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Smallholder Rice Farmers in Ghana's Kpong and Weta Irrigation Projects.

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Scope: Keywords and Topic Classifications

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Abstract

The study sample is comprised of 1,616 smallholder farmers who cultivate rice plots within the Kpong and Weta Irrigation Projects, located in Ghana's Eastern and Volta Regions. Approximately one-third of the study sample farmers are female.

Three main data collection rounds took place. A baseline survey in late 2013 captured data on the 2012 major cropping season. And two additional data collection rounds captured data on the 2013 minor and 2014 major cropping seasons, respectively.

This study took place as part of the Ghana Commercial Agriculture Project (GCAP), which is a program funded by the World Bank and USAID that aims to promote agricultural productivity and livelihoods, specifically by linking small farmers into the agricultural value chain. These surveys were conducted with the intent of being used as part of an impact evaluation on the impact of out-grower contracts on smallholder farmers. However, the impact evaluation was discontinued after GADCO, the private sector partner that was operating the out-grower program, changed their plans for the program.

KEY VARIABLES

- Demographics of primary cultivator and his or her household, including household wealth
- Farming activities, agricultural production and productivity
- Other income generating activities
- Access to land: quantity held and farmed, tenure security, land quality, and improvements
- Use of agricultural inputs and technologies
- Labor use on agricultural plots
- Use of credit
- Output markets (for rice only)

USES OF DATA

This data can be used to produce descriptive summary statistics.

SURVEY INSTRUMENT MODULES – BASELINE

- A – Survey info
- B – Household Roster
- C – Ethnicity, geographical origin, and political office (part of the household roster)
- D – Education (part of the household roster)
- E – Physical ability and illness (part of the household roster)
- F – Parcel roster (for all household parcels)
- G – Land holding details
- H – Crop area (all crops farmed by household)
- I – Crop production
- J – Agricultural inputs (all chemical, mechanical and labor inputs)
- Li – Hired labor
- Lii – Safety (farm safety)
- M – Networks (farmer information networks)
- N – Income from wage employment and paid labor (all HH members)
- O – Income from non-farm self-employment
- P – Livestock
- Q – Physical assets
- R – Housing quality
- Si - Siv – Credit constraints ; loan applications ; loans taken ; loans given out
- Ti - Tii – Remittances in ; remittances out
- V – Other income
- W – Household decision-making
- X – Expenditures
- Y – Attitudes
- Z – Short term memory test
- NM – Non-member roster

SURVEY INSTRUMENT MODULES – HIGH FREQUENCY DATA COLLECTION

- 1 – Days 1 to 35 of the crop cycle: land preparation, planting, chemical application, and use of inputs (both chemical and labor), farmers used during these.

2 – Days 35 to 130 of the crop cycle: Harvest and post-harvest activities, and labor used during these.

SURVEY INSTRUMENT MODULES – INPUT SELLERS SURVEY

– Prices of chemical inputs (insecticides, herbicides, fungicides and fertilizer) for the 2012 Major Season, 2013 Minor Season and 2013 Major Season.

– Data to convert non-standard measurement units to standard measurement units for chemical inputs.

SURVEY INSTRUMENT MODULES – LABOR WAGE SURVEY

– Labor rates for agricultural tasks Major Season, 2013 Minor Season, and 2013 Major Season.

Scope – Summary Data Description

COUNTRIES

Ghana

GEOGRAPHIC COVERAGE AND TIMELINE

The study sample is formed of individuals cultivating plots within the Kpong and Weta irrigation projects.¹ The Kpong Irrigation Project (KIP) is located in the Greater Accra Region, in Shai Osudoku District, along the Volta River, and is fed from the Kpong Dam (also known as Akuse) dam. The KIP covers 3,000 hectares, and its headquarters are in Asutsuare. The Weta Irrigation Project (WIP) is located in the Volta Region, in Ketu North District, just west of Lomé. The WIP covers approximately 900 hectares.

Study sample members reside in a number of very small communities. For the purposes of the labor wage survey, the study grouped these into 14 groupings, each with a “converging community”, which would be the likely place where farmers in that group would travel to purchase inputs; to access facilities for rice drying, storage, milling; or to hire heavy farm machinery for ploughing or harvesting. Converging communities were identified as those to which farmers could most conveniently travel to make input purchases. In some cases, communities in a group are distributed along a major road, while in others the communities are simply distributed circularly around the converging community.

The community groupings are as follows. The converging community for each group has an * symbol.

Kpong	Group 1	Adakope, Lubuse*, Klebuse, Dzogbedzi
Kpong	Group 2	Akuse*, Natriku, Amedeka, Kadjanya
Kpong	Group 3	Asutsuare*, Dormeliam
Kpong	Group 4	Atrobinya*, Avakpo, Kewum
Kpong	Group 5	Kasunya*
Kpong	Group 6	Factory, Estates*, Yokornya, Osuwem
Kpong	Group 7	Volivo*, Mafikope, Dorfor, Atabui

¹ Both are owned by the Government of Ghana, and operated by the Ghana Irrigation Development Authority (GIDA).

Weta	Group 1	Ehi, Adzorti*, Adrume, Agbadomi
Weta	Group 2	Dekpor, Dekpor Dome, Dekpor Hume*, Dekpor Yia, Larve, Devego
Weta	Group 3	Gblewukofe, Kporkofe, Kporvukofe, Avekordome*, Morkofe, Aglonukofe, Atsiakofe
Weta	Group 4	Afiaadeyigba Junction* (also known as Weta Junction), Afiaadeyigba, Weta, Atiteti, Hartokofe
Weta	Group 5	Adidome Klenormadi, Klernormadi*, Gagodofe, Tordome
Weta	Group 6	Galleykofe, Kpayiborkofe, Quarters*, Afife, Avalavi, Abor, Atikpe
Weta	Group 7	Agbogakofe, Kumakipote, Kekemekofe*, Samefukofe, Agbladomi*

UNIT OF ANALYSIS

Individual primary cultivators and their households

TIMELINE

- 1) Listing and formation of study sample: July to August 2013
- 2) Baseline survey²: August to November 2013
- 3) High Frequency Data Collection Round 1³: January to July 2014⁴
- 4) Labor wage survey and input seller survey: June 2014
- 5) High Frequency Data Collection Round 2⁵: Module 1 from July to September 2014, and Module 2 from October 2014 to February 2015

SAMPLING PROCEDURE

The Government of Ghana leases irrigation project plots to farmers via a non-transferrable lease⁶. Thus, the tenure status of leaseholders is similar to ownership. Although plots cannot be sold, they are commonly sub-letted out to other individuals for cultivation. Thus, henceforth we refer to leaseholders as “owners” and sub-letters as “renters”.

This study sample is comprised of individuals who are the primary cultivators (PCs) of plots within the Kpong and Weta irrigation projects. We define a (plot) primary cultivator as the farmer (person) who makes day-to-day decisions on the cultivation of a particular plot, including land preparation, seeding (broadcasting or transplanting), agronomic practices (fertilizer application, disease control and pest control) and harvesting. He or she may be the plot owner or a renter.

The study sample was formed via the following steps:

² Focuses on 2012 Major Cropping Season, which ran from April-September 2012.

³ Focuses on 2013 Minor Cropping Season, which ran from December 2013 to March 2014.

⁴ Module 1 was administered to a farmer only if at least 35 days had elapsed since the start of the crop life cycle; and module 2 only after post-harvest activities had been completed.

⁵ Focuses on 2014 Major Cropping Season, which ran from April to September 2014.

⁶ This lease cannot be transferred to another party except on the death of the leaseholder or the decision of GIDA to reclaim the plot from the leaseholder. In practice, the plots are rarely reclaimed by GIDA except in the case of abandonment.

1) The Ghana Irrigation Development Authority (GIDA) provided a list of plots within the Kpong and Weta Irrigation Projects. This list included 3,065 plots in Kpong and 1,087 plots in Weta, as well as the name of the leaseholder for each plot.

2) The study met with the KIP and WIP block leaders.⁷ With the help of the block leaders, plots that were vacant, waterlogged, had no owner, or were owned by a private firm or institutions were removed from the list⁸. Plots that were de facto subdivided for use by multiple cultivators were counted as multiple plots. And names of the PC for each plot were secured. After this process the resulting number of plots and PCs in the KIP was 2,606 plots with 1,875 PCs and in WIP was 1,093 plots with 993 PCs. In total, 31% of PCs were female; 78% were plot owners; 16% were renters; and 6% were both owners and renters.

3) The study decided to enroll in the sample 1,600 of these PCs⁹. All female PCs were drawn into the sample, to achieve as close to a balanced sample as possible by gender. And a random subset of male cultivators was drawn into the sample, stratifying on number of plots (one plot or more than one plot), tenure type (owner, renter, or owner and renter), and irrigation site (Kpong or Weta). For Kpong only, the study also stratified on plot section.

4) The selected individuals were screened for their willingness to participate in the study and interest in participating in GADCO's Copa Connect Smallholder Program (CCSP). The study sample was then formed only of those individuals who were interested in participating in CCSP and who completed the baseline survey. Those who did not meet these criteria were replaced, with replacements randomly drawn from within the same strata as the replaced farmer, where possible. For cases where the sample frame contained no more cultivators within that strata (primarily in the case of female cultivators), a cultivator was randomly drawn from all remaining primary cultivators. The target number was exceeded by 16, such that a total of 1,616 PCs were enrolled in the study sample.

The **Baseline survey** captured data from the full sample of 1,616 PCs, and the High Frequency Data Collection (HFDC) rounds from a subset. For **HFDC round 1**, the study attempted to collect data from all of the PCs assigned to the control group (808), and from those PCs assigned to the treatment group who participated in CCSP during the 2013 minor season (188).¹⁰ During HFDC round 1, 97% of the targeted 996 PCs were interviewed¹¹. For **HFDC round 2**, the study attempted to collect data from all 1,616 PCs in the study sample, and was successful in interviewing 1,613 PCs.¹²

The **Input Seller Survey** was conducted with all individual persons or shop establishments that sell chemical inputs within the study communities, including herbicides, insecticides, fungicides and fertilizer for rice production. Input sellers in study communities totaled 22.

⁷ Each irrigation project is divided into sections, and blocks, and each block has a leader. Kpong has 282 blocks and Weta 48.

⁸ The count of drops by type was as follows: Vacant (115); Waterlogged (104); Not cultivated for unreported reason – most likely waterlogged, plot vacant or water payment too high (237); Religious association or demonstration plot (3).

⁹ 1,600 was chosen as a sample size based on statistical power calculations.

¹⁰ The CCSP program did not reach the full treatment group for this season due to financial constraints.

¹¹ The remaining 3% were not available to be interviewed due to ill-health, travelling, and in one instance the passing away of a farm manager who had in-depth knowledge about the plot.

¹² 1,483 completed module 1 during a first visit and module 2 during a second visit. The remainder completed both modules 1 and 2 during the second visits.

The **Labor Wage Survey** was conducted with 14 focus groups: one in each of the 14 community groupings. Each focus group was comprised of between 7 and 10 individuals. Focus groups were formed from a listing of agricultural laborers, which gave particular attention to gender¹³, community of residence, the agricultural tasks the laborer specialized in¹⁴, and whether the laborer has been involved in this activity since the 2012 major season, to ensure a fair representation of gender, labor, task and communities¹⁵. The listing was done with the assistance of a popular person, block leader, or family head who directed the survey enumerators to places where laborers could be found.

MODE OF DATA COLLECTION

The **Listing** used a paper questionnaire, and was conducted by 15 survey enumerators, 3 team leaders, and 1 auditor.

The **Baseline survey** used a paper questionnaire, and averaged 3 hours to administer. The survey was led by 2 field managers and was conducted by 6 teams, each comprised of 5 enumerators, 1 team leader, and 1 editor. 10% of surveys were back-checked. And double-data entry with reconciliation was used to minimize data entry errors. It is worth noting that the survey instrument was slightly shortened after the first 475 interviews: questions on prices of chemical and labor inputs were removed, and this data was later collected in the Input Seller and Labor Wage Surveys.

HFDC Round 1 was administered electronically, using the Syngenta Foundation's Farmforce Software and Samsung GT3500 phones. The survey team was comprised of three enumerators and one auditor, who conducted backcheck surveys.

HFDC Round 2 was also administered electronically, using the Syngenta Foundation's Farmforce Software and Samsung GT3500 phones. The survey team was comprised of one field supervisor, six enumerators and one auditor, who conducted backcheck surveys.

The **Input Seller Survey** was administered one-on-one with input sellers, and the **Labor Wage Survey** was carried out with focus groups of agricultural laborers.

All survey questionnaires were written in English, but were administered in Ga, Dangbe, and Ewe as needed. The survey enumerators were fluent in these languages.

WEIGHTING

None

¹³ All but one focus group had at least 3 men and 3 women.

¹⁴ Including plowing, transplanting, broadcasting, weeding, clearing, bond dressing, chemical application, scaring of birds, hand picking, harvesting/cutting, threshing, transporting out of the field, winnowing, drying, and bagging.

¹⁵ The survey found that labor rates are constant across the communities in the sample, and to be constant irrespective of the laborers age or gender. And when tasks were hired out to groups, payment for the task was found to be divided evenly amongst members of the group.

RELATED STUDIES

Intra-household dynamics and farm productivity: the effects of women's access to irrigated land rental and inputs

RELATED PUBLICATIONS

Ali, Daniel Ayalew; Bowen, Derick; Deininger, Klaus W.. 2017. Personality traits, technology adoption, and technical efficiency : evidence from smallholder rice farms in Ghana. Policy Research working paper; no. WPS 7959. Washington, D.C. : World Bank Group.