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Land tenure, access to credit, and agricultural performance of ARBs, farmer beneficiaries, and other rural workers

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DISCUSSION PAPER SERIES NO. 2020-44

Land Tenure, Access to Credit, and Agricultural Performance of ARBs, Farmer Beneficiaries, and Other Rural Workers

Ivory Myka R. Galang



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Land Tenure, Access to Credit, and Agricultural Performance
of ARBs, Farmer Beneficiaries, and Other Rural Workers

Ivory Myka R. Galang

PHILIPPINE INSTITUTE FOR DEVELOPMENT STUDIES

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Abstract

Policymakers and donors have long viewed credit programs as salient means to develop the agriculture sector, especially the small-farm agriculture. Credit programs in the country have evolved from subsidized directed credit programs to a more market-based approach. There have been little to no studies that examine poor agricultural producers' access to credit and how it affects agricultural performance, especially in the context of Agrarian Reform Beneficiary Organization (ARBO) members. This policy study utilized primary data from the Baseline Survey of Project ConVERGE, a project of the Department of Agrarian Reform, to analyze the borrowing incidence among ARBO member households, particularly those engaged in farm production. It appears from the results of the study that: membership in an ARBO is associated with better credit access; borrowing ARBO agricultural households are better off than nonborrowing ARBO agricultural households; and farmer associations/cooperatives are among the top sources of agricultural credit in the countryside aside from microfinance institutions; and Certificate of Land Ownership Award (CLOA)-holding ARBO agricultural households have higher borrowing incidence than the average ARBO agricultural households. Strengthening the capacity of credit retailers through trainings, especially in leadership and credit management, is needed to further improve their lending performance.

Keywords: credit, loan, formal credit, informal credit, CLOA, collective CLOA, individual CLOA, agricultural households, poor, DAR

Acknowledgment

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List of Acronyms

ACPC	Agricultural Credit Policy Council
AFMA	Agriculture and Fisheries Modernization Act
AMCFP	Agro-Industry Modernization Credit and Financing Program
AOI	Agriculture Orientation Index
APCP	Agrarian Production Credit Program
ARB	Agrarian Reform Beneficiaries
ARBO	Agrarian Reform Beneficiary Organization
ARC	Agrarian Reform Community
BIR	Bureau of Internal Revenue
CDA	Cooperative Development Authority
CLOA	Certificate of Land Ownership Award
DA	Department of Agriculture
DAR	Department of Agrarian Reform
DBM	Department of Budget and Management
DBP	Development Bank of the Philippines
DOLE	Department of Labor and Employment
FAO	Food and Agriculture Organization
GFI	Government Financial Institutions
IFAD	International Fund for Agricultural Development
LBP	Land Bank of the Philippines
MFI	Micro-Finance Institution
MPC	Multi-Purpose Cooperative
NSM	National Strategy for Microfinance
PFI	Private Financial Institutions
Project ConVERGE	Project Convergence on Value Chain Enhancement for Rural Growth and Empowerment
PSA	Philippine Statistics Authority
PSRTI	Philippine Statistical Research and Training Institute
RSBSA	Registry System of Basic Sectors of Agriculture
SEC	Securities and Exchange Commission

Land tenure, access to credit, and agricultural performance of ARBs, farmer beneficiaries, and other rural workers

Ivory Myka R. Galang¹

I. Introduction

Policymakers have long viewed credit programs as salient means to develop the agriculture sector, especially the small-farm agriculture. Credit programs in the country have evolved from subsidized directed credit programs to a more market-based approach. There is a vast literature looking at different credit programs for smallholders. They mainly present the eligibility of borrowers, purpose of the loans, terms and conditions, program performance, and capacity-building component (if any). Such studies often evaluate program effectiveness only based on borrowing incidence (that is whether or not number of borrowers over the total target population increased).

There have been little to no studies that examine poor agricultural producers' access to credit and how it affects agricultural performance in the context of Agrarian Reform Beneficiary Organization (ARBO) members. ARBO members could be agrarian reform beneficiaries (ARBs), farmer beneficiaries, and other rural workers. By being part of a farmer's organization or cooperative, individual farmers and other workers are able to access government programs and also private sector-led initiatives, such as agricultural workshops and trainings, input and technological support, market linkage, and credit facilitation, among others.

This study aims to shed light on the borrowing patterns and effects of borrowing on the agricultural performance of agricultural households, particularly those who are ARBO members. Important questions that could be raised include the following:

- 1) Who are the borrowers and nonborrowers?;
- 2) Where do they usually source their credit from, informal or formal lenders?;
- 3) How does access to credit help agricultural households in improving their agricultural performance?; and
- 4) If income level is an important factor in credit access, do poor agricultural households have a different borrowing behavior or preference from nonpoor agricultural households?

II. Research objectives

The general objective of the study is to shed light on the borrowing patterns and effects of borrowing on the agricultural performance of agricultural households, particularly those who are ARBO members.

¹ Supervising Research Specialist at the Philippine Institute for Development Studies. The author would like to acknowledge the technical guidance and advice of Dr. Roehlano Briones (PIDS Senior Research Fellow) for this study.

Specifically, the study aims to:

- 1) Provide brief background on agricultural credit demand and supply based on existing literature;
- 2) Investigate agricultural performance (i.e. agricultural net income) and overall household income of various types of borrowers and nonborrowers; and
- 3) Explore potential correlations or other relationship between access to credit and agricultural performance.

III. Review of Literature

Shift from subsidized credit to market-based credit. Policymakers and international donors have long viewed credit programs as salient means to develop the agriculture sector, especially the small farm agriculture (Meyer and Nagarajan 1999; and Meyer and Nagarajan 2003 as cited in Geron, Llanto, and Badion 2016). Governments in Asia earlier thought that to be able to maximize the potential of the Green Revolution, farmers needed to have “elastic supply of funds at more reasonable interest rates than available from informal sources.” This prevailing view was the main reason for the provision of targeted and subsidized agricultural credit programs in conjunction with other support mechanisms to encourage the adoption of Green Revolution technologies. Among the projects that adopted this strategy were the Bimas project in Indonesia (introduced in 1967) and the Masagana 99 (introduced in 1973) in the Philippines. Both projects showered farmers with highly subsidized loans so that farmers would agree to try out new agricultural technologies; However, both were not sustained and eventually collapsed due to unpaid loans (Meyer and Nagarajan 1999).

It was during 1990s that governments and donors realized that subsidized directed credits were not sustainable in the long run. Since then, not only was the extent or degree of outreach used as measure of rural financial systems’ efficiency and effectiveness, but also self-sustainability (Geron, Llanto, and Badion 2016).

With policy reforms in rural financial systems, especially the National Strategy for Microfinance (NSM), adopted in the Philippines, the microfinance industry in the country started to grow. NSM espoused the following principles: “1) greater role of the private sector/MFIs in the provision of financial services; 2) an enabling policy environment that will facilitate the increased participation of the private sector in microfinance; 3) market-oriented financial and credit policies, e.g. market-oriented interest rates on loan and deposits; and 4) non-participation of government line agencies in implementation of credit/guarantee programs.”² In addition to this, entry of rural banks as retailers was advanced through the further mainstreaming of microfinance in the banking sector (i.e. General Banking Law amendments that recognize microfinance’s distinct features) (Llanto, 2005; Conning, et al., 2007; Meyer, 2010; Micu, 2010 as cited in Geron, Llanto, and Badion 2016).

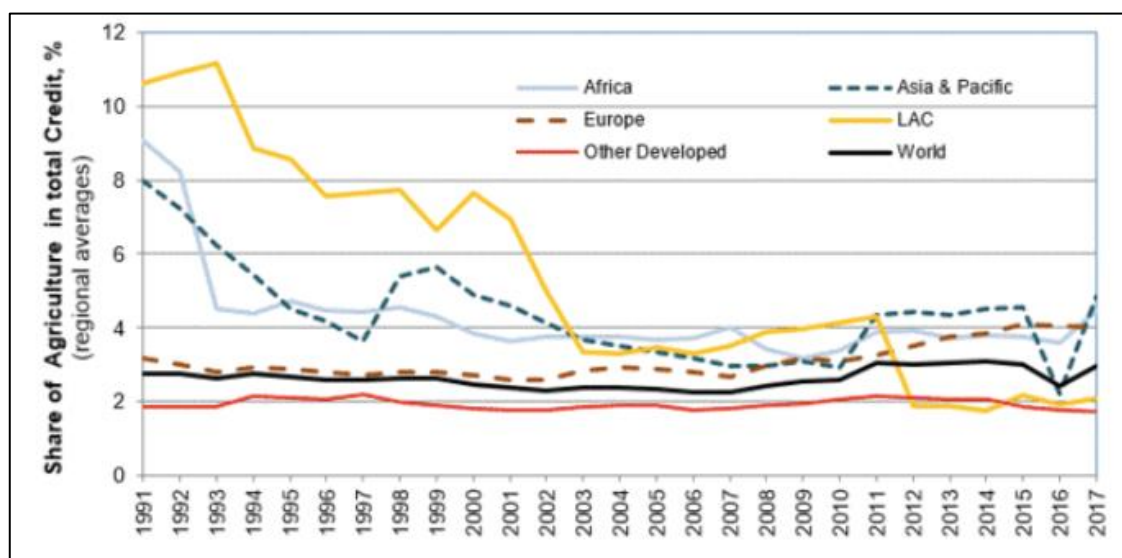
Concurrently, market-oriented principles were reinforced in the agriculture sector through the passing of the Agriculture and Fisheries Modernization Act (AFMA). With this law, subsidized directed credit programs were officially phased-out and

² NSM was released in 1997. The goal was to provide access to financial services to the majority of poor households and microenterprises by the year 2005. (Source: <http://www.gdrc.org/icm/govern/strategy-philippines.html>)

were replaced with credit programs that were market-based. Government non-financial agencies were also prohibited to implement agricultural credit programs. The funds of these defunct credit programs were redirected to the Agricultural Modernization Credit and Financing Program (AMCFP). AMCFP's objective was to provide the financial needs of small farmers and fisherfolk. From AMCFP, the funds are transferred to Government Financial Institutions (GFIs) and to qualified cooperative banks, which serve as wholesalers of credit. These institutions then unload funds to retailers of credit—private financial institutions (PFIs). It is through these PFIs, which implement market-based credit policies, that small farmers and fisherfolks are able to access credit to meet their financing needs (Meyer 2011 as cited in Geron, Llanto, and Badion 2016).

Agricultural commercial credit by region. Figure 1 shows the share of agricultural credit in total commercial credit globally and by region. The trend in Asia and the Pacific is represented by the blue dashed line. It can be observed that the share of Asia and the Pacific has been consistently above the world average (which is characterized by the black solid line) except in 2016. The downward trend continued until the food price crisis in 2007 to 2008. Thereafter, agricultural credit started to increase not only in Asia and the Pacific, but also in Africa and in Europe. The world average of the share of agricultural credit in total credit is between three to four percent over the period 1991 to 2017. In 2017 alone, agricultural credit share in the Asia and the Pacific and globally was at 5 percent and 2.9 percent, respectively. The world trend appears to follow that of the European and advanced countries' trends. This is due to the massive share of these countries in the global credit flows.

Figure 1. Share of Agriculture in Total Credit Flow to Economy, by region, 1991-2017



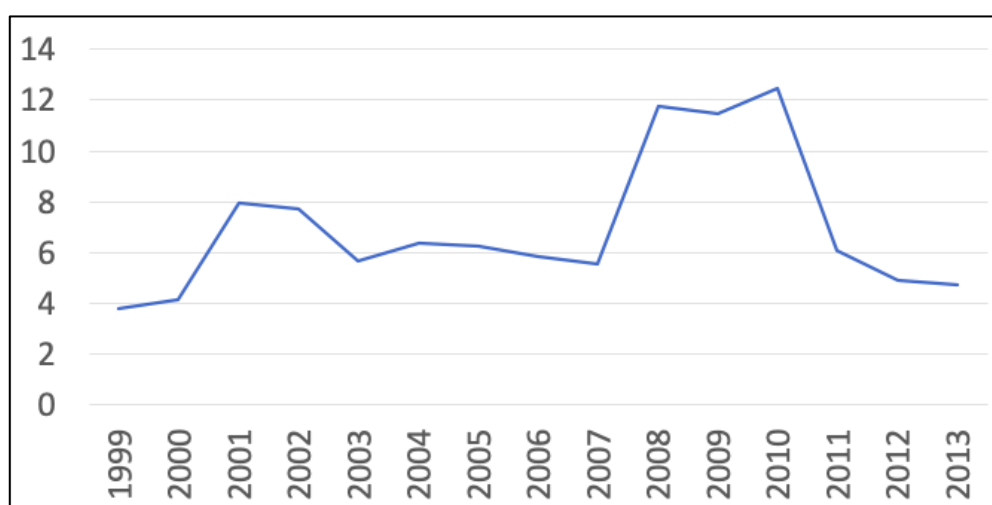
Source: FAO (2018)

Agricultural Orientation Index for credit. To be able to gauge the importance placed by commercial banks on financing the agriculture sector, one may look at the Agriculture Orientation Index (AOI). AOI is computed by taking the ratio of the share of agricultural credit in all credit and the share of gross value added of the agriculture sector in the overall economy (i.e. Gross Domestic Product). An AOI

less than 1 indicates that the agriculture sector obtains credit share less than its contribution to the economy. On the other hand, an AOI greater than 1 shows that the credit share of the agriculture sector is greater than its economic contribution. Developed countries tend to have greater than 1 AOI compared to developing countries. This suggests that advanced countries' agriculture sector has 1) many large producers; 2) a commercial production orientation; 3) numerous agribusinesses; 4) higher degrees of mechanization; and 5) greater capacity to provide collateral.

Agricultural credit in the Philippines. Based on FAO data from 1999 to 2013, in the Philippines, the average share of agricultural credit in total commercial credit was at seven percent (see Figure 2). Consistent with Asia and the Pacific trend, the share in the Philippines was higher than world average (3% to 4%). For the same period (1999-2013), the contribution of agriculture, fisheries, and forestry sector in the total economy of the Philippines was 13 percent. Taking the ratio of seven percent share in total commercial credit and 13 percent share in overall economy, the computed AOI is 0.5. This number indicates that the agriculture sector in the Philippines received credit share less than its economic contribution during that period.

Figure 2. Philippines: Share of agriculture credit in total commercial credit, in percent, 1999-2013



Source of basic data: FAO (2018)

Official domestic data reveal that the biggest source of agricultural credit in the Philippines is the private sector. In 2018, the total amount of agricultural loan granted to farmers and fisherfolks was PHP596 billion (PSA 2019). Eighty-four percent of which (amounting to PHP502 billion) was used to finance agricultural production purposes. More than 80 percent of PHP502 billion came from private banks, while 20 percent came from government banks. The government banks that offer credit to farmers and fisherfolk are Land Bank (LBP) and Development Bank of the Philippines (DBP), with 62 percent and 38 percent shares, respectively.

Formal lenders of agricultural credit in the Philippines. Based on the study of Cuevas and Sumalde (2015) about agricultural credit borrowers and lenders, private banks have the biggest loanable fund among formal creditors with an average of PHP130 million. This is followed by rural banks with PHP57.5 million. Banks offer loans to a bigger market covering wider locations (mostly within a province) compared to formal lending investors.³ Rural banks and private banks have the most number of borrowers, with an average of 1,930 and 730 borrowers, respectively.

Formal lenders give credit to individual borrowers, cooperatives/associations, and group borrowers (comprised of 5 to 6 people). However, only cooperatives and lending investors cater to group borrowers, with an average of 68 group borrowers, and 20 group borrowers, respectively. Interestingly, only Land Bank offers loan to cooperatives (Cuevas and Sumalde 2015).

Most of the lenders (72%) in their study's sample provided loans for rice. In addition, 24 percent and 22 percent of the lenders offered loans for swine and corn commodities, respectively (Cuevas and Sumalde 2015).

In another study, Geron, Llanto, and Badiola (2016) did a process and outcomes evaluation of various rural credit programs in the Philippines, for which they interviewed small farmers and credit lenders (e.g. rural banks) through Focus Group Discussions.

Rural banks are supposed to allocate ten percent of their loans to ARBs and small farmers in the countryside under the Agri-Agra Law. Collateral is required by rural banks before lending to small farmers. In the case of ARBs, given their inability to provide readily transferrable collaterals (since Certificate of Land Ownership Award [CLOA] cannot be sold or transferred to non-ARBs within ten years after its award), rural banks and other formal credit sources would often refuse to give them credit or would just refer them to cooperatives. One rural bank reported to have imposed an age limit of 60 years old as eligibility requirement for farm credit. Instead of complying with the ten percent loan allocation, these banks would prefer to just pay the penalties and cater to large farmer borrowers who have much larger agricultural projects (Geron, Llanto, and Badiola 2016).

To entice banks, such as rural banks, to lend to small farmers, guarantee mechanisms were put in place. Under Agricultural Guarantee Fund Pool (AGFP) of DA, participating banks and PFIs are allowed to call on the guarantee fund for up to 85 percent of the principal balance of the loan (Geron, Llanto, and Badiola 2016).

Cooperatives as conduits of formal credit in rural areas. Apart from providing guarantee fund to rural banks, the government also use cooperatives as conduits of formal credit to widen their reach in the countryside. In 2015, Agricultural Credit Policy Council (ACPC), an attached agency of the Department of Agriculture (DA) that is in charge of evaluating the economic soundness of and overseeing the implementation of agricultural credit policies and programs, commissioned a study on cooperatives' capacity to serve as conduits of credit. The study provided a

³ The data gathered about lenders were based on the responses of 20 cooperatives, 17 rural banks, seven non-governmental organizations, five lending investors, two private banks, two cooperative banks, and Land Bank.

general profile of cooperatives in the country existing around that time, which was 23,672 cooperatives (as of 2013). Multipurpose cooperatives (MPC) and credit cooperatives comprised 62 percent and 13 percent, respectively. Other cooperative types, which corresponded to the remaining 25 percent, include marketing cooperatives, consumer cooperatives, service cooperatives and others (ACPC 2015). Based on ACPC website, the total number of registered cooperatives increased to 28,784 by 2018.

Based on their study's findings, MPC and credit cooperatives generally had the same membership requirements. Most of them also complied with government documentary and tax requirements (i.e. Cooperative Development Authority [CDA] and Bureau of Internal Revenue [BIR]).

CDA, which was created in 1990 under Republic Act 6939, is the government agency in charge of cooperative registration and regulation in the country. The ACPC study (2015) noted issues with CDA's regulatory functions.

- CDA did not have developmental assistance provided to cooperatives. It was the cooperatives that had to pay for training fees conducted by service providers of CDA. Cooperatives that were interviewed in the study suggested that CDA should provide the trainings itself to help cooperatives cut their costs.
- Part of CDA's function is to monitor the cooperatives and this involves the submission of numerous reports. Cooperatives, however, reported that the volume of reports were too many for them to handle.

The potential of cooperatives as lenders to small farmers and fisherfolks, who are in need of credit to support production activities, is huge given that majority of farmers and fisherfolks are still not members of cooperatives and do not have access to formal credit sources. Sample cooperatives in the study said that they are willing to relax membership requirements to encourage more farmers and fisherfolks to join them. The tendency according to them is that as cooperatives grow bigger, their membership requirements also become more complicated thus more difficult to comply with. Furthermore, the study found that many of the micro and small cooperatives that had limited internal fund and had experienced difficulty in securing funds from government financial institutions like LBP were not able to cater to the credit needs of their members.

Cooperatives have the capacity to absorb additional credit funds according to the ACPC study (2015). First of all, these cooperatives have trained staff to implement lending activities. Also, they have already set up their credit policies, systems, and procedures. However, the study noted that additional training (on leadership and credit management) and additional trained staff are needed to improve their lending performance.

In terms of the role of ACPC, the study (2015) suggested that capacity building be included in the functions of ACPC to improve the sustainability of the lending program. It has to continue its coaching and mentoring approach. CDA, on the other hand, should be stricter in assessing the registration of cooperatives, such that only those cooperatives with trained and capable officers will be registered.

Agrarian Reform Beneficiary Organizations (ARBOs) as conduits of credit.

One of the intervention delivery modalities that the Department of Agrarian Reform (DAR) implements to be able to reach a wider set of small farmers is through the Agrarian Reform Communities (ARCs) network. Each ARC covers a number of Agrarian Reform Beneficiary Organizations (ARBOs), whose members include agrarian reform beneficiaries (ARBs), farmer beneficiaries, and other rural workers. Complementing packages of development interventions are developed and delivered in ARCs to achieve bigger impact and more sustainable results.

In partnership with DA and LBP, DAR implements the Agricultural Production and Credit Program or APCP, which engendered the streamlining of documentary requirements for accessing credit in banks. ARBOs serve as conduit of credit to its members. The ARBO also provides support to its members to help them access credit from other formal sources (Geron, Llanto, and Badion 2016).

IV. Conceptual Framework

Agricultural credit for small-scale farmers differs from the usual credit extended to non-farmers. They differ in terms of the level of risk and borrower's creditworthiness. Agricultural credit is riskier due to 1) the risky nature of agriculture as a business venture (e.g. natural risks, such as typhoon and pests) and 2) the characteristics of farmer borrowers, who do not usually have credit history and often lack collateral.

A. Agricultural credit demand

On the demand side, farmers need cash to support farming operations, such as purchase of inputs and other materials needed for production, and household operations, such as purchase of food for the household and education expenses for the children.

Farm-related expenditures are driven by many factors, such as farm size and type of crop planted. The bigger the farm size, the larger the expenses needed for inputs and labor. Likewise, the type of crop could affect the level of cost and need for cash. If the crop planted is labor-intensive, like vegetables, then labor costs would tend to go up. Moreover, the level of farm expenses would depend on whether or not the crop requires high levels of fertilizer and other chemicals.

In terms of the level of household expenses, the need for cash would vary depending on the size of the household and on the number of dependents. The bigger the household size, the bigger the spending on food, utilities, education, and many others. However, if the household has fewer dependents against the number of income-earners, then the need for cash would be reduced since it can easily be satisfied by available income.

Given their fungibility, farm expenses and household expenses are hardly taken separately. The greater the combined farm and household expenses, the greater the household's need for cash, which is mainly derived from their income. If income is not enough, households would need to find other sources of cash.

With the seasonality of agricultural production, there are farmers who are unable to fully support their farm and household operations by relying solely on their income. The inflow of cash would only occur during the sale of the harvest, which is toward the end of the production cycle. The gap in the timing of cash inflow and cash outflow could be addressed if households have any of the following liquid sources: i) current income of other household members; ii) savings from earnings during the previous production season; iii) money from the sale of non-financial assets; and iv) access to credit. By having adequate cash savings and possessing financial and/or non-financial assets, the need of household for cash is reduced. Consequently, demand for credit is also reduced.

In the absence of savings or other liquid assets, demand for credit increases. Credit could either come from formal or informal sources. In the case of formal credit, land titles are usually used as collateral. Past studies find that indeed owning a title for a parcel of land makes it easier for farmers to access credit (Tenaw et al. 2009, World Bank, 2009). Consequently, with greater access to credit, farmers are able to invest in durables and apply inputs more intensively, which could result in higher agricultural productivity (Platteau (1993) as cited in Tenaw et al. p.8).

On the other hand, small-scale farmers who do not own land have difficulty accessing credit from formal lenders (e.g. rural bank). Apart from not having sufficient assets to serve as collateral, the tedious processing and paperwork involved in credit applications turn farmers off.⁴ Moreover, those farmers who have preexisting past due loans with banks are also discouraged to borrow again. Some farmers also fear of not being able to pay off the loan within the repayment period or to pay due to force majeure. Other reasons include inaccessibility of banks in far flung areas and having no information on bank lending programs and information on procedures (Geron, Llanto, and Badiola 2016).

Even if informal credit sources (e.g. traders) would apply higher interest rates than formal lenders, farmers would still choose to borrow from informal sources due to the convenience and expedient release of loan. However, assuming that access to formal credit is not an issue, demand for credit would tend to increase as interest rate goes down.

B. Agricultural credit supply

Credit supply is driven by the level of interest rate. The higher the interest rate, formal lenders (e.g. rural banks) tend to offer more credit. However, there are other reasons aside from the level of interest rate that affect credit supply. Formal lenders tend to reject loan applications from farmers due to the following:

⁴ Cuevas and Sumalde (2015) argue that these transaction costs could be reduced by the government by 1) lessening the number of requirements; and 2) shortening the approval time of the loan. A good example of this is the Sikat-Saka credit program of the Department of Agriculture (a component of Food Staples and Sufficiency Program). In 2013, more small holder farmers were found to have availed of their credit program after they expanded the list of collateral and relaxed the eligibility requirements.

- 1) One reason is that lenders perceive farmers as high-risk borrowers and that these often are not able to comply with minimum loan requirements (e.g. collateral) (Onumah 2003 as cited in Awodite et al (2015)).
- 2) Agricultural farming is seen as a risky venture. The seasonal nature of crop production schedule result in shortage in credit funding and labor in some months of the year. Farmers are exposed economic and environmental shocks (Geron, Llanto, and Badiola 2016). When farmers experience untoward events in the farm, such as a typhoon or pest wreaking havoc on their plots, this obviously would result to significantly lower output level, thereby increasing the probability that farmers would not be able to pay off their loans (Ezike (1984), Nweke and Onyia (2001) and Kodieche (2002) as cited in Badiru 2010).
- 3) With the lack of credit history, formal lenders face imperfect/asymmetric information. Creditors may have access to information that allows them to directly discriminate among potential borrowers. Another means to discriminate is to apply terms and conditions, i.e. documentary requirements, adjusting the loan maturity, adjusting payment terms, etc. It is likely for informal creditors to rely relatively more on direct information on borrowers (especially within neighborhoods and communities, or among kin), whereas formal credits may rely relatively more on terms and conditions.

C. Increasing the probability of accessing formal credit

Given the problems faced by formal lenders, especially on farmer's inability to present collateral and information asymmetry, other channels are currently used to be able to reach small-holder farmers. In the case of the Philippines, farmer cooperatives usually serve as conduit of credit from rural banks to individual/small-scale farmers (Geron, Llanto, and Badiola 2016). Also, crop insurance could be used as a substitute for land as collateral (Briones 2007; and Geron, Llanto, and Badiola 2016). In terms of information asymmetry, farmer cooperatives are in a better position than rural banks to assess farmer's credit worthiness since they are more familiar with the borrowers' background and social networks (e.g. family ties, farmer colleagues, which could be tapped in case of loan default. In Vietnam, social capital and social networks are being considered by credit providers in the absence of collateral (Linh et al 2019).

D. Effect of borrowing constraints on poor farmers' household consumption and production decisions

Consumption smoothing and production improvement are among the benefits that poor households could experience should they be given access to credit (Swain et al 2008, Conning and Udry 2005, Armendariz and Morduch 2005, Robinson 2001, Zeller et al 1997 as cited in Awodite et al (2015)). Apart from influencing consumption levels, credit constraints also could also affect health and education investments of poor households (Kumar et al 2013).

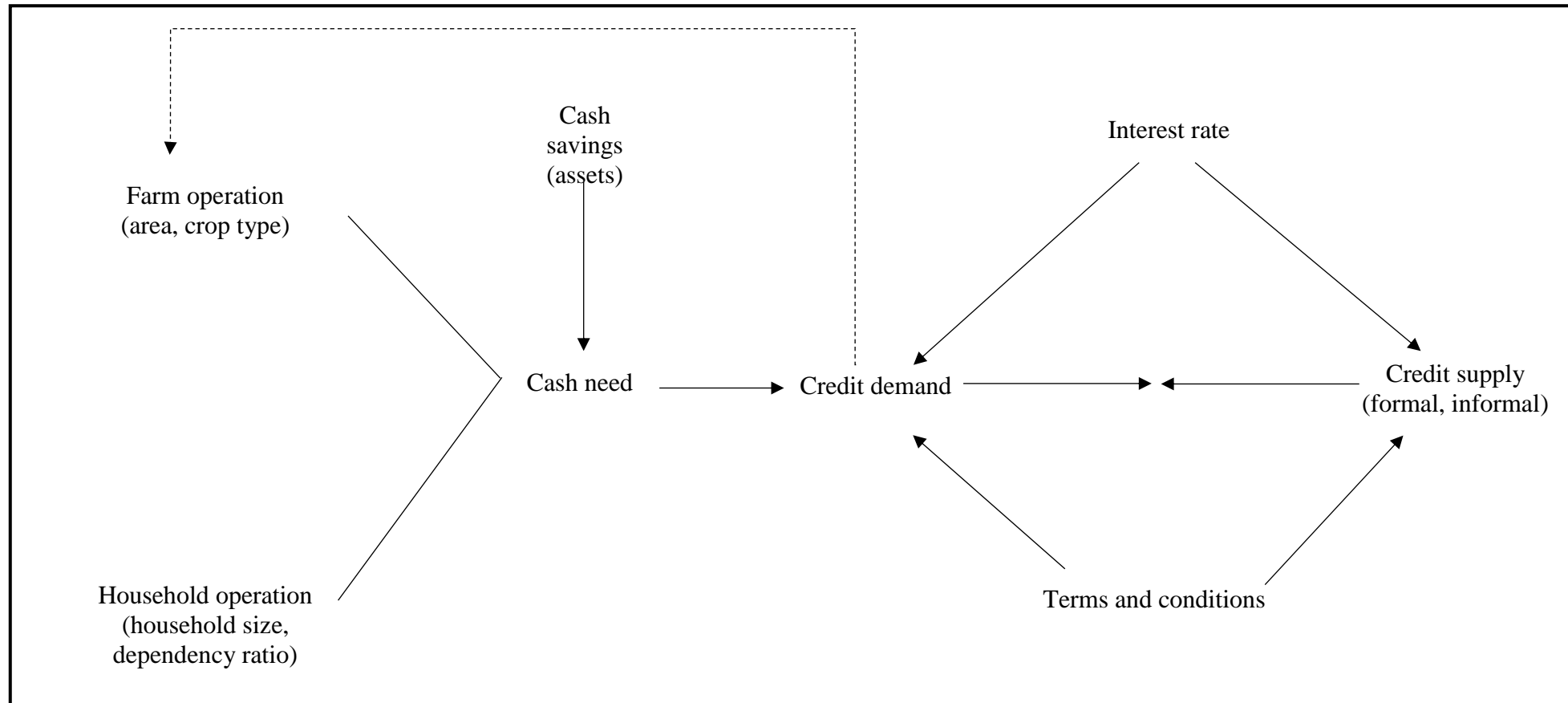
In the absence of access to credit, farmers who do not have sufficient liquid assets would likely apply lower levels of production inputs (Feder et al 1989 and Petrick, 2004 as cited in Awodite et al (2015)). In addition, farmers would

prefer less risky production choices (e.g. safer varieties over riskier, high-yielding varieties). This also means that adoption of agricultural technology and innovations would not be pursued by farming households with borrowing constraints. The underutilization of inputs and risk-mitigation strategies result in lower level of output, which could also mean lower income (Morduch 1995).

In addition to production-related decisions of farming households with credit constraints, these households also smoothen their income by diversifying plots and diversifying their income sources (that is, greater likelihood for other household members to engage in off-farm employment).

By being able to bridge the gap between need for cash and availability of cash (no matter the level of interest rate and terms and conditions, from formal or informal), farmers and fisherfolks will be able to finance their usual production operations, adopt better technologies, that could increase their output, production volume, which in turn would increase their income from these agricultural activities.

Figure 3. Schematic diagram of credit demand and supply



V. Data and Analysis Method

Scope of the study. This study focuses on Agrarian Reform Beneficiary Organization members. What sets them apart from a typical small holder farmer is the fact that they are members of an organization. Membership in farmers' organization means that these farmers are organized and so they are able to have access to information and to other forms of support from government and even the private sector.

Project ConVERGE Baseline Study. Since this policy paper is part of Project ConVERGE, which is a project of Department of Agrarian Reform with funding from International Fund for Agricultural Development (IFAD), the study made use of the available primary (survey) data from Project ConVERGE's Baseline Study, which was conducted in 2019. Using this primary dataset, the author analyzed the borrowing incidence and other borrowing patterns among ARBO member households, while highlighting those ARBO member households engaged in farm production.

In the Baseline Survey Questionnaire, a set of questions related to credit access (with reference period that is from June 2018 to May 2019) were included, albeit limited questions only. Owing to the length and complexity of the whole survey instrument, which was designed to capture farm-level and household-level income and expenditures, the questions on credit were only limited to the following:

- 1) Credit sources that the household have tried getting loan from during the reference period;
- 2) Credit source category (e.g. relatives, neighbors, sari-sari store, government bank, private/commercial bank)
- 3) Which of the credit sources mentioned allowed the household to incur largest debt during the reference period?⁵
- 4) In connection with the largest debt:
 - a. Where is the creditor located?
 - b. How much was the largest debt the household ever incurred?
 - c. What was the interest rate charged by the creditor?
 - d. How much time is allowed for paying off the debt incurred with the creditor?
 - e. What is the status of loan that the household borrowed from the creditor?

The Baseline Survey dataset has a total of 1,144 sample households. Among these households, 80 percent can be classified as agricultural households. Agricultural households are defined in this study as those households who have at least one member reported to have done primary production activities as operators (e.g. farmer of palay or corn, raising of livestock and/or poultry). This does not mean that these agricultural households solely depend on agriculture for their income. Their household members could still be engaged in nonfarm businesses or employment. The remaining 20 percent of the full sample are engaged in agri-based and non-agriculture business and employment.

⁵ By limiting the questions in relation to the largest debt, the author is able to distinguish the borrowing incidence and patterns with respect to the "most important" creditor.

Analysis. Following the conceptual framework, the analysis is centered on agricultural households since the ultimate goal is to see the relationship of credit access with agricultural performance. In addition to this, results were also disaggregated by type of main commodity and by poverty status. Agricultural households in the dataset were grouped into their main commodity based on gross revenue. For instance, a farming household planted palay, corn, and coconut during the reference period. If their gross revenue coming from palay was the highest among three crops, then this farming household will be classified as a “Palay” household. With regard to poverty status, the households were classified as poor or non-poor using PSA’s poverty thresholds for 2018. It can be observed in the sample that 51 percent of ARBO agricultural households are poor.

The analysis relied mostly on summary data comparisons (using frequency [freq.] count and statistical averages). Basic statistical tests (i.e. Chi-square test and t-test⁶) were also implemented to confirm possible relationship between borrowing dummy variable and other variables.

Limitations in the analysis. Given that the only available dataset is a cross-section dataset, the causal relationship between credit access and agricultural performance could not yet be established.

VI. Results and Discussion

The results and discussion are presented for each element of the conceptual framework, which are 1) Credit supply; 2) Crop type; 3) Household characteristics; 4) Farm area and land tenure; and 5) Assets.

A. Credit Supply

1. Borrowing incidence among full sample and agricultural households

Based on the dataset, there are 428 households who were able to access any type of credit during the reference period (See Table 1). The borrowing incidence among the full sample is at 37 percent. In the same table, frequencies for agricultural ARBO households are also presented. The borrowing incidence among agricultural households is higher at 39 percent.

Of those that borrowed, 73 percent relied on formal loans only, while 18 percent accessed informal loans only. A small share of nine percent reported that they accessed both formal and informal loans during the reference period. The notion that farmers and rural folk are mostly dependent on informal credit is strongly rejected in our sample. If they borrowed at all, they more often borrowed from formal sources.

⁶ For the **Chi-square test of independence**, the default assumption (also known as null hypothesis) is that “the two categorical variables are independent. This means that there is no relationship between the two categorical variables. For the **t-test**, the null hypothesis is that “the two groups being compared are equal.” This means that there is no significant difference in the means observed between the two groups.

Table 1. Number of households that borrowed and did not borrow a loan

	All ARBO HHs	Agricultural ARBO HHs
Nonborrowing	716	560
Borrowing	428	356
Formal loans only	308	258
Informal loans only	85	65
Both formal and informal	35	33
Total	1,144	916
Borrowing Incidence (%)	37.41	38.86

Source: Author's calculations

2. Sources of largest credit among full sample and agricultural households

Table 2 identifies the formal and informal sources of credit among borrowing ARBO households. The most common source of the largest loan (37%) was Microfinance Institutions (MFIs). The second most common was (around 25 percent) was Cooperatives/Farmers Association. Another 13 percent accessed private/commercial bank loans. On the other hand, the common notion that farmers often borrow from their traders does not seem to hold among ARBO members. Only three percent of the ARBO households reported to have borrowed their largest credit from traders. Grouping the creditors into formal and informal creditors, the share of formal sources of largest loan is 79 percent, while informal credit sources was 21 percent.

Among borrowing agricultural households, the pattern is even more prominent. The top source of largest credit is MFIs (37%), followed by Cooperatives/Farmers Association (26%). The share of formal sources of credit is slightly higher than the full sample at 80 percent, while share of informal is at 20 percent.

Table 2. Sources of credit

	Full Sample		Agri HH	
	Freq.	%	Freq.	%
Relatives	19	4.44	15	4.21
Neighbors/friends	23	5.37	19	5.34
Sari-sari store	18	4.21	11	3.09
Local money lenders	16	3.74	11	3.09
Input supplier	1	0.23	1	0.28
Trader/buyer	13	3.04	12	3.37
Directly from government*	16	3.74	13	3.65
Private/commercial bank*	57	13.32	49	13.76
Cooperatives/Farmers Association*	105	24.53	93	26.12
Microfinance institutions (MFI) *	158	36.92	130	36.52
Others	2	0.47	2	0.56
Total	428	100.00	356	100.00

Note: Creditors with asterisk (*) are considered as "formal" sources of credit

Source: Author's calculations

3. Location of creditor among full sample and agricultural households

Among all borrowing ARBO households (n=428). A large share of informal creditors were located within the barangay (61%). On the other hand, formal creditors were dispersed within the province, with 38 percent located within the barangay, 41 percent is outside the barangay, still but within the municipality/city, and 19 percent is outside the municipality/city but still within the province.

Among all borrowing agricultural ARBO households (n=356). The same pattern can be observed among agricultural households. Informal creditors were mostly within the barangay (58%), while formal creditors were located much farther (i.e. 39% within the barangay, 40% outside barangay within municipality/city, and 20% outside municipality/city, within province). It seems that a big factor in patronage of informal credit is proximity, as banks and other formal sources (except for cooperatives) tend to be located farther from the typical ARBO member, whether agricultural operator or otherwise. Nonetheless, the latter are still the most common sources of credit.

4. Largest loan payment terms among full sample and agricultural households

Among all borrowing ARBO households (n=428). Eighty-five percent of the largest loans were paid by cash payment (capital plus interest), while 10 percent were also paid by cash payment but without interest. Only three percent of the largest loans were paid based on a purchase agreement (wherein creditor is arranged to be the buyer of farm produce).

Formal credit sources were mostly paid in cash with interest (95%). Shares for other payment terms were small, which was two percent for cash payment without interest and two percent for purchase agreement.

Informal credit sources, on the other hand, were paid in various payment terms. Forty-eight percent was paid by cash payment with interest, 39 percent by cash payment without interest, and eight percent under purchase agreement.

Among all borrowing agricultural ARBO households (n=356). The same pattern is observed among borrowing agricultural households. Considering all credit sources, the average share for cash payment with interest was 86 percent, while cash payment without interest was only 8 percent and purchase agreement was four percent.

In terms of formal credit sources, 95 percent had to be paid by cash payment with interest, while other payment terms comprised 5 percent. For informal credit sources, the share of cash payment with interest was just 49 percent, while cash payment without interest was at 34 percent. Only 10 percent was under purchase agreement.

Table 3. Payment terms among agricultural ARBO households

	Informal credit source		Formal credit source		All credit source	
	Freq.	%	Freq.	%	Freq.	%
1 Share in production	3	4.23		0.00	3	0.84
2 Arrangement to be the buyer of farm produce	7	9.86	6	2.11	13	3.65
3 Cash payment (capital plus interest)	35	49.30	271	95.09	306	85.96
4 Combination of cash and produce	2	2.82	4	1.40	6	1.69
5 Cash payment (no interest)	24	33.80	4	1.40	28	7.87
Total	71	100.00	285	100.00	356	100.00

Source: Author's calculations

5. Amount of largest loan and interest rate among full sample and agricultural households

As discussed in earlier section, not all debts were recorded during the data collection period. Only the information on the amount of the largest debt ever incurred with the creditor during the reference period was recorded. For cash payment with interest terms of payment, the corresponding annual interest rate was also asked to the survey respondents.

All borrowing ARBO households whose loan payment term is cash payment with interest (n=364). Among borrowing households whose loan payment term is cash payment with interest (n=364), the average amount of informal credit and formal credit were PHP13,618 (average interest rate: 42.6%) and PHP46,523 (average interest rate: 23.8%), respectively. The median amount of informal credit and formal credit were PHP5,500 (median interest rate: 19%) and PHP15,000 (median interest rate: 18%), respectively. Hence, on average, loan sizes were larger and interest rates lower for formal credit.

All borrowing agricultural ARBO households whose loan payment term is cash payment with interest (n=306). Among borrowing agricultural households whose loan payment term is cash payment with interest (n=306), the average amount of informal credit and formal credit were PHP14,419 (average interest rate: 45.7%) and PHP41,195 (average interest rate: 23.8%), respectively (See Table 4). The median amount of informal credit and formal credit were PHP8,000 (median interest rate: 18%) and PHP18,000 (median interest rate: 18%), respectively. For agricultural operators, informal loans were smaller, but interest rates were the same compared with formal loans (i.e. they were likelier to get “friendly” rates from their informal creditors).

Table 4. Average amount of largest credit by payment terms among agricultural ARBO households

	Informal credit source		Formal credit source		All credit source	
	Obs.	Average Amt.	Obs.	Average Amt.	Obs.	Average Amt.
1 Share in production	3	8,333			3	8,333
2 Arrangement to be the buyer of farm produce	7	14,000	6	43,667	13	27,692
3 Cash payment (capital plus interest)	35	14,419	271	41,195	306	38,132
4 Combination of cash and produce	2	15,000	4	48,500	6	37,333
5 Cash payment (no interest)	24	6,163	4	35,287	28	10,323
Total	71		285		356	

Source: Author's calculations

6. Status of largest credit among full sample and agricultural households

Among all borrowing ARBO households (n=428). At the time of the survey, forty-nine percent of those households who borrowed from informal sources (n=92) have already paid their loans in full. Others have started paying the amortization (22%), have delayed payment (23%), have restructured payment terms (2%) and have not paid any amortization (4%).

In terms of formal loans (n=336), only 17 percent of the households have already paid their loans in full. Many of them have already started paying the amortization (65%). Others have delayed payment (14%), have restructured payment terms (2%) and have not paid any amortization (3%).

Among all borrowing agricultural ARBO households (n=356). At the time of the survey, forty-six percent of those agricultural households who borrowed from informal sources (n=71) have already paid their loans in full (See Table 5). Others have started paying the amortization (20%), have delayed payment (25%), have restructured payment terms (3%) and have not paid any amortization (6%) (See Table 5).

In terms of formal loans (n=285), only 17 percent of the households have already paid their loans in full. Many of them have already started paying the amortization (66%). Others have delayed payment (12%), have restructured payment terms (2%) and have not paid any amortization (3%). For both formal and informal sources, repayment delays are widespread, but behavior that is conducive to loan default is rare.

Table 5. Status of loan among agricultural ARBO households

Status of loan	Informal credit source		Formal credit source		All credit source	
	Freq.	%	Freq.	%	Freq.	%
1 Started amortization/on-time payment	14	19.72	188	65.96	202	56.74
2 Fully paid	33	46.48	48	16.84	81	22.75
3 Delayed payment	18	25.35	35	12.28	53	14.89
4 Restructured	2	2.82	6	2.11	8	2.25
5 Not paid any amortization	4	5.63	8	2.81	12	3.37
Total	71	100.00	285	100.00	356	100.00

Source: Author's calculations

Furthermore, the table above shows that most of the loans from informal creditors were already paid in full compared to that of loans from formal creditors. This difference may be due to two reasons—magnitude of loan and length of time for repayment. The amount of informal loans is smaller than that of formal loans. Even if the payment of interest rate is taken into consideration, total credit payment is still smaller for informal loans. In terms of repayment period, the time for repayment is shorter for informal loans compared to formal loans. The average repayment period for informal loans is 20 weeks, while the average is 40 weeks for formal loans.

B. Crop type

1. Borrowing Incidence by crop

Table 6 shows that almost one-fifth of the agricultural households in the sample have livestock and poultry as their main commodity, while palay households and corn households comprise 20 percent and 17 percent, respectively. Among the borrowing agricultural households, around 30 percent is a palay household, while 20 percent is livestock and poultry households. Among the nonborrowing agricultural households, 23 percent is livestock and poultry households, while 19 percent is corn households.

On average, the borrowing incidence among agricultural households is 38.9 percent. In terms of borrowing incidence by commodity, the highest is palay households with 57 percent. Focusing on crops alone, the borrowing incidence among temporary crop households is higher than permanent crop households.

Table 6. Number of Borrowing HH and Nonborrowing HH, by main commodity

	Nonborrowing		Borrowing		Borrowing Incidence
	Freq.	%	Freq.	%	%
Palay	76	13.57	99	27.81	56.57
Corn	107	19.11	47	13.20	30.52
Vegetables and Fruits (Temporary crops)	13	2.32	14	3.93	51.85
Other Temporary Crops	24	4.29	10	2.81	29.41
Coconut	72	12.86	51	14.33	41.46
Banana	81	14.46	35	9.83	30.17
Other Permanent Crops	48	8.57	24	6.74	33.33
Livestock and Poultry	129	23.04	70	19.66	35.18
Other Agriculture, Fishing, and Forestry Activities	10	1.79	6	1.69	37.50
Total	560	100.00	356	100.00	38.86

Source: Author's calculations

This is consistent with the hypothesis that the more cash-intensive type of crop will be associated with more borrowing on the part of farmers. According to PSA's data on cost and returns in 2019, The share of cash costs in total costs is 92 percent for temporary crops, while the share is lower at 82 percent for permanent crops. Furthermore, temporary crops have higher average cash costs per hectare than permanent crops. Temporary crops' cash costs amount to PHP76,012 per hectare, while permanent crops' cash costs amount to PHP57,364 per hectare (PSA 2019).

2. Source of largest credit by crop

Households whose main commodity was a temporary crop borrowed their largest formal credit from Cooperatives/Farmers Association more than MFIs (see Table 7). Among palay households, the share of loans from Cooperatives/Farmers Association was at 29 percent, while 22 percent of the loans were coming from MFIs. For households whose main commodity is corn, 43 percent of the largest loans were from Cooperatives/Farmers Association, while the share of MFIs was at 26 percent.

On the other hand, those households whose main commodity was a permanent crop borrowed mostly from MFIs. Those households with coconut as their main commodity sourced their largest loans from MFIs (37%), and from Cooperatives/Farmers Association (18%). Banana households also got most of their largest loans from MFIs (49%) than from Cooperatives/Farmers Association (9%).

Table 7. Number of formal loan borrowers by source of largest credit and by major crop type

	Temporary Crop HH		Permanent Crop HH	
	Freq.	%	Freq.	%
Directly from government banks	6	4.58	6	6.82
Private/commercial bank	24	18.32	17	19.32
Cooperatives/Farmers Association	61	46.56	18	20.45
Microfinance institutions (MFI)	40	30.53	47	53.41
Total	131	100.00	88	100.00

Source: Author's calculations

Temporary crop households tend to borrow more from Cooperatives/Farmer Association than MFIs. The opposite is true for permanent crop households. A plausible reason for this is that cooperatives are more dependent on shorter cash turnover compared with MFIs. Since MFIs lend to wider set of borrowers (different sources of income, location, payment schedule), and have more diverse sources of funds (savings deposits, other banks, etc.) they are able to manage their cash flows better than smaller cooperatives/farmer associations that often cater to similar type of borrowers (e.g. farmers cultivating similar crops with synchronous seasonality).

3. Location of formal credit source by crop

In the case of households whose main commodity was a temporary crop (n=131), their formal creditors were located mostly within the barangay (47%), which was much higher than the average share considering all agricultural commodities (See Table 8). Other formal creditors were located outside the barangay but within the municipality/city (35%), and outside the municipality/city but within the province (18%).

Those households with permanent crops as main commodity (n=88) sourced their formal loans mostly outside the barangay but within the municipality/city (47%). Only 31 percent of their formal creditors were located within the barangay, while 20 percent was outside the municipality/city but within the province.

Table 8. Number of borrowers by location of formal creditor and by crop

	Temporary Crop HH		Permanent Crop HH	
	Freq.	%	Freq.	%
1 Within the barangay	62	47.33	27	30.68
2 Outside the barangay, but within the municipality/city	46	35.11	41	46.59
3 Outside the municipality/city, within the province	23	17.56	18	20.45
4 Outside the province	0	0.00	2	2.27
Total	131	100.00	88	100.00

Source: Author's calculations

In Table 9, it is shown that most MFIs are located outside the barangay. Cooperatives/Farmers' Association are located mostly within the barangay.

Table 9. Location of Cooperatives/Farmers Association and MFIs by crop

	Temporary Crop HH		Permanent Crop HH	
	Coop/FA (%)	MFI (%)	Coop/FA (%)	MFI (%)
1 Within the barangay	75.41	18.75	50.00	31.91
2 Outside the barangay, but within the municipality/city	16.39	65.63	33.33	51.06
3 Outside the municipality/city, within the province	8.20	15.63	16.67	14.89
4 Outside the province	0.00	0.00	0.00	2.13
Total	100.00	100.00	100.00	100.00

Source: Author's calculations

C. Household Characteristics

1. Household size

In terms of household size, the table below shows that borrowing households have more members than nonborrowing households. After subjecting these variables under a statistical test called t-test⁷, it was found that the difference in the means between nonborrowing and borrowing agricultural households in terms of household size is significant (see Annex B). Considering formal loans only, the difference in average household size is still significant (See Annex D). This is consistent with the hypothesis that larger households require more cash outflow and leads to more borrowing.

Table 10. Household size by borrowing category

	Obs	Mean	Median
Non-Borrowing HH	560	4.93	4
Borrowing HH	356	5.31	5

Note: All credit sources considered.

Source: Author's calculation

2. Dependency ratio

a. Dependency based on age of household members

As shown in Table 11, dependency ratio of nonborrowing agricultural households was 0.4, which is higher than 0.3 ratio of borrowing agricultural households. Based on the t-test results, it was found that the difference in the means between nonborrowing and

⁷ Significance level is alpha=0.10

borrowing agricultural households in terms of dependency ratio is not significant (see Annex B).

Table 11. Dependency ratio by borrowing category

	Obs	Mean	Median
Non-Borrowing HH	560	0.4	0.3
Borrowing HH	356	0.3	0.3

Note: 1) Dependents are those HH members whose ages are below 15 and above 64;

2) All credit sources considered

b. Dependency based on working status of household members

If dependency ratio based on the working status of household members is to be analyzed, the difference in means is small (-0.01) (see Table 12). Based on t-test results (See Annex B), this mean difference between nonborrowing and borrowing agricultural households is not significant. Dependency ratio is not a good indicator of need for credit in this sample, perhaps because of other confounding factors.

Table 12. Nonworking dependency* Ratio by borrowing category

	Obs	Mean	Median
Non-Borrowing HH	560	0.5	0.5
Borrowing HH	356	0.5	0.5

Note: 1) Nonworking HH members over total number of HH members;

2) All credit sources considered

3. House characteristics

a. Type of Building/House

Comparing nonborrowing and borrowing agricultural households based on their house type, no significant difference can be observed based on mere count and percentages (see Table 13). Upon checking the association between two categorical variables (which are borrowing category [1 if HH borrowed, 0 if HH did not borrow] and house type [1 if single house, 2 if duplex, and 3 if other type] using Chi-square test), it was found that these variables are independent, thus no significant relationship was detected.

Table 13. Type of Building/House by borrowing category

	Nonborrowing		Borrowing	
	Frequency	%	Frequency	%
Single house	548	97.86	354	99.44
Duplex	11	1.96	2	0.56
Commercial/industrial/agricultural building	1	0.18		0.00
Total	560	100.00	356	100.00

Note: All credit sources considered.

Source: Author's calculation

b. Type of Roof

Unlike the housing type above, the distribution of households by type of roof between nonborrowing and borrowing agricultural households seems different (see Table 14). Many of the nonborrowing agricultural households (13%) have “Half galvanized iron and half concrete” as roof material, compared with only three percent among borrowing agricultural households for the same roof material type. Chi-square test results show that indeed, the type of roof and borrowing category have a significant relationship.

Table 14. Type of Roof by borrowing category

	Nonborrowing		Borrowing	
	Frequency	%	Frequency	%
Galvanized Iron/Aluminum	451	80.54	327	91.85
Concrete/Clay Tile	2	0.36	2	0.56
Half Galvanized Iron and Half Concrete	74	13.21	9	2.53
Bamboo/Cogon/Nipa/Anahaw	27	4.82	15	4.21
Asbestos	1	0.18		0.00
Makeshift/Salvaged/Improvised materials	5	0.89	3	0.84
Total	560	100.00	356	100.00

Note: All credit sources considered.

Source: Author's calculation

c. Type of Outer Wall

The distribution by type of outer wall between nonborrowing and borrowing agricultural households also appears different as observed in Table 15. Many of the nonborrowing agricultural households (18%) have “Bamboo/Sawali/Cogon/Nipa” as outer wall material, compared with only 8 percent among borrowing agricultural households for the same outer wall material type. Chi-square test results show that indeed, the type of outer wall and borrowing category have a significant relationship.

Table 15. Type of Outer Wall by borrowing category

	Nonborrowing		Borrowing	
	Freq.	%	Freq.	%
Concrete/Brick/Stone	162	28.93	97	27.25
Wood	144	25.71	120	33.71
Half concrete/brick/stone and Half wood	148	26.43	106	29.78
Galvanized Iron/Aluminum	3	0.54		0.00
Bamboo/Sawali/Cogon/Nipa	100	17.86	30	8.43
Makeshift/Salvaged/Improvised Materials	3	0.54	1	0.28

Others		0.00	2	0.56
Total	560	100.00	356	100.00

Note: All credit sources considered.

Source: Author's calculation

d. Tenure status of housing

In terms of tenure status of housing, most of the borrowing agricultural households (71%) own their house and lot, while the share for the same category is only 61 percent among nonborrowing agricultural households (see Table 16). Many of the nonborrowing agricultural households (32%) have “Own house, rent-free lot with consent of owner” as tenure status, compared with only 24 percent among borrowing agricultural households for the same tenure type. Chi-square test results show that indeed, the tenure status of house and borrowing category have a significant relationship.

Table 16. Tenure Status by borrowing category

	Nonborrowing		Borrowing	
	Freq.	%	Freq.	%
Own or owner-like possession of house a	341	60.89	252	70.79
Rent house or room including lot	3	0.54	1	0.28
Own house, rent lot	8	1.43	3	0.84
Own house, rent-free lot with consent of owner	181	32.32	87	24.44
Own house, rent-free lot without consent of owner	8	1.43	4	1.12
Rent-free house and lot with consent of owner	19	3.39	9	2.53
				100.0
Total	560	100.00	356	0

Note: All credit sources considered.

Source: Author's calculation

4. Household access to water and sanitation

a. Source of water supply for drinking and cooking

In terms of drinking water, the top source is “Own use faucet, community water system” for both nonborrowing and borrowing agricultural households (See Table 17). The second top source of drinking water for nonborrowing households is “Shared faucet, community water system” at 24 percent, while it is “Water refilling station” for borrowing households at 30 percent. Based on Chi-square test results, the source of drinking water and borrowing category have a significant relationship.

In Table 18, it shows that for both nonborrowing and borrowing agricultural households, the top source of water for cooking is still

“Own use faucet, community water system”. A big chunk of borrowing agricultural households use “Shared faucet, community water system” and “Unprotected well” for cooking, with 14 percent and 12 percent, respectively. Nonborrowing agricultural household’s top two source is “Shared faucet, community water system” with a 24 percent share. The relationship between source of water for cooking and borrowing category is significant based on Chi-square test.

Table 17. Source of Water Supply for Drinking by borrowing category

	Nonborrowing		Borrowing	
	Frequency	%	Frequency	%
Own use faucet, community water system	201	35.89	116	32.58
Shared faucet, community water system	135	24.11	51	14.33
Own use tubed/piped deep well	10	1.79	7	1.97
Shared tubed/piped deep well	11	1.96	4	1.12
Tubed/piped shallow well	4	0.71	3	0.84
Protected well	22	3.93	15	4.21
Unprotected well	7	1.25	7	1.97
Protected spring	43	7.68	31	8.71
Unprotected spring	13	2.32	7	1.97
Rainwater	1	0.18	5	1.40
Surface water (river, dam, lake, pond)		0.00	1	0.28
Peddler		0.00	1	0.28
Water refilling station	113	20.18	108	30.34
Total	560	100.00	356	100.00

Note: All credit sources considered.

Source: Author’s calculation

Table 18. Source of Water Supply for Cooking by borrowing category

	Nonborrowing		Borrowing	
	Frequency	%	Frequency	%
Own use faucet, community water system	249	44.46	148	41.57
Shared faucet, community water system	148	26.43	49	13.76
Own use tubed/piped deep well	15	2.68	7	1.97
Shared tubed/piped deep well	16	2.86	7	1.97
Tubed/piped shallow well	6	1.07	8	2.25
Protected well	32	5.71	25	7.02
Unprotected well	23	4.11	43	12.08
Protected spring	40	7.14	34	9.55
Unprotected spring	13	2.32	7	1.97
Rainwater	7	1.25	12	3.37
Surface water (river, dam, lake, pond)	3	0.54	11	3.09
Peddler		0.00	1	0.28

Water refilling station	7	1.25	4	1.12
Others	1	0.18		0.00
Total	560	100.00	356	100.00

Note: All credit sources considered.

Source: Author's calculation

b. Toilet Facility

With regard to toilet facility, more than 70 percent of the agricultural households answered that they have “Flush or Pour Flush Toilet: Flush to septic tank” type of toilet, that is for both the nonborrowing and borrowing agricultural households. The distribution across different types of toilet facility seems to differ a bit between the nonborrowing and borrowing households (See Table 19). Based on Chi-square test results, the toilet facility and borrowing category have a significant relationship.

Table 19. Toilet Facility by borrowing category

	Nonborrowing		Borrowing	
	Frequenc y	%	Frequenc y	%
Flush or Pour Flush Toilet: Flush to piped to sewer	24	4.29	5	1.40
		72.5		70.5
Flush or Pour Flush Toilet: Flush to septic tank	406	0	251	1
		17.8		25.5
Flush or Pour Flush Toilet: Flush to pit latrine	100	6	91	6
Flush or Pour Flush Toilet: Flush to open drain	2	0.36	2	0.56
Pit latrine: Pit latrine and slab	23	4.11	3	0.84
Pit latrine: Pit latrine without slab/open	1	0.18		0.00
Composting toilet	1	0.18	2	0.56
No facility/bush/field	3	0.54	2	0.56
Total	560	100	356	100

Note: All credit sources considered.

Source: Author's calculation

D. Farm Area

1. Area harvested

Table 20 shows the difference in area harvested between borrowing and nonborrowing. It appears that borrowing households have bigger area harvested than nonborrowing households, which is consistent with the author's hypothesis. However, the difference is significant only if we consider formal borrowing.

Table 20. Difference in farm size between nonborrowing and borrowing households

	Average agri land area (Nonborrowing HH) - Average agri land area (Borrowing HH)	t value	Pr(T < t)	Interpret.
Any loan	-0.20	-1.18	0.12	Not significant
Formal loan	-0.26	-1.43	0.08	Significant

Note: All credit sources considered.

Source: Author's calculation

2. Land tenure

Based on the dataset, there are 690 agricultural households with at least one owned agricultural land, while 226 agricultural households do not have their own agricultural land. The proportions of borrowers and nonborrowers among those with and without own agricultural land appear the same (see Table 21). The Chi-square test results show that indeed there is no significant relationship between agricultural land ownership and borrowing category.

Table 21. Agricultural land ownership by borrowing category

	HH without owned agri land		HH with at least one (1) agri land owned	
	Frequency	%	Frequency	%
Nonborrowing	140	61.95	420	60.87
Borrowing	86	38.05	270	39.13
Total	226	100.00	690	100.00

Note: All credit sources considered.

Source: Author's calculation

Ownership of land could be through inheritance, purchase, or awarding from government (e.g. Certificate of Land Ownership Award [CLOA]). CLOA may be given to an individual or a group. Based on Table 22, among individual CLOA holders, only 47 percent are borrowing, while among collective CLOA holders, the share of those who borrow is only 41 percent. The last column refers to households with either individual CLOA or collective CLOA, or both.

Table 22. CLOA ownership by borrowing category

	Individual CLOA HH		Collective CLOA HH		CLOA HH	
	Frequency	%	Frequency	%	Frequency	%
Nonborrowing	68	53.13	27	58.70	96	54.24
Borrowing	60	46.88	19	41.30	81	45.76
Total	128	100.00	46	100.00	177	100.00

Note: All credit sources considered.

Source: Author's calculation

The following table juxtaposes the borrowing incidence of 1) households with at least one agricultural land owned, 2) households with individual CLOA, and 3) households with collective CLOA, against the borrowing incidence of households without at least one (1) own agricultural land. Based on Chi-square test, there is no significant relationship between the following dummy variables:

- 1) Ownership of agricultural land (1 if household owns at least one agricultural land, 0 if no owned agricultural land) and Borrowing status (1 if borrower, 0 if nonborrower);
- 2) Individual CLOA households (1 if individual CLOA household, 0 if no owned agricultural land) and Borrowing status (1 if borrower, 0 if nonborrower); and
- 3) Collective CLOA households (1 if collective CLOA household, 0 if no owned agricultural land) and Borrowing status (1 if borrower, 0 if nonborrower).

Table 23. Comparing borrowing incidence of households by agricultural land ownership and CLOA holding

	Borrowing Incidence (%)	Borrowing Incidence among HH without owned agri land (%)	Difference	Chi square test results*
HH with at least one (1) agri land owned	39.13	38.05	1.08	not significant
Individual CLOA HH	46.88	38.05	8.82	not significant
Collective CLOA HH	41.30	38.05	3.25	not significant

Note: All credit sources considered; *Comparing dummy variables

Source: Author's calculation

However, when formal credit is considered, the Chi-square test result for the following dummy variables becomes significant: Individual CLOA households (1 if individual CLOA household, 0 if no owned agricultural land) and Borrowing status (1 if formal loan borrower, 0 if nonborrower of formal loan).

Table 24. Comparing formal borrowing incidence of households by agricultural land ownership and CLOA holding

	Formal Borrowing Incidence (%)	Borrowing Incidence among HH without owned agri land (%)	Difference	Chi square test results

HH with at least one (1) agri land owned	31.59	29.65	1.95	not significant
Individual CLOA HH	40.63	29.65	10.98	significant
Collective CLOA HH	39.13	29.65	9.48	not significant

Source: Author's calculation

3. Among CLOA households

Source of largest credit. Table 25 shows the sources of largest credit among CLOA households (both individual and collective CLOA households). Out of 81, 36 percent borrowed from Cooperatives/Farmers Association, while 30 percent and 17 percent borrowed from MFIs and private/commercial bank, respectively. Most of them were able to borrow from formal credit sources (89%).

The average amount of largest loan borrowed by CLOA households from formal sources is PHP51,535, and PHP10,156 from informal credit sources.

Table 25. Sources of largest credit among agricultural households and CLOA households

	Agri HH		CLOA HH	
	Freq.	%	Freq.	%
Relatives	15	4.21	2	2.47
Neighbors/friends	19	5.34	1	1.23
Sari-sari store	11	3.09	2	2.47
Local money lenders	11	3.09	2	2.47
Input supplier	1	0.28	1	1.23
Trader/buyer	12	3.37	1	1.23
Directly from government*	13	1.97	5	2.47
Private/commercial bank*	49	13.76	14	17.28
Cooperatives/Farmers Association*	93	26.12	29	35.80
Microfinance institutions (MFI)*	130	36.52	24	29.63
Others	2	0.56	0	0.00
Total	356	100.00	81	100.00

Note: Creditors with asterisk (*) are considered as "formal" sources of credit

Source: Author's calculation

Location of formal credit (n=72). Forty-four percent of formal creditors are within the barangay, while those outside the barangay but within the municipality/city comprised 31 percent and those located outside the municipality/city but within the province is 22 percent.

Payment terms of formal credit (n=72). As expected, the payment terms of formal credit is mostly cash payment with interest (93%). Other payment terms are purchase agreement (6%) and cash payment without interest (1%).

Amount and interest rate of formal credit under cash payment with interest payment terms (n=67). Under the cash payment with interest payment scheme, the average amount of loan borrowed from formal creditors is PHP53,187, while the interest rate is at 23.74%.

Status of formal loan (n=72). Only 13 percent of the formal loans have been fully paid, but 68 percent have already started paying the amortization. Fourteen percent have delayed payment, while restructured payment and those who have not paid any amortization have 3 percent shares each.

E. Agricultural Performance

The indicator for agricultural performance used in this study is net agricultural income. Total net income from agricultural activities is higher for borrowing agricultural households than for nonborrowing agricultural households by PHP14,666, on average. The difference in mean net income from agriculture between nonborrowing and borrowing is significant based on t-test results. If borrowing will be limited to formal borrowing, the difference is much bigger and still significant per t-test result, which is at PHP24,721.

F. Assets

Nonborrowing households in the above analyses include both 1) households who did not need credit so they did not borrow; and 2) households with unmet credit demand (those who needed credit but were not successful in getting it). By using the “poverty status” variable, those nonborrowers who actually needed the credit could be isolated from those who did not need it in the first place. The author used PSA’s Family Income and Expenditure Survey (FIES) 2018 poverty thresholds to classify whether households into poor or nonpoor category. Out of 916 agricultural households, around 51 percent is classified as poor households.

Apart from isolating nonborrowers needing credit from those without need, poverty status could also be used as proxy for level of asset. Those households classified as poor have fewer assets than nonpoor, thereby increasing poor households demand for credit.

1. Borrowing Incidence among poor and nonpoor agricultural households

The breakdown of borrowing households and nonborrowing households among poor and nonpoor agricultural households are displayed in Table 26. It shows that borrowing incidence among nonpoor is greater than poor households. This may be explained in terms of the conceptual framework as follows: poor households may have greater cash needs (and greater credit demand), but supply tends to be restricted (e.g. the poor are less able to comply with lender’s terms and conditions, or satisfy lenders’ expectations about repayment.)

Table 26. Number of borrowing and nonborrowing households among poor and nonpoor households

	Nonborrowing	Borrowing	Total	% in Total	Borrowing Incidence (%)
Nonpoor	261	189	450	49.13	42.00
Poor	299	167	466	50.87	35.84
Total	560	356	916	100.00	38.86

Source: Author's calculations

2. Source of largest credit among poor and nonpoor agricultural households

Among the poor agricultural households who borrowed any type of loan (n=167), the main sources of largest credit were also MFIs (33%) and Cooperatives/Farmers Association (27%) (See Table 27). This implies that poor households were able to borrow their largest loan from formal credit (74%). Only 26 percent sourced their credit from informal sources (e.g. family and friends). The average amount of the largest credit borrowed by poor households from formal sources was PHP 23,964.

Nonpoor agricultural households (n=189) also borrowed from MFIs (40%) and Cooperatives/Farmers Association (25%), but the share of formal sources was much bigger, which was at 86 percent. This means that only 14 percent of the nonpoor agricultural households got loans from informal sources. The notion that the poor are excluded from formal credit sources is strongly rejected by the survey data; nevertheless, they are still at a disadvantage in accessing formal loans compared with nonpoor borrowers; they are also more dependent on informal credit.

Table 27. Sources of largest credit among poor and nonpoor households

	Agri HH		Poor HH		Nonpoor HH	
	Freq.	%	Freq.	%	Freq.	%
Relatives	15	4.21	11	6.59	4	2.12
Neighbors/friends	19	5.34	13	7.78	6	3.17
Sari-sari store	11	3.09	5	2.99	6	3.17
Local money lenders	11	3.09	5	2.99	6	3.17
Input supplier	1	0.28	0	0.00	1	0.53
Trader/buyer	12	3.37	8	4.79	4	2.12
Directly from government*	13	1.97	5	1.20	8	2.65
Private/commercial bank*	49	13.76	18	10.78	31	16.40
Cooperatives/Farmers Association*	93	26.12	45	26.95	48	25.40
Microfinance institutions (MFI)*	130	36.52	55	32.93	75	39.68
Others	2	0.56	2	1.20	0	0.00
Total	356	100.00	167	100.00	189	100.00

Note: Creditors with asterisk (*) are considered as “formal” sources of credit

Source: Author's calculations

3. Location of creditor among poor and nonpoor agricultural households

Among the poor agricultural households who borrowed any type of loan (n=167), formal creditors were located mostly within the barangay (42%), while another chunk was located outside the barangay but within the municipality/city (43%). Only 13 percent of the formal creditors were located outside the municipality/city but within the province.

Nonpoor agricultural households (n=189) were able to borrow from creditors in much farther places. In fact, 25 percent of their formal credit sources were found outside the municipality/city but still within the province, while 38 percent was located outside the barangay but within the municipality/city. Only 36 percent of their formal creditors were located in the barangay. Hence, nonpoor agricultural households have greater wherewithal to travel and transact with more distant formal institutions (e.g. MFIs) compared to poor agricultural households.

4. Largest loan payment terms among poor and nonpoor agricultural households

Among poor agricultural households, 82 percent of the all types of loans were supposed to be paid by cash payment with interest, 11 percent by cash payment without interest, and four percent paid under a purchase agreement. For the informal credit alone, 50 percent must be paid by cash payment with interest, 34 percent by cash payment without interest, and 7 percent under a purchase agreement. Formal credit sources were mostly paid by cash with interest (93%).

Unsurprisingly, most of the loans of nonpoor agricultural households had to be paid by cash payment with interest (89%). Especially for formal creditors, the share of cash payment with interest is at 96 percent. Of the informal loans, only 48 percent had to be paid in cash with interest and around 15 percent needed to be paid under a purchase agreement.

5. Amount of largest loan and interest rate among poor and nonpoor agricultural households

In the case of poor borrowing agricultural households whose loan payment term is cash payment with interest (n=137), the average amount of informal credit and formal credit were PHP12,666 (average interest rate: 52.3%) and PHP23,088 (average interest rate: 21.6%), respectively. The median amount of informal credit and formal credit were PHP8,000 (median interest rate: 22%) and PHP14,000 (median interest rate: 18%), respectively. Based on this, it can be observed that the amount of loan from informal credit sources is much lower for poor agricultural households, while the interest rate is higher, when compared to average agricultural households. On the other hand, amount of formal loan and interest rate are smaller for poor agricultural households than average agricultural households.

The average amount borrowed by nonpoor borrowing agricultural households whose loan payment term is cash payment with interest (n=169) from informal and formal credit sources were PHP17,385 (average interest rate: 34.3%) and PHP54,579 (average interest rate: 25.4%), respectively. The median amount of informal credit and formal credit were PHP8,000 (median interest rate: 22%) and PHP20,000 (median interest rate: 18%), respectively. This is consistent with the framework, which predicts that poor agricultural households have smaller cash requirements, compared with the average household.

6. Status of largest credit among poor and nonpoor agricultural households

Forty-eight percent of those poor agricultural households who borrowed from informal sources (n=44) have already paid their loans in full. Others have started paying the amortization (20%), have delayed payment (23%), have restructured payment terms (2%) and have not paid any amortization (7%).

In terms of formal loans (n=123), only 18 percent of the poor agricultural households have already paid their loans in full. Many of them have already started paying the amortization (60%). Others have delayed payment (15%), have restructured payment terms (2%) and have not paid any amortization (5%).

It seems that nonpoor agricultural households are having trouble paying their debt from informal sources than those nonpoor agricultural households who got their loans from formal sources. Although, 44% percent of those agricultural households who borrowed from informal sources (n=44) have already paid their loans in full, 30% of them have delayed payment. Others have started paying the amortization (19%), have restructured payment terms (4%) and have not paid any amortization (4%).

In terms of formal loans (n=162), only 16 percent of nonpoor agricultural households have already paid their loans in full. Many of them have already started paying the amortization (70%). Others have delayed payment (10%), have restructured payment terms (2%) and have not paid any amortization (1%).

7. Among poor agricultural households

a. Household size

In terms of household size, borrowing households have more members than nonborrowing households (see Table 28). After subjecting these variables under a statistical test called t-test⁸, it was found that the difference in the means between nonborrowing and

⁸ Significance level is $\alpha=0.10$

borrowing poor agricultural households in terms of household size is significant (see Annex B).

Table 28. Household size by borrowing category among poor agricultural households

	Obs	Mean	Median
Non-Borrowing HH	299	5.04	5
Borrowing HH	167	5.55	5

Source: Author's calculations

b. Dependency Ratio

i. Dependency* ratio based on age of household members

As shown in Table 29, dependency ratio of nonborrowing agricultural households was 0.39, which is higher than 0.38 ratio of borrowing agricultural households. Based on the t-test results, it was found that the difference in the means between poor nonborrowing and borrowing agricultural households in terms of dependency ratio is not significant.

Table 29. Dependency ratio by borrowing category among poor agricultural households

Poor agricultural HHs	Obs	Mean	Median
Non-Borrowing HH	299	0.39	0.4
Borrowing HH	167	0.38	0.4

Note:

1) Dependents are those HH members whose ages are below 15 and above 64;

2) All credit sources considered

ii. Dependency based on working status of household members

If dependency ratio based on the working status of household members is to be analyzed, the difference in means is very small (0.001) (See Table 30). Based on t-test results, this mean difference between poor nonborrowing and borrowing agricultural households is not significant.

Table 30. Nonworking dependency* Ratio by borrowing category among poor agricultural households

Poor agricultural HHs	Obs	Mean	Median
Non-Borrowing HH	299	0.554	0.6
Borrowing HH	167	0.551	0.6

Note:

1) Nonworking HH members over total number of HH members;

2) All credit sources considered

c. House Characteristics

i. Type of Building/House

Comparing poor nonborrowing and borrowing agricultural households based on their house type, no significant difference can be observed based on mere count and percentages (see Table 31). Based on Chi-square test, it was found that these variables are independent, thus no significant relationship was detected.

Table 31. Type of Building/House by borrowing category among poor agricultural households

	Nonborrowing		Borrowing	
	Frequency	%	Frequency	%
Single house	294	98.33	166	99.40
Duplex	4	1.34	1	0.60
Commercial/industrial/agricultural building	1	0.33		0.00
Total	299	100.00	167	100.00

Source: Author's calculations

ii. Type of Roof

Unlike the housing type above, the distribution of households by type of roof between poor nonborrowing and borrowing agricultural households appears to be different (See Table 32). Many of the nonborrowing agricultural households (15%) have "Half galvanized iron and half concrete" as roof material, compared with only 2 percent among borrowing agricultural households for the same roof material type. Chi-square test results show that indeed, the type of roof and borrowing category have a significant relationship.

Table 32. Type of Roof by borrowing category among poor agricultural households

Poor agricultural HHs	Nonborrowing		Borrowing	
	Frequency	%	Frequency	%
Galvanized Iron/Aluminum	230	76.92	151	90.42
Concrete/Clay Tile		0.00	1	0.60
Half Galvanized Iron and Half Concrete	44	14.72	3	1.80
Bamboo/Cogon/Nipa/Anahaw	19	6.35	10	5.99
Asbestos	1	0.33		0.00
Makeshift/Salvaged/Improvised materials	5	1.67	2	1.20
Total	299	100.00	167	100.00

Source: Author's calculations

iii. Type of Outer Wall

The distribution by type of outer wall between poor nonborrowing and borrowing agricultural households also appears different as observed in Table 33. Many of the nonborrowing agricultural households (22%) have “Bamboo/Sawali/Cogon/Nipa” as outer wall material, compared with only 13 percent among borrowing agricultural households for the same outer wall material type. Chi-square test results show that indeed, the type of outer wall and borrowing category have a significant relationship.

Table 33. Type of Outer Wall by borrowing category among poor agricultural households

	Nonborrowing		Borrowing	
	Frequency	%	Frequency	%
Concrete/Brick/Stone	58	19.40	26	15.57
Wood	89	29.77	71	42.51
Half concrete/brick/stone and Half wood	84	28.09	46	27.54
Galvanized Iron/Aluminum	2	0.67		0.00
Bamboo/Sawali/Cogon/Nipa	65	21.74	21	12.57
Makeshift/Salvaged/Improvised Materials	1	0.33	1	0.60
Others		0.00	2	1.20
Total	299	100.00	167	100.00

Source: Author's calculations

iv. Tenure status of house

In terms of tenure status of housing, most of the borrowing agricultural households (65%) own their house and lot, while the share for the same category is only 56 percent among nonborrowing agricultural households. Many of the nonborrowing agricultural households (35%) have “Own house, rent-free lot with consent of owner” as tenure status, compared with only 28 percent among borrowing agricultural households for the same tenure type (see Table 24). Chi-square test results show that tenure status of house and borrowing category do not have a significant relationship.

Table 34. Tenure Status by borrowing category among poor agricultural households

	Nonborrowing		Borrowing	
	Frequency	%	Frequency	%
Own or owner-like possession of house	167	55.85	109	65.27
Rent house or room including lot	2	0.67	1	0.60
Own house, rent lot	5	1.67	2	1.20
Own house, rent-free lot with consent of owner	105	35.12	46	27.54

Own house, rent-free lot without consent	7	2.34	4	2.40
Rent-free house and lot with consent	13	4.35	5	2.99
		100.0		100.0
Total	299	0	167	0

Source: Author's calculations

d. Household access to water and sanitation

i. Source of water supply for drinking and for cooking

In terms of drinking water, the top source is “Own use faucet, community water system” for poor borrowing agricultural households, while the top source for poor nonborrowing agricultural households is “Shared faucet, community water system” (see Table 35). More than a quarter of poor borrowing agricultural households get their drinking water from “Water refilling station”, while the share of this category among poor nonborrowing agricultural households is only 16 percent. Based on Chi-square test results, the source of drinking water and borrowing category have a significant relationship.

For both poor nonborrowing and borrowing agricultural households, the top source of water for cooking is still “Own use faucet, community water system” (see Table 36). A big chunk of poor borrowing agricultural households use “Shared faucet, community water system” and “Unprotected well” for cooking, with 20 percent and 13 percent, respectively. Poor nonborrowing agricultural household's top two source is “Shared faucet, community water system” with a 33 percent share. The relationship between source of water for cooking and borrowing category is significant based on Chi-square test.

Table 35. Source of Water Supply for Drinking by borrowing category among poor agricultural households

	Nonborrowing		Borrowing	
	Frequency	%	Frequency	%
Own use faucet, community water system	92	30.77	44	26.35
Shared faucet, community water system	93	31.10	35	20.96
Own use tubed/piped deep well	5	1.67	2	1.20
Shared tubed/piped deep well	7	2.34	2	1.20
Tubed/piped shallow well	3	1.00	1	0.60
Protected well	13	4.35	9	5.39
Unprotected well	4	1.34	7	4.19
Protected spring	29	9.70	15	8.98

Unprotected spring	5	1.67	4	2.40
Rainwater	1	0.33	4	2.40
Surface water (river, dam, lake, pond,		0.00		0.00
Peddler		0.00	1	0.60
Water refilling station	47	15.72	43	25.75
Total	299	100.00	167	100.00

Source: Author's calculations

Table 36. Source of Water Supply for Cooking by borrowing category among poor agricultural households

	Nonborrowing		Borrowing	
	Frequency	%	Frequency	%
Own use faucet, community water system	107	35.8	55	32.9
Shared faucet, community water system	98	32.8	33	19.8
Own use tubed/piped deep well	8	2.7	1	0.6
Shared tubed/piped deep well	9	3.0	4	2.4
Tubed/piped shallow well	4	1.3	2	1.2
Protected well	17	5.7	16	9.6
Unprotected well	16	5.4	22	13.2
Protected spring	28	9.4	17	10.2
Unprotected spring	6	2.0	5	3.0
Rainwater	2	0.7	3	1.8
Surface water (river, dam, lake, pond,	2	0.7	8	4.8
Peddler		0.0	1	0.6
Water refilling station	2	0.7		0.0
Others		0.0		0.0
Total	299	100.0	167	100.0

Source: Author's calculations

ii. Toilet Facility

With regard to toilet facility, around than 80 percent of the poor borrowing agricultural households answered that they have “Flush or Pour Flush Toilet: Flush to septic tank” type of toilet, while only 66 percent of poor nonborrowing agricultural households have access to this type of toilet facility (See Table 37)). With the apparent difference in distribution across types of toilet facility, Chi-square test results confirm this observation that toilet facility and borrowing category have a significant relationship.

Table 37. Toilet facility by borrowing category among poor agricultural households

	Nonborrowing		Borrowing	
	Frequency	%	Frequency	%
Flush or Pour Flush Toilet: Flush to piped to sewer	10	3.34	4	2.12
		65.5		
Flush or Pour Flush Toilet: Flush to septic tank	196	5	152	80.42
		24.4		
Flush or Pour Flush Toilet: Flush to pit latrine	73	1	29	15.34
Flush or Pour Flush Toilet: Flush to open drain	1	0.33	1	0.53
Pit latrine: Pit latrine and slab	17	5.69	2	1.06
Pit latrine: Pit latrine without slab/open		0.00		0.00
Composting toilet	1	0.33		0.00
No facility/bush/field	1	0.33	1	0.53
		100.		
Total	299	0	189	100.0

Source: Author's calculations

e. Agricultural performance of poor agricultural households

Total net income from agricultural activities is higher for poor borrowing agricultural households than for poor nonborrowing agricultural households by PHP14,109, on average. The difference in average net income from agriculture between nonborrowing and borrowing is significant based on t-test results.

For formal credit, the difference is smaller at PHP10,577 and is no longer significant. One possible explanation for this is the fact that the poor badly need cash and so the source, whether from formal or informal credit, does not matter that much. What matters to them is the fact that they are able to meet their need for sufficient pool of cash.

VII. Results validation: Comparison with related studies⁹

How do ARBO agricultural households (in Project ConVERGE Baseline Study sites) fare against average ARB households (in terms of poverty incidence and access to credit)? Poverty incidence among Project ConVERGE Baseline Survey respondents is 50.8 percent. Earlier figures on poverty incidence among ARB households were 46 percent and 45 percent in 2000 and 2006, respectively (Philippine Statistical Research and Training Institute [PSRTI] 2015). The high poverty incidence implies the continuing relevance of Project ConVERGE in alleviating poverty in project area sites.

In terms of access to credit, PSRTI found that 33 percent and 29 percent of ARBs were able to access **any size of** credit from Cooperatives/farmers Association and

⁹ Caution needs to be taken in comparing the figures computed in this policy paper with other studies. Simple comparison cannot be readily done due to differences arising from differences in definitions and/or reference periods.

from MFIs, respectively. Eleven percent of their sample households (n=857) (both ARB and non-ARB) accessed at least one formal credit. Around 40 percent of those who accessed formal credit have already paid the availed credit.

Project ConVERGE ARBO households who borrowed had more access to MFIs (37%) than Cooperatives/Farmers Organization (25%). Twenty-five percent of the sample households (n=1,144) had access to formal credit. Among those who accessed formal credit, 20 percent reported that they have already paid their loan in full.

Among all largest loans borrowed by Project ConVERGE agricultural households, 80 percent came from formal credit sources. It was observed that among temporary crop households, their top credit source is Cooperatives/Farmers Association, while permanent crop households' top credit source is MFIs.

How do ARBO agricultural households (in Project ConVERGE Baseline Study sites) fare against average small farmers and fisherfolks (in terms of access to credit)? In the study of Cuevas and Sumalde (2015), small farmers and fisherfolks were said to have a borrowing incidence of 80 percent, while the share of borrowing ARBO agricultural households in the Project ConVERGE Baseline Study is only around 39 percent (See Table 38).

Table 38. Borrowing incidence comparing the DA-ACPC study and Project ConVERGE Baseline Study

Borrowing Incidence	Nonborrowing	Borrowing	Borrowing Incidence (%)
DA-ACPC Study*	127	519	80.34
Project ConVERGE Baseline Study	560	356	38.86

Note: *Refers to Cuevas and Sumalde (2015).

Further inspection on the data revealed that most of the loans referred to in Cuevas and Sumalde (2015) were coming from informal sources of credit. On Table 39, it is shown that 81 percent of those small farmers and fisherfolks borrowed from informal sources, while it was only 20 percent for ARBO agricultural households.

Table 39. Source of loan comparing the DA-ACPC study and Project ConVERGE Baseline Study

Source of Loan	No. of borrowers			
	DA-ACPC study*		Project ConVERGE Baseline	
	Freq.	%	Freq.	%
Informal Sources	421	81.12	71	19.94
Formal Sources	98	18.88	285	80.06
Total	519	100.00	356	100.00

Note: *Refers to Cuevas and Sumalde (2015).

Therefore, after recomputing the borrowing incidence to include formal borrowing only, small farmers and fisherfolks appear to borrow less than ARBO agricultural

households, which is at 15 percent and 31 percent, respectively (See Table 40). The sample data in this paper seems not representative of the average small farmer in the country; this fact will have policy implications, discussed below.

Table 40. Recomputed borrowing incidence comparing the DA-ACPC study and Project ConVERGE Baseline Study

Source of Loan	Non-borrowing	Borrowing	Total	Borrowing Incidence (%)	Formal borrowing	Formal Borrowing Incidence (%)
DA-ACPC Study*	127	519	646	80.34	98	15.17
Project ConVERGE Baseline Study	560	356	916	38.86	285	31.11

Note: *Refers to Cuevas and Sumalde (2015).

VIII. Summary

Policymakers and donors have long viewed credit programs as salient means to develop the agriculture sector, especially the small-farm agriculture. Credit programs in the country have evolved from subsidized directed credit programs to a more market-based approach. There is a vast literature looking at different credit programs for smallholders. They mainly present the eligibility of borrowers, purpose of the loans, terms and conditions, program performance, and capacity-building component (if any). Such studies often evaluate program effectiveness only based on borrowing incidence (that is whether or not number of borrowers over the total target population increased).

There have been little to no studies that examine poor agricultural producers' access to credit and how it affects agricultural performance in the context of Agrarian Reform Beneficiary Organization (ARBO) members. ARBO members could be agrarian reform beneficiaries (ARBs), farmer beneficiaries, and other rural workers. By being part of a farmer's organization or cooperative, individual farmers and other workers are able to access government programs and also private sector-led initiatives, such as agricultural workshops and trainings, input and technological support, market linkage, and credit facilitation, among others.

This study utilized primary data (Baseline Survey of Project ConVERGE) to analyze the borrowing incidence among ARBO households, agricultural households (further grouped by main commodity and poverty level). Based on the data, out of 1,144 households, there are 428 households who were able to access any credit during the reference period. Most of the ARBO household borrowers (37%) got loans from Microfinance Institutions (MFIs), while around 25 percent sourced their loans from Cooperatives/Farmers Association. Thirteen percent accessed private/commercial bank loans. A third of the ARBO households were able to access formal credit.

Agricultural households comprise 80 percent (or 916 households) of the sample. In terms of poverty status, the author used Philippine Statistics Authority (PSA)'s

Family Income and Expenditure Survey (FIES) 2018 poverty thresholds to classify whether a household is poor or not. Of the 916 agricultural households, around 51 percent were classified as poor households. Based on the results presented in previous section, **borrowing agricultural households have greater number of household members, and have better roof and outer wall materials, tenure of housing, and toilet facility.** Surprisingly, nonborrowing households have better access to safer water sources.

Among those ARBO households who borrowed (from any credit source), the top credit source of their largest credit is MFIs (37%). Seventy-nine percent of the loans borrowed by respondents came from formal creditors. In terms of the location of creditors, among agricultural households, 58 percent of informal creditors are located within the barangay. Formal creditors are located farther (39 % within the barangay, 40% outside the barangay, but within the municipality/city, and 20% outside the municipality/city but still within the province).

Households whose main commodity was a temporary crop borrowed their largest credit from Cooperatives/Farmers Association more than MFIs. The opposite is true among households whose main commodity was a permanent crop.

Even poor ARBO households were able to access formal credit (from Cooperatives/Farmers Association and MFIs). The borrowing incidence in terms of formal credit and any credit are 27 percent and 37 percent, respectively. Among the poor agricultural households who borrowed (n=167), the main sources of largest credit were MFIs (33%) and Cooperatives/Farmers Association (27%). This implies that poor households were able to borrow their largest loan from formal credit (74%). Only 26 percent sourced their credit from informal sources (e.g. family and friends). The average amount of the largest credit borrowed by poor households from formal sources was PHP 23,964.

CLOA-holding ARBO agricultural households have higher borrowing incidence than the average ARBO agricultural households. Focusing on borrowing households (who are CLOA holders) (n=81), most of them were able to borrow from formal credit sources (89%), this is much higher than the average for the whole sample, which is at 79 percent. Out of 81, 35.8 percent borrowed from Cooperatives/Farmers Association, while 30 percent and 17 percent borrowed from MFIs and private/commercial bank, respectively.

Borrowing ARBO agricultural households earned higher net income from agricultural activities than nonborrowing ARBO agricultural households. It appears from the results of the study that borrowing households are better off than nonborrowing households, in terms of housing characteristics and in terms of agricultural performance indicator (i.e. net income from agriculture). Net income from agriculture of borrowing agricultural households is significantly greater than nonborrowing agricultural households, with difference of PHP14,666. The difference is slightly smaller, but still significant, among poor agricultural households at PHP14,109.

Using a stricter definition of borrowing (i.e. borrowing from formal credit), the difference in net income from agriculture between borrowing and nonborrowing agricultural households is much greater than the figure above and still significant, which is at PHP24,721. Among poor agricultural households, the difference between borrowing and nonborrowing is smaller, which is at PHP10,577 but no longer significant.

In terms of formal credit, the borrowing incidence of ARBO members (using 2019 data) is higher than borrowing incidence of smallholder farmers and fisherfolks (using 2015 data). It seems that membership to ARBOs improves small farmers' access to formal credit. ARBOs, just like other cooperatives, could be effective conduits of credit in rural areas. Strengthening the capacity of these credit retailers through trainings, especially in leadership and credit management, is needed to further improve the lending performance.

IX. Policy implications and directions for further research

1. Based on comparisons with the average small farmer and fisherfolk, being a member of an ARBO implies better access to formal credit. Policies directed toward organizing farmers may help in increasing their access to formal credit.
2. Individual CLOA households tend to have higher formal loan borrowing incidence than households without owned agricultural land. The study found a significant relationship between (formal) borrowing status and holding of an individual CLOA. On the other hand, no significant relationship between (formal) borrowing status and holding of a collective CLOA was found. With this finding, it seems that the acceleration of the parcelization of collective CLOA households could also contribute to the enhancement of borrowing incidence among farmers.
3. Echoing Geron, Llanto and Badiola's (2016) policy recommendations, the government should look into ways of reducing 1) the cost of lending (such as through the use of farmer cooperatives/associations as conduits and use of mobile technology/digital finance); and 2) the risks related to small farmer lending (such as through the strengthening of market linkage of farmer producer organizations, fast-tracking of the payout of crop insurance claims, and instituting mechanisms for the provision of guarantee for cooperatives).

With the availability of time series data on credit access and agricultural performance among ARBO households, a causal relationship could be explored and established. Future data collection activities should include the following information:

- Reasons for nonborrowing (to establish the need for cash)
- Availability of liquid assets
- Crop insurance
- Cash vs. noncash costs should be disaggregated
- Other variables measuring the risk profile of borrowers
- Barangay-level or municipal-level information on availability of credit supply (both from formal and informal sources).

X. References

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XI. Annex A. Results of Chi-square Test (Any loan borrowed)

		Pearson chi ²	Agricultural HHs		Pearson chi ²	Poor agricultural HHs	
			Probability	If alpha=0.10		Probability	If alpha=0.10
Borrow dummy	Type of Building/House	3.707	0.157	no relationship	1.116	0.572	no relationship
Borrow dummy	Type of Roof	31.738	0.000	significant rel	22.652	0.000	significant rel
Borrow dummy	Type of Outer Wall	24.936	0.000	significant rel	15.704	0.015	significant rel
Borrow dummy	Tenure Status of House	9.546	0.089	significant rel	4.179	0.524	no relationship
Borrow dummy	Source of water for drinking	30.602	0.002	significant rel	21.728	0.027	significant rel
Borrow dummy	Source of water for cooking	57.495	0.000	significant rel	32.774	0.001	significant rel
Borrow dummy	Toilet Facility	22.018	0.003	significant rel	18.831	0.004	significant rel
Borrow dummy	Ownership of other residential, commercial, aside from the one presently occupied	1.948	0.163	no relationship	2.915	0.088	significant rel
Borrow dummy	Main commodity	37.378	0.000	significant rel	22.330	0.004	significant rel
Borrow dummy	Ownership of at least one agricultural land	0.083	0.773	no relationship	0.022	0.882	no relationship
Borrow dummy	Ownership of individual CLOA	4.609	0.032	significant rel	0.885	0.347	no relationship
Borrow dummy	Ownership of collective CLOA	0.347	0.556	no relationship	1.328	0.249	no relationship
Borrow dummy	Ownership of any CLOA	4.394	0.036	significant rel	1.706	0.192	no relationship
Borrow dummy	Proxy for liquid asset: Receivables (e.g. dividend, interest, rent)	0.0169	0.896	no relationship	0.204	0.652	no relationship

Note: Chi-square test is a test of independence between categorical variables. Borrow dummy takes a value of 1 if the household borrowed a loan in 2019, while the value is 0 if the household did not borrow a loan.

XII. Annex B. Results of t-Test (Any loan borrowed)

		Mean (Nonborrowing HH)- Mean(Borrowing HH)	t value	Pr(T < t)	Significance of the difference between the means
Land area	Agri HHs	-0.20	-1.18	0.12	Not significant
	Poor Agri HHs	-0.41	-2.27	0.01	Significant
	Agri HHs with at least one agri land owned	-0.32	-1.52	0.07	Significant
	Poor Agri HHs with at least one agri land owned	-0.63	-2.87	0.00	Significant
HH size	Agri HHs	-0.37	-2.29	0.01	Significant
	Poor Agri HHs	-0.51	-2.32	0.01	Significant
Dependency ratio	Agri HHs	0.02	1.39	0.92	Not significant
	Poor Agri HHs	0.02	0.69	0.75	Not significant
Nonworking dependency ratio	Agri HHs	-0.00	-0.82	0.21	Not significant
	Poor Agri HHs	0.00	0.17	0.57	Not significant
Total Net Income from Agri	Agri HHs	-14,665.98	-1.30	0.10	Significant
	Poor Agri HHs	-14,109.22	-1.29	0.10	Significant
Total Gross Income	Agri HHs	-36,593.00	-1.22	0.11	Not significant
	Poor Agri HHs	-11,469.61	-0.47	0.32	Not significant
Total Net Income	Agri HHs	-45,992.77	-2.56	0.01	Significant
	Poor Agri HHs	-21,069.61	-1.98	0.02	Significant

Note: Alpha=0.10

XIII. Annex C. Results of Chi-square Test (Formal loan borrowed)

		Agricultural HHs			Poor Agricultural HHs		
		Pearson chi ²	Probability	If alpha=0.10	Pearson chi ²	Probability	If alpha=0.10
Formal dummy	Type of Building/House	3.837	0.147	No relationship	0.468	0.791	No relationship
Formal dummy	Type of Roof	19.028	0.002	Significant rel	13.835	0.017	Significant rel
Formal dummy	Type of Outer Wall	20.673	0.002	Significant rel	13.525	0.035	Significant rel
Formal dummy	Tenure Status of House	13.479	0.019	Significant rel	8.448	0.133	No relationship
Formal dummy	Source of water for drinking	23.732	0.022	Significant rel	17.889	0.084	Significant rel
Formal dummy	Source of water for cooking	49.657	0.000	Significant rel	29.061	0.004	Significant rel
Formal dummy	Toilet Facility	16.290	0.023	Significant rel	12.567	0.050	Significant rel
Formal dummy	Ownership of other residential, commercial, aside from the one presently occupied	1.228	0.268	No relationship	2.754	0.097	Significant rel
Formal dummy	Main commodity	21.287	0.011	Significant rel	14.570	0.068	Significant rel
Formal dummy	Ownership of at least one agricultural land	0.302	0.583	No relationship	0.184	0.668	No relationship
Formal dummy	Ownership of individual CLOA	7.287	0.007	Significant rel	4.538	0.033	Significant rel
Formal dummy	Ownership of collective CLOA	2.274	0.132	No relationship	3.068	0.080	Significant rel
Formal dummy	Ownership of any CLOA	9.364	0.002	Significant rel	7.021	0.008	Significant rel
Formal dummy	Proxy for liquid asset: Receivables (e.g. dividend, interest, rent)	2.1086	0.146	No relationship	1.8452	0.174	No relationship

Note: Chi-square test is a test of independence between categorical variables. Borrow dummy takes a value of 1 if the household borrowed a loan in 2019, while the value is 0 if the household did not borrow a loan.

XIV. Annex D. Results of t-Test (Formal loan borrowed)

		Mean (Nonborrowing HH)- Mean(Borrowing HH)	t value	Pr(T < t)	Significance of the difference between the means
Land area	Agri HHs	-0.26	-1.43	0.08	Significant
	Poor Agri HHs	-0.37	-1.85	0.03	Significant
	Agri HHs with at least one agri land owned	-0.41	-1.86	0.03	Significant
	Poor Agri HHs with at least one agri land owned	-0.48	-2.04	0.02	Significant
HH size	Agri HHs	-0.43	-2.52	0.01	Significant
	Poor Agri HHs	-0.67	-2.80	0.00	Significant
Dependency ratio	Agri HHs	4.29	2.33	0.02	Significant
	Poor Agri HHs	2.72	1.03	0.30	Not significant
Nonworking dependency ratio	Agri HHs	-0.36	-0.22	0.41	Not significant
	Poor Agri HHs	0.21	0.09	0.93	Not significant
Total Net Income from Agri	Agri HHs	-24,721.01	-2.09	0.02	Significant
	Poor Agri HHs	-10,577.40	-0.89	0.19	Not significant
Total Gross Income	Agri HHs	-73,872.96	-2.37	0.01	Significant
	Poor Agri HHs	-16,740.33	-0.64	0.26	Not significant
Total Net Income	Agri HHs	-75,833.63	-4.03	0.00	Significant
	Poor Agri HHs	-21,875.91	-1.89	0.03	Significant

Note: Alpha=0.10

