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Publication date:
2022

Document Version
Early version, also known as pre-print

No. 2022-028

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26 October 2022

ISSN 0924-7815
ISSN 2213-9532

Improving Workers' Performance in Small Firms: A Randomized Experiment on Goal Setting in Ghana*

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October 25, 2022

Abstract

Behavioral constraints like workers' motivation and self-control problems can be a barrier to growth of small firms in LICs. In a field experiment, we test whether setting non-binding production goals improves workers' performance in small cassava processing firms in Ghana. We first train workers to measure their daily production and then randomly assign a sub-sample to set daily production goals. Workers who set goals increase output by 16%, work 40 minutes longer per day and are 9% more productive per hour, increasing the average product of labor by 14%. The data suggests that goals act as a commitment device and ignite workers' competitive spirit.

Keywords: Behavioral Constraints; Goals Setting; Management Practices; Small Firms; Informal Businesses.
JEL Codes: O12; L26; M20; O31; O33; O35; O17; M50

*We thank Innovations for Poverty Action Ghana (IPA-Ghana) for implementing this study and NBSSI for their invaluable partnership. In particular, we thank Pierre Ives Durand for his help, Cornelius Owusu Adjei, Isaac Arthur, and Eric Tawiah for the excellent coordination in the field and Santiago Sanchez Guiu for his input during the design stage. We are very grateful to Ty Turley for his collaboration at the beginning of this project. We also thank seminar participants at Brigham Young, Tilburg, GATE Lyon, Glasgow, WU Vienna, Berlin, Exeter, UC Louvain, OSLOMET, NOVA, Essex and Utrecht, and participants at the Arne Ryde Workshop in Lund, the World Congress of the Econometric Society Meeting at Bocconi University, the Center for the Study of African Economies Conference at Oxford and the Bogota Experimental Economics Conference. Special thanks to Catia Batista, Michele Battisti, Fenella Carpena, Brice Corgnet, Julian Dyer, Lenka Fiala, Johannes Johnen, Rossa O'Keeffe-O'Donovan, Alex Koch, Mahreen Mahmud, David McKenzie, Karlijn Morsink, Amma Panin, Aureo de Paula, Eugenio Proto, Florian Schuett, Teodora Tsankova, Gonzague Vannoorenberghe, Pedro Vicente, for helpful discussions and comments. This paper was produced under the framework of the "Enabling Innovation and Productivity Growth in Low Income Countries (EIP-LIC/PO5639)" project, funded by the Department for International Development (DFID) of the United Kingdom and implemented by Tilburg University. This project received IRB approval by Brigham Young University (IRB X16388). We post-registered this trial (AEA RCT Registry ID: 0009976) as pre-registration was not customary at the time when the project started.

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I Introduction

Small firms are the main source of employment in low income countries (LICs) (see, e.g. Gollin, 2008). In Sub-Saharan Africa, they provide 80% of all jobs, representing an important driver of economic growth (Runde, 2021). Understanding how to foster the development of small firms is thus an important research and policy goal. The vast literature studying this question focuses on three main constraints to growth: capital (De Mel et al., 2008; Fafchamps et al., 2014), technology (Alfaro-Serrano et al., 2021) and managerial practices (McKenzie, 2021). Much less is known about how to improve the motivation of workers in the developing world, in spite of the fact that this lies at the core of firms' performance (Bloom and Van Reenen, 2011).

Monetary incentives, such as pay for performance, bonuses, firing, etc., are established tools to motivate workers. However, even though employers in LICs face difficulties in managing their labor force (Bloom and Van Reenen, 2011; Fafchamps and Söderbom, 2006), the use of monetary incentives is relatively uncommon (Bloom and Van Reenen, 2007; McKenzie and Woodruff, 2017; Bandiera and Fischer, 2013).[1] Several reasons can explain this observation. Compared to firms in high income countries, firms in LICs face larger resource and borrowing constraints, which may limit the adoption of incentive schemes. Weak institutions hinder the enforcement of work contracts and, as a consequence, employers often rely on informal mechanisms, such as long-term relationships based on trust and reputation, to sustain performance (Macchiavello and Morjaria, 2021). Furthermore, there is evidence challenging the effectiveness of monetary incentives in certain contexts. Experiments conducted in Ghana show that performance rewards are not sufficient to motivate workers and managers are consistently reluctant to implement them (Bandiera and Fischer, 2013; Davies and Fafchamps, 2021).

Non monetary incentives, such as recognition, praise and feedback, have shown promise in LICs.[2] The existing evidence comes from studies with agents in the public health sector (Ashraf et al., 2014), and from experimental settings (Davies and Fafchamps, 2017), but to the best of our knowledge there is no field study testing the effect of non-monetary incentives on workers' performance in small, informal firms. In this paper we report the results of an RCT designed to test whether setting non-incentivized goals can increase the performance of workers in cassava processing firms in Ghana. Food processing and agricultural firms employ over a billion of people in LICs (ILO,2013); barriers

[1] Davies and Fafchamps (2022) show that the same monetary incentives can lead to different outcomes in developed versus developing countries. Also, the effect of monetary incentives can be ephemeral, as shown by Jayaraman et al. (2016) in India.

[2] Non monetary incentives, such as recognition, feedback and social incentives, have been successfully employed to increase workers' motivation in the western world. For an overview see List and Rasul (2011).

to access capital, technology and management practices are high for these firms (Fuglie et al., 2019), and their labor productivity is typically low (Gollin et al., 2014). In addition, work is tedious, informal, labor intensive, and motivating workers in this context can be challenging (Fafchamps, 1993; Kaur et al., 2010). We focus on non-binding goals because they are both inexpensive and simple to implement. Moreover, a large body of evidence has already shown that non-binding goals can boost employees' performance and motivation (Locke, 1996). However, there is little evidence of their effectiveness within small firms in LICs, which are characterized by very different working conditions.

To implement this study, we partnered with Innovations for Poverty Action (IPA-Ghana) and the National Board for Small Scale Industries (NBSSI) of Ghana, who collaborated in the design and implementation of the intervention. Since keeping track of the amount of peeled raw cassava tubers is necessary to set goals, we randomly selected a group of 315 firms to be trained in measuring and recording daily production of peeled cassava, and a subset of 210 firms to also be trained in goal setting. We also assign 110 firms to a *Control* group. These firms only answer questions in the baseline and post-experiment survey. Firms were provided with pans to store the peeled cassava, booklets to record the number of pans peeled, and if applicable, to set production goals, and a camera phone to generate digital records of both the pans and the booklets. After four weeks of production measurement, employers and workers in the goal setting group were instructed to record at the beginning of the work shift the number of bowls they aimed to peel on that day. Actual production was recorded at the end of the work shift. The *Goals* group set daily goals for the remaining four weeks of the intervention period, while the *Production* group continued to record only production. All firms were visited weekly to ensure adherence to the protocol and to collect the records firms were generating.

We identify the effect of setting goals on workers' performance by exploiting the random assignment to the *Goals* treatment and the panel structure of our database, and estimate difference-in-difference regressions with both workers and time fixed effects. Since measures of production may be noisy, using daily records allows us to average out noise thus increasing the precision of our estimates and statistical power (McKenzie, 2012). Setting goals has large effects on performance: workers trained in this practice peel on average 0.8 extra bowls of cassava per day compared to workers who only measure production, which corresponds to a production increase of 16% (0.30 of a standard deviation). Furthermore, workers assigned to *Goals* peel cassava for 40 minutes extra per day, which corresponds to an increase of 10% in working time (0.24 of a standard deviation). Hourly productivity increases by 0.07 bowls, a productivity gain of around 8%. The practice has large

benefits for firms. The average productivity of labor increases by 0.66 bowls per worker, which is 13% more than the labor productivity of firms assigned to *Production* (0.23 of a standard deviation). These results are important as about 40% of the employers interviewed at baseline complain about a lack of labor supply, consistently with what is observed in the agricultural sector in West Africa (Fafchamps, 1993). Goal setting behavior is quite heterogeneous: around 50% of workers tend to underachieve their goals, about 20% exactly achieve them and less than one-third tend to surpass them. Importantly, all workers assigned to the *Goals* group improved their performance once the goal setting task was introduced, relative to their performance when only production is measured.

Why is goal-setting effective in this context? In line with the theoretical literature showing that goals are a tool to mitigate self-control issues, we find that setting goals is more effective for workers that produced relatively less during the pre-training period and that are thus more likely to benefit from a commitment device. In addition, setting goals has very large effects on the performance of workers that are paid piece-rate, but not on those that receive flat rate payments. This result is a further indication that goals help workers overcome motivational problems that prevent them from working longer, more productively and ultimately earning more. Similar to many agro-businesses, in our study workers peel cassava outdoors and interact frequently. Peer effects are thus potentially important in explaining the success of goals setting. Four months after the intervention, we find that workers who set goals report a higher tendency to compete with others. Even so, we find no evidence of increased stress levels or reduced life satisfaction among the workers that participated in goal setting, controlling for the baseline levels of these variables. On the contrary, the large majority of employers and workers were satisfied with the training and found it useful.

Our paper contributes to the literature that studies how to improve workers' performance in developing countries. The paper by Kremer et al. (2015) is possibly the closest one to ours. The authors conducted a field experiment in a data-entry firm in India, where workers could choose between a piece rate contract and one where payment was still piece rate, but conditional on meeting a self-chosen production goal. More than one-third of the workers selected the dominated contract with targets, which shows that they were willing to pay for a commitment device that limited self-control problems.[3] Our study differs from that in Kremer et al. (2015) in some important aspects. First, in our study goal achievement is neither punished nor rewarded, thus our intervention does not modify existing monetary incentives. Furthermore, instead of studying an urban firm, we focus on several small agri-businesses. The nature of the work performed in these firms is tedious and

[3]For evidence on the existence of self-control problems in tedious tasks see also (Bulte et al., 2020), who conduct lab-in-the-field experiment in Uganda.

self-control problems can be widespread (Kaur et al., 2010).

Our study is additionally related to the literature that studies the effect of goal setting on economic outcomes. Non-binding goals have been shown to be an effective motivator in western cultures (Locke et al., 1984; Locke, 1996; Locke and Latham, 2002; Gosnell et al., 2020), and to sometimes work even better than incentivized goals (Brookins et al., 2017; Gonzalez et al., 2020). We show that non-binding goals are also an effective tool to increase workers' performance in a LIC. The results from our intervention also speak to an emerging literature that studies how certain practices, including setting goals, can improve the performance of micro entrepreneurs in the developing world. Results so far are mixed: Batista and Seither (2019) find that encouraging firm owners in Mozambique to set realistic goals had positive effects on savings and effort levels, while McKenzie et al. (2022) show that inducing higher financial aspirations among poor entrepreneurs in the Philippines did not have positive effects on savings and investments. We deviate from the cited studies by focusing on production goals and by allowing workers, instead of employers, to set goals.

Lastly, our paper contributes to the literature on business training of micro and small businesses in developing countries. Business practices are important for small firms in the developing world and the simpler the practice, the better (Drexler et al., 2014; McKenzie and Woodruff, 2017; Dalton et al., 2021). The experiments reported in this literature typically evaluate trainings that require several days, involve a set of business practices and measure a number of firms' performance indicators. We consider one, understudied, practice and collect individual data on workers' performance. Another important difference is that most of the existing training programs are targeted to retailers or small producers, while we focus on agricultural firms. Finally, the business training literature typically finds that trainings are not effective, or less effective, for female-owned enterprises (McKenzie and Woodruff, 2014). We show that setting goals works well in a sector where both firm owners and workers are predominantly female.

II Conceptual Framework

Goal setting is a commonly used practice to promote personal growth and improve performance on the job. The importance of goals was first recognized by psychologists, who drew on the philosophy of motivation to study goal setting. This theory is based on what Aristotle called final causality, that is, action caused by a conscious motive (Locke, 1996). Social psychologist Timothy Ryan had already suggested in the 1970s that 'a fruitful approach to human motivation might be to simply ask people what they were trying to accomplish when they took an action' (Ryan, 1970). In this sense, the

process of setting a goal forces a worker to devote more attention to a certain task, bringing that task to the front of mind and inducing the worker to make plans. A goal gives structure, organization, and focus. Introducing a goal that is difficult but attainable also increases the challenge of the job, thus providing meaning to otherwise tedious activities. In addition, a specific goal makes it clear to the worker what she is expected to do. Finally, meeting one's goals provides a sense of achievement, recognition, and accomplishment (Latham and Locke, 1979).

Economists and management scholars have also studied goals, both theoretically and empirically. Decision making models show that goals can work through different behavioral channels such as reference-dependent preferences (Heath et al., 1999; Wu et al., 2008; Corgnet et al., 2018; Dalton et al., 2015; Gonzalez et al., 2020), intrinsic motivation (Gómez-Miñambres, 2012), as a source meaning (Cassar and Meier, 2018) or as a self-control device for time inconsistent decision makers (Koch and Nafziger, 2011; Hsiaw, 2013). The latter conceptual framework is especially useful to understand why goals can be effective in work environments characterized by tedious tasks; by choosing an individual goal, a present-biased agent creates a reference point that mitigates her tendency to get distracted and to interrupt work. Given that individuals' ability to exert self-control is lower when in poverty (Bernheim et al., 2015), it is all the more important to test whether setting goals can be an effective mean to motivate workers in LICs.

Goals can be bundled with monetary incentives, such as bonuses for reaching a goal or penalties for under-achievement, but they can also be wage irrelevant, i.e. non-binding. Important for our study is that wage-irrelevant goals effectively boost performance. For example, Brookins et al. (2017) and Corgnet et al. (2015) show that non-binding goals can increase performance in a lab-in-the-field experiment and laboratory experiment, respectively. There is also evidence to suggest that rewarding goal achievement with a monetary prize may not be optimal. Gonzalez et al. (2020) show theoretically and experimentally that financial prizes can back-fire when workers are loss averse, as they may crowd-out the intrinsic motivation ignited by the presence of a goal. Notably, most of the existing evidence on goal setting originates from western countries[4] and to the best of our knowledge, this study is the first to test whether goals are effective for workers employed in small firms, in a LIC.

[4]The papers of Kremer et al. (2015), Batista and Seither (2019) and McKenzie et al. (2022) constitute an exception (c.f. the Introduction section). However, their focus is not on testing the effectiveness of goals for workers' performance.

III Research Design

A Study Setting

The study was conducted in the south east of Ghana, where the bulk of the nation's cassava is produced.[5] Our sample consists of traditional micro and small cassava processors situated in rural areas. We describe the firms' characteristics at the beginning of Section IV.

Cassava processing has several features that make it an ideal sector for the purposes of this study. First, the sector has economic relevance in African economies. Cassava is an important staple for both the diets and incomes of rural farmers in West Africa, and in Ghana in particular. Cassava forms approximately 26% of the per capita daily consumption in Ghana, and 22% of the agricultural gross domestic product (Fao, 2005). The Government of Ghana has targeted cassava cultivation and processing as a way to support food security and incomes among the poor (Angelucci, 2013). Additionally, there is increased interest in cassava for industrial purposes, such as for plywood, animal feed, and alcohol production (Kleih et al., 2013). Given cassava's economic importance, improving labor management in this sector can have important implications for the livelihoods of many people.

We focus on the first stage of the process, which involves peeling the cassava tubers. Cassava is a highly perishable crop which deteriorates 2-3 days after harvest, and it is thus crucial to peel the tubers as quickly as possible. Although other phases of the processing have been successfully mechanized, the peeling stage presents technological challenges and is still largely done by hand (Seth, 2020). This stage is ideal for product measurement and goal setting, as it is quite simple, measurable, and comparable across all cassava processors. Furthermore, it does not rely upon electricity, which is unpredictable in Ghana.[6]

Lastly, cassava firms share features with other agro-processing industries in developing countries, which increases the external validity of our study. For example, the production of cereals, palm oil, honey, and other goods operates on a similar scale and is often characterized by informal labor relations. The lessons learned by studying cassava processing should thus be transferable to other sectors.[7] To implement the study, we partnered with the National Board for Small Scale Industries, a

[5] For budgetary reasons, we limited our study to four districts encompassing 36 communities in total. The four districts are: Nsawam-Adoagyiri (15 communities), Ayensuano (5 communities), Akuapem North (15 communities) and Upper West Akyem (1 community). The districts were selected on the basis of their vicinity to Accra, where IPA's central office is located.

[6] Around 75% of cassava is later processed into gari through a process that involves cutting raw cassava tubers, grinding these tubers into a mash, and fermenting and pushing this mash through a sieve. The ensuing pieces of cassava are fried, resulting in a crispy, granulated product similar to couscous (Okechukwu et al., 2012).

[7] Before selecting cassava processing for our study, we considered other possible sectors, including palm oil, fruit juice, cosmetics, cereals, and sachet water. Cassava processing was selected for the reasons outlined in this section.

public sector organization under the Ministry of Trade and Industry. Among other responsibilities, NBSSI serves as the principal government agency for developing, implementing, and monitoring programs that enable private sector businesses to grow. This partnership allowed us to harness NBSSI's extensive network of firms. Furthermore, we trained NBSSI employees to conduct the training sessions with firms, which were subsequently implemented by IPA and NBSSI employees in tandem. The involvement of researchers in the trainings was thus minimal.

B Sampling

Due to the absence of a representative list of cassava processors in the study area, we created a list of 1052 cassava processing firms identified with the support of NBSSI. Out of these 1052 firms, 859 satisfied the conditions to participate in our study. The conditions were: a) to be a gari producing firm that has cut and peeled cassava daily over the past six months, and plans to continue operations over the next six months; b) to have 3 to 20 regular employees who peel cassava (i.e. that work every week) and c) to be interested in participating in the research project. Out of these 859 firms, the baseline sample was generated on the basis of additional criteria, as collected during the listing. These criteria were (a) to have processed cassava over the last six months, and to intend to continue processing cassava over the next six months, (b) to have employees that peel cassava during both high and low seasons, (c) to employ between 2 and 20 employees during low season, (d) to peel cassava at least once a week, (e) the firm is not formally registered as a businesses, and (f) the firm has not received assistance from NBSSI in the prior 6 months. This sampling procedure resulted in 595 eligible firms. These firms were then randomly assigned to either the baseline sample, or to a backup list, and stratified on community.

C Experimental Design and Timeline

We randomly selected 425 firms out of the 595 eligible firms. After completion of a baseline survey, the firms were randomly assigned to a *Control* group ($N = 110$), a *Production* measurement group ($N = 105$), and a production measurement plus *Goals* setting group ($N = 210$).[8] The random assignment was stratified on number of employees, profits (positive or negative), employer's life satisfaction, and age (median split). In addition, firms were randomly assigned to be trained either by a pair of representatives from both NBSSI and IPA, or exclusively by an IPA representative.

[8]Twice as many firms were assigned to *Goals* as to *Production* because we initially planned to implement both self-chosen and exogenously given goals. We later opted only for the first treatment because it is a more natural intervention for the context. Additionally, oversampling *Goals* is useful for the analysis of goal setting behavior.

Firms in the *Control* group did not receive any training, while all firms assigned to either *Production* or *Goals* were invited to participate in a training on production measurement. During the training, firms were instructed to follow a protocol to measure and record the amount of cassava peeled per employee, per day. The training was offered to both employers and employees and was conducted on the premises of each firm on an agreed-upon date and time.[9] For logistical reasons, a maximum of four employees per firm were allowed to participate in the training. Firms are usually run by one single employer, who receives the training. The training took approximately one hour per firm.[10]

At the beginning of the training, trainers introduced the tools that were to be used for production measurement. These tools consisted of a booklet for each employee, one aluminum bowl of a standardized size per each trained employee, a mobile-phone with a camera, a video outlining the protocol, and miscellaneous utensils (e.g. pencils, sheets, stickers, markers, etc..). The video was available in two local languages and it served as a reference in case the firm forgot the protocol. Each employee was given his/her own production booklet with a unique ID code and the names of both employee and employer on the front cover. On each page, the booklet had an illustration of twelve cassava bowls, numbered from 1 to 12, and at the top of the page, the following was written: 'Today, I peeled this many bowls of cassava'. A picture of the production booklet and goals booklet can be found in Appendix C. The design of the booklets and protocol is the result of careful piloting.

Once the tools were presented, employers and employees were trained to measure and record production using the following protocol. At the beginning of each working day, the employer would place on the side of the bowls a pre-printed sticker with the employer and employee ID and name, and the date of peeling. The employer would take the employee booklet and write down the date and the starting time of peeling. The employee would then start peeling cassava, placing the peeled cassava into her uniquely identified bowl. Employees received clear instructions that they could only use their uniquely identified bowl, and no other person could use their bowl to hold peeled cassava. At the end of the working shift, the employer would count the number of bowls filled to the brim, circle in the employee booklet the total number of bowls, write down the end time, and place his/her thumb print or signature.[11] The employer would then remove the stickers from each bowl and store the raw cassava.

[9] Firms are typically owned and managed by one person. We thus use the terms firm and employer interchangeably.

[10] In total the field team consisted of an IPA Research Associate, an IPA Field Manager, two IPA Team Leaders, two IPA Auditors, 14 BAs and 21 MOs. The training sessions were conducted either by a trained NBSSI Business Advisor (BA) and an IPA Monitor Officer (MO), or only by an IPA MO.

[11] Bowls not filled to the brim were only considered if they were the last bowl of the employee for that peeling day. Any bowl that was not filled to the brim with peeled cassava was considered a half bowl. In this case, the employee was to indicate a half bowl in the booklet.

In addition to recording production in each booklet, the employer was instructed to take a photograph of each bowl immediately after it was filled. The photos thus recorded information on the date and time at which a worker filled a bowl. In the event that the employer was absent, workers were permitted to take pictures of their bowls.[12] Firms were informed that a monitor from IPA would visit each firm once a week to assess the firm's progress, collect data on production, and retrain on protocols if necessary. During the training, we promised that employers and employees would receive a completion certificate provided by IPA if they followed the protocols. We made it explicit that the phone and bowls were tools to be used only for the duration of this exercise, that they would be recollected after the conclusion of the training and that firms would not receive any reward based on how much cassava was peeled.

All firms were instructed to follow the production measurement protocol for eight weeks. Firms assigned to the *Goals* group were re-visited in week four and trained to set and record employees' production goals for the remaining four weeks.[13] The protocol for setting goals was as follows. At the beginning of each working day, the worker would propose a daily target to the employer. We chose to implement daily work goals, as opposed to goals that span a longer time horizon, as they may better facilitate self-control (Koch and Nafziger, 2016). If necessary, employer and worker would discuss whether the target was realistic, and the two would then agree on a target. Due to the informality of the context, the close employer/employee relationships, and after consulting them in the piloting phase, we decided that goals would be set together by the employer and employee rather than individually by one of the two. Moreover, this is also in line with modern workplace practices, where it is common to have employees and employers agree on a target. The employee would then use his or her own goals booklet to record the number of bowls set as a target, and the employer would take a picture of the booklet immediately after the goal was set. The goals booklet was identical to the production booklet, in addition to an illustration of 12 numbered bowls at the top of each page with the sentence 'Today, my goal is to peel this many bowls of cassava'. At the bottom of each page, there was an illustration of 12 numbered bowls representing the actual number of bowls filled on that day. After setting and recording a daily goal, employers and employees had to follow the same production measurement protocol described above.

The timeline of the project was as follows. In October and November 2016 we listed cassava

[12]The employers were instructed to turn the phones off after each working day, and emphasized that the batteries were not to be removed for any reason. In case this was not done, the trainers taught the firms how to charge the phones when necessary. The trainers also emphasized that the phones were to be used only for the purposes of the project, and not to be used personally.

[13]During the production measurement weeks firms assigned to *Goals* did not know that they were going to be trained in goal setting later. For logistical reasons, we had to randomize firms into treatments at the beginning of the entire training period.

processors. From May to June 2017 we piloted both the baseline survey and the interventions. In August and September 2017 we administered the baseline survey. Firms were trained in October and November and the data collection of production measurement and goal-setting took place from October to December 2017. In April and May 2018 we administered a post-intervention survey. A detailed timeline can be found in section B of the Appendix.

D Production Measurement

The protocols were specifically created to facilitate the measurement of production, accounting for the informality of the context. Their design was informed by several pilots and consultations with employers and workers. First, the combination of bowls, booklets, cameras, and unique employee ID stickers was meant to minimize measurement and recording errors. The booklets provided a simple didactic tool to record the amount of cassava peeled daily by each employee and to record daily targets. The aluminum bowls provided a standardized unit of measurement and the camera phone registered different events (e.g. bowls filled, booklets circled) with a date stamp.[14] Second, to avoid production goals being altered after the work was completed, we instructed employers to take a picture of the booklet right after the goal was agreed upon. Moreover, we collected the photographs of bowls and booklets on a weekly basis to ensure that we could intervene if any firm was failing to record their production and goals accurately.

One may worry that employers or workers could take many photographs of the same bowl, take pictures of someone else's work, or put a filler in the bottom of the bowls to make it look like they peeled more. However, since goal achievement was not financially rewarded, cheating would not bring any material benefit. In addition, cheating could only happen if the employer would collaborate in taking fake pictures of the booklets and bowls. Even though we deemed data falsification to be very unlikely, we introduced spot checks by IPA monitors.[15] While there were no monetary incentives to comply with the protocols, employers understood that having a systematic way of measuring and recording production would help them structure their daily activities. Employers welcomed the project and, overall, seemed intrinsically motivated to follow the protocol.

Whenever possible, we took measures to mitigate the possibility of treatment contamination. Animosity and envy can breed among community members when an intervention carries material gains, or is a funding source. Since our intervention was not material in nature, the possibility of creating frictions between two treated processors in the same community was low. Furthermore,

[14] We did not provide scales to weight the cassava bowls because this option was both very expensive and perceived as too time consuming by the employers.

[15] All firms were spot-checked at least once. In total, auditors conducted 767 audits on randomly selected firm IDs.

training sessions were conducted in private, firms were asked to keep their materials private, and trainers emphasized that the data generated from the intervention was strictly confidential. Furthermore, spillovers into the control group were inherently limited by the fact that control firms received none of the materials needed to properly execute the intervention. Finally, we collected data on workers' movement across firms during the intervention. For employees that noted that they work for other processors in the same community, we collected data on who these processors were, if in our sample, how frequently the employee peeled for him or her, and what the employee's relationship was to him or her. In this way, we could control in our analysis for individuals who may have been exposed to varying experimental arms.[16]

IV Data and Empirical Approach

A Data Sources and Descriptive Statistics

We use three sources of data: a baseline survey of firms and workers, data from photos of filled bowls and booklets, and a post-intervention survey. The baseline survey included detailed business and socio-demographic questions, as well as past experience with goal-setting and other behavioral measures. In total, at baseline, we contacted 425 owners of cassava processing businesses and surveyed 422. The remaining three owners could not be found at the time of the survey and are thus not included in the analysis. To collect data on employees, we asked employers to put us in contact with two employees satisfying the following conditions: is 18 years-old or above, peels and cuts cassava relatively frequently (at least once a week) and plans to peel cassava for at least the next six months. In total, we interviewed 844 employees, two per business. All the interviews were done in private.

Table A.1 presents summary statistics and randomization checks for the baseline sample of employers assigned to *Production*, *Goals*, and *Control*, respectively. We include employers' background characteristics, business characteristics, and variables related to record keeping and goal setting. The last three columns of the table present p-values for tests of differences in means between the treatment groups. The overwhelming majority of firms are owned by women (>90%), with an average age of about 43 years. Employers attain on average 4.4 years of schooling and about a third have no education at all. The average firm has been producing cassava for about 13.5 years and employs

[16] We identified three cases of employees who worked for more than one firm in a given week; out of these three, only one employee changed treatment groups as a result of these movements. We dropped this employee from the analysis.

4.5 employees (of which half are family members).[17] Based on their last peeling cycle, firms generate about 550 USD (PPP) in sales and 160 USD (PPP) in profits per month. Importantly, only 19% of the firms separate their business and family accounts, fewer than 5% keep written business records or measure production, and only half of the owners responded 'yes' when asked if they have ever set a goal. Employers report a high level of life satisfaction. The table shows that the randomization was successful, with none of the variables differing significantly between the groups.

Table A.2 presents summary statistics and randomization checks for the baseline sample of employees in *Production*, *Goals* and *Control*, respectively. Like in the employers' case, the majority of workers (79%) are women. Their average age is 36 years and their average educational attainment is 5.6 years. The average employee has 4.6 years of experience working for the same business; employees work approximately two weeks per month, and on a peeling week, they work on average three days a week. They are very poor, with a reported weekly income of about 24 $PPP. We observe some heterogeneity in how employees are paid for peeling cassava. Almost half of the employees state that they are paid a flat-rate, about one third are paid piece-rate, and the rest paid by other methods.[18] Slightly more than half of the workers state that peeling cassava is their only source of income. About half of the employees responded that they never experienced goal setting in their job.[19] The tests for differences in means between treatment groups show that the randomization was in general successful, with only three variables showing significant differences between treatments. Compared to workers in firms assigned to *Goals*, workers in firms assigned to *Production* are somewhat younger, with less experience and receive slightly lower income on a peeling week. We control for these imbalances in the regression analysis by using individual fixed effects.

We construct the dataset on workers' production using the information in the photos of filled bowls and booklets that were taken as part of the intervention protocols. Production is measured as the number of cassava bowls filled during a peeling shift. Workers perform one peeling shift per day and for each worker we measure labor supply on average 4.66 (s.d. 3.4) times during the entire period of study. From the booklets, we also extract information on the length of each peeling shift

[17] The 80% of firms in our sample either grow their own cassava or buy ropes to harvest it. A minority of firms buys cassava from the local market. Firms in *Production* and *Goals* do not differ in terms of where they procure the cassava to peel (Chi-square test $p = 0.75$).

[18] The large majority of employees are paid in cash (75%) and the rest are paid in-kind (about 8%) or in other ways (e.g. gift exchange, favors, etc.). Most firms, 74%, use the same payment scheme for all their employees.

[19] To both employees and employers we asked 'What is your definition of the word goal or target'. About 50% of respondents answered 'I do not know what a goal or target is', while the remaining half gave his/her own definition. Regardless the answer given, the enumerator read out loud: 'A goal is a desired outcome that a person envisions, plans and commits to achieve.' In this way, all respondents could continue answering the survey with the same definition in mind.

and, for the *Goals* intervention, on the goal set for a given shift. The resulting data set has a panel structure with workers as the unit of observation and days as the time dimension.

For the post experiment survey we contacted all the firms and employees who took part in the intervention and who answered the baseline survey. Among the 272 firms that answered the baseline survey and took part in the intervention, 265 also answered the post experiment survey. In these firms, there was also at least one worker who answered the post-experiment survey. In total, 469 out of 671 workers (i.e. about 70%) took part in the baseline survey, in the intervention, and in the post intervention survey.

B Treatment Compliance

For firms, we consider two types of treatment compliance: a) participation in the training sessions and b) compliance with the protocol to measure production and goals during the intervention period. We observe very high compliance rates in both dimensions, and no evidence of selective compliance.

Out of the 312 cassava processors who answered the baseline survey and who were invited to the production measurement training, 296 completed the training sessions; 16 firms (6 in *Production* and 10 in *Goals*) could not be trained because they were unreachable at the time of the training. To address potential concerns of selection bias by firms into the training, we regress a dummy variable equal to one if a firm took part in the training on 1) treatment assignment, 2) key observable firm characteristics elicited in the baseline survey[20] and 3) both set of variables together. Regression results reported in the first three columns of Table A.3 show that firms that have been operating for a longer period are more likely to join the training (p-value < 0.05) and to be active peeling (p-value < 0.10). However, there is no evidence of selective compliance by treatment status.

Out of the 296 trained firms 24 firms (12 in *Production* and 12 in *Goals*) either did not peel or did not follow the protocol during the intervention period. This leaves us with a sample of 272 firms, of which 86 firms correspond to the *Production* group and 186 to the *Goals* group. To test for the presence of selection bias among firms that we observe peeling, we run the same three probit specifications mentioned above but where the dependent variable is a dummy equal to one if the trained firm peeled at least once during the intervention period. Results are reported in columns 4 to 6 of Table A.3. The positive and marginally significant coefficient of *Goals* in column 4 and in column 6 indicates that firms trained in goal setting are slightly more likely to also peel cassava during the intervention period (p-value < 0.10), but it is important to notice that this effect is driven

[20]The included firm characteristics are: employer's age, total staff members, and number of years operating in the cassava business.

by very few observations.

In total, we trained 788 workers, of which 672 also peeled during the intervention period. Three workers worked for more than one firm during the intervention period: out of these, we exclude from the analysis the one employee that worked for firms assigned to different interventions. This leaves us with 671 peelers, 220 in *Production Measurement* and 451 in *Goals*, that are trained and for whom we observe production. Out of these, 469, 147 in *Production Measurement* and 322 in *Goals*, also answered the baseline and post-intervention survey.[21]

To test whether there is differential treatment assignment of workers depending on whether they participated in the entire intervention (i.e., the baseline, the training and the peeling phase) as compared to only the training and peeling, we run a probit regression. The dependent variable is equal to one if the employee took part in the entire intervention and is zero if the employee was trained and peeled, but did not answer the baseline survey. Column 1 of Table A.4 shows that the probability of belonging to one of these two groups of employees does not depend significantly on treatment assignment. Second, in column 2 of the same table we show that workers' average production during the entire period of study is not significantly different between workers who participated in both the baseline survey and in the training, compared to workers who only took part in the training. Taken together, these results indicate that no selection bias influences our treatment effect estimates.

C Empirical Approach

We use the following difference-in-difference regression to identify the effect of goal setting on workers' performance:

$$y_{it} = \alpha_i + \omega + \beta \text{Goals}_f * \text{Post} + \epsilon_{it} \tag{1}$$

and conduct three specifications where y_{it} is respectively 1) the number of cassava bowls peeled by worker i on day t, 2) the number of hours worker i spends peeling on day t, 3) the daily productivity of worker i, defined as the number of bowls peeled divided by the hours worked on a day t. Workers fixed effects are captured by α_i and ω represents week fixed effects. By including individual and time fixed effects we control for stable unobservable differences among workers and working weeks. The interaction term $\text{Goals}_f * \text{Post}$ is equal to one if an individual works in a firm that is assigned to the

[21] Recall that two employees per firm were surveyed at baseline, but we measured production of at most four employees per firm.

Goals training and if the training has started (i.e. the dummy Post is equal to one). Our coefficient of interest β estimates the differential effect of the *Goals* training on workers' performance. Since observations within the same firm are unlikely to be independent, we cluster standard errors at the firm level.

From the perspective of firms, a fundamental question is whether the practice of setting goals can increase the average product of labor. To answer this question we conduct the following regression:

$$y_{ft} = \alpha_f + \omega + \beta \text{Goals}_f * \text{Post} + \epsilon_{ft} \tag{2}$$

where the dependent variable is defined as the total number of bowls peeled during a peeling day at a given firm, divided by the number of workers who have been peeling. Firms fixed effects are captured by α_f, and week fixed effects by ω. In all specifications based on eq.1 and eq.2 the dependent variable is winsorized at 5% and 95% levels to deal with outliers.

V Results

We start by describing the effect of setting goals on workers' performance and explore possible channels through which goal setting works in our context. We then continue with an analysis of goal setting behavior, and then document the effect of goal setting on outcomes related to workers' wellbeing. Lastly we comment on goal setting persistence and diffusion.

A Impact of Goal Setting on Performance

Specifications (1) to (3) in Table 1 present estimates of the model described in eq.1. The positive and statistically significant coefficient of *Goals**Post in specification (1) indicates that setting goals effectively increases output. Compared to their counterparts who were only trained to measure production, workers in *Goals* peel 0.82 extra bowls of cassava per day (p-value < 0.01). Considering that the average number of bowls peeled in the period preceding the intervention was about 5.2 per peeling shift, the increase in output due to goal setting is substantial and amounts to 16% (0.31 of a standard deviation).

In specifications (2) we test whether workers in *Goals* spend a different amount of time peeling as compared to those in *Production*. To this end, we conduct regressions based on eq. 1 where y_{ift} is now the number of hours spent peeling by worker i in firm f on day t. The coefficient of the

Table 1: **Effect of Goal Setting on Worker's Performance**

Dep.var:	Bowls peeled (1)	Peeling time (2)	Productivity (3)	Product of Labor (4)
*Goals**Post	0.819***	0.505*	0.0726*	0.656***
	(0.268)	(0.281)	(0.0406)	(0.251)
Constant	5.188***	6.601***	0.810***	4.923***
	(0.259)	(0.283)	(0.0436)	(0.208)
Observations	3,126	3,089	3,089	1,527
N. of workers	671	666	666	
N. of firms				272

*Notes: Regressions include individual and week fixed effects. Dependent variables are winsorized on both tails at the 5th and 95th percentiles. Standard errors in brackets are adjusted for clustering at the firm level. *** p<0.01, ** p<0.05, * p<0.1.*

interaction term *Goals**Post in specification (2) shows that setting goals significantly increases time spent peeling (p-value < 0.1). Relative to workers who are only trained in measuring production, workers who set goals peel cassava for 0.5 hours extra per peeling shift, i.e. for almost 30 minutes longer. Peeling shifts lasted on average 6.6 hours before our interventions took place, which implies that setting goals increases time spent at work by 8 percent (0.2 of a standard deviation). Column (3) in Table 1 shows that productivity, defined as number of bowls peeled per hour, increases by 0.07 bowls per hour in *Goals* relative to *Production*, which amounts to a productivity gain of around 8% (0.14 of a standard deviation).

We now turn to the question of whether setting goals has an effect on firms' average product of labor, defined as the average amount of cassava bowls peeled by workers in a firm, during a shift. Column (4) of Table 1 displays the results of conducting regression eq. 2. Among treated firms, the average product of labor increases by 0.66 bowls per worker (p-value < 0.05) that is 13% more than in *Production* (0.26 of a standard deviation). This indicates that setting goals is not only effective for individual workers, but also for firms, as it allows increasing their per-worker output.[22]

To test the robustness of our main results we conduct additional regressions that are reported in the Appendix. First, we run the specifications in Table 1 exclusively focusing on the sample of workers that have been observed during the entire period of the study, i.e. both before and after the goal setting training. The sample size shrinks by about 40%, but the estimated treatment effects are largely in line with those found for the full sample. Table A.5 reports the results. On the balanced sample, we also conduct ANCOVA regressions where we regress our dependent variables as defined

[22] One may worry that such output gains may come at the cost of a decrease in the quality of the work performed, but the photographs of peeled cassava bowls suggest that this was not the case. Furthermore, employers' high satisfaction with the intervention (c.f. section E) further suggests that peeling quality did not decrease after the intervention.

above on a treatment dummy and on the mean value of the dependent variable during the period preceding the intervention. The effect of goal setting on time spent peeling, productivity and average product of labor is analyzed in a similar fashion. The results of this analysis, reported in Table A.6 confirm the positive and significant effect of goal setting on performance.

B Why Do Goals Increase Performance? Possible Channels

Having established that setting goals improves worker's performance, we explore possible channels driving this effect. Following the literature on personal goals, we first consider the possibility that goals are means to overcome a lack of self-control at the workplace (see, for example, Hsiaw (2013) and Kremer et al. (2015)). In a second step, we investigate peer effects among workers.

Self-Control Economic models predict that goals increase motivation and effort because they act as reference points and self-commitment devices for individuals with low self-control (Wu et al., 2008; Koch and Nafziger, 2011; Hsiaw, 2013). We take workers' production in the first four weeks of the experiment as an indicator of the ability to exert self-control. Albeit imperfect, this measure should be at least correlated with existing self-control problems. Goal setting should then be more effective for individuals who were peeling lower amounts of cassava before receiving the training.

To test this, we perform a median split of the workers based on their average production during the pre-training period, and then test the effectiveness of goal setting on these two sub-samples by conducting regressions like in eq.1. Specifications (1) and (3) and (5) in Table 2 show results for workers that had a relatively low production before the intervention. After the training, these workers peel on average 0.81 extra bowls of cassava and spend an additional 1.2 hours peeling (p-value < 0.01). The effect of the training on productivity is also positive, but not statistically significant. Workers that peel relatively little cassava have certainly more scope for increasing their performance than those who peel large amounts, but having such a scope is just a necessary condition, not a sufficient one, for a production training to be effective. The training may fail to have the desired effects because, for instance, workers are not interested in increasing their production or because they do not benefit from the training. The fact that goal setting has a large impact for these workers is thus a non-trivial result.

Setting goals has a smaller impact on workers that were peeling relatively large amounts prior to the training: specification (2) shows that the number of peeled cassava bowls increases by 0.84 (p-value < 0.10), and specification (4) shows that peeling time is basically unchanged. Productivity of both low and high production workers increases, albeit insignificantly, in both groups.

Table 2: **Effect of Goal Setting by Workers' Pre-training Production**

Dep.var:	Bowls Peeled		Peeling Time		Productivity	
	Low	High	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)
*Goals**Post	0.807***	0.837*	1.214***	-0.0618	0.0405	0.0985
	(0.279)	(0.424)	(0.429)	(0.361)	(0.0514)	(0.0623)
Constant	3.149***	6.828***	5.949***	6.848***	0.613***	0.989***
	(0.148)	(0.496)	(0.449)	(0.334)	(0.0509)	(0.0705)
Observations	1,146	1,564	1,132	1,546	1,132	1,546
N. of Workers	257	264	254	264	254	264

*Notes: Low (High) indicates below (above) median performance in the period preceding the goal setting intervention. Regressions include individual and week fixed effects. Dependent variables are winsorized on both tails at the 5th and 95th percentiles. Standard errors in brackets are adjusted for clustering at the firm level. *** p<0.01, ** p<0.05, * p<0.1.*

We exploit the fact that firms adopt different payment schemes to test whether setting goals has differential effects depending on existing incentives.[23] We conduct regressions as in eq. 1 for both samples separately and report the results in Table 3.[24]

Column (1) shows that workers paid piece rate peel significantly more cassava after the goal-setting training (p-value < 0.01), while the estimated effect of the training for workers paid flat-rate is modest and insignificant (cf. column 2). Results in columns (3) and (4) show that setting goals increases time spent peeling for both groups of workers by about 40 minutes, but these effects are not statistically significant. Lastly, results in column (5) and (6) show that setting goals significantly increases the productivity of workers paid piece rate by 0.2 extra bowls of cassava per hour (p-value $<$ 0.05), while the productivity of those paid flat rate remains unchanged.[25] These results are consistent with those reported by Corgnet et al. (2015), who show both theoretically and with a laboratory experiment that wage irrelevant goals are most effective at increasing workers' effort when monetary incentives are strong.

To conclude, while we do not have direct evidence that workers had low self-control, the results of a heterogeneity analysis consistently suggest that setting goals helps workers overcome challenges that limit their performance. First, the practice increases the performance of workers who were peeling few cassava bowls before the training, and who were thus more likely to suffer from problems

[23] Recall that employers tend to pay all their workers either piece rate or flat rate, and there is no treatment difference in the number of workers paid with these schemes (cf. A.2). Furthermore, results in Table A.8 show that no observable firm characteristics explain the use of either scheme.

[24] We exclude from the analysis workers for which we do not have information on the payment scheme.

[25] A related question is whether firms in *Goals* are more likely to pay piece rate after the training. We regress a dummy variable equal to one if in the baseline survey a worker states that he/she is paid piece rate, on a dummy equal to one if the worker states to be paid piece rate in the post-experiment survey, and on a *Goals* dummy. Results reported in Table A.7 in Appendix show that the likelihood of being paid piece rate in the post training period does not depend on the treatment.

Table 3: **Effect of Goal Setting by Payment Scheme**

Dep.var:	Bowls peeled		Peeling time		Productivity	
	Piece rate	Flat rate	Piece rate	Flat rate	Piece rate	Flat rate
	(1)	(2)	(3)	(4)	(5)	(6)
*Goals**Post	1.708***	0.0613	0.691	0.640	0.214**	-0.0675
	(0.381)	(0.362)	(0.603)	(0.520)	(0.108)	(0.0597)
Constant	5.235***	5.307***	6.460***	8.044***	0.908***	0.815***
	(0.446)	(0.298)	(0.385)	(0.591)	(0.130)	(0.0686)
Observations	779	963	768	949	768	949
N. of workers	173	217	169	216	169	216

*Notes: Columns 1, 3 and 5 report results for workers paid piece-rate, column 2,4 and 6 for workers paid flat-rate. Regressions include individual and week fixed effects. Dependent variables are winsorized on both tails at the 5th and 95th percentiles. Standard errors in brackets are adjusted for clustering at the firm level. *** p<0.01, ** p<0.05, * p<0.1.*

impairing their performance. Furthermore, setting goals substantially improved the performance of workers paid piece rate. Given that goal achievement is not incentivized in the experiment, and existing incentive schemes were not altered, this result is again consistent with the idea that setting goals enabled workers to overcome behavioral frictions.

Peer Effects Even though goals are set individually in our experiment, interaction among coworkers in this context is common. Cassava peelers typically work outdoors, sitting together in a shared space (see Figure C.1 in the Appendix). Workers can observe each other and often chat during the work shift. It is possible that the interventions stimulated workers to compare individual production and goals, and that such comparisons increased performance.[26] To test this hypothesis, we use data from the post experiment survey of all three groups, i.e. including the *Control*. We conduct a probit regression where the dependent variable is one if a worker stated that he/she prefers to peel more cassava than his/her colleagues, and dependent variables are dummies for the two interventions. Regression results are reported in column 1 of Table A.9. Workers in both *Goals* and *Production* are significantly more likely to report that they prefer to peel more than their colleagues compared to workers in *Control* (7% and 9% percent respectively, p-value ≤ 0.05). The Wald test results show that this increase in self-reported competitiveness is not statistically significantly different between the two groups. In the post experiment survey, workers in *Production* (*Goals*) were also asked whether tracking production (setting goals) made their job into more of a competition. Column 2 of Table A.9 shows that workers in *Goals* are 12% more likely to answer affirmatively to the question

[26] See Ashraf and Bandiera (2018) for a comprehensive review of the empirical evidence on social incentives in organizations and their interaction with monetary incentives.

(p-value < 0.01).[27]

A higher level of competition can increase earnings' inequality within firms if some workers are motivated to exert extra effort when setting goals, while at the same time, others are disinclined to do so. Since we do not have information on individual payments to workers, for each firm we calculate the standard deviation of the number of cassava bowls peeled during each peeling day and use it as a proxy for earnings' dispersion. We then regress within firm daily variation in production on *Goals**Post, using week and firm fixed effects. We conduct two specifications: the first includes all firms, the second includes only firms that pay piece-rate and where variation in production is thus a more precise proxy of earnings' dispersion. The regression results reported in specification (4) of Table A.9 show that cassava production has a higher standard deviation within firms in *Goals* relative to those in *Production*, but this increase is statistically insignificant in both specifications. We thus conclude that the increase in earnings' inequality is negligible.

Signaling The last channel we consider is signaling. Goals can be discussed between the employer and the worker, and the training protocol requires employers to observe both goal setting and production of their workers at the end of the working shift. Setting goals may thus increase performance because it provides workers with the opportunity to signal their motivation in a clearer way, realtive to just measuring production. We find no evidence, however, that signaling could be a relevant mechanism. In the post intervention survey only 15% of workers in *Goals* mention pleasing the boss as one of the reasons to set goals, and only 4% mention this as the main reason to set goals. Workers' incentives to signal their motivation may be stronger among those that work for a relatively short time at the firm. We thus test whether pleasing the boss is a more frequent motive among workers with a tenure below median, which is three years in the treated sample. We find no evidence that workers with a relatively short tenure at the firm try to please their boss more frequently (Chi-square test p-value = 0.19). Lastly, if present, signaling motives should be stronger for workers who do not have family ties with the employer and whose employment is thus more subject to the evaluation of performance. We may then expect that goal setting is more effective in firms that employ relatively fewer family members. The results in Table A.11 show that this is by and large not the case. Setting goals effectively increases output in both types of firms, although its effects on productivity are more marked in firms that employ fewer relatives.

[27] The results in Table A.10 show that setting goals effectively increases the number of bowls peeled and peeling time also of workers who do not report being competitive in the post-intervention survey. This suggests that goals have an effect on their own on performance, and that competition with peers is not the unique channel through which they operate.

C Goal Setting Behavior

In this section we closely study goal setting decisions and their relation to workers' actual production. Table 4 provides summary statistics on chosen goals, production, and on the gap between goals and production during the four weeks of the intervention. All variables are expressed in terms of number of peeled cassava bowls. On average, workers peel just a bit less than 6 bowls of cassava per day and set a slightly higher goal, the gap between a goal and actual production being equivalent to 0.36 bowls of cassava. The standard deviations reported in the third column of the table highlight that there is a large variation both in chosen goals and actual bowls peeled.

Table 4: Summary Statistics of Chosen Goals

Variable	Mean	Std. Dev.	Min	Max	Median	Obs
Goals	6.24	2.49	0	12	6	1223
Bowls peeled	5.88	2.57	1	12	6	1225
Gap (=goal-bowls peeled)	0.36	1.96	-7	10	0	1223

To further understand the relation between chosen goals and production, we conduct a regression analysis with two specifications. In the first specification y_{it} is the goal chosen by worker i at time t, and in the second the dependent variable is the difference between the chosen goal and production, which we name *Output Gap*. The explanatory variables $Bowls_{it-1}$ ($Goals_{it-1}$) indicate the bowls peeled (goals) during the previous work shift, *Week* is a linear time trend. Results reported in column (1) of Table A.12 show that goals at time t are positively related both to goals at time $t-1$ and to the number of bowls peeled during the preceding shift. The positive, yet insignificant, coefficient of *Week* indicates that goals do not follow a strong weekly trend.[28] In specifications (2) we control for workers' gender, age, years of education, tenure at the firm and payment scheme.[29] Estimation results show that chosen goals are not significantly related to any of the workers' observable characteristics. We add employers' and firm's characteristics in specifications (3): age, gender, years of education, the number of family members employed in the firm and the total number of employees. Goals are higher in firms that employ more workers (p-value < 0.01), but all other observables are not significantly related to chosen goals.

The dependent variable in column (4) is the gap between goals and actual production. The gap is larger the higher the goals in the previous shift, and smaller the higher the production in the previous shift (p-value < 0.05). Also in this case we do not observe a significant time trend. We add workers' characteristics in (5) and employers'/firms' characteristics in (6). Male workers tend

[28] Using week dummies instead of a linear time trend confirms that goals increase weakly over time.

[29] The payment scheme is a worker-level variable because a minority of employers use different payment schemes within their firm (see Table A.2).

to display larger goal-production gaps (p-value < 0.10) while gaps are smaller the longer workers were employed at the firm (p-value < 0.10), a plausible effect of experience. Employers' and firms' characteristics are unrelated to goal-production gaps.

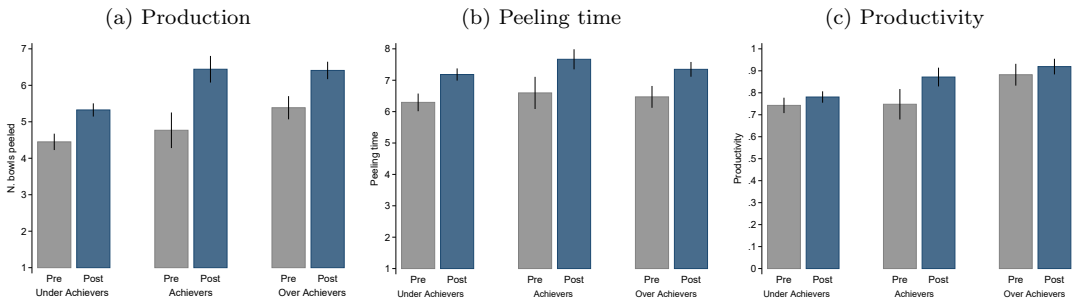
Since we observe workers for several peeling shifts, we can categorize them into types based on their tendency to over, under or exactly achieve their goals. We follow a simple approach and assign types based on the sign of the most frequent gaps. We find that 51% of workers are mostly under-achieving their goals, 19% tend to meet their goals and 30% to surpass their goals.[30] Figure 1 shows the average number of bowls peeled (panel a), the average time spent peeling (panel b), and the productivity (panel c) of the three types of workers, before and after the goal setting training. Relative to the pre-training period, goal setting increases both production and time spent peeling for all types of workers (p-value < 0.05). Productivity also increases among all types of workers, but significantly so only for workers who tend to achieve their goals (p-value < 0.05). Although these results should not be given a causal interpretation, they suggest that the practice is effective irrespective of how workers set goals.

D Impact of Goal Setting on Wellbeing

If setting goals mitigates self-control problems on the one hand but increases effort at work on the other, a natural question is whether the practice had on balance positive effects on workers' wellbeing. Another unintended effect of the practice could be that workers feel stressed about meeting their targets and are thus less happy than usual. To test the effect of goal setting on workers' wellbeing we employ a number of indicators. First, we use data on self-reported life satisfaction collected during the baseline survey and the post-intervention survey. In both surveys workers were asked how satisfied they were with their life on a scale from 1 to 5, where higher numbers correspond to higher satisfaction levels. We then regress workers' life satisfaction, elicited four months after the end of the training, on life satisfaction elicited at baseline and a dummy for both *Production* and *Goals*. The responses of workers in the *Control* group, i.e. those who were not assigned to any training but did answer both surveys, constitute the omitted category. The results in specification (1) of Table 5 show that workers' life satisfaction four months after the intervention is strongly associated with life satisfaction measured at baseline, and is not significantly influenced by the intervention. In column (2) and (3) we conduct the same regression as in specification (1) but separating workers into those paid piece rate and flat rate, as the former may find the intervention more stressful. Reassuringly,

[30] In Table A.13 we show that the longer employees work for the firm the more likely it is that they meet or surpass their goals. A number of other observables are uncorrelated with goal types.

Figure 1: **Performance by Worker Type**



Notes: Under Achievers *are defined as workers who mostly produce less than their goals,* Achievers *are workers who tend to meet their goals, and* Over Achievers *are workers who tend to surpass their goals. Bars include 95% confidence intervals.*

we again observe that setting goals does not influence the wellbeing of these groups. Lastly, in column (4) we focus on workers in *Goals* and check whether effects on wellbeing are different for different types of goal setters. Relative to Achievers, Over achievers report the highest increase in life satisfaction at the end o the intervention. Perhaps more importantly, we do not observe a relation between being an Under achiever, i.e. falling short of one's goals, and wellbeing.

As a second indicator of wellbeing, we consider whether in the post-intervention survey workers agreed with the statement '[the intervention] created stress and worries for me', where the intervention would be either setting goals or measuring production. Only 14% of the workers in *Production* and 10% of the workers in *Goals* agreed with the statement.

E Persistence and Diffusion

An important question for all interventions that aim to change individuals' way of doing things, is whether the intervention is actually endorsed by the recipients and subsequently adopted after the experiment period is over. Employers' answers in the post-experiment survey show that the practice has been widely recognized as useful, as they overwhelmingly agree with statements such as *setting goals helps my firm to be more productive* and *setting goals helps my employees to be more productive*. Almost all employers (99%) state that they plan to set goals in the future. Furthermore, firms in *Goals* are more likely to say that the last time they had set a goal for their business was on a date after the completion of the intervention. Although this is not statistically significant at conventional levels (p-value = 0.14), it is an indication that the intervention stimulated employers to think more broadly about goal setting. Workers alike display high levels of satisfaction with the intervention, as 92% of them state that they are very satisfied or satisfied. Furthermore, 94% state

Table 5: **Effect of Goal Setting on Life Satisfaction**

	Life Satisf. Post Intervention			
	All	Piece rate	Flat rate	By type
	(1)	(2)	(3)	(4)
Life Satisf. at Baseline	0.199***	0.209***	0.168***	0.319***
	(0.039)	(0.063)	(0.053)	(0.062)
Goals	-0.114	-0.162	0.068	
	(0.112)	(0.181)	(0.159)	
Production	-0.146	-0.003	-0.290	
	(0.136)	(0.218)	(0.183)	
Under Achiever				0.397**
				(0.200)
Over Achiever				0.733***
				(0.212)
Constant	2.661***	2.518***	2.759***	1.704***
	(0.171)	(0.287)	(0.227)	(0.292)
Observations	831	294	394	276
Wald test:				
Goals=Production	0.80	0.41	0.04	
Under achiever=Over achiever				0.059

Notes: OLS regression results. Life Satisfaction *is self-reported on a 1 to 5 scale, workers in Control constitute the omitted category in specifications 1 to 3. In specification 4 the omitted category is* Achiever*, i.e. workers that exactly achieve their goal.* Under (Over) Achiever *is a dummy for workers that mostly fall short (surpass) their goals (see section C). Standard errors in brackets are adjusted for clustering at the firm level.*

that the program was very helpful or helpful for them, and 81% of workers state that the process of making and tracking goals did not take away time from peeling, or if it did, it did not affect how much they peeled. All in all, the intervention seemed to be very well received and there are indications that the practice of setting goals will be persistently used by cassava peeling firms.

Another way in which interventions can have enduring effects beyond the implemented experiment is when practices spill over to untreated groups. We test whether workers and firms in *Control* and *Production* are more likely to be familiar with goal setting after the conclusion of the intervention, as compared to their answers at baseline. In both groups, after the intervention a larger number of firms state that they know what a goal is, but the increase is statistically significant only in *Production* (Chi-2 test, p-value < 0.01). We also ask employers whether they have ever set a target for their business; again we observe that firms in both groups more frequently answer positively to this question after the intervention, and that this increase is statistically significant for firms in *Production* (Chi-2 test, p-value < 0.05). As far as workers are concerned, we observe that after the intervention period a higher number of workers in *Production* and *Control* state that they had

set a goal in their job. The change is marginally statistically significant in the former group (Chi-2 test, p-value < 0.10), but not in the latter (Chi-2 test, p-value $= 0.12$). In sum, there is suggestive evidence that the practice of setting goals has been diffused to firms and workers in non-treated groups, especially among those that were trained in measuring and recording production.[31]

VI Conclusions

Small firms in developing countries often do not apply human resource practices proven in the West (Bloom and Van Reenen, 2011; McKenzie and Woodruff, 2017). On the one hand, this can be attributed to lack of resources, the informality of labor markets and lack of awareness of the practices. On the other hand, practices that work well in high income countries may not deliver the same results in the developing world. In this paper we study whether setting non-binding production goals on a daily basis can increase the performance of cassava peelers in Ghana.

We find that workers who set goals perform better than those who only measure production: workers peel more cassava and their hourly productivity increases as well, although the effect size is smaller in the latter case. Firms benefit from the intervention as the average amount of cassava peeled by each worker in the firm increases substantially. The estimated effects are sizable, and range from a 14% standard deviation increase in productivity to a 30% standard deviation increase for production.[32] These results are all the more remarkable considering that the implementation of goal setting is rather inexpensive; paper booklets to record production and goals are cheaply available and both employers and workers report that the intervention did not take time away from their main activities. Furthermore, men tend to benefit more from goal setting interventions than women (Dalton et al., 2015; Brandts et al., 2021). Given that workers and employers in our sample are predominantly female, we may expect to find even larger effects in other populations.

We also find that while goal setting behavior is quite heterogeneous, all types of goal setters improve their performance relative to the pre-intervention period. This indicates that the practice of setting goals, and not necessarily their achievement, is sufficient to increase work effort in this context.[33] In line with the fact that most workers set goals by themselves, we find that employers'

[31] We also test whether diffusion of goal setting is a function of the geographical distance between untreated firms and firms in *Goals*, but we do not find consistent evidence to this effect. Results are available upon request.

[32] In comparison, Kremer et al. (2015) find that workers in an Indian factory who self-select into a contract with binding goals increase production by 6%.

[33] The fact that a relative majority of workers under achieve their goals is consistent with evidence from laboratory experiments. In these settings, non-monetarily rewarded goals may be set higher than expected outcomes so as to maximize their motivational power (Gonzalez et al., 2020). When goals are monetarily rewarded, loss averse workers tend to set lower goals so that they are more likely to reach them (Wu et al., 2008; Dalton et al., 2015; Gonzalez et al., 2020).

and firms' characteristics are by and large uncorrelated with chosen goals and with goal achievement. Additional analysis suggests that goal setting increases performance for two main reasons: it helps workers improve self-control and it generates competition among co-workers.

The fact that performance improvements are very large among workers paid piece rate, but not among those paid a fixed fee, indicates a complementarity between goals and monetary incentives. This result is especially interesting in light of previous findings on the ineffectiveness of incentives in LICs (Bandiera and Fischer, 2013; Davies and Fafchamps, 2017, 2021). A key difference with such studies is that our intervention did not alter the payment schemes in place at the cassava firms, it only provided a tool to structure work. Furthermore, if goals help workers to overcome behavioral constraints that affect their ability to reach their desired productivity and earnings, then it is natural that they function best when workers are paid piece rate. Behavioral constraints, such as self control issues, are indeed less consequential under a flat rate scheme. It is thus conceivable that setting goals does not significantly change behavior when such schemes are in place.

Any intervention that alters an existing work environment may negatively impact workers' well being, but we fortunately find no indications of this in our data. Measuring production and setting goals did not significantly affect workers' self-reported life satisfaction, and stress did not increase as a result of the goal setting training. Also, even though competition increased, earnings' dispersion within cassava firms did not increase significantly. This is important as concerns for pay inequality can affect relations among co-workers and foster discontent within the firm (Breza et al., 2018).

To conclude, our paper offers a proof of concept that setting non-binding goals is an inexpensive and easily implementable practice that can improve workers' performance in small, informal firms. Low working hours and low productivity of labor are common problems in agriculture in Africa (McCullough, 2018), so we hope that the intervention will be replicated in sectors facing similar constraints. Following List (2022), we believe that the practice is scalable for several reasons. It relies on simple protocols, it does not have negative spillover effects on workers' wellbeing, it is effective for all types of workers, and was endorsed and implemented by the Ghanian governmental organization of small scale industries. Moreover, our results are derived from an unusually rich dataset that contains repeated individual-level measures of daily labor supply decisions, in a context where the tracking of production is not a standard practice. This gives us confidence that our results are not false positives.

References

Alfaro-Serrano, D., T. Balantrapu, R. Chaurey, A. Goicoechea, and E. Verhoogen (2021). Interventions to promote technology adoption in firms: A systematic review. *Campbell Systematic Reviews 17*(4), e1181.

Angelucci, F. (2013). Analysis of Incentives and Disincentives for Cassava in Ghana. *Technical notes series, MAFAP, FAO*.

Ashraf, N. and O. Bandiera (2018). Social incentives in organizations. *Annual Review of Economics 10*, 439–463.

Ashraf, N., O. Bandiera, and J. Kelsey (2014). No Margin, No Mission? A Field Experiment on Incentives for Public Service Delivery. *Journal of Public Economics 120*, 1–17.

Bandiera, O. and G. Fischer (2013). Can "Good" HR Practices be Exported? Evidence from a Field Experiment in Ghana. *Internatinoal Growth Center, Working Paper*.

Batista, C. and J. Seither (2019). Aspirations, expectations, identities: behavioral constraints of micro-entrepreneurs. Technical report, Nova School of Business and Economics, NOVAFRICA.

Bernheim, B. D., D. Ray, and S. Yeltekin (2015). Poverty and Self-Control. *Econometrica 83*(5), 1877–1911.

Bloom, N. and J. Van Reenen (2007). Measuring and explaining management practices across firms and countries. *The Quarterly Journal of Economics 122*(4), 1351–1408.

Bloom, N. and J. Van Reenen (2011). Human resource management and productivity. In *Handbook of labor economics*, Volume 4, pp. 1697–1767. Elsevier.

Brandts, J., S. El Baroudi, S. J. Huber, and C. Rott (2021). Gender differences in private and public goal setting. *Journal of Economic Behavior & Organization 192*, 222–247.

Breza, E., S. Kaur, and Y. Shamdasani (2018). The morale effects of pay inequality. *The Quarterly Journal of Economics 133*(2), 611–663.

Brookins, P., S. J. Goerg, and S. Kube (2017). Self-chosen Goals, Incentives, and Effort. *mimeo*.

Bulte, E., J. A. List, and D. Van Soest (2020). Toward an understanding of the welfare effects of nudges: Evidence from a field experiment in the workplace. *The Economic Journal 130*(632), 2329–2353.

Cassar, L. and S. Meier (2018). Nonmonetary Incentives and the Implications of Work as a Source of Meaning. *Journal of Economic Perspectives, 32(3), 215-238*.

Corgnet, B., J. Gómez-Miñambres, and R. Hernán-Gonzalez (2015). Goal setting and monetary incentives: When large stakes are not enough. *Management Science 61*(12), 2926–2944.

Corgnet, B., J. Gómez-Miñambres, and R. Hernán-Gonzalez (2018). Goal setting in the principal–agent model: Weak incentives for strong performance. *Games and Economic Behavior 109*, 311–326.

Dalton, P. S., V. H. Gonzalez-Jimenez, and C. Noussair (2015). Paying with Self-Chosen Goals: Incentives and Gender Differences. *Discussion Paper 2015-021, Tilburg University, Center for Economic Research*.

Dalton, P. S., J. Rüschenpöhler, B. Uras, and B. Zia (2021). Curating local knowledge: Experimental evidence from small retailers in Indonesia. *Journal of the European Economic Association 19*(5), 2622–2657.

Davies, E. and M. Fafchamps (2017). Pledging, Praising and Shaming: Experimental Labour Markets in Ghana. Working Paper 10520, IZA.

Davies, E. and M. Fafchamps (2021). When no bad deed goes punished: Relational contracting in Ghana and the UK. *Journal of Economic Behavior & Organization 191*, 714–737.

Davies, E. and M. Fafchamps (2022). Material incentives and effort choice: Evidence from an online experiment across countries. Working Paper 30372, National Bureau of Economic Research.

De Mel, S., D. McKenzie, and C. Woodruff (2008). Returns to Capital in Microenterprises: Evidence from a Field Experiment. *Quarterly Journal of Economics 123*, 1329–1372.

Drexler, A., G. Fischer, and A. Schoar (2014). Keeping it Simple: Financial Literacy and Rules of Thumb. *American Economic Journal: Applied Economics 6*(2), 1–31.

Fafchamps, M. (1993). Sequential labor decisions under uncertainty: An estimable household model of West-African farmers. *Econometrica: Journal of the Econometric Society*, 1173–1197.

Fafchamps, M., D. McKenzie, S. Quinn, and C. Woodruff (2014). Microenterprise growth and the flypaper effect: Evidence from a randomized experiment in Ghana. *Journal of Development Economics 106*, 211–226.

Fafchamps, M. and M. Söderbom (2006). Wages and labor management in African manufacturing. *Journal of Human Resources 41*(2), 356–379.

Fao (2005). A Review of Cassava in Africawith Country Case Studies on Nigeria, Ghana, the United Republic of Tanzania, Uganda and Benin. *Proceding of the Validation Forum on the Global Cassava Development Strategy, Vol. 2*.

Fuglie, K., M. Gautam, A. Goyal, and W. F. Maloney (2019). *Harvesting prosperity: Technology and productivity growth in agriculture*. World Bank Publications.

Gollin, D. (2008). Nobody's Business but my Own: Self-employment and Small Enterprise in Economic Development. *Journal of Monetary Economics 55*, 219–233.

Gollin, D., D. Lagakos, and M. E. Waugh (2014). Agricultural productivity differences across countries. *American Economic Review 104*(5), 165–70.

Gómez-Miñambres, J. (2012). Motivation through Goal Setting. *Journal of Economic Psychology 33*, 1223–1239.

Gonzalez, V. H., P. S. Dalton, and C. Nousair (2020). The Dark Side of Monetary Bonuses: Theory and Experimental Evidence. *CentER Discussion Paper 2020-001*.

Gosnell, G. K., J. A. List, and R. D. Metcalfe (2020). The impact of management practices on employee productivity: A field experiment with airline captains. *Journal of Political Economy 128*(4), 1195–1233.

Heath, C., R. P. Larrick, and G. Wu (1999). Goals as Reference Points. *Cognitive psychology 38*, 79–109.

Hsiaw, A. (2013). Goal-setting and Self-control. *Journal of Economic Theory 148*(2), 601–626.

Jayaraman, R., D. Ray, and F. De Véricourt (2016). Anatomy of a contract change. *American Economic Review 106*(2), 316–58.

Kaur, S., M. Kremer, and S. Mullainathan (2010). Self-control and the development of work arrangements. *American Economic Review 100*(2), 624–28.

Kleih, U., T. W. M. Phillips David, and K. Gregory (2013). Cassava Market and Value Chain Analysis: Ghana Case Study. *Report by the Food Research Institute, Accra, Ghana and Natural Resources Institute, University of Greenwich, UK.*.

Koch, A. K. and J. Nafziger (2011). Self-regulation through Goal Setting. *Scandinavian Journal of Economics 113*(1), 212–227.

Koch, A. K. and J. Nafziger (2016). Goals and bracketing under mental accounting. *Journal of Economic Theory 162*, 305–351.

Kremer, M., S. Kaur, and S. Mullainathan (2015). Self Control at Work. *Journal of Political Economy 123*(6), 1227 – 1277.

Latham, G. P. and E. A. Locke (1979). Goal Setting, a Motivational Technique that Works. *Organizational Dynamics, 8(2), 68-80*.

List, J. (2022). *The Voltage Effect*. Penguin Books Limited.

List, J. A. and I. Rasul (2011). Field experiments in labor economics. In *Handbook of labor economics*, Volume 4, pp. 103–228. Elsevier.

Locke, E. a. (1996). Motivation through Conscious Goal Setting. *Applied and Preventive Psychology 5*, 117–124.

Locke, E. a., E. Frederick, C. Lee, and P. Bobko (1984). Effect of self-efficacy, goals, and task

strategies on task performance. *Journal of Applied Psychology 69*(2), 241–251.

Locke, E. A. and G. P. Latham (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist 57*(9), 705–717.

Macchiavello, R. and A. Morjaria (2021). Competition and relational contracts in the Rwanda coffee chain. *The Quarterly Journal of Economics 136*(2), 1089–1143.

McCullough, E. B. (2018). Agricultural Labor Is Not So Unproductive in Africa. *Agriculture in Africa Telling myths from facts. World Bank Group*.

McKenzie, D. (2012). Beyond Baseline and Follow-up: The Case for More T in Experiments. *Journal of Development Economics 99*, 210–221.

McKenzie, D. (2021). Small business training to improve management practices in developing countries: re-assessing the evidence for 'training doesn't work'. *Oxford Review of Economic Policy 37*(2), 276–301.

McKenzie, D., A. Mohpal, and D. Yang (2022). Aspirations and financial decisions: Experimental evidence from the Philippines. *Journal of Development Economics 156*, 102846.

McKenzie, D. and C. Woodruff (2014). What Are We Learning from Business Training and Entrepreneurship Evaluations Around the Developing World? *World Bank Research Observer 29*(1), 48–82.

McKenzie, D. and C. Woodruff (2017). Business Practices in Small Firms in Developing Countries. *Management Science 63*(9), 2967–2981.

Okechukwu, James, B., R. Abass, A. Fannah, S. B. Maziya-Dixon S., L. Osei-Sarfoh, S. Fomba, and Lukombo (2012). Producing gari from cassava: An illustrated guide for smallholder cassava processors. *International Institute of Tropical Agriculture (IITA): Ibadan, Nigeria.*.

Ryan, T. A. (1970). *Intentional behavior*. New York: Ronald Press.

Seth, O. (2020). A review on the performance of some cassava peeling machines developed. *North American Academic and Research Journal 3*(2), 97–162.

Wu, G., C. Heath, and R. Larrick (2008). A Prospect Theory Model of Goal Behavior. *Mimeo*.

Appendix

A Tables

Table A.1: **Employers Balance Tests**

	(1) Production	(2) Goals	(3) Control	(1) vs. (2) p-value	(1) vs. (3) p-value	(2) vs. (3) p-value	N
Male	0.087	0.072	0.100	0.653	0.737	0.390	422
Age	42.837	42.599	42.500	0.863	0.815	0.938	422
	(1.136)	(0.791)	(0.893)				
Education	4.519	4.470	4.155	0.920	0.496	0.497	422
	(0.397)	(0.279)	(0.360)				
Years in firm	14.146	13.216	13.473	0.419	0.631	0.811	421
	(1.068)	(0.612)	(0.912)				
Peeling days	3.048	2.851	2.891	0.276	0.473	0.824	422
	(0.156)	(0.101)	(0.153)				
N. of workers	4.942	4.729	4.330	0.535	0.089	0.195	419
	(0.290)	(0.193)	(0.213)				
Family members	2.359	2.295	1.982	0.765	0.094	0.111	419
	(0.179)	(0.122)	(0.139)				
Sales $PPP	659	532	483	0.175	0.106	0.524	421
	(93.899)	(46.621)	(57.572)				
Profits $PPP	191	158	134	0.662	0.515	0.714	421
	(74.120)	(39.172)	(47.859)				
Life satisfaction	3.538	3.769	3.734	0.114	0.223	0.803	421
	(0.117)	(0.085)	(0.110)				
Separate accounts	0.202	0.168	0.218	0.467	0.772	0.278	422
Written records	0.067	0.048	0.027	0.482	0.167	0.374	422
Track production	0.058	0.043	0.036	0.576	0.462	0.768	422
Has set goal	0.553	0.570	0.555	0.776	0.987	0.786	420

Notes: Sales *and* Profits *are calculated over the last peeling cycle.* Separate accounts *is a dummy equal to 1 if the firm keeps separate account for personal and business finances;* Written records *is equal to 1 if the firm keeps written business records;* Track production *is equal to 1 if the business keeps production records;* Has set a goal *is equal to 1 if the business has ever set a target;* Life satisfaction *is self-reported by employers on a 1 to 5 scale. When relevant, standard deviations are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.*

Table A.2: **Employees Balance Tests**

	(1) Production	(2) Goals	(3) Control	(1) vs. (2) p-value	(1) vs. (3) p-value	(2) vs. (3) p-value	N
Male	0.178	0.234	0.195	0.110	0.642	0.269	843
Age	38.231	35.200	35.277	0.027	0.066	0.955	843
	(1.128)	(0.782)	(1.137)				
Education	5.346	5.764	5.616	0.202	0.473	0.651	842
	(0.264)	(0.190)	(0.268)				
Experience	5.364	4.567	4.144	0.059	0.009	0.274	834
	(0.366)	(0.235)	(0.285)				
Income $PPP	28.435	26.672	20.741	0.563	0.005	0.020	737
	(2.551)	(1.735)	(1.087)				
Piecerate	0.327	0.378	0.332	0.209	0.914	0.247	843
Flatrate	0.495	0.451	0.505	0.293	0.847	0.196	843
Only income	0.534	0.552	0.527	0.668	0.895	0.556	843
Had a goal	0.543	0.571	0.490	0.663	0.461	0.185	397

Notes: Experience *is the number of years working at the firm;* Income *indicates weekly income;* Had a goal *is equal to 1 if the worker had a goal in his/her job at least once.* Only income *is equal to 1 if cassava peeling is the only income generating activity for the worker. When relevant, standard deviations are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.*

Table A.3: **Firms' Compliance**

Dep.var:	Trained			Peeled		
	(1)	(2)	(3)	(4)	(5)	(6)
Goals	0.108		0.096	0.058*		0.397*
	(0.227)		(0.224)	(0.033)		(0.226)
Age		-0.011	-0.011		-0.005	-0.006
		(0.012)	(0.012)		(0.011)	(0.011)
N. of workers		-0.030	-0.030		0.054	0.054
		(0.035)	(0.035)		(0.056)	(0.057)
Years in business		0.033**	0.032**		0.024*	0.026**
		(0.015)	(0.014)		(0.014)	(0.013)
Constant	1.426***	1.724***	1.651***		1.073**	0.832
	(0.181)	(0.483)	(0.477)		(0.526)	(0.552)
Observations	312	309	309	296	292	292

Notes: Probit regression results, robust standard errors in parentheses. Trained *equals one if a firm at baseline took part in the production measurement training and zero otherwise.* Peeled *equals one if the trained firm peeled at least once during the intervention period and zero otherwise. *** p<0.01, ** p<0.05, * p<0.1.*

Table A.4: **Workers' Compliance**

Dep.var:	Compliant (1)	Bowls Peeled (2)
Goals	0.118	
	(0.099)	
Compliant		-0.295
		(0.187)
Constant	0.460***	5.469***
	(0.083)	(0.217)
Observations	671	671

Notes: Specification (1) presents probit regression results where Compliant *is one if the worker took part in the entire intervention (baseline, training and peeling) and is zero if the worker was trained and peeled, but did not answer the baseline survey. Specification (2) presents OLS regression results, where* Bowls Peeled *is the average number of bowls peeled during a shift during the entire intervention period. Standard errors in brackets are adjusted for clustering at the firm level. *** p<0.01, ** p<0.05, * p<0.1.*

Table A.5: **Effect of Goal Setting, Balanced Sample**

Dep.var:	Bowls Peeled (1)	Peeling Time (2)	Productivity (3)	Product of Labor (4)
*Goals**Post	1.110***	1.041***	0.0403	1.138***
	(0.353)	(0.369)	(0.0718)	(0.352)
Constant	5.135***	7.039***	0.809***	5.112***
	(0.239)	(0.468)	(0.0490)	(0.234)
Observations	1,678	1,654	1,654	1,678
N. of Workers	294	294	294	
N. of Firms				160

*Notes: Specifications (1) to (3) include workers and week fixed effects, specification (4) includes firm and week fixed effects. Dependent variables are winsorized on both tails at the 5th and 95th percentiles. Standard errors in brackets are adjusted for clustering at the firm level. *** p<0.01, ** p<0.05, * p<0.1.*

Table A.6: **Effect of Goal Setting, ANCOVA**

Dep.var:	Bowls Peeled (1)	Peeling Time (2)	Productivity (3)	Product of Labor (4)
Goals	0.603**	0.626**	-0.0145	0.666**
	(0.297)	(0.286)	(0.0545)	(0.291)
Bowls Pre	0.802***			
	(0.0527)			
Time Pre		0.426***		
		(0.0727)		
Productivity Pre			0.358***	
			(0.0653)	
Product of Labor Pre				0.854***
				(0.0599)
Constant	0.556	3.511***	0.376***	0.0808
	(0.360)	(0.765)	(0.0857)	(0.422)
Observations	874	861	860	874

Notes: All the Pre *explanatory variables are based on averages calculated in the period preceding the goal setting intervention. Regressions include date fixed effects, standard errors in brackets are adjusted for clustering at the firm level. *** p<0.01, ** p<0.05, * p<0.1.*

Table A.7: **Effect of Goal Setting on Paying Piece-rate**

Dep.var:	Piece-rate Post
Piece-rate Pre	1.211***
	(0.147)
Goals	-0.0365
	(0.156)
Constant	-0.431***
	(0.136)
Observations	469

Notes: Probit regressions, Piece-rate Post (Pre) *is 1 if the firm adopted a pice-rate scheme after (before) the goal setting intervention. Standard errors in brackets are adjusted for clustering at the firm level. *** p<0.01, ** p<0.05, * p<0.1.*

Table A.8: **Determinants of Adoption of a Payment Scheme**

Dep.var:	Piece rate (1)	Flat rate (2)
Goals	0.334	-0.188
	(0.206)	(0.197)
Employer's age	0.002	0.013
	(0.009)	(0.009)
Total n. of employees	-0.010	-0.014
	(0.046)	(0.046)
N. of family members	-0.008	-0.058
	(0.066)	(0.066)
Years in business	0.001	-0.019*
	(0.012)	(0.011)
Constant	-0.674	-0.039
	(0.433)	(0.419)
Observations	197	197

Notes: Specification (1) presents probit regression results where Piece rate *is one if the firm pays workers with a piece rate scheme and is zero if the firm uses any other scheme. In specification (2)* Flat rate *is one if the firm pays workers with a piece rate scheme, and is zero if the firm uses any other scheme.*

Table A.9: **Peer Effects**

	Peel More (1)	Compete (2)	Sd Peeled Bowls (3)	Sd Peeled Bowls Piece-rate Only (4)
Production	0.070*			
	(0.036)			
Goals	0.092***	0.122***		
	(0.030)	(0.045)		
*Goals**Post			0.174	0.165
			(0.118)	(0.271)
Constant			0.826***	0.214
			(0.169)	(0.340)
Observations	834	469	1,041	311
Wald test: *Goals=Production*	0.45			

Notes: Specification (1) and (2) report marginal effects from probit regressions. Peel More *is 1 if a worker stated that he/she prefers to peel more cassava than his/her colleagues.* Compete *is 1 if a worker agrees with the statement that the intervention made his/her job into more of a competition. Specification (3) and (4) report panel regression with firm and week fixed effects.* Sd Peeled Bowls *is the standard deviation of the amount of bowls peeled in a firm on a given day. Standard errors in brackets are adjusted for clustering at the firm level. *** p<0.01, ** p<0.05, * p<0.1.*

Table A.10: **Effect of Goal Setting by Competitive Attitude**

	Not Competitive			Competitive		
Dep.var:	Bowls Peeled	Peeling Time	Productivity	Bowls Peeled	Peeling Time	Productivity
	(1)	(2)	(3)	(4)	(5)	(6)
*Goals**Post	1.037*	1.998***	-0.0713	0.686**	0.285	0.0747*
	(0.547)	(0.585)	(0.0978)	(0.304)	(0.312)	(0.0447)
Constant	3.765***	7.703***	0.652***	5.400***	6.881***	0.803***
	(0.218)	(1.324)	(0.111)	(0.282)	(0.264)	(0.0433)
Observations	268	264	264	1,877	1,855	1,855
N. of workers	59	57	57	410	407	407

Notes: Competitive *is a dummy equal to 1 if a worker states that he/she prefers to peel more than the other workers. Workers who do not want to peel more than their colleagues are classified as* Not Competitive. *Regressions include individual and week fixed effects. Standard errors are adjusted for clustering at the firm level. *** p<0.01, ** p<0.05, * p<0.1.*

Table A.11: **Effect of Goal Setting by number of Family Members**

	Less than 3			More than 2		
Dep.var:	Bowls Peeled	Peeling Time	Productivity	Bowls Peeled	Peeling Time	Productivity
	(1)	(2)	(3)	(4)	(5)	(6)
*Goals**Post	0.889***	0.378	0.100*	0.873**	0.513	0.0756
	(0.332)	(0.430)	(0.0562)	(0.379)	(0.378)	(0.0515)
Constant	5.169***	6.540***	0.780***	5.226***	6.591***	0.850***
	(0.298)	(0.308)	(0.0486)	(0.419)	(0.466)	(0.0712)
Observations	1,719	1,696	1,696	1,407	1,393	1,393
N. of Workers	391	387	387	280	279	279

Notes: Less than 3 *is a dummy equal to 1 for firms that employ fewer than 3 family members,* More than 2 *is a dummy equal to 1 for firms that employ at least 3 family members. All regressions included week fixed effects, standard errors in brackets are adjusted for clustering at the firm level. *** p<0.01, ** p<0.05, * p<0.1.*

Table A.12: **Correlates of Goal Setting Behavior**

Dep.var:	Goal			Gap		
	(1)	(2)	(3)	(4)	(5)	(6)
Bowls_{t-1}	0.121**	0.139***	0.133***	-0.194**	-0.177**	-0.170**
	(0.060)	(0.051)	(0.050)	(0.086)	(0.076)	(0.078)
Goals_{t-1}	0.404***	0.344***	0.323***	0.221**	0.203***	0.197***
	(0.077)	(0.060)	(0.061)	(0.089)	(0.073)	(0.076)
Week	0.112	0.144	0.172*	-0.061	-0.023	-0.030
	(0.085)	(0.089)	(0.088)	(0.067)	(0.066)	(0.065)
Worker age		-0.005	-0.005		0.003	0.002
		(0.006)	(0.006)		(0.006)	(0.006)
Worker male		0.057	0.088		0.461*	0.490**
		(0.271)	(0.261)		(0.249)	(0.241)
Worker years of education		-0.027	-0.027		-0.039*	-0.043*
		(0.027)	(0.028)		(0.023)	(0.024)
Years in the firm		-0.025	-0.027		-0.030	-0.026
		(0.020)	(0.018)		(0.020)	(0.021)
Piece rate		-0.198	-0.284		-0.256	-0.234
		(0.306)	(0.297)		(0.284)	(0.301)
Flat rate		-0.416	-0.457		-0.101	-0.113
		(0.318)	(0.306)		(0.255)	(0.256)
Employer age			-0.001			-0.000
			(0.010)			(0.011)
Employer male			0.687			0.081
			(0.488)			(0.323)
Employer years of Education			0.005			0.006
			(0.028)			(0.027)
N. of workers			0.139***			0.001
			(0.044)			(0.061)
N. of family members in firm			-0.031			-0.070
			(0.077)			(0.086)
Constant	2.287***	2.969***	2.421***	0.484	0.549	0.765
	(0.519)	(0.759)	(0.914)	(0.473)	(0.525)	(0.746)
Observations	953	646	640	953	646	640

Notes: Panel regression results, in specifications 1-3 the dependent variable Goal *is the goal set by worker i on a peeling day, in specifications 4-6 the dependent variable* Gap *is the difference between the chosen goal and the actual number of bowls peeled on a given day.* Week *is a linear time trend. Standard errors in brackets are adjusted for clustering at the firm level. *** p<0.01, ** p<0.05 * p<0.1.*

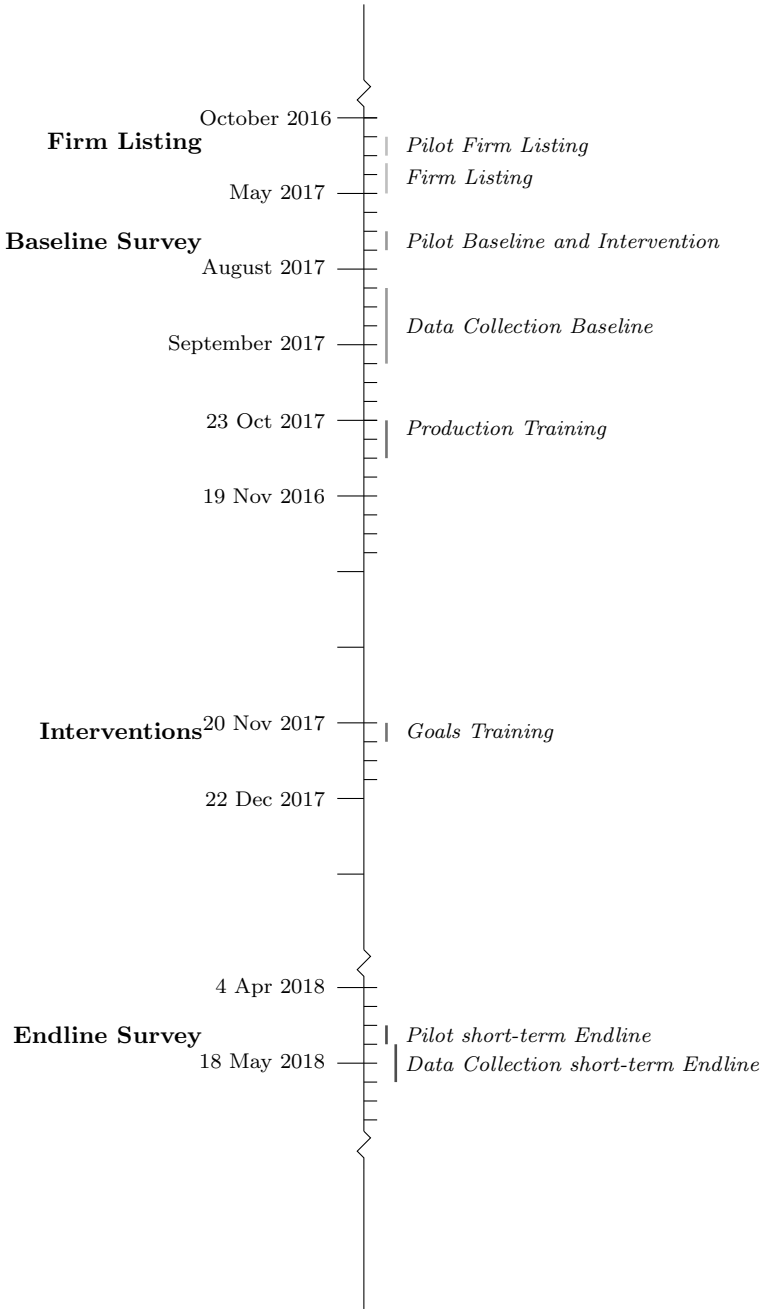
Table A.13: **Correlates of Goal Types**

Dep.var:	Goal Type
Worker age	0.006
	(0.008)
Worker male	-0.479
	(0.300)
Worker years of education	0.031
	(0.035)
Years working for the firm	0.061***
	(0.023)
Constant cut 1	0.659
	(0.424)
Constant cut 2	1.467***
	(0.432)
Observations	277

Notes: Ordered Logit regression results. The categories of the dependent variable Goal Type *are* Under achiever*,* Achiever *and* Over achiever*. *** p<0.01, ** p<0.05, * p<0.1.*

B Project Timeline

FIGURE 1: STUDY TIMELINE



C Cassava Production

Figure C.1: Cassava Peelers at Work

Figure C.2: A Filled Bowl

Figure C.3: Production Booklet

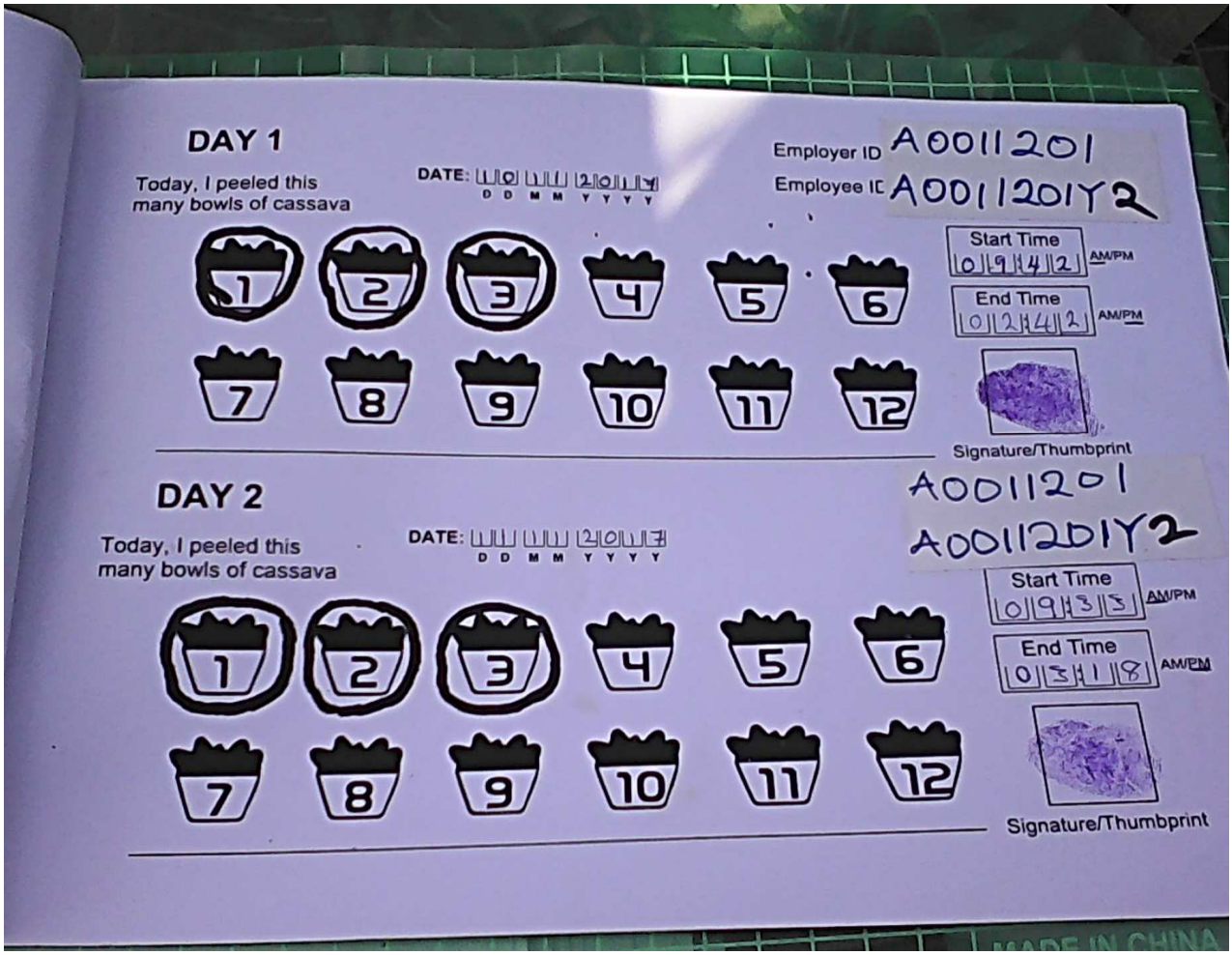


Figure C.4: Goals Booklet