three (3) farmers with average holdings and three (3) farmers with below average holdings.

Each of the six focus-groups took a approximately two hours, one hour for each of two questions:

1. *What have the been successes and advantages of the development experience to date?* (1 hour)
2. *What internal and external constraints have prevented those successes from being greater?* (1 hour)

¹⁴ In Côte d'Ivoire, logistical problems led to the fact that members and non-members were interviewed together in a single focus group at Adzopé. To make up for the non-member discussion so lost, we therefore added a focus group of non-members in Abengourou.

A Discussion Leader fluent in the local language was present to explain each of these questions and to interpret the results back to the Lead Researcher. It was the job of the latter to keep the discussion focused on the question at hand and to ensure that all participants took part on an equal basis in the discussion. Meanwhile the Focus Group Recorder took complete notes of all comments made, including (and especially) repetitions of the same points of view.

These notes were then transferred to an Excel spreadsheet where the frequency of answers was compiled. The responses were sorted by descending order of importance and separated into five categories consistent with the logical structure presented in Figure II.1.

1. Well-being, health and environmental
2. Production technology
3. Marketing
4. Social development
5. Services

For each focus group, two **summaries** were generated: “Past successes” in each of the five areas, and “Future priorities” in each of the five areas. In addition to the tables, (Appendix V) five-point **radar diagrams** were generated to clarify the relative areas of self-evaluated strengths and weakness on the part of each of the twelve groups interviewed. These diagrams were in turn used to generate strategic recommendations.

Semi-structured interviews

At the end of the focus group discussions with members, the participants were thanked and dismissed. Then the researchers met for semi-structured interview (APPENDIX II) with the 5 to 7 leaders of the cooperative to explore in more detail the rankings made by their members, and to discuss the strategic implications for the management of the cooperative in the future. Such discussions took between one and two hours, depending upon the location. The results were integrated with those of the focus groups in section V of this report.



Focus groups can take place even under a tree! (Tiassalé, Côte d'Ivoire)

IV. Description of the study area

IV. 1 Côte d'Ivoire

Figure IV.1a and IV.1b shows the maps of the six study regions for the current study. The three regional areas selected in Côte d'Ivoire reveal dramatically different levels of well-being, technology, and market performance (Table IV.1). **Tiassalé**, which lies the farthest to the west, had been a very successful cocoa producing area some 30 to 40 years ago, when virtually all producers had been members of a cooperative. But the ageing of plantations, and the lack of means to replant or protect the trees, has forced many farmers to abandon their membership, or even to replace cocoa with other crops. The 25000 FCFA (50 USD) per hectare required to replant would seem low to an outsider, but local farmers and their young-adult children report that there is nowhere they can obtain that sum.

Adzopé, by contrast, fares better in per hectare yields (bottom line of table IV.1) and many cooperatives are active. It is for this reason that a Cooperative Union has been set up to unite all members. The Union now numbers a total of 2600 members, about 20% of total cocoa planters who farm more than 25% of the cocoa plantation land in the area.

Abengourou is the eastern-most regional area studied. Its plantations are relatively young, and the management of FOs is dynamic. Sankadiokro, the leading cocoa cooperative in the whole region, was founded in 1968. Since 1991, they renamed themselves the Union of Cooperatives because there are so many separate units below them. The members of the cooperative represent about 10% of the total cocoa producers in the region: a total of 1222 members, up from 1000 at the creation in 1968 but down from some 6000 members in 1999, when prices had been more favourable.

Figure IV.1b: Map of the study area, Ghana



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Table IV.1 : Descriptive statistics of the study regions in Côte d'Ivoire

Areas of potential cooperative impact	Study region			Côte d'Ivoire
	Tiassalé (N=62)	Adzopé (N=76)	Abendgourou (N=75)	Total (N=213)
<i>Well-being, health and environment</i>				
Living area per capita (m ²)	13.36	9.12	46.79	23.05
Land ownership per household (ha)	2.8	6.2	9.5	6.2 ¹⁵
Land to cocoa (ha)	2.75	6.22	9.53	6.15 ¹⁶
Proportion cocoa land share-cropped (%)	14%	34%	72%	40% ¹⁷
Score of habitat quality (max = 31)	14.42	17.68	20.0	17.35
Distance to clinic or health center (km)	4.5	1.8	1.4	2.6
Diarrhoea in kids (%)	12%	10%	8%	10%
Malaria in kids (%)	33%	36%	40%	37%
Diarrhoea in adults (%)	4%	3%	4%	4%
Malaria in adults (%)	33%	30%	25%	29%
Meals per day (last 24 hours)	2.3	2.1	2.5	2.3
Meat per week (meals over last 7 days)	9.2	14.1	12.3	11.9
Value of possessions per capita	6.3	4.1	6.3	5.6
Dependency ratio (non-workers supported by each worker)	1.31	1.61	1.59	1.50
<i>Income level and sources</i>				
Income from cocoa as a % of total income	52%	61%	77%	64% ¹⁸
Non-farm income as % of total income	13%	1%	2%	5%
Salaried employment as % of total income	8%	5%	1%	5%
Remittances from migrants as % of total income	3%	5%	1%	3%
Income per capita (in USD)	113.71	212.06	202.86	175.94
<i>Production technology</i>				
N per hectare (kg)	0.48	0.17	0.10	0.25 ¹⁹
P per hectare (kg)	0.03	0.09	0.03	0.05
K per hectare (kg)	0.01	0.04	0.01	0.02
Pesticide use per hectare (in USD)	5.11	12.85	13.22	10.41
Yield per hectare (kg)	243.37	310.33	226.76	261.41 ²⁰

¹⁵ STCP Impact Brief Issue no. 2, April 2005 estimated 5.16 (0.52 ha/capita) for Côte d'Ivoire in 2000/2001.¹⁶ STCP estimated 4.96 ha per household in 2000/2001 for the entire country.¹⁷ STCP estimated 30% for Côte d'Ivoire in 2000/2001.¹⁸ STCP estimated 51% for Côte d'Ivoire as a whole.¹⁹ STCP estimated at 14.4% the percentage of cocoa farmers who apply fertilisers in Côte d'Ivoire.²⁰ STCP estimates 393 kg/ha for Côte d'Ivoire as a whole in 2000/2001.

IV.2 Ghana

Mabang, **Tepah** has relatively good conditions for cocoa production (Table IV.2). However, the Kuapa Kokoo coop there was founded a scant three years ago. At the beginning, getting people organized was troublesome; but in the end, they managed to stand together. Now they are one of the biggest coops. There are 112 members at the moment.

The productive conditions and yields in **Konongo** are less favourable than in Tepah. Yet the Kuapa Kokoo Society there is extremely democratic, and the leaders insist on mass consultation before they make any decisions. Transparent information flows also take into account cultural practices and beliefs. Although leaders are very responsible they seem to have virtually no knowledge of accounting or microfinance (interest rates, percentage estimation, projection). The Konongo cooperative chosen for study earned its independence in 2003 from the regional cooperative office. Although they had had a substantial amount of beans on their own, which represented the majority of the sales of cocoa in the whole society, they had to take their beans to sell to the cooperative office in the next town. Forming their own sub-society cooperative allowed them to sell their own beans directly. There are currently more than 80 members in the sub-society.

New Edubiase is the most successful and dynamic cocoa producing area studied. This may be explained not only by very favourable rainfall, soil, and market location; but also by dynamic leadership. The cooperative chosen for interview was established in 2002. It now formally counts 52 members, of which 22 are members of an emerging Credit Union.

Table IV.2 : Descriptive statistics of the study regions in Ghana

Areas of potential cooperative impact	Study region			
<i>Well-being, health and environment</i>	Tepah (N=72)	Konongo (N=74)	New Edubiase (N=74)	Ghana (N=220)
Living area per capita (m ²)	9.35	7.81	7.34	8.16
Land ownership per household (ha)	7.70	5.25	6.61	6.51 ²¹
Cocoa land per household (ha)	5.77	3.50	4.73	4.66 ²²
Proportion of cocoa land share-cropped (%)	26%	20%	23%	23% ²³
Score of habitat quality (max = 31)	16.15	16.69	14.26	15.70
Distance to clinic or health center (km)	7.2	6.0	21.7	11.6
Diarrhoea in kids (%)	8%	5%	7%	6%
Malaria in kids (%)	36%	31%	35%	34%
Diarrhoea in adults (%)	10%	2%	3%	5%
Malaria in adults (%)	17%	21%	24%	21%
Meals per day (last 24 hours)	2.4	2.5	2.4	2.4
Meat per week (meals over last 7 days)	10.0	10.1	11.1	10.4
Value of possessions per capita (1 = Wellington boots ... 50 = automobile)	3.2	3.7	4.4	3.7
Dependency ratio (non-workers supported/ worker)	1.3	1.3	1.5	1.4
<i>Income level and sources</i>				
Income from cocoa as a % of total income	82%	74%	81%	79% ²⁴
Government dividends/payments as % of total	1%	1%	1%	1%
Non-farm income as % of total income	1%	5%	4%	4%
Salaried employment as % of total income	1%	3%	2%	2%
Remittances from migrants as % of total income	4%	6%	3%	4%
Income per capita (in USD)	158.36	121.80	164.90	148.23
<i>Production technology</i>				
N per hectare (kg)	0.14	1.82	0.00	0.66 ²⁵
P per hectare (kg)	11.0	16.19	9.19	12.15
K per hectare (kg)	9.0	13.25	7.52	9.94
Pesticide use per hectare (in USD)	14.38	15.26	14.41	14.69
Yield per hectare (kg)	232.16	230.55	277.35	246.82 ²⁶

²¹ STCP estimated that each household has on average 6 ha in Ghana, or 0.67 ha/capita in 2000/2001.

²² STCP estimated cocoa land per household in 2000/2001 as 6 ha.

²³ STCP estimated 22% for Ghana as a whole in 2000/2001.

²⁴ STCP estimated 56% for Ghana as a whole.

²⁵ STCP estimated at 2% the proportion of households who used fertiliser in 2000/2001

²⁶ STCP estimated 257 kg/ha for Ghana as a whole.

IV. 3 The issue of child well-being

There has been much debate in the British and American press about the possible exploitation of child labour, whereby children are forced out of schools to work long hours under the hot sun with dangerous machetes and pesticide sprayers. A recent report by the STCP has convincingly laid those rumours to rest. The STCP findings will be circumstantially supported by the results of the present study, which reveal extremely high school attendance rates by school-age boys and girls, averaging some 95% across the entire sample.

Even so, given the very difficult economic conditions in the study areas, it is possible that a significant proportion of children in the most vulnerable age group (0 to 5 years) and even older (6 to 14 years) are malnourished. If so, a concerted program involving government, NGOs and cooperatives may be in order, particularly in socially unstable Côte d'Ivoire and in regions in each country where incomes are lowest.

We used the WHO height, weight, and body mass classification system described above to compare Ghana with Côte d'Ivoire as a whole, regardless of membership status (Table IV.3a and IV.3b). There is a strikingly higher percentage of healthy, and lower percentage of severely deficient, children in Ghana than in Côte d'Ivoire. For example, 38% of Ghanaian boys 0 to 5 are healthy versus only 29% in Côte d'Ivoire with respect to height (column 1). Similar patterns are found among girls. For example, 65% of girls 0 to 5 in Ghana have adequate weight versus only 46% in Côte d'Ivoire. The only exception to this pattern is the group of 6-14, where Ivorian boys have a slight advantage.

Table IV.3a: Boy weight and height - Results breakdown by country

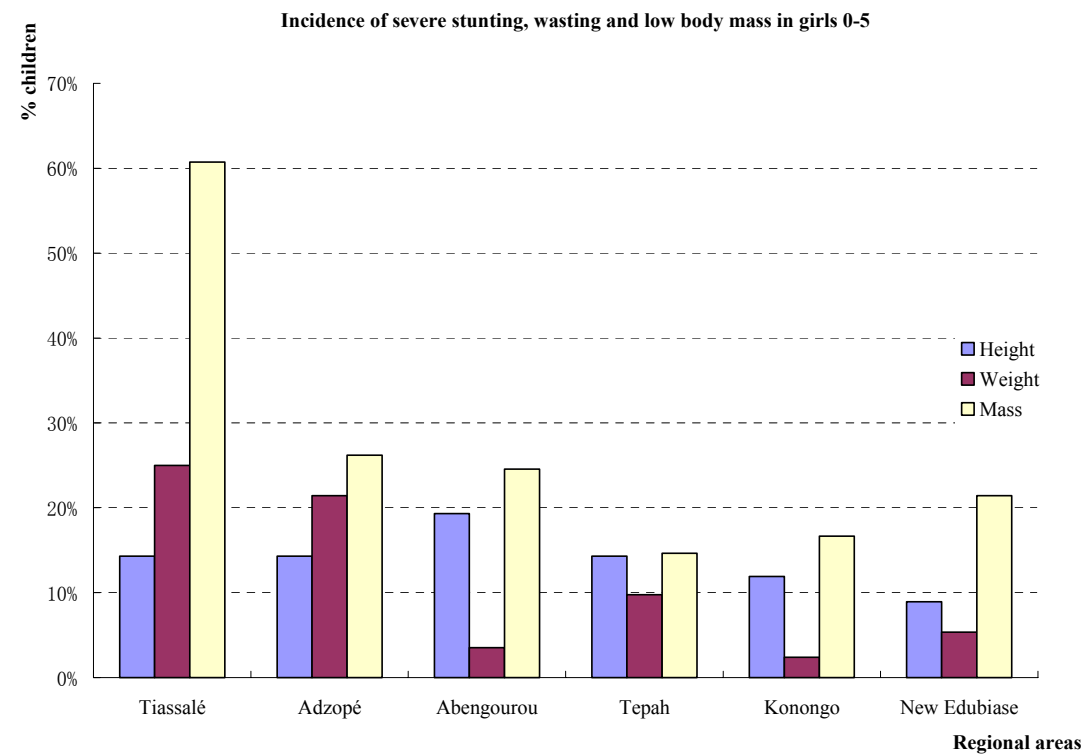
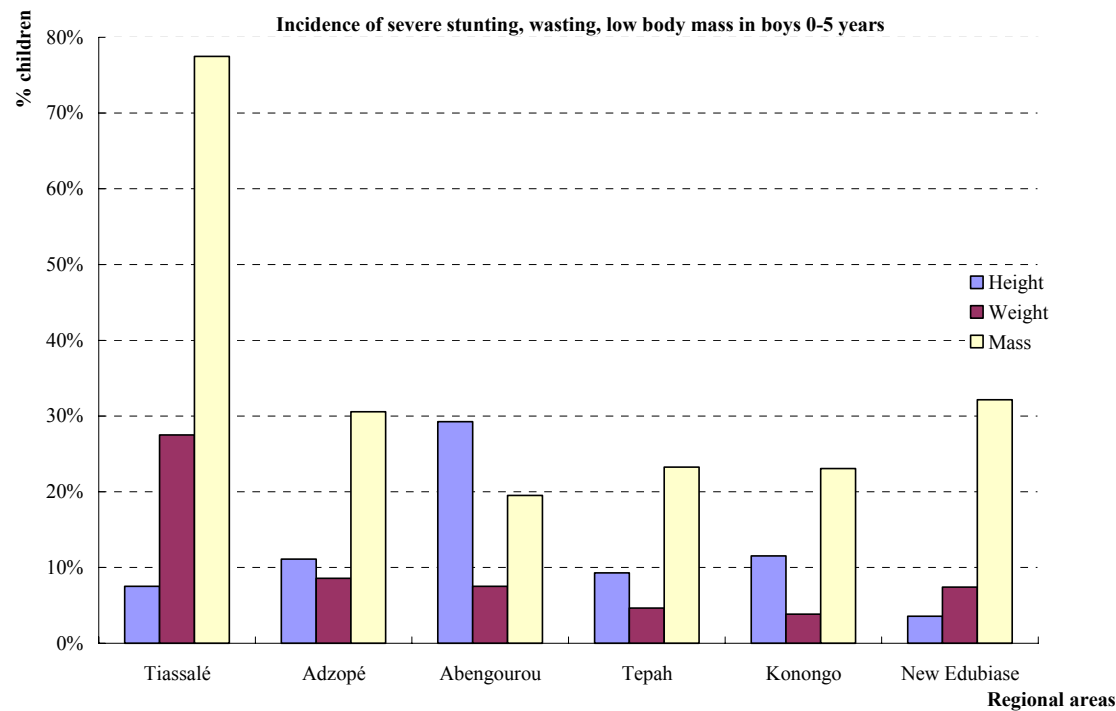
	0 to 5			6 to 14		
COTE D'IVOIRE	Height	Weight	Mass	Height	Weight	Mass
Severe deficiency	16%	15%	43%	20%	32%	38%
Moderate deficiency	14%	21%	4%	7%	15%	8%
Mild deficiency	41%	24%	6%	17%	12%	8%
Healthy	29%	41%	47%	56%	42%	46%
GHANA						
Severe deficiency	8%	5%	26%	21%	33%	36%
Moderate deficiency	12%	11%	15%	8%	17%	15%
Mild deficiency	41%	21%	8%	13%	13%	10%
Healthy	38%	63%	51%	57%	38%	39%

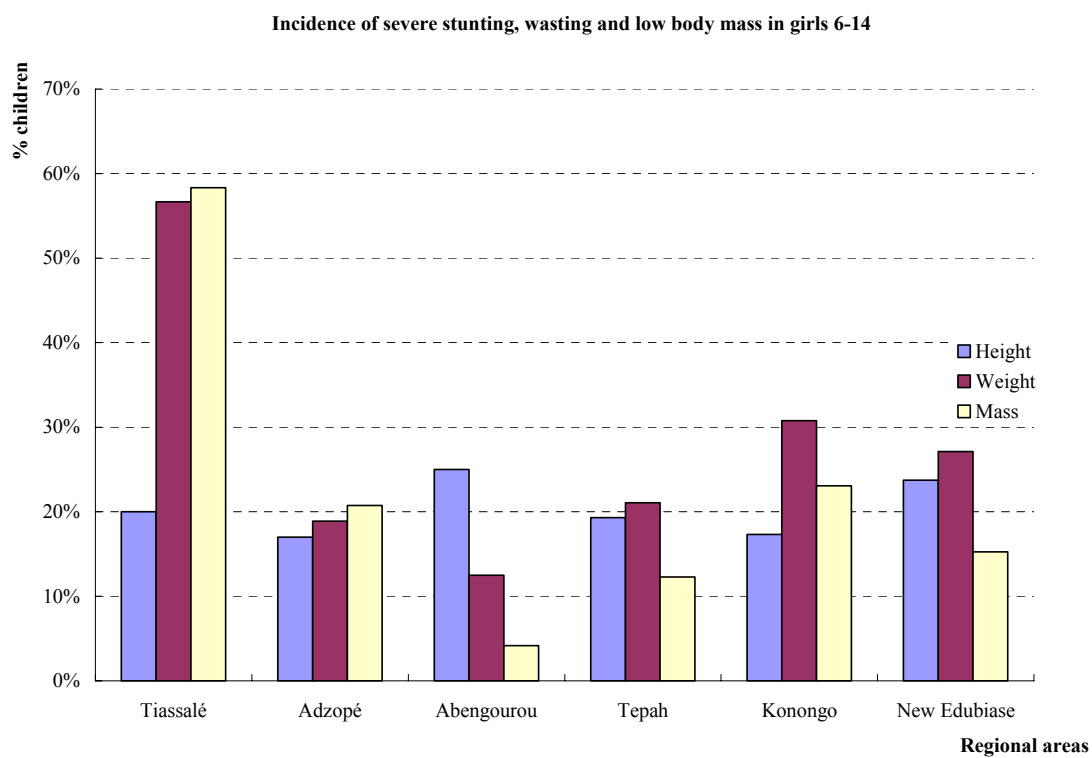
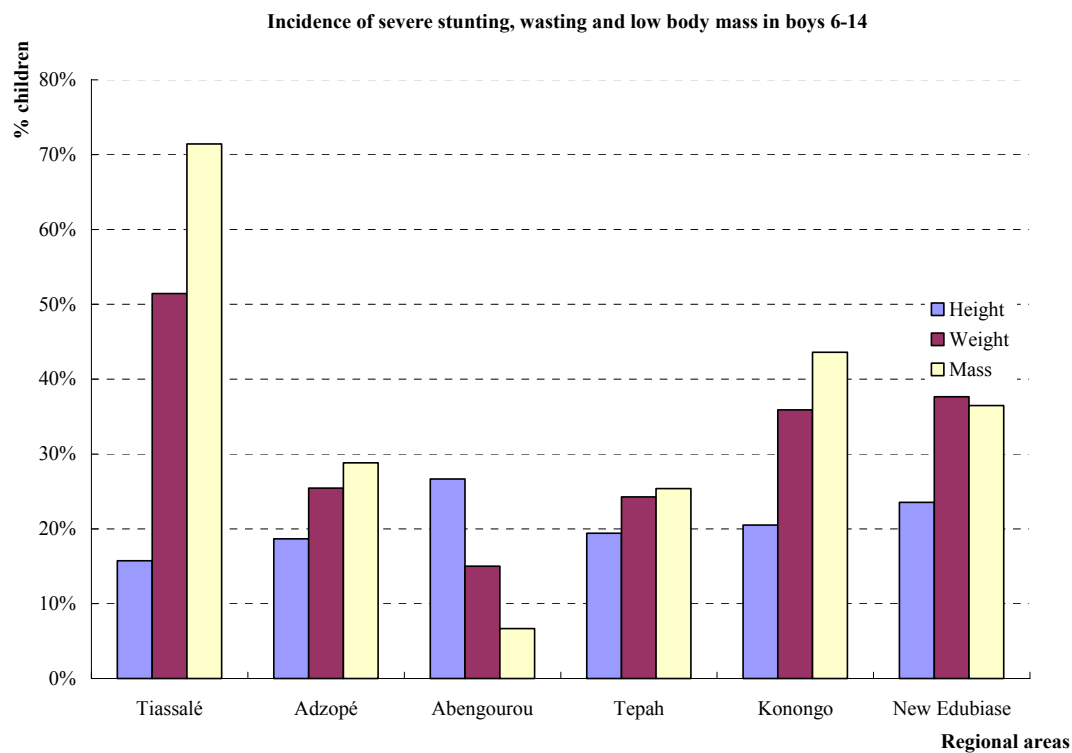
Table IV.3b: Girl weight and height - Results breakdown by country

	0 to 5			6 to 14		
COTE D'IVOIRE	Height	Weight	Mass	Height	Weight	Mass
Severe deficiency	16%	16%	38%	20%	31%	30%
Moderate deficiency	11%	17%	8%	14%	12%	9%
Mild deficiency	16%	21%	9%	14%	10%	7%
Healthy	57%	46%	45%	52%	47%	54%
GHANA						
Severe deficiency	11%	6%	19%	20%	26%	17%
Moderate deficiency	9%	12%	4%	15%	14%	11%
Mild deficiency	14%	17%	12%	10%	14%	13%
Healthy	65%	65%	65%	54%	45%	60%

Comparisons by regional areas are even more striking. When a child is “severely” malnourished (more than 3 standard deviations under the WHO standard), he or she is probably hungry, listless, unable to learn in school, and vulnerable to childhood and other diseases, particularly malaria. Figures IV.1 through IV.4 show comparative histograms of stunting, wasting, and subnormal body mass for all six regions. Within Côte d’Ivoire, the drier, lower-yielding Tiassalé region has significantly higher percentages of malnourished children than in either Adzopé or Abengourou. Similarly, Tepah in Ghana has significantly better levels of child health than either Konongo or New Edubiase.

The anthropometric results of our study point, therefore, to a substantial humanitarian problem in the entire region, and particularly in Tiassalé, that the cooperative movement alone cannot be expected to solve.





V. Results of hypothesis testing

V.1 Production

*Hypothesis 1: The **intensity of “modern” input use** (fertilisers, pesticides, mechanical implements) and hence **per hectare yields** of members are significantly higher than those of non-members, especially control-village producers.*

We may accept hypothesis 1 for Ghana and for the entire sample on average. Ghanaian members (Table V.1) have higher yields, gross household cocoa income, and gross margins/hectare than non-members and significantly higher levels of these variables than the control group.²⁷ As for the intensity of modern input use, costs of fertiliser and pesticide per hectare for members in Ghana are significantly lower than for other groups; further increasing gross margins per hectare. This means that cooperative members use agricultural chemicals in smaller quantity but much more efficiently than non member farmers, particularly in the control group. Nor do member farmers rely on more agricultural implements. In contrast, the control group has much lower yield, higher pesticide and fertiliser use, and significantly lower gross cocoa household income and gross margins than the members.

In Côte d’Ivoire, however, we cannot accept the hypothesis in the absence of any statistically significant patterns of yield, gross household income from cocoa or gross margins per hectare. Two factors may explain the non-significance of these results. First, in Côte d’Ivoire, yields range importantly from 243 kg/ha in Tiassalé to 310 in Adzopé (bottom of table V.1) . This over-riding ecological reality may have dwarfed the potential impacts of cooperatives. Secondly, the free market policy in Côte d’Ivoire has favoured the subset of non-members with extremely large plantations (up to 50 hectares). These farmers have the choice of selling through either the cooperative or to Ghana, or to seek higher prices from *pisteurs* anxious to procure large quantities. Members, in contrast, are morally bound to sell through the cooperative.

²⁷ Detailed data show this difference to be particularly significant in the Konongo region.

Table V.1: Descriptive production statistics for hypothesis 1

Variables of cooperative impact on productive efficiency	Yield per hectare (kg)	Gross household cocoa income (USD)	Fertiliser cost/ha (USD)	Pesticide use per hectare (USD)	Gross margin/ha including sales in off-season (USD)
Whole sample (N=433)	254.00	814.28	17.66	12.52	177.58
<i>Members</i>	262.14	869.89	15.09	11.42	188.88
<i>Non-members</i>	274.26	837.63	19.91	12.25	191.83
<i>Control</i>	220.26	689.83^c	19.92	14.96	145.15^b
Côte d'Ivoire (N=213)	261.41	861.81	0.71	10.41	155.21
<i>Members</i>	255.49	881.92	0.35	12.61	146.56
<i>Non-members</i>	299.23	918.08	0.16	9.46	182.87
<i>Control</i>	239.07	767.79	1.93	7.56^b	146.40
Ghana (N=220)	246.82	764.81	35.07	14.69	199.23
<i>Members</i>	268.72	857.52	30.25	10.21	229.39
<i>Non-members</i>	252.68	753.09	40.66	15.18	199.58
<i>Control</i>	200.79^b	607.78^b	37.90	21.83^b	143.85^b
By regional area					
<i>Tiassale</i>	243.37	296.14	1.46	5.11	135.19
<i>Adzopé</i>	310.33	1180.62	0.41	12.85	197.28
<i>Abendgourou</i>	226.76	1116.10	0.25	13.21	129.12
<i>Tepah</i>	232.16	888.69	25.81	14.38	194.40
<i>Konongo</i>	230.55	533.20	49.56	15.26	164.51
<i>New Edubiase</i>	277.35	875.87	29.63	14.41	238.66

a = significantly different from members at the 1% level, *b* = significant at the 5% level, *c* = significant at the 10% level.

In order to shed more light on the profiles of cocoa farmers who are the most (and least) successful in achieving high yields, head and tail group analysis was conducted. The sample was sorted by yield per hectare to isolate the top 50 (“head group”) and bottom 50 producers (“tail group”). The characteristics which most differed between the two groups were then identified (Tables V.2 and V.3).

It is immediately apparent (Table V.2) that high-performing producers obtain loans from the cooperative, which they rate far higher than private banks; and obtain supplementary advice from pamphlets, STCP and private input companies. They rely on a particular subset of agricultural chemicals (Actara and Funin), as well as their own sprayers to apply them. They also use significantly higher levels of potassium and phosphorus, and therefore have higher fertiliser investments per hectare. They produce substantial income from other crops, poultry and hogs, and as government workers or teachers. With the income so earned, they are able to support more dependent infants, retirees and infirm members per household than the tail group. The head group markets their products by motorbike and rates cooperatives much higher in terms of market services provided than the private sector.

Table V.2: Characteristics of head group in Cocoa yield per hectare

Characteristics of the head group in cocoa yield/ha	Means		Difference	
	Head	Tail	Absolute	/means
Interest paid to cooperative (% per year)	11.25	1.00	10.25	1.67
Labourers government workers or teachers	0.34	0.03	0.31	1.64
Sprayers for pests and diseases	0.42	0.05	0.37	1.57
Fertiliser cost per hectare (in USD)	62.22	9.05	53.17	1.49
Income from crops (in USD)	223.63	42.98	180.65	1.36
Poultry (animals)	3.96	0.83	3.13	1.31
Actara and Funin	1.74	0.37	1.37	1.30
Dependents (infants, aged, infirm) in the household	0.46	0.11	0.35	1.21
Income non-farm sources (in USD)	115.92	29.30	86.62	1.19
Potassium per hectare (kg)	12.56	3.18	9.38	1.19
Phosphorus per hectare (kg)	15.35	3.89	11.46	1.19
Performance of coops as a % of private banks and companies	4.94	1.34	3.60	1.15
Advice from pamphlet (times over last 12 months)	0.06	0.02	0.04	1.12
Hogs (head)	0.56	0.17	0.39	1.07
Pesticide per hectare (in USD)	19.84	6.18	13.66	1.05
Motorcycles and motorbikes	0.16	0.05	0.11	1.04
Marketing edge of cooperative over private sector (max= 5; min= -5)	1.16	0.37	0.79	1.03
Advice from STCP (times over last 12 months)	0.12	0.05	0.07	0.81
Advice from input company (times over last 12 months)	0.08	0.03	0.05	0.81

By contrast, the tail group (Table V.3) is characterised by use of an entirely different panoply of agricultural chemicals (Califan, Dithane, etc), livestock income from fish (as opposed to poultry and hogs), greater applications of nitrogenous fertiliser (as opposed to P and K), reliance on the trucks and cars of others for marketing, women household heads, loans from sources other than cooperatives, income from migrant remittances, and advice coming from neighbours rather than through formal extension channels.

Table V.3: Characteristics of tail group in cocoa yield per hectare

Characteristics of the tail group in cocoa yield/ha	Means		Difference	
	Tail	Head	Absolute	/means
Califan, Dithane, Ilocon, funguran, Gana 20, Diazole, Thionex, Cabamalt	0.00	0.03	-0.03	-2.00
Fish (number)	0.00	45.76	-45.76	-2.00
Nitrogen per hectare (kg)	0.00	0.18	-0.18	-2.00
Trucks or cars	0.00	0.02	-0.02	-2.00
Man hours in cooking, washing and gathering	0.08	0.56	-0.48	-1.51
Gender of the household head (0 = male, 1 = female)	0.06	0.27	-0.21	-1.27
% Income from livestock	0.01	0.03	-0.02	-1.08
Interest paid to other sources (% per year)	12.88	35.00	-22.12	-0.92
Land to other crops (ha)	0.03	0.08	-0.05	-0.86
Telephones and cell-phones	0.04	0.10	-0.06	-0.86
% Income from salaried employment	0.02	0.05	-0.03	-0.85
% Income from remittances from migrants	0.04	0.09	-0.05	-0.80
Man hours in livestock	0.18	0.40	-0.22	-0.76
Land of cocoa plantation total	3.63	7.95	-4.32	-0.75
Land per capita (ha per person)	0.92	1.90	-0.98	-0.69
Advice from neighbours (times over last 12 months)	0.76	1.44	-0.68	-0.62
Percentage of young trees (%)	16.47	31.08	-14.61	-0.61
% Income non-farm sources	0.03	0.05	-0.02	-0.59

V.2 Marketing

Hypothesis 2: Cooperative members receive fairer weight and quality evaluations of their beans from cooperatives than non-member and control farmers receive from the private sector.

We may strongly accept this hypothesis for both countries and for the sample as a whole. Members strongly believe that their beans are weighed and classified fairly (4.45 out of 5), while non-members and control farmers award significantly lower scores to private buyers for the same services (second and third columns, Table V.4). Indeed, a full 61.7% of members either strongly agree or agree with the idea that they receive true weights for the beans. The significant Student t-test results highlighted in **boldface** in the table thus confirm the widely-held belief in both countries that *pisteurs* and other private purchasing agents falsify their scales downward to give lower weight than those of cooperatives. It bears note that satisfaction with scales is the highest in the Abengourou region of Côte d'Ivoire, probably because of the excellent purchasing practices of the cooperative in that area.

This said, we must also report that farmers in both countries are perplexed as to why no producers' beans are evaluated as first grade. They believe this is a national problem to which an immediate remedy should be sought. For the moment, the higher revenues being awarded to member farmers probably derive from true weights being accorded, not better quality.

Table V. 4: Descriptive marketing statistics for hypotheses 2 through 4

Variables of cooperative impact on marketing	% of cocoa sales in total income	True weight (scale of 5)	True quality (scale of 5)	Cooperative members receive more revenue/bag (scale of 5)	Coop marketing performance score (max= 20)	Producers should assume more roles in marketing (scale of 5)	Ease of transport used by producers (scale of 5)
Whole sample	71%	4.02	4.22	3.36	14.87	3.70	1.96
<i>Members</i>	76.4%	4.45	4.45	3.67	16.16	3.59	2.04
<i>Non-members</i>	71.0% ^c	3.88 ^a	4.13 ^a	3.24 ^b	14.67 ^a	3.93 ^b	1.97
<i>Control</i>	63.9% ^a	3.23 ^a	3.90 ^a	2.73 ^a	12.69 ^a	3.67	1.81 ^b
Côte d'Ivoire	64%	4.03	3.98	2.92	13.76	3.61	2.72
<i>Members</i>	69.6%	4.43	4.35	3.16	15.23	3.41	2.8
<i>Non-members</i>	61.0%	3.81 ^a	3.87 ^a	2.97	13.42 ^a	3.75	2.70
<i>Control</i>	58.0% ^b	3.50 ^a	3.40 ^a	1.83 ^a	11.41 ^a	3.82 ^c	2.60 ^c
Ghana	79%	4.01	4.46	3.69	15.95	3.79	1.20
<i>Members</i>	84%	4.62	4.55	4.16	17.10	3.77	1.27
<i>Non-members</i>	82.%	3.93 ^a	4.37 ^c	3.41 ^a	15.83 ^a	4.08 ^c	1.24
<i>Control</i>	69% ^a	2.95 ^a	4.42	3.11 ^a	13.98 ^a	3.51	1.03 ^b
By regional area							
<i>Tiassale</i>	52.69%	3.97	3.61	2.05	11.78	2.83	2.28
<i>Adzopé</i>	61.16%	3.84	3.87	2.89	14.82	4.31	2.88
<i>Abengourou</i>	77.41%	4.27	4.40	3.84	14.39	3.57	2.99
<i>Tepah</i>	81.97%	4.13	4.47	3.19	15.31	3.51	1.38
<i>Konongo</i>	74.20%	3.84	4.42	3.89	16.00	3.85	1.20
<i>New Edubiase</i>	81.78%	4.08	4.50	3.96	16.53	3.99	1.01

a= significantly different from members at the 1% level, b = significant at the 5% level, c= significant at the 10% level.

Hypothesis 3: Cooperative members receive better marketing and transportation services from the cooperative than non-members or control group farmers obtain from other sources, if any .

The last three columns of table V.4 allow us to accept this hypothesis. Column 5 is a composite 20-point cooperative marketing score built up from four separate 5-point scales relating to individual services (credit, administrative procedures, input supply and output

marketing) provided by the cooperative to members and large numbers of non-member farmers. A clear pattern emerges: Cooperative members award cooperatives a full 16.2 out of 20; non-members give cooperatives 14.67 (still far above average); and even control producers award cooperatives more than 50 percent of the points possible (12.69). When farmers appreciate group performance in this way, they tend to wish to take over more steps and assume a more active role in the marketing channel (column 6), in order to benefit from higher value added.

One key marketing service provided by cooperatives is group transport, particularly for those farmers living far from the shed or selling point. Column 7 of Table V.4 clarifies this point. A higher score means that more frequent use is made of trucks or tractors (vs. foot or bicycle) to transport the beans from the field or home to the shed.

In Côte d'Ivoire, product transportation services are taken care of by the cooperative with collectively owned trucks. Ghanaian cooperatives have adopted a different approach: they have set up a subsection (selling point) in each village, so members need not be concerned with the distance separating their village from the central selling point. Column 7 of table V.5 confirms that in each country, cooperative members enjoy significantly more convenient transport of their beans.

The case of control farmers in Côte d'Ivoire requires particular explanation. Farmers typically only join the cooperative if they are far from a road or a selling point for their beans, which means that non-member and control farmers have generally superior geographical positions with respect to markets than members. Control farmers²⁸ in Abengourou are particularly favoured in this respect because they live near the border with Ghana and are free to sell their beans for substantially higher prices to Ghanaian buyers although according to the Côte d'Ivoire authorities regulation it is unlawful to sell their beans abroad. A fine of 15 000 FCFA is levied on member producers to dissuade them to sell to such private buyers.

*Hypothesis 4: The **cocoa revenues of members** (prices including bonuses paid by the coops to their members for yield, weight and grade accorded) are significantly higher per household and per hectare than those of non-members, especially control-village producers.*

Before evaluating this hypothesis, it is important to emphasize the radically different marketing contexts (pricing policies and quality-control mechanisms) in state-controlled Ghana and free-market Côte d'Ivoire. In Ghana for example, there is no difference at all between pre-cooperative bonus prices received by cocoa cooperative members, non-members, and control producers. Prices for all cocoa farmers are in fact made up of two fixed components: market price, and a government bonus of 15 000 Cedis (1.67 USD) per bag, regardless of cooperative membership. The only difference between members and others is that the Kuapa Kokoo cooperative pays 1000 Cedis (0.11 USD) per bag over and

²⁸ But Table 1 shows how many control farmers fritter away this advantage by misusing pesticides and fertiliser, which cuts their yields and gross margins per hectare.

above the government bonus. That is what gives Kuapa Kokoo members (and non-members who sell through Kuapa Kokoo) a slight price edge compared to other producers.

In Côte d'Ivoire, the situation is more complicated because of the free-market pricing system. Members receive higher prices than non-members, but about the same price as control farmers. Cooperatives are willing to pay their farmers up to 50 FCFA (some 10 to 20%) more per kilogram but make payments up to three weeks late. Given severe cash liquidity problems in the school-return period, which coincides with traditional harvest-period cultural festivals, many members are forced to sell their beans to *pisteurs* who pay lower prices, but pay in ready cash.

Returning to hypothesis 4, the results in the first four columns of table V.4 support acceptance for the sample as a whole and in both countries. The true weight and bonuses received from cooperative purchasing clerks are factors contributing to the higher revenues received by cooperative members. Column 4 is in fact the logical result of columns 2 through 3 discussed above. In this column, members in the whole sample accord an average score of 3.67²⁹ (close to agreement) and members in Ghana 4.16 out of 5 with respect to the proposition that “*cooperative members receive more revenues per bag*” than other producers. Interestingly, non-members also agree, if less strongly (3.24). In fact, the cooperative is willing to buy beans from non-members in the same village and will pay them the same price and the same bonus. Only control farmers stand somewhere between fair agreement and disagreement (2.73), perhaps due to their lesser experience with cooperative purchasing practices. High Konongo and New Edubiase scores awarded to cooperative revenues per bag prove that the elevated post-bonus price awarded by cooperatives is recognized even by non-members. We thus strongly accept hypothesis 4.

This result gives members higher percentages of income from cocoa than either non-members or control farmers (Table V.4, column 1). Particularly in Ghana, 84% of members' total income is from cocoa, while the corresponding figure for control farmers is only 69%. These income patterns may be explained by the entire set of services provided by the cooperative. This point will be addressed in the following hypothesis.

V.3 Services

*Hypothesis 5: The **services** (technical training in production, marketing and management; cash advances and credit-based sale of inputs; marketing services; household loans; medical services, infrastructural and social investments, and group-based consumption purchases) received by members are significantly more numerous and of greater quality than for non-members, especially control-village producers.*

Table V.5 allows us to confirm this hypothesis with respect to all comparable services received from private and cooperative sources by members. Column six of Table V.5 is a

²⁹ These results would be even higher, except that members know that their cooperatives also award the same prices to non-members who sell through the cooperatives. As an other element, which might have influenced negatively the result is that no cooperative in Côte d'Ivoire has distributed surpluses during the campaign (2004/05) due to the actual socioeconomic situation.

composite score calculated on the basis of five services offered by both cooperatives and private sources: loan principal awarded, loan application procedures, input supply, extension, and output marketing³⁰. A positive score means that cooperatives are evaluated higher, a negative score that private sources are preferred; and a score of 0 signals indifference to the quality of cooperative or private services.

The results reveal that members respond far more positively (9.5) in favour of the credit, information, other inputs, marketing and overall performance they receive from coops than non-members or control farmers respond in favour of private alternatives (0.14 and 3.63, respectively). Similarly, members favour cooperative marketing services at 3.57, a higher absolute score than non-members or control farmers give to private marketing outlets (3.02 and 3.03, respectively). We therefore accept hypothesis 5.

Within this portrait, the first two columns of Table V.6 point to an urgent need for better credit and loan services in both countries, possibly through an expansion of credit unions as competitors to private financial institutions. For example, the specific proposition evaluated in column 1 was *“loans from the bank help me during the cocoa season”*. The main conclusion from this column is its alarmingly low scores, ranging between 1 = strongly disagree and 2 = disagree for all groups of producers. This result points to the real need to strengthen credit unions as one of the major components of the cooperative movement. In Côte d’Ivoire for example, since many cooperatives no longer have a credit union, cooperative members sometimes must seek private loans from banks or money lenders and pay up to 100% interest. In Ghana as well, younger members enrolled for three years and less are awarded no loan at all and must turn to anyone available: family, friends, money-lenders.

As for input supply (column 3), cooperative members are significantly less satisfied than control farmers with input coming from private sellers (1.79 vs. 2.57), again because of the convenience and favourable pricing provided by their own cooperative.

³⁰ This score can only be calculated for cocoa farmers of any membership category who have received services from both types of source.

Table V.5: Descriptive management statistics for hypotheses 6 and 7

Variables of cooperative impact on management efficiency	Credit		Input	Marketing		Overall	
	Bank loan satisfaction	Bank loan procedures satisfaction	Private input satisfaction	Coop marketing services satisfaction	Private marketing services satisfaction	Quality of services from coops minus private banks & companies (-20 to +20)	Prefer coop in my village (scale of 5)
Whole sample	1.89	2.02	2.22	3.48	2.89	3.39	4.46
<i>Members</i>	1.62	1.79	2.26	3.57	2.24	9.51	4.34
<i>Non-members</i>	1.86	2.05	2.46	3.36	3.02^a	-0.14^a	4.40
<i>Control</i>	2.57^b	2.36	1.86	2.78^b	3.03^a	-3.63^a	4.70^a
Côte d'Ivoire	1.65	1.63	2.13	3.15	2.90	4.62	4.57
<i>Members</i>	2.10	2.09	2.08	3.27	2.64	9.34	4.55
<i>Non-members</i>	1.00^b	1.00^c	2.00	3.15	2.88	3.03^a	4.47
<i>Control</i>	1.00	1.00	3.00^c	2.23^a	2.98	-2.13^a	4.68
Ghana	1.96	2.20	2.25	3.87	2.88	3.40	4.34
<i>Members</i>	1.42	1.54	2.28	3.87	2.05	9.69	4.13
<i>Non-members</i>	2.69^b	2.57^b	2.68^b	4.00	3.10^a	-3.47^a	4.35
<i>Control</i>	2.19	2.46	1.84	4.2	3.09^a	-5.12^a	4.72^a
By regional area							
<i>Tiassale</i>	1.00	1.00	1.80	2.46	1.21	2.00	4.73
<i>Adzopé</i>	n.a.	n.a.	2.33	3.09	3.48	6.84	4.22
<i>Abendgourou</i>	2.57	2.71	2.27	3.77	3.38	5.07	4.76
<i>Tepah</i>	1.36	1.67	2.45	3.64	2.97	1.65	4.14
<i>Konongo</i>	1.33	1.67	2.22	3.85	2.51	1.63	4.34
<i>New Edubiase</i>	2.56	2.74	2.15	4.16	3.16	3.12	4.54

a = significantly different from members at the 1% level, *b* = significant at the 5% level, *c* = significant at the 10% level.

The contrast in the evaluations by the three populations of cooperative vs. private marketing (columns 4 and 5) is also eloquent. Cooperative members consistently prefer to market through their own cooperative (3.57) than through private sellers (2.24). The high score of marketing services satisfaction awarded to cooperatives from non-member and control farmers in Ghana results from Kuapa Kokoo acceptance of beans from non-registered members. These non-registered members even receive the cooperative bonus, exactly as if they were registered members!

To integrate the above analyses, we asked respondents to rate the overall efficiency of cooperative management (Table V.6). Members believe significantly more than non-

members or control farmers that cooperatives are managed efficiently. But ANOVA tests signal important differences by country and by regional area in Côte d'Ivoire. Despite the relative decline of cocoa yields over time in Tiassalé, decades of experience in cooperative management there give it the highest efficiency rating overall. Cooperative management efficiency is therefore ranked significantly higher in Côte d'Ivoire than in Ghana.

Table V.6 Evaluation of the efficiency of cooperative management by country, regional area, and membership category

Country or region	N	Mean
Whole sample		3.74
<i>Members</i>	208	3.88
<i>Non-members</i>	5	1.60^a
<i>Control</i>	36	3.22^a
Côte d'Ivoire		3.89
<i>Tiassale</i>	37	4.59
<i>Abengourou</i>	44	3.55^a
<i>Adzope</i>	57	3.04^a
Ghana		3.62^d
<i>New Edubiase</i>	40	3.95
<i>Tepah</i>	36	3.81
<i>Konongo</i>	35	3.91

a = significantly different from members at the 1% level, *b* = significant at the 5% level, *c* = significant at the 10% level, *d* = significant at the 10% level between the two countries.

*Hypothesis 6: Cocoa cooperatives are highly instrumental in giving **production, marketing, and management training** to their members, as well as share-croppers and neighbours.*

There is strong evidence in support of this hypothesis because of the intensity, diversity and collaborative nature of cooperative training. Surprising to some, cooperatives provide substantial amounts of extension information to non members and even to control farmers. This is particularly true in New Edubiase, Ghana, where over the last year alone, no less than 101 training sessions were given (Table V.7)! Roughly five times as many members attended those sessions as non members. STCP also delivered a great number of training sessions (296 times) over the last year. Because of the close collaboration between STCP and SOCODEVI partner cooperatives in Côte d'Ivoire, most of the beneficiaries of that training were cooperative members.

Government extension efforts are very important in Ghana, where they have compensated for the relative focus of STCP training in neighbouring Côte d'Ivoire. Although government training is offered to all cocoa producers, in each country more members than non-members or control farmers benefit from government extension. This pattern reflects a strong push by cooperative leaders to have their members attend any training session, regardless of who organises it. Radio programming for agricultural extension seems

adequate in Ghana, but virtually absent in Côte d'Ivoire. Again, members rely upon radio for technical advices much more than member or control farmers.

Technical extension pamphlets are seriously underused as an avenue to communicate technical and marketing advices³¹. On a per capita basis, far less than one pamphlet per year was read by any category of respondents. For example, it took 105 cooperative members in Ghana to read 13 extension pamphlets over the last year, implying that a given individual needs 8 years to read a single pamphlet!

Taken together, these sources of technical advice led to approximately 1.5 changes per respondent over the past two years. Members in both countries had significantly higher rates of technical change than control farmers. Meanwhile, Côte d'Ivoire control farmers show a significantly higher adoption rate per technical message, but only because they hardly receive any information from any source! Their technical changes therefore fall mainly into the category of late adoption.

We may also evaluate the quality of cooperative extension messages in addition to their quantity. The last three columns of Table V.7 show that there were substantially more technical changes per unit of advice received through the cooperative than through all sources taken together.

In sum, the, we strongly accept hypothesis 6, to the effect that cooperatives are highly instrumental in giving relevant training to all types of cocoa producers. This effort of communication extends even to share-croppers. Members share training course information with their croppers significantly more often than non members, particularly in Ghana³².

³¹ This is all the more serious in that reading pamphlets is the fourth most important item in head-group satisfaction with cooperatives (Table VII.1) and among the top factors in the head-group in cocoa yields per hectare (Table V.2)!

³² This is probably because of the higher rate of family/blood relation share cropping in Ghana. In Côte d'Ivoire, by contrast, the majority of share-croppers are non-relative and come from Burkina Faso.

Table V.8: Source and relative impacts of training and extension

Variables of cooperative impact in training and extension	Sources of advice for cocoa producers								Relative impact by source			
	Cooperative	STCP	Government	Private input company	Radio	Pamphlet	Neighbours	Total	Technical changes past 2 years	Change /unit of advice from all sources	Change/unit of coop advice	Differential impact of coop advice minus all sources
Whole sample	349	376	331	44	3156	13	496	4787	1.43	0.4	0.8	0.5
<i>Members</i>	282	322	142	15	1397	12	212	2398	1.6	0.3	0.8	0.5
<i>Non-members</i>	60	54	100	19	992	0	140	1371	1.5	0.4	0.9	0.6
<i>Control</i>	7	0	89	10	766	1	144	1019	0.96^a	0.4	0.8	0.5
Côte d'Ivoire	90	366	55	12	2	0	0	526	0.67	0.5	0.5	0.1
<i>Members</i>	71	320	22	3	2	0	0	418	0.8	0.4		
<i>Non-members</i>	19	46	19	6	0	0	0	91	0.8	0.6	0.7	0.3^b
<i>Control</i>	0	0	14	3	0	0	0	17	0.28^a	1.00^b		
Ghana	258	8	276	31	3161	13	497	4265	2.21	0.4	0.8	0.5
<i>Members</i>	212	1	121	13	1403	13	214	1987	2.5	0.3	1.0	0.7
<i>Non-members</i>	40	7	81	13	1001	0	142	1290	2.3	0.3	1.0	0.7
<i>Control</i>	7	0	74	7	754	1	141	986	1.63^a	0.3	0.8	0.5
By regional area	<i>(a= significant at the 1% level, b = significant at the 5% level, c= significant at the 10% level)</i>											
<i>Tiassale</i>	1	0	18	1	2	0	0	21	0.34	0.4	1.0	0.0
<i>Adzopé</i>	30	113	25	8	0	0	0	178	1.01	0.7	0.6	0.2
<i>Abendgourou</i>	41	177	0	0	0	0	0	218	0.67	0.4	0.4	0.0
<i>Tepah</i>	38	0	67	5	777	2	138	1029	1.92	0.4	0.8	0.4
<i>Konongo</i>	68	3	87	7	934	2	145	1253	2.24	0.2	1.0	0.8
<i>New Edubiase</i>	101	3	68	14	829	7	117	1145	2.46	0.3	0.9	0.6

V.4 Social development

*Hypothesis 7: Through their direct experience with cooperatives, members award more positive evaluation to the role of cooperatives in the **socioeconomic development** of their village.*

Due to the many strengths and benefits of the cooperative movement presented in the previous hypotheses, it is not surprising that the qualitative and quantitative data confirm this hypothesis for the sample as a whole and for both countries, notably Côte d'Ivoire (Table V.8). For the sample as a whole, members gave a score of 3.07 out of 5 ("fairly agree") to the proposition "*a cocoa cooperative in the village benefits community development*", significantly higher than the 1.6 awarded by control farmers and 2.44 by non-members. This pattern holds in both Côte d'Ivoire and Ghana, except that all farmers groups in Côte d'Ivoire gave higher scores to cooperatives than in Ghana, especially in the case of non-members. This difference in countries may be explained both by the relative newness of the cooperative experience in Ghana, and by how the dividends are used in the two countries. Cooperatives have been established by Kuapa Kokoo in areas such as Tepah and New Edubiase only within the past three years. And while annual dividends are distributed each year directly to members in Ghana according to the surplus generated, they are also used in Côte d'Ivoire to invest in such social projects for the village as schools, teacher housing, teacher salaries; and contributions to potable water, health centre and electricity projects. Non-members are allowed to use those facilities as if they were members.

Finally, we must seek to both understand and eventually improve the low scores given by control and non-member farmers in Ghana. It is likely, for example, that control farmers already enjoy better market access because of where their villages are located, and that they lack direct experiences with cooperatives; they therefore have no way to see any positive benefits from cooperatives.

Table V.8: Community benefits from cooperative existence (scale of 5)

	Whole sample	Côte d'Ivoire	Ghana
Members	3.07	3.3	2.8
Non-members	2.44^b	2.7^b	1.4^b
Control	1.6^b	4.0	1.0^b
Tiassale	3.5		
Adzopé	2.7		
Abendgourou	3.6		
Tepah	1.7		
Konongo	2.6		
New Edubiase	3.5		

a = significantly different from members at the 1% level, b = significant at the 5% level, c = significant at the 10% level.

The foregoing discussion explains why all cocoa producer groups surveyed strongly prefer (with scores ranging between “agree” and “strongly agree”) to have a cooperative in their village. Indeed, non-members as a whole, and the control group in Côte d’Ivoire, subscribe to that belief even more strongly than the members themselves! A detailed breakdown of the level of approval of the role of cooperatives in villages was also studied (Table V.9). Despite a few disagreements or even strong disagreements on the part of a vast minority of respondents, the results echo the qualitative analysis : there is a real need for farmers to be organised and to work in groups.

Table V.9: Preference for a cooperative in the village by membership status

Prefer cooperative in my village (scale of 5)	Strongly disagree	Fairly disagree	Fairly agree	Agree	Strongly agree	Total
Society members (N)	3	2	8	69	151	233
Percentage	1.3%	0.9%	3.4%	29.6%	64.8%	100.0%
Other respondents (N)	8	3	11	75	113	210
Percentage	3.8%	1.4%	5.2%	35.7%	53.8%	100.0%
Total (N)	11	5	19	144	264	443
Percentage	2.5%	1.1%	4.3%	32.5%	59.6%	100.0%

Hypothesis 8 : The decision-making role and the “productivity” ratio³³ of member household women are significantly higher than for non-member women, especially those in control villages.

To evaluate the decision-making part of this hypothesis, we constructed a composite variable called *Score of gender relations* (Table V.10). With a maximum value of 21 points, this variable reflected the extent to which the household head made decisions alone (1 point), consulted other household members (2 points), or consulted his or her spouse (3 points) in each of seven key decision areas. The eighth column of table V.10 fails to show a statistically higher rate of sharing of major household decisions between spouses. While not statistically significant, the average gender score of decisions is actually lower in member than either non-member or control households in both countries.³⁴ The division of tasks, spousal interactions, and the gender roles of men and women seem therefore to be virtually all explained by cultural traditions and local values. Cooperatives do not seem as yet to have had an influence on the cultural beliefs and practices of their members, and we must reject this part of the hypothesis.

³³ The productivity ratio is defined as the percentage of productive work (income generation, child education, self-education, decision-making) to reproductive work (house-cleaning, child-care, cooking, water- and wood-gathering).

³⁴ This said, gender equity in both physical work and intangible decisions seems greater in Ghana than in Côte d’Ivoire.

The other part of the hypothesis seeks to test whether member household women spend a significantly higher percentage of their time in cocoa production and other income-generating activities; and whether this springs from a lower dependency ratio (number of non-workers per number of worker). Both the dependency ratio and the absolute number of dependents show that cooperative households are able to take care of significantly more non workers than other cocoa producing households,³⁵ presumably at the expense of women's productive activities. The apparent pattern of non-respect for women in cooperative households even seems to cross the age barrier down to school-age girls: Cooperative members sent a smaller percentage of their daughters to school (93%) than non member households (98%), and significantly so in Côte d'Ivoire (90% vs. 98%). At first glance, therefore, we would have to reject the second half of this hypothesis as well.

But in fact we may accept the second part of this hypothesis because women in member household do spend a higher percentage of their time (50.1%) in productive activities, vs. 44.6% for the control group and 47.9% by non-members. To find out why, we must go deeper into the social patterns of each country. In Ghana, for example, men take over some of the reproductive task (cooking, cleaning, fetching, child care), freeing the woman to generate income. In Côte d'Ivoire, the cocoa industry in a single regional area – Tiassalé -- is at the end of its productive cycle and in urgent need of regeneration. Former members have become non-members or abandoned cocoa production altogether. They have sought out livestock and non-farm sources of income. That is why non-members in Tiassalé have substantially higher incomes per capita and higher non-farm income sources. That income can be used to send children of both sexes to school in higher percentages than the members. The most significant impact of their lack of liquidity appears in the drop-out rate of girls in Tiassalé: 23%. That is why members rightfully complain that they need loans from the cooperative to help sending their children to school.

³⁵ Indeed, in Côte d'Ivoire, member workers support significantly more non workers than the control group (1.60 vs. 1.14), rather than less as implied by the hypothesis.

Table V.10: Measure of social development by membership

Variable of cooperative impact on social development	Dependency ratio (non-workers supported by each worker)	Total hours male work per day	Total hours female work per day	Male productive activities (%)	Female productive activities (%)	Cocoa production/processing % in male labour	Cocoa production/processing % in female labour	Gender score of decisions (max= 21)	School-going percent of boys (%)	School-going percent of girls (%)
Whole sample	1.43	12.9	14.5	75.8	48.1	59.6	20.2	9.9	95.3	94.79
<i>Members</i>	1.46	13.1	14.9	75.1	50.1	58.9	20.2	9.6	94.5	93.7
<i>Non-members</i>	1.49	12.9	14.2	76.2	48.0	59.0	19.8	10.09	95.5	98.1^c
<i>Control</i>	1.3	12.5	14.3	76.5	44.6	61.3	20.6	10.03	96.7	93.1
Côte d'Ivoire	1.50	12.0	13.2	72.9	42.0	58.6	17.8	8.0	93.4	93.08
<i>Members</i>	1.60	12.0	13.3	73.1	40.5	58.4	15.8	7.8	89.8	90.4
<i>Non-members</i>	1.68	12.0	13.2	72.0	43.8	55.8	16.6	8.3	95.5	99.1^b
<i>Control</i>	1.14^b	12.1	13.1	73.4	42.9	61.9	22.4^b	8.0	98.2^b	91.4
Ghana	1.35	13.9	15.9	79.2	54.3	60.8	22.7	9.9	96.9	96.29
<i>Members</i>	1.31	14.3	16.5	77.5	60.2	59.5	24.9	11.4	98.6	96.6
<i>Non-members</i>	1.29	14.1	15.3	81.4	52.1	63.0	22.9	11.9	95.5	97.3
<i>Control</i>	1.47	12.9^c	15.5	79.9	46.4^c	60.6	18.7^a	12.0	95.6	94.5
By regional area										
<i>Tiassale</i>	1.31	12.1	14.2	64.2	36.6	41.8	11.3	8.7	91.6	85.29
<i>Adzopé</i>	1.61	10.6	12.7	76.7	46.0	67.2	26.3	7.1	97.9	94.23
<i>Abendgourou</i>	1.59	13.5	12.9	77.1	42.5	65.8	14.5	8.2	90.2	98.72
<i>Tepah</i>	1.26	13.4	15.8	77.6	50.1	58.8	23.1	10.3	96.9	98.08
<i>Konongo</i>	1.25	15.3	16.6	79.0	59.8	58.6	20.5	11.3	99.0	97.78
<i>New Edubiase</i>	1.54	13.1	15.3	81.0	52.9	64.4	24.5	13.7	94.6	93.18

a= significantly different from members at the 1% level, b = significant at the 5% level, c= significant at the 10% level.

V.5 Standard of living

*Hypothesis 9 : The **quality of life** (living area per capita, total value of possessions, habitat quality, health, and child nutritional status) is not significantly lower for members than for control-village producers despite the significantly shorter distances that separate the latter from clinics and markets.*

Distance to clinics and markets

A wide range of habitat and health indicators were used to evaluate this hypothesis (table V.11). We first sought to establish whether members do in fact live farther away from clinics and markets than control producers³⁶, as suggested by the hypothesis. Since transportation means are severely lacking in the rural areas of both countries, distant farmers are in real need of collective transportation means to get the sick to hospital and themselves and their products to market. As a whole, members do indeed live farther away (7.32 km) than non-members (6.44), significantly so in all regional areas except New Edubiasé (Table V.11). Our direct observations in the field revealed that, if the cooperative has a truck or another vehicle, they also allow the non-members to use it. That is an important spillover effect of the cooperative movement.

Living areas and possessions

Generally, in both countries members have larger living areas and total possession value than non-members, significantly so in Adzopé and New Edubiasé (Table V.11). The control group of course lives in different villages, often in more favourable environments closer to markets, and therefore in most cases (both countries, Adzopé, Tiassalé, Tepah) have greater living space per capita.

Habitat quality

Habitat quality is a composite score built up from roof and wall quality, electricity source, drinking water, bathing and bathroom facilities. Again, Côte d'Ivoire members have significantly higher habitat quality than non-members. The results are the opposite in Ghana, where both of the other groups (control and non-members) have significantly higher scores than members. At first glance, this result seems surprising. However, it stems from a conscious decision on the part of Kuapa Kokoo leaders to implant their new cooperatives amidst the very poorest and most desperate populations in rural areas. In the two to three years since their establishment, there has not yet been enough time for those disadvantaged areas to build up the long-run components of habitat quality; as compared to Côte d'Ivoire, where cooperatives have been established for 30 years.

³⁶ The relevant comparison is between members and control village farmers, since members and non-members are neighbours in the same villages.

Health

There are no significant differences in health status among members, non-members and the control group³⁷. Although non-significant, non-members do seem to have marginally higher percentages of sickness than members in all regions, even though they live in same villages. Control farmers are, on the other hand, slightly less sick than members, probably because of their greater proximity to clinics, roads, and markets. Overall, one of 10 people have had diarrhoea over the past two weeks, and some 30 % of adults and 37% of children have had malaria over the past two years.



Measuring the children (New Edubiase, Ghana)

³⁷ Except that Ivoirian non-members have a significantly higher malaria rate (36%) than members (27%).

Table V.11: Descriptive standard of living statistics for hypothesis 9

Variables of cooperative impact on habitat & health	Living area/capita (m ²)	Total value of possessions (1 = boots- 50=auto)	Value of possessions per capita	Score of habitat quality (max= 31)	Distance to clinic/ health centre (km)	Diarrhoea in kids (%)	Malaria in kids (%)	Diarrhoea in adults (%)	Malaria in adults (%)
Whole sample	15.71	35.05	4.63	16.55	7.06	8.2%	35%	4.3%	25%
<i>Members</i>	16.43	35.00	4.50	16.36	7.32	7.9%	33.0%	4.1%	24%
<i>Non-members</i>	12.26	30.05	4.60	16.21	7.26	10.21%	40.02%	5.01%	30.14%
<i>Control</i>	17.92	36.09	4.91	17.18^b	6.44	7.0%	33.02%	4.01%	22.83%
Côte d'Ivoire	23.05	40.02	5.61	17.35	2.56	10%	36.54%	4.0%	29.42%
<i>Members</i>	24.10	43.84	5.71	17.72	2.71	8.7%	36%	3.6%	27%
<i>Non-members</i>	17.83	33.14^c	5.26	16.74^c	4.46^c	14.6%	39%	4.6%	36%^c
<i>Control</i>	26.56	41.06	5.78	17.32	0.32^a	7.0%	34%	3.3%	28%
Ghana	8.16	29.98	3.63	15.73	11.6	6.5	34 %	4.7%	21%
<i>Members</i>	8.53	25.99	3.26	14.97	12.06	7.1%	31%	4.3%	21%
<i>Non-members</i>	6.40	27.62	3.88	15.64^b	10.21	6.0%	41%	5.5%	24%
<i>Control</i>	9.27	31.03	4.02	17.03^a	12.55	5.8%	32%	4.7%	18%
By regional area									
<i>Tiassale</i>	13.36	39.90	6.41	14.42	4.46	11.8%	33%	4.2%	33%
<i>Adzopé</i>	9.12	34.58	4.13	17.68	1.78	10.1%	36%	3.4%	30%
<i>Abendgourou</i>	46.79	45.59	6.28	19.99	1.41	8.1%	40%	3.8%	25%
<i>Tepah</i>	9.35	25.21	3.20	16.15	7.24	7.6%	36%	9.7%	17%
<i>Konongo</i>	7.81	27.55	3.76	16.69	5.98	4.8%	31%	1.6%	22%
<i>New Edubiase</i>	7.34	37.10	3.92	14.35	21.70	7.2%	35%	2.9%	24%

a= significant at the 1% level, *b* = significant at the 5% level, *c*= significant at the 10% level.

Child nutrition

Despite the fact that cooperative-member children live farther away from health services in dwellings of lower habitat quality than control farmers, member children have achieved par with control children in many categories (table V.12), and are even healthier in the youngest, most vulnerable categories (boys and girls 0 to 5)! This is a remarkable achievement that probably results from the many services provided by the cooperative.

Within the same villages of similar distance to clinics, Côte d'Ivoire children whose parents are members are systematically healthier than non-members in all health categories except for height-for-age of boys 6-14 and BMI of girls 6-14. The evidence from Ghana also lends strong support to the idea that member children are healthier than their non-member playmates. These results are most evident in boys and girls 6-14.

To confirm these results, a composite score of the three health parameters (height for age, weight for age, and BMI for age) was calculated across all children in each household (Table V.13). The maximum score (no health deficiencies in any parameter) equalled zero, while the lowest possible score for a given child was -9 (severe malnutrition in all three areas). We then used ANOVA and t-tests to identify to test for significant differences in means by country and membership status for all children and for each of the four age-sex categories. Control household children living much closer to clinics and markets, do have better health status than non-members both overall and in the category girls 6 to 14. However, in all age and sex groups, member children enjoy scores closer to 0 than non-member children,³⁸ except in the category girls 0-5 (-2.73 for members and -2.42 for non-members).

Taken together, these results lead us to reject hypothesis 9 as written (that is, in comparison with control villages); but to congratulate cooperatives on the important achievements in housing, habitat, health and nutrition they have made compared to their within-village neighbours. Although farmer associations, government and NGOs may all be valued partners in the struggle to improve living standard and health cares in rural Africa, particularly the wide-spread child nutrition evoked in section III of this report; no single actor can improve that livelihood alone. All actors, with their unique strengths, should be involved in an integrated PPPP³⁹ strategy to combat ill health malnutrition in the entire region.

³⁸ In other words, member children are healthier.

³⁹ Public private participation partnerships

Table V.13 Composite scores of child malnutrition by membership and age-sex category

	N	Mean
Deficit/all children		
<i>Member</i>	178	-3.19
<i>Control</i>	101	-2.95^b
<i>Non-member</i>	112	-3.56
<i>Total</i>	391	-3.23
Deficit/boys 0 through 5		
<i>Member</i>	76	-3.33
<i>Control</i>	46	-3.04
<i>Non-member</i>	49	-3.69
<i>Total</i>	171	-3.36
Deficit/boys 6 through 14		
<i>Member</i>	125	-3.69
<i>Control</i>	59	-3.43
<i>Non-member</i>	80	-4.05
<i>Total</i>	264	-3.74
Deficit/girls 0 through 5		
<i>Member</i>	76	-2.71
<i>Control</i>	42	-2.51
<i>Non-member</i>	52	-2.42
<i>Total</i>	170	-2.57
Deficit/girls 6 through 14		
<i>Member</i>	113	-3.08
<i>Control</i>	61	-2.67^b
<i>Non-member</i>	73	-3.73
<i>Total</i>	247	-3.17

V.6 Income

Hypothesis 10: Per capita incomes and the proportion of cocoa revenues in total income are higher in member households than non-member households, especially those in control villages.

We may accept this hypothesis, but statistically so only for Ghana. In that country (Table V.14), member households enjoy incomes of 162 USD per capita, higher than both control farmers (137 USD) and non-members (135 USD). The percentage of cocoa sales in total income is also higher for members (86%) vs. 70% and 83%, respectively. There are corresponding increases in non-farm, salaried, and migrant income in non-member households. These results point to the clear success of cooperatives in Ghana in terms of increasing and specialising incomes in cocoa. This success results in large part from the direct role of cooperatives in seeking a high share of the world market prices for their members.

In Côte d'Ivoire, however, while the results generally favour cooperatives, the presence of free-market *pisteurs* and the border effect mentioned above do not permit statistical acceptance of the hypothesis. In Tiassalé, for example, members receive significantly less income per capita (80 USD) than non members (153 USD). As we have seen, Tiassalé is by far the poorest region, and the cooperatives have ceased to function as robustly as in the past; therefore, these results should come as no surprise. Elsewhere in Côte d'Ivoire, income per capita is not significantly different between member households and non member households, pointing to a spill-over effect from members to non-members. In contrast, members do have higher income than control farmers in all areas, except again for Tiassalé.

As for the composition of that income, the percentage that members derive from cocoas sales, bonuses and dividends is significantly higher than for non-member and control producers (76% vs. 71% and 64%, respectively). Non-members and particularly control group farmers must therefore make up the difference with income from non-farm sources (column 3), salaried employment (column 4) and remittances from migrants (column 5). These patterns, which are strongest in the Abengourou region of Côte d'Ivoire and in the Tepah and New Edubiase regions of Ghana⁴⁰, suggest that control farmers have had to seek out non-cocoa sources of income in an effort to maintain adequate living standards. Comparisons between members and nonmembers suggest the same patterns, except that only in the sample as a whole are cocoa sales and salary significant. Once again spillover benefits from member to non member households are likely present.

⁴⁰ ANOVA analysis shows the effects of regional area on these two variables to be significant.

Table V.14: Descriptive income statistics for hypotheses 10

Variables of cooperative impact on income and community development	Breakdown of income by source				
	Income per capita (USD)	Cocoa sales, bonuses & dividends as % of total income	Non-farm income as % of total income	Salaried employment as % of total income	Remittances from migrants as % of total income
Whole sample	162.27	71%	4%	3%	4%
<i>Members</i>	168.10	76%	3%	3%	3%
<i>Non-members</i>	163.93	71.0%^c	5%	2.9%	3%
<i>Control</i>	150.36	63.9%^a	7%^b	5%^a	5.5%^c
Côte d'Ivoire	175.94	63%	5%	5%	3%
<i>Members</i>	174.11	68%	3%	4%	3%
<i>Non-members</i>	191.03	60%	8%	4%	2%
<i>Control</i>	163.61	58.0%^b	7%	6%	5%
Ghana	148.23	71%	4%	2%	4%
<i>Members</i>	161.92	86%	2%	1%	3%
<i>Non-members</i>	135.44	83%	2%	2%	4%
<i>Control</i>	137.10	69.8%^a	7%^a	4%^c	6.1%^c
Tiassale	113.71	52%	13%	8%	3%
Adzopé	212.06	61%	1%	5%	5%
Abendgourou	202.86	78%	2%	1%	1%
Tepah	158.36	82%	1%	1%	4%
Konongo	121.80	74%	5%	3%	6%
New Edubiase	164.90	81%	4%	2%	3%

a= significantly different from members at the 1% level, *b* = significant at the 5% level, *c*= significant at the 10% level.

VI. Quantitative analysis

VI. Answers to the research questions

Impact analysis is always a difficult task, because many factors can hardly be fully and quantitatively captured through direct measures (for instance a social development index, a women empowerment index or an index of community self-management). Therefore, focus group discussions performed during data collection in the fields sought to respond to those research questions involving the why and how of success questions that could not be directly reflected by quantitative analysis. We now turn to the answers to five such questions posed in this study during the twelve focus group discussions and six semi-structured interviews. The detailed scoring sheets for the focus groups are presented in their entirety as Appendix tables V.1a through V.12b.

Production

1. What factors, if any, have permitted member farmers to learn about and finance appropriate technical changes more effectively than non-members or control farmers?

We have seen in the results to hypothesis 1 that cooperative members receive important financial, technical and marketing services from their FO that help to give them significantly higher yields and gross margins, particularly in Ghana. Beneath this general pattern lie specific strategies that depend very much on the regional area, country and even time period analysed. For example, **cooperative members in M'brimbo, Tiassalé** reported in their focus group that their village once had the highest yields in the entire region of Tiassale, but the ageing plantations, worn out and unfertilised soil, and inability of both older and younger generations to pay the 25,000 FCFA per hectare to renew the plantations have meant the slow death of trees and a substantial decline in yields on the average of two hectares per household. Despite these challenges, improved technology has been taught in the villages by government extension agents working with and through well installed cooperative structures of village organisation. As a result, the quality of the cocoa beans marketed has improved.

Meanwhile, **members and non-members in Adzopé** report that government extension agents teach technology in each of their villages, and that members of cocoa and other cooperatives in turn collaborate to extend the technologies to each other. In semi-structured interviews, Cooperative Union leaders reported that this year the Farmer Field Schools got help from STCP and SOCODEVI to build a mini-laboratory for analysis of the beans; as well as 36 units of training (7 times per month, two times per week but in only in some months.) On the basis of the number of

participants (25 – 55 per session) in such rough conditions, the extension program performed by cooperative extension agents has been a success.⁴¹

A complementary role is clearly observed between cooperatives as a practical implement at the base level and STCP or government programs as a larger umbrella at higher levels. In order to reach farmers at the grass-root level and facilitate the implementation process, it would be prohibitively costly to either the government or similar regional programs like STCP to build a working network such as the one that already exists through cooperatives.

Abengourou cooperative leaders in semi-structured interviews praised STCP assistance for the Farmer Field Schools, information on extension, and mass-spraying campaigns for the whole village. In contrast, in the absence of cooperatives as a training source and information provider, the **Abengourou control group** have made no significant changes in technology, using neither pesticides nor fertiliser. They feel they have to diversify out of cocoa production entirely and into banana, eggplant and okra. As non-members of cooperatives, they have no choice but to wait for government assistance to promote cassava, which can be produced year-round and avoid the seasonal cash-flow problems associated with cocoa; and a tapioca factory to create value added through cassava processing. They also wish to diversify into livestock farming (cattle, fish and poultry), but need technical instruction on how to do so scientifically. Here, an organisational structure is urgently needed at the village level. Farmers “feel” the need to do something different to improve their lives. But the lack of immediate leadership has led them to a passive attitude: waiting for and relying on outside assistance rather than taking direct part in self-organisation and self-help.

Across the border, cooperatives in Ghana have broader-reaching strategies for technology transfer. In **Tepah** for example, the cooperative provides its members cash-flow loans to hire adequate manpower for the labour intensive technology used cocoa production. Similarly, **Konongo** members have been quite active in technology transfer and adoption. For example, a recent Kuapa Kokoo training course gave new content and new information on fermenting for six days rather than three to give higher quality after drying. Kuapa Kokoo training has also taught how to peel the flesh off the beans, to diversify income through snail-raising and grass-cutters, and to create nursebeds and plant cocoa trees with optimal spacing. Members appreciated the training so much that they are calling for future sessions in cocoa spraying, pesticide mixing, land maintenance, and mistletoe removal.

As part of its broad social development mission⁴², Kuapa Kokoo even does a good job of information dissemination to **Konongo non-members**. Cocoa yield is going up because of government intervention (mass spraying and fertiliser), which is free; and fertiliser use, which can be paid for in instalments over a year. There are private

⁴¹ But much still has to be done to increase farmer understanding. The agent requests a cell-phone and teaching materials to increase his effectiveness.

⁴² and recruitment strategy

spraying providers and agricultural chemical stores if mass spraying is inadequate. Non-members, however, suffer from a cash flow deficit for input purchase at the start of the season, and from a need from improved seedlings.

New Edubiase members are trained by Kuapa Kokoo three times a year. They have learned to ferment for 7 days instead of 4; and are eager for future training in maintaining trees for high yield, cutting mistletoe and producing well-shaped quality pods. Important spill-over effects are clearly observed. Where the cooperative exists, information and technical training have been disseminated across members and non-members. Particularly in Ghana, where the government fixes price, performs quality control tests, and provides free mass spraying, the only difference that distinguishes cooperatives from other private service providers is their intention and mission to support community development, to build a collective mechanism that responds not only to economic purposes but also to the human and social need for self-reliance.

Marketing

2. What equipment and practices, if any, have allowed cooperatives to award higher prices, fairer quality grades, and fair scale weights to beans sold to them by member farmers, non-member and control farmers, and share-croppers?

We have already accepted hypotheses 2, 3, and 4 to the effect that cooperative members receive fairer weight and quality evaluations, better marketing and transport services, and higher cocoa revenues per bag and per hectare than non-members or control farmers. The question is how. The focus group and semi-structured interviews point to a whole set of practical solutions to alleviate four key problems: low price, delays in payment, poor road quality and lack of transport facilities. For example, **Tiassalé members** have already built an open-market hangar with help from Canada. They collectively own pickups, trucks, tractors for member transport; and offer the same prices in their store to non-members and members alike. Under free market competition and the downturn in cocoa prices, what has held Ivorian cocoa farmers together and still kept them in the cooperative is a common interest for cocoa. Large numbers of ex-cocoa farmers have transferred a whole or a part of their farms to other crops, but current cocoa farmers are those who have decided to hang on and wait for a better chance with cocoa. The cooperative is standing by to serve the needs of those producers.

Similarly, to counter both transportation problems and cash-flow deficits at harvest, the **Abengourou cooperative** has paid the first year's interest and instalment payment for four trucks in four of the ten villages in their area. There are 66 cooperatives in the region, so even that number is inadequate to cover and respond to the needs of all the cocoa producers. Concerning other services, there is a laboratory operated by the coop. In marked contrast, **Abengourou control producers** report no successes in marketing and place 30% of their future priorities in this area. Specifically, they call for diversification of income-generating activities (cassava, tapioca) to defend against crisis periods in cocoa price and weather. Control farmers also want to build market-place in the village, and to enlarge production of fish and

poultry because their prices are always constant. They need market training and information to deal with low agricultural product prices for not only cocoa, but also bananas, pineapple, taro, cassava, and maize.

Meanwhile in Ghana, semi-structured interviews with **Tepah** coop leaders revealed that 90% of cocoa producers in the area have become members of this society. Their drawing strategy is this: even though farmers are not initially members, their cocoa beans are still accepted by the society. They then automatically become members of the society. As business volume grows, the number of bags has increased so significantly they need a shed with a tin roof that can hold up to 500 bags at a time.

Konongo members proudly report that the cooperative currently has two power tillers for transport from the farm to the shed. Although well-trained Quality Control Officers (QCOs) are perceived by both members and non-members alike as an objective “standard” across the country; members particularly trust the Purchasing Clerk at the Kuapa Kokoo (KK) shed, who often gives them training and technical advice, which other purchasing agents can't supply. Unlike Côte d'Ivoire, Kuapa Kokoo pays farmers instantly and gives members a bonus over the government-set price. Indeed, many non-members sell their cocoa beans to Kuapa Kokoo (KK) because they believe that KK's scale is correct, while some buyers can cheat up to 20%. To further develop the cocoa marketing channel at the village level, members plan to purchase a tractor or 4-5 power tillers to transport people, and to replace head transport of cocoa from the farm to the shed.

Similarly for **New Edubiase members**, selling beans to Kuapa Kokoo has brought about improvements in income, work and living conditions. Once a week, a cooperative truck comes to the village to pick up the cocoa beans, and farmers receive payment the same day without anxiety. Members are convinced that Kuapa Kokoo has the best scale and weighs the beans correctly. Only Kuapa Kokoo gives extra bonus, giving the highest price in total. Even **New Edubiase non-members** admit that Kuapa Kokoo gives the highest price in total when bonus is included.

Overall, the cooperative experience in Ghana, where the government has created an excellent and supportive environment, has been a success. At least, the fixed price (1 USD/kg) has helped to keep a good portion of the cocoa selling price in the farmers' pocket; while in Côte d'Ivoire, a good third of that sum ends up in the *pisteurs'* pocket and farmers get a much lower price (0.63 USD/kg). Again, cooperative or farmer associations can be a helpful farmer-support mechanism within the whole entire marketing chain, provided they are embedded in an appropriate environment that can bring about positive impact at grass root level.

Services

3. What criteria and procedures, if any, have made cooperatives a more accessible and advantageous source of credit, input purchase, household- and school loans to cocoa farmers?

We have accept hypothesis 5 and noted the particular impacts of credit unions. The focus group results confirm this conclusion, although the stage of advancement (or even creation) of such institutions varies by locality. For example, **Adzopé members** (Côte d'Ivoire) assign 41% of their entire past achievement score to accomplishments in this area. In addition to offering the same prices and services to members and non-members, the Adzopé credit unions give immediate and transparent dividends to members of 5 to 10 thousand FCFA/year. The coop helps each member to re-invest his dividend to replant his plantation. Members can also use the truck at will as long as they pay for the gasoline. However, during the current slow-down in the cocoa industry, re-establish a formal credit unions will require an outside capital injection. In future, they wish to continue and to enlarge the collaboration with the STCP and the SOCODEVI.

School loans are one of the most urgent needs of farmers to make sure all children, particularly girls go to school through at least junior high school. While only senior members get loans to send their children to school, the lack of cash at the end of the cocoa season (also the beginning of the school year) may have contributed to the drop-out rate of school-age children. To help themselves, the cooperative in Tiassalé has withheld dividends to build schools that are located right in their village. They manage to finance teachers' housing and teachers' salaries. Fortunately, the school is open to all children in the village, regardless of their parents' membership status.

In contrast, **control farmers** in Côte d'Ivoire lack the social organisation to achieve their targets. They have to better manage their capital to provide emergency credit for hospital bills, transportation the sick to hospitals, and to deal directly with the Abidjan market. As if unaware of the idea of a credit union, control farmers would like to see a "small coop that combines physical and human capital"; because, as they say, "money without education yields nothing".

In Ghana, most private banks have closed down because the payback rates are extremely low. A few operating banks charge almost 40% interest per year and directly deduct a portion of the loan up front, to keep it as the first year interest payment. Often, farmers receive only 50% of their approved loans. On the farmer side, given the fact that mass spraying is provided free by the government, producers feel it is not necessary to pay back the production loans from either private banks or cooperatives. Indeed, it is problematic that farmers will sell beans to other persons, tell the coop they have nothing to sell or to be deducted. Similarly, the farmer who signs the loan may choose to travel, assigning harvest tasks to some family members. A little while later, he comes back and announces that he has no cash to pay his loan.

To combat this problem, the Konongo Credit Union has decided to fix a percentage interest charge on loans that is neither so high that it threatens a movement against the Credit Union; nor so low that it delays the realisation of the social development program. The final decision will be collectively made after mass consultation with members of the association. It is observed that in a similarly difficult situation, when control villages assign development tasks for either the government or foreign aid,

villages with a cooperative are able to take a direct step to decide what they could do to help themselves. In fact, a cooperative is a mechanism that allows decisions and actions to be made collectively at the base level with a minimum of outside intervention.

Konongo non-members realize the good intentions of Kuapa Kokoo and many fully intend to join. Currently, Kuapa Kokoo provides help to all when needed⁴³. Household income has definitely gone up. But farmers still need long-term no-interest loans (potentially from the credit union) to set up a plantation. They say that if the cooperative built a kindergarten for the village, the people would all become members. This implies an expectation from farmers, particularly with respect to the cooperative movement. They are looking forward to having community development programs that compensate for government failure and respond to the common needs of the village offered by the cooperative. Farmers did not expect a private LBC to build kindergartens or nursery centres in their villages! It goes without saying that this is what has made cooperatives different from other private service providers.

At the moment, farmers cannot get loans elsewhere, so the coop is taking steps to set up a credit union for their members as soon as possible. In terms of training and extension as well, two farmers from each village always take turns to attend training sessions from both Kuapa Kokoo and government extension agents in the Konongo area, and then transfer that information to neighbours. Kuapa Kokoo's training sessions are preferred to those given by the government extension agent because farmers get more detailed instruction and practical guidance.

In contrast to Konongo, most credit unions in Ghana, including those in Tepah and New Edubiase, are still in their infancy or not even formally established. Even so, in **Tepah, members** attribute 57% of their success to improved credit and service management. Members not only receive bonuses and dividends; the coop also helps to buy supplies from the distributed bonus. The coop allows a maximum loan of 200% of the amount of savings. Loans given at planting and weeding are no-interest, but the borrowers must agree to sell beans back to Kuapa Kookoo and pay back loan within two years. However, **Tepah control** farmers, who have no access to cooperative loan programs, complain that the private bank takes too long and administrative procedures are too complicated. Farmers are forced to seek other solutions before the loans come through and bank administrators may use money for their selfish purposes. The urgent need for better social organisation would justify a cooperative. In the future, control farmers hope that their youth can be organized into coops or groups because potential farmers need capital and credit more than established farmers. They need some kind of credit union, but lack a capital base to set one up.

Similarly, it was **New Edubiase members** who started the village borehole project, which then attracted the government to refine and finish it. More help in the future could be given if the villagers show initiative. Members are even willing to make a

⁴³ Specially, Kuapa Kokoo's training sessions are preferred to those given by the government extension agent. No other LBC has come to them and trained them the way Kuapa Kokoo has.

minor contribution to show their willingness to participate in infrastructure projects. Kuapa Kokoo likes the idea of forming a small credit union for members to buy/own equipment collectively, and provides loans for medical emergencies. Although the Credit Union is still in its infancy, leaders plan to provide loans to members up to a maximum value of twice their savings. The interest money earned from the Credit Union could then be used to buy collective equipment to be shared amongst the members (cutters, tiller, tractor) in order to improve cocoa yields and income and create an upward spiral of income to technical change to income.

Social development

4. What direct or indirect contributions by cooperatives, if any, have helped them to bring about greater social organisation, socioeconomic development, educational and health infrastructure, and child well-being in villages where they are installed, as compared to control villages?

The results of hypotheses 8 or 9 showed that member girls go to school less than those in other families in Tiassalé, and that member children on the whole are not significantly better schooled, fed or medically treated than the control group. Yet this was clearly not the intention of cooperatives or the belief of cooperative members, as revealed in the focus group discussions. Cooperatives in both countries have emphasised building and staffing schools and providing transportation to sometimes distance health centers. For example, **Tiassalé members** built two schools, one of them recently; constructed residences for school teachers; and even pay school teachers themselves every month! Loans are provided to help families send children to school. These and other social investments come out of dividends withheld from members.

What is more, **Adzopé and Abengourou members** confirm that, unlike in economically depressed Tiassalé, there is no difference between boys' and girls' school attendance rate. **Abengourou members** have already built one school with six classes and three houses for teachers. The school is for everyone, not just cooperative members. Yet, **Abengourou non-members** complain they have no means to school their children; only four out of ten children go to school, and three of them are boys.

In Ghana, **Tepah members** are thankful to the present government for building two schools at the primary and junior secondary school (JSS). Yet it is the cooperative that provides school loans. Some members even have a savings account at the cooperative for children's university. All children go to grade six. No gender discrimination as to sending boys or girls to school. Yet members want to see a new school directly in the village because the population is growing. They are willing to pay for a boarding school, perhaps the highest priority for members.

Given the fact that the government can hardly cover all real needs (education, health care, transportation...) of farmers in remote areas, cooperatives could be a collective service provider, that can respond more specifically and closely to the local needs. If embedded in an adequate environment, this mechanism can fill in the "half empty"

part of public services, that has not been covered by the government. Until the income per capita of cocoa farmers is high enough and that they afford to pay for services offered by private service providers, cooperatives remain a solution well worth considering.

Konongo members started the daycare center on their own to watch numerous children and to free parents to work in fields. They even have a nursery center for smaller children. The day care centre and nursery are community assets, serving both members and non-members. They have two primary schools, and two junior middle schools built by government. In the next 3 - 5 years, they hope to build more schools, with government contribution. In contrast, **Konongo non-members** report no progress in social development. Children have to go to school in two shifts because of insufficient classrooms and teachers. They ask for help to complete the nursery center and kindergarten. Only 3 of ten children go on to senior high school, only one of whom is a girl, due to the “risk of teen pregnancy”. Many children drop out in grades 10 and 11 because of financial or scholastic difficulties. Non-members therefore ask for some kind of scholarship to help children finish secondary school. They feel girls' scholarships should come from government, where should also build a secondary school in the village. These patterns confirm the much higher value put upon education and health investments within the “cooperative culture”.

We were struck by how better organised villages with a cooperative were. When informed about the study, the cooperative leaders immediately took charge to call meetings, organising villagers into “member” and “non-member” groups. There is a real sense of self-responsibility from each participant. On the other hand, in control villages, it took a much longer time to call for attention, explain the purposes and organise people. During the discussion, a list of “needs” and “requests” are submitted with little sense of self-help, collective action or community responsibility.

Well-being

5. What factors and practices, if any, have led cooperative member households to enjoy higher incomes, healthier surroundings, and better nutrition than other cocoa-producing households?

Cooperative members, as well as their non-members neighbours, have made significant strides in well-being and income with respect to control farmers not only because of the preceding reasons, but also because of specific investments in health infrastructure. For example, **Tiassalé members** are proud of a water tower under construction with German help, to which each household contributed 5,000 FCFA, for a total 7 million. They boast a small clinic in the village with a male nurse, public pumps and three water sources with fountains. Similarly, when the French helped with the little clinic, cooperative members put in their labour. **Tiassalé non-members** acknowledge the above, assigning 29% of their “own” successes to date to improvements in well-being brought about through cooperative-based projects!

In semi-structured interviews, **Adzopé members and non-members** confirmed that there was no problem of child labour exploitation. Members contributed labour and partial financing to the construction of a school, a church, a water tower, and even a village clinic, and do teaching about public illness.

Similarly, in **Abengourou**, the coop's role in well being improvement has also been substantial. In semi-structured interviews, cooperative leaders noted that they have contributed labour and money to construct a clinic. The coop has committed to contributing a third of the total capital needed (4 to 5 million FCFA) to buy roofing tin (1 million) and cement (0.5 million). At the moment there are no particular programs for disadvantaged people, but the coop provides a vehicle for the funeral, even of non-members. Abengourou members report that the Mutual Group of Youth helps the cooperative with health and childbirth. In contrast, **Abengourou control** farmers request a vehicle to transport their sick to the clinic. There is only one pump for drinking water. Although the death rate has increased significantly, there is no money to buy medicines

Meanwhile in Ghana, semi-structured interviews with cooperative leaders in **Tepah** revealed that Kuapa Kookoo has come to offer help for farmers to start up either a potable water project or a vegetable farming cooperative; and asked the member farmers to come up with a specific proposal. So far, the clinic seems to receive the highest priority. In contrast, the **Tepah control group** manifests great social inertia. Although they are fortunate to have a clinic right in front of the village; drinking water comes directly from river, giving many burundiosa, stomach ulcers, typhoid, and diarrhoea. The water pump built ten years ago is now broken. Control farmers claim to have no money to go for treatment for their many health problems. They need four toilets, but to date only have two. The new toilet built by the government has broken down because people are not used to modern facilities.

In stark contrast, coop leaders in **Konongo** wish to give priority to hospital and drinking water projects, which could draw on their community development fund. They also revealed a laudable concern for feeding the family, and appropriate level of sharing with the tenant/share croppers.

Finally, it bears note that in most villages visited, the term “member” refers to members of cocoa cooperatives. Very often, the “non members” in our study can well be members of other production groups, such as coffee or livestock cooperatives. Particularly, one always finds Women Vegetable Cooperatives, that are associates with and supported (through encouragement, technical advice and sometime physical and financial means) by larger cocoa cooperatives. Vegetables are sometime produced and sold to markets, but also are one of the additional means to better nourish the children. These farmer and/or producer groups are working closely hand in hand.

VII. Strategic implications and recommendations

This final section of the report is divided into two sections. In the first, we shall explore the possibilities of solving common problems, and even organising cross-visits across countries, regions and groups, including control producers, non-members and members. Once the potential role of cooperatives is determined in this way, we shall then look at the specific strengths to be improved, and weaknesses to be avoided, within the cooperative movement as viewed by the head- and tail-groups. We end with three overall strategies for future enhancement of the very real impacts of farmer organisations upon the standard of living

VII.1 Profiles of past success and future priority

The profile of cooperative absence

The importance of the impact of cooperatives must be seen against the backdrop of the control villages in the two countries, which show a surprising similarity in their focus group results. To highlight the areas of relative impact across the twelve regions and membership categories in which focus-groups were conducted, we constructed five-point radar diagrams. The five points are the same key areas of potential impact we have seen throughout this report, and notably in the hypothesis testing:

-) Well-being, health and nutrition
-) Production technology development and extension
-) Marketing, prices and transport facilities
-) Social and education development
-) Other services and social management

After each focus group discussion, the total number of mentions in each of these five categories was tallied and inserted as a sub-total into the results table (Appendix V). Each of the five area sub-totals were then divided by the total number of mentions during the discussion to give a percentage score out of 100%. It is these scores that measure how far out from the origin (0%) the lines on the radar diagram go for a given dimension. For example, if only 10% of the total score is given to marketing, prices and transport facilities; while a full 50% is given to social and educational development, we may assume that the respondents feel the latter is five times more important than the former.

To distinguish past successes from future needs in these five areas, we used a colour and stroke-type distinction. The green, solid stroked star image in the following radar figures shows the shape of relative areas of successes to date. Meanwhile, the red, dotted star image shows the areas for future improvement, in other words, the areas of lack of success to date.

If we start with the control groups, Figures VII.1 and VII.2, as calculated from the focus group results in Appendix tables V.6a-b and V.8a-b, respectively we can form an image of social laboratories where no cooperatives have been present to date.

What is striking as we compare the two figures is their similarity. Farmers in both control groups agree that the only development that has occurred to date is in welfare and social development through government programs. No or virtually no improvements have occurred in services, technology or marketing. We may infer that these benefits cannot come about in the absence of cooperative.

Figure VII.1: Past successes and future priorities, Control village farmers, Abengourou, Cote d'Ivoire

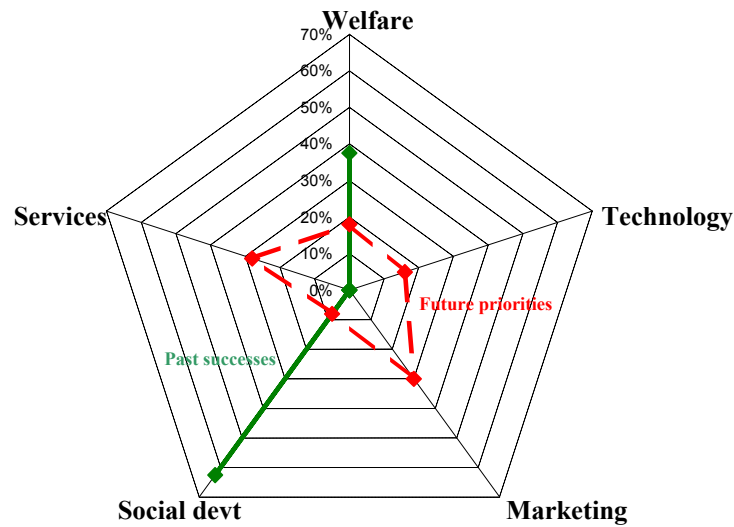
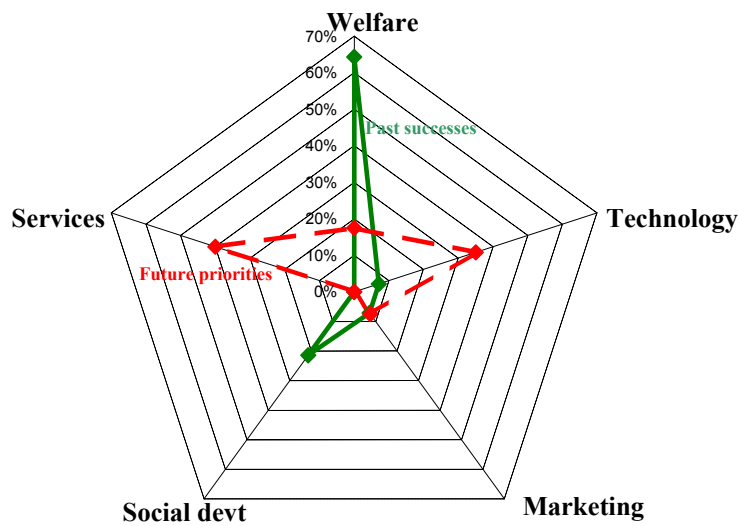


Figure VII.2: Successes to date and future priorities of control village farmers, Achirensua, Tepah, Ghana



The profile of the typical advantages and needs of a cooperative

To explore what the relative successes to date and future needs might be for typical cooperatives, it is striking to visually compare the members and non-members (who are all nonetheless members of some cooperative) in Adzopé with the members in Konongo (Figures VII.3 and VII.4). Both should build on past success in welfare and services but shift their focus to put strong future emphasis on marketing and technology, in which they have enjoyed only modest progress to date.



A typically smiling cooperative purchasing clerk in Ghana

Figure VII.3: Past success and future priority, member and nonmember Adzopé, Côte d'Ivoire

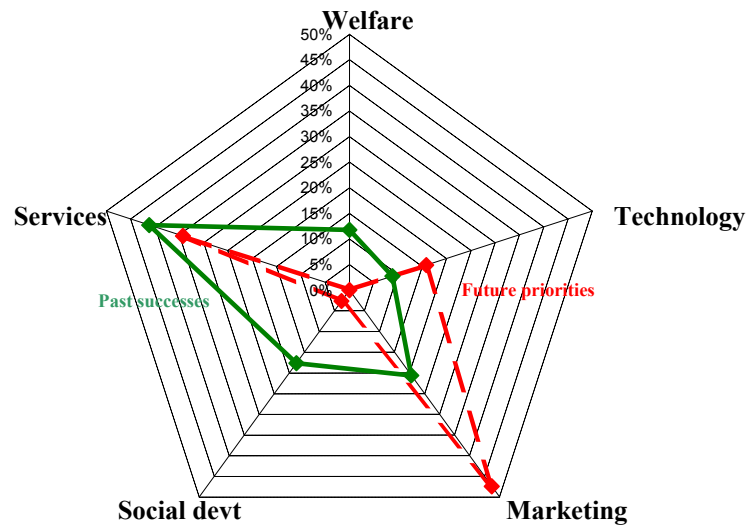
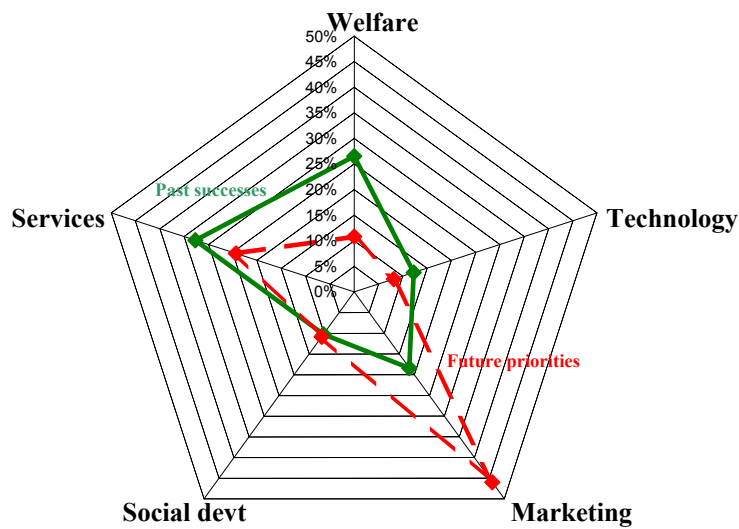
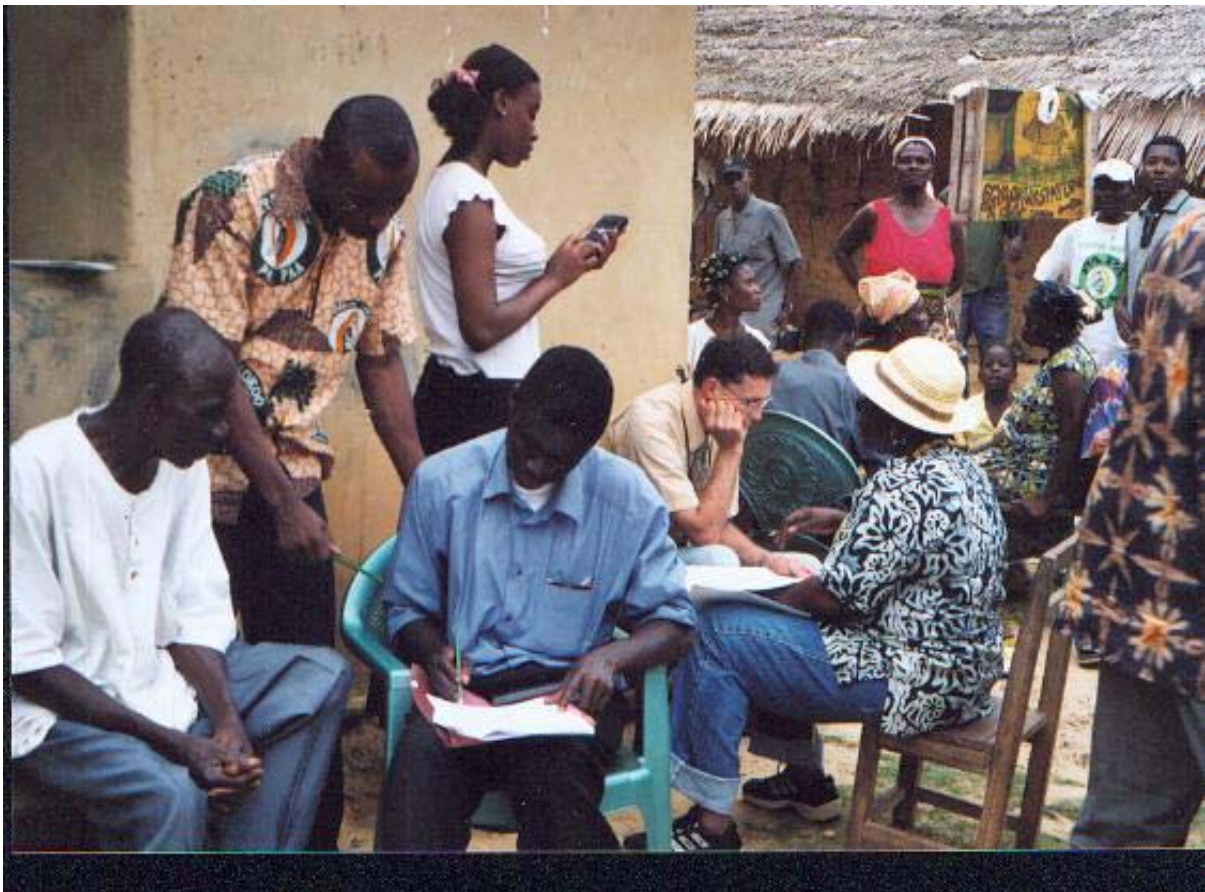


Figure VII.4: Successes to date and future priorities, Society members, Nobewan, Konongo, Ghana



Sometimes, however, the age of plantations and other conditions can make the profile of a current non-member population similar to that of a previously successful cooperative. This is the case with non-members in New Edubiase, Ghana (Figure VII.5) and members in M'mbrimbo, Tiassalé (Figure VII.6). It would be interesting for non-members in New Edubiase to learn of the history of their member *confrères* in Tiassalé in order to strengthen their growth and avoid possible pitfalls. Such learning is all the more interesting in that the green lines in the M'mbrimbo, Tiassalé profile show almost a perfect balance among the five dimensions of cooperative success. This balance is even better than in the most important current success story: New Edubiase. In that sense, historic M'mbrimbo might represent the Platonic ideal of cooperative development in the West African region.



Running to meet a survey deadline in the field! (Ghana)

Figure VII.5: Past successes and future priorities of Society Members, M'brimbo, Cote d'Ivoire

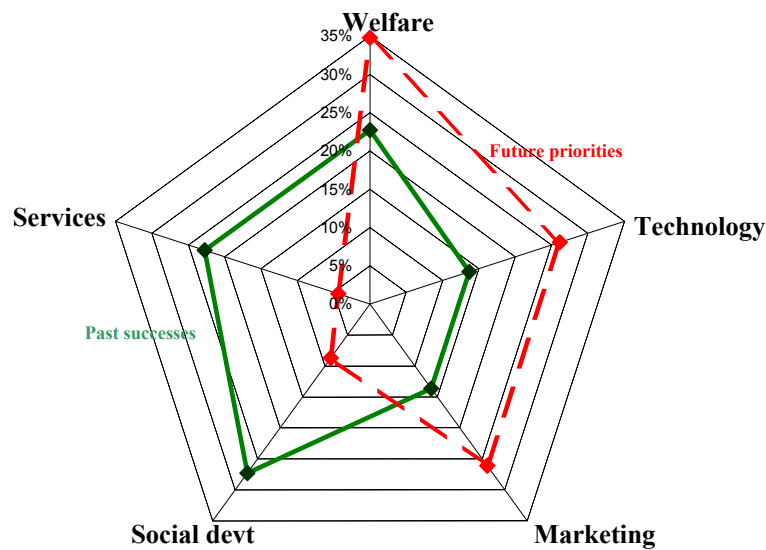
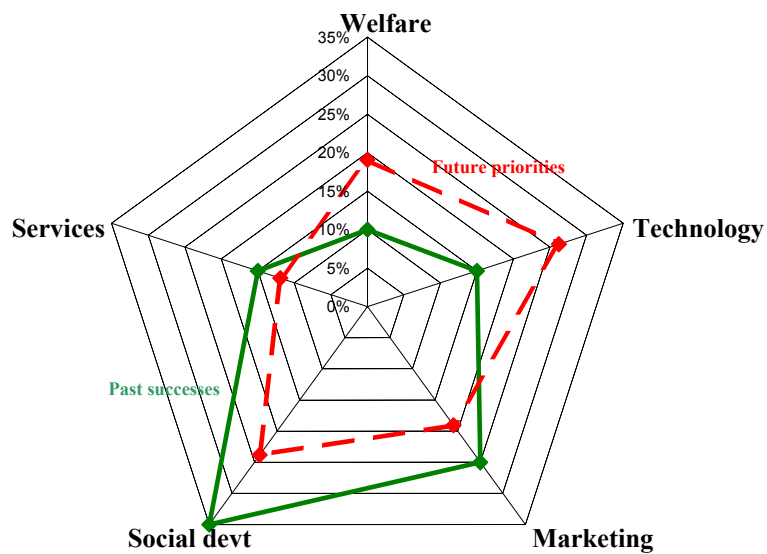


Figure VII.6: Past successes and future priorities, Non-members, New Edubiasé, Ghana



As cooperatives develop in the future, stress should be placed on solutions to common problems. Figures VII.7 (for non-members in Tiassalé) and VII.8 (for members in New Edubiase) show almost identical profiles of past success and future need. Programme emphasis in the future for these and similar localities should therefore be placed on a “red shift” from service and social development to training and project aid in welfare, marketing and technology.



Cooperative head office in Abengourou, Côte d'Ivoire

Figure VII.7: Past successes and future priorities of Nonmembers, M'brimbo, Cote d'Ivoire

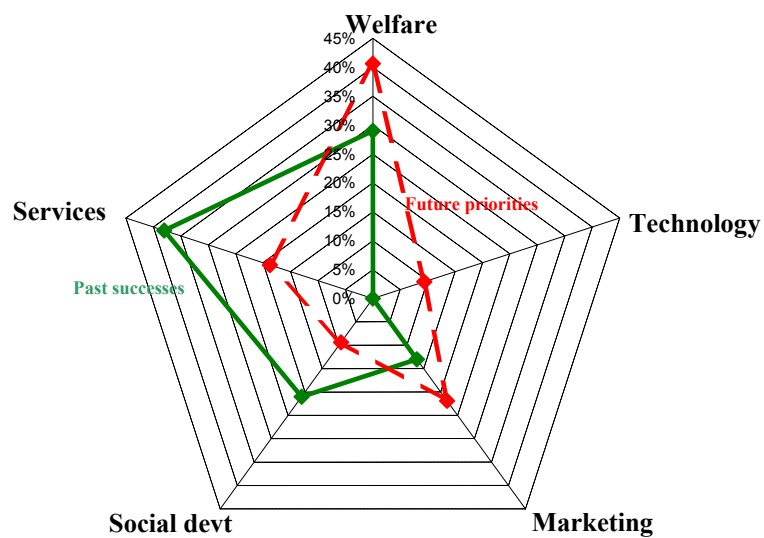
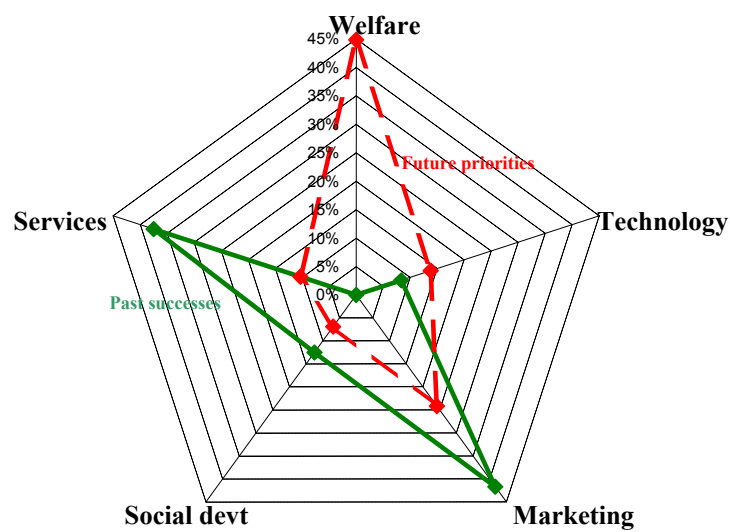


Figure VII.8: Past success and future priorities of Society members, New Edubiase, Ghana



Perhaps most excitingly, the focus group results yield pairs of cocoa producer groups who have complementary patterns of strength and weakness. For example, the past successes of society members in Abengourou correspond to the future needs of non-members in Konongo; and *vice versa* (Figures VII.9 and VII.10)! The same pattern holds between society non-members in Abengrouou (Figure VII.11) and society members in Tepah (Figure VII.12). These results suggest the possibility for productive cross-border visits by delegates of each community to the other.



Only if her parents' bean are weighed fairly, can she weigh in ... at school!

Figure VII.9: Past successes and future priorities, Society members, Sankadiokro, Abengourou, Cote d'Ivoire

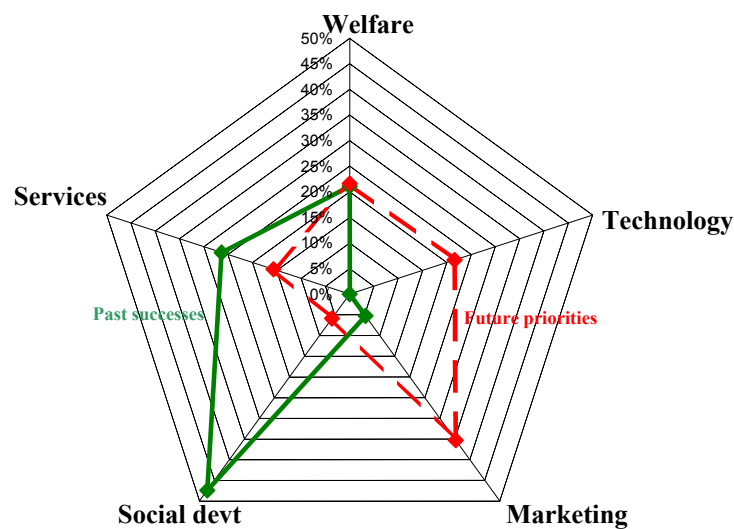


Figure VII.10: Successes to date and future priorities, Nonmembers of society, Nobewan, Konongo, Ghana

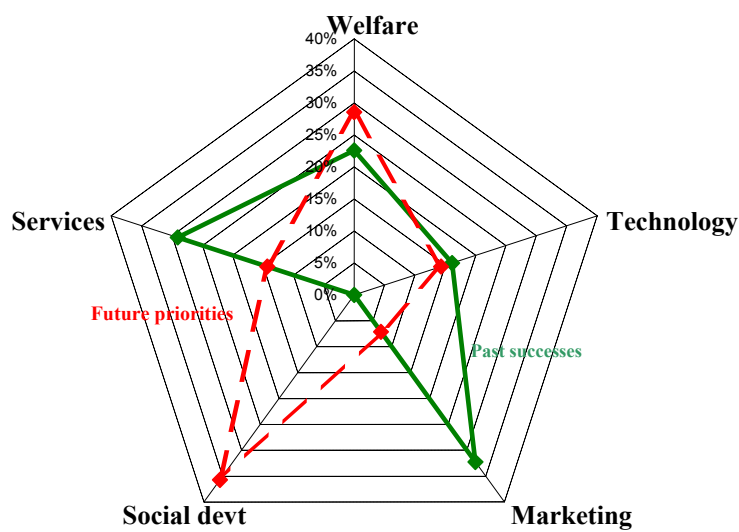


Figure VII.11: Past successes and future priorities, Society nonmembers, Sankadiokro, Abengourou, Cote d'Ivoire

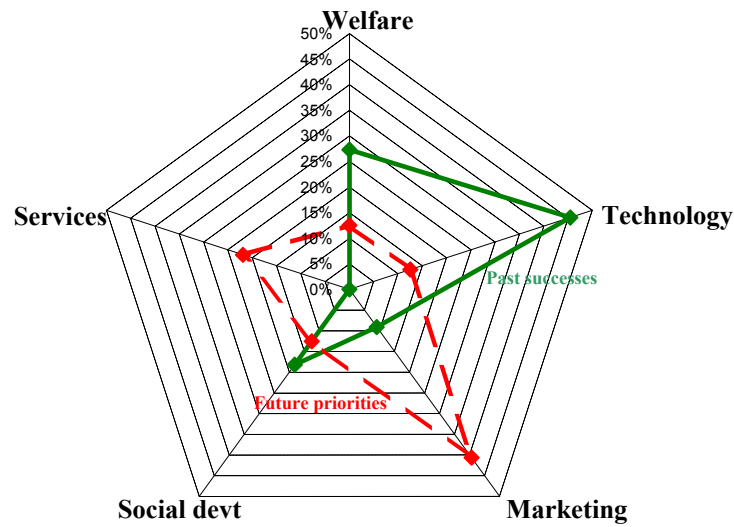
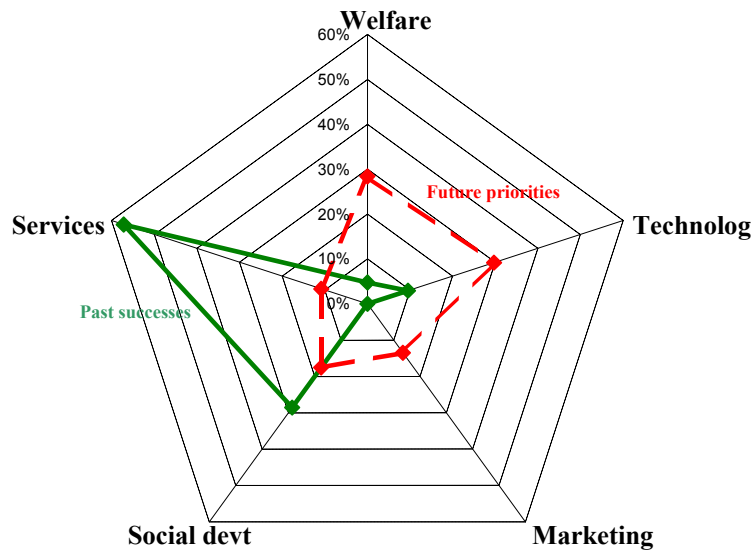


Figure VII.12: Successes to date and future priorities, Society members, Tepah, Ghana



VII.2 Strengths to be retained and weaknesses to be corrected

Close inspection of the above profiles leads to a striking result: overall, cooperative members have had strongest successes in services and social development; non-members in technology and marketing, and control populations in welfare (if only because of government intervention). Based on these results, it is evident that cooperatives have a key role to play in the future improvement of productive and living conditions in the cocoa-producing areas of West Africa.

It is also clear from that above patterns that future such programmes to promote cooperatives should draw upon the collective search for common problems on the one hand; and cross-visits between groups who have had opposite past successes and future needs. For example, there isn't one group in Côte d'Ivoire that isn't crying out for more and better technology, and all but one also call for improvements in marketing.

For such a strategy to work, larger numbers of farmers must be drawn into cooperative membership, and the reasons for past adhesion or non-adhesion identified. It is therefore important to analyse the factors which have led cocoa producers in the past to award high marks in cooperative satisfaction. We therefore conducted head- and tail-group analysis on the characteristics of the 50 most satisfied and the 50 least satisfied producer households out of the entire 453 household sample. The results are presented in Tables VII.1 and VII.2.

Strengths in need of further promotion

The results from Table VII.1 show the clear importance of expanding advice, training and credit given to cocoa producers. Advice is currently most highly appreciated from input companies, NGOs, pamphlets, STCP, and cooperatives, in that order. Loans, as well as dividends and bonuses, from cooperatives – and to a lesser extent from private sources -- provide much -- needed capital flows to finance technical change and other investments. Private income services and livestock income, particularly from hogs, also distinguish this group.

Weaknesses in need of reduction

Meanwhile, the tail group farmers least satisfied with cooperatives to date (Table VII.2) are strongly dependent upon income from non-farm sources, notably migration and salaried employment. They have been refused credit significantly more than the head group; and prefer private output services to private input services. They are more present in Côte d'Ivoire than in Ghana. Finally they suffer more from joblessness and diarrhoea than the head group farmers. These factors should be corrected through yield improvements, microfinance schemes, job creation and health programs as part of future efforts to promote the cooperative movement and to draw in new members.

Table VII.1: Characteristics of head group in cooperative satisfaction

Characteristics of the head group in cooperative satisfaction	Rank	Means		Differences	
		Head	Tail	Absolute	/ Mean
% Income from government dividends and other payments	1.0	0.01	0.00	0.01	2.00
Advice from input company (times over last 12 months)	2.0	0.09	0.00	0.09	2.00
Advice from NGO (times over last 12 months)	3.0	0.09	0.00	0.09	2.00
Advice from pamphlet (times over last 12 months)	4.0	0.15	0.00	0.15	2.00
Advice from STCP (times over last 12 months)	5.0	3.12	0.00	3.12	2.00
Cabamalt, Dithane, Hydrocao, PP, Sidaro and Touchtone	6.0	0.21	0.00	0.21	2.00
Land to other crops (ha)	7.0	0.02	0.00	0.02	2.00
Manure applied to cocoa (0 = no, 1 = yes)	8.0	0.03	0.00	0.03	2.00
Other services received (0 =no, 1 =yes)	9.0	0.03	0.00	0.03	2.00
Private input service satisfaction level (Scale of 5)	10.0	1.63	0.00	1.63	2.00
Income from livestock (inUSD)	11.0	32.84	1.21	31.63	1.86
Loans from cooperative (principal)	12.0	28113	1282	26831	2
Ridomil and Thionex	13.0	11.43	0.82	10.61	1.73
Interest paid to other sources (% per year)	14.0	64.83	5.00	59.83	1.71
Advice from cooperative (times over last 12 months)	15.0	3.44	0.33	3.11	1.65
Hogs (head)	16.0	0.38	0.05	0.33	1.52
Income from cooperative dividends and bonuses (USD)	17.0	18.17	3.13	15.04	1.41

Table VII.2: Characteristics of the tail group in cooperative satisfaction

Characteristics of the tail group in cooperative satisfaction	Rank	Means		Differences	
		Head	Tail	Absolute	/ Mean
Low gross margin per hectare (USD)	1.0	226.47	-4399.38	4625.85	-2.22
Wheelbarrows	2.0	0.00	0.05	-0.05	-2.00
Califan, Gana20, Thiodan, Funguran	3.0	0.00	0.10	-0.10	-2.00
Jobless persons in the household	4.0	0.00	0.15	-0.15	-2.00
% Income non-farm sources	5.0	0.01	0.07	-0.06	-1.56
Diarrhoea in adults (%)	6.0	0.01	0.05	-0.04	-1.30
% Income from remittances from migrants	7.0	0.01	0.04	-0.03	-1.26
Land to forest (ha)	8.0	0.29	1.22	-0.93	-1.23
Labourers in the service sector	9.0	0.06	0.23	-0.17	-1.19
Loans from other sources (principal)	10.0	17133	61750	-44617	-1
% Income from salaried employment	11.0	0.01	0.03	-0.02	-1.06
Refusals of credit (times over last 12 months)	12.0	0.09	0.23	-0.14	-0.89
Income from salaried employment (in USD)	13.0	25.88	62.82	-36.94	-0.83
Private output service satisfaction level (Scale of 5)	14.0	2.25	5.00	-2.75	-0.76
Woman hours in entertainment	15.0	0.28	0.60	-0.32	-0.73
Percentage of young trees (%)	16.0	15.04	29.02	-13.98	-0.63
Labourers in crop production	17.0	0.86	1.57	-0.71	-0.58
Land in pasture	18.0	1.32	2.40	-1.08	-0.58
Income total for the past year (in USD)	19.0	12217	21865	-9648	0
Country (1=Cote d'Ivoire, 0 = Ghana)	20.0	0.38	0.64	-0.26	-0.51

VIII. Conclusions

Given these unique contributions to productivity, marketing, essential service provision, social development, health status and income, this concluding strategic section of the report outlines three fundamental suggestions for enhancing and expanding that contribution in the future. First, it is essential that cooperatives be actively involved as one of several component thrusts within an overall strategic plan. Cooperatives cannot do all of the work alone. If cooperatives are to help extend technology, that technology must be generated by well-financed and qualified agronomists. If cooperatives are to improve marketing power, promote vertical integration and equitable pricing, others must be working to generate up-to-date market information as well as the tangible and intangible scaffolding of efficient markets. If cooperatives are to implement, and in some cases even inform, government policy, that policy must take to heart to what extent the development needs of the nation depend upon improving well-being in each courtyard.

Second, we recommend exchange visits between farmers with similar problems – or complementary solutions – to help to seek common strategies for cocoa production, marketing and well-being improvement at the household and community levels. The five-point radar diagrams in the last section of report suggest which sites in Côte d'Ivoire and Ghana would likely most profit from such exchanges. Of particular interest are cases where the successes of one region may provide the answers to another, and *vice versa*.

Third, we encourage continuation and expanded funding for the STCP project and similar initiatives in Africa as a whole. The issue of well-being is not limited to the six regions selected for this report, nor to cocoa as a crop. It has to do with the sustainable improvement in the levels and inter-household distribution of income, dignified employment, health and nutrition throughout the entire developing world, not least in West Africa. Sustainable tree crops of all types and sustainable social institutions including cooperatives must therefore be given much greater financial and policy importance in the future. In the specific context of the STCP, the positive results of this study suggest that the scope and reach of all four components should be considerably expanded in the next phase of the project.