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Reintegrating and Employing High Risk Youth in Liberia: Lessons from a Randomized Evaluation of a Landmine Action and Agricultural Training Program for Ex-Combatants

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Yale University



REINTEGRATING AND EMPLOYING HIGH RISK YOUTH IN LIBERIA: Lessons from a randomized evaluation of a Landmine Action an agricultural training program for ex-combatants

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Executive Summary

Following the 2011 elections, one of the most pressing challenges for the President, government ministries and international organizations will be boosting youth incomes and employment, especially that of high-risk youth. What kinds of programs can boost employment and incomes and reduce the risk of social instability? This report details findings from an impact evaluation of a reintegration and agricultural livelihoods program for high-risk Liberian youth, and draws out lessons for employment policies in 2012 and beyond. This report builds on recent IPA studies of rural conflict resolution and civic education programs, and analysis of conflict trends and patterns in Liberia. Future IPA reports will look at innovative programs for urban youth.

Context and Program

In 2003, Liberia's 14-year civil war finally came to an end. The war was disruptive and destructive, displacing the majority of Liberia's 3 million inhabitants, halting economic activity, deepening poverty, and depriving a generation of basic education. The bulk of Liberia's youth remain poor and underemployed. While the security situation has steadily improved since 2003, many rural youth continue to make their living through unlawful activities, including unlicensed mining, rubber tapping, or logging. Many of them are ex-combatants, and some remain in loose armed group structures.

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Unemployed and idle in Red Light, Montserrado County

The government, the UN, and NGOs fear that these youth are a possible source of instability. How to promote legal and sustainable employment among such high-risk youth? And how to reduce the risk of violence or re-recruitment in future?

Agriculture is and will continue to be a major source of employment and income for rural Liberians. But can high-risk youth be transformed into stable and successful smallholder farmers? The international NGO Landmine Action (LMA, now known as Action on Armed Violence) runs an intensive, best practices agricultural training program, targeting ex-combatants and other high-risk youth in rural hot spots.

LMA recruited ex-combatants and other high-risk youth and offered them several months of skills training and psychosocial counseling, along with a start-up package, to give youth a peaceful, sustainable, and legal alternative to illicit resource extraction, ease their reintegration into society, reduce the risk of their re-recruitment into crime and insurrection in the future, and to improve security in hotspot communities.

The research

From 2009 to 2011, Christopher Blattman (Yale) and Jeannie Annan (International Rescue Committee) worked with IPA (www.poverty-action.org) and LMA to do a quantitative and qualitative study of the LMA program. The centerpiece of the research strategy was a randomized evaluation. The NGO recruited 1,330 youth, and the researchers randomly assigned these to either "treatment" (receiving the program) or "control" (not receiving the program). By comparing the "treatment" group to the random "control" group 18 months after the program, we can see the effect of the intervention on agricultural livelihoods, shifts from illicit to legal employment, poverty, social integration, aggression, and potential for future instability. As researchers, our aim is not simply to evaluate the success of a single program, but also to use the findings to weigh in on the broader implications for security and poverty reduction in Liberia and beyond.

Additional questions we address include:

- Are rural youth interested in agriculture?
- What kinds of agricultural support can help them expand their activities?
- Can anti-poverty programs reduce illegal activities, peacefully open up concessions, and reduce the propensity for crime and violence?
- What are the most cost-effective means to reduce poverty and improve security in rural towns and villages?

Turning High Risk-Youth into Farmers: Increased engagement in agriculture

The first and most obvious place to look for impact is engagement in agriculture. Here we see a large and significant impact of the program.

- Agriculture is common even without the intervention. Roughly half of the control group is engaged in agriculture, though in the majority of cases it is subsistence farming only.
- More than a year after completion of the program, program participants are at least a quarter more likely than the control group to be engaged in agriculture, and 37% more likely to have sold crops.
- In general there is also a high level of interest in agriculture among these rural youth—both those who received the program and those who did not.

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- 94% of the control group (who did not participate in the program) believes that someone can make a good living farming, 81% think farming is a good thing for them, 76% are interested in farming in future, and 89% are interested in raising animals in future.
- These attitudes are all significantly higher among program participants, in particular the interest in farming in future.



A program participant displays his produce, Bong County

Reducing Engagement in Illicit Activities: Participation rates unchanged, but participation levels dropped

The program not only aimed to increase agricultural activity and productivity, but also to shift high-risk youth away from illicit livelihoods, such as unlicensed or illegal mining, logging, rubber-tapping, and hunting. The researchers measured youth's participation rates (i.e. whether youth had done x in the past month), and participation levels (i.e. number of hours spent doing x).

- Prior to the program, in 2009, 44% of youth were engaged in at least one of these illicit activities, falling to 42% two years later (in both the treatment and control group).
- Overall, rates of illicit mining went up in both the treatment and control group, most likely because of skyrocketing gold prices over the course of the program and study.

The program had little impact on rates of participation in illicit activities like mining, but those who participated in the program do spend fewer hours engaged in illicit activities.

- There is little difference in participation *rates* between those that participated in the program and those that did not.
- While overall illicit activities decline slightly, the incidence of mining increases in both the treatment and control groups by similar amounts—probably because of high and rising prices for gold.
- Nevertheless, participation *levels* fall among the treatment group, as agricultural hours seem to substitute somewhat for hours spent in illicit activities.

Poverty Reduction: Little change in current income and expenditures, but a large rise in durable wealth

Agricultural employment and engagement is higher among beneficiaries, but how successful are these new agricultural activities?

Overall, the evidence suggests that cash cropping provides periodic windfalls from sales, and that these are mainly invested in durable assets (and not necessarily in agricultural inputs or equipment). But there is little effect on observed income or current expenditures (both measured for last month), and other measures of economic advancement.

- The program aimed to develop not only legal livelihoods, but sustainable and, ideally, lucrative ones. We see a sizable increase in average wealth from the program, especially in household durable assets, but no change in current income, savings or spending for the average program participant.
- The very top earners in the treatment group, however, do show more statistically significant higher earnings than the top earners in the control group.
- These agricultural enterprises are sustainable and profitable but their current revenue generation and employment generation is modest.

Modest improvements in social engagement, citizenship, and stability

The residential training experience, the life skills and psychosocial programming, the new livelihoods, and reinsertion assistance were also designed to increase social integration. We observe small but positive improvements across most measures. While not all of the estimated impacts are large enough to be statistically significant, they nevertheless suggest a small but broad-based reduction in alienation and some gains in stability.

Do we observe reductions in crime and violence? There are at least two reasons to expect the program could reduce both.

- First, relocation to the training center (and, ultimately, a new village) can replace previous ties to ex-combatants and former commanders by counselors, other motivated students, and farmers. The goal is to help participants adopt a new set of norms, reference groups, and networks, and encourage a process of socialization from ‘combatant’ into community life.
- The second rationale is economic: to give ex-combatants and war-affected youth alternatives to their current illicit activities or low-return alternatives, and thus dissuade them from future violence.

The evidence on aggression and crime is somewhat equivocal, however, and does not point to a significant reduction in illegal or aggressive behaviors among program participants.

- Looking at interpersonal aggression and crime, we see that by some measures program participants are slightly more violent and open to crime, and by other measures they appear less aggressive.
- In most cases the impacts are not statistically significant. This remains true even when we restrict our analysis to those men who, at baseline, showed a high propensity for aggression and instability.

Less likely to have been interested in, or mobilized into, the election violence in Cote d'Ivoire

Conflict broke out in Cote d'Ivoire shortly before we launched the evaluation of the program. We asked subjects about levels of interest in recruitment, connections to people recruited, and activities like attending, or even knowing of, meetings and other recruitment activities.

Rates of interest in the violence and mobilization were fairly low, but they were especially low among program participants – they tended to report a third less interest in or links to recruiters and recruitment activities.

Our interpretation is that aggressive responses to the program are highly heterogeneous—many who participated succeeded and so reduce their interest in armed insurrection. But because these traits are difficult to measure, and because not all respond to treatment in this way, the average impacts are large but not statistically precise. Given the difficulty of shifting such behaviors, however, we regard these impacts of the program as extremely promising.

Bringing in evidence from other livelihoods programs

The program focuses on providing agricultural skills and start-up tools to encourage a transition from illicit livelihoods to farming and animal husbandry. We are not aware of similar programs for high-risk populations, let alone hard evidence on their success or failure. Agricultural assistance programs can show high returns but they typically target more established farmers.

While evidence on agricultural interventions is limited, there is a broader base of evidence on programs that focus on providing business skills and capital for small income generating activities and microenterprises.

- “Microenterprises” include non-farm employment (like vending items, operating a kiosk, a vocation, or handicraft production) plus agricultural enterprises such as animal raising or trading (i.e. at other points in the agriculture value chain).
- These evaluated programs have targeted rural ultra-poor or urban high-risk populations, but focus on non-farm employment. We summarize some of the evidence on these interventions, including evidence from a growing number of randomized trials of the very poor, excluded and (in some cases) high risk youth.

Rigorous evaluations of employment and income generation programs in Africa, South Asia, and elsewhere have shown promising results.

- Poor people appear to have opportunities to earn high returns to capital, but with limited assets or the ability to borrow, they have difficulty achieving them. Programs that have provided capital— either in-kind assets, credit, or cash—to poor individuals have observed annual returns on those investments of 30 to 60%, and sometimes higher.
- The returns to skills, however, appear to be lower than the returns to capital, suggesting that credit and capital may be the scarcer resource.
- Indeed, to promote legal employment generation and poverty alleviation, a growing base of evidence stresses the cost-effectiveness of financial access and capital or cash transfers to the poor. These programs tend to perform especially relative to the cost of implementation.
- Whether these poverty alleviation and employment programs reduce the potential for social instability and violence is still unproven, though early evidence suggests there are modest reductions in alienation and violence.

Recommendations for reintegration, livelihoods, and poverty alleviation programs in Liberia

This program and Liberia's government and non-governmental sector share a common objective: to promote legal, sustainable, and lucrative employment opportunities for youth, steer them away from illicit activities or occupation of concessions, and reduce poverty and the potential for instability.

To do so most successfully, we argue that these legal employment alternatives must be labor-intensive, provide opportunities for full-time work, and have high revenue-generating potential.

In agriculture, external evidence suggests that the returns to capital are higher than the returns to skill.

- Given scarce aid and resources for employment-generation, the most cost-effective means of expanding the returns to smallholder commercial agriculture probably involves a shift in emphasis from skills training towards capital.
- More of both are clearly better per beneficiary, but the opportunity cost may be high in terms of other beneficiaries not served.
- These are conjecture based on a thin base of evidence across African farm and non-farm enterprises, however, and so we advocate for experimentation in future agricultural programming in Liberia, to understand which packages are most cost-effective in terms of legal employment generation.

Our qualitative study of the program impacts suggests that access to markets may have been an important constraint on success. Our research does not speak directly to this question, however, and more investigation on this point will be needed. But agricultural training programs should stress to trainees the need for proximity to markets, and encourage graduates to settle closer to major markets both for inputs and produce.

Where skills training may be most effective is where graduates can be linked to concession owners and agribusiness as employees. This could include out-grower schemes or placement in commercial farms or plantations.

Finally, we view rural non-farm enterprises as a major short-term source of poverty alleviation and legal livelihoods.

- Looking at a variety of impact evaluations of ultra-poor, or post conflict youth, we see high returns of 30 to 60% on enterprise development support, including business skills training and cash or in-kind grants. Village- town- and city-based microenterprises are also viable economic alternatives for youth, one that the evidence suggests can yield high potential economic returns, modest social returns, and the potential to reduce crime and aggression among unstable populations.

We will address the potential for these non-farm alternatives, including design alternatives, in a future policy memo.

Contents

Executive Summary	i
Contents	vi
1. Introduction and background.....	1
2. The Program	2
3. Target Population	3
4. The Evaluation	5
Qualitative research	5
Quantitative research.....	5
Strengths and limitations of the methodology	6
5. Qualitative observations	7
6. Impacts on program participants	9
A. Pursuit of legitimate agricultural livelihoods	9
B. Shift from illicit to legal livelihoods	11
C. Impacts on employment levels, income and wealth.....	13
Measuring income, wealth and poverty reduction	13
Impacts	14
Distribution of impacts.....	16
D. Citizenship and social integration	17
E. Other psychosocial impacts.....	19
F. Aggression and potential for mobilization into violence	21
7. Comparative analysis of impacts.....	26
A. Evidence from demobilization programs	26
B. Evidence from related economic programs outside Liberia	27
C. Interpreting our findings in light of this evidence	29
8. Recommendations and implications for the reintegration of high-risk youth	31
A. Immediate versus longer term reintegration programming	31
B. Capital versus skills investment in agricultural programming.....	32
C. Alternative youth employment program options	33
9. Appendix: A statistics primer.....	34

1. Introduction and background

Poor and unemployed young men are widely considered a threat to political stability, often blamed for everything from fights to crime, riots and revolutions. Ex-combatants cause policymakers special worry. Not only do they have professional experience in warfare, but their social networks are dense with potential recruiters. War may also have left them poorer or more traumatized than their peers. Each of these factors has the potential to raise the risk of rebellion, crime, or other aggression, risks greatest in weak states and uncertain economic climates like that of Liberia.

In Liberia, a national demobilization program successfully demobilized tens of thousands of ex-combatants, but many thousands of young men and women – often the hard core – were poorly served or unserved by the official program. These youth remain underemployed and many are engaged in illicit activities, such as unlicensed mining, logging, rubber tapping, and marijuana production. In some cases, loose armed group chain-of-command structures remain in place, making youth susceptible to re-recruitment. At the outset of the LMA program, the government and the UN peacekeeping mission (UNMIL) regarded these ‘hot spots’ as a major threat to peace and stability, and they continue to be a source of concern.

Ex-combatants and other high-risk youth are just one particularly precarious population in Liberia. The bulk of Liberians are young, poor, and underemployed. Following the 2011 elections, one of the most pressing challenges for the President, government ministries and international organization will be boosting youth incomes and employment, especially that of high-risk youth.

Key policy questions include:

- What kinds of programs can boost employment and incomes and reduce the risk of social instability?
- How can policymakers break illicit networks and steer high-risk youth towards legal, lucrative, and sustainable employment?
- Do high risk youth need special programs or attention?

This report studies a pioneering NGO program that targets ex-combatants and other high risk youth in Liberian hot spots and provides them with the skills and tools to engage in commercial smallholder agriculture. In 2006-07, the international NGO Landmine Action, or LMA (now known as Action On Armed Violence, or AOAV¹) worked with the UN and the Ministry of Agriculture to develop an innovative program of agricultural livelihoods development and social reintegration for the hard core ex-combatants in Liberia’s hot spots.

Innovations for Poverty Action (IPA) is a research NGO that works with leading academics and organizations, using rigorous techniques to develop, test and scale up proven solutions to real-world problems faced by the poor.² The researchers partnered with IPA and LMA to study the program and draw out lessons for youth employment and stabilization policies in 2012 and beyond.

Our objective is not merely to understand the effects of a single program, but to use the program to help answer some basic questions in post-conflict recovery and peacebuilding: the constraints facing youth who pursue agricultural livelihoods; the competing opportunities for high-risk youth; the determinants of effective poverty alleviation; the links between employment and potential for aggression; and the links between employment and psychosocial well-being.

¹ See <http://aoav.org.uk/>

² See <http://www.poverty-action.org/>

This report complements recent IPA studies of rural conflict resolution and civic education programs³ and a recent analysis of conflict trends and patterns in Liberia.⁴ Future IPA reports will look at innovative programs for urban youth in Liberia. In the final sections, we also bring in IPA and other related research and evidence on post-conflict youth employment.

2. The Program

The LMA intervention is broader and more intensive than most ex-combatant reintegration programs, and is designed to rectify some of the main failings of prior demobilization programs: it is oriented towards agriculture (the largest source of employment in the country); it provides both human and physical capital; and it integrates economic with psychosocial assistance. It is also targeted at hot spots that present the most immediate security concerns.

The program had five official aims:

1. Rebuild and transfer to government full ownership and management of training centers
2. Improve security and implementation of rule of law in hot spots
3. Help ex-combatants formerly dependent on illegal livelihoods pursue legal and sustainable livelihoods
4. Help beneficiaries become better citizens, with greater respect for rule of law and improved social and communication skills
5. Reinsert and reintegrate ex-combatants into communities away from former hot spots

LMA rebuilt an agricultural training center that was destroyed by the war in the west of the country, in Bong County, which can accommodate 400 students, and built another center in the east, in Sinoe County, which can accommodate 200. The Bong class ran from November 2009 to March 2010 and the Sinoe class ran from September to December 2009. Each program offered a package of services, at an average cost of approximately \$1250 per student.

The program has 6 main components:

1. Three to four months of coursework and practical training in rice and vegetable farming, animal husbandry, and rubber and palm oil production;
2. Basic literacy and numeracy training;
3. Formal and informal psycho-social counseling and conflict management, led by former combatants turned counselors and mentors;
4. Meals, lodging, clothing, basic medical care, and personal items while in residence;
5. Facilitation of re-entry and access to land into any community of their choice;
6. A two-stage package of agricultural tools and supplies, tailored to the specific type of agriculture chosen by the trainee, and worth approximately \$200.

The program aimed to promote peace and security at two levels: at the community or 'hotspot' level and at the level of the individual beneficiary as well.

³ Christopher Blattman, Alexandra Hartman, and Robert Blair, "Can we teach peace and conflict resolution? Results from a randomized evaluation of the Community Empowerment Program (CEP) in Liberia " (New Haven, CT: Innovations for Poverty Action, 2011). See full report at <http://www.poverty-action.org/project/0139>.

⁴ Robert Blair, Christopher Blattman, and Alexandra Hartman, "Patterns of Conflict and Cooperation in Liberia (Part 1): Results from a Longitudinal Study," (New Haven, CT: Yale University & Innovations for Poverty Action, 2011).

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Program center in Salala, Bong County

At the community level, the program is designed to give incentives for leaders or groups to peacefully hand over resource concessions, break existing chains of command, shift people out of illicit resource extraction and either remove high-risk youth permanently from the hotspot or, if they return, give them legal employment alternatives. The program aims to cool the hot spots and permit the resumption of state authority.

At the individual level, the program is designed to provide ex-combatants and other war-affected youth with sustainable, legal, and lucrative alternatives to their current illegal activities, facilitate their reintegration into society, and reduce their ability to be re-recruited into crime or insurrection, thus contributing positively to enduring peace in Liberia.

The researchers, and this study, are best positioned to study the individual rather than the community impacts of the program, and the report focuses on these objectives in particular. We investigate the direct aims of the project, as well as indirect and unplanned outcomes for participants.

3. Target Population

For the Sinoe program, LMA principally target ex-combatants living in 35 communities on and around the Sinoe Rubber Plantation, an enclave which, until a few months before the program, had been occupied and managed illegally by a rebel commander, and was expected to revert to state control in the coming months.

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For the Bong program, LMA focused mainly on ex-combatants from 60 communities in Gbarpolu County in areas known mainly for small-scale (and often illicit) diamond and gold mining, logging, and hunting. Such communities are potential hotspots because they attract young men from around the country with an interest in making “fast money.” As long as the price of minerals remains high and illicit miners continue to operate, these men may not pose an immediate threat. If the situation changes, however, these high concentrations of young men may be vulnerable to recruitment for criminal or violent activities. The Bong program also targeted ex-combatants in and around Ganta where, at the time of registration, there were signs of political instability in Guinea and reports of recruitment of ex-combatants. LMA also registered a small number of people from the villages adjoining the training site, in order to maintain community goodwill.

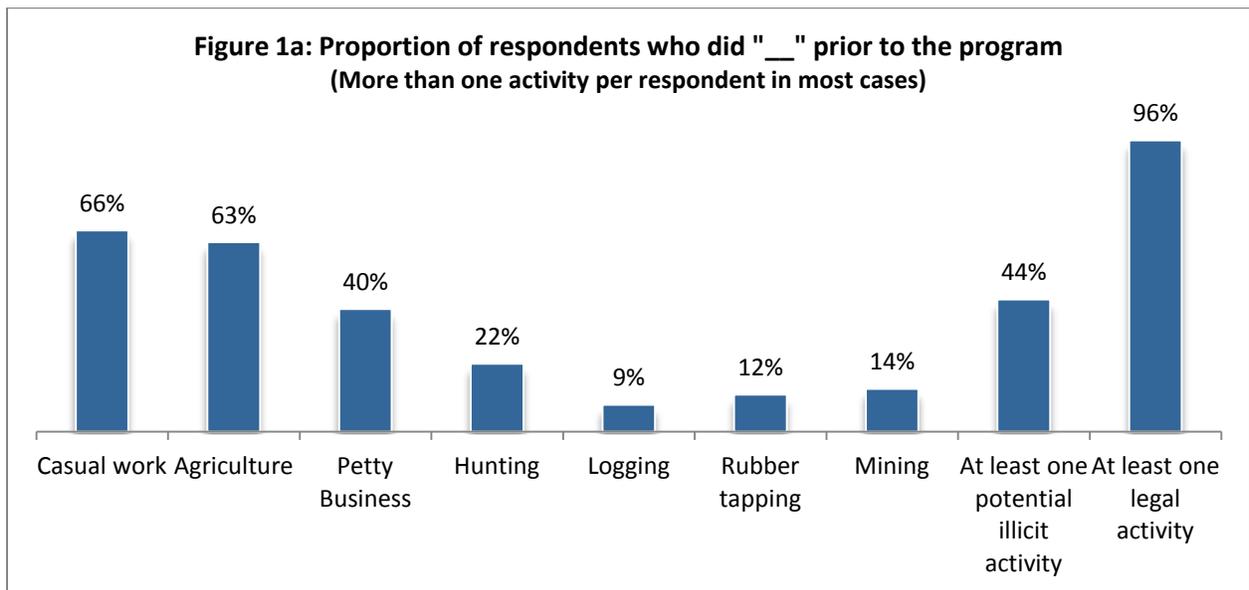


Youth in Red Light, Montserrado County

To mobilize the target population, LMA sent a registration team to each site to identify risky populations, publicize the program, and screen interested persons using a detailed registration questionnaire that focused on war experiences and current activities. IPA staff assisted in site selection and research.

On average, the target population was 30 years of age and had nearly 6 years of education. 69% lived with a spouse and 64% lived with children. Before the program, 93% had done some kind of income-generating work in the previous week, although seldom a full week of work, and they earned \$50 on average in the previous 4 weeks.

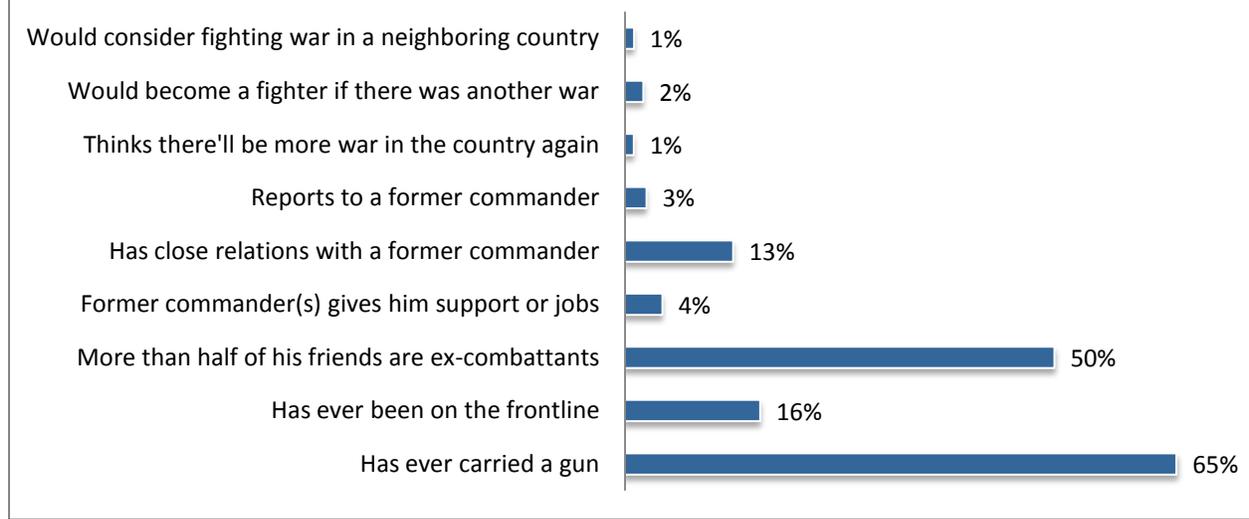
Respondents were engaged in a wide variety of activities prior to the program. Figure 1a illustrates the major activities self-reported at baseline. Respondents were typically involved in multiple income-generating activities--typically two to four at any one time. The most commonly reported activities were casual labor (66%), agriculture (63%), and petty trading (40%). Respondents were also engaged in a number of generally unlicensed (and hence illicit) activities: hunting to sell (22%); mining (14%), rubber tapping (12%), and logging (9%). (We suspect a small proportion were involved in petty crime, prostitution or drug sales, but do not have data on these activities.) In all, 96% of respondents reported they were engaged in at least one legal livelihood, and 44% reported that they were involved in one of the four main illicit livelihoods.



Some non-combatant youth were also targeted by the program, especially youth who were considered potentially as unstable or deserving as the ex-combatants. All are war-affected, and a majority were engaged with an armed group in some fashion, but only 65% of those registered for the program, for instance, carried a gun on an armed force, and just 16% were on the front lines.

In general, potentially high-risk youth were targeted. Figure 1b illustrates self-reported data before the program. Nearly two thirds were fighters (i.e. carried a gun). At the time, half said that more than half their friends were other ex-combatants, 13% had close relations with a former commander, and 4% were actively receiving support from a former commander.

Figure 1b: Self-reported indicators of potential for instability



4. The Evaluation

Can agricultural training and start-up assistance provide high-risk youth with an alternative, stable and lucrative livelihood? Will this reduce illicit activities and lower the risk of violence, aggression, crime, or re-recruitment? Finally, what can such programs tell us about agricultural employment and poverty alleviation strategies generally?

To answer these questions, the lead researchers and IPA worked with LMA to rigorously evaluate their program using both qualitative and quantitative methods. The purpose of the study is not simply to evaluate the success of any one program, but also to generate generalizable findings for post-conflict recovery, peace-building and poverty alleviation.

Qualitative research

For the qualitative investigation, two Liberian and one American research assistant followed 37 members of the treatment and 13 members of the control group at regular intervals over two years. The qualitative researchers attempted to interview participants before, during and after the intervention, often multiple times. The analysis of this vast store of qualitative data is ongoing, and preliminary findings are reflected in this evaluation.

Quantitative research

The core of the study was a randomized, survey-based evaluation of the program. Demand outstripped the supply of spaces in the program, and so registrants in each community were admitted to the program by lottery, providing a random “treatment” and “control” group for comparison. Of 1330 people registered and surveyed⁵, 790 were offered the program, and 254 declined (or were unable to be found).⁶ To assess impacts, we estimate the effect of the treatment on the treated only (i.e. the effect of the program on those who do not decline).⁷

⁵ We omit from this analysis people who were registered, surveyed, but were not experimentally assigned to the program. These include 59 generals and women in the Sinoe program who were automatically admitted. We do not have a control group for comparison, and so omit them from the analysis. Data are available on these participants, however, since we tracked them as well. Women and generals were randomized into the larger program at Tumutu, and are included in the current analysis.

⁶ The greatest source of non-compliance comes from individuals who refused to come at pick-up. The training is a four month residency program, requiring students to leave their families for a considerable length of time. Our interviews suggest that

We collected extensive survey data on registrants several weeks prior to the program. We followed them up 16 to 20 months later, roughly 12 to 16 months after program completion. Despite massive migration, with intensive tracking we found nearly 93% for the endline survey. To provide an incentive for control group members to maintain contact with IPA for surveying purposes, and as compensation for their time (approximately 2 hours at each survey), a mobile phone worth approximately \$18 was given to each control group member upon completion of the survey.

Before and after the program, we collected detailed data on economic activities (especially engagement in agriculture), expenditures and assets, family, physical and psychological health, political attitudes, attitudes towards violence, aggressive behaviors, and war and program experiences. All data are self-reported.

This represents the first randomized evaluation of a post-conflict reintegration program for high risk youth. The number of subjects is large enough that we expected to be able to detect with statistical precision changes larger than 10% relative to the control group. We report all impacts, large and small, statistically significant and not. In general, “small” impacts (changes less than 10%) will be imprecise, meaning we will not be able to say for certain they are not zero. A short statistics primer is provided in an appendix.

Strengths and limitations of the methodology

Since entry into the program was randomized, any differences between program participants (the treatment group) and those who were not invited to attend (the control group) can be attributed to the program. This is the chief strength of the randomized controlled trial approach.

We should first note that this is a medium-term assessment, 15 months after the program conclusion, after two to three agricultural seasons. As we discuss below, 15 months is generally proven sufficient to see improvements in non-farm self-employment, or with existing farmers, but it is possible that new farmers (especially in a post-conflict context) may take longer to see impacts to appear.

Second, in some instances we observe small or medium impacts, or treatment effects, but the impact is not “statistically significant” at conventional levels (see the appendix for an explanation of technical terms). In these cases it is customary to follow standard scientific practice and mute our confidence in the impact. We usually take such evidence as suggestive of an impact, but not assuredly so.

Even so, it is important to note that an absence of evidence is not necessarily evidence of absence. What we estimate is a confidence interval. In some cases the confidence interval only includes small or modest effects. In these instances we can be more confident that the impact was low. In other instances, the confidence interval includes fairly large effects, positive or negative. In cases where the average treatment effect is large, but the confidence interval includes zero, we especially cannot rule out large impacts.

Finally, while rigorous, note that the evaluation method relies on people’s self-reported data. Measurement error and misreporting is a risk, and will have small to serious effects depending on the nature of that misreporting:

- **Small measurement error.** If misreporting is idiosyncratic, and if treated and control individuals are equally likely to misreport, then it will reduce our precision but any measurement error will cancel out and not affect the size of our impact estimates.

compliance was especially difficult for household heads, parents of small children, those with small businesses or farms, those with bosses who did not want them to leave (usually in mining or rubber production) ,and those with outstanding debts in their community. Non-compliance was especially high in Sinoe both because the program was new (and hence suspicious) and because of the delayed start and hurried pick-up.

⁷ For a detailed description of the research design, see the full paper and analysis: Annan, Jeannie and Christopher Blattman. 2011. “Can swords be turned into ploughshares? Experimental evidence from an ex-combatant reintegration program in Liberia.” Unpublished working paper, Yale University.

- **Medium measurement error.** If people systematically underreport success in both the treatment and control group (say, because they hope for more benefits), we will tend to underestimate the impact of the program by a modest amount. We believe this to be the most likely source of error.
- **Serious measurement error.** We are most worried if treated subjects misreport more than control subjects. If so, our estimated impacts will confuse the real impact of the program with impacts of the program on whether people are honest. We might worry, for instance, that people underreport their success in the hopes of more benefits. If control subjects have just as much reason to underreport as treated subjects however, then this is a less serious concern.

Our qualitative work is designed to understand and minimize these forms of measurement error, but they exist. In addition, certain effects of the training may be difficult, if not impossible, to measure with survey questions, or may not emerge until months or years after the program implementation and thus are not captured by the evaluation.

5. Qualitative observations

Based on our observational and qualitative data, the program appears to have been highly popular, and imparted valuable skills to program participants. We also observed, qualitatively, a remarkable improvement in confidence and respect. Upon return, a majority approached farming with vigor but, like many Liberian farmers, faced a number of difficulties and constraints that may have impeded short term success. We describe these observational results in order to help us understand and interpret the quantitative impact analysis to follow.

The residential training program appeared to be both carefully implemented and popular. Classroom and practical instruction were intensive, hands-on, and appeared to be pitched at an appropriate speed and level. Three to four months of training is not enough time to master skills, but is far greater than most farmers receive in Africa. Students seem to have acquired beginner and intermediate knowledge in modern farm practices appropriate for small scale cash cropping and animal husbandry—such as more advanced cropping and animal care techniques, seed germination and transplanting skills, fertilizer, pesticide and vaccine knowledge—seldom possessed by subsistence and lay farmers.

The psychosocial component also appears to have been well-implemented and especially valuable to the students. Roughly half of program participants reported that the psychosocial training or one-on-one counseling was the part of the program that most changed their life. Students entering the program often came from peer groups where conflicts were frequently settled by violence. While severe psychological trauma and depression was infrequent, few had come to terms with their war experiences and fewer still operated easily in a peacetime environment. The residential program provided a transitional space in which the people could accustom themselves to a new set of norms and behaviors. The counseling and counselors encouraged this process.

Strikes, communal grievances, and even the threat of violence were common occurrences on the training sites. While the events were disruptive, these were largely productive opportunities for the students to learn how to work out grievances and exercise voice in a peaceful manner, and contributed to the changes in behavior.

Our qualitative observation of these students suggests that a majority became more settled, composed, and confident over the course of the program. They learned to live better in groups and according to rules, and to settle disagreements non-violently.

The vast majority of students graduated from the program, and only a small number needed to be expelled or left on their own accord. At graduation, students had little trouble identifying communities where they would like to resettle and start a farm, and land was generally plentiful and available. Communities generally appeared proud of their new (or returned) residents and both envious and in admiration of the skills acquired. The students them-

selves were commonly proud of their participation, and their training t-shirts, ID cards, and certificates were marks of pride.

As we will see in the next section, more than two thirds of program participants were doing agriculture for themselves or another at the time of surveying, and nearly two-thirds planted crops or raised animals after returning from the program. But program participants faced a number of challenges after training and return, and qualitative visits suggest that a large number of graduates were having difficulty establishing successful farming or raising animals.

First, some graduates, especially those who came from and returned to Gbarpolu, returned to remote communities with large local markets but difficult road access and consequently limited access to external markets and supplies. Distance meant that new or replacement tools, seeds and other inputs were unavailable or expensive, and transporting any produce to market was difficult and costly. These problems are faced by remote farmers across the country.

Second, agriculture is a tough and risky enterprise, and many students reported difficulties in their first seasons. Some had trouble clearing enough land since the brush is thick and many people do not have access to a plow or capital to hire one. Pests and water and other problems were also mentioned. This led to lower success on average, with high variance across people, at least after just two or three growing seasons.

Third, graduates were relatively poor and had limited assets, cash, or access to credit. The program provided a fairly comprehensive and generous set of skills and inputs. But if seeds spoiled or tools broke they were difficult to replace, and participants seldom had funds to buy added inputs, to transport goods to and from markets, or to hire or mobilize people to help them clear land. The latter is apparently especially important for women, who by custom and by physical constraints seldom clear land. It is not fully apparent how important these cash and capital constraints were to success. We return to the subject below in our analysis of impacts.

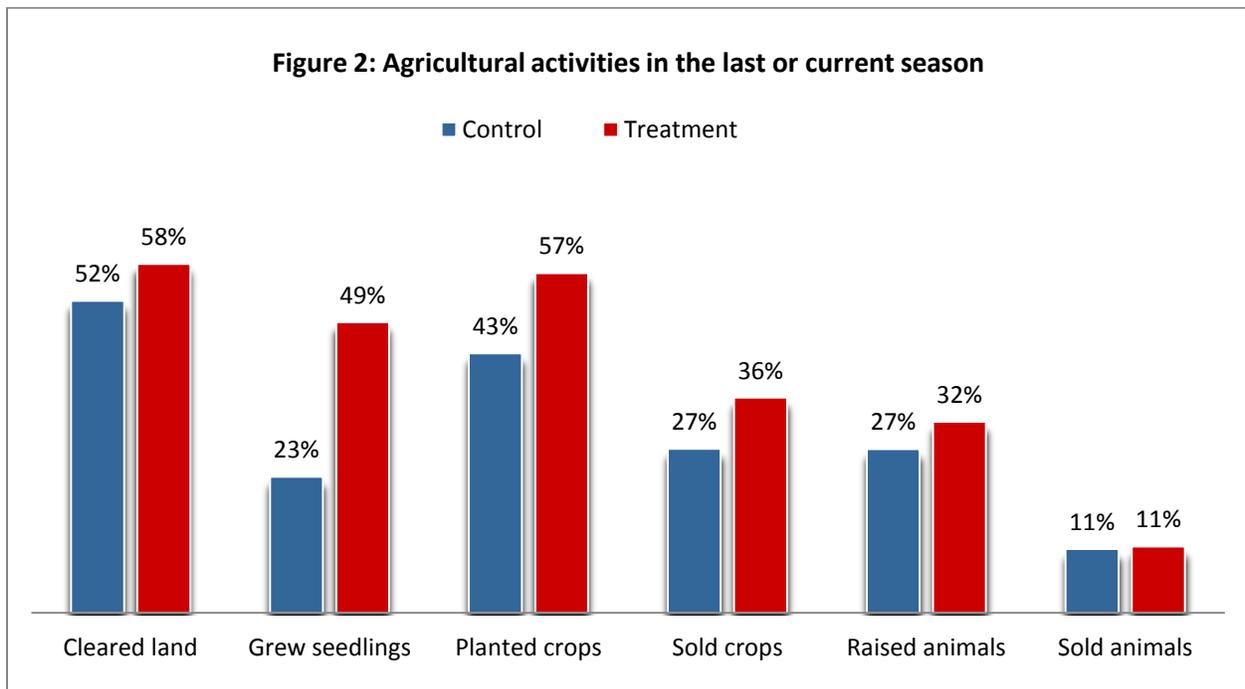
Finally, some graduates reported problems with the reintegration materials received. Those who chose animal husbandry, especially chickens, generally received the construction materials but, due to national supply problems, had not received chicks at the time of the survey. A cash equivalent was being distributed during and after the survey, but because of the timing this is not reflected in the results. On occasion, therefore, when evaluating program impacts we will consider the impacts on chicken-raisers separately. Of those who chose crops (mainly vegetable farming), about half reported that some of the materials received were spoiled or quickly broke, including seeds and tools. It's difficult to confirm the extent and seriousness of these claims, and LMA contests the accuracy of the reporting on reintegration packages and numbers of spoilt packages. We share their suspicions of these reports. Nevertheless, spoiled seeds were especially commonly reported, and may have been widespread (either due to supply problems or perhaps storage and treatment by trainees upon receipt). It may also be possible that program graduates blame any problems with their farm on spoiled seeds, even if it is not the real cause. At the same time, seed growing is a skill most learned and is not too difficult or costly to implement, and so while this could have slowed success, it should not have been a major barrier.

We return to the subject of agricultural and economic success below, after looking at average impacts and patterns of variation in these impacts.

6. Impacts on program participants

A. Pursuit of legitimate agricultural livelihoods

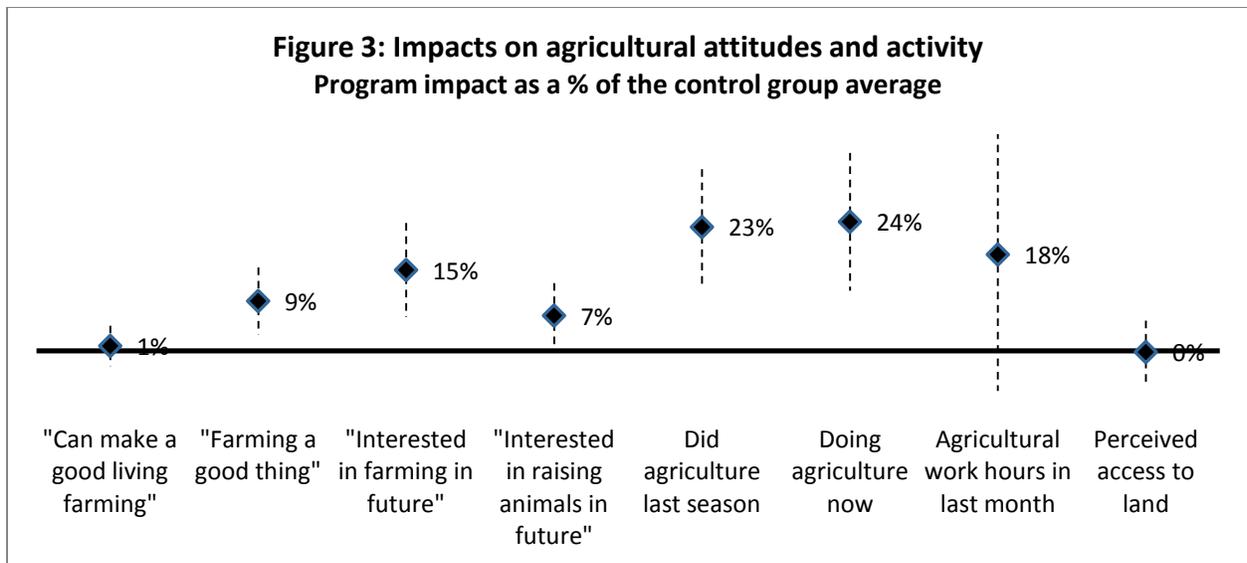
The first and most obvious place to look for impact is engagement in agriculture. Here we see a significant impact of the program. More than a year after completion of the program, program participants are at least a quarter more likely to be engaged in agriculture, and almost a third more likely to have sold crops.



Agriculture is already strikingly common, even among the control group. Asked about the current or last season, nearly half of the control group cleared land and planted crops, and more than a quarter sold crops or raised animals. While we do not have the same detailed data on agricultural activity before the program, what we have suggests that the control group increased their agriculture activity over the course of the study, probably as a process of settling down in a more stable political climate, or perhaps due to changing economic opportunities.

Nevertheless, program participants saw significant increases over the control group. Figure 2 shows the proportions of people engaged in agricultural activities. Program participants were more likely to clear land, produce their own seedlings, plant crops, sell crops, and raise animals. In the case of planting and selling crops, program participants are about 50% more likely to report this activity than controls. All but the increase in animal raising are statistically significant.

Figure 3 displays the percentage impacts of the program on other indicators of agricultural activity. For instance, roughly 76 percent of the control group and 87 percent of the program participants said they are interested in farming in the future. The difference (of 11 percentage points) represents a 15% increase relative to the control group. It is this percentage change that we graph for most outcomes. The diamond gives the average treatment effect and the dotted line gives the statistical 95% confidence interval. (The appendix provides a short statistical primer.)



In general there is a high level of interest in agriculture. 94% of the control group believes that someone can make a good living farming, 81% think farming is a good thing for them, 76% are interested in farming in future, and 89% are interested in raising animals in future. These attitudes are all significantly higher among program participants, in particular the interest in farming in future. The one exception—the question, “Can you make a good living farming?”—had nearly unanimous support from both groups, providing no room for a treatment effect. These opinion levels ought to put (somewhat) to rest notions that Liberian youth are uninterested in agriculture.

The real effect of the program is to turn these interests into action. When we look at self-reported engagement in agriculture this and last season in general, we see substantial impacts—an increase of 23 to 24% relative to controls.

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Finally, consistent with the above pattern, we see an average 18% increase in hours engaged in agriculture and an increase in acres under cultivation, though neither result is statistically precise (meaning the confidence interval includes zero). The increase in employment hours is statistically significant for male program participants, however. We take this to suggest that treatment increases the likelihood of engaging in agriculture most of all, but also increases the level of work once agriculture is selected.



A program participant processes rubber in Salala, Bong County

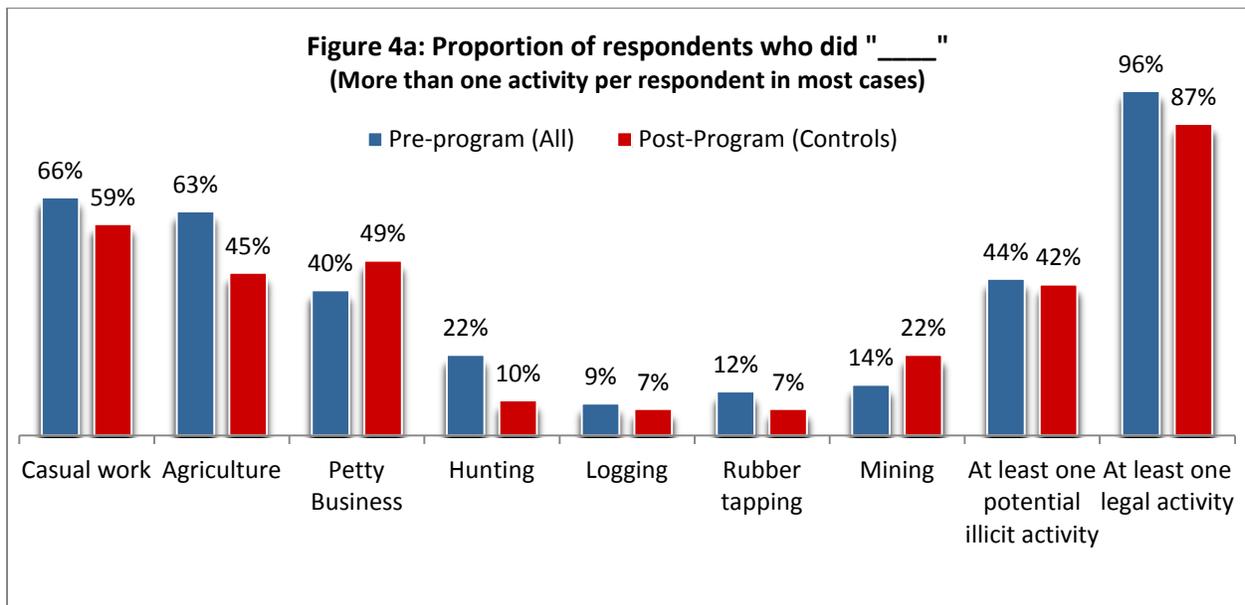
Data analysis not shown here reveals some other interesting patterns. First, females and males were equally likely to be engaged in agriculture, and the impact of the program is about the same for both genders. Second, prior agricultural experience had a relatively weak effect on participation in agriculture after the program, and program participants with prior agricultural experience show fairly similar levels of current agricultural activity as those without prior experience.

B. Shift from illicit to legal livelihoods

The program not only aimed to increase agricultural activity and productivity, but also steer high-risk youth away from more illicit livelihoods, such as unlicensed or illegal mining, logging, rubber-tapping, and hunting. Our survey suggests that engagement in illicit activities declines slightly for both treatment and control groups, with little difference in participation *rates* between those that participated in the program and those that did not. (While overall illicit activities decline slightly, the incidence of mining increases in both the treatment and control groups by similar amounts.) Nevertheless, participation *levels* fall among the treatment group, as agricultural hours seem to substitute somewhat for hours spent in illicit activities.

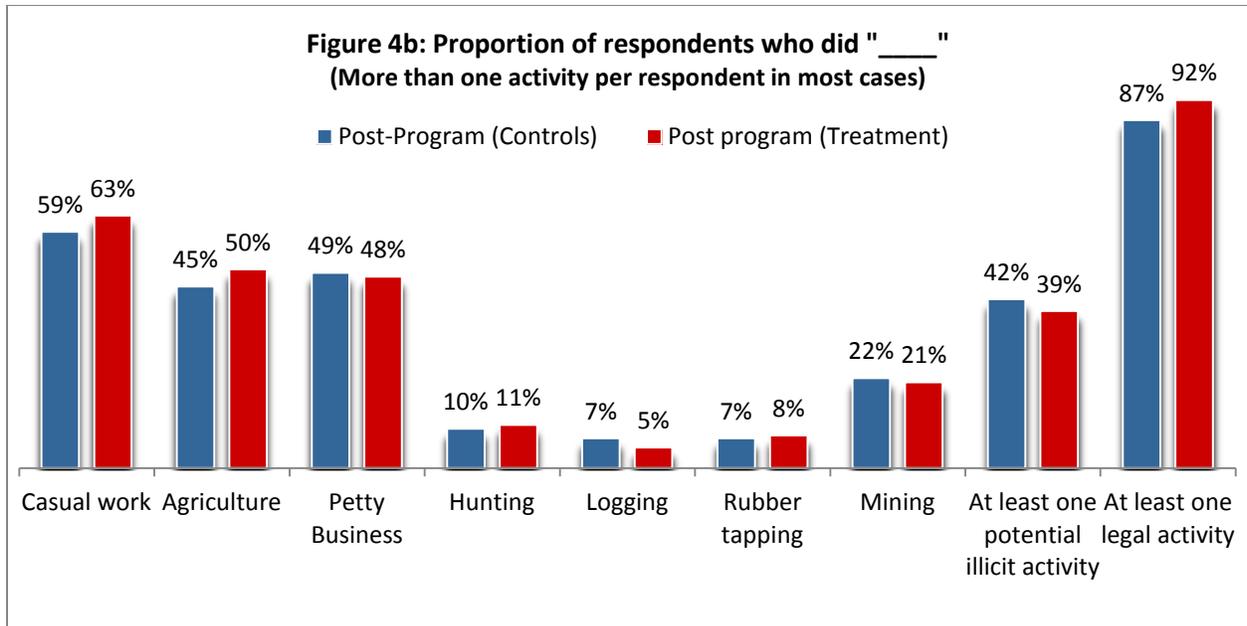
First, to see what opportunities were available to these high risk youth in the absence of the program, we compare employment activities at baseline to those of the control group nearly two years later (and roughly 15 months after beneficiaries completed the program), in Figure 4a. We see that 42% of control group members are engaged in potentially illicit activities, versus 44% at baseline—a minor and not statistically significant fall.

The fall conceals a significant change in the mix, however. Logging, rubber-tapping, and hunting have all become much less common. Mining, however, has increased from 14% of respondents to 22% of the control group. While some of this increase may represent legal mining activities, for prospectors with licenses, we suspect the majority is unlicensed (we do not have data on whether or not the operation is licensed, typically because the respondent—a laborer in the surface mining rather than the owner or miner—did not know the licensed status of the operator). Gold prices rose throughout the period between the two surveys, attracting more young men in these areas to mining activities, and this mini-gold rush probably accounts for much of the increase.



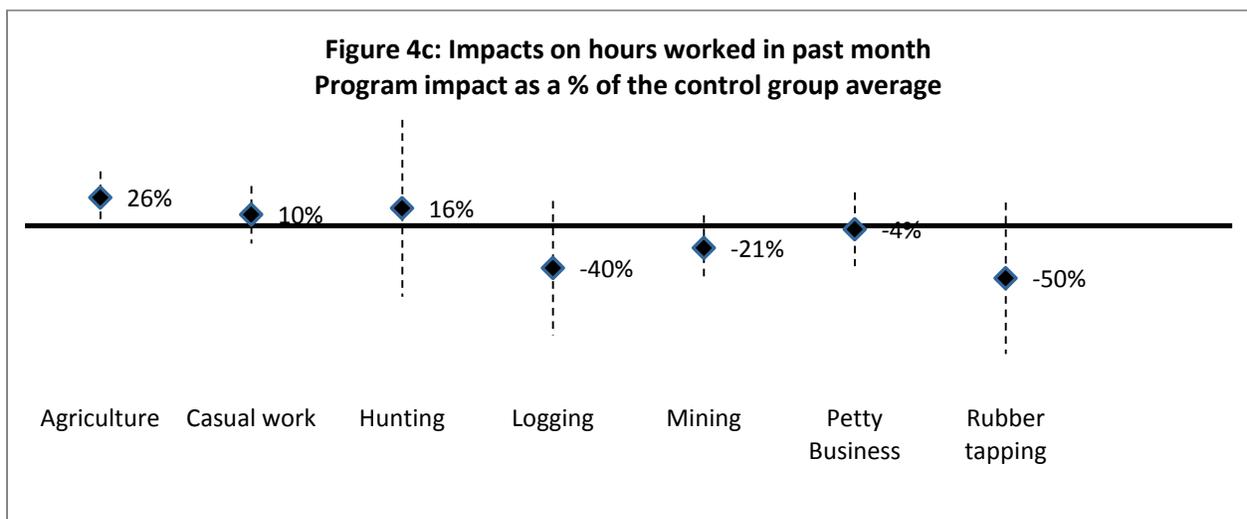
We compare post-program employment activities in the treatment group to the control group in Figure 4b. We start by looking at any participation in these activities. Those who passed through the program are more likely to engage in agriculture, as we have seen above. They are also more likely to be engaged in casual labor.

We see little change, however, in participation in illicit activities. Participation in mining goes up in both the treatment and control group, by similar magnitudes. 21% of the treated engage in mining, compared to 22% of controls. Logging, rubber tapping, and hunting decline since baseline, as in controls, but in similar magnitudes. Overall we see a small (three percentage point) but not statistically significant decrease in participation in potentially illicit activities among the treatment group.



As an alternative to rates of engagement, we can examine the number of hours employed. While participation *rates* in illicit activities decline, participation *levels* could fall if time spent in agriculture crowds out time in other activities.

Figure 4c illustrates the effect of treatment on hours employed in each activity, relative to the control group. We see some evidence of crowding out, and a shift in hours from illicit activities to agriculture. The average person in the sample works 30 to 40 hours a week (with a mean of 36 hours of income-generating employment, and 52 hours of all activities, including chores). We see a 26% increase in agricultural hours, little change in casual work and petty trading, a slight (16%) increase in hunting time, but steep average falls in other illicit activities: a 40% average decline in logging hours, a 21% decline in mining hours, and a 50% decline in tapping hours compared to the control group. These declines are not statistically significant, and the confidence interval includes anything from no change to very steep declines (nearly a 100% elimination of the activity, in some cases). We can't say conclusively that these hours have declined, but the evidence is strongly suggestive.





Miners display their gold in Bong County.

Though hours may reduce, program beneficiaries seem to keep at least one foot in illicit activities. There are several possible explanations for the persistent rates of illicit employment. One is that agricultural incomes are risky, and beneficiaries mitigate that risk by keeping active in other areas—essentially, diversifying their portfolio of income and optimizing expected returns. We commonly see such diversification in agricultural households the world round.

Another is that the rise in gold prices since baseline is simply too alluring for any employment program to prevent. Another possibility is that respondents are not necessarily fully employed. Hence an increase in agricultural hours and activity does not necessarily fully crowd out other opportunities, including illicit ones.

C. Impacts on employment levels, income and wealth

The LMA program aimed to develop not only legal livelihoods, but sustainable and, ideally, lucrative ones. Fifteen months is too short a time to judge the long term impact of the program on income and wealth, but it can give us medium-term impacts after two or three seasons.

We see a sizable increase in average wealth from the program, especially in household durable assets, but no change in current income (measured for last week and last month), savings or spending for the average program participant. The top earners in the treatment group, however, do show more statistically significant higher earnings than the top earners in the control group, although the effect is not large.

There are several possible interpretations of this evidence, but the one that seems especially plausible is the following:

- Agricultural income is quite volatile: it comes for some farmers but not all, and when it comes, it arrives in lumps rather than smoothly. Thus it is not unusual to see more significant impacts on current income in a minority. These may have been the minority who had sold crops shortly before the survey.
- Asset wealth is less volatile than income. The fact that we see a sizable increase in household assets suggests that agricultural profits from past seasons have been higher among program participants than controls, and that these profits have been invested mainly in durable goods that either improve quality of life or act as a non-cash form of savings.
- The fact that we see reasonable profits in a minority, low average profits, little change in spending, but a moderate and broad-based increase in wealth suggests that many farmers experience spikes in profitability, probably when crops are sold (and especially when yields are high). Averaged over the year, incomes increase but not dramatically.

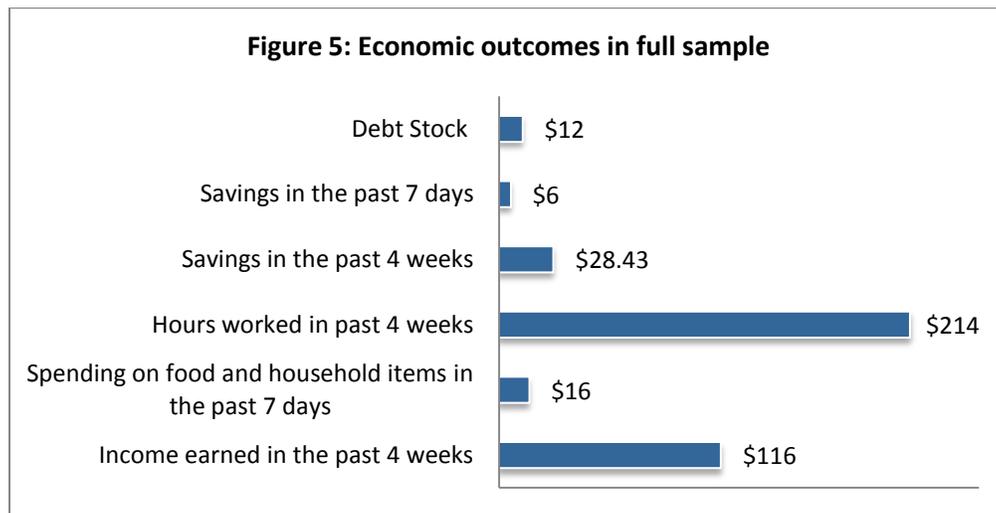
When we consider this evidence with that of the previous section, especially a general enthusiasm for agriculture and its prospects, it appears that the program has been successful in creating sustainable agricultural livelihoods with modest increases in wealth. Agricultural hours and employment level may also rise over time. But in the medium term, commercial cropping has not been sufficiently profitable to raise spending levels or shift youth out of illicit activities.

Measuring income, wealth and poverty reduction

We focus on four main measures of economic well-being. First we attempt to measure current income: net cash earnings from wages, business and farm profits in the four weeks prior to the survey. Since cash income, especially agricultural income, is highly variable over time, we also look at a less variable measure of poverty, the total of

common types of short-term expenditures.⁸ This amount tends to be more stable than cash income, and is the most commonly used poverty measure internationally. Third, we look at current savings and debt levels. And finally, we create an index of wealth by taking stock of housing quality, major assets and land possessed by the respondent. In each case we try to look at average impacts as well as the distribution of economic well-being and impacts. The expenditures and wealth measures are generally the most reliable measures of any permanent impacts on economic well-being.

Figure 5 provides summary statistics for the full sample (including all treatment and control subjects). To give a sense of earnings in the absence of the program, the median person in the control group reports about \$50 in cash income in the past month. The average income is higher, about \$106, because the average is pulled upwards by the small number of people who earned very large amounts in the past month (for instance, the control group member at the 90th percentile earned \$240). Incomes are about 15% lower for women than men.



Impacts

Figures 6 and 7 display impacts of the program for the major variables. We do not see a large or statistically significant change in incomes between program participants and controls in average current income, employment, level of spending on food and household items, or savings. The average income reported is about \$3 per month greater among program participants (a 2% increase) but the change is sufficiently small that we cannot say for sure that the impact is not zero. If we exclude program participants who specialized in poultry-raising, the results are relatively unchanged. We also see no significant difference in the aggregate number of hours worked at any activity in the past month.

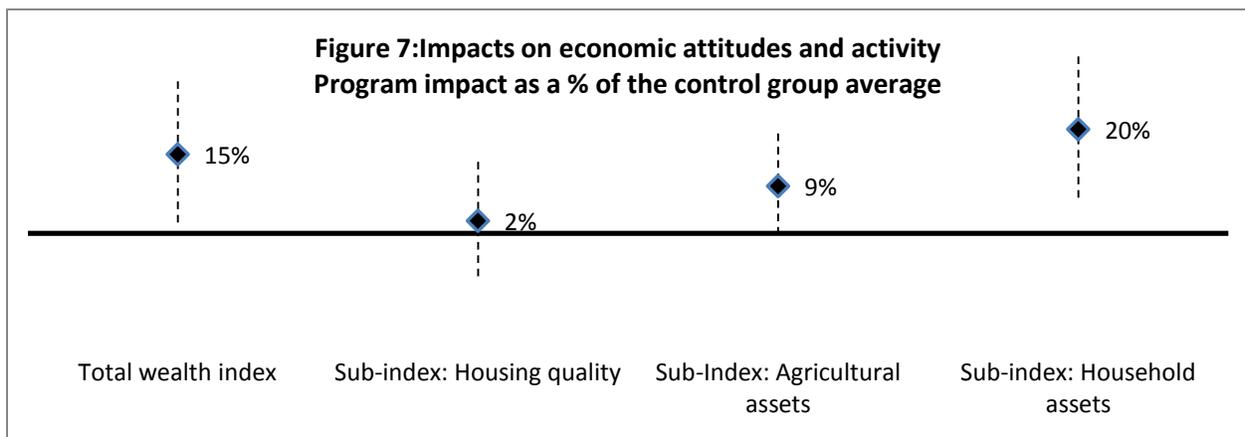
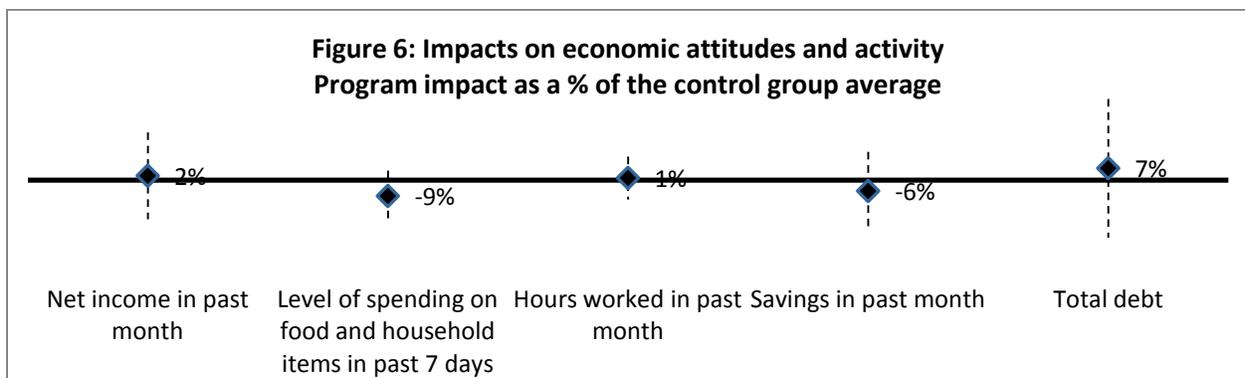
Income is volatile, and can be a noisy and unreliable measure of poverty. A person’s “consumption”—all the goods they use and own and consume—is typically considered a better measure of poverty than income, since it is more stable. People tend to smooth out income volatility and consume at more steady levels.

We have two measures of consumption. One is a measure of recent expenditures on food and household items, and other short-term consumables. A second is a measure of durable assets, including housing quality, large assets, and smaller but long-lasting household items.

⁸ We actually measure expenditures at the household level and examine per capita expenditures here. We have yet to adjust this expenditures measure for the fact that children consume less, and so the results may change after this adjustment is programmed.

Looking at our expenditures measure, the estimated impact is actually negative: program participants have 9% lower spending than the control group – they are spending slightly less on food and non-food and other household items than controls. Again the effect is relatively small, and is not statistically significantly different than zero. Together the income and consumption effects suggest no major change in *current* income and poverty, at least at the 15 month mark.

Expenditures could be lower if program participants are saving or investing more of their earnings, perhaps because the program increased their future orientation or because they see higher returns from savings and investment. There is little difference in cash savings levels in the past month between treatment and control groups. Control group members saved roughly \$26 in the past month compared to \$25 by program participants. We do not have data on the total stock of savings, but we do have data on the most common measures of wealth—housing quality and asset stocks, discussed below, where we do see a modest increase. We also ask about borrowed sums. Debt levels are 7% higher among program participants, roughly \$12 to the \$11 reported by control group members (and not statistically significant).



We do have data on housing quality and assets – both agricultural tools and also a wide variety other household assets (including durables, like furniture or electronics, and smaller items like utensils and buckets. We create an index of these assets that ranges from 0 to 1. The index is 15% higher among program participants. Breaking it into its sub-components, we can see that housing quality increases little, agricultural assets increase more, and other household durables most of all.

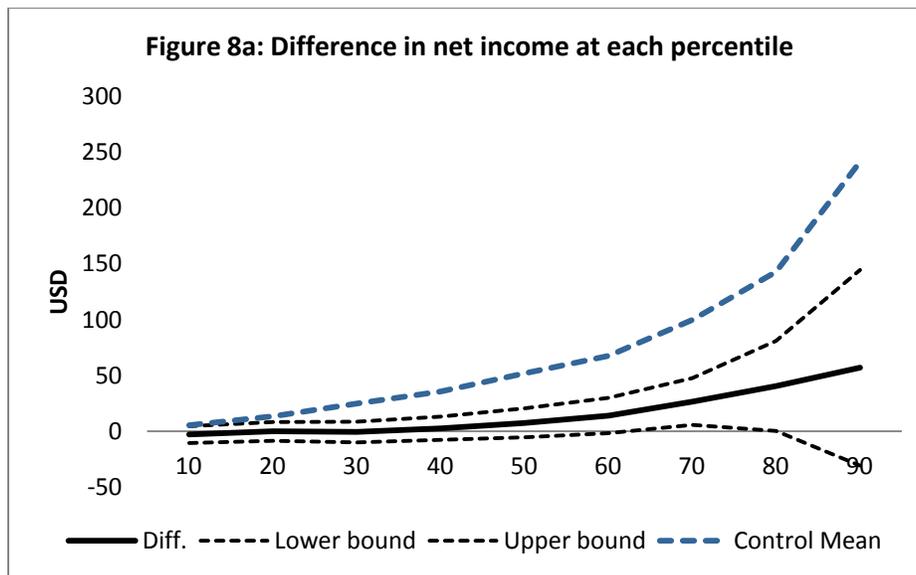
The increase in assets but not in current expenditures is unusual, but not inconsistent with general agricultural success. If people are forward looking, are concerned with reinvesting profits in the business or in durables that provide long term benefits, then we might expect to see this pattern, especially if people have few means to save

cash income, or do not trust themselves to manage cash well (and so pre-commit against wasteful spending by investing in durables).

Distribution of impacts

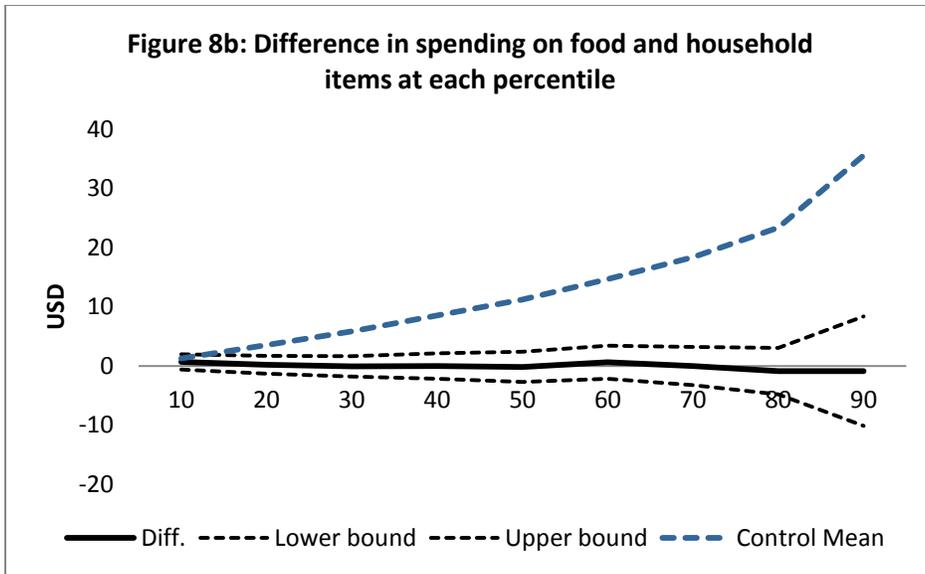
We can also look at the distribution of impacts on income and expenditures. We look at the difference between the treatment and control group at each percentile of the distribution – people in the bottom 10th percentile, the 20th, the 30th, and so on, up to the 90th percentile, in figures 8a and 8b. This effectively takes the person at the *n*th percentile in the distribution of the control group and compares their income or expenditures to the person at the same percentile in the treatment group. We calculate upper and lower bounds for each estimate.

Looking at income, we can see the control mean income rising from about \$5 at the 10th percentile to about \$52 at the median (50th percentile) and above \$240 at the 90th. The solid line gives the difference. This difference is close to zero up to the 40th percentile and climbs to about \$8 at the median—a 7% increase relative to the control group but not statistically significant. The difference continues to climb after the median, to \$27 and \$41 at the 70th and 80th percentiles. These are statistically significant differences, and reasonably large ones—increases of about 25% to 30% in income.



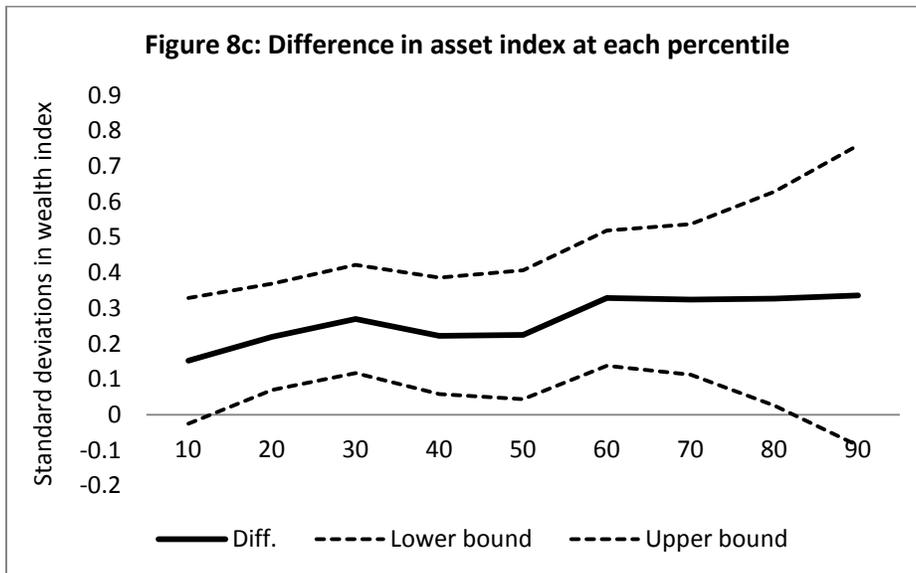
Since most income, especially agricultural income, is lumpy and risky, it's not unusual to see a skewed impact – low average or median impacts but high impacts for a minority. Since we are measuring at a point in time, it is not clear whether the higher profits are experienced by many eventually, or if they are concentrated among a few. The fact that the wealth impact is more evenly distributed (see below) suggests that the profits are eventually shared by many. If shared, however, it means that those with high profits now experience low profits in most other months, meaning that average profits are quite low.

Looking at the distribution of expenditure, meanwhile, we see that the difference between the treatment and control groups remains close to zero even as spending rises. This low impact on spending is consistent with low average incomes.



Finally, we look at the distribution of the wealth effect in Figure 8c. The upward shift we noted in the average treatment effect is not driven by a handful of highly successful beneficiaries with large increases in wealth. Rather, the wealth effect appears fairly broad based and consistent across the sample.

This evidence weighs in favor of the idea that income is quite volatile and the impacts among a minority are a consequence of the fact that income is measured at a point in time, missing the crop sales or other volatile sources of income, and that the returns from agriculture and the increase in cash cropping and sales is a slightly more broad-based wealth effect.



D. Citizenship and social integration

The residential training experience, the life skills and psychosocial programming, the new livelihoods, and reinsertion assistance were designed to increase social integration. We observe small but positive improvements across

most measures. While not all of the estimated impacts are large enough to be statistically significant, they nevertheless suggest a broad-based reduction in alienation and some gains in stability.

Citizenship and social integration are difficult to capture, but we attempt to measure several aspects of positive social life, including an index of various types of community participation, an index of family relations, and index of social support received, and also measures of how settled the youth are in their communities: whether they have changed communities in the past 6 months and whether they are interested in staying in their current community. (In a later section we look at violence and aggression as well).

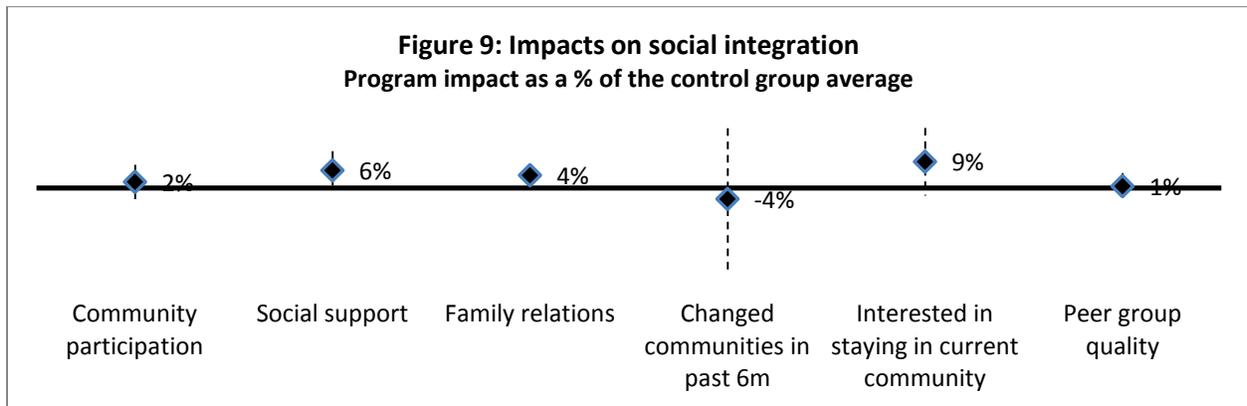


Figure 9 displays treatment effects relative to the control group mean. The index of community participation captures a range of different activities, including group memberships, leadership activities, participation in community meetings, and contributions to public goods. Participation among both the treatment and control groups was already extremely high, and so it might be difficult to achieve many gains in our measure. Indeed, we observe almost no difference between the treatment and control group

The social support index measures the presence of people in the participant’s life who can comfort them when sad, offer advice, lend belongings, and so forth. We see a slight increase among program participants, of 6%, though this result is not statistically significant. Looking by gender, however, the improvement is 7% and significant for males, but negative and insignificant for females.

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A program participant with family, Bong County

We also look at family relations in particular. We develop an index based on questions about the frequency they see family members or attend meetings, the degree of concern their family shows for them, advising and support given, and disputes and troubles within the family. The level of this index increases a small amount, about 4%, overall. The improvement is larger and significant for women, who report a 9% increase on average.

We also construct an index of peer group quality that falls to the extent that peers have “negative” characteristics (such as gambling, drug use, stealing, etc.) and rises with “positive” characteristics (such as hard working, participate in community, provide advice, etc.). We see virtually no change between treatment and control individuals.

Finally, we see some evidence of a slight increase in locational stability, although the results are not statistically significant. Program participants are 4% less likely to have changed communities in the past 6 months, and 9% more likely to say they would like to stay in their current community.

Aggression and violence are also important indications of social integration, and we turn to them below. Before that, however, we also consider other psychosocial effects of the program relevant to social integration.

E. Other psychosocial impacts

Improving psychological well-being was not a formal objective of the program, and counselors were not trained mental health professionals. Even so, there are three reasons to investigate whether the program leads to improvements in the psychosocial health of participants.

1. More stable livelihoods and new skills have the potential to improve self-esteem and reduce depression. This link from poverty and uncertainty to mental health is uncertain and unproven, however, mainly for lack of rigorous evidence from victims (and perpetrators) of war trauma. This program and evaluation provides a unique opportunity for new evidence.
2. A number of studies have shown a link between social support and mental health. Since this program aims to reintegrate individuals into society and improve social skills, we might expect to see increased links to family and community. In turn, we would expect to see an improvement in mental health.
3. Dealing with war trauma and understanding the causes of violence (and one's role in that violence) was also a theme of the psychosocial and life skills classes, and the curriculum included psycho-education on war trauma and post-traumatic stress disorder. While not mental health professionals, the psycho-education and supportive counseling given by trainers is similar to other psychosocial counseling conducted by other NGOs in Liberia, and its effectiveness is likely to be of interest.
4. Finally, inside and outside the classroom, participants learned to regulate their emotions, communicate clearly, build sustainable relationships, and resolve interpersonal conflicts.

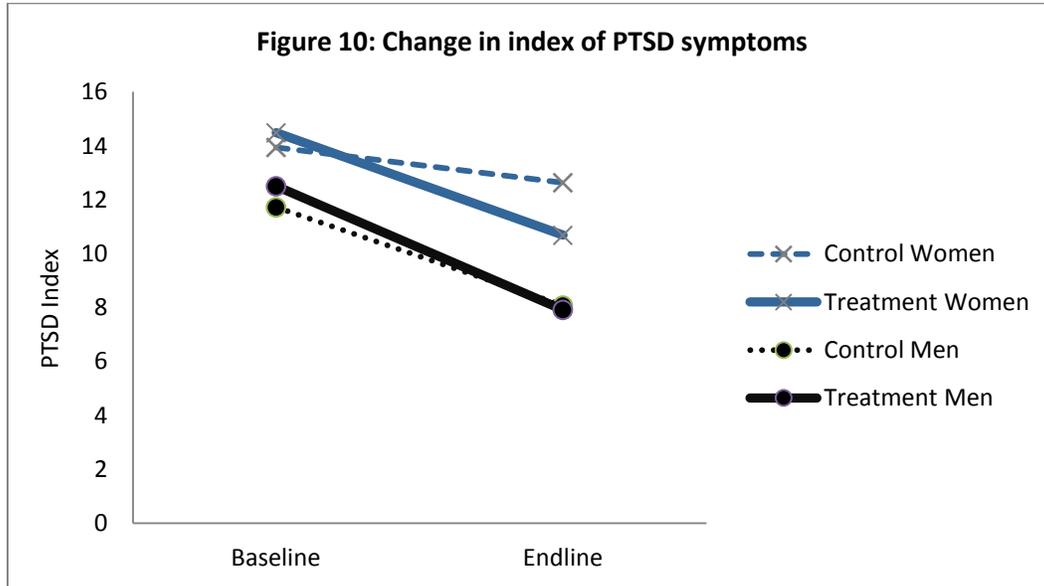
As we noted above, our qualitative work suggests a substantial change in confidence and less aggressive and risky behavior, as well as a new framework for thinking about the past, especially the war. Looking at the quantitative data, measuring self-reported symptoms and severity, we see significant improvements in two areas of mental health: depression and emotional distress, and symptoms of post-traumatic stress disorder (PTSD). Both male and female program participants report a third fewer symptoms after the program.

We also see improvements in mental health in the control group, however, especially among males. Males who did not participate in the program also showed almost identical improvement. Thus we can't attribute the changes in male mental health to the program per se. It is possible that other factors—such as the passage of time since war and the normalization of life and continued peace across the country—helped males in the control group deal with their distress and trauma.

We do, however, see marked improvements among female program participants in both depression/distress and PTSD symptoms. Exploring these unintended positive consequences are an important part of any post conflict programming, especially when dealing with high-risk or vulnerable youth, and so we seek to explore these findings a little further.

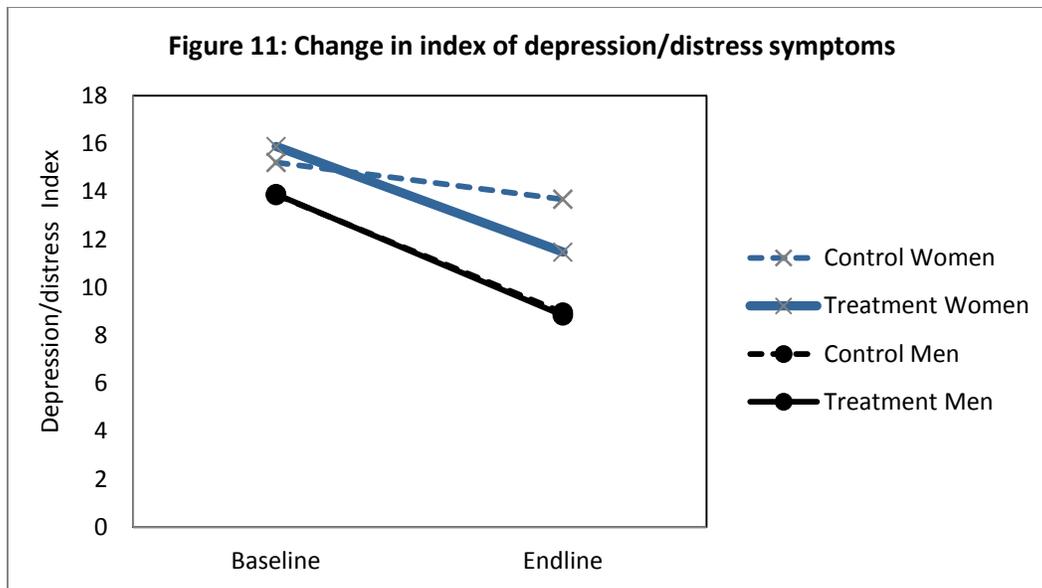
We focus on two main measures of mental health: self-reported symptoms of post-traumatic stress disorder (PTSD) and self-reported symptoms of depression and emotional distress. The PTSD scale includes symptoms such as nightmares, feeling jumpy, feeling detached, and avoiding things that are reminders of trauma. The depression scale includes standard symptoms such as feeling sad, fatigued, or having lack of appetite, as well as culturally-specific manifestations and perceptions of depression and distress, such as having your 'heart spoiled' or your 'body feeling dry from worry'.

Figures 10 and 11 show the trend change in our two indices for men and women, both treatment and control. At baseline, males reported an average of 12 and females an average of 14 on a scale of 39. At baseline, treatment and control are nearly identical, and differences are not statistically significant (as would be expected from the randomization).



The trend change among males looks similar for both treatment and control groups. Both fall from roughly a score of 12 to 8 on the PTSD scale and from roughly 14 to 19 on the depression/distress scale—an improvement of about one third in both indices. In fact, after controlling for differences in the treatment and control group composition, male program participants actually report a 6% greater reduction in PTSD symptoms and a 3% greater reduction in depression/distress symptoms relative to the controls, but these differences are small and statistically insignificant.

Women, however, report significant improvements. We observe a very different trend change among treatment women compared to controls in the figures above. Relative to the control group, women report 30% fewer symptoms or intensity of PTSD, and 30% fewer symptoms or intensity of depression/distress.



We continue to investigate the symptoms and process of recovery using the qualitative analysis. While there was a range of symptoms in both genders, females reported higher symptoms on average, which is similar to global trends.

The findings among males echo a large literature on resilience to trauma: in populations with high levels of exposure to violence, a large number of people experience some symptoms of PTSD or depression. However, the majority heals over time without psychological intervention and only a minority need specialized services. In this program, female participants reported higher levels of symptoms at the beginning of the program and may have needed more help addressing those symptoms than males. Outside of the program, females may continue to be exposed to situations or violence that may contribute to the persistence of symptoms. The program may therefore better target their distress and trauma..

F. Aggression and potential for mobilization into violence

Finally, there are at least two reasons to expect the program could reduce the potential for violence. First, relocation to the training center (and, ultimately, a new village) can replace previous ties to ex-combatants and former commanders with counselors, other motivated students, and farmers. The goal is to help participants adopt a new set of norms, reference groups, and networks, and encourage a process of socialization from ‘combatant’ into community life.

The second rationale is economic: to give ex-combatants and war-affected youth alternatives to their current illicit activities or low-return alternatives, and thus dissuade them from future violence. While we do not see increases in current income or spending on food and household items, we do see a significant rise in assets, suggesting that the program is likely leading to long term changes in wealth, especially durable and fixed wealth. Also, engagement in agriculture is high. Thus we might expect the expectation of future returns to mitigate violence.

We examine a set of measures of criminal and aggressive attitudes and behaviors, as well as a variety of proxies for risk of mobilization into armed rebellion in the future. Our discussion focuses mainly on males.

Interpersonal aggression and potential for crime

The evidence on aggression and crime is ambiguous, and does not suggest a significant change in the behavior of program participants. Looking at interpersonal aggression and crime, we see that by some measures program participants are slightly more violent and open to crime, and by other measures they appear less likely. In most cases

the impacts are not statistically significant. This remains true even when we restrict our analysis to those men who, at baseline, showed a high propensity for aggression and instability.

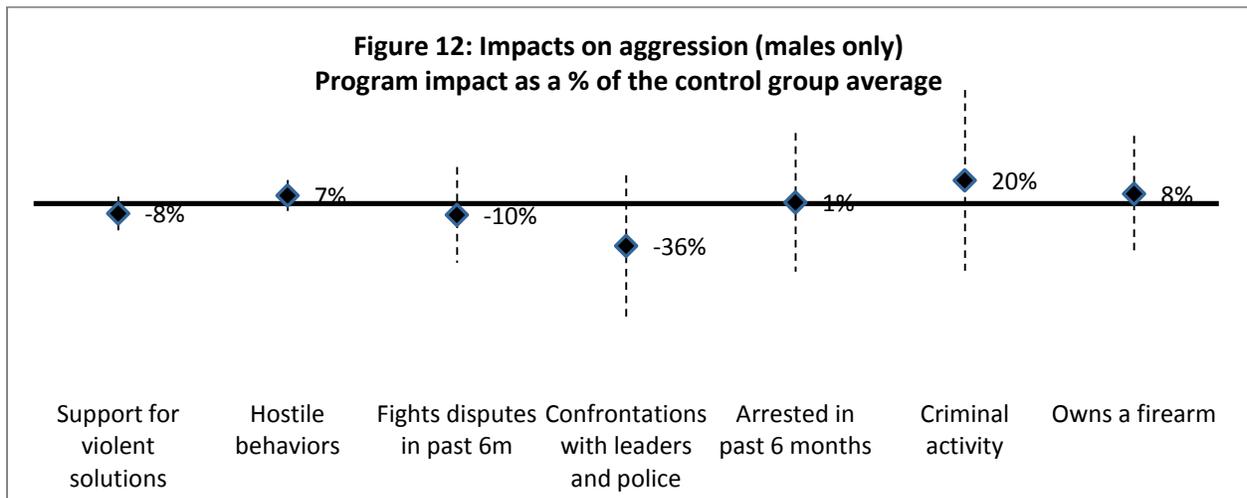


Figure 12 reports treatment effects on our key measures. First, we asked respondents about their attitudes to violent solutions to problems, 11 in all, such as the appropriateness of trial by ordeal for suspected witches or criminals, storekeepers chasing and killing thieves, or corrupt leaders being beaten. Male program participants are 8% less likely to report support for violent solutions, though the impact is not statistically significant.

Second, we ask respondents about their own hostile behaviors, 11 in all, such as cursing, threatening others, having uncontrollable anger, etc.. We see little effect of treatment: male program participants report 7% higher levels of hostile behaviors, though again the impact is not statistically significant.

Third, we ask about the total number of fights and angry disputes they have had in the past six months, as well as the total number of confrontations with leaders and police in the past six months. The average number of fights in the control group in the past six months is small, at 0.8, implying that the average person had at most one fight. Males report 10% fewer fights and 35% fewer confrontations with leaders, though in each case large positive and negative changes are within the confidence interval.

Fourth, we ask whether they were arrested or jailed in the past six months, whether they admit to involvement in any crime (including drug selling, theft (minor or major), robbery, or pickpocketing), and whether they owned a firearm. Overall, 8% of all respondents reported being jailed, 8% reported involvement in crime, and 10% reported owning a firearm (typically a hunting rifle).

Relative to these average levels, male program participants were 1% less likely to report being arrested but 20% more likely to report that they were involved in a crime. They were 8% more likely to own a firearm. Again, these results are not statistically significant.

It is possible that these small average results conceal large variation in impacts, especially improvements among the most violent. After all, those that began the program as non-aggressive persons have little room for improvement. In results not displayed here, we also look whether men with the most potential for instability and aggression are more likely to reduce aggression through the program. We use baseline measures of hostile behaviors, war experiences, and attitudes to violence to identify those with the most propensities. While this pre-program propensity for violence is strongly predictive of post-program aggression overall, we see little evidence that the “worst” cases improved more as a result of treatment. The correlations are in the expected direction, but the results are fairly weak. Only in the case of arrests and jailings do we see a statistically significant impact: relatively

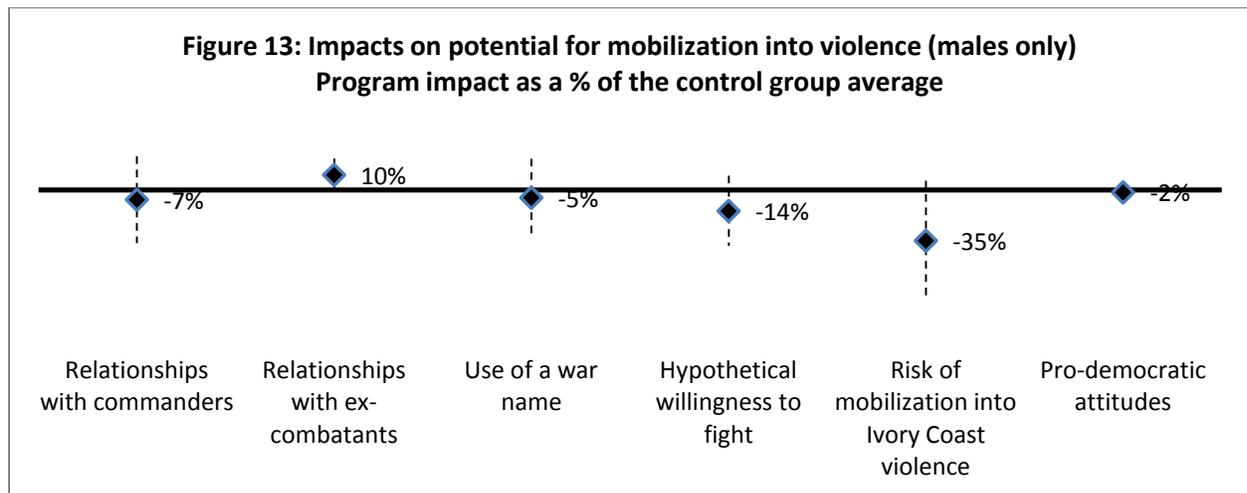
less aggressive men do not see any treatment effect on arrests, but the more aggressive are less likely to be arrested when they are treated.

Mobilization into violence and potential for re-recruitment

We also look at measures that may indicate ease of mobilization into insurrection or crime. In particular, the survey data collection coincided with the breakout of election violence in Cote d’Ivoire, and we looked closely at respondents’ interest in the conflict and closeness to recruitment activities.

Here we see some strongly suggestive evidence that program participants are less likely to be re-recruited into warfare. Partly because of the rarity of such behaviors they are difficult to identify precisely, and so they are not statistically significant. Nevertheless, the direction and magnitude of the average impacts are much more consistent in their direction, and much larger, than with interpersonal aggression. The reduction of interest in the violence in Cote d’Ivoire was quite marked.

Our interpretation is that aggressive responses to the program are highly heterogeneous—many who participated succeeded and so reduce their interest in armed insurrection. But because these traits are difficult to measure, and because not all respond to treatment in this way, the average impacts are large but not statistically precise. Given the difficulty of shifting such behaviors, however, we regard these impacts of the program as extremely promising.



We report treatment effects in Figure 13. Male program participants are 7% less likely to report close relationships with former commanders (based on an index for counting commanders as close peers, for other close relations with a commander, for receiving jobs from commanders, or currently reporting to a commander), but 10% more likely to associate with other ex-combatants as their close peers. The pattern is relatively intuitive: participation in the program weakens commander ties somewhat, but strengthens peers relationships with other ex-combatants, probably because of the shared experience in the program. (Given the marked decrease in war-like forms of aggression (discussed next) we do not regard the increase in relations with ex-combatants as particularly concerning. Rather, it is a mechanical function of the program and does not seem to carry risks.)

For instance, male program participants are also 5% less likely to call themselves by a “war name”, which may be an indicator of identification with a faction or their former lives. Since abandoning a war name was a theme in the psychosocial counseling, it is good to see these impacts persisting, although the impact is not statistically significant.

We also construct an index of six general attitudes on willingness to fight in a hypothetical conflict (such as, without specifying a specific cause or faction, their interest in joining a faction, in fighting war again, in “going to the

bush" if asked, willingness to attend secret meetings, and knowledge of how to get weapons). This index is 14% lower among program participants.

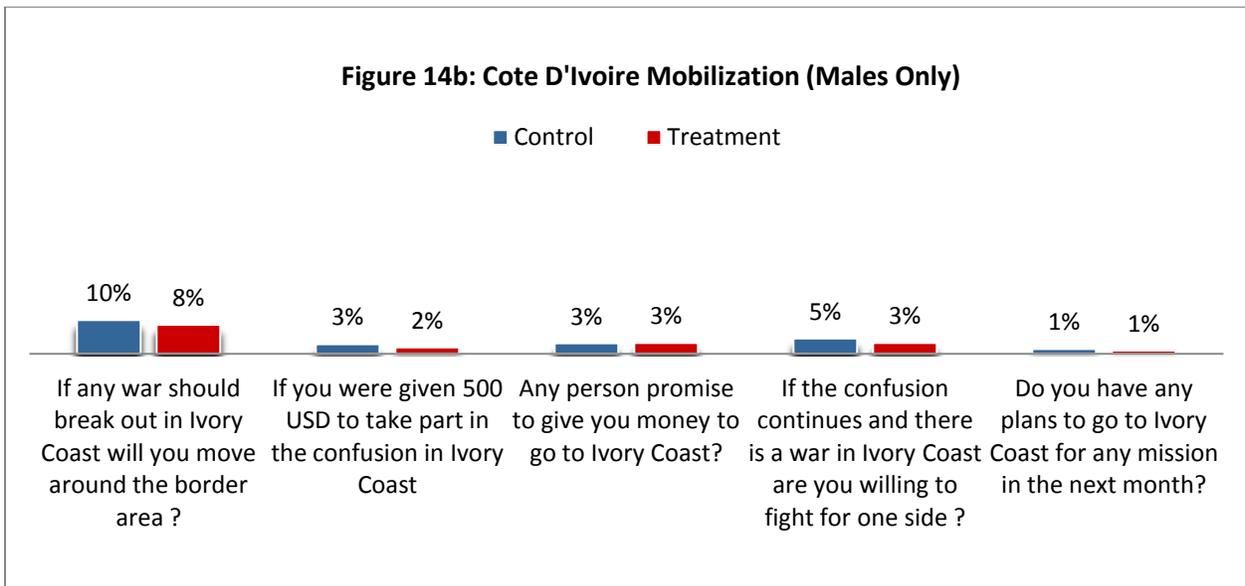
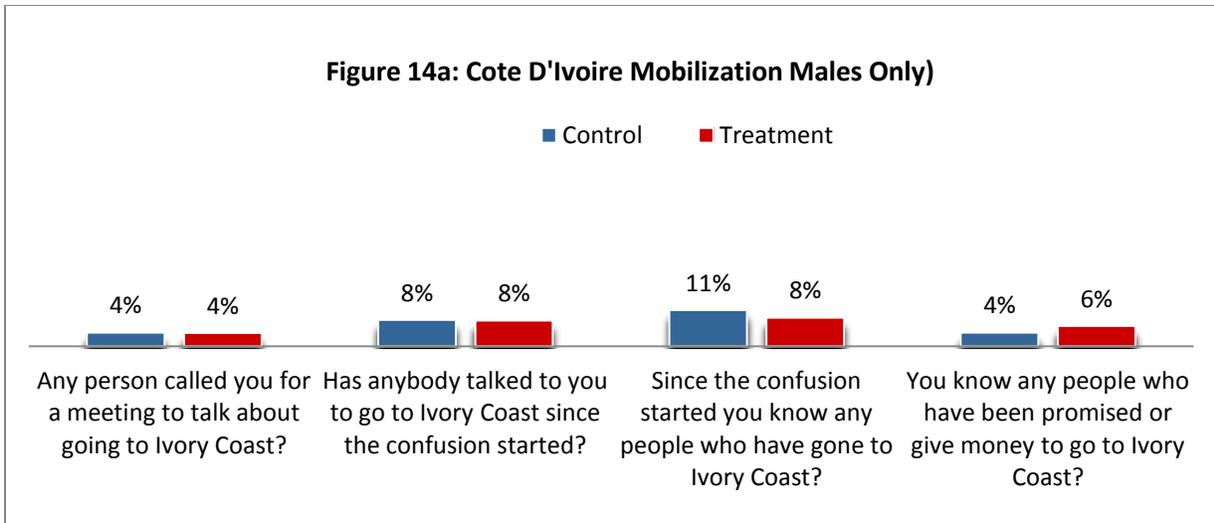
Additionally, we construct an index of attitudes towards democracy, including attitudes towards military coups, autocrats, the elimination of term limits, and so forth. We see little difference between treatment and control males.

Finally, the post-election violence in Cote d'Ivoire was rising in intensity during the main survey months, February through April 2011. We added questions to the survey to measure the risk of mobilization into Cote d'Ivoire violence, and created a composite of 11 questions. For the 10% of respondents we could not find, we also made discreet inquiries in their communities and among friends as to whether they could not be found because they had gone to fight.

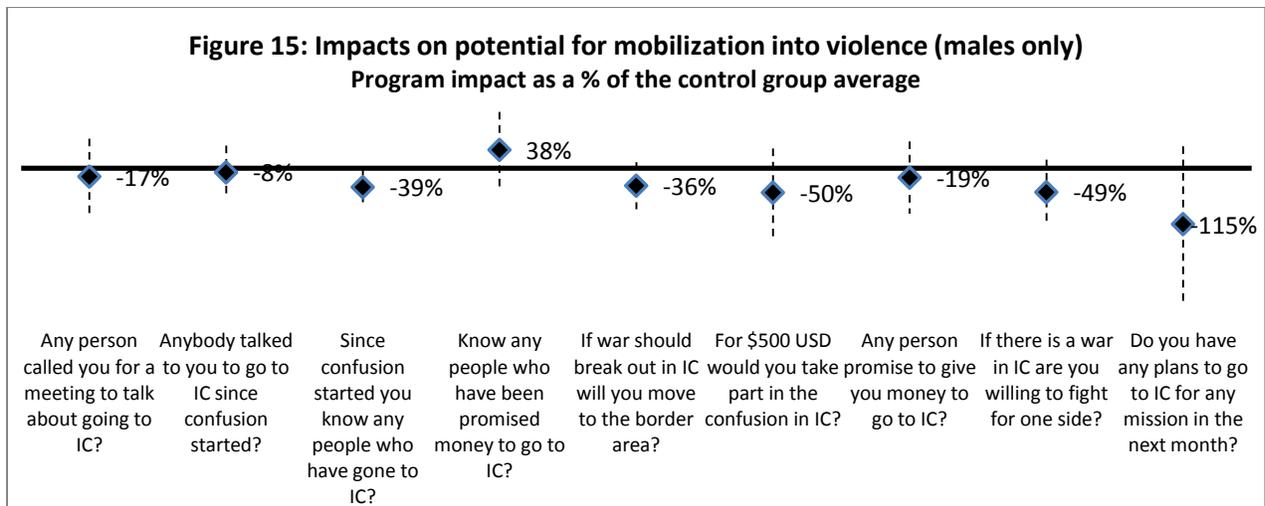
None of our sample—treatment or control—appear to have actually gone to Cote d'Ivoire. But we observe a large decrease in interest in the violence and exposure to opportunities among program participants—a fall of 35%. Unfortunately the result is not statistically significant. One reason (as we see below) is the relative rarity of interest in the Cote d'Ivoire violence – this makes our threshold for statistical significance that much more difficult to cross. Nevertheless, this is an exceptionally difficult measure to estimate, and we take the coefficient as fairly strongly suggestive evidence that war held less appeal for beneficiaries of the program.

More detail here may be of interest. Newspaper reports and our informal field investigations suggest that Liberians were being recruited as mercenaries through former generals. These generals received money from both sides of the conflict to attract young men to fight. Our investigations suggest that most of the active recruitment was taking place in the capital and in large towns like Ganta, not the rural areas where most of our sample resides. We heard accounts of recruits being offered \$100 to \$200 to transport themselves to Cote d'Ivoire, with promises of more money upon arrival. Recruitment levels were modest, however. Our best guess is that no more than one or two thousand were recruited in this way. Nevertheless, there was considerable potential for the war to escalate and potential recruits watched with great interest.

In our experience, people spoke relatively freely about their interest in the conflict, and from the survey we have 11 indicators of whether respondents: were asked to attend a secret meeting about Cote d'Ivoire (4%); attended such a meeting (3%); have talked to people about going (8%); know people who have gone to Cote d'Ivoire (9%); know people who were promised money to go (5%); would move towards Cote d'Ivoire if war broke out (9%); would go if called to fight for a particular tribe (3%); would go to Cote d'Ivoire if offered \$500 (2%); were promised money to go to Cote d'Ivoire (3%); are willing to fight if war breaks out (3%); and, have plans to go to Cote d'Ivoire in the next month (1%).



Figures 14a and 14b display responses and Figure 15 displays treatment effects relative to the control group mean for each of these measures. We see sizable improvements in several of these individual indicators, but like the aggregate index, none are statistically significant.



As with interpersonal aggression and crime, we might expect that higher initial propensity for aggression and instability would affect the response to the program. In fact, while higher initial propensity for instability is a strong predictor of ease of mobilization overall, there does not appear to be any different effect of treatment on those with high versus low propensities at the outset.

7. Comparative analysis of impacts

There is little rigorous evidence of the impact of agriculture, training, or economic programs on aggression and peacebuilding. The LMA program, which targets high-risk youth, unfortunately has no close comparisons, especially given the poor track record of demobilization and reintegration programs worldwide. Evaluations of youth employment and anti-poverty programs, however, are more common, and it may be useful to compare these results to the impacts observed in other developing country employment programs. Since income and employment is one of the major channels by which we think peace is encouraged, and young men are dissuaded from re-recruitment, a focus on these impacts, and what it implies for future economic programming, is worthwhile.

A. Evidence from demobilization programs

The LMA program under study has few comparisons. Most national demobilization and reintegration programs are more modest in size, less comprehensive in their service delivery, and take place in the immediate aftermath of conflict while economies are still in flux. Not surprisingly, evaluations of these programs have shown mixed results at best, and fairly disappointing results on economic and social reintegration, falling short of their goals.⁹

By comparison to the majority of demobilization programs, the LMA program is unambiguously among the most successful of its kind, in part because of the intensity of the approach, the comprehensiveness of the program, and the focus on especially hard cases.

The lesson for other demobilization programs is that targeting of high-risk cases and provision of comprehensive support to cool hot spots may be a useful complement to a broad-based demobilization and reintegration pro-

⁹ For a review of the evidence see Yuhki Tajima, "Background Paper on Economic Reintegration," in *International DDR Congress (CIDDR)* (Cartagena, Colombia 2009).

gram, especially after the initial stages of demobilization are complete and the majority of ex-combatants have reintegrated to some extent.

B. Evidence from related economic programs outside Liberia

The program focuses on providing agricultural skills and start-up tools to encourage a transition from illicit livelihoods to farming and animal husbandry. We are not aware of similar programs for high-risk populations, let alone hard evidence on their success or failure. Other evaluated programs have targeted rural “ultra-poor”, or urban high-risk populations, but typically focus on non-farm microenterprise employment (like vending items, setting up shops and kiosks, vocations, or handicraft production). Agricultural assistance programs can show high returns but they typically target more established farmers. The results from this study suggest, however, that expanding the size, productivity and profitability of relatively non-established farmers into the activity is quite difficult, especially in an environment such as Liberia.

While evidence on agricultural interventions is limited, there is a broader base of evidence on programs that focus on providing business skills and capital for small income generating activities and microenterprises, including agricultural enterprises such as animal raising or trading (i.e. at other points in the agriculture value chain). We summarize some of the evidence on these interventions, including evidence from a growing number of randomized trials of the very poor, excluded and (in some cases) high risk youth.

Rigorous evaluations of employment and income generation programs in Africa, South Asia and elsewhere have shown promising results. First, poor people appear to have opportunities to earn high returns to capital, but with limited assets or the ability to borrow, they have difficulty achieving them.¹⁰ Programs that have provided capital—either in-kind assets, credit or cash—to poor individuals have observed annual returns on those investments of 30 to 60%, and sometimes higher. These groups range from farmers in Ghana, to ultra-poor women and men in rural areas, to small entrepreneurs in Sri Lanka, to unskilled youths in northern Uganda, often with grants of \$200 to \$400.¹¹ These returns have a large variance, in part because entrepreneurship is by its nature quite risky, but also because people have different capacities as entrepreneurs. In general, we see that high ability, more patient, less risk-averse, and more capital-constrained people perform better when given access to capital and basic business skills training.

The evidence on pure skills training programs is more mixed. Job retraining programs in the US and Europe have the largest amount of evidence—hundreds of evaluations in all—and the general conclusion is that most of these programs do not have significant impacts, and almost none pass a cost-benefit test.¹² The relevance of such studies for developing countries is probably quite limited, however, as they take place in very different skills and sectors and populations.

¹⁰ Abhijit V. Banerjee and Esther Duflo, "Growth theory through the lens of development economics," in *Handbook of Economic Growth*, ed. Philippe Aghion and Steven Durlauf (Amsterdam: Elsevier Press, 2005).

¹¹ Christopher Udry and Santosh Anagol, "The return to capital in Ghana," *The American Economic Review* 96, no. 2 (2006); Suresh de Mel, David J. McKenzie, and Christopher Woodruff, "Returns to Capital in Microenterprises: Evidence from a Field Experiment," *Quarterly Journal of Economics* 123, no. 4 (2008); Marcel Fafchamps et al., "When is capital enough to get female microenterprises growing? Evidence from a randomized experiment in Ghana," *Unpublished working paper* (2011); Abhijit Banerjee et al., "The Miracle of Microfinance? Evidence from a Randomized Evaluation," *Unpublished working paper, MIT* (2010); Christopher Blattman, Nathan Fiala, and Sebastian Martinez, "Can Employment Programs Reduce Poverty and Social Instability? Experimental evidence from an aid program in Uganda," *Unpublished working paper* (2011).

¹² David Card, Jochen Kluge, and Andrea Weber, "Active labor market policy evaluations: A meta-analysis," *CESifo Working Paper* 2570(2009).

Skills training programs in developing countries show more promise. Not all skills. Pure business skills training programs, without any access to capital, generally show positive but small impacts.¹³ There is some evidence that vocational skills training and some agricultural extension programs provide more sizable returns, especially in the poorest countries. In general, however, the balance of evidence suggests that the returns to skills are lower than the returns to capital, suggesting that credit and capital may be the scarcer resource and the most binding constraint on growth and poverty alleviation.¹⁴

Little of this evidence, however, speaks to potentially high risk individuals, such as ex-combatants who remain in loose armed group structures or engaged in illicit activities. This is a large and crucial group of (mostly) men, who may not respond quite so well to simple cash or capital transfers, by virtue of being less established, poorer, having fewer initial skills, or psychological trauma or social dislocation that constrains their potential.

Nevertheless, a handful of studies of other war-affected populations suggest that micro-entrepreneurship, with a focus on business skills training and grants, has the potential to yield high returns. Some of these enterprises are explicitly agricultural, though they usually involve activities elsewhere in the agricultural value chain, such as transporting goods or bringing goods from distant markets to sell in smaller local markets where goods are scarcer.

For example, in northern Uganda, a program with ultra-poor and war-affected households, especially women, yield evidence of returns of 30% or more to basic business skills training and cash grants of approximately \$150.¹⁵ Out of concern that cash grants would be wasted, or at least not invested in productive enterprise, the NGO provided extensive monitoring and follow-up. Perhaps because of this extensive monitoring, the vast bulk of the grants were invested in business. This monitoring, however, proved extremely expensive, and probably does not pass a simple cost-benefit test. The researchers are presently working with the NGO to test the impact and cost-effectiveness of this follow-up, looking at how cash is spent by beneficiaries with and without the extensive follow-up.

Another grants program in Uganda, with both war-affected and non-war affected young men and women, also appears to yield average returns of 20% to 35% on grants of roughly \$400.¹⁶ These grants were provided to youth with the proviso that they would be used for vocational skills training and start-up expenses in villages and small towns. There was little or no monitoring or follow-up after disbursement, however. Rather, youth were formed into groups and made decisions on spending together. The majority of the grants were used for business purposes. Unfortunately, it's not possible to say whether the group dimension was what contributed to good use of the grant, and more follow-up and advising may have raised average returns. But the design was inexpensive to implement and so is more likely to pass a cost-benefit test.

Finally, pilot results from a study of cash grants to 100 urban street youth in Liberia (including a majority of ex-combatants and other high risk youth) suggest that cash grants and a psychosocial intervention were effective at promoting investment in business enterprises, raising incomes, and reducing risky and illegal behaviors. Within two months of the intervention, drug sales and petty crime were estimated to halve. More time will be required to determine the lasting effects of cash grants, and the long term impacts on income, and so these results should be taken with caution. A scaled up intervention and evaluation are underway. They do indicate, however, that high-risk populations may be capable of making legal and forward-looking investments with unconditional cash transfers.

¹³ Dean Karlan and Martin Valdivia, "Teaching entrepreneurship: Impact of business training on microfinance clients and institutions," *Review of Economics and Statistics* 93, no. 2 (2011).

¹⁴ Banerjee and Duflo, "Growth theory through the lens of development economics."

¹⁵ Jeannie Annan et al., "Midterm progress report: Experimental evaluation of the Women's Income Generating Support (WINGS) program in Uganda," (Innovations for Poverty Action, 2011).

¹⁶ Blattman, Fiala, and Martinez, "Can Employment Programs Reduce Poverty and Social Instability? Experimental evidence from an aid program in Uganda."

Indeed, a growing base of evidence stresses the high impact of cash transfers to the poor, especially relative to the cost of implementation. Two recent research reports commissioned by DFID summarize the evidence on conditional and unconditional transfers in poor countries worldwide, and argue that such programs are impactful, fair and assured—more so than many of the alternative aid strategies.¹⁷ We feel the evidence base remains too thin for such a strong conclusion. Nevertheless, the evidence favors (i) more emphasis on capital and asset building, possibly through cash transfers or increased availability of finance; and (ii) close evaluation of the impact of cash or capital injections, especially in comparison to skills training.

C. Interpreting our findings in light of this evidence

A core objective of the program is to provide legal, sustainable and lucrative employment alternatives to high-risk youth, and steer them away from illicit activities. To do so most successfully, these legal alternatives must be labor-intensive, provide opportunities for full-time work, and have high revenue-generating potential.

We observe significant impacts on wealth but no impact on current income, spending on food and household items, and poverty. In comparison to the impacts identified in non-farm employment programs discussed above—typically 30 to 60% annual returns on the skills training and capital components combined—the economic returns to the agricultural training and reintegration appear to be in the lower end of this range. There are several possible reasons:

- 1) **Population.** The target population may be particularly difficult. We have observed higher levels of performance in ultra-poor populations, including war-affected populations, but these were generally not high-risk youth. It is possible that their social and economic situation limited their potential to perform. There are a few pieces of evidence that weigh against this interpretation, however. Looking at our sample, the program is not more effective for participants with more wealth, more ability, or more social stability. Also, preliminary results from another IPA evaluation of a non-farm employment show reasonable returns with a group of urban youth in Liberia.
- 2) **Gestation time.** It may take more time for new farmers, risky populations or not, to build a successful agricultural livelihood, perhaps several seasons. Farm employment may have a longer gestation period than non-farm business. Unfortunately, we do not have the data to say. Nor do we have data on future expected economic returns. Nevertheless, the fact that many program participants continue to attempt agriculture and express interest in agriculture in future suggests that they see at least some future in the activity. In principle, the expectation of future returns could have just as powerful an impact on economic and social reintegration as immediate returns, as the hope of future returns deters dangerous or risky behaviors today.
- 3) **Risk.** From our qualitative interviews, there was no shortage of graduates who saw their seeds fail to germinate, their crops bring little at market, or other hardships. This will lead to high short term variation in success and lower average returns. Eventually a subset of program participants with a continued string of successes may show significant improvements. Again, however, this may take more than a few seasons to reveal itself.
- 4) **Market access.** While the program appears to have successfully oriented youth towards agriculture and relieved important constraints—namely skills and start-up materials—it may be that other constraints limit their success, at least in the short term. Most report that land is abundantly available to them, in the control group and treatment group, so what might these other constraints be? One is poor market development and access, especially in remoter areas. Another is high transportation and transaction costs, which limit access to what markets exist.

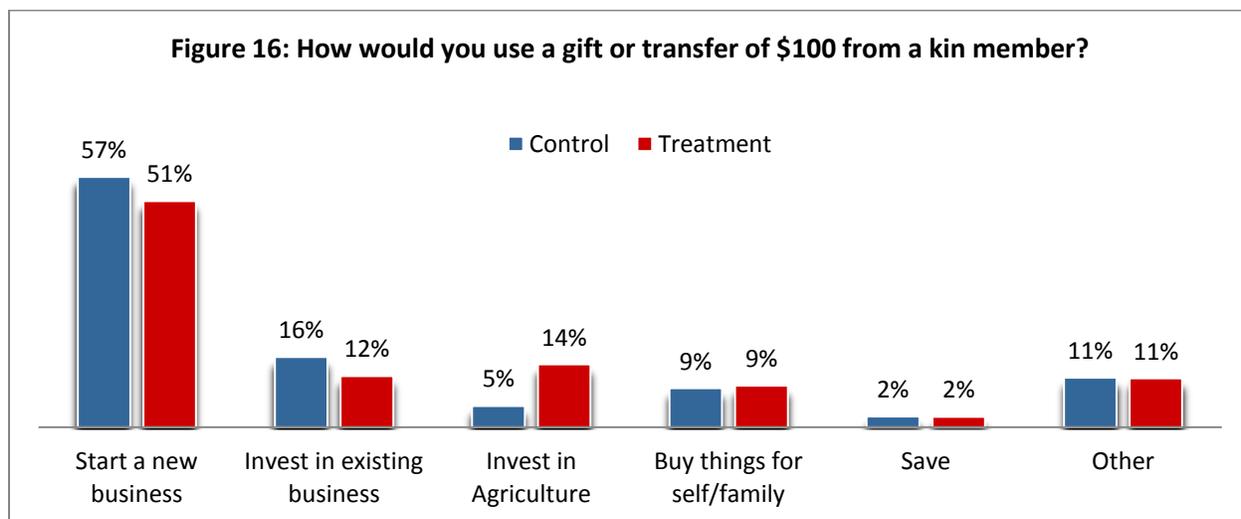
¹⁷ Joseph Hanlon, Armando Barrientos, and David Hulme, *Just give money to the poor* (Sterling, VA: Kumarian Press, 2010); Catherine Arnold, Tim Conway, and Matthew Greenslade, "Cash Transfers Evidence Paper ", ed. DFID Policy Division (London: UK Department for International Development, 2011).

- 5) **Insufficient training.** Agricultural productivity and profits would almost certainly be greater if the training itself were more intensive, or included an agricultural extension component after the program. If trainees also act as informal agricultural trainers and extension agents to kin or community members at home, this knowledge could spill over into the community. We unfortunately do not have measures of these positive spillovers.

Nevertheless, in most economic activities, additional inputs into production show diminishing returns—that is, more inputs mechanically lead to more outputs, but everything else equal, more of the same input has less and less of an impact on output. Given the broadening base of evidence on the general scarcity of capital in Africa, and the relatively high returns to capital (discussed above), we suspect that the marginal dollar would have higher impact if invested in capital rather than skills. We elaborate below. This is a conjecture rather than proof, however, and remains an important area for experimentation and evaluation in youth employment programs.

- 6) **Capital constraints.** In addition to the general literature reviewed above, some of the variation in success points to the importance of capital. Program participants and control group members with more initial assets and access to credit generally engaged in more agriculture and earned higher profits. Moreover, of the program participants, it is those with the least initial wealth and access to credit who seem to have made the largest improvements in agricultural activities and income. These results suggest that future programs may increase success by increasing the amount of capital—in kind or cash—available to program participants. This is particularly true in light of the high risk of agriculture—those constrained in capital and credit will find it difficult to recover from a single seed or crop failure and continue farming.

How would trainees invest capital? We asked respondents how they would invest a gift or transfer of \$100 from a kin member. (We use “kin member” so as not to create expectations of a grant from IPA or LMA.) Responses are in Figure 16. 9% or fewer say they would mainly consume the money, with little treatment-control difference. 73% of controls and 63% of program participants say they would invest in a new or existing business. 5% of controls and 14% of treatment group members say that they would mainly invest in agriculture.



Answers to hypothetical questions must be taken with caution. The results suggest that treatment has increased interest in agriculture and expectations of future returns. Nevertheless, agriculture is a minority choice even for program participants. One reason may be that, when engaged in risky activities, the optimal use of new capital is to invest in another income stream with a low correlation of risk. Thus, when one income stream fails, there is still a chance of income from another source. Our qualitative research—and indeed a broad base of development research—suggests that this may be especially true with agriculture since income rises and falls depending on the season. Another explanation, however, is that the returns to non-farm enterprise may be higher for these youth,

even after heavy investments in skills and training. All of the reasons above—poor market access, high risk, and length of time to reach returns—may make agriculture a less attractive option for this group.

8. Recommendations and implications for the reintegration of high-risk youth

This section addresses government, civil society and international organization reintegration plans and efforts in general. Based on our analysis of program impacts and our assessment of other youth employment programs, we suggest a number of possible future adjustments and programs to explore. None of these solutions are as yet proven, and so we also encourage experimentation and, where possible, evaluation of what works and what does not.

A. Immediate versus longer term reintegration programming

When considering recommendations from this evaluation, it is crucial to understand the context in which the program will be implemented. This evaluation took place approximately six years after war ended in Liberia. While the program participants came from potential hot spots, the country as a whole was becoming increasingly stable. In this phase of post-conflict reconstruction, the purpose of such a reintegration program is to promote the prevailing stability and contribute to enduring peace by reducing the risk of future conflict. This should be distinguished from reintegration programs that launch in the immediate post-conflict period.

When a conflict first comes to an end, there is often an active threat of a return to violence, chains of command among ex-combatants are still intact and influential, war trauma is acute, and norms of war dominate. In these cases, the goal of such a program is to help individuals transition from wartime to peace, making the residential and psychosocial components particularly important. Liberia's own national reintegration program demonstrated that in order to take advantage of skills training, ex-combatants need more than just courses and toolkits when conflict first ends. This program's unique approach of combining psychosocial and life skills education with practical skills training in a residential environment seems necessary to transition people from fighters to productive members of a peaceful society.

There are good arguments to continue highly intensive programs targeted at hot spots, especially if these target areas where the government wishes to regain control over resources and concessions, or where active recruitment may take place for conflict in neighboring countries—as recent events in Guinea and Cote d'Ivoire make abundantly clear. To be effective, these highly targeted interventions may have to be as timely and as speedy as the competing opportunities. Hence the government or UN or NGOs may want to consider strategic reserves of funds for such counter-recruitment or concession reclamation efforts, along with systems that can move into place quickly.

Is a comprehensive model of intensive training and capital otherwise required? There is a trade-off involved. On the one hand, Liberia sorely lacks high-skill labor in any industry, including agriculture. Intensive training programs can help build a more highly skilled labor force and help the growth of industry and agri-business. On the other hand, when resources are scarce, a smaller and less intensive program for more people can more equitably and efficiently spread the benefits. If, after some level, there are diminishing returns to added investments in the same person, splitting that assistance between two persons can result in higher aggregate gains.

The goal of this report is not to conclude that one direction is better than the other, but merely to highlight the trade-off itself. Our other research and review of the literature incline us towards the more broad-based approach, but the answer will depend on the specific policy aims of any given project. For instance, when it comes to achieving the Poverty Reduction Strategy, and especially when targeting high-risk youth (outside hot spots) or the ultra-poor, we also favor less intensive approaches because here our aims are inherently broad based (i.e. minimize po-

verty) and because it seems unlikely that the ultra-poor or the high-risk youth are the population most likely to develop into a high-skilled workforce. Intensive training and high-skill programs are undoubtedly crucial to growth and poverty reduction in Liberia, but perhaps amongst a different population.

B. Capital versus skills investment in agricultural programming

Above we focus on the trade-off between heavy investments in a smaller number of individuals versus smaller investments in more. But given a per person level of resources, every employment program must encounter trade-offs to investments in skills versus capital. Both of each is clearly better for beneficiaries, and will improve their performance and private returns. But for a fixed cost per beneficiary, more of one means less of the other.

The evidence discussed above that the private returns to capital (goods, assets or cash) tend to be higher than the private returns to skills, at least in non-farm enterprises. It is unproven whether this is the case for agriculture, but several pieces of evidence suggest this may be the case. First, returns to capital in agriculture seem to be quite high, at least among established farmers. And second, capital seems to have been a strongly binding constraint among the beneficiaries of this program.

This capital could come in several forms:

- As part of capital assistance, programs could consider conditional cash transfers, designed in such a way as to mitigate wastage and potential self-control problems.¹⁸ Group-level monitoring, or multiple disbursements conditional on past performance, could be cost-effective means of minimizing wastage, at least when beneficiaries are not too thinly spread.
- Provide informal insurance to graduates, such that in the event that seeds fail to germinate, tools break, or the first crop is a failure, more assistance can be provided. To mitigate the risk that graduates work less hard, or attempt to defraud the system, simple community or group monitoring systems could verify the graduate's efforts. A growing body of research and pilot programs illustrates the working of such programs in African agriculture.¹⁹
- Facilitate access to credit, by linking graduates to village-level microfinance organizations or rotating savings and credit organizations, or instructing graduates on how to form their own rotating savings and credit associations.
 - While access to "susus" is very broad, the interest rate paid on savings is actually negative (meaning people pay large sums to save), time horizons for both savings and borrowing are very short (typically less than a few months, which is seldom time to accumulate a large savings amount or borrow and repay a loan for investment purposes), and interest rates on loans are high—reaching or exceeding 10% interest per month, or 200% annual rates of interest.

Once they have returned to their communities, graduates face a large number of challenges. It may be that they would also benefit from increased follow-up or access to agricultural extension. The more remote these graduates, the less cost-effective any such extension services are likely to be. But residential training is also costly. It is worth exploring cost-effective models of delivering advice and instruction both before and after graduates' independent attempts to start-up a farm.

¹⁸ We should note, however, that not all non-business forms of spending are necessarily wastage; economic theory suggests that cash windfalls are optimally allocated not only to future-based investment but also payment of debts, current consumption, and savings, and so some room for alternative expenditures is recommended.

¹⁹ See, for example, Clarke Daniel and Stefan Dercon, "Insurance, Credit and Safety Nets for the Poor in a World of Risk," (United Nations, Department of Economics and Social Affairs, 2009).

Both of the above strategies come at a cost. To contain costs, it may make sense to shift the mix of skills training and capital towards more capital-intensive assistance. For instance, a program of shorter courses with more capital and (possibly) more extension services. This might be a more effective mix given our (cautious) evidence that the returns to capital are greater than the returns to skills. Moreover, given the fixed cost of rebuilding training sites and space constraints within each site, this shift could increase the capacity of the program to take on more classes of more students.

- This ignores, of course, the psychosocial and life skills component of the program. Shorter training periods may not be enough time to adjust norms, reintegrate socially, learn to manage conflict, and so forth. While qualitatively we saw this to be very important during the program, we also see that improvements in social participation, aggression, and psychological well-being were shared by the control group. Hence it is not clear that longer trainings are needed for psychosocial purposes except perhaps with populations that could not have accessed this stability or gains outside the program. High-risk women may be an example, as well as extremely high risk populations (like the Guthrie plantation occupants that attended previous phases of the program).

Training need not be limited to agricultural production. There is money to be made at every step of the agricultural value chain, and successful farmers also understand the importance of input markets and the sales channel. Program participants may benefit from more training on the marketing aspects of agriculture, market information, and business skills training, illustrating other areas of the agricultural value chain.

Finally, access to markets may have been an important constraint on success. Our research does not speak directly to this question, however, and more investigation on this point will be needed. But perhaps any training component of the program should stress to trainees the need for proximity to markets, and encourage graduates to settle closer to major markets both for inputs and produce.

Linking graduates to producers could provide this market linkage directly. This could include out-grower schemes or placement in commercial farms or plantations.

C. Alternative youth employment program options

The evidence from non-farm employment programs discussed above suggest that village- town- and city-based microenterprises are also viable economic alternatives for youth, one that the evidence suggests can yield high potential economic returns, modest social returns, and the potential to reduce crime and aggression among unstable populations. We will address the potential for these non-farm alternatives, including design alternatives, in a future policy memo.

One could imagine, however, a reintegration program that offers the target population the choice between non-farm microenterprise assistance and agricultural training and start-up. It would allow NGOs to expand the range of services they deliver to their target population, and may produce higher average results. At present, many youth may opt to enter the agricultural livelihoods program in spite of a low aptitude or interest in farming as a profession (relative to the alternatives). They do so because the absence of alternatives.

In fact, at the outset of the program, participants expressed a great deal of interest in agricultural skills. This response, however, was after having been briefed about the nature of the program. We suspect that agricultural skills are highly valued, and valuable. But as we have seen, even dedicated farmers wisely invest in alternative enterprises. (The interest in using a \$100 gift to invest in a new or existing business speaks to interest in such alternatives.) Also, not all youth necessarily have the aptitude for farming. Restricted choices may be unavoidable with small targeted programs, especially with volatile populations. In general, however, as governments and large aid agencies look to programs like these for evidence, we feel that informed choice will be centrally important to any large-scale, nation-wide training and employment programs. Any program that enabled youth to make informed choices and sort themselves into professions for which they have more aptitude is likely to raise impacts overall.

9. Appendix: A statistics primer

We set out to write a report that is free of excessive technical jargon. Whenever possible, we tried to present findings in meaningful terms, our prose aided by several tables and figures. While we believe that the lessons of the report can be understood without a background in statistics, there are a few concepts that are good to review.

Average, mean and median

The average, or mean, is simply the sum of all values for the group divided by the number of people in that group. It is not the only way to measure the central tendency of a group of numbers, or the difference between two groups, however. Because means can be distorted by extreme values—people who do really well or really poorly—we sometimes report the median, the precise middle value in the group (the 50th percentile). Both are common measures of central tendency.

Impact or effect size

Simply put, impact refers to the size of the difference between groups when evaluating outcomes. In this report, impact will often be stated as the average difference between people who received the program (the treatment group) and people who did not (controls). This difference can be framed as an absolute value (e.g., increase of \$x in income for the average beneficiary) or as a percentage increase relative to the control group (e.g., the treatment effect is equivalent to an increase of 50% over the control group mean).

Statistical significance and confidence intervals

When we calculate an average treatment effect, we compare the average in the treatment group to the average in the control group. Both groups contain a great deal of variation, and this implies that any average treatment effect is measured with error. This error decreases as we increase the number of people in the sample and the precision of measurement. But some uncertainty always remains.

In any study, the default hypothesis is always that there is no treatment effect. When we detect an average difference between the treatment and control group, at a minimum we want to know whether or not we can say with confidence that the result is not zero, or runs in the opposite direction.

In statistics, a result is called statistically significant if it is unlikely to have occurred by chance, and the amount of evidence required to accept that an event is unlikely to have arisen by chance is known as the significance level. Conventionally, we regard a result as statistically significant if there is a less than 5% risk that it is not zero. Sometimes a 10% risk is accepted, but the convention is typically 5%.

Of course, we are not merely satisfied to know that a result is not zero. We would like to know the possible range of error of our average treatment effect. How high or low could the true value be? One way to evaluate our results is to report confidence intervals. Confidence intervals tell us the range of values that our finding could take with 95% significance. For instance, we might report that the average effect size is \$50, but because there is some error in this estimate, we would also report that the “true” effect size falls somewhere between \$30 and \$70 with 95% confidence.