Improving youth livelihoods in the Ghana cocoa belt

An impact evaluation of the MASO programme

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Working paper | October 2020

ODI

mastercard foundation Youth Forward

Participatory Development Associates Ltd.

YOUTH POWERED MASO

Cover photo: MASO youth participants from Tweapease, New Edubiase, Ghana. © MASO/Solidaridad.

Acknowledgements

Many thanks to all research participants including MASO participants, their relatives, non-participant youth, local officials and MASO staff for their time and the inputs that made this research possible.

Many thanks also to fieldwork supervisors, assistants and enumerators who walked long distances on unstable terrain under the intense Ghanaian sun to collect quantitative and qualitative data that form the basis of this working paper. Many thanks also to Participatory Development Associates for their invaluable inputs, ethics committee and logistical support, throughout the project.

Many thanks also to Francis Lavoe who provided excellent research assistance alongside Sophie Bridonneau, who laid the foundation of data analysis and coding of the baseline necessary for Vidhya Unnikrishnan to conduct the propensity score matching (PSM) quantitative analysis and for Maya Atta-Mensah to assist with the quantitative analysis of the descriptive statistics.

Thanks to Tiina Pasanen and Anne Buffardi for their advice and support throughout the project and for their inputs into the design of this study, primarily led by Nathaniel Boateng (Solidaridad) and Lukasz Marc, former Youth Forward Learning Partnership Manager.

The authors are grateful to the stakeholder network including Solidaridad, particularly Suzan-Hermina Yemidi, Fred Frimpong, Philip Kankam, Kwadwo Boadi Mensah and Fanny Ampon, as well as Sena Agbodjah Agyepong, Ashesi University, Wahab Suleman, Ghana Cocoa Board (COCOBOD), Daniel Amankwah-Aboagye, Fidelity Bank and Patricia Formadi, Aflatoon International for their valuable inputs throughout this process.

John Maher assisted with the editing of the publication, and Franklin N. Mabe, Karishma Banga and Alexandra Löwe gave excellent peer review comments on an earlier draft of this paper.

Thanks to Tricia Williams, Awa Sanou and Dina Randrianasolo for their invaluable feedback and support and to the Mastercard Foundation who made this project possible.

Thanks to Katie Forsythe for providing editorial support; and to Sarah Turner, Aaron Bailey-Athias and Elaine Antwi for project management and to Caelin Robinson for design and formatting support.

This working paper has been produced with the financial assistance of the Mastercard Foundation. The contents of this document are the sole responsibility of ODI and can under no circumstances be regarded as reflecting the position of the Mastercard Foundation.

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Acronyms

CEDI	Cocoa Entrepreneur Development Incubator
COCOBOD	Ghana Cocoa Board
DiD	difference-in-differences
FGD	focus group discussion
GLSS	Ghana's 2016/17 Living Standards Survey
GDP	gross domestic product
IVR	Interactive Voice Response
KII	key informant interview
LMIC	low- and middle-income country
PDA	Participatory Development Associates
pp	percentage points
PPI	Poverty Probability Index
PSM	propensity score matching
SRH	sexual and reproductive health
ToC	theory of change
ToT	training of trainers
VSLA	village savings and loans association
YSLA	youth savings and loans association
Y-SEG	Youth Sector Engagement Group

Executive summary

This study uses a youth livelihood lens to assess the impacts of the MASO multifaceted five-year cocoa programmes, implemented in Ghana by a consortium of six partners led by Solidaridad West Africa and funded by the Mastercard Foundation. This programme was targeted at not-in-school youth aged 17–25 years-old living under the $2 per day poverty line in the following cocoa-growing regions of the country including: Afadzato South, Hohoe, Adanse South, Assin Foso, Bia West, Ho West, Kasapin and Sewfwi-Wiawso. Overall, the MASO programme targeted 10,700 youths across the country and had already trained 8,395 at the time of the writing.

Overall, the research aims at assessing the impact of the MASO integrated programme on cohort two youth outcomes 12 months after the training ended. The primary objective of this research was to assess whether or not the MASO programme had contributed to improving economic outcomes for youth participants, through which implementation mechanisms and why. The secondary objective of this research was to measure the impact of the programme on youth knowledge and skills acquisition, behaviour and attitude changes as outlined in the theory of change (ToC). The evaluation questions that this impact evaluation seeks to answer are: *Compared to non-participants, to what extent has the MASO project improved economic outcomes for participants? How and why?*

This study aimed at assessing changes in economic activity, the use of modern agricultural practices, income and poverty levels, and access to land and finance which were categorised in four types of outcomes:

- Agriculture
- Employment
- Income and poverty likelihood
- Financial inclusion

In assessing the effects of the MASO multifaceted programme, this study generated evidence on its capacity to improving economic and financial inclusion in eight districts of the cocoa-growing regions in Ghana. While there is a plenty of evidence on the impact of skills training on youth employment and livelihoods, this study is unique in that it brings new evidence regarding the impact of multi-integrated training in a sector rarely targeting youth directly: cocoa farming and its associated enterprises.

This study used mixed methods and was conducted in Ashanti, Brong Ahafo, Central and Western in 2017 and 2019, using a quasi-experimental impact evaluation – propensity score matching (PSM). A qualitative study was conducted in late 2019 to complement the quantitative findings. For the quantitative survey, all 3,658 youth selected for the programme participated in the baseline (enrolment in the training), while for postline a random stratified sampling was conducted among those participants who had finished the training (i.e. excluding those participants who had dropped out of the training or refused to answer the postline questionnaire). The final postline sample size was 790 for MASO participants. Counterfactual data was collected from a representative sample of 1,777 youth.

To provide a greater understanding of the estimated effect of the training on gender differences, in addition to the whole sample, we analysed sub-samples of young women and young men. We have further evaluated the impact of the training based on the age cohorts' classification of the respondents

by splitting the sample into two age cohorts, a cohort of younger youths aged 17–19 years[1] and a cohort of older youths aged 20–25 years.[2] Sub-sample estimates provided here compare the differences in the behavioural responses based on the treatment recipients' sex and age.

We examined whether the MASO programme had an impact on four broad groups of outcome dimensions: agricultural practices, cocoa farming, farming; employment (past seven days), employment (past 12 months), log of hours worked (past seven days); number of saving places, bank saving, mobile money saving, receiving or sending mobile money, income (past seven days), income (past 12 months) and Poverty Probability Index (PPI).

Contribution of the MASO programme to improving economic outcomes for youth participants

By means of a variety of indicators and data, we have shown that the MASO programme has positive but mixed impacts on participants' economic outcomes (and on their household for poverty likelihood) with positive impacts on poverty likelihood reduction, intensive labour supply (youth average hours worked in the last seven days) and income (last seven days). However, we find small or insignificant impacts for the extensive labour supply (youth participation in employment over the last seven days and the last 12 months) and income (last 12 months). As expected, we have little evidence of the impact of training on economic inclusion at such an early stage in the youth journey into cocoa and at the onset of their enterprises.

Impact of the programme on youth knowledge, skills acquisition, behaviour and attitude changes

Overall, the PSM impact analysis found notable impacts on agriculture-related indicators and young people's attitude towards farming, cocoa growing and the adoption of agricultural practices. Noteworthy impacts were found among financial-inclusion indicators, particularly regarding youth saving at a formal institution (bank) and their use of mobile money, closely followed by mobile money use and a relative increase of diversification of saving places. However, it found mixed impacts on financial-inclusion indicators across gender and age groups.

Unanticipated effects occurred: why and to what effect?

The qualitative analysis shows some improvements in areas that were not originally included in the analytical framework. However, various unintended effects were captured during the qualitative interviews, including effects on social norms, intra-household and community relationships, as well as knowledge transmission and sustainability. Overall, the qualitative study found positive effects on a number of indicators of economic inclusion, though strong effects on gender equality, access to land and finance remain limited.

1 Age 17–19 includes youth who were 17–19 years old in the baseline. Two years after the baseline survey these youth move towards the age cohort of 19–21 years in the postline. The sub-sample estimates on age 17–19 years takes the value 1 if the youth belongs to age 17–19 years (in the baseline) and 19–21 years in the postline.

2 Age 20–25 year includes youth that are under 20–25 years old in the baseline. Subsequently, two years after the baseline survey these youth move towards the age cohort of 22–27 years in the postline. The sub-sample estimates on age 20–25 years take the value 1 if the youth belongs to age 20–25 years (in the baseline) and 22–27 years in the postline.

This working paper presents five key recommendations for practitioners seeking to implement youth cocoa initiatives through targeted and multifaceted interventions:

1. **Youth employment programmes need to consider gender- and age-specific challenges and address them ahead of and as part of the intervention.** In the case of MASO, rolling out gender and legal training at the onset of the programmes would pave the way for young female enrolment and involvement in a male-dominated sector such as cocoa, facilitated by proactive changes in gender norms. Similarly, focusing on building women-centred local networks and women's land rights advocates' associations through national-level advocacy could encourage young women's participation in cocoa-related activities, promote collective action and ultimately enhance the right of women to access land. Targeting the older age youth cohort to promote cocoa cultivation could be more impactful, while younger age cohorts may benefit more from business-related enterprises.
2. **Skills training must be accompanied by private sector engagement, entrepreneurship training and a supply-chain approach to job creation considering the political economy of the country.** It appears that skills training alone is not enough to affect overall youth employment participation in the cocoa value chain and does not necessarily lead to job creation. Skills development should not exist separately from the supply side. Linking youths to existing cocoa cooperatives and produce-buying companies would support youth groups in accessing markets throughout the cocoa value chain and this would be mutually beneficial for youths and the companies, because the latter would not be required to train youths in cocoa farming and other cocoa-related business activities, as these would have the appropriate skills for providing support services to the companies' clients.
3. **The right incentives and demand for the use of newer technologies and agricultural methods should be created.** In the face of the dramatic and fast-changing nature of the agricultural sector, including the effects of Covid-19, climate change, digital technologies, urban growth and evolving eating habits, farmers will need to adapt and innovate to be resilient and improve their livelihoods (FAO, 2020a), but before this happens, youth needs to be exposed to new technologies and to acquire the necessary additional learning capital to innovate.
4. **Financial products not only adapted to youth but also sensitive to the agricultural sector and the seasonality of the cocoa activity should be encouraged**. While MASO greatly encouraged youth in accessing formal and community-based finance through saving, youth savings and loans associations (YSLAs) and mobile money, more efforts will be needed for youth to accumulate the capital needed to transform their farms into revenue-generating and sustainable businesses. Furthermore, the introduction of digital payments could increase cocoa farmers' productivity with an appropriate level of accessibility and internal controls and systems.
5. **Further research is needed to assess the suggested logic chain for the MASO programmes.** As it is too early to assess the impact of the MASO intervention until cocoa reaches its maturation stage (five years following the establishment of cocoa nurseries), research in three to four years' time would allow to assess the medium-term impact of the training on youth livelihood in the cocoa sector. Additional research on the type of interventions, whether agricultural or business, could shed some light on the effectiveness of specific aspects of the training.

1 Introduction: evidence and challenges around youth, employment and the cocoa sector

Globally, youth unemployment has steadily increased in the last decade, as approximately 15% of young people aged 15–24 are unemployed (World Bank, 2020). Youth unemployment for sub-Saharan youth has ebbed and flowed, but has been rising since 2015, reaching 11.6% as of 2019 (ibid.). Given this widespread phenomenon, many governments and civil actors have introduced labour market training programmes with the aim of strengthening human capital of young people (Kluve et al., 2019). However, despite this global trend, there has been little research on the impact of such programmes on youth economic empowerment. Using a quasi-experimental mixed-methods approach, this working paper aims to contribute to the literature by analysing the impact of the Next Generation Youth in Cocoa Programme (MASO), an integrated farming and entrepreneurship training programme for youth in rural Ghana.

As in most sub-Saharan countries, the increase in numbers of Ghana's youth exceeds the economic opportunities presently available (Mueller and Thurlow, 2019). Youth comprise 25% of Ghana's population, yet, as of 2017, 30% of youth were not in school, in training or employed (World Bank, 2020). MASO's objective was to empower Ghanaian youth aged 17 to 25 with the skills, tools and long-term support necessary to succeed as they embarked into farming or other related businesses. The programme specifically focused on increasing the attractiveness of a career in the cocoa sector. Despite being the main driver of Ghana's agriculture industry, the average age of Ghanaian cocoa farmers has remained at over 50 years old on average over the last two decades, and this ageing demographic has raised concerns about the viability of the sector in the future. Thus, MASO's vocational, entrepreneurial and financial management training offer a prime opportunity to not only increase human capital among youth, but also to improve the longevity of one of Ghana's most important sectors.

The need to understand the impact of youth empowerment programming is particularly relevant in the context of the Covid-19 global pandemic. Youth livelihoods have been significantly impacted by health and social measures in response to the pandemic. Approximately 73% of youth who were studying part-time or full-time experienced school closures, and only a fraction were able to access educational resources online or through socially-distant learning (ILO, 2020). Youth also saw declines in extensive and intensive labour supply; 23% of young workers aged 18–24 have stopped working since the beginning of health crisis and 23% of young workers aged 18–29 report reduced working hours, resulting in significant reductions in annual income (ibid.). In Ghana's agricultural sector, production systems, supply chains and food commodity preferences were substantially impacted by the virus (Abroquah, 2020). While disruptions in both agricultural value chains and markets are negatively impacting rural livelihoods, rural youth is disproportionally affected by the crisis and vulnerable to poverty (FAO, 2020b). Young people's higher rates of unemployment and underemployment, unstable income, limited access to social services and important financial losses experienced by agripreneurs all need addressing in the short- and medium-term to alleviate youth from situations of poverty and extreme poverty (ibid.). Other concerns are the drop of cocoa prices since the beginning of 2020 (-6% as of 7 April 2020) and the contracted economic growth in primary cocoa importing areas (EU, UK, US) that countries such as Ghana are depending on (19%) (UNECA, 2020). Given that youth unemployment is

Rita Ofori, a young MASO participant, works on her two-acre farm. © MASO/Solidaridad.

expected to persist as the pandemic continues to unfold, the efficacy of youth training programmes in exposing youth to sustainable employment options will be even more important.

1.1 Ghana's cocoa sector

Ghana's tropical climate makes it well suited to producing and exporting a variety of crops, including tubers, roots, cotton, palm oil, cocoa, tobacco and sugar cane. As a result, the agricultural sector accounts for about 18% of the country's gross domestic product (GDP) and serves as the largest source of employment for the country's labour force (ISSER, 2019). Unlike the development path of Asian agrarian economies, Ghana has also experienced significant urbanisation in recent years without major increases in agricultural output (Mueller and Thurlow, 2019). Ghana's cocoa production dominates its agricultural industry, accounting for 80% of agricultural exports and employing nearly 800,000 households (Mabe et al., 2020).

Low productivity is due in part to past abuses of the cocoa marketing board for political gains – until reforms were introduced in the 1980s – coupled with episodes of overvalued exchange rates (Löwe et al., 2016). In its current state, the cocoa sector is producing below its full potential. Though projections suggest the adoption of modern agricultural practices could increase farming productivity by up to 300% and cocoa production by 210,000 metric tons annually (Solidaridad, 2014). Minimal output growth also stems from the ageing demographics within the agricultural sector. Older farmers, who perceive young people to be lazy and not serious about farming, dominate the farming industry (Löwe, 2017). The cocoa sector has seen little demographic change, with average farmer age consistently between 48 and 53 since 2000 (Mabe et al., 2020). Current literature also suggests older farmers are more risk averse and are slow to adopt modern technology, which further contributes to low productivity (ibid.).

Profits from close ties with the gold and cocoa sectors has diminished political incentives to implement reforms for modernisation or expand into other productive sectors such as manufacturing, which

declined from 15% to 5% of GDP between the 1980s and 2018 (Löwe, 2017; Mueller and Thurlow, 2019). Overall, the fortunes of the cocoa sector have been very volatile since the 1980s and have had an important role in influencing recent production fluctuations. Ghana's cocoa sector is dominated by the Ghana Cocoa Board (COCOBOD), which has the power to determine the fate of the country's cocoa farmers through its state regulatory presence, including a quality control system (Buur and Whitfield, 2011). COCOBOD's important relative success at managing the cocoa sector is frequently cited as a case study in African farming political economy. Undeniably, the cocoa export sector appears to be a unique success story among productive sectors despite competitive clientelism in Ghana (Whitfield, 2011).

1.2 Barriers to youth economic empowerment in Ghana's cocoa belt

As stated above, the cocoa sector has historically been an industry for older people. The routine dismissal of young people as idle deters them from going into farming (Löwe, 2017). From the perspective of youth, many factors have further deterred them from entering the farming industry. Many youth that grew up in cocoa-producing households were not exposed to modern, higher revenue generating farming methods, and assume cocoa farming can only afford them the same living standards as their parents, and so migrate to cities for more lucrative work (Löwe, 2017; Mueller and Thurlow, 2019).

Additionally, barriers to land access in sub-Saharan Africa add to the 'false picture that youth […] detest agriculture' (Kumeh and Omulo, 2019). Low supply of land and finance pose barriers to entry for youth interested in cocoa farming. There is limited documentation of property rights in Ghana, but low supply of land and lack of consistency in buying and leasing leaves many young people waiting to inherit land from family (Löwe, 2017). Besides, evidence from the Bono East region of Ghana shows that, under customary land tenure, for that significant proportion of youth who managed to acquire land to farm – whether indigenous or migrants – their shares tend not to exceed 1–3 acres (Kidido et al., 2017). Despite the traditional matrilineal inheritance systems prevalent in some Ghanaian regions, young women still face disproportionately lower opportunities.

Furthermore, cocoa trees can take up to five years to produce any yield, requiring considerable upfront investments for youth lacking the initial capital to start a cocoa business (ibid.). While not limited to youth in the cocoa sector, financial inclusion constitutes a significant barrier to economic opportunity in the cocoa belt. Informal moneylenders are the primary source of lending in rural regions, conveniently structuring repayment periods to align with cocoa harvest cycles. However, funding via informal lenders is very expensive, with some lenders expecting full repayment at the end of each cocoa season, regardless of when the loan was provided (ibid.). COCOBOD historically provided older farmers with loans and the ability to open a bank account with its buying company. However, this programme has been discontinued, leaving many young farmers without access to banking (ibid.). These barriers, along with population growth, have contributed to low youth employment and self-employment opportunities.

In tandem with Ghana's significant urbanisation in recent years, youth are more attracted to the city lifestyle rather than farming (Mueller and Thurlow, 2019). One of the main factors underlying this trend is the shift from employment in the agricultural sector towards the service and, to a certain extent, the industry sectors.[3] As a result, many stakeholders in the sector have made efforts in recent years to attract youth, to improve the viability of the industry and provide more economic opportunities to

3 See http://datatopics.worldbank.org/gender/country/ghana

youth. The various levels of the cocoa production value chain offer a wide range of potential, often complementary, employment opportunities. A study analysing determinants of youth engagement in the cocoa sector finds that young people in cocoa farming are also likely to work as labourers on other farms or produce and sell cocoa seedlings (Mabe et al., 2020). Many youths also create small- and medium-sized trading enterprises, selling agrochemical inputs within cocoa communities. However, due to the time-consuming nature of such businesses, they are less likely to engage in other value chain activities (Mabe et al., 2020).

1.3 The role of youth programming

Given concerns about the viability of the cocoa sector in the face of rising global demand and growing youth unemployment and underemployment greatly accentuated since the Covid-19 crisis hit the continent, there is a strong desire among government and non-governmental agencies to expand youth employment opportunities within the cocoa sector. In recent years, Ghana has been a leader within sub-Saharan Africa in encouraging youth to turn to entrepreneurship or agriculture by challenging the perception of farming as low-status and as a sector relegated to the poor (Ichikowitz Family Foundation, 2020).

A number of organisations, including COCOBOD, Solidaridad, Winrock International and World Cocoa Foundation, have rolled out a variety of programmes with the aim of attracting more youth into the industry to take over from older farmers and increase youth's access to reliable income sources (Mabe et al., 2020). These programmes are aimed at expanding the sector to young adults to help ensure sustainability, and in rural regions to also provide alternatives for youth who typically migrate to urban cities for employment. Such programmes have also been instrumental in exposing youth to a wide array of opportunities across all levels of the cocoa production value chain, including pre-planting and planting, farm maintenance, harvest and post-harvest, as well as cocoa-related trading or business opportunities (ibid.). However, there is no statistically significant evidence that these programmes work beyond qualitative and descriptive statistic studies demonstrating effects on participants.

Early impact assessments found employment-specific programmes to be cost-ineffective relative to alternative youth programming (Stöterau, 2019). However, more recent literature has found them to have significantly positive impacts on youth, particularly vocational training. A recent study in Uganda found youth that graduated from vocational training relative to workplace training were more likely to find employment and earn more. Since formal employment is generally scarce in low- and middle-income countries (LMICs) where micro-enterprises dominate the informal economy, entrepreneurship training can represent an entry point to economic inclusion. Studies have also found positive impacts on self-employment for youth in Uganda and Sierra Leone (ibid.). Similarly, while there is mixed evidence on the level of impact of financial-inclusion programmes, a systematic review of meta-studies on financial-inclusion programmes in LMICs finds that interventions providing increased access to savings have a small, but consistently positive, impact for low-income individuals and households (Duvendack and Mader, 2020). Overall, integrated business-orientated training combining a business element with mentorship and access to finance is most successful. Livelihood initiatives are generally most impactful when combining skills training while facilitating business growth challenges, including access to finance, through affordable credit and support services enabling micro-enterprise development (Kluve et al., 2019).

Anane Ayetey, a trained community facilitator in Edubiase, Ghana, leads climate-smart cocoa training for MASO youth. © MASO/Solidaridad.

Conceptual framework of the MASO project

To address these issues, the MASO consortium provides relevant technical, financial and business development skills to enable economically disadvantaged young people to have the skills, tools and long-term support necessary to be successful as they embark on cocoa farming or related business (Figures 1 and 2). The consortium trains young farmers and entrepreneurs on how to expand their cocoa-related enterprises and create more employment opportunities within the cocoa value chain. The consortium has targeted districts in each of the cocoa-growing regions that combine both heavy cocoa production and provides demonstration opportunities throughout the entire cocoa-producing parts of the country including: Afadzato South, Hohoe, Adanse South, Assin Foso, Bia West, Ho West, Kasapin and Sewfwi-Wiawso Municipal District. Its core activities consisted of:

- **Establishing 'cocoa academies' and training young people.** MASO provided field-based training for young cocoa farmers in eight districts, enabling economically disadvantaged youth to receive training in agricultural best practices, numeracy, and financial management and life skills. These skills are aimed at preparing them to work in the cocoa industry.
- **Creating a business incubator to train young people to be entrepreneurs in the cocoa sector,** Cocoa Entrepreneur Development Incubator (CEDI). The consortium trained youth in basic business skills and ensured mentorship from programme graduates. Leading cocoa-buying companies would have contributed to training tools and hired young people from the programme.
- **Creating an enabling environment that makes it easier for youth to participate in and contribute to a profitable cocoa sector.** MASO worked with consortium members and local leaders to increase access to land and secure appropriate financial services for youth.
- **Developing a youth network for alumni to provide post-training support and facilitate access to markets.** A Cocoa Youth Network was established to link graduates to employment opportunities and to encourage knowledge sharing and mentorship.

Figure 1 MASO original ToC

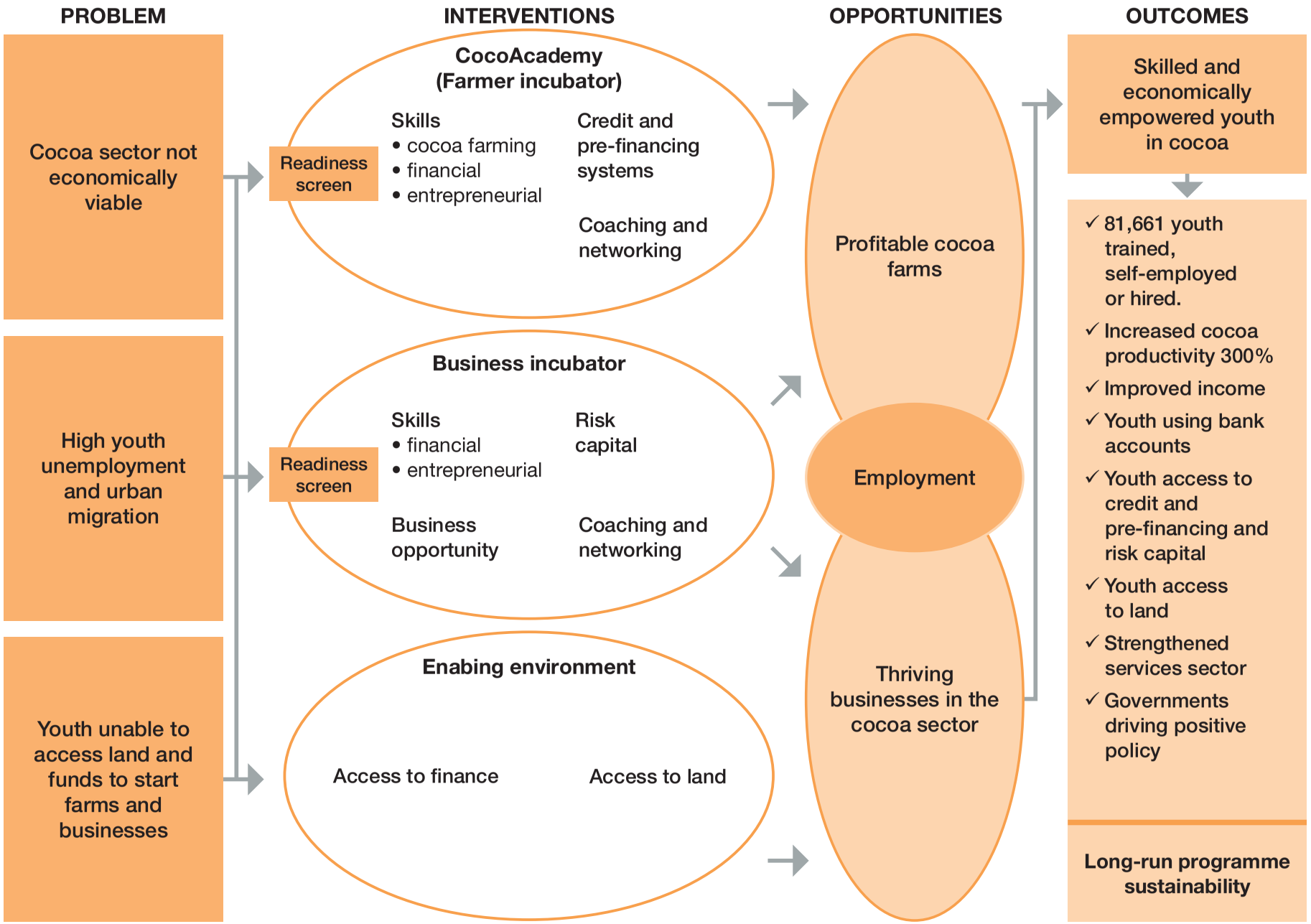
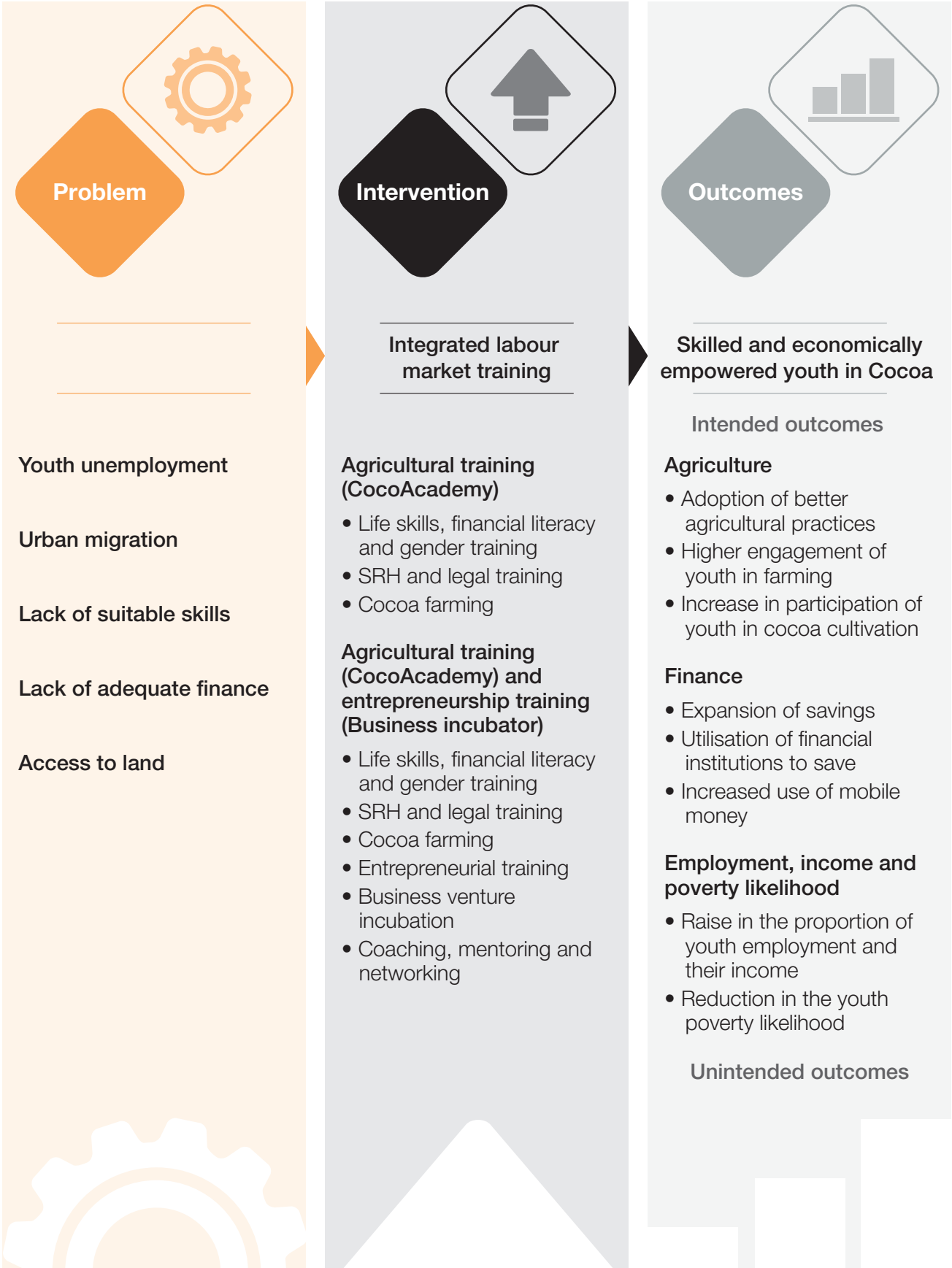


Figure 2 MASO revised ToC

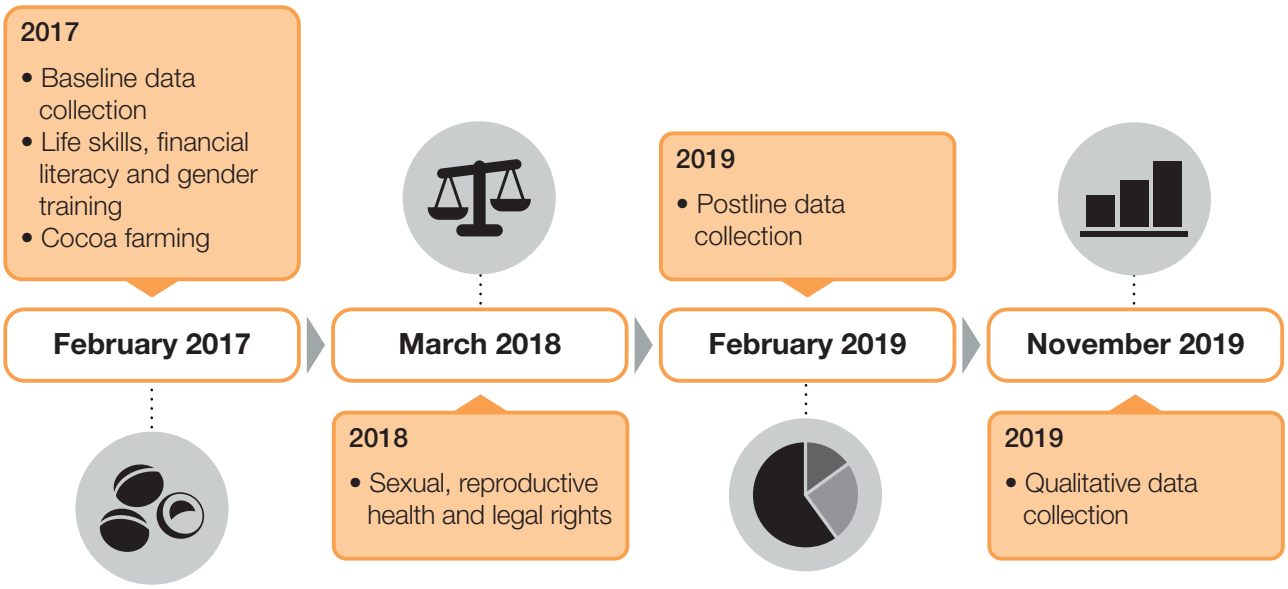


1.4 Project implementation

Table 1 Summary of programme tools and activities

Activity	Overview and Purpose	Strategies, Tools and Activities
1. Sensitisation	This activity is intended to create awareness of the programme at the local level and recruit qualified youth into it. It is also to obtain buy-in from national and local institutions to ensure continuity after exit of programme support.	• Stakeholder (particularly local-level stakeholders) engagement • Readiness scan and numeracy literacy test
2. CocoAcademy	The CocoAcademy and Business Academies are designed to prepare young people to take up businesses in the cocoa sub-sector in Ghana. The youths are trained to identify and take advantage of business opportunities along the cocoa value chain. The youths in the academies are introduced to essential business practices by experts in the field.	• CocoAcademy curriculum (and review), training manual and implementation guide • Model Farm development • Implementation of CocoAcademies
3. Business Incubator		• Development (and review) of Curriculum, procedures and guiding documents for the Mentorship Programme • Sourcing and training of mentors/ coaches • Training of trainers (ToT) and consultants • Implementation of Business Incubator Process
4. Access to Finance	These enablers are intended to provide the context that encourages and fosters the entrepreneurship in the cocoa value chain. Therefore, the enabling environment offers the conditions that together facilitate stimulate the interests of the youths in cocoa production and/or support services.	• Access to finance situational research • Design and delivery of credit and savings products tailored to youth • Communication materials for financial products • Training of relevant stakeholders (such as Solidaridad Staff, financial service providers and other programme stakeholders) • Implementation of products
5. Access to Land		• Access to land situational research • Development of land contract models • Land-sector stakeholder engagements • Negotiations with landowners, local chiefs and communities
7. Youth Network	The Youth Network is an important exit strategy for the programme. Members of the Youth Network come together for a common course as well as serve as the mouthpiece of the youth entrepreneurs. This is a critical model to foster the sustainability of the programme benefits.	• Set up Youth Think Tank and consultative meetings • Annual youth–government engagements • Monthly youth events

Figure 3 Timeline of activities



MASO programme targeted economically disadvantaged out-of-school youth aged 17 to 25 who were live below the poverty line of $2 per day, in rural or peri-urban areas and who were already farming or willing to become cocoa farmers. The programme aimed to provide young Ghanaians in rural communities with the skills needed to become successful farmers and agripreneurs, with a focus on the cocoa sector. Youth eligibility for the programme was determined based on a short screening questionnaire and participants were initially selected if they met the following criteria: (1) out of school and aged 17–25 years; (2) living under the poverty line (below $2 per day); (3) geographic location; and (4) willingness of participants to engage with MASO. If youth were within the age range and were not in school, they were rarely rejected (less than 1%).

The training started shortly after the baseline data was collected (Figure 3). Participants were assigned to one or two of the two main tracks – basic technical skills training in cocoa academies or entrepreneurship training. All youth attended cocoa academies that trained them along four components: best agricultural practices, numeracy skills, financial management skills and life skills. Entrepreneurship training aimed at equipping youth with basic business skills and was providing mentorship for graduates. It was undertaken by 9.6% of youth. Moreover, MASO talked with village chiefs to facilitate access to land and created an alumni network that aimed at providing post-training support and facilitated access to markets.

1.5 Research methodology and study design

Purpose, scope and limitations

This research was designed as a quasi-experimental mixed-methods study and combines both quantitative and qualitative research tools for complementary purposes (Greene and Caracelli, 1997). This working paper aims at assessing the impact of the MASO integrated programme on cohort 2 youth outcomes 12 months after the training ended.

MASO was aiming to provide skills to 10,800 youth over five years in 54 cohorts of 2,300–3,300 youths each. The first cohort started trainings in April 2016 while the second cohort started training in 2017. The

Young women from Wuriye, Ashante region, Ghana, take part in MASO training. Gender integration is a core component of the programme. © MASO/Solidaridad.

second cohort was optimal for the evaluation purposes for the following reasons: (1) first cohort was a testing ground both for the programme staff and for the data collection tools that allowed to improve practices in both areas; (2) the postline for cohort 3 took place in the last months of the programme, which was too late; and (3) there was no plan to collect postline data for cohorts 4 and 5.

The 12-month period was sufficient to observe change in income levels, economic activity, access to land and use of modern agricultural practices. Admittedly, the period is not sufficient to capture yields and production changes of the main crop given that a cocoa tree takes three to five years to grow. Therefore, a follow up six or seven years after the training (which is beyond the programme end date) would be better suited to capture changes in the cocoa production. However, youth were also trained in best agronomic practices for other crops that have a seasonal or yearly harvest. Some of these crops are planted on the same plots as cocoa trees to provide shade for cocoa (and income for partners) when cocoa trees are growing. The evaluation question that this impact evaluation seeks to answer are: *Compared to non-participants, to what extent has the MASO project improved economic outcomes for participants? How and why?*

Ethical considerations

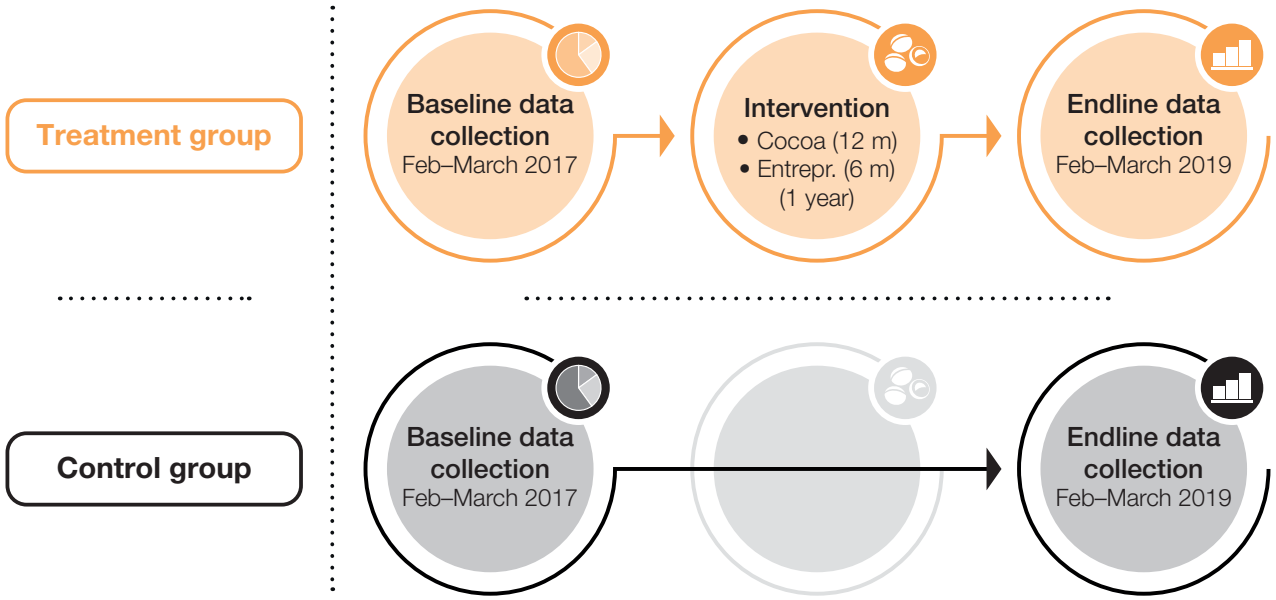
Ethical review for the control group was cleared by research ethics committees from the both ODI and local partner Participatory Development Associates (PDA) research committees. PDA's ethics committee includes members external to the organisation, including from the University of Ghana, and is structured to be independent from the research unit submitting ethics application. For the treatment group, by enrolling, MASO youth participants agreed for their data to be collected. Results of the baseline assessment were shared with both treatment and control groups' community leaders during the postline data collection undertaken in February and March 2019.[4]

Participant recruitment

Baseline data for the MASO cohort 2 participants was collected in February and March 2017, just before the start of the training in April (Figure 4). Youth selected to enrol in the MASO programme undertook 12 months technical training in cocoa academies while some undertook an additional five months' entrepreneurship training. They were followed up 12 to 13 months after the training ended, in the first quarter of 2019. Baseline was administered to all 3,658 youth who were selected for the programme while for postline, a random stratified sampling was conducted among those participants who had finished the training (i.e. excluding those participants who had dropped out from the training or refused to answer the postline questionnaire). The final postline sample size was 790 for MASO participants.

4 After analysing the baseline data, ODI-designed posters summarising key findings were presented by the field work team when visiting both the treatment and control communities for the postline data collection.

Figure 4 Study design



Youth is a period of transitioning into adulthood and greater economic responsibility, which means that the impact assessment will not be only biased by the self-selection into the training, but also by the maturation effect – i.e. the fact that older youth have, in general, higher incomes and are more economically active. To account for these biases, a control group was created by collecting data from youth with the same background characteristics (with a narrower age limit of 18 to 24, instead of 17 to 25)[5] who live in the same regions, but in different districts and who are not part of MASO programme.[6] The older age groups represent the matured age cohort. The rationale is that older youths are more likely to participate in the training than their younger peers. Training is self-selected and some youths choose to participate while some choose not to. Age of the youths could be a possible determinant, as older youths are expected to be more mature than younger youths.

Counterfactual data was collected from a representative sample of 1,777 youth that allowed comparisons between regions (Ghana cocoa-growing areas) or comparisons between males and females at the national level. To avoid differences in the data collection methods, the same selection criteria and the same tools were used for the treatment and controls groups, enumerators were trained jointly, and the data collection happened at the same time. Again, postline participants' data collection was accompanied by the data collection from counterfactual communities – enumerators visited the same communities as during counterfactual's baseline, but interviewed randomly selected youths aged 20 to 26.

A **purposive sampling** was used to select counterfactual districts and the main criterion was to select cocoa-growing districts that were close to intervention districts but in which MASO was not operating. Non-participants' data collection ('control districts') was conducted in four regions of Ghana where MASO

5 Due to the ethical considerations and programme constraints counterfactual group includes only youth aged 18 to 24. For the evaluation purposes, treatment sample is also limited to the 18 to 24 age range. The communities were selected using the Probability Proportional to Size approach.

6 Treatment group creates a panel, whereas the counterfactual group creates a pseudopanel.

With support from MASO, Andrew Fosu now owns an agro-input shop in Kasapin, Ahafo region, Ghana.
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was also operating: Western, Ashanti, Brong Ahafo and Central (Figure 5).[7] Selected districts were all cocoa growing, with similar characteristics to the MASO districts and the choices were discussed with MASO.

Sample size calculations

The representative sample for the counterfactual (with an assumed 10% non-response rate) was calculated using population data from 2010 census for the 11–17 age cohort (so teenagers who were 18–24 at baseline). The sample is representative for regional comparisons and for sex comparisons at the national level. Within each district, eight communities[8] were selected using Probability Proportional to Size (PPS) methodology.[9] After community entry, enumerators listed all households and all youths aged 18–24 who were out-of-school in randomly selected clusters. Afterwards, 28 youths were randomly selected[10] (taking into account sex distribution) and interviewed. Replacements were allowed only if wrong information about age or school status was provided at the listing stage or if youths were no longer available to be interviewed. After matching, 1,777 observations for the control group and 699[11] observations for the treatment group were used in the analysis.

7 MASO is also operating in Volta, but this region was not included in counterfactual regions because MASO is operating in all cocoa-growing districts (which would create a risk of contamination), and also, according to the 2017 COCOBOD data, cocoa production in Volta accounts for only 0.3% of total Ghanaian production (based on cocoa purchase data from the COCOBOD website https://cocobod.gh/, accessed in February 2017. At time of publishing (October 2020) the webpage with this data (https://cocobod.gh/weakly_purchase.php) is inaccessible).

8 For the piloting purposes, in Amansie West 10 communities were selected to easily accommodate five data collection teams. 22 youth were approached for interview in each of those communities.

9 Communities within each district were ordered according to 2010 population size. Communities of above 3,500 and below 250 inhabitants were excluded, because the former are likely to reach 5,000 inhabitants in 2017 and be considered as an urban area, and the latter were excluded because they have too few youths to create a training group, hence MASO is unlikely to work in this type of communities.

10 Enumerators were provided random table numbers to proceed with the random selection of youths.

11 Observations were lost as a result of the matching process.

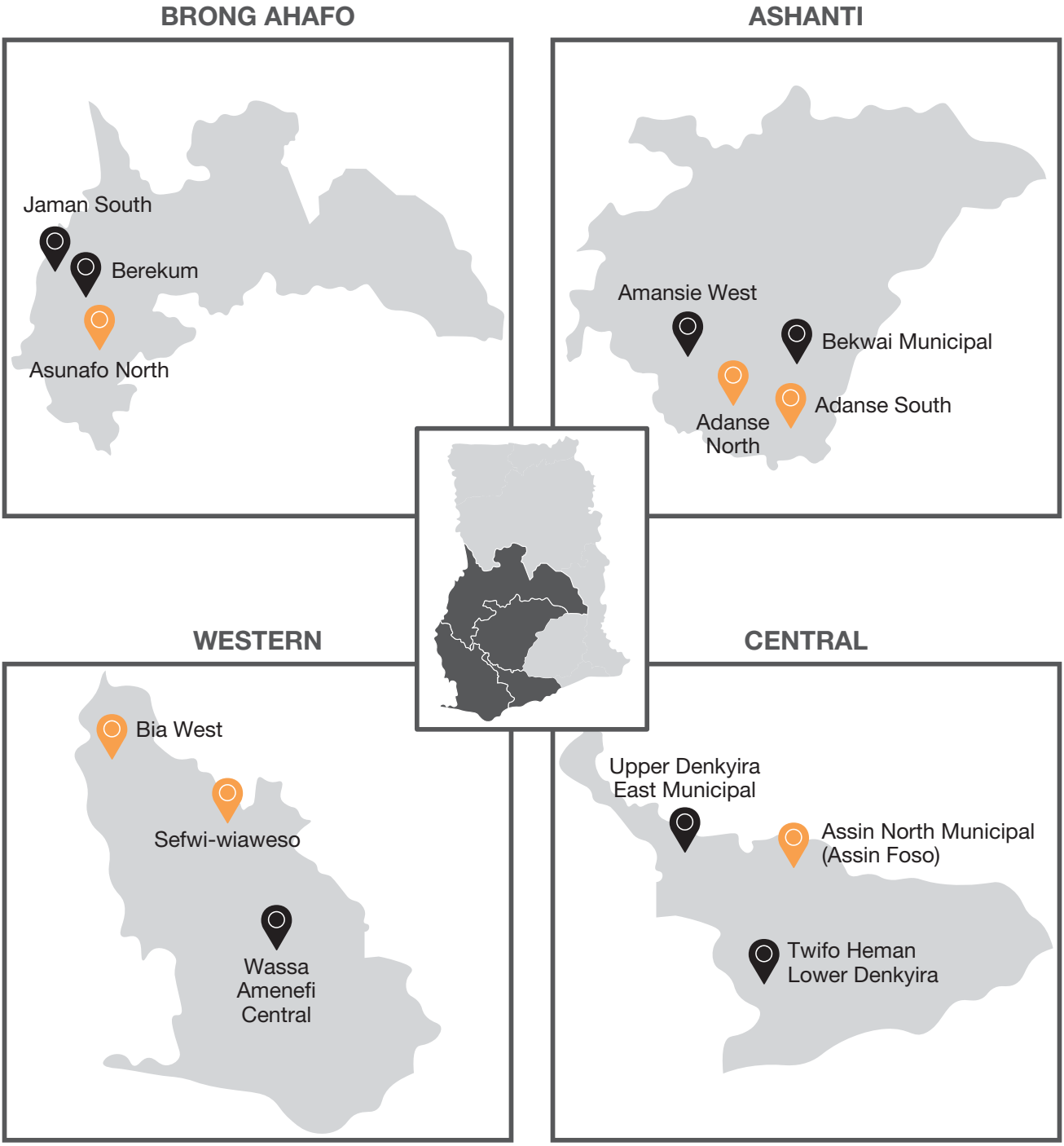
Figure 5 Map of sampled areas

MASO (treatment group) districts

Sample size:
Baseline: N=758
Postline: N=790

Counterfactual (control group) districts

Sample size:
Baseline: N=1,709
Postline: N=1,777



Note: as of October 2020, Ghana's regional demarcations have changed. The figure above depicts regional demarcations at the time of baseline data collection in 2017.

2 Empirical framework

2.1 Summary statistics

The summary statistics of the key outcome variables on agriculture, finance, employment, poverty likelihood and income are presented in Table 2. F-stat reported compares the statistical difference between the means of the treatment and the control group after matching in the baseline and postline. The large F-stat suggests that there are significant differences in the outcome variables between the treatment and the control group in baseline and postline after matching. It should be noted that the treatment and control group are sufficiently balanced based on the covariates used in the propensity score model. The propensity score model details, the covariates used and the quality of matching are discussed in the subsequent section.

Table 2 Summary statistics

	Baseline			Postline		
	Mean Treatment (N 701)	Mean Control (N 1,502)	F-stat	Mean Treatment (N 699)	Mean Control (N 1,450)	F-stat
Agriculture						
Agriculture practice (1/0)	0.23	0.05	116.72***	0.55	0.11	455.38***
Grow cocoa (1/0)	0.67	0.39	42.18***	0.63	0.12	651.59***
Farming (1/0)	0.42	0.15	162.13***	0.71	0.22	590.73***
Finance						
Number of saving places	0.59	0.55	3.05	0.85	0.56	94.57***
Saving at bank (1/0)	0.20	0.26	5.29*	0.25	0.13	44.49***
Saving at cooperative (1/0)	0.05	0.03	2.45	0.04	0.02	7.26*
Saving at microfinance (1/0)	0.08	0.07	0.12	0.02	0.03	0.67
Saving at VSLA (1/0)	0.00	0.0025	0	0.02	0.0006	11.02**
Saving mobile money (1/0)	0.25	0.22	1.59	0.23	0.13	31.27***
Used mobile money (1/0)	0.60	0.64	3.19	0.84	0.76	17.47***
Employment						
Employment – last 7 days (1/0)	0.20	0.18	0.53	0.22	0.18	5.53*
Employment – last 12 months (1/0)	0.35	0.28	9.23**	0.46	0.36	19.94***
Total number of hours worked in last 7 days	1.02	1.39	8.73**	1.42	1.21	2.27
Pov_likelihood	31.79	28.11	14.25***	29.15	28.76	0.17
Income (excluding income >26,000)						
Total real income in last 12 months	1,388.40	1,565.007	1.74	1,535.80	1394.50	1.55
Income (excluding income >300)						
Total real income in last 7 days	5.06	5.53	0.42	37.39	32.72	2.3

Robust standard errors: *p<0.05,**p<0.01,***p<0.001
Income measured in Ghanaian currency (Ghanaian cedi)

2.2 Empirical strategies

Quantitative methods

In this research, PSM and difference-in-differences (DiD) methods are used to compare the variance in outcomes over time between MASO cohort 2 participants and non-participants.

PSM is used here to match youths who participate in the MASO training (treatment group), with similar youths who do not participate in the training (counterfactual group). We match the treatment and the control group based on a wide range of characteristics so that the only difference between the two groups is participation in the training. The advantage of using PSM is that it eliminates selection bias due to observable characteristics, thereby the treatment and the counterfactual groups look similar based on observable characteristics. However, there can be systematic differences between the treatment group and the control group that can arise due to unobservable characteristics (Smith and Todd, 2005). Unobservable characteristics occur for various reasons. For example, systematic differences can arise because of the differences between locational characteristics that can influence the economic opportunities available for the treatment and the counterfactual group. While PSM does not address selection bias due to such unobservable characteristics, this can be ameliorated by using the DiD method in the next stage.

The impact of a programme intervention on the differences in outcome variables between the treatment and the control group can be contaminated for two reasons. The first reason is possible differences in time trends. The second is any unobserved differences across the treatment, and the counterfactual group could also affect the estimated treatment effect. However, the DiD method accounts for variation in time trends and any unobservable differences across the two treatment and counterfactual groups in the model. DiD is commonly used to assess the impact of a programme intervention (training) on the differences in the outcome variables between programme participants (treatment group) and non-participants (counterfactual group) (Columbia Public Health, n.d.). The quasi-experimental method of combining matching (PSM) with the DiD is one of the main methods used in the evaluation of labour market policies (Heckman et al., 1997; Smith and Todd, 2005; Díaz and Jaramillo, 2006). We have detailed the empirical procedures and the results below.

First step: propensity score matching

Rosenbaum and Rubin (1984) proposed the method of matching, which is used to match treatment and control groups. In the first step, we estimate a propensity score model. The propensity score is defined as the likelihood of receiving the treatment, that youth participate (or not) in the programme. Here, we model the probability of youth to participate in the programme using a probit model. We constructed a probit model with a binary dependent variable on receiving training (1/0) conditioned on various covariates. The covariates used in the probit model includes their age (i.e. belongs to age group 23–25 years), education (i.e. completed junior high school), access to road (i.e. residing in a community that has a road network), marital status (i.e. youth is single), sex (female/male), having a biological child, education of the male spouse or head (i.e. male spouse or head can read a sentence in English), number of adults in the household and the youth helping the family with agriculture. The list and the description of the variables used in the propensity score model are presented in Appendix 3. The selection of variables here is based on the programme implementation mechanism discussed in the previous section. The choice of covariates in the PS model is conditioned on factors that simultaneously determine participation in the training and affect outcomes (Caliendo and Kopeinig, 2008).

First stage: construction of the probit model

In the following two paragraphs, we outline results from the baseline probit result and subsequently postline probit results.

The choice of variables in the PSM are based on the nature of the intervention and other country-specific characteristics and were all selected in collaboration with MASO. The probit results in the baseline show that the likelihood of a youth participating in the training increases with age. Youths who are in the higher 23–25 age brackets are more likely to participate in the training than others. This highlights the 'maturation effect' discussed earlier. The results suggest that the presence of a biological child, youth completing at least high school or above, and the education level of the male spouse or head increases the likelihood of participating in the training. However, youth who are single are less likely to participate. We also find that having access to roads reduces the likelihood of receiving training. It could be because the availability of road networks provides other employment opportunities, so lowering the probability of training participation. The possibility of participating in the training is also lower for young women than men.

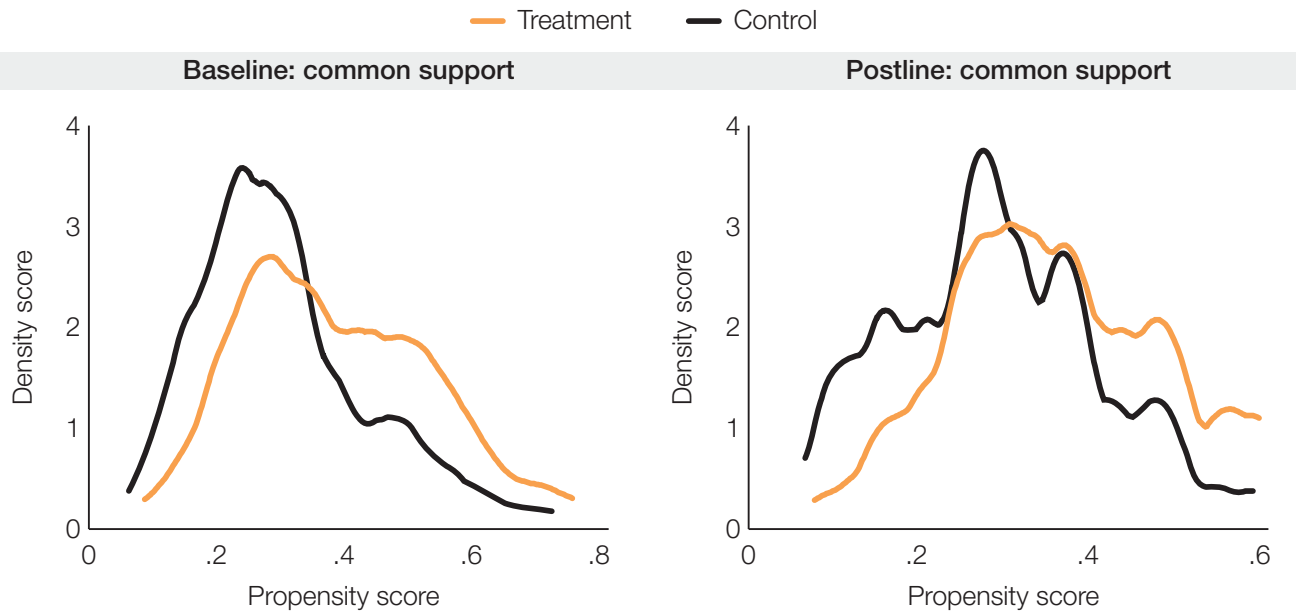
The counterfactual group here is a repeated cross-section. This suggests that the counterfactual group in the baseline and that postline surveys are different. Thus, we may not be able to use the propensity score model derived from the baseline on the postline as the counterfactual groups are different. Therefore, we have repeated the first-stage probit model of estimating the propensity score, with a binary dependent variable of receiving training (1/0) for the postline survey. We have broadly used the same set of explanatory variables in the baseline and postline probit estimations. This ensures the determinants of training participation remain consistent in both the rounds of the survey. The results suggest that the first-stage probit model derived in the baseline and postline are comparable. The first-stage probit results including baseline and postline probit results are presented in Annex 1.

Second stage: kernel matching

Using the propensity score constructed from the probit model, in the second stage we use a kernel matching algorithm to match youth who received training with similar youth who did not. The choice of kernel matching algorithm is justified as this matching method uses the weighted averages of all the youths in the control group to build the counterfactual group, and this minimises information lost compared to other matching methods (Caliendo and Kopeinig, 2008). Since we use all the information in the counterfactual group, there is a possibility of pairing a wrong match. Therefore, it is essential to impose the common support restriction here. The common support restriction assures that the distribution of the propensity score in the treatment and counterfactual group looks similar. Therefore, after matching, we have only retained observations in our sample that have met the common support condition. We have dropped observations that did not attain the common support conditions. From the baseline, we lost 264 observations in total, of which 57 are from the treatment group and 207 observations from the control group. In the postline, we lost 418 observations, 91 from the treatment and 327 from the control group as they failed to meet the common support.

PSM entails 'common support' being attained as a result of the matching exercise. This means that the distribution of propensity scores between observations from the treatment and the control group are comparable. Figure 6 suggests the probability functions outlining the treatment, and the control group are similar to each other at baseline and postline: robustness of the matching was assessed using the

Figure 6 Baseline and postline common support



PS test.[12] Appendix 2 has details on the t-test, pseudo-r-square, Rubin's B and R value obtained from the baseline (panel A) and postline (panel B) propensity score models. The t-stat compares if there is statistical significance between the means in the treatment and control group. Post-matching there should not be any difference between the two groups, the rejection of t-test on variables used in the propensity score models (both baseline and postline results) and a low pseudo-r-square confirms the same. Rubin (2001) recommends that for the treatment and the control group to be sufficiently balanced Rubin's B value should be less than 25, and Rubin's R should be between 0.5 to 2. The Rubin's B and R value reported here are within limits signifying that the treatment and the control group are sufficiently balanced.[13] On this basis, we pursued using DiD in the matched data outlined in the next section.

Second step: Difference-in-differences estimated on the matched data

Post-matching, we ran a DiD model on the matched data.

$$Y_{it} = \propto_0 + \propto_1 \text{postline} + \propto_2 \text{training} + \propto_3 \text{training} * \text{postline} + \propto_4 X_{ht} + \propto_5 X_{it} + e_{it} \quad (1)$$

The outcome variables (Y_{it}) in the 'agriculture' category includes agricultural practice, growing cocoa, and farming, observed for individual 'i' in the baseline and postline (t). Alternatively, the dependent variable Y_{it}, also consist of outcome variables reported under the categories of 'finance', 'employment', 'income' and 'pov_likelihood'. The list of outcome variables selected here are based on the ToC discussed in the conceptual framework section.

12 The PS test is conducted to assess the quality of the matching.

13 Rubin's B value is the standardised difference between the treatment and the control group in a linear propensity score model. Rubin's R is the ratio of variances between the treatment and the matched control group.

Postline is a dummy variable that takes the value 1 for postline and 0 for the baseline. The variable on training takes the value 1 for the treatment group, and 0 for the control group. **training * postline** captures the policy effect of participating in the training in the postline on the outcome variables. $\propto_3$ is the DiD coefficient indicating the average treatment effect on the treated population on $\mathbf{Y}_{it}$ in comparison with similar individuals who remain non-participants. Since we are using DiD on the matched data setting the non-participants are comparable with participants.

$\mathbf{X}_{ht}$ denotes a vector of control variables at the household level. This includes the number of adults in the household, and whether the male spouse or household head can read a phrase in English. $\mathbf{X}_{it}$ denotes the vector of individual-level characteristics controlled in all the specifications including youths having biological children, marital status (single), sex, if the respondent helps family with agriculture, and their education status (completed junior high school or above). The choice of control variables in the regression model reflects upon the covariates used in the propensity score model.[14]

Qualitative research methodology

The qualitative fieldwork was inspired by the Participatory Impact Assessment approach used to measure the impact of livelihoods based intervention in humanitarian and development contexts (Catley et al., n.d.) and had two objectives. First, collecting information on the implementation process of the MASO programme complementing the desk-based review of programme documents with both staff members and participants. Second, to triangulate quantitative results with research participants' perceived impact of the programme on youth participants. 35 key informant interviews (KIIs) were conducted, primarily with staff of five of the six implementing partners. The selection of district was made based on the highest numbers of youth participants represented in the sample of the quantitative study respectively in Asin Foso, Kasapin and Asawinso. The data collection included six focus group discussions (FGDs) with youths consisting a timeline exercise coupled with a ranking of activities and expected outcomes. When possible, FGDs were also conducted with youth participants' parents, though in some locations KIIs were conducted to make up for challenges encountered in the recruitment of participants.

Limitations

The empirical results reported in this working paper should be considered in the light of some limitations. The following section outlines the limitations that the study design is subject to.

External validity and representativeness of the control group sample

One of the main limitations is the fact that we cannot test the common trend assumption and that counterfactual is not a panel. While, to capture the variety, it would have been preferable to select as many communities as possible, budgetary and, especially, time considerations played a limiting role. For example, during baseline data collection, in Amansie West District, 10 communities were selected to accommodate all five teams of enumerators (two communities per team). In each they interviewed 22 youths. For the other districts, eight communities per district were used to account for enumerators' fatigue and enumerators' team size.

14 Control variables include children, number of adults in the household, single, gender, completed at least junior high school, male spouse or head can read a phrase in English, helps family with agriculture.

Counterfactual data collection

Enumerators encountered difficulties during the listing when recruiting youth to participate in the study, partly due to migration to urban areas. The lack of any proof of identification and difficulties relating to participants confirming their age or date of birth at the time of the study were also reported. Finally, announcements about the eligibility of the participants over speakerphone to ease the recruitment during community entry might have biased some of the responses of youth.

The PPI for Ghana was last updated in May 2019 to more accurately capture poverty levels. The changes were based on data from Ghana's 2016/17 Living Standards Survey (GLSS) conducted by the Ghana Statistical Service. Having collected postline data in February–March 2019, it is clear that the index calculated using the previous PPI are not reporting up-to-date poverty figures consistent with the new definition of poverty lines. Changes in poverty likelihood accuracy between the two indexes are related to the overall change in the economic situation of Ghana between the two time points. For our research, this implies that insights on poverty, while valuable to measure changes in young people's well-being, are based on a previous definition of poverty (Grameen Foundation, 2013).

Qualitative data collection

FGD recruitment of youth was sometimes challenging and limited to the treatment group and representative of three districts only. Some of the selected MASO communities could not be visited due to poor road networks and roads being blocked due to construction work. One of the youth FGD transcripts was not received. Despite a smaller sample, we collected sufficient qualitative data to confirm the implementation process of programme activities to contextualise and inform our findings.

Despite the above mentioned limitations, which must be stressed, we did not consider these to be critical to the overall analysis. However, results must be interpreted with caution.

3 Econometric results

The primary objective of this research was to assess whether or not the MASO programme had contributed to improve economic outcomes for youth participants, and if so through which implementation mechanisms and why. The secondary objective of this research was to measure the impact of the programme on youth knowledge and skills acquisition, behaviour and attitude changes as outlined in the ToC.

This section discusses the results of the PSM analysis and explores the rationale behind the findings. Overall, it aims at aligning evidence on mechanisms, outcomes and contexts against the programme theory (see Figure 2). The list of variables and details on how they were constructed is available in Appendix 3. The estimated result of (1) for the various outcomes listed in the 'agriculture' category is presented in Table 3. Panel A in Tables 3–8 is the estimated effect of the training on the whole sample. Panel B is the estimated effect on the sub-sample of young women and panel C is the estimated effect on young men. We have further evaluated the impact of the training based on the age cohort classification of the respondents. We have split the sample into two age cohorts, a cohort of younger youths aged 17–19 years[15] and a cohort of older youths aged 20–25 years.[16] Sub-sample estimates provided here compare the differences in the behavioural responses based on the treatment recipients' sex and age.

Patience Normenyo, a MASO youth from Tweapease, New Edubiase, Ghana. © MASO/Solidaridad.

15 Age 17–19 includes youth who were 17–19 years old in the baseline. Two years after the baseline survey these youth moves towards the age cohort of 19–21 years in the postline. The sub-sample estimates on age 17–19 years takes the value 1 if the youth belongs to age 17–19 years (in the baseline) and 19–21 years in the postline.

16 Age 20–25 year includes youth that are under 20–25 years old in the baseline. Subsequently, two years after the baseline survey these youth moves towards the age cohort of 22–27 years in the postline. The sub-sample estimates on age 20–25 years takes the value 1 if the youth belongs to age 20–25 years (in the baseline) and 22–27 years in the postline.

In the subsequent sections, we have detailed the findings on the outcome variables studied under each category: 'agriculture', employment', 'finance', 'income' and 'poverty'. Also presented are findings on social relations and gender norms, as well as unintended effects identified during the qualitative field study. Finally, the sustainability of the MASO project is assessed in the final section.

3.1 Agriculture

Considering that the average cocoa-growing cycle takes five years, it is de facto too early to assess youth farming productivity based on cocoa yield, particularly for Ghanaian youth who have started cocoa nurseries during the MASO programme. Hence, this impact evaluation is measuring the youth uptake of some of the cocoa-farming practices taught during the training and the proportion of youth growing cocoa and farming (for cocoa-associated crops) as proxies to measure the impact of the programme on youth engagement in mixed-crop farming.

Box 1 Agriculture – key results

- **Youths who receive training are more likely to farm** (21.3 percentage points (pp)) compared to similar youths who do not receive the training. **The probability of young women engaging in farming is higher** (22.7 pp) compared to men (19.8 pp).
- Respondents who are in the age bracket 17–19 years are twice as likely to be engaged in farming (33.5 pp) compared to the 20–25 years cohort (17.2 pp).
- **Youths who receive training are more likely to grow cocoa** by 22.5 pp, compared to similar youths who do not receive the training. However, **young men are twice as likely to grow cocoa (30.8 pp) compared to young women (15.1 pp).**
- The **adoption of good agricultural practices is stronger among young women** (26.3 pp) than male participants (22.8 pp).
- Overall, the access to land variable (whether land is owned or rented) was statistically insignificant across age groups and sex.

Impacts on youth participation in farming activities

We find that youths who receive training are more likely to farm (21.3 pp) than similar youths who do not receive the training. These results further support the literature, as Bonan and Pagani (2017) also found evidence that community-based agricultural training for youth in northern Uganda increased participants' agricultural knowledge, proxied by an index of qualitative questions, by 0.77 to 0.95 standard deviations as well as overall attitude towards farming (ibid.). In the qualitative group discussions, youth ranked training in establishing cocoa nurseries and agricultural practices as the most impactful activities. The probability of young women engaging in farming is higher (22.7 pp) than for men (19.8 pp). Access to land, which is often more problematic for young women than men, and non-cocoa crops requiring less financial collateral and a shorter period needed to access land could explain young women's higher level of engagement in farming activities than for men and the overall sample. Additionally, in the MASO cocoa academy, youth were taught to grow cocoa-associated crops such as plantain, cassava and maize. Crop diversification is generally encouraged for its capacity to decrease risks, including pest outbreaks, the transmission of pathogen and protection of crops from climate disparities, ultimately strengthening environmental resilience (Lin, 2011, in Cadger et al., 2016).

Qualitative data indicates that some authorities may have granted land access to young women for food crops production. What drove those decisions could be result of the changing perception of adults on youth engaging in farming over time in MASO communities (Kodom, 2018). This suggests

that young people's access to land is correlated with their ability to farm non-cocoa crops. The empirical results also indicate that the respondents who are in the age bracket 17–19 years are twice as likely to be engaged in farming (33.5 pp) than the 20–25 year group (17.2 pp).

> Earlier, there was no training in farming or anything of the sort, so the youth were not interested in farming. They just did anything they liked. Now, there has been proper training and they know how to go about their farming like professionals and they are even teaching us.
>
> **FGD Youth relatives**

To summarise, the findings on the outcome variables on agriculture suggest that the overall effect of training is positive in improving agricultural practices, promoting cocoa cultivation and boosting youth participation in farming. Qualitative evidence suggests that once acquired, youth tend to adopt long-lasting good agricultural practices. There are differences in the behavioural response of young men and women in all the outcomes reported in Table 3. The most significant difference is with cultivating cocoa, as men are twice as likely to grow cocoa as women. This is probably due to the prevalence of patriarchal domination in cocoa cultivation as well as barriers to women accessing finance and land. Farming non-cocoa crops do not require young women to enter into contractual agreement in comparison with starting a cocoa enterprise requiring land access for the cultivation of semi-permanent trees. The younger age cohort face similar challenges in accessing land and finance, resulting in greater impact of the training for farming than cocoa-growing outcome variables. Overall, the access to land variable (whether owned or rented) was statistically insignificant across age groups and sex.

Impacts on youth participation in cocoa-farming activities

We find that youths who receive training are more likely to grow cocoa by 22.5 pp, in comparison with similar youths who do not receive the training. However, young men are twice as likely to grow cocoa (30.8 pp) as young women (15.1 pp). Due to traditional social norms and limited gender economic independence, difficulty in accessing land in non-matrilineage regions and on the effect of the type of land ownership typical of each region in Ghana (Sarpong, 2006), as well as the 'tedious' and 'physical' nature of the work, some young women are often excluded from the cocoa-growing workforce. However, gradually changing norms along with holistic training, including the distribution of cocoa seedlings, have increased female youth participation (50%) in cocoa-growing activities in comparison to female non-participants (7%) and male non-participants (17%) as indicated by the descriptive statistics (see appendices). As outlined earlier, qualitative data from interviews and FGDs indicates that in some rural communities, due to cultural restrictions, women are not allowed to access agricultural land or, if they do, they have little control over resources deemed essential for their productivity. One year after graduating from the training, disparities between female and male participants remain despite great strides having been made since their enrolment, with 60% of females farming or cultivating their own land or rented land against 82% of males. While the situation in Ghana is considered better than in other countries, gender differences are also supported by recent data on gender gaps, ranking inheritance rights for daughters 0.75 on a scale of 0 to 1 where 1 is worst (World Economic Forum, 2019). This adversely impacts young women and prevents them from cultivating cocoa as the crop requires long-term commitment and financial investment.

> Most women are into cocoa production but they usually hire labour for most of the activities and that becomes a financial burden to them. The men can easily do that but the women spend a lot of money in hiring labour.
>
> **Project Officer**

During the qualitative data collection, mentions of the relevance of the gender and legal training from youth participants (introduced after the quantitative data collection) was reported as a positive driver for young female participation in cocoa farming.

In the qualitative interviews, cocoa growing was increasingly perceived by youth as a profitable business after the training. However, in some instances participants reported that it also represented a step to continuing one's education or towards other unexplored career paths. This held particularly true for young women.

> With last year's yield I bought a sewing machine and this year I am planning to learn sewing. I want to leave the cocoa to my father and concentrate on sewing. I have been trained and put in a book everything I have learned, so I am planning on teaching to my father and my siblings will learn from him. The farms will belong to me when he dies because I am the elder sister.
>
> **Youth female participant**

However, youth in the higher age cohort (20–25 years) tend to cultivate cocoa more (27.2 pp) than those in the lower age cohort (17–19 years) and female youth. The results on cocoa cultivation are insignificant for respondents in lower age cohort (17–19 years). Qualitative data from interviews suggests that younger youths' greater geographic mobility may constrain them from committing to long-term farming projects such as cocoa growing and may favour business activities in the cocoa value chain. There also seems to be a correlation between entrepreneurship activities and education, with more educated youths' aspirations leaning towards the business aspect of the cocoa value chain as opposed to offering labour services.

> Those [youths] who are a bit older are more inclined towards practical cocoa farming. Thus they are more interested in going to the farm while the younger ones (aged 18–20 years) are more interested in the business aspects of the cocoa value chain.
>
> **MASO Project Officer**

> The younger youth are not so interested in practical cocoa farming as compared to the older ones. Most of the younger ones have had some form of education, thus their interest wasn't really on the cocoa farming. They preferred business to cocoa farming.
>
> **Community gender champion**

Impacts on agricultural practices

Sound cocoa-farming practices represent one of the key indicators for future cocoa productivity and sustainability of the cocoa farms. This is evidenced by the Cocoa Research Institute of Ghana's classification of farmers per level of productivity, the highest (yields 1,400 per ha) responsible for the production of only 5% of total outputs facilitated by consistent fertiliser application, weeding, pruning, shade trees, disease management and crop protection practices (Löwe, 2017). The curriculum of the MASO CocoAcademy was divided into three modules designed according to the growth stages of cocoa and covered areas ranging from: (1) farm establishment including access to land; (2) farm management including climate smart approaches for cocoa; and (3) harvest and post-harvest operations including

record keeping and occupational health and safety (Manual, 2016). Finally, aspects of the manual covered social issues as well as life and financial skills such as leadership potentials and gender in agriculture (Solidaridad West Africa, 2016). The 'adoption of better agricultural practices' variable was constructed based on participants' positive response to at least one of the following practices: burying agricultural containers outside the farm; using inorganic substances to maintain the soil fertility; maintaining shades on the farm; burying outside the diseased pods that were cut off from the farm.

> […] how we are planting crops, grow the crops new method we used increase the yield of cassava for example, plantain and maybe cocoa. First year I harvested was in 2019, the way my mum and dad did the cocoa, we do now lining and pegging, we see from that year too wind and sun go through to help us yield more cocoa, sometimes you need sunlight not always the shade for new nurseries.
>
> **Young male**

We find that youths who receive training increase the adoption of better agricultural practices by 24.8 pp compared to similar youths who do not receive the training. The adoption of good agricultural practices is stronger among young women (26.3 pp) compared to male participants (22.8 pp). On evaluating the impact of the training on different age cohorts (age 17–19 cohort and age 20–25 cohort), we find comparable results between the two age groups on the adoption of agricultural practice.

Table 3 Agriculture

	Good agriculture practice (1/0)	Grow cocoa (1/0)	Farming (1/0)
All (Panel A)			
Training	0.159***	0.256***	0.227***
	-0.01	-0.04	-0.02
Postline	0.0464***	-0.240***	0.0518***
	0	-0.03	-0.01
Postline * training	0.248***	0.225***	0.213***
	-0.02	-0.04	-0.02
Number of observations	4,352	2,666	4,352
F-stat	101.8	148.8	174.3
R-square	0.243	0.317	0.249
Women (Panel B)			
Training	0.0940***	0.264***	0.161***
	-0.01	-0.06	-0.02
Postline	0.0358***	-0.198***	0.0478**
	-0.01	-0.04	-0.01
Postline * training	0.263***	0.151*	0.227***
	-0.03	-0.07	-0.04
Number of observations	2,264	1,329	2,264
F-stat	30.09	38.22	55.08
R-square	0.194	0.244	0.193

Table 3 cont.

	Good agriculture practice (1/0)	Grow cocoa (1/0)	Farming (1/0)
Men (Panel C)			
Training	0.221***	0.242***	0.287***
	-0.025	-0.05	-0.02
Postline	0.0558**	-0.288***	0.0529*
	-0.01	-0.04	-0.02
Postline * training	0.228***	0.308***	0.198***
	-0.03	-0.06	-0.03
Number of observations	2,088	1,337	2,088
F-stat	70.09	89.01	111.9
R-square	0.26	0.326	0.274
Age 17–19 (Panel D)			
Training	0.0941***	0.388**	0.0868**
	-0.02	-0.12	-0.03
Postline	0.0378**	-0.171*	0.0511*
	-0.01	-0.08	-0.02
Postline * training	0.254***	0.00373	0.335***
	-0.04	-0.13	-0.05
Number of observations	1,201	648	1,201
F-stat	11.49	15.98	22.96
R-square	0.189	0.252	0.201
Age 20–25 (Panel E)			
Training	0.175***	0.231***	0.266***
	-0.02	-0.04	-0.02
Postline	0.0555***	-0.246***	0.0605***
	-0.01	-0.03	-0.01
Postline * training	0.241***	0.272***	0.172***
	-0.03	-0.05	-0.03
Number of observations	3,151	2,018	3,151
F-stat	90.81	124.6	137.2
R-square	0.254	0.321	0.253

Robust standard errors: *p<0.05,**p<0.01,***p<0.001

3.2 Employment

We examined the impact of the training of three outcome indicators on employment (Box 2). This includes employment activity in the previous seven days, 12 months, and also hours worked in the previous seven days. The variables on participation in employment (employment activity in the last seven days and in the last 12 months) capture the extensive labour supply margins. While the number of hours worked in the last seven days (log) reflects the intensity of labour supply. We also examined the impact of the training on self-employment and compare the youth sectors of employment and self-employment, as well as youth job satisfaction, between baseline and postline.

Box 2 Employment – key results

- Overall, **we do not find any significant impact of training on the extensive labour supply** margins (seven days and 12 months) for both the overall sample, the male sample, the female sub-samples and for those who are in the 20–25 year age group compared to non-participants.
- The sub-sample estimates suggest that **youths in the lower age cohort (17–19 years) have increased their employment participation in last seven days (11.2 pp).**
- Descriptive statistics indicate that **MASO participants' job satisfaction generally increases** between youth enrolment in the training (baseline) and one year after their graduation (postline) across age groups, predominantly for males, though **not for young females.**
- Youth who participated in the skills training programme have **significantly improved their hours worked** (11.2 pp), compared to non-participants in the control group. Similarly, on average, men are more likely to increase their intensity of labour supply (17.4 pp). For the sub-sample of young men, we find an impact only on their hours worked.
- **For young women we find that the training significantly boosts their participation in business-related activities** (by 11 pp); however, we did not find significant impact on any of the employment outcome variables.

Impacts on youth extensive labour supply

Overall, we do not find any significant impact of training on the extensive labour supply margins (employment activity in the last seven days and in the last 12 months) for both the overall sample, the male sample, the female sub-samples and for those who are in the 20–25 age group compared to non-participants (Figures 7 and 8). The sub-sample estimates suggest that youths in the lower age cohort (age 17–19 years) had increased their employment participation in preceding seven days (11.2 pp), mirroring the findings of a school-based financial literacy programme called Honest Money Box in Ghana, which was found to increase participants' number of days worked in the previous month by 0.68 days (Berry et al., 2018). These findings need to be contextualised within the cocoa cycle spread over several months twice a year in Ghana. Crops tend to be harvested between a main-crop (October and March) and a mid-crop season (June–September) (Better Than Cash Alliance and World Cocoa Foundation, 2020a). The latter accounting for about 15% to 20% of the total harvest (ICCO, 2014). The lean season could last from April to July depending on the variety of cocoa and on the climate (Hirons et al., 2018). Quantitative data was collected in February 2017 and 2019 soon after most youth are likely to have harvested and sold their cocoa. The seasonal nature of cocoa cultivation justifies the large majority of insignificant results for the employment variable in the preceding seven days. However, this does not justify the results for the outcome variable on employment in the preceding 12 months, which may be explained by youth potential recall bias. Despite limited impacts on youth participation in employment, we observe changes in young people's attitude towards economic activities in regard to farming throughout the qualitative analysis.

> An important change is change in mindset when it came to farming, before thought it as mean of survival, not a business. Now no longer survival but business solution.
>
> **Business coach**

However, descriptive statistics below indicate that youth job satisfaction generally increased between youth enrolment in the training (baseline) and one year after their graduation (postline) across age groups and for males, though not for young females. By disaggregating youth employment by sectors from the descriptive statistics, we observe as per the above sub-sample impact evaluation results that more male and older age youth cohorts are engaging in cocoa farming than are female cohorts between the two time periods, with an important decrease for females from 28% at baseline to 6% at postline. Young females represent the only sub-group with an increase in farming activities from 45% at baseline to 60% at postline.

Figure 7 Employment sector disaggregated by sex

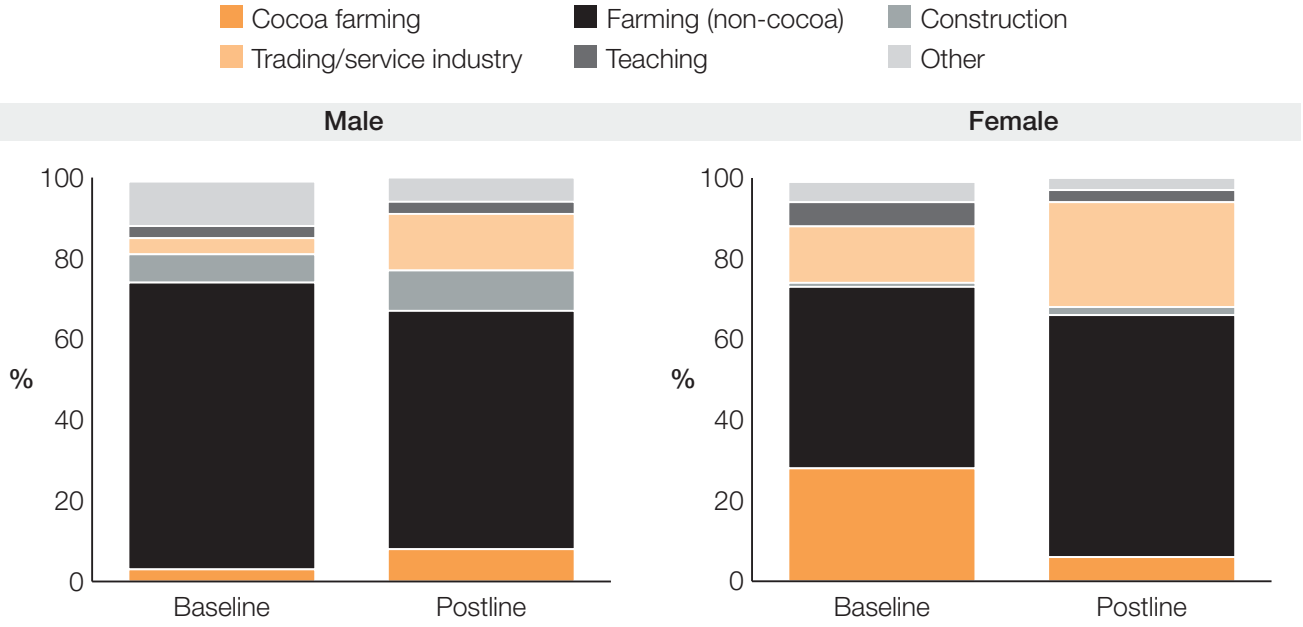
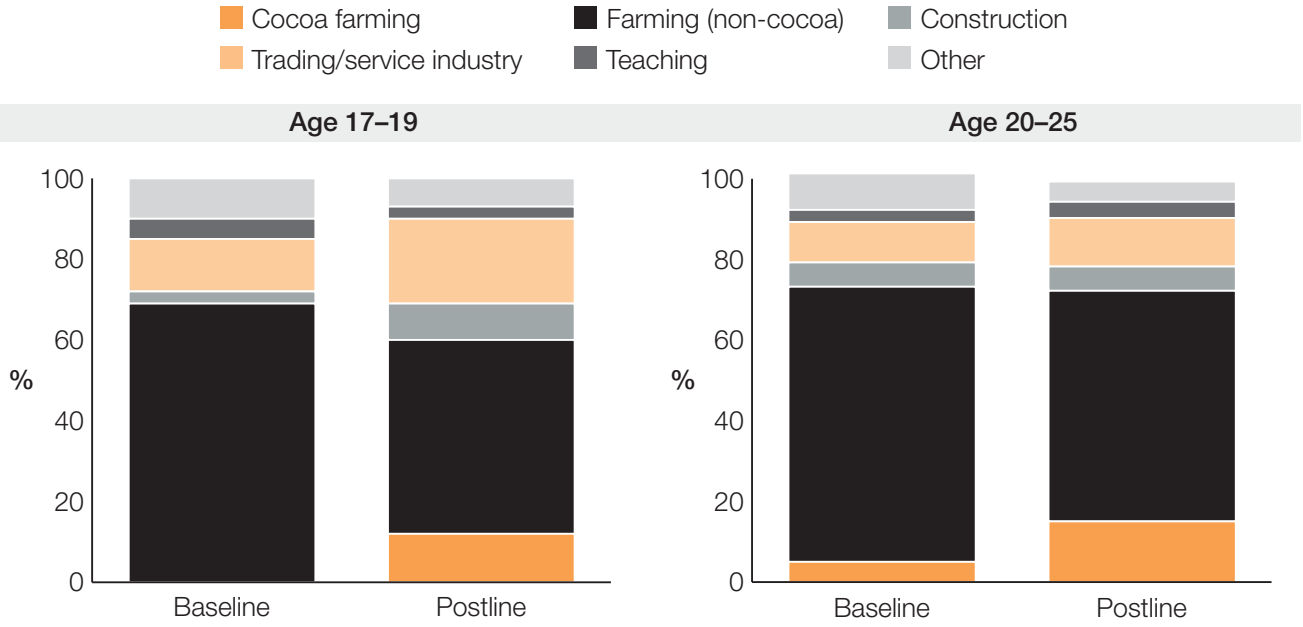


Figure 8 Employment sector disaggregated by age



However, we note an increase in the younger age cohort for cocoa farming and a decrease in non-cocoa farming. Youth participation in trading and the service industry has increased across all sex and age groups, with notable differences for male and female, respectively 4% and 14% at baseline and 14% and 26% at postline.

Impacts on youth intensity of labour supply

Youth who participated in the skills training programme have significantly increased their working hours (11.2 pp), compared to non-participants in the control group. Similarly, on average men are more likely to increase their intensity of labour supply (17.4 pp). For the sub-sample of young men, we find an impact only on their hours worked. For the sub-sample of young women, we do not find any significant effect on their intensity of labour supply. Overall, then, we did not find significant impact on any of the employment outcome variables for young women. This is likely to be because women engage more in domestic chores and childcare responsibilities than men. From our data, we find that 70.85% of young women have a biological child, compared to 25% of men in the sample. The presence of a child increases the caring responsibilities of young women. Hence, they tend to choose flexible employment opportunities in the form of small family-run businesses. To empirically test this, we estimated the impact of training on the respondent doing any type of business or trade in the last 12 months. For the male sub-sample, we do not find a statistically significant effect of the training on the outcome of business or trade. However, for the female sub-sample, we find that the training significantly boosts their participation in business-related activities by 11 pp. This substantiates our previous claim on young women choosing flexible self-employment opportunities and on young men more likely to be employed for the delivery of labour services.

> Both males and females are into cocoa farming. However, when it comes to business, the men are more interested in offering labour services like pruning, spraying, etc. That notwithstanding we have two ladies in the Abebrese community who are also into labour services like spraying. The women are generally interested in selling or trading along the cocoa value chain.
>
> **Project Officer**

Similarly, this result aligns closely with impact evaluations of other youth programming. Bandiera et al. found a vocational training programme targeting adolescent girls increased participants entrepreneurial skills and had statistically significant impact on self-employment income (Bandiera et al., 2015). As per the graph in Figure 9, descriptive statistics suggests that young women's core self-employment activity is in trading as per baseline (64%) reaching 71% of their activity at postline, followed by food processing. These are representative of the sociocultural environment and the opportunities available to young women in rural Ghana encouraging diversification in addition to farming activities. Furthermore, these findings underline those in the literature in this area indicating that programmes, such as MASO, that provide young women with training on both economic and social norm constraints lead to significant improvements in business skills and engagement in income-generating activities (Bandiera et al., 2015). Furthermore, we observe that MASO youth (66% of males and 41% of females) have improved the record-keeping for their businesses following their participation in the training (32% of male and 32% of females report this).

From the descriptive statistics, we find that the proportion of young female entrepreneurs trading increases to 71% and remains important, though we observe a greater increase from male (16 pp) in comparison to female (7 pp) between baseline and postline. The proportion of hired labourers has significantly contracted from 35% to 13% for male while food processing decreased from 25% to 19% for young women.

When disaggregating by age groups, we find that the proportion of youth engaged in food processing more than doubles from 11% to 23%, closely followed by artisan activities (11% to 19%) (Figure 10). However, we observe a decrease in the proportion of youth hired labourers from 26% to 6% between baseline and postline. For the older age group (20–25 years old), the proportion of trading greatly increases (15 pp) while all other sectors, except for financial services, decline.

We do not find major differences at baseline between age groups; however, there are some differences in postline for business and job sectors. Namely, a large share of older youth has trade-related businesses, while only half of younger cohort do. Similarly, the majority of all youth are employed in the farming sector, but younger youth seem to switch to trading/service work at postline.

Figure 9 Self-employment sector disaggregated by sex

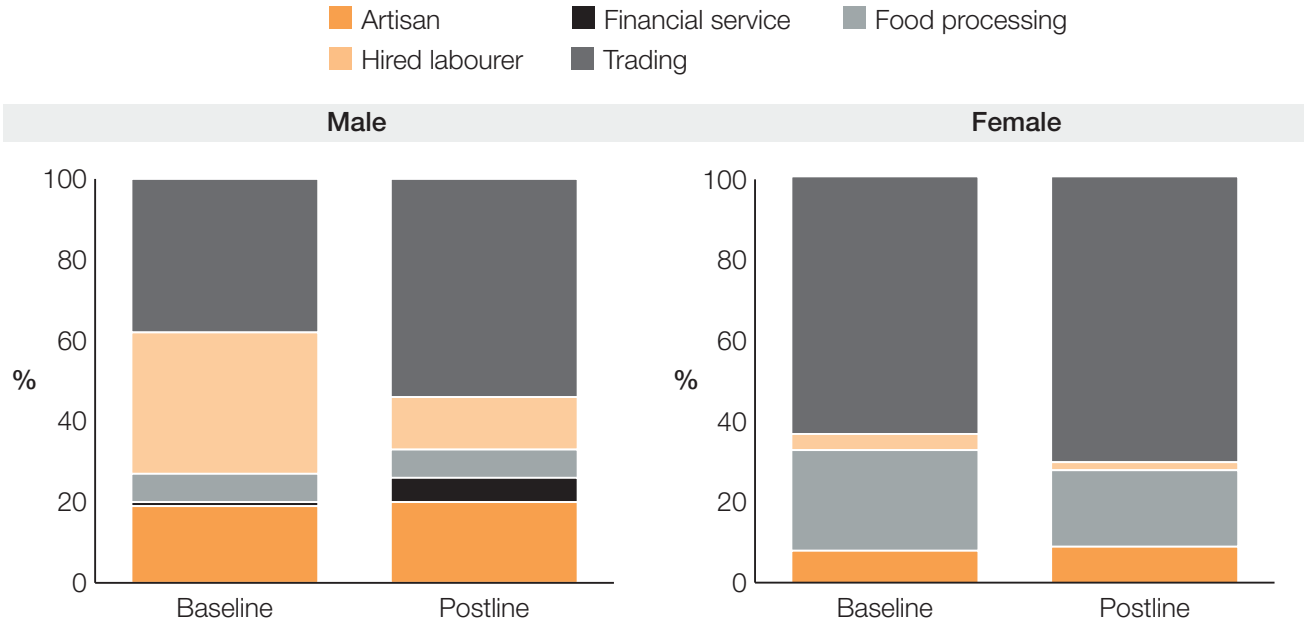
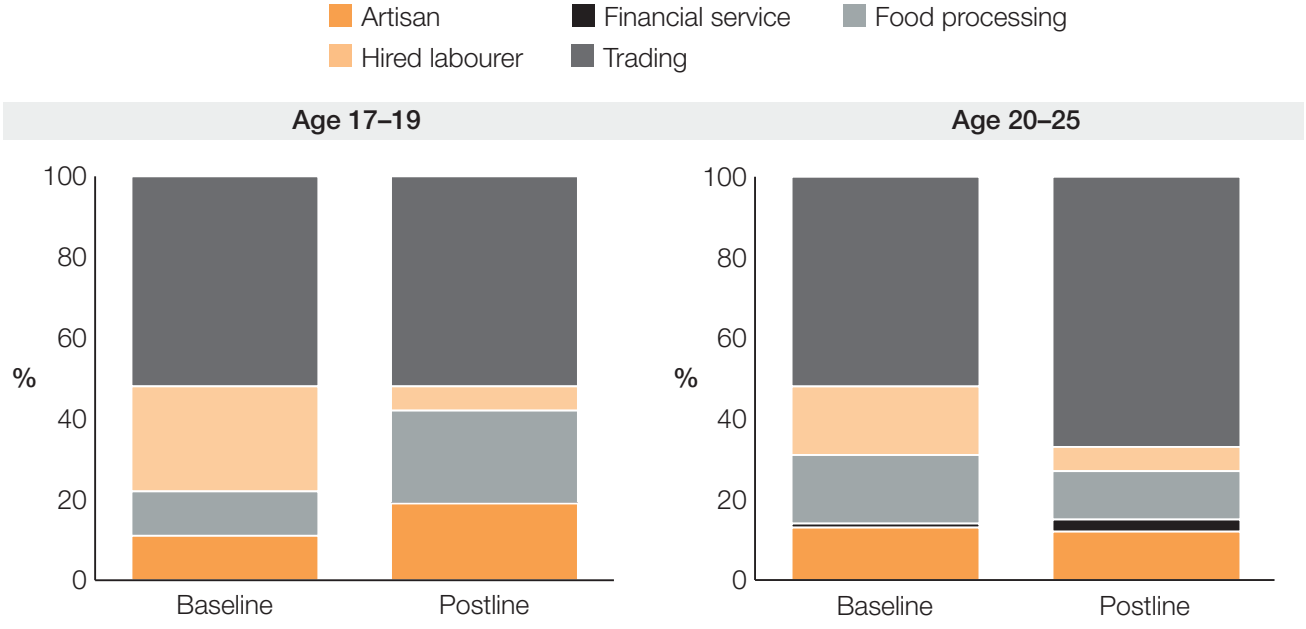


Figure 10 Self-employment sector disaggregated by age



Patience Normenyo is trained by COCOBOD as a pollinator and supervises cocoa pollination in Tweapease, New Edubiase, Ghana. © MASO/Solidaridad.

The sub-sample estimates suggest that youths in the lower age cohort (age 17–19 years) have increased the hours worked during the previous seven days (23.8%). Hence, the impact of the training on employment is only visible for youths in the age group of 17–19 years, an interesting finding that is not substantiated by qualitative data and common assumptions that youth in the older age group (20–25 years old) would have better economic outcomes.

> Because I acquired knowledge on how to peg during planting, the forest ministry employed some of us to work for them.
>
> **Youth participant**

As cocoa growing is a seasonal activity, youth were encouraged to diversify their production (also compatible with farming practices for establishing cocoa nurseries). The findings on the employment section suggest that the training improved the intensive labour supply rather than the extensive labour supply. Overall, youths who took part in the training have significantly improved their number of hours worked, but it does not affect their overall employment participation. This is likely to be because of the seasonal nature of the cocoa sector resulting in a higher number of hours worked in a day during the cocoa season and lower activity during the lean season. These findings are similar to that of an impact evaluation of a youth self-employment training programme in Uganda; the authors found this programme to increase total hours worked by 17% relative to the control group, but did not find a direct impact on the extensive self-employment labour supply (Blattman et al., 2014). There are no statistically significant effects of the training on young women's employment outcomes.

From the descriptive statistics, we found that job satisfaction tends to increase greater for male than female with respectively a 15 pp difference against 4 pp between baseline and postline though, these findings are coupled with an increase in the proportion of female not satisfied from 27% to 32% (Figure 11).

We found less differences across age groups than sex groups with both youths aged 17–19 years old at the time of enrolment and a year after they graduated from the MASO programme (Figure 12). However, the older cohort's proportion of very satisfied youth increased by 14 pp between the two time-periods.

Figure 11 Job satisfaction disaggregated by sex

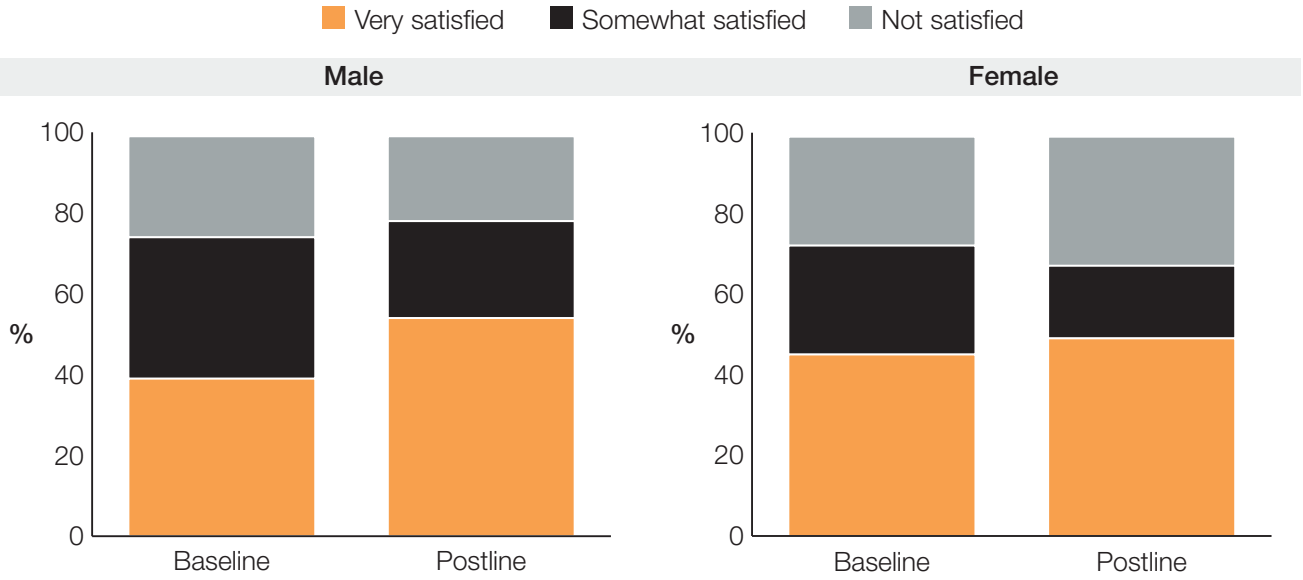


Figure 12 Job satisfaction disaggregated by age

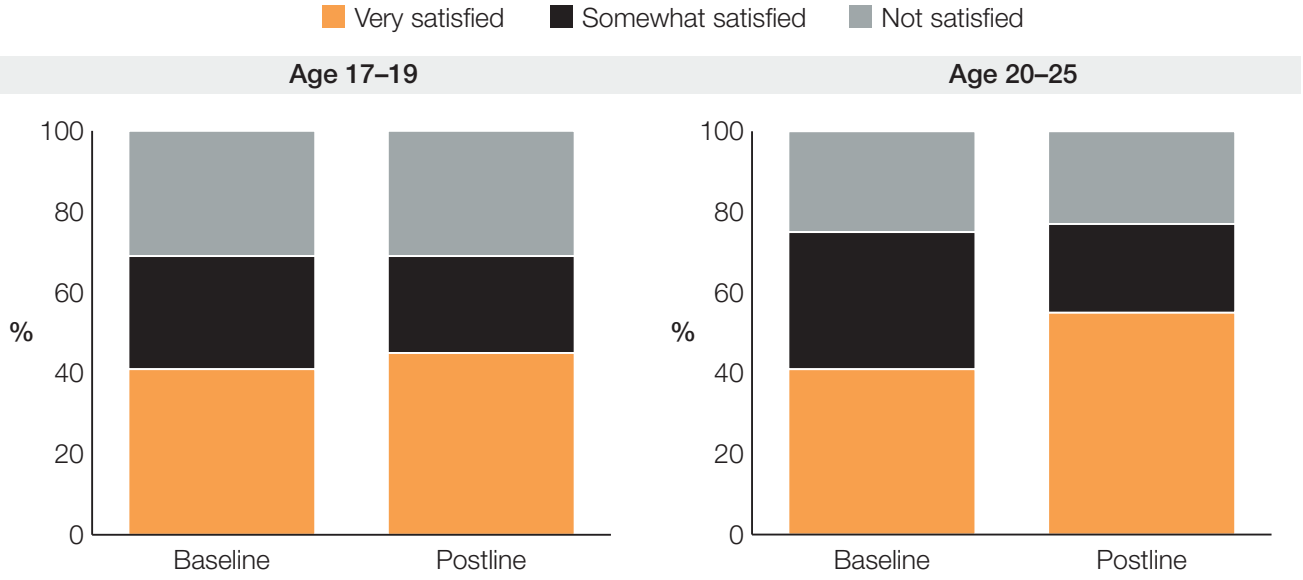


Table 4 Employment

	Emp. last 7 days (1/0)	Emp. last 12 months (1/0)	Hours worked in last 7 days emp. (1/0)
All (Panel A)			
Training	0.00533	0.0529*	-0.0598*
		-0.02	-0.02
Postline	0.00184	0.0901***	-0.0201
	-0.013	-0.01	-0.02
Postline * training	0.0293	0.031	0.112**
	-0.02	-0.02	-0.04
Number of observations	4,352	4,352	4,325
F-stat	35.97	54.33	32.47
R-square	0.0775	0.107	0.0723
Women (Panel B)			
Training	0.00181	0.0371	-0.0204
	-0.01	-0.02	-0.02
Postline	0.00223	0.0540**	-0.00469
	-0.01	-0.02	-0.02
Postline * training	0.0106	0.0453	0.0472
	-0.02	-0.03	-0.04
Number of observations	2,264	2,264	2,255
F-stat	2.103	4.01	1.777
R-square	0.0089	0.0166	0.0073
Men (Panel C)			
Training	0.00756	0.0702*	-0.0988
	-0.02	-0.03	-0.05
Postline	-0.000726	0.130***	-0.0409
	-0.02	-0.02	-0.04
Postline * training	0.0472	0.0101	0.174*
	-0.04	-0.04	-0.07
Number of observations	2,088	2,088	2,070
F-stat	1.336	6.061	1.827
R-square	0.00552	0.0248	0.00735

Table 4 cont.

	Emp. last 7 days (1/0)	Emp. last 12 months (1/0)	Hours worked in last 7 days emp. (1/0)
Age 17–19 (Panel D)			
Training	-0.0554	0.0122	-0.151**
		-0.03	-0.04
Postline	-0.0079	0.133***	-0.0143
	-0.02	-0.02	-0.04
Postline * training	0.112*	0.0796	0.238**
	-0.04	-0.05	-0.08
Number of observations	1,201	1,201	1,196
F-stat	9.545	20.39	8.416
R-square	0.0753	0.137	0.0697
Age 20–25 (Panel E)			
Training	0.0234	0.0619*	-0.0349
	-0.02	-0.02	-0.03
Postline	0.00736	0.0791***	-0.0203
	-0.01	-0.02	-0.03
Postline * training	0.00314	0.0181	0.0748
	-0.02	-0.03	-0.05
Number of observations	3,151	3,151	3,129
F-stat	27.88	37.84	25.24
R-square	0.082	0.102	0.0769

Robust standard errors: *p<0.05,**p<0.01,***p<0.001

3.3 Income and poverty likelihood

In the income and poverty likelihood section we examined the impact of the holistic cocoa training on the youths, short-term (log of monthly income during the previous seven days) and long-term income (log of income in the last 12 months). We have also evaluated the impact of the MASO programme on poverty likelihood (Box 3).

Box 3 Income and poverty likelihood – key results

- We find that the **training has increased the short-term income (log of income in the last seven days)** by 23%. However, the impact on long-term income (log of income in the last 12 months) is insignificant.
- We find a significant **positive effect on the training on income (in last 12 months) for the sub-sample on men.**
- The results of **crop income are not significant** for most outcome variables. We only find statistically significant results for the younger age cohorts with a 1.4 pp increase.
- Overall, **the training reduced the poverty likelihood of the participants by 2.71%.** The poverty reduction impact of the training is stronger on youth in the 20–25 years group (3.9%). However, we do not find any significant impact of the training for the other sub-groups studied here.

Impacts on income

We find that the training has increased the short-term income (log of income in the last seven days) by 23%. We find a positive effect on the training on income (in last 12 months) for the sub-sample on men. For all the other estimations, the impact of the skills training on the long-term income[17] (log of income in the last 12 months) is positive but statistically insignificant. The variable on income earned during the previous 12 months is inclusive of cocoa income, though it does not account for non-cocoa crop income. Given that young men are twice as likely (31%) to grow cocoa than young women (15%), the income generated from cocoa must have influenced this result. The sub-sample estimations also suggest that young women and the lower age cohort (17–19 years) group are likely to increase income in the previous seven days by 51% and 60% compared to men in the same age cohort in the counterfactual group.

> So much time [is spent] in reproductive activities which is unpaid work – how much time have they [young women] left on farming? There is a need to find ways to engage in the community to be supportive of women's reproductive role so they can have enough time to focus on productive activities that brings in an income.
>
> **Gender advisor**

We calculated non-cocoa crop income for the preceding 12 months in an effort to further investigate the impact of the training on youth farming income. Youths were trained to grow cocoa-supporting crops and to diversify their sources of livelihoods and it is expected that non-cocoa crops are

17 Variable construction: Total income in the past 12 months = total cocoa income + total livestock income + total entrepreneurship income + total employment income.

generating more frequent revenues due to seasonality. Overall, the results of non-cocoa crop income are not significant for most outcome variables. We only find statistically significant results for the younger age cohorts with a 1.4 pp increase.

> Before 2017, their involvement with work was not encouraging at all. Most of them did not have any meaningful work to do. Now those who joined MASO are doing better in terms of income-generating activities and keeping themselves busy.
>
> **Local leader**

Impacts on poverty likelihood

An essential limitation of using an income/expenditure-based poverty measurement is that it fails to take into account those who are structurally poor (Desiere et al., 2015). Income/expenditure-based poverty measurements used by the World Bank and other international organisations classifies someone as poor if their income/expenditure level is lower than a predefined threshold, also known as the poverty line. However, individuals can be transient poor if their income is below the poverty line at a given point but has sufficient assets to break the poverty chain over time (Barrett et al., 2006; Baulch and Hoddinott, 2000). Structurally poor individuals lack assets that are essential to escape poverty. Having acknowledged those limitations, an asset-based approach to measure youth poverty likelihood was calculated. The advantage of using this approach is that it helps to differentiate between youths who are structurally poor and those who are transient poor (Carter and Barret, 2006).

The use of an asset-based approach (poverty likelihood index) as a poverty-measurement tool here provides insights into the impact of the training on long-term, structural poverty. The poverty index used provides insights as to whether the training has any effect on the probability that a household is living below the $2 per day poverty line[18]. Poverty likelihood or the Progress out of Poverty Index[19] is considered to be an objective and cost-effective tool used by development agencies to measure poverty (Desiere et al., 2015). This poverty-measurement tool estimates using the answers to a set of 10 country-specific questions about household characteristics and asset ownership.[20] Each answer has an allocated score, which is used to compute the likelihood of a household to be living under the $2 per day poverty line. By averaging the poverty likelihoods of a group of individuals, we can estimate the actual poverty rate of the group in question.

Savings and access to credit improve the borrowing ability of the poor, which fuels investment, thereby improving asset ownership and reducing structural poverty. This also holds true for young people.

18 Based on World Bank's definition of extremely poor people: those who live on $1.90 a day or less.

19 Based on PPI for Ghana 2012.

20 10 country-specific questions:

1. How many members does the household have?
2. Are all household members aged 5 to 17 currently in school?
3. Can the male head/spouse read a phrase/sentence in English?
4. What is the main construction material used for the outer wall?
5. What type of toilet facility is usually used by the household?
6. What is the main fuel used by the household for cooking?
7. Does any household member own a working box iron or electric iron?
8. Does any household member own a working television, video player, VCD/DVD/MP3/MP4 player/iPod, or satellite dish?
9. How many working mobile phones are owned by members of the household?
10. Does any household member own a working bicycle, motorcycle or car?

Poor households or individuals that have access to credit (formal/informal), savings can get the funds required and are thereby able to build assets and exit poverty over time (Carter and Barret, 2006). The increase in saving behaviour (number of saving places) and the use of banks (formal institutions) for saving has fostered financial inclusion. It has also reduced the likelihood of being asset poor. Initial asset ownership is also linked to the impact of financial literacy programmes on participants. Frisancho, using data from a randomised control trial of a financial literacy programme for Peruvian participants in households with higher asset index scores, finds that these experienced larger increases in financial skills relative to other participants (Frisancho, 2019).

The results suggest that poverty likelihood falls by 2.71% for the treatment group. The findings from the whole sample indicate that training raises youths income and reduces poverty. Access to finance in the form of savings plays a vital role in determining asset ownership as demonstrated above. The programme persists to reduce asset poverty reduction for both the young women (2.49 pp) and young men (2.70 pp) sub-samples; however, the parameters of the estimates are insignificant. Rather, we find a positive but insignificant effect of the training on poverty likelihood for the lower age cohort group (17–19 years) who seem to be progressively building their assets. For youths in the 17–19 age group, the programme had no significant impact on their saving behaviour (number of places used to save or saving at banks), which increases their likelihood of being asset poor. The poverty reduction effect (3.97%) is the strongest for the older age cohorts (20–25 years). Due to their becoming more mature, youth in this age cohort also had a strong tendency to save and to use formal institutions like banks to keep their funds in, which perpetuates asset formation and substantially reduces the probability of their being poor. Youth who gained access to finance and were subsequently able to invest into a cocoa business would not see a return on investments before the fifth year following their enrolment in the MASO programme. Five years after youth have first planted a cocoa seed, cocoa maturity will be reached. Hence, any substantial income increase facilitating structural exit from poverty for youth is expected to be gradual and the impact of the intervention will only be visible from 2022 at a very minimum for youth who enrolled in the MASO programme in 2017.

> The youth now have money and they do savings as well. They can even give us loans when the need arises.
>
> **Youth relative**

Table 5 Income and poverty likelihood

	Log of real total income in 12 months excl. crop income	Log of real total income in 7 days
All (Panel A)		
Training	0.184	-0.0156
	-0.1	-0.05
Postline	-0.141	2.313***
	-0.09	-0.07
Postline * training	0.214	0.229*
	-0.13	-0.11
Number of observations	2,422	2,565
F-stat	12.57	316.3
R-square	0.0466	0.428

Table 5 cont.

	Log of real total income in 12 months excl. crop income	Log of real total income in 7 days
Women (Panel B)		
Training	0.390*	-0.0115
	-0.15	-0.04
Postline	-0.0527	2.301***
	-0.15	-0.14
Postline * training	-0.0911	0.510*
	-0.2	-0.22
Number of observations	1,040	1,218
F-stat	1.971	60.3
R-square	0.016	0.44
Men (Panel C)		
Training	0.0283	-0.0267
	-0.13	-0.09
Postline	-0.221	2.316***
	-0.12	-0.09
Postline * training	0.442*	0.165
	-0.17	-0.14
Number of observations	1,382	1,347
F-stat	7.103	134.8
R-square	0.0381	0.343
Age 17–19 (Panel D)		
Training	-0.198	0.0403
	-0.22	-0.06
Postline	-0.235	2.346***
	-0.18	-0.09
Postline * training	0.555	0.109
	-0.29	-0.13
Number of observations	568	1,855
F-stat	2.702	228.1
R-square	0.0445	0.417

Table 5 cont.

	Log of real total income in 12 months excl. crop income	Log of real total income in 7 days
Age 20–25 (Panel E)		
Training	0.272*	0.0403
	-0.11	-0.06
Postline	-0.0677	2.346***
	-0.11	-0.09
Postline * training	0.124	0.109
	-0.15	-0.13
Number of observations	1854	1855
F-stat	9.218	228.1
R-square	0.0465	0.417
		Poverty likelihood
All (Panel A)		
Training		4.461***
		-0.88
Postline		1.126
		-0.72
Postline * training		-2.715*
		-1.2
Number of observations		4,347
F-stat		120.6
R-square		0.224
Women (Panel B)		
Training		5.103***
		-1.31
Postline		1.536
		-0.99
Postline * training		-2.493
		-1.78
Number of observations		2,259
F-stat		86.11
R-square		0.244

Table 5 cont.

	Poverty likelihood
Men (Panel C)	
Training	3.827**
	-1.19
Postline	0.696
	-1.04
Postline * training	-2.696
	-1.62
Number of observations	2,088
F-stat	47.99
R-square	0.187
Age 17–19 (Panel D)	
Training	1.698
	-1.77
Postline	-0.803
	-1.39
Postline * training	0.764
	-2.43
Number of observations	1,201
F-stat	41.55
R-square	0.229
Age 20–25 (Panel E)	
Training	5.538***
	-1.02
Postline	1.752*
	-0.84
Postline * training	-3.975**
	-1.38
Number of observations	3,146
F-stat	84.86
R-square	0.225

Robust standard errors: *p<0.05,**p<0.01,***p<0.001

Table 6 Crop income

	All	Age 17–19	Age 20–25	Men	Women
Training	0.315	-0.515	0.355	0.535*	-0.0973
	(0.178)	(0.433)	(0.191)	(0.218)	(0.313)
Baseline	0.494*	0.369	0.479*	0.615*	0.299
	(0.191)	(0.536)	(0.2)	(0.24)	(0.314)
Postline* training	-0.0333	1.379*	-0.125	-0.216	0.313
	(0.238)	(0.639)	(0.248)	(0.293)	(0.409)
Number of observations	1,000	146	854	638	362
F-stat	12.83	4.188	13.84	4.921	1.051
R-square	0.106	0.16	0.125	0.0568	0.0245

Standard errors in parentheses
*p<0.05, **p<0.01, ***p<0.001

3.4 Financial inclusion

In the last part, we have examined the impact of the integrated cocoa training on the financial inclusion of the youths (Box 4). The integrated training programme also aimed to develop the financial management competencies of the youth. This includes encouraging the practice of saving, the use of formal and community-based institutions such as village savings and loans associations (VSLAs) and banks for savings purposes through links with financial institutions, to use mobile technologies to save and access finance. In this section, we examine if the training has any impact on developing the financial inclusion of the youth.

Box 4 Financial inclusion – key results

- **The training has increased the number of places used to save** in our sample (0.24 units).
- **Older age cohorts (20–25 years) are more likely to save** (0.26 units), compared to the younger group.
- **The use of banks for saving has improved** by 18 pp for youths who have undertaken skills training. Young men tend to use banks more (23 pp) compared to young women (12 pp).
- We find that the training has successfully increased the use of banks for saving in relation to cooperatives/microfinance.
- **The training has increased MASO youth usage of mobile money to save** by 6.7 pp.
- **The training has also increased MASO youth usage of mobile money both for sending and receiving financial transfers** by 12.3 pp.
- We find that **women and youths in the lower age group are more likely to use mobile money** than men and the older age cohort.
- **The effect of the comprehensive training on loans was negative and insignificant,** which is probably due to a very limited number of youths subscribing for loans.
- **The proportion of females subscribing to a loan through a VSLA increased by 23%** at postline, suggesting that group-based finance offers female youth greater credit opportunities than it does male participants.
- Among successful applications, **reasons for youth to request a loan varied across sex and age groups.** A large proportion of young women invested in their business (41%) while male participants were more likely to borrow money for emergency purposes (30%) and farm inputs (21%).

Impacts on savings practices

The results confirm that the training has increased the number of places used to save in our sample by less than half a saving place (0.24 units).[21] Both young women (0.21 units) and young men (0.25 units) have increased their saving options. We also find that older age cohorts (20–25 years) are more likely to save (0.26 units) than the younger group. In the case of the cohort aged 17–19, we do not find any statistically significant result of the training on the number of places used for saving nor in their ability to save through banks, micro finance or cooperatives. This suggests that the overall savings habits of 17–19 year olds – where diversification is used as a proxy – did not improve. Subsequently, we also explored whether youth save with any formal institutions or community-based financial mechanisms (bank/microfinance/cooperative). The use of a formal institution for saving augments financial inclusion and reduces dependence on informal lenders, while community-based financial mechanisms such as cooperatives are often used as a pathway for future access to formal institutions such as banks and cooperatives. The use of formal financial institutions can significantly improve the economic empowerment of low-income households and mitigate vulnerability to income shocks; however, rural farming communities often have limited access to formal institutions, as most are located in towns or cities (Tan et al., 2019).

On comparing across formal institutions, we find that the training has substantially boosted the usage of banks. The use of banks for saving has improved by 18 pp for youths who have undertaken skills training. Young men tend to use banks more (23 pp) compared to young women (12 pp), which highlights the gender differences in accessing formal institutions and asset ownership within the household in Ghana. We do not find any significant impact of the training on the usage of cooperatives or microfinance. This could be justified by the nature of activities supporting youth formal financial inclusion deliberately pursued by MASO financial inclusion partners.

> Formal banks (Fidelity bank for cohort 1 and Opportunity International for cohort 2) opened an account for everybody linked with mobile money. [There are] different interest [rates] and terms and conditions but [they are] all linked to mobile money platform [such as] MTN, Tigo Cash and Vodafone.
>
> **Project Officer**

To summarise, we find that the training has a positive impact on improving youth saving behaviours and instilling a saving culture, and more places are used to save. In addition, the financial literacy training was reported by a large number of research participants in the qualitative study as having a significant impact on youth participants, ultimately leading to greater frequency and commitment in terms of saving and financial planning. The opening of bank accounts coupled with the financial literacy training have also encouraged saving behaviour. It was reported that youth employed by COCOBOD are now gradually requesting that payment be made directly to their accounts as opposed to cash, ultimately restricting them in spending newly received payments. The results highlight that the older age cohort is more likely to save than the younger age cohort, which is consistent with findings in the literature that age has a positive correlation with access to finance in rural communities (Tan et al. 2019). Among various formal institutions, we find that the training has successfully increased the use of banks for saving in relation to cooperatives/microfinance. This may also be due to increased security and greater use of banking services more generally, as well as the higher interest rates provided on savings in banks stimulating their use.

21 Number of places to save is a continuous variable. Hence, the interpretation of results denotes the average increase of unit, one unit representing one place to save.

Table 7 Savings practices

	Number of saving places	Saving at bank (1/0)	Saving at cooperative (1/0)
All (Panel A)			
Training	0.0235	-0.0700**	0.0194
	-0.02	-0.02	-0.01
Postline	0.0174	-0.124***	-0.00423
	-0.02	-0.01	0
Postline * training	0.236***	0.181***	0.00371
	-0.03	-0.03	-0.01
Number of observations	4,352	3,336	3,336
F-stat	32.19	21.09	1.866
R-square	0.0751	0.0579	0.00526
Women (Panel B)			
Training	0.035	-0.0648	0.0241
	-0.03	-0.03	-0.01
Postline	0.0227	-0.121***	-0.00173
	-0.02	-0.02	0
Postline * training	0.219***	0.123**	-0.00325
	-0.05	-0.04	-0.02
Number of observations	2,264	1,634	1,634
F-stat	10.95	5.379	1.891
R-square	0.041	0.0321	0.00779
Men (Panel C)			
Training	0.00727	-0.0729*	0.0149
	-0.03	-0.03	-0.01
Postline	0.00774	-0.131***	-0.00706
	-0.03	-0.02	-0.01
Postline * training	0.250***	0.230***	0.0105
	-0.05	-0.04	-0.02
Number of observations	2,088	1,702	1,702
F-stat	9.244	8.495	1.04
R-square	0.0453	0.0412	0.00528

Table 7 cont.

	Number of saving places	Saving at bank (1/0)	Saving at cooperative (1/0)
Age 17–19 (Panel D)			
Training	0.0546	0.00507	-0.000574
	-0.04	-0.04	-0.01
Postline	0.0696	-0.00117	0.000315
	-0.03	-0.02	-0.01
Postline * training	0.147	0.0779	0.00762
	-0.07	-0.05	-0.02
Number of observations	1,201	882	882
F-stat	8.22	3.153	0.936
R-square	0.0659	0.0328	0.00758
Age 20–25 (Panel E)			
Training	0.0128	-0.100**	0.0263
	-0.02	-0.03	-0.01
Postline	0.00239	-0.159***	-0.00416
	-0.02	-0.02	0
Postline * training	0.264***	0.215***	0.00211
	-0.04	-0.03	-0.01
Number of observations	3,151	2,454	2,454
F-stat	25.72	20.1	1.766
R-square	0.0803	0.0708	0.00764

	Saving at microfinance (1/0)	Saving at VSLA (1/0)
All (Panel A)		
Training	0.00221	0.000193
	-0.01	0
Postline	-0.0484***	-0.00172
	-0.01	0
Postline * training	-0.0107	0.0162**
	-0.01	0
Number of observations	3,336	3,336
F-stat	4.057	1.467
R-square	0.0154	0.00945

Table 7 cont.

	Saving at microfinance (1/0)	Saving at VSLA (1/0)
Women (Panel B)		
Training	-0.000539	0.000207
	-0.02	0
Postline	-0.0680***	0.00202
	-0.01	0
Postline * training	-0.00336	0.0216**
	-0.02	0
Number of observations	1,634	1,634
F-stat	3.511	1.016
R-square	0.0264	0.0176
Men (Panel C)		
Training	0.00653	-0.000364
	-0.02	0
Postline	-0.0305*	-0.00456
	-0.01	0
Postline * training	-0.0204	0.0115
	-0.02	0
Number of observations	1,702	1,702
F-stat	1.768	0.78
R-square	0.0108	0.00517
Age 17–19 (Panel D)		
Training	-0.0234	-0.0047
	-0.02	0
Postline	-0.0526**	-0.00304
	-0.01	0
Postline * training	0.00362	0.0356*
	-0.02	-0.01
Number of observations	882	882
F-stat	2.676	0.616
R-square	0.0249	0.0251

Table 7 cont.

	Saving at microfinance (1/0)	Saving at VSLA (1/0)
Age 20–25 (Panel E)		
Training	0.00978	0.00167
	-0.01	0
Postline	-0.0454***	-0.00119
	-0.01	0
Postline * training	-0.0156	0.0103
	-0.02	0
Number of observations	2,454	2,454
F-stat	2.987	0.949
R-square	0.0144	0.00652

Robust standard errors: *p<0.05,**p<0.01,***p<0.001

Impacts on usage of mobile money

Mobile money is another popular option for saving money. We also find that the training has increased MASO youth usage of mobile money to save by 6.7 pp and, in general, the use of mobile money both for sending/receiving financial transfers by 12.3 pp.

The results are not surprising, given the growing popularity of mobile money in the African region (Demirgüç-Kunt et al., 2017) and that mobile money is widely available on both analogue and smartphones. This resonates with the global trend of digital financial services expanding access to and use of accounts by unbanked adults traditionally excluded from the formal financial sector, such as women, poor people, young people and those living in rural areas in sub-Saharan Africa (ibid.). There seems to be a correlation between digital payments with savings for cocoa farmers who only receive their overall annual income twice a year, as observed in a recent study on costs of analogue payment in Ghana's cocoa sector (Better Than Cash Alliance and World Cocoa Foundation, 2020a). Farmers who took part in an experiment on digital payment recorded greater savings resulting from money left on their cards and e-wallets serving as an ad hoc savings account (ibid.). The current Covid-19 health crisis is also accelerating this process with new policy initiatives encouraging digital payments, such as the launch of the Universal QR Code and Proxy Pay aimed at easier cashless transactions in March 2020 (UNECA, 2020).

The use of mobile money both for sending and receiving funds has improved for the treatment group. We find that women and youths in the lower age group are more likely to use this than men and the older age cohort. Evidence indicates that women prefer to use mobile money as they can hide the arrival of funds and their spending behaviour from other household members, which increases their autonomy to spend on essential household items (Aker et al., 2016). This could be the reason behind the increase of mobile money use among young women. However, the qualitative findings also indicated that in most cases mobiles were shared across family relatives, and as a result mobile money accounts are shared within a household more frequently.

> I have been saving into a mobile money account from my dad to buy a sewing machine.
>
> **Female youth**

The MASO programme has supported Abigail Okaija Oblie, a proud owner of a creche with 60 children. © MASO/Solidaridad.

In particular, we find that young women participants have increased their use of mobile money to send/receive funds by 18.8 pp. The results for the sub-sample estimation on young men are insignificant. There is also an age divide in the use of mobile money for money transfers. The sub-sample estimates indicate that the treatment increases the likelihood of mobile money use by 23 pp for those in lower age cohorts, compared to 8.9 pp increase for the older age group (20–25 years). Links between MASO and its two financial partners, Fidelity Bank and Opportunity International, facilitated the opening of bank accounts for youth. To summarise, while dormant accounts tend to be prominent among youth in the literature, these results and the qualitative findings show positive signs of youth usage of their bank accounts, with an increased number of transactions reported by financial partners, particularly in locations more distant from a bank branch.

> There was no bank here. There is still no bank in this town. The only place we transact financial interactions is via Mobile money.
>
> **Local leader**

Specific individual characteristics such as age are a crucial determinant for the adoption of mobile transfers (Munyegera and Matsumoto, 2016). Qualitative findings indicate that respondent location also tends to influence youth usage of mobile money, especially for youth in the most remote areas where banks do not usually have branches. This results in the higher usage of mobile money by the younger cohorts.[22] With greater emphasis on the digitisation of Ghana's cocoa supply chain, digital financial literacy acquired through the MASO programme may benefit youth in the future (Better Than Cash Alliance and World Cocoa Foundation, 2020b). One aspect young cocoa farmers were wary of during the qualitative study was the sometimes prejudicial weighting process by cocoa clerks, leading cocoa farmers to believe that they rarely get the accurate value of their crop. The adoption of digital payment could have the potential to render this process more transparent if they are linked to digital scale and humidity sensors (Better Than Cash Alliance and World Cocoa Foundation, 2020b). However, if adopted, this policy will first need to address some of the barriers for farmers (especially the most vulnerable female and illiterate farmers) to switch from analogue to exclusively digital payments, such as the lack of mobile network signal (and electricity), lack of liquidity at agents or bank branches; and more importantly, fear of mobile money fraud or being misled (ibid.). Increasing occurrences of mobile money fraud legitimise farmers' caution towards the service, leading to calls for mobile money services to initiate greater internal controls and systems, information technology to spot threats, adequate training and fairer remuneration of employees (Akomea-Frimpong et al., 2019).

22 We have already controlled for other household-specific characteristics, like the level of education of the household head, in our specification, which can possibly affect the outcome variable.

Table 8 Usage of mobile money

	Saving mobile money (1/0)	Used mobile money (1/0)
All (Panel A)		
Training	0.0305	-0.0423
	-0.02	-0.02
Postline	-0.0673***	0.121***
	-0.01	-0.01
Postline * training	0.0673*	0.123***
	-0.03	-0.02
Number of observations	3,336	4,352
F-stat	20.88	36.67
R-square	0.0553	0.0749
Women (Panel B)		
Training	0.017	-0.108***
	-0.03	-0.03
Postline	-0.0669**	0.0989***
	-0.02	-0.02
Postline * training	0.0784	0.188***
	-0.04	-0.04
Number of observations	1,634	2,264
F-stat	5.745	20.36
R-square	0.0334	0.0723
Men (Panel C)		
Training	0.0367	0.0172
	-0.03	-0.02
Postline	-0.0698**	0.146***
	-0.02	-0.02
Postline * training	0.0615	0.0554
	-0.04	-0.03
Number of observations	1,702	2,088
F-stat	3.74	19.41
R-square	0.0187	0.0737

Table 8 cont.

	Saving mobile money (1/0)	Used mobile money (1/0)
Age 17–19 (Panel D)		
Training	0.00613	-0.0937*
	-0.05	-0.04
Postline	-0.0392	0.152***
	-0.03	-0.03
Postline * training	0.0555	0.230***
	-0.06	-0.05
Number of observations	882	1,201
F-stat	6.321	16.44
R-square	0.0658	0.11
Age 20–25 (Panel E)		
Training	0.0433	-0.0322
	-0.03	-0.02
Postline	-0.0754***	0.119***
	-0.01	-0.01
Postline * training	0.0706	0.0897**
	-0.03	-0.03
Number of observations	2,454	3,151
F-stat	16.08	23.84
R-square	0.0566	0.0716

Robust standard errors: *p<0.05,**p<0.01,***p<0.001

Impacts on loans subscription

The effect of the comprehensive training on loans was negative and insignificant, which is likely to be due to the very limited number of youths subscribing for loans. High interest rates in Ghana and young people's limited collateral usually restrict the attractiveness of loans and limit youth eligibility to access credit. However, from the descriptive statistics, 2% of our sample subscribed for a loan at baseline (n=53) while 8% did at postline (n=171). Of those, 92% made a successful loan application at postline.[23] In 2019, MASO launched a YSLA strategy to encourage youth to set up VSLAs where they did not already exist. This was aimed at facilitating greater access for youth to borrow money from the group at low interest rate and flexible terms that they could pay back. Hence, VSLAs tend to better respond to youth finance needs, particularly during the lean season. In addition to inadequate interest rates, access to credit tends to be more challenging for women who generally have a lower level of education and less collateral to secure a loan.

> Before [youths] didn't know how to save so they borrower from friends, father, mothers … They have learned how to save through financial literacy showing the importance of saving, through susu box[24] savings VSLA.
>
> **Community facilitator**

23 Successful loan application data was only collected at postline.

24 Comparable to 'piggy banks' and money tins.

In the descriptive statistics, we find that at postline, youth who applied for a loan tended to have found new forms of loan subscription, including mobile money for males and cooperatives for both sexes, instead of using informal finance (family/friends) and formal finance institutions (banks). The proportion of females subscribing to a loan through a VSLA increased by 23% at postline, suggesting that group-based finance offers female youth greater credit opportunities than it does male participants (Figure 13).

When disaggregating by age group, the younger group seems to have switched from banking loan subscription to cooperative and other finance options. For the older age cohort, notable changes include a reduction in the use of banking services and family/friends in favour of subscribing loans at the profit of VSLAs, cooperative and money lender and mobile money (Figure 14).

Figure 13 Loan institution disaggregated by sex

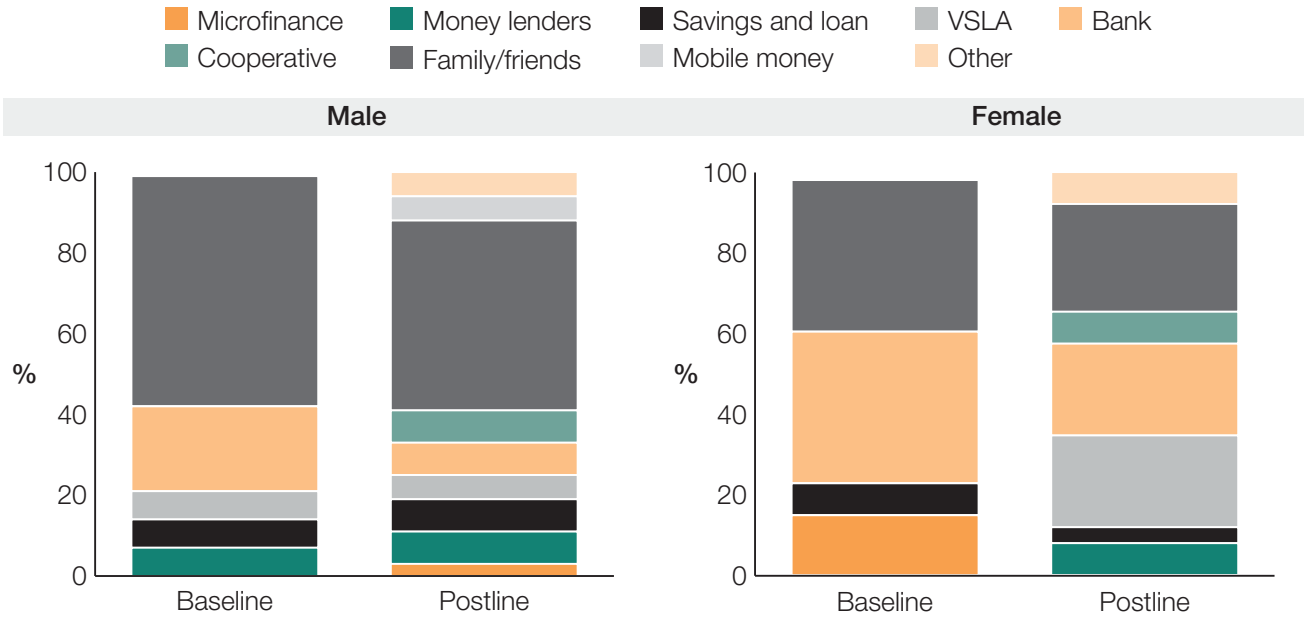
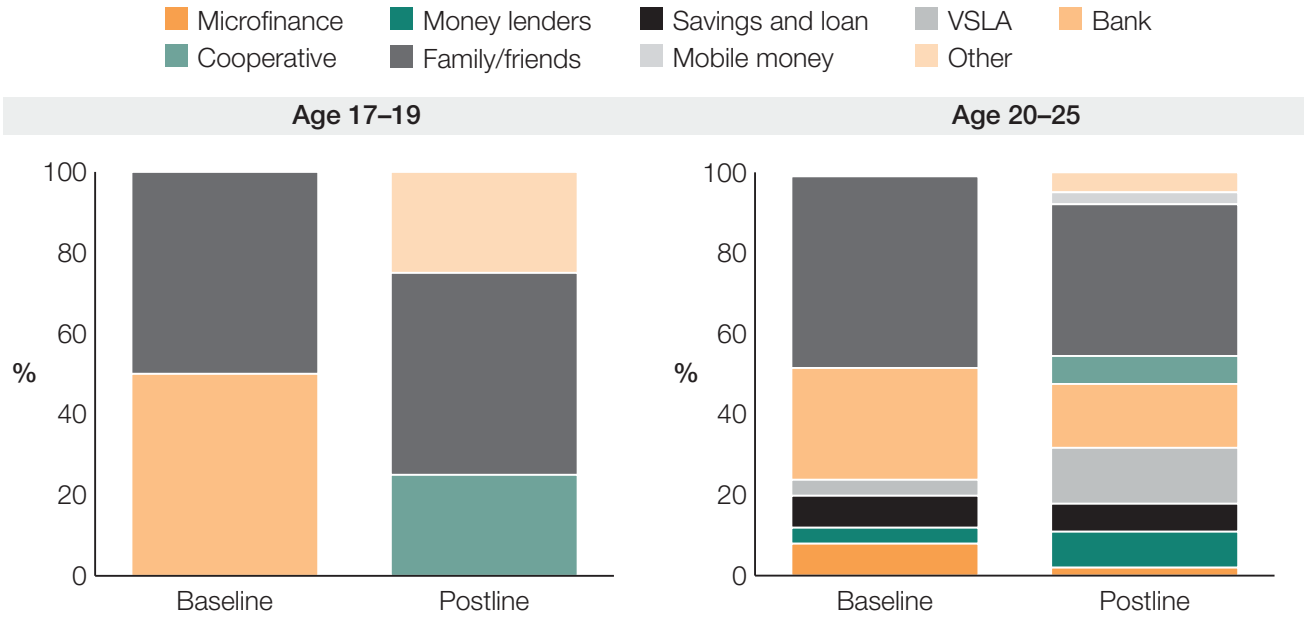


Figure 14 Loan institution disaggregated by age



MASO youth Elizabeth Kuffuor is a young cocoa farmer who also packages Alata (black) soap for sale.
© MASO/Solidaridad.

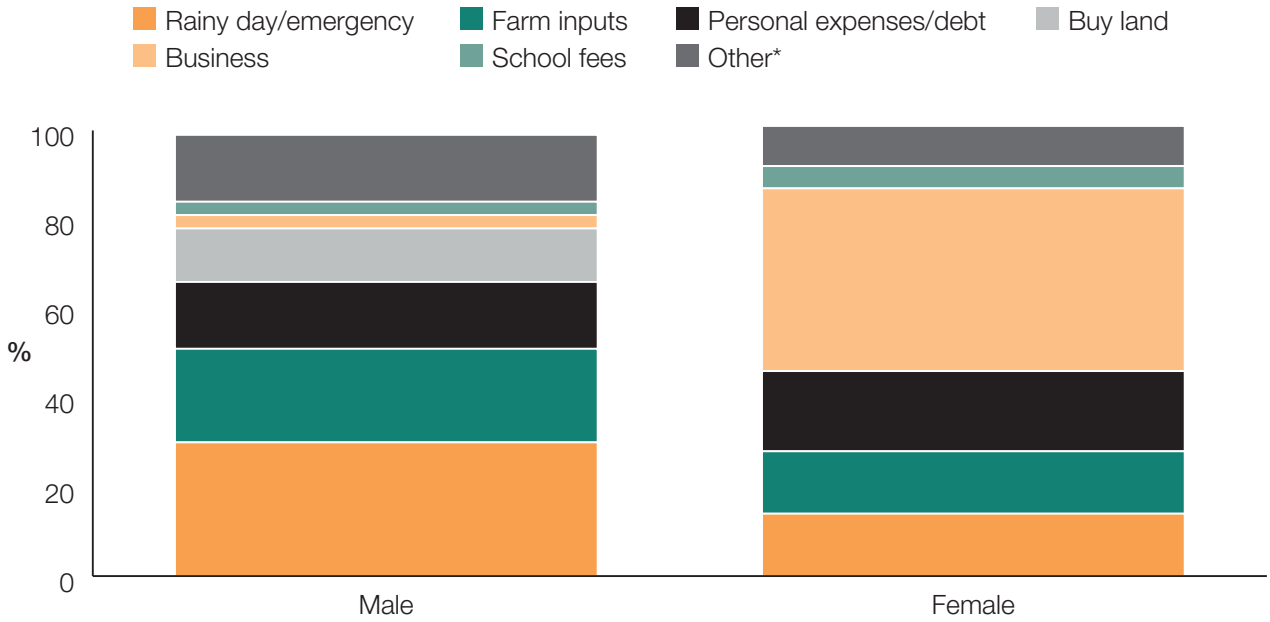
Based on the descriptive statistics, participants were asked whether their loan application was successful at postline only. Among those successful applicants, reasons for youth to subscribe a loan varied across sex and age groups (Figures 15 and 16). A large proportion of young women invested in their business (41%) while male participants were more likely to borrow money for emergency purposes (30%) and farm inputs (21%). Loans aimed at farm inputs (seed, unsubsidised fertiliser or labour) are very limited among farmers, with only one in eight having make such purchase according to a 2016/2017 survey (Vigneri and Kolavalli, 2018).

> The whole point of interventions is not access to finance but affordable finance.
>
> **Financial partner**

Farmers are almost exclusively paid in cash, twice a year, further hindering their ability to generate verifiable business and to demonstrate financial records (Better Than Cash Alliance and World Cocoa Foundation, 2020a). This restricts them from investing in agricultural technology and human resources, leading to persisting cycles of poverty from small plots and family based-production (Vigneri and Kolavalli, 2018; Better Than Cash Alliance and World Cocoa Foundation, 2020a). Finally, both males (15%) and females (18%) have borrowed for personal expenses and debts.

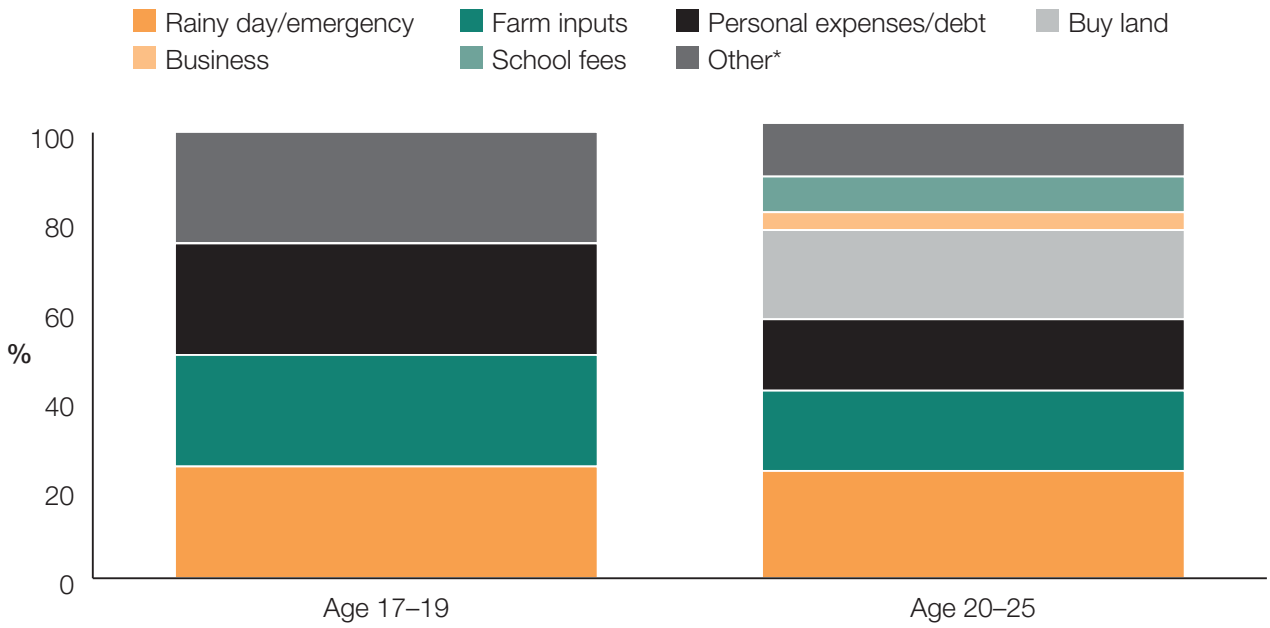
With regard to age groups, the younger youth cohort has borrowed for rainy days/emergency (25%), farm inputs (25%), personal expenses/debt (25%) and other reasons (25%), while the older age cohort primarily subscribed to loans for rainy days/emergency (24%), business (20%) and farm inputs (18%), closely followed by personal expense/debts (16%).

Figure 15 Reason for loan disaggregated by sex



Note: *includes medical expenses, support for family or friends, and funeral costs.

Figure 16 Reason for loan disaggregated by age



Note: *includes medical expenses, support for family or friends, and funeral costs.

4 Unintended effects

Box 5 Unintended effects – key results

- **The perception of young women's involvement in decision-making has increased** from 56% to 72%. **Nevertheless, all remaining quantitative findings indicate a greater adherence to traditional gender roles,** as well as social norms towards gender inequality.
- Male-dominated cocoa programme is likely to require a **stronger enabling environment for young females** to participate actively in the cocoa value chain.
- Gains in youth female **income and saving culture have translated into economic independence,** allowing them to redistribute towards their children's education and healthcare services.
- Youth expressed a **greater awareness of SRH practices,** and demonstrate better personal hygiene and understanding of nutrition.
- **Increased economic activities and greater community involvement generated a positive intergenerational dialogue.**
- MASO's formation of groups for each cohort in every community represents an intentional mainstreaming of group creation, which has **encouraged collective action and, in most cases, granted youth economic and bargaining power.** It also served as a model for COCOBOD to move away from its former traditional model of service delivery.
- **Non-participants also reported some changes** as a result of the MASO training, often generated through knowledge transmission mechanisms.
- **Effects on the sustainability of the programme and development outcomes were observed,** ranging from sturdy environmental practices to structural policy changes, community ownership and partnerships with the private sector.

4.1 Social norms and gender independence (economic independence)

As per many youth employment programmes, and particularly in its first implementation phase, MASO struggled to enrol and retain young female participants. This is not uncommon for youth programmes that are concentrated on or train youth in skills related to male-dominated sectors (Löwe, 2019) such as cocoa farming. The MASO holistic training was delivered in the Ghana cocoa belt and within both the local context of social norms specific to the areas of intervention and more broadly of rural Ghana. Despite the evolving nature of social norms, change is slow to happen. Unequal female participation in cocoa-growing activities is a consequence of worldviews, attitudes and behaviour shaped by a combination of broader economic, technological, institutional and political processes (Marcus et al., 2015). Individual factors also have the power to bring about norm change when presented with the appropriate opportunity such as economic empowerment or greater agency (ibid.).

As highlighted in the previous section, the impact of the comprehensive training greatly differs between young men and young women when identifying a female sub-sample. This was particularly striking for variables heavily influenced by social norms such as cocoa growing, employment, income and access to formal finance where male participants had greater outcomes than their female counterparts. While gender attitudes were not originally designed as an outcome variable of this evaluation, emerging changes on gender equality were observed primarily among the qualitative data and some findings

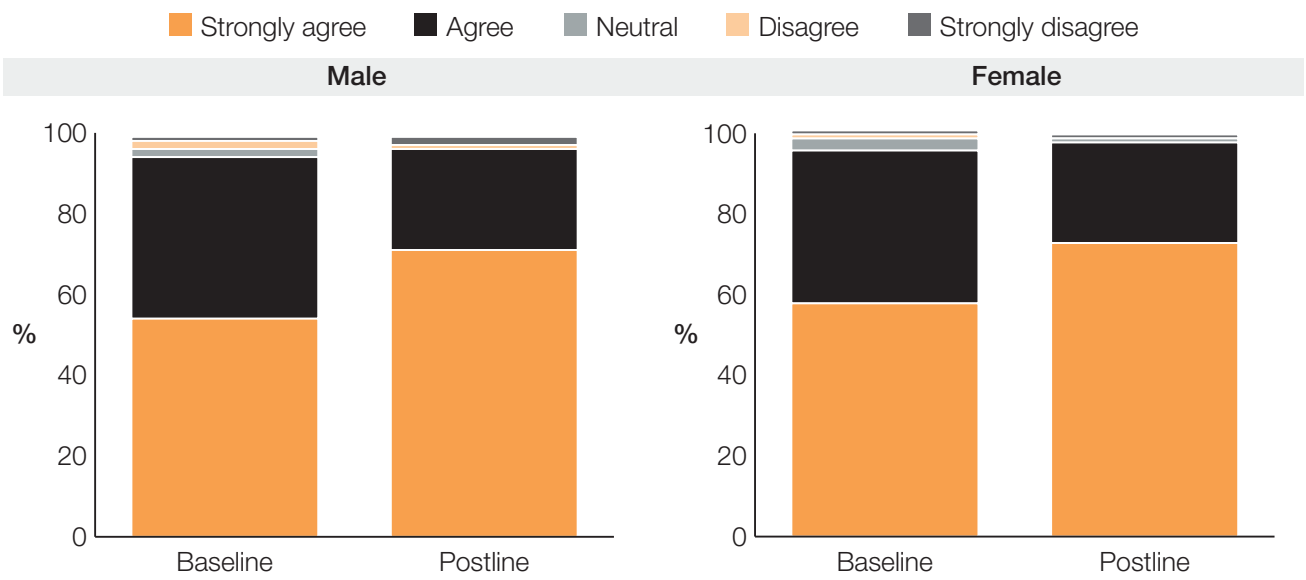
from the descriptive statistics of the treatment group. As depicted in Figure 17, the perception of young women's involvement in decision-making has increased from 56%, with 72% of participants now strongly agreeing that both men and women should take part in decision-making in the household. These findings reiterate the impact of social norms training for disadvantaged women, with Bandiera et al. (2015) also finding the imparting of life skills training to adolescent girls in Uganda to have a 2.86 pp increase on participants' gender empowerment index. Previously, women had less of a say on issues but seem to now be more actively involved in decision-making. Some have even acquired leadership positions in their respective communities.

> Before we had training on gender issues from MASO, women did not have a say on issues. But after the training women are now actively involved in decision-making.
>
> **Gender champion**

Participants from KIIs and FGDs reported that the gender training had brought about increased harmony in various marriages and households, suggesting that now that men and women see the value in supporting each other, gender roles seem to have improved in some communities of the districts of intervention. More specifically, the idea is germinating that women's economic empowerment and men's participation in house chores (such as cooking, washing and caring for children) would be mutually beneficial not only to both individuals but to the entire household. This has also been demonstrated through greater enrolment and retention of married or cohabiting young women, who were formerly restricted and sometimes victims of gender-based violence on the part of husband or boyfriend when it came to taking part.

> Due to the training I had on gender related issues, I have a fruitful marriage now because I now support my wife financially and I do help in household chores such as washing and cooking.
>
> **Young male participant**

Figure 17 Perception of whether both men and women should take part in decision-making in the household



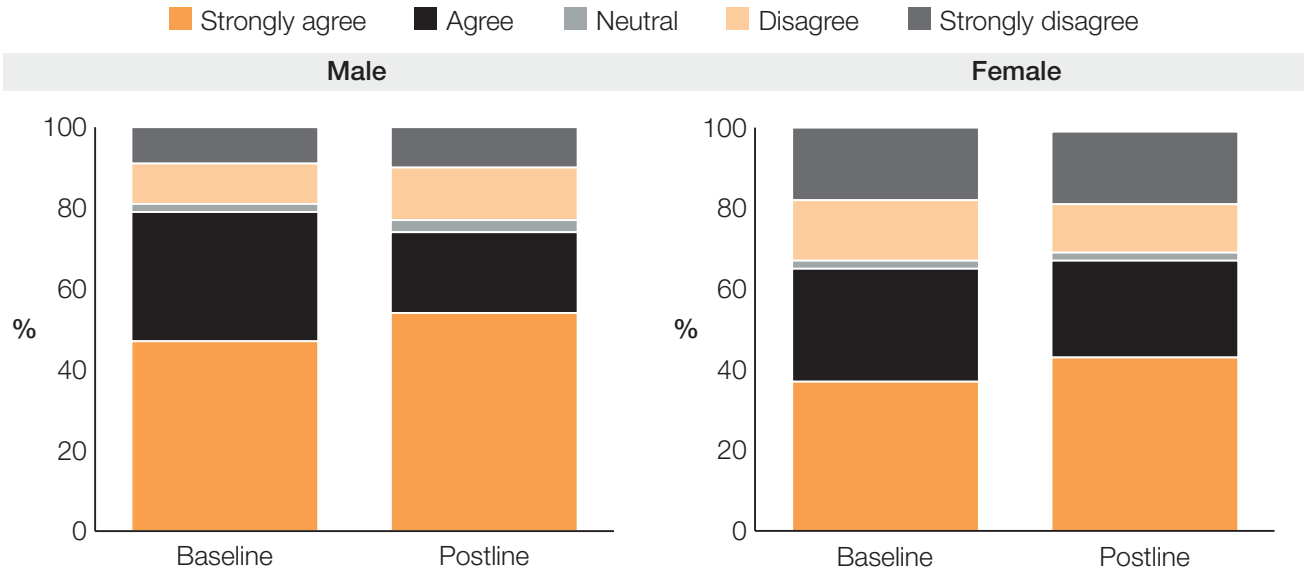
> There's the perception that men cannot play roles that are meant for women. This was creating a lot of confusion among couples. But because of MASO I know gender roles are the same.
>
> **Young female participant**

Nevertheless, all remaining quantitative findings indicate a greater adherence to traditional gender roles as well as social norms towards gender inequality. As depicted in Figure 18, across both genders, the proportion of young men and women participants agreeing that men should concentrate on income activities while women should take care of the home decreased from 32% to 20% for men and from 28% to 24% for women. The proportion of those strongly agreeing with the statement that both men and women should take part in decision-making in the household increased from 47% to 54% for men and from 37% to 43% for women strongly agreeing. The data assessing the general perception of gender roles has yielded contradictory findings. While participants' perception of gender roles could have evolved over time until the qualitative data collection was conducted, the sample of the quantitative data reflects perceptions of a larger number of youths across all MASO districts. A MASO Gender Study found that young women's low level of education decreases their opportunities to be involved in community activities and leadership roles (Owusu-Amankwah, 2016)

We find similar patterns for statements about 'women's secondary role in taking care of the family', 'men controlling big things in the household' while 'female should be controlling small things' and, 'women being disrespectful when they control family resources and are the main bread winners'. However, cultural norms and the gender division of labour tend to vary substantially across MASO districts (ibid.). As suggested earlier, the patriarchal nature of society in rural Ghana will take time to change, suggesting that in the future, male-dominated cocoa programmes like MASO are likely to require a stronger enabling environment for young women to participate actively in the cocoa value chain.

However, discrepancies between qualitative and quantitative findings could also be due to a number of factors, including the nature of the qualitative sample (restricted to three districts) or misunderstandings relating to the survey questions. It could also be that the exhibition of greater gender independence behaviours may have triggered negative reactions in some of the communities that were not ready yet for such change.

Figure 18 Perception of whether men should concentrate on income activities while women should take care of the home



Despite insignificant results on income variables, throughout their ranking exercise, participants reported that the income and the saving culture they have gained has translated into economic independence, allowing young women to devote more time on their children's education and healthcare services. Some added that they no longer depend on male partners for their living and have gained a greater sense of agency. Such progress is particularly relevant in in sub-Saharan Africa where female-managed agricultural plots are on average one third less productive compared to those managed by men (World Bank, 2019). Similarly, the gender gap in profit for female entrepreneurs' stands at 36% in Ghana, slightly above the sub-Saharan 34% average.

> The girls have their own jobs and income so they do not rely on men for money in exchange of sexual favours.
>
> **FGD Youth relatives**

> I don't have to provide for my child because she is employed. She doesn't disturb me with money.
>
> **FGD Youth relatives**

> I see changes in her entire livelihood. She has a more serious outlook to life now. She sets her priorities and works to achieve them.
>
> **Youth relatives**

A significant majority of young participants have reported the importance of the sexual and reproductive health (SRH) training and links with directorate Ghana services and relevant health practitioners, both introduced at later stage in the programme as a result of an unexpectedly high number of cases of teenage pregnancies to improve retention of female participants and, ultimately, programme outcomes. There is as yet no evidence youths have been able to adopt those changes in their lives, though they expressed a greater awareness of SRH practices, and demonstrated better personal hygiene and understanding of nutrition. Since the beginning of the century, Ghana has made great strides towards reducing teenage pregnancy. Indeed, the number of births per 1,000 women aged 15–19 has decreased from 84 to 65.8 in 2018, below the average for sub-Saharan Africa (101.2). Existing literature also indicates that awareness-raising and empowerment initiatives combined with skills training programmes and advocacy for policies and law changes have the potential to improve SRH and associated norms (Leon-Himmelstine et al., 2019).

> I have acquired knowledge to prevent pregnancy. I am currently in school and will be able to focus on my education because I know how to prevent unplanned pregnancies.
>
> **Female participant**

> It is important for me because it will help me protect myself from disease and prevent pregnancies. I am currently learning hairdressing and I don't have to get pregnant which will destroy my future and prevent me from learning the trade.
>
> **Female participant**

4.2 Intergenerational dialogue

The fracture between the youth and older generations is not new. The global deficit of youth inclusion in governance of the African continent is also symptomatic of this trend with the average age of African leaders being 66-years-old in 2016 (Mo Ibrahim Foundation, 2018). A 2018 public scandal leading to a social media campaign by Nigerian youths against their President, Muhammadu Buhari, with the sarcastic hashtag #LazyNigerianYouths, is emblematic of this tension. However, in the context of Ghanaian cocoa, such relationships can have detrimental impacts not only on youths aspiring to better opportunities but also on the broader cocoa sector. Given that the average age of cocoa farmer is above the 48–53 age range, if landowners do not entrust youth with operating capital, the entire sector will be put at risk. As a result, Ghana could suffer greatly from loss of cocoa exports revenues. During the qualitative study, research participants indicated that intergenerational dialogue was blossoming slowly as a result of increased economic activity and greater community involvement. Programme staff were also intentional in ensuring that the environment in which youths were working was supportive, responding to their needs and minimising the barriers previously cited:

> The parents initially had the mentality that the youth were not interested in cocoa production, but based on the support and the resource materials (fertilisers, seedlings, etc.) we give the youth the parents are now more willing to give lands to the youth. I also meet with the traditional leaders about this issue and some of them do release lands to the youth.
>
> **Project Officer**

As youth are transitioning into adulthood, these changes cannot fully be attributed to their participation in the training. However, terms such as 'hardworking' and 'hav[ing] a sense of direction and responsibilities' were frequently cited and observed by relatives and community members among both age groups (17–19 and 20–25 year-olds). During the FGD, youth participants' relatives reported that their children are 'now supportive at home … and closer to the family unit'. Other research participants stated that the way youth now relate to each other and to other members of the community including their own family had significantly improved and traditional leaders observed a change and respect for the elderly. The excess seedlings that were redistributed to members of the communities to establish cocoa nurseries or to sell them seem to have contributed to this change in dynamics and to have improved interpersonal relationship among youth themselves and between youth and community members. Similarly, activities led by the MASO alumni association Youth Network at the community district and national levels may have influenced the perception of youth in the cocoa sector and as agent of change in their communities.

> The cocoa nursery has been very beneficial. The seedlings are good and everyone wants some to plant.
>
> **FGD Youth relative**

The youth and agriculture 'problem' as outlined by Anyidoho et al. indicates that despite a common acknowledgement that food and young people constitute 'two of the most important concerns in Africa', policy-makers do not rely on an evidence base to make decisions (Anyidoho et al., 2012). While more research has been commissioned since Anyidoho et al.'s publication, only a few have brought youth voices to the conversation (Löwe and Boateng, 2018). Greater youth involvement in policy processes at both local and national level could enable a more critical assessment of the assumption

underpinning government-led youth programmes (Anyidoho et al., 2012). The role of the Youth Sector Engagement Group (Y-SEG), the Youth Forward advocacy group that brings the challenges of MASO participants to a wider audience of policy-makers, has been necessary in bridging the gaps between policy and practices and improving the enabling environment for youth to engage in cocoa farming.

4.3 Collective action

The concept of collective action among rural communities born out of a notion to facilitate the provision of support to marginalised groups in accessing resources that would originally be inaccessible is not new (Löwe et al., 2019). Yet, the investigation of collective action in the context of youth employment initiatives is fairly recent (ibid.). It essentially consists of the formation of small- or medium-sized groups into a unit that can be more or less structured to allow individuals to advance similar aims, such as accessing finance (ibid.) and gaining greater negotiation power and access to markets or sharing agricultural equipment. For instance, a labour team that did not have enough adequate equipment came together to save collectively thanks to profits from other crops in order to buy the appropriate equipment to work in additional farms. In the final phase of the programme, the introduction of YSLAs in 2018 is likely to have contributed to this type of financial arrangement. However, the existence of 'gangs' (groups) in the cocoa value chain such as pollination ones have been historically used by government agency COCOBOD to deliver spraying services. Hence, MASO's formation of groups from each cohort in every community represents an intentional mainstreaming of group creation to encourage collective action and, in most cases, enhance youth economic and bargaining power. Other groups have, for instance, created a farm management group model to work collaboratively on their own farms and on other farmers' farms. This practice is particularly effective during the high season as it allows participants of the group to maximise their efforts through collective action while cultivating their social capital.

4.4 Societal change

While the quantitative analysis focused exclusively on impact on participants in comparison with non-participants, we found from the qualitative data that participants engaged in economic and volunteering activities were beneficial beyond their individual development. These youth-led activities range from communal activities (animation of a community information discussing gender issues) to the provision of services (opening of a day-care facility).

Similarly, we found from the qualitative data that non-participants also reported some changes as a result of the MASO training, often generated through knowledge-transmission mechanisms. Knowledge-transmission mechanisms, as identified by non-participants, primarily materialised through intra-household exchanges and to a certain extent between farmers and community members. Information shared ranged from saving practices (household level), agricultural practices (for farmers) and gender (within community members). Franzel and Scherr (2002) argue that farmer-to-farmer knowledge transmission in relation to new agricultural technologies and by extension, agricultural practices is reliant on the central role of farmers. However, access to information and agricultural practices uptake remains heavily reliant on farmers' social ties within and beyond their community (Cadger et al., 2016), particularly in developing countries with high exposure to agriculture development interventions. Institutions often facilitate agricultural training projects, with a focus on agroecological practices, such as agroforestry and agrobiodiversity. The structural characteristics of social networks among land managers influences decision-making to adopt such adaptive agroecoloigcal practice; however, the extent of knowledge transfer beyond direct project participants is often unknown. Using a social network approach, we chart the structure of agrarian knowledge networks (n = 131). Cadger et al. (ibid.) found that farmers who diversify their production tend to have greater access to

diverse types of knowledge through their adhesion to multiple networks. Within households, Bonan and Pagani (2017) found positive knock-on effects from youth engaged in agricultural community-based training as regards their families. The authors found evidence that the programme significantly increased guardians' perceptions of their children as knowledgeable, marginally increased household agricultural knowledge, and that at least one agricultural practice from the programme was adopted by participants' families (Bonan and Pagani, 2017). Though this is not the case for all outcome variables. For example, Bonan and Pagani (ibid.) did not find evidence that youth agricultural training in Uganda led participants' households to increase crop diversification, but households were found to significantly improve diet diversification, as measured by food consumption, number of weekly food types and overall dietary diversity. This suggests that transmission of knowledge between participants and non-participants, though visible, remains inconsistent.

Finally, non-participants interviewed were primarily adults, such as young people's relatives, local leaders and gender champions, as well as programme staff ranging from community and business facilitators, project officers and business mentors who regularly interacted with youth participants, who also reported positive training effects. For instance, they reported the uptake of skills ranging from farming practices to gender equality, financial management and record keeping, business management and saving practices.

5 Sustainability

The MASO holistic programme covered several aspects contributing to the sustainability of the programme and development outcomes ranging from sturdy environmental practices to structural policy changes, community ownership and partnerships with the private sector.

Throughout the agriculture training youth were encouraged to think about sustainable environmental practices ranging from the safe disposal of cocoa pods to youth usage of fertilisers and methods encouraging a cleaner environment. Some youth groups ranked this activity second most important in some of the FGDs and third most impactful.

> We have to protect our forests to improve our climate which affects farming.
>
> **Male participant**

> With this knowledge, we have been able to clean our environments. We have also planted trees which give us fresh air.
>
> **Male participant**

> Very mindful of the effect of cocoa farmers in the environment, encourage young people not to burn their farm but a challenge, some forest very thick don't have the patience to clear the place. So we encourage to cut only.
>
> **Member of programme staff**

Development programmes tend to generate greater outcomes when they are linked to structural policy changes. As mentioned earlier, the creation of groups based on youth enrolment year and geographical coverage encouraged collective action. It was reported during the qualitative research that it also served as a model for COCOBOD to move away from its former traditional model of service delivery. The previous system of 'nomination' would not provide youth with equal opportunities, largely due to political interference preventing the fair and consistent application of eligibility criteria. The practical identification process facilitated by the MASO programme through strict selection criteria, including youth age and motivation, has reportedly inspired the newly introduced process to access COCOBOD's delivery of services (supplying chemical and other inputs) through the registration of cooperatives. This policy is intended to improve government accountability and transparency through more systematic tracing of inputs distributed to farmers. In relation to this change, the creation and implementation of the Youth Network has permitted the establishment of a structure accessible to COCOBOD. For instance, in some areas of intervention, each community trained as part of the MASO initiative has registered a cooperative and, when COCOBOD started giving out inputs, it requested a list of groups and youth leaders who had undertaken the training, for credential purposes. Another objective of the Youth Network through the delivery of soft skills and leadership training has been to encourage the formation of associations to keep MASO youth graduates assembled and actively involved in the organisation of community activities to help them in managing their own businesses and so that they may serve as role models to aspiring cocoa farmers.

Finally, the wide range of partnerships with private sector actors provided opportunities for youth to be directly connected to markets and finance, and to benefit from agricultural technologies. For instance, the development of rural services and mini centres in some communities required private sectors to reach out to participants in order to expand. Other examples include private companies such as ECOM Ghana or TOUTON to employ youth trained by MASO directly without having to invest further in professional training. In the financial sector, partners in the project reported a greater understanding of the needs of youth farmers through their regular interaction during the financial literacy training. As a result, in 2019 Fidelity Bank opened a specialist agriculture desk, with a team of five to 10 people, for clients working in agriculture.

6 Conclusions

The objective of the research was to study the contribution of the MASO multifaceted cocoa programme on economic outcomes for participants and more specifically its capacity to improve economic inclusion in eight districts of the cocoa-growing regions in Ghana. As the training was completed only one year before the fieldwork, large impacts cannot yet be expected, particularly regarding the profitability of cocoa, which tends to take five years before providing returns. **The PSM impact analysis found notable impacts on agriculture-related indicators, mixed impacts on financial-inclusion indicators and small or insignificant impacts for employment and income indicators.** As expected, we have little evidence of the training impact on economic and financial exclusion at such an early stage in the youth journey into cocoa.

However, various unintended effects were captured during the qualitative interviews, including effects on social norms, intra-household and community relationships as well as knowledge transmission and sustainability. Overall, the qualitative study found positive effects on a number of indicators of economic inclusion, though strong effects on gender equality, access to land and finance remain limited.

Econometric results: we examined whether the MASO programme had an impact on four broad groups of outcome dimensions: agricultural practices, cocoa farming, farming; employment (previous seven days), employment (previous 12 months), log of hours worked (past seven days); number of savings options (bank saving, mobile money saving, receiving or sending mobile money), income (previous seven days), income (previous 12 months) and PPI. By means of a variety of indicators and data, we have shown that **the MASO programme has positive but mixed impacts on participants and on their households (for PPI only).** The quantitative analysis found significant differences between youth participants and non-participants for some of the indicators. The qualitative analysis shows some improvements in areas that were not originally included in the analytical framework.

The MASO programme has had significant impact in the uptake of agricultural practices across sex and age groups and both participants and non-participants consider this one of the main impacts of the training. **The intervention also had significant impacts on the proportion of youth growing cocoa,** except for the younger youth cohort and with reduced intensity for young women as expected. Regarding the propensity of youth participants to farm, we also found significant impacts across sex and age groups.

The MASO programme had no significant impact on youth extensive labour supply over the preceding 12 months. Significant impacts on youth extensive labour supply over the preceding seven days were limited to the younger age cohort. For intensity of labour supply, the programme had significant impacts for the entire sample, including males, with the most notable impacts being observed in the younger age cohort.

We find that that the training had a significant impact on young female's participation in business-related activities, though we did not find significant impact on any of the employment outcome variables for young women. From the descriptive statistics, we observe that more males and older age youth cohort members are engaging in cocoa farming than females between the two time periods, with an important decrease for females from 28% at baseline to 6% at postline. Young females represent the only sub-group with an increase in farming activities from 45% at baseline to 60% at postline.

However, **we note an increase in the younger age cohort for cocoa farming and a decrease in non-cocoa farming. Youth participation in trading and the service industry has increased across all sex and age groups,** with notable differences for male and female groups respectively, at 4% and 14% at baseline and 14% and 26% at postline. Regarding the youth business activity sector, we find that the proportion of young female entrepreneurs trading increases to 71% and remains important, though we observe a greater increase from men (16 pp) in comparison to women (7 pp) between baseline and postline.

The proportion of hired labour activity has significantly contracted from 35% to 13% for men while food processing decreased from 25% to 19% for young women. When disaggregating by age groups, **we find that the proportion of youth engaged in food processing more than doubles, from 11% to 23%, closely followed by artisan work (11% to 19%).** We observe a decrease in those working as hired labourers from 26% to 6% between baseline and postline. For the older age group (20–25 years old), the proportion of trading greatly increases (15 pp) while all other sectors other than financial services decline.

The impact of the training on employment is only visible for youths in the 17–19 age group, an interesting finding that is not substantiated by qualitative data and common assumptions that youth in the older age group (20–25 years old) would have better economic outcomes. The findings relating to the employment section suggest that **the training improved the intensive labour supply (number of hours worked) rather than the extensive labour supply (previous seven days and previous 12 months).** Overall, youths who have taken part in the training have significantly improved their number of hours worked, but it does not affect their overall employment participation.

From the descriptive statistics, we found that **job satisfaction tends to increase more for men than women,** with respectively a 15 pp difference compared to 4 pp between baseline and postline, though this is in tandem with an increase in the proportion of women dissatisfied with their work, from 27% to 32%. We found fewer differences across age groups with youth aged 17–19 years at the time of enrolment and a year after they graduated from the MASO programme, though for the older cohort the proportion that stated they were very satisfied increased by 14 pp between the two time periods.

We find greater diversification of places in which youth save funds, with impact ranging from 0.21 to 0.26 units across sex and age groups, excluding the younger age cohort for which impact were insignificant.

Similarly, **all sex and age groups except the younger age cohorts have a greater propensity to save at formal financial institutions (banks) with great disparities between male and female groups.** The impact of the training on **the propensity to save via mobile money was significant for the entire sample, and mobile money use was also statistically significant across sex and age groups except for males, with a greater impact on the younger age cohort.** Qualitative findings indicate that the location of the respondent also tends to influence youth usage of mobile money, especially for youth in the most remote areas where banks do not usually have branches.

Finally, **we find no significant impact on any of the income indicators except for the short-term income (preceding seven days) for the all sample. Poverty reduction impacts are most prominent for the entire sample and the younger age cohort.**

6.1 Unintended effects

The qualitative study identified several unintended effects. While gender attitudes were not originally designed as an outcome variable of this evaluation, **emerging changes on gender equality were observed primarily among the qualitative data** and some findings from the descriptive statistics of the treatment group. Participants reported that the income and the saving culture they gained has translated into economic independence, allowing young women to redistribute towards their children's education and healthcare. **A large majority of young participants reported the importance of the SRH training and linkages with health directorate services and relevant health practitioners,** though there is currently no evidence that youths have adopted SRH practices in their lives.

Research participants indicated that **intergenerational dialogue was a nascent reality that slowly evolved as a result of increased youth economic activities and greater community involvement.** MASO's formation of groups for each cohort in every community was an intentional mainstreaming of group creation that **encouraged collective action and, in most cases, granted youth economic and bargaining power.** While the quantitative analysis focused exclusively on the impact on participants in comparison with non-participants, we found from the qualitative data that participants engaged in economic and volunteering activities that were beneficial beyond their individual development. Similarly, we found from the qualitative data that non-participants also reported some changes as a result of the MASO training, often generated through knowledge-transmission mechanisms.

The MASO integrated programme covered a number of aspects **contributing to the sustainability of the programme and development outcomes** ranging from sturdy environmental practices to structural policy changes, community ownership and partnerships with the private sector.

Our research findings point to a number of important practical implications that may help the MASO comprehensive programme have a stronger impact, as well as broader implications to support economic inclusion.

6.2 Recommendations

Recommendation 1

Skills training for young women is not enough on its own. From a policy perspective, the findings on agricultural outcomes suggest that in the presence of gender imbalance, skills training provided to young women is not in itself sufficient to increase their participation in cocoa-related activities. Integrated training programmes need to take into account the presence of power dynamics and social norms within the communities of the Ghana cocoa belt. Training can also focus on building women-centred local cocoa networks and women land rights advocates' associations through national level advocacy. The presence of an active community-based group for young women engaged in the cocoa business can inspire the participation of other young women living in the vicinity. This can also promote collective action, which can push women's rights to access land. It has the potential to augment young women's participation in cocoa-related activities. Evidence of the benefits of collective bargaining have been found in Morocco, in which a collective bargaining agreement negotiated by a national trade union helped secure equal wages and working conditions and reduced gender discrimination for female workers in the agricultural sector (International Center for Research on Women, 2019). Similarly, starting gender and legal training at the onset of the programmes would pave the way for young female enrolment and involvement in a male-dominated sector such as cocoa, facilitated by proactive changes in gender norms.

A young MASO participant shares how the programme has provided training in record keeping. © MASO/Solidaridad.

Age-sensitive programming could bring about greater impacts. We find that youths (both male and female) in older age cohorts are more likely to be involved in growing cocoa (27%). Targeting the older age youth cohort to promote cocoa cultivation could be more impactful. This finding was corroborated by qualitative reports from programme staff and implies that training targeting the older age youth cohort could result in greater cocoa-growing outcomes. Stronger impacts on poverty reduction were driven by the capital-focused older age cohort whom it was less challenging to have engage in cocoa-growing activities. In a post-Covid-19 world, where young people are more vulnerable to suddenly losing their usual economic activity, training is more important, particularly when transportation and relocations are becoming increasingly complex and restricted. Sustainable agriculture practices are key in enabling young people to find or create employment opportunities in their own communities.

Recommendation 2

Skills training alone is not enough to affect youth employment in the cocoa sector. Findings on employment suggest that the MASO programme is effective in improving the intensive labour supply (number of hours worked over the preceding seven days) with youth participants significantly increasing their number of hours worked rather than the extensive labour supply (youth who were in employment over the preceding seven days or 12 months). It appears that skills training alone is not enough to affect youth overall employment participation in the cocoa value chain and does not necessarily lead to job creation.

Skills training must be accompanied by private sector engagement, entrepreneurship training and a supply-chain approach to job creation that considers the political economy of the country. There is a body of evidence on the scarcity of formal employment in LMICs. This suggests that entrepreneurship skills training, greater engagement with the private sector and advocating for an enabling environment for youth to grow their enterprises through financial services tailored to the targeted value chain could offer them some alternative economic opportunities. Partnering with the private sector can encourage the provision of youth-friendly services and also support a better

matching of the supply of skills with demand. Skills development from the supply side (of training) should not exist in silos. Linking youths to existing cocoa cooperatives and produce-buying companies would support youth groups in accessing markets and this would be mutually beneficial for the companies as they would not be required to train youth in cocoa farming as the former would have the appropriate skills for provide support services to companies' clients.

Recommendation 3

Create the right incentives and demand for the use of newer technologies and agricultural methods. In the face of the dramatic and fast-changing nature of the agricultural sector in the face of factors such as Covid-19, climate change, digital technologies, urban growth and evolving eating habits, farmers will need to adapt and innovate to be resilient and improve their livelihoods (FAO, 2020a). MASO's Interactive Voice Response (IVR) training represents an opportunity for youth to be exposed to new technologies and to acquire additional learning capital to innovate and adopt digital tools and innovative farming methods (Krishnan et al., 2020). While there is still mixed evidence regarding the impact of digital tools such as agri-platforms on farmers' livelihoods (Levi et al., 2019), digital technologies hold a disruptive potential to digitise the agricultural value chain and ultimately expand access to finance and markets for young farmers via blockchain-based smart-contracting, payment and marketplace systems for example.[25]

Recommendation 4

Encourage financial products that are not only adapted to youth but also sensitive to the agricultural sector and the seasonality of the cocoa activity. While MASO greatly encouraged youth in accessing formal and community-based finance through saving, YSLAs and mobile money, more efforts will be needed to enable youth to accumulate the capital needed to transform their farms into revenue-generating and sustainable businesses. The introduction of YSLAs and youth-led VSLAs currently offer some initial signs of success, though savings remain small and limit the amount of liquidity available for members in need of credit. YSLA effectiveness and youth loan repayment need to be further assessed in the future. Extending entrepreneurship training to all youths could encourage them to become entrepreneurs in the cocoa value chain. Finally, the introduction of digital payment could hold the potential to increasing cocoa farmers' productivity levels by saving via auto-deposit portions of their harvest earnings. Cocoa farmers could benefit from affordable finance (Better Than Cash Alliance and World Cocoa Foundation, 2020a), though accessibility as well as greater internal controls and systems, information technology to spot threats, adequate training and fairer remuneration of employees will be necessary to reduce the threat of mobile fraud (Akomea-Frimpong et al., 2019).

Recommendation 5

Further research is needed to assess the suggested logic chain for the MASO programmes. First, as mentioned previously, it is too early to assess the impact of the MASO intervention until cocoa reaches its maturation stage (five years following the establishment of cocoa nurseries). Research in three to four years' time should allow an assessment of the medium-term impact of the training on youth livelihoods in the cocoa sector. Second, the difference of impact between the agricultural and the business training on youth has not yet been evaluated. This study assesses the overall effect of the training on all participants. Additional research on the type of interventions could allow some light to be shed on the effectiveness of specific aspects of the training.

25 See www.cellulant.com/agrikore/

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Appendices

Appendix 1 Construction of the probit model

	Baseline	Postline
Age 23–25	0.522***	
	-0.06	
Children	0.231**	0.295***
	-0.07	-0.07
Number of adults in the household	0.0273	-0.013
	-0.01	-0.01
Access to road	-0.220***	
	-0.06	
Single	-0.214**	-0.328***
	-0.07	-0.07
Sex	-0.278***	-0.300***
	-0.06	-0.06
Completed at least junior high school or above	0.164*	0.0119
	-0.08	-0.08
Male spouse or household head can read a phrase in English	0.184**	0.231***
	-0.05	-0.05
Helps family with agriculture	0.379***	0.638***
	-0.07	-0.07
Observations	2,258	2,188
Pseudo r-square	0.073	0.0689
	Baseline	Postline
Common support		
Not attained	264	418
Attained	2,203	2,157
Common support among the treatment recipients		
Not attained	57	91
Attained	701	707
Common support among the non-treatment recipients		
Not attained	207	327
Attained	1,502	1,450

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Appendix 2 PSM score

Baseline		Treatment	Control	T-stat	p>t of T-stat		
		Mean	Mean				
Age 23–25		0.48	0.39	2.87	0.00		
Children		0.48	0.43	1.46	0.14		
Number of adults in the household		3.69	3.71	-0.12	0.91		
Access to road		0.25	0.26	-0.49	0.62		
Single		0.62	0.66	-1.55	0.12		
Sex		0.47	0.49	-0.82	0.41		
Completed junior high school or more		0.86	0.86	0.04	0.97		
Male spouse or household head can read a phrase in English		0.48	0.45	0.81	0.42		
Helps family with agriculture		0.85	0.85	0.43	0.67		
P sR2	**LR chi2**	**p>chi2**	**MeanBias**	**MedBias**	**B**	**R**	**%Var**
0.008	12.67	0.178	5.9	5	21.9	1.24	0
*	if	B>25%,	R	outside	[0.5;	2]	
Postline		**Treatment**	**Control**	**T-stat**	**p>t of T-stat**		
		Mean	Mean				
Children	0.64	0.60	1.23	0.22			
Number of adults in the household	3.41	3.47	-0.56	0.578			
Single	0.46	0.51	-1.81	0.071			
Sex	0.49	0.51	-0.85	0.394			
Completed junior high school or more	0.85	0.84	0.45	0.653			
Male spouse or household head can read a phrase in English	0.52	0.48	1.33	0.183			
Helps family with agriculture	0.84	0.80	1.52	0.128			
Ps R2	**LR chi2**	**p>chi2**	**MeanBias**	**MedBias**	**B**	**R**	**%Var**
0.007	10.13	0.181	6.6	7.4	19.5	1.12	0
*	if	B>25%,	R	outside	[0.5;	2]	

Appendix 3 Variable list

Variable lavel	Description
Age 23–25	This takes the value 1 if the respondent belongs to any of this age group (23 years/24 years/25 years)
Completed junior high school or above (1/0)	Takes the value 1 if the respondent has completed at least junior high school or above
Access to road (1/0)	Value 1 if the community has any access to road (either partial road or complete) else takes the value 0
Single (1/0)	This takes the value 1 if the respondent is single, otherwise 0
Sex (1/0)	1 for female and 0 for male
Children (1/0)	Takes the value 1 if the respondent has a biological child, else 0
Male spouse or household head can read a phrase in English (1/0)	If the male spouse or household head can read a phrase or sentence in English then this takes the value 1
Number of adults in the household	How many household members are adults? 18 years old and above
Helps family with agriculture (0/1)	Do you help your parents or family to farm?
Outcome variables	
Agriculture	
Good agriculture practice (1/0)	This variable takes the value 1 if the respondent follows at least one good agricultural practice. Good agricultural practice includes burying agricultural containers outside the farm; using inorganic substances to maintain the soil fertility; maintaining shades on the farm; burying outside the diseased pods that were cut off from the farm
Grow cocoa (1/0)	Which crops are you growing/did you grow?: Cocoa
Farming (1/0)	Do you farm or cultivate land?
Employment	
Employment – last 7 days (1/0)	Have you done any work for pay during the last 7 days?
Employment – last 12 months (1/0)	Have you done any work for pay during the last 12 months?
Log of hours worked in last seven days of employment	Number of hours worked in jobs in last 7 days

Outcome variables	
Finance	
Number of saving places	Count number of places where respondent saves money
Saving at bank (1/0)	Where do you save or keep money in the last 12 months?: Bank
Saving at cooperative (1/0)	Where do you save or keep money in the last 12 months?: Cooperative
Saving at microfinance (1/0)	Where do you save or keep money in the last 12 months?: Microfinance
Saving at VSLA (1/0)	Where do you save or keep money in the last 12 months?: VSLA
Saving mobile money (1/0)	Where do you save or keep money in the last 12 months?: mobile money
Used mobile money (1/0)	Have you ever received or sent money using a mobile phone?
Income	
Log of real total income in 7 days	
Log of real total income in 12 months excl. crop income	
Crop income	
Poverty likelihood	
See PPI section	

Appendix 4 Descriptive statistics

Employment sector

	Male		Female	
	Baseline	Postline	Baseline	Postline
Cocoa farming	3%	8%	28%	6%
Farming (non-cocoa)	71%	59%	45%	60%
Construction	7%	10%	1%	2%
Trading/Service industry	4%	14%	14%	26%
Teaching	3%	3%	6%	3%
Other	11%	6%	5%	3%
	Age 17–19		Age 20–25	
	Baseline	Postline	Baseline	Postline
Cocoa farming	0%	12%	5%	15%
Farming (non-cocoa)	69%	48%	68%	57%
Construction	3%	9%	6%	6%
Trading/Service industry	13%	21%	10%	12%
Teaching	5%	3%	3%	4%
Other	10%	7%	9%	5%

Self-employment sector

	Male		Female	
	Baseline	Postline	Baseline	Postline
Artisan	19%	20%	8%	9%
Financial service	1%	6%	0%	0%
Food processing	7%	7%	25%	19%
Hired labourer	35%	13%	4%	2%
Trading	38%	54%	64%	71%
	Age 17–19		Age 20–25	
	Baseline	Postline	Baseline	Postline
Artisan	11%	19%	13%	12%
Financial service	0%	0%	1%	3%
Food processing	11%	23%	17%	12%
Hired labourer	26%	6%	17%	6%
Trading	52%	52%	52%	67%

Job satisfaction

	Male		Female	
	Baseline	Postline	Baseline	Postline
Very satisfied	39%	54%	45%	49%
Somewhat satisfied	35%	24%	27%	18%
Somewhat unsatisfied	0%	0%	0%	0%
Not satisfied	25%	21%	27%	32%
	Age 17–19		Age 20–25	
	Baseline	Postline	Baseline	Postline
Very satisfied	41%	45%	41%	55%
Somewhat satisfied	28%	24%	34%	22%
Somewhat unsatisfied	0%	0%	0%	0%
Not satisfied	31%	31%	25%	23%

Loan institution

	Male		Female	
	Baseline	Postline	Baseline	Postline
Microfinance	0%	3%	15%	0%
Money lenders	7%	8%	0%	8%
Savings and loan	7%	8%	8%	4%
VSLA	7%	6%	0%	23%
Bank	21%	8%	38%	23%
Cooperative	0%	8%	0%	8%
Family/friends	57%	47%	38%	27%
Mobile money	0%	6%	0%	0%
Other	0%	6%	0%	8%
	Age 17–19		Age 20–25	
	Baseline	Postline	Baseline	Postline
Microfinance	0%	0%	8%	2%
Money lenders	0%	0%	4%	9%
Savings and loan	0%	0%	8%	7%
VSLA	0%	0%	4%	14%
Bank	50%	0%	28%	16%
Cooperative	0%	25%	0%	7%
Family/friends	50%	50%	48%	38%
Mobile money	0%	0%	0%	3%
Other	0%	25%	0%	5%

Reason for loan

	Male		Female	
	Baseline	Postline	Baseline	Postline
Rainy day/emergency		30%		14%
Farm inputs		21%		14%
Personal expenses/debt		15%		18%
Buy land		12%		0%
Business		3%		41%
School fees		3%		5%
Other		15%		9%
Funeral costs		9%		0%
Support for family or friends		0%		5%
Medical expenses		0%		5%
Other		6%		0%
	Age 17–19		Age 20–25	
	Baseline	Postline	Baseline	Postline
Rainy day/emergency		25%		24%
Farm inputs		25%		18%
Personal expenses/debt		25%		16%
Buy land		0%		20%
Business		0%		4%
School fees		0%		8%
Other		25%		12%
Funeral costs		0%		6%
Support for family or friends		25%		0%
Medical expenses		0%		2%
Other		0%		4%

Perception of whether both men and women should take part in decision-making in the household

	Male		Female	
	Baseline	Postline	Baseline	Postline
Strongly agree	54%	71%	58%	73%
Agree	40%	25%	38%	25%
Neutral	2%	0%	3%	1%
Disagree	2%	1%	1%	0%
Strongly disagree	1%	2%	1%	1%

Perception of whether men should concentrate on income activities while women should take care of the home

	Male		Female	
	Baseline	Postline	Baseline	Postline
Strongly agree	47%	54%	37%	43%
Agree	32%	20%	28%	24%
Neutral	2%	3%	2%	2%
Disagree	10%	13%	15%	12%
Strongly disagree	9%	10%	18%	18%

Perception of whether men should control big things in the household (cash, crops) while women should control the small things (vegetables, utensils)

	Male		Female	
	Baseline	Postline	Baseline	Postline
Strongly agree	50%	57%	38%	44%
Agree	32%	25%	30%	27%
Neutral	3%	2%	4%	3%
Disagree	9%	11%	13%	12%
Strongly disagree	6%	5%	16%	13%

Perception of whether women are supposed to play a secondary role in taking care of the family

	Male		Female	
	Baseline	Postline	Baseline	Postline
Strongly agree	28%	36%	33%	37%
Agree	38%	31%	32%	34%
Neutral	7%	4%	5%	3%
Disagree	16%	21%	15%	13%
Strongly disagree	12%	8%	15%	13%

Perception of whether women are disrespectful when they control family resources and are the main bread winners

	Male		Female	
	Baseline	Postline	Baseline	Postline
Strongly agree	52%	68%	38%	43%
Agree	22%	13%	19%	14%
Neutral	7%	8%	8%	10%
Disagree	12%	6%	17%	17%
Strongly disagree	7%	5%	18%	17%

Appendix 5 Gender analysis of MASO participants

Figure A5.1 Perception of whether men should concentrate on income activities while women should take care of the home

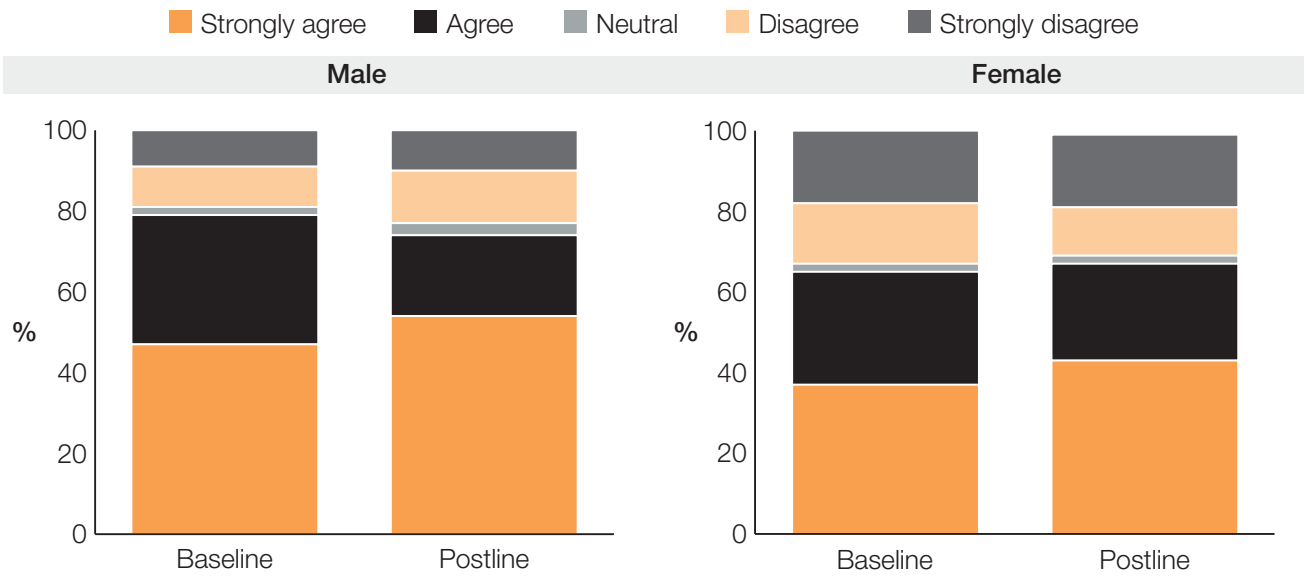


Figure A5.2 Perception of whether both men and women should take part in decision-making in the household

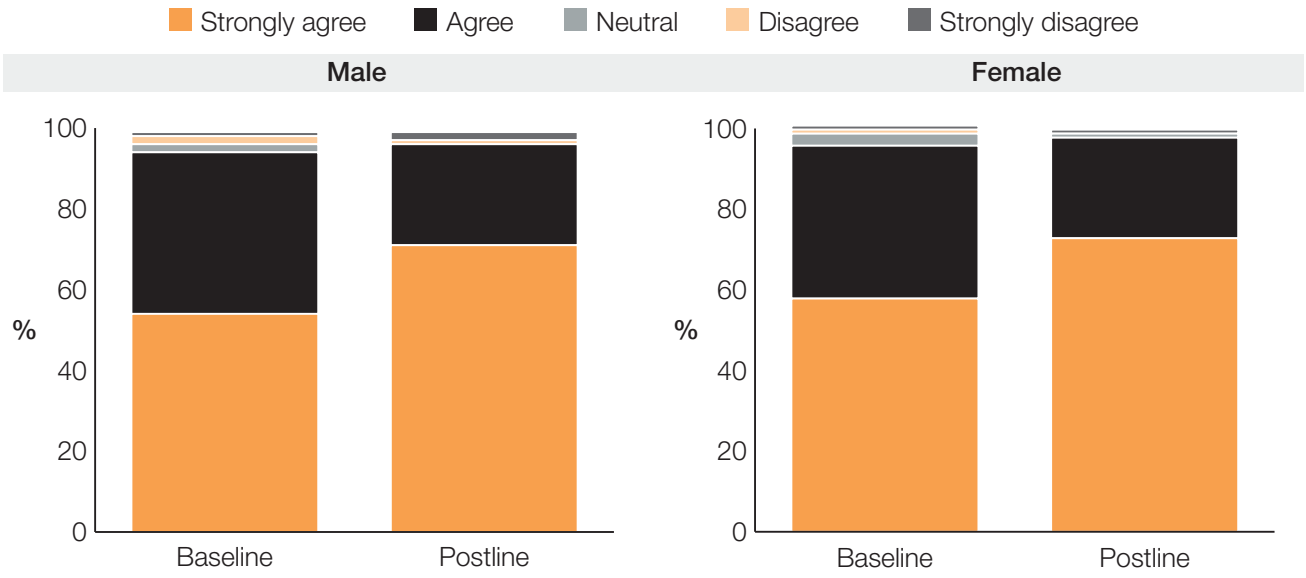


Figure A5.3 Perception of whether men should control big things in the household (cash, crops) while women should control the small things (vegetables, utensils)

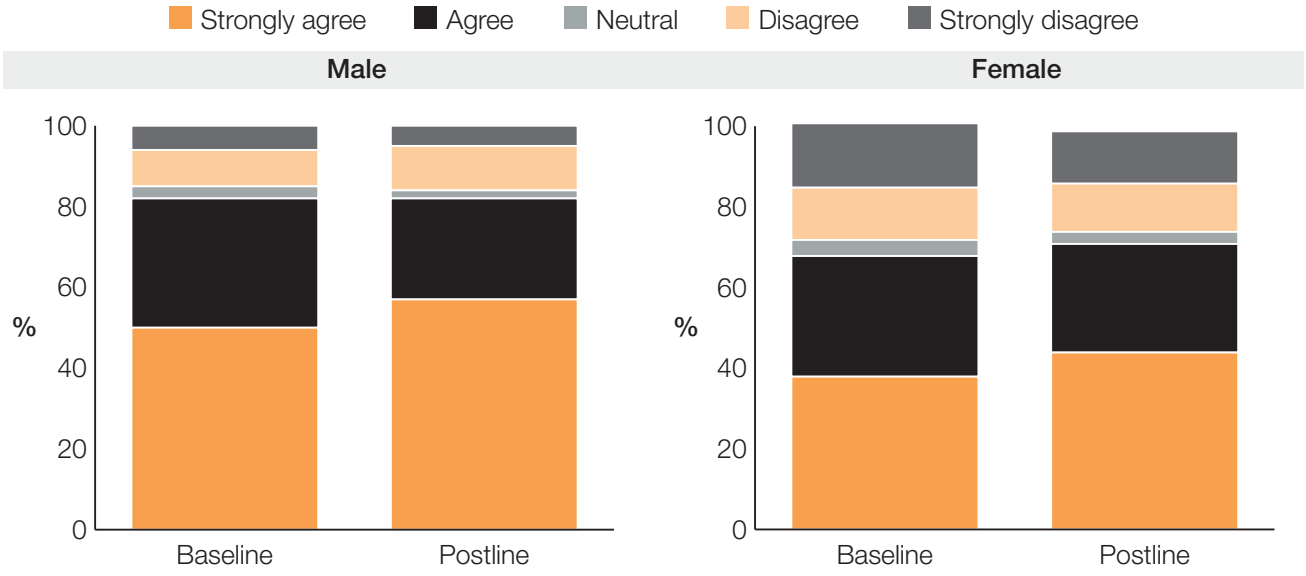


Figure A5.4 Perception of whether women are supposed to play a secondary role in taking care of the family

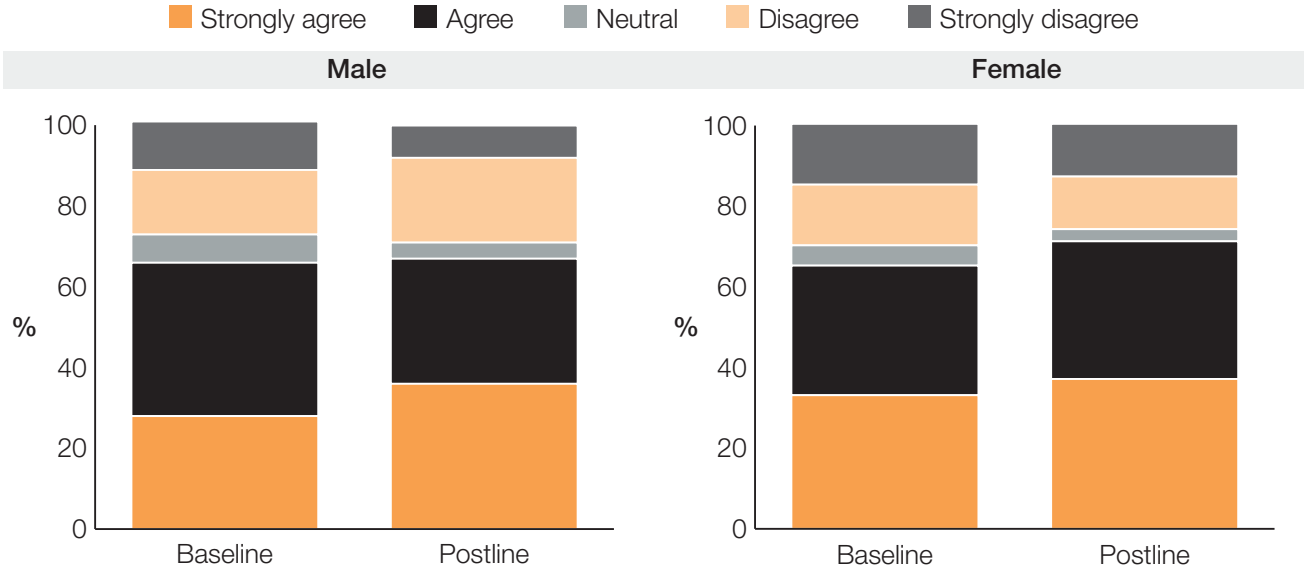
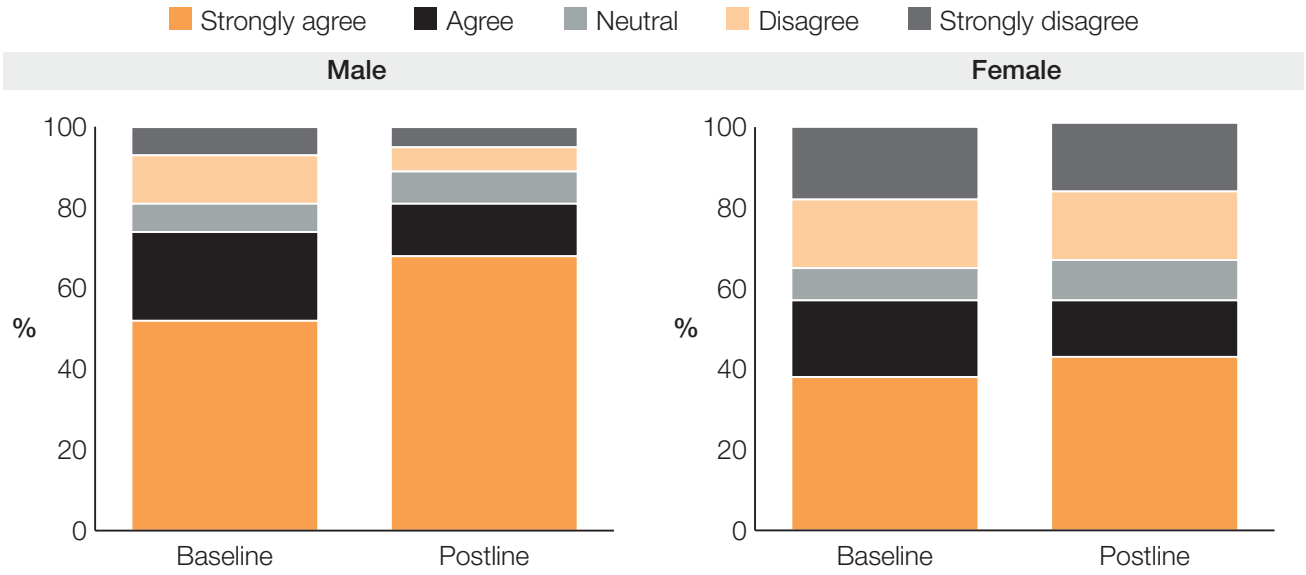


Figure A5.5 Perception of whether women are disrespectful when they control family resources and are the main bread winners



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