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Abstract

The Mexican Ministry of Agriculture provides lending institutions outlooks for respective crops grown in the country. This study sought to assist in determining Mexican banks' perceptions of the relative advantage, compatibility, complexity, trialability, and observability of agricultural information from the Ministry to aid in distributing loans to farmers. Fourteen (N = 14) agricultural loan officers from Mexican banks were interviewed to meet the study's objectives. The majority of participants believed the Ministry's information had a relative advantage over other sources. Complexity was the primary barrier for lending institutions not adopting the Ministry's information. Providing the information more quickly, improved communication between both entities, and using social media were recommendations lending institutions provided the Ministry for increasing the rate of adoption of their information. Expanding the timeframe under which lending institutions receive commodity analyses from the Ministry may increase the amount of accessible finance to Mexican farmers

Keywords

Diffusion of Innovations, Mexican Banks, Ministries of Agriculture, Loan Distribution to Farmers

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Improving Loan Distribution to Farmers: Informational Needs of Mexican Banks

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Abstract

The Mexican Ministry of Agriculture provides lending institutions outlooks for respective crops grown in the country. This study sought to assist in determining Mexican banks' perceptions of the relative advantage, compatibility, complexity, trialability, and observability of agricultural information from the Ministry to aid in distributing loans to farmers. Fourteen (N = 14) agricultural loan officers from Mexican banks were interviewed to meet the study's objectives. The majority of participants believed the Ministry's information had a relative advantage over other sources. Complexity was the primary barrier for lending institutions not adopting the Ministry's information. Providing the information more quickly, improved communication between both entities, and using social media were recommendations lending institutions provided the Ministry for increasing the rate of adoption of their information. Expanding the timeframe under which lending institutions receive commodity analyses from the Ministry may increase the amount of accessible finance to Mexican farmers.

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Introduction

Finance is the most significant constraint to growth for entrepreneurs across the globe (de Mel, McKenzie, & Woodruff, 2011). Individuals in developing countries encounter a high level of difficulty and barriers in accessing finance (Schultz, 2009). Lending institutions have the ability to improve the lives of farmers throughout the world (Yasmeen & Sarwar, 2011). Financial credit plays a critical role in assisting agricultural production in developing and developed countries (Mohan, 2006).

The International Monetary Fund (2011) indicated Mexico is not classified as a developing country, but over forty-five percent of country's population lives in poverty. Mexico has the 12th largest economy in the world (USAID, 2012) and the 2nd largest economy in Latin America (The World Bank, 2012). Teichman (2008) indicated The World Bank's primary goal in Mexico is to reduce poverty. Banks can assist in decreasing the poverty rate among Mexicans by accelerating the loan appraisal process for entrepreneurs (Copestake, 2007). Paxton (2006) suggested Mexican banks should strive to decrease poverty and improve rural areas. Farming the local community is one approach rural Mexicans can use to overcome poverty (Tetreault, 2010). Mexican banks should more efficiently expedite loans to farmers in order to improve food production in local communities (Lustig, 2001).

The Mexican Ministry of Agriculture works to provide the national marketplace with high-quality food from the country's farms (SAGARPA, 2011). Increased participation in processing, supplying and marketing agricultural products in Mexico could lead to more income and enhance the standard of living for rural citizens (Zertuche Guerra & Eaton, 2000). The Mexican Ministry of Agriculture supplies

agricultural statistics to lending institutions with the intent of assisting farmers acquire loans. Mexican banks need accurate agricultural statistics, in a timely manner, in order to identify the correct amount of finances needed for distribution to individual farmers (P. Brown, personal communication, August 10, 2011). The Ministry of Agriculture should work closely with Mexican banks in order to foster improved agricultural development throughout the country (Teichman, 2008).

Credit is essential for small farmers in Mexico to manage their production processes (Chang, 2009). Tetreault (2010) reported the lack of accessible credit for farmers is a problem in Mexico. There are specific agricultural lands in Mexico now utilized for nonagricultural use due to a lack of credit available to farmers (David, Dirven, & Vogelgesang, 2000).

Farmers required loans from Mexican lending institutions in order to purchase the appropriate machinery to harvest large acres of sugarcane (Arjona, Bueno, & Salazar, 2001). John Deere Capital Corporation, located in the United States, was the largest provider of farm machinery leases in Mexico (Nair & Kloeppinger-Todd, 2006). Gravel (2007) found that Mexican farmers did not receive loans from lending institutions in a timely manner in order to purchase seed, fertilizer, and equipment to plant crops.

Agricultural and extension education researchers have conducted studies associated with the role of banks and available credit for farmers across the globe. Dlamini, Masuku, and Dlamini (2008) suggested more robust banks are needed to serve small businesses in Swaziland. In a study with Honduran rural banks and farmers, Hernández and Place (2000) found the cooperation between rural banks and farmers was successful due to a climate of collaboration, ownership, and dedication

among the banks' stakeholders. Mudukuti and Miller (2002) reported information about credit was an educational need of female farmers in Zimbabwe. Credit was a constraint for farmers' adoption of hybrid rice seed in the Philippines (Cidro & Radhakrishna, 2007) and home gardening practices in Swaziland (Dlamini, Simelane, Keregero, & Dlamini, 2006). Access to credit is a problem many Afghan farmers face (Kock & Turnbull, 2011). This study was conducted to gain an understanding of Mexican lending institutions' awareness and usage of the Ministry of Agriculture's statistics in determining and disseminating loans to farmers.

Theoretical Framework and Literature Review

Rogers' (2003) diffusion of innovations was implemented to frame this study. Rogers (2003) defined rate of adoption as the relative speed an innovation is accepted by associates of the respective social system. The evolution in which an innovation is communicated across specified channels over time among members of a social structure is the diffusion of innovations (Rogers, 2003).

Rogers (2003) constructed a five-stage model to illustrate the innovation-decision process. Persuasion, the second stage, is when a decision-making entity develops a positive or negative perception toward the innovation. Aligned with the persuasion stage, Rogers (2003) identified five perceived attributes of an innovation, which aid in determining an innovation's rate of adoption: (a) relative advantage, (b) compatibility, (c) complexity, (d) trialability, and (e) observability.

Relative advantage refers to the extent to which an innovation is perceived as more advantageous than the previous method (Rogers, 2003). Economics and social status are examples of motivations

that may influence an innovation's relative advantage. Individuals want to learn why a specific innovation is better than what currently exists. Relative advantage is the one of the most robust predictors of an innovation's rate of adoption (Rogers, 2003).

Compatibility is the extent to which an innovation is consistent with existing values and needs of budding adopters (Rogers, 2003). An innovation's compatibility produces familiarity toward the innovation for the potential adopter. Rogers (2003) suggested individuals will not adopt an innovation unless the innovation is familiar. The more compatible an innovation is perceived to be, the higher the likelihood of adoption because the innovation is less of a change in behavior than the previous approach (Rogers, 2003).

Complexity is the extent to which an innovation is perceived as difficult to comprehend and implement (Rogers, 2003). The complexity of an innovation is negatively correlated with rate of adoption. Rogers (2003) indicated complexity is the strongest barrier to an innovation's rate of adoption.

Trialability is the extent to which an innovation may be experimented with for a limited time (Rogers, 2003). Innovations that can be tested more easily have a higher rate of adoption. Rogers (2003) found early adopters perceive trialability as more important than late adopters. Individual trials assist potential adopters in learning how an innovation works through their respective environment (Rogers, 2003).

Observability is the extent to which outcomes of an innovation are observable to others (Rogers, 2003). Certain innovations are easier to observe than others. An innovation that is highly observable is more likely to be adopted than an innovation not easily observed from potential adopters (Rogers, 2003).

The diffusion of innovations has been used in international agricultural and extension education studies to identify an innovation's rate of adoption. Moriba, Kandeh, and Edwards (2011) used the diffusion of innovations to frame their study of technologies for farmers in Sierra Leone. Erbaugh, Donnermeyer, Amujal, and Kidoido (2010) implemented the diffusion of innovations as the theoretical framework for assessing IPM farmer adoption in Uganda. The diffusion of innovations was also used to frame a study on agricultural innovations in Guatemala (Oleas, Dooley, Shinn, & Giusti, 2010). Harder and Lindner (2008) incorporated the diffusion of innovations to scaffold a study of United States extension agents' acceptance of eXtension. The diffusion of innovations was also used as the theoretical framework in a study of Chinese agricultural faculty perceptions of web-based distance education (Li & Lindner, 2007).

Purpose and Objectives

The purpose of this study was to assess the dissemination of information from the Mexican Ministry of Agriculture's agricultural statistics division to lending institutions in order to more efficiently distribute loans to farmers for local food production. More specifically, this study sought to:

1. Describe lending institutions' perceived persuasion attributes of the Ministry of Agriculture's information; and
2. Describe lending institutions' recommendations to the Ministry of Agriculture for increasing the rate of adoption of the agricultural statistical information.

Methodology

This was a descriptive study of the fourteen ($N = 14$) agricultural loan administrators at Mexican lending

institutions that loan currency to farmers. A fundamental qualitative research design (Dooley, 2007) was employed for this study. The agricultural loan administrator at each respective Mexican lending institution was purposively selected in order to meet the objectives of this study. Purposeful sampling allows the researcher to magnify the function of data attained from the context (Lincoln & Guba, 1985). The Ministry of Agriculture provided the names and contact information for each of the agricultural loan administrators. Each of the fourteen lending institutions offered credit for farmers to produce crops and livestock.

A semi-structured interview guide was utilized with participants to answer the study's objectives. Denzin and Lincoln (2008) indicated a semi-structured interview guide provides the researcher the opportunity to ask questions related to the study's objectives while simultaneously allowing respondents to share data that may uncover facets the researcher has yet to consider. Semi-structured interviews provide the researcher more flexibility than a structured interview guide (Lincoln & Guba, 1985). Each of the fourteen participants spoke fluent English. The interviews lasted approximately forty-five to sixty minutes and were conducted between June and November 2011. Interviews took place via Skype™ with the researcher and each individual agricultural loan administrator. The researcher utilized audio recorders and handwritten notes to record the interview data.

The dataset from interviews and observations was triangulated to achieve trustworthiness (Lincoln & Guba, 1985). Trustworthiness is the degree of confidence that the results represent the respondents and context of a study (Dooley, 2007). Lincoln and Guba (1985) reported that the generalizability, credibility, dependability, transferability, and confirmability of a

dataset to the context of the study and the population produce the study's trustworthiness. The data was triangulated from each of the fourteen participant interviews and member checks with each participant in order to attain trustworthiness. Denzin and Lincoln (2008) indicated triangulation and member checks are approaches to achieve trustworthiness.

Member checks are an approach to review the data received and obtain participants' agreement of the data (Denzin & Lincoln, 2008). The researcher implemented member checks as each participant was emailed a transcription of their remarks for confirmation. All participants ($N = 14$) in the study emailed their confirmation of the data they individually supplied before the researcher analyzed the data.

The researcher implemented an audit trail to consolidate, connect, and identify meaningful themes in the dataset. Denzin and Lincoln (2008) defined an audit trail as a series of records acquired in the data collection process. The development and inclusion of an audit trail improves the trustworthiness of a dataset in qualitative research (Merriam, 2009). Lincoln and Guba (1985) reported that an audit trail organizes, links, and prioritizes the data. Dooley (2007) indicated audio recordings, videotapes, field notes, and survey results are potential records that can be included in an audit trail. Electronically recorded data and field notes made up the audit trail in this study.

The data was analyzed through the implementation of the constant comparative method. Glaser (2002) identified the constant comparative method as a qualitative data analysis approach to discern units of data that create categories for postulated themes. Selective coding is routinely used in the constant comparative method to identify core categories in a dataset (Walker & Myrick, 2006). Glaser

(2002) identified selective coding as the procedure for choosing the dominant category and authenticating its relationship to existing categories. Similar results and common themes were discovered from selective coding with the constant comparative method.

The results should not be generalized to Ministries of Agriculture and lending institutions in other countries due to the qualitative nature of this study. However, the results do provide insights on methods to more efficiently disseminate information to Mexican banks.

Results

Key findings emerged from the interviews with agricultural loan administrators at Mexican banks. The results were categorized based upon the study's objectives. Findings from the first objective were illustrated per each phase of Roger's (2003) persuasion stage. Results from the second objective were communicated per the predominant lending institution's recommendations for increasing the rate of adoption of the Ministry's information.

The first objective was to describe lending institutions' perceived Rogers' (2003) persuasion attributes of the Ministry of Agriculture's information. The majority of agricultural loan administrators believed information from the Ministry of Agriculture provided a relative advantage over other sources of agricultural information. Nine ($N = 9$) of the fourteen agricultural loan administrators participating in this study perceived information from the Ministry of Agriculture as advantageous and, therefore, used the information to distribute loans to farmers. The process of distributing loans and repayment is vital to Mexican banks (R13). One participant (R11) stated, "We believe the Ministry's information is the most accurate source we have to determine future market value of

agricultural commodities.” Some participants (R2, R7, R9) indicated no other Mexican agency or organization had the immediate agricultural statistical information that the Ministry possessed. One agricultural loan administrator (R1) detailed further, “The loan process can be stressful for everyone involved, and the Ministry’s price outlooks are the best, if not only, avenue to help us determine if a farmer can repay our loan.”

Compatibility was found to be a contributor in the rate of adoption of the Ministry’s information. Eight ($n = 8$) participants felt the Ministry’s information was compatible with the immediate needs of their lending institution. R7 stated, “We need to understand the information we are given in an expeditious manner. The Ministry has provided us that.” Two participants (R1, R12) believed the Ministry met their needs by providing information related to crop forecasts. Several responses were centered on familiarity with the Ministry’s information, meeting the compatibility aspect of adoption. Three ($n = 3$) participants cited familiarity as the primary reason they adopted the Ministry’s information to aid in assessing loans to farmers (R3, R10, R14). R3 added, “I am accustomed to receiving information from the Ministry and reading their information to help me make a quick verdict toward a potential loan is something I routinely do.”

Complexity with the Ministry of Agriculture’s information led to some lending institutions ($N = 4$) not adopting specific pieces of information. Four agricultural loan administrators (R4, R5, R6, R8) did not use the agricultural information from the Ministry of Agriculture because it was too difficult to comprehend for their loan inquiry processes. R4 stated, “The Ministry sends us too much information, pages and pages, to sort through for us to find fast answers to our questions. When we

need to know what maize will sell for in six months, I don’t need to read about squash to get it.” R8 added, “We don’t use their information a lot because it is difficult to understand.” R6 said, “The information is hard to find and difficult to understand.” R5 stated, “I think the Ministry probably has credible information but the information we receive is too challenging for us to practically use to evaluate loan applications.”

All ($N = 14$) participants believed the Ministry’s statistical information offered trialability. Each of the agricultural loan administrators reported at least one experience in which they used the Ministry’s information to assist in their loan process. R9 added, “I really appreciate that the Ministry sends us a commodity analysis report each Friday. Whether we use it or not, it is available.” Respondents echoed similar beliefs. R5 stated, “As the loan administrator, I don’t have time to harass the Ministry of Agriculture for information because it is routinely available.” R10 added, “It seems we always have the Ministry’s price outlooks for crops in the office.” The gratitude for the Ministry’s price outlooks or commodity analysis was revealed in some interviews (R2, R7, R14).

Observability was the last Roger’s (2003) persuasion attribute examined in this study. Six ($N = 6$) agricultural loan administrators observed the rate of adoption of the Ministry’s information based upon loans repayment. R3 indicated if farmers were able to repay the loan, then the Ministry’s information had a part to play in that success. Farmers repaying loans within the agreed timeframe was the measure of observability (R3, R8, R10, R12). Some participants (R5, R11) verbalized the difficulty of solely observing the Ministry’s information and determining success. R11 stated, “We are talking about growing food

and Mother Nature has a greater influence on success than statistical information.”

The second objective of the study was to describe lending institutions' recommendations for increasing the rate of adoption of the Ministry of Agriculture's statistical information. Twelve ($N = 12$) of the fourteen agricultural loan administrators wanted specific commodity price analysis information at least two weeks before processing loans related to that commodity. Processing and distributing farm loans were a judicious process (R3, R5, R6, R12, R13). R7 added, “It may take us at least a two weeks to gather the information we think we need before making the decision to approve a farm loan.” R12 included, “Depending on the loan application, the research process can be intense or reasonably simple. I would like the commodity's forecast on my desk 10 days before I we review a potential agricultural loan.” One participant (R1) stated, “Farm loans have a poorer history of being repaid than other commercial loans. If I could receive the Ministry's commodity forecasts two weeks before crop planting, we could make a better evaluation of which applicants could repay us.” R9 added, “We work to get everything right. I would like an analysis of a commodity no later than two weeks before the prospective planting dates. This would help us make a better informed judgment and to distribute the loan expediently.” R10 summarized the findings from this theme, “We want farmers to receive loans they can repay. We need specified crop forecasts two weeks ahead of the loan decision date in order to thoroughly review the crop analysis and the farmer's potential to repay the loan.”

The complexity of the Ministry's information led to another area of need, in some cases. Ten ($N = 10$) agricultural loan administrators recommended establishing a stronger communicable relationship with personnel in the Ministry of Agriculture's

agricultural statistics division. R3 stated, “We have difficulty contacting the Ministry sometimes. Even though their information can be challenging to understand if we had someone to talk directly to, when we had questions, it would help us.” R9 added, “If I have questions about some of the Ministry's statistics, I need a point person to contact.” R8 included, “I need a person to talk to when I have questions. Right now, I am not sure who that would be.” Banks may use the Ministry's statistics more if they had someone to directly solicit their questions (R2, R7).

Other participants described how better communication would benefit their lending institution and the Ministry of Agriculture (R4, R13). R14 cited, “All banks need to make money and Mexico needs to feed itself. Stronger communications between us and the Ministry of Agriculture would accomplish multiple goals.” R5 added, “Improved communications would help us distribute loans for efficiently and help the Ministry meet their goals.” A further recommendation to improve communications was provided. R4 included, “I am not sure how many staff the Ministry of Agriculture has. If one Ministry professional were assigned to assist four to five banks, maybe communication between both partners.”

As mentioned previously, some participants were grateful to the Ministry for providing their agricultural information. Some respondents believed the newsletters they received included too much information (R5, R8). Seven ($N = 7$) or half of the lending institutions, however, suggested Facebook or other social media platforms as a means of disseminating information or providing a direct link to the information once available. R1 added, “Our bank has a Facebook page that we use to inform customers about new products and services. The Ministry can include a link to

specific commodity information on their Facebook page to share with us.” R9 stated, “Twitter and Facebook are everyday tools to share small amounts of information. Price outlooks on individual commodities could be tweeted or posted on the Ministry of Agriculture’s Facebook. Their information is public and Facebook would make it more public.” R12 added, “Our bank receives Twitter updates on costs for construction material and energy. This leads me to believe that outlooks for particular crops could be tweeted too.” R5 provided a synopsis of the social media theme, “I like to receive information from social media outlets because it is usually concise and explicit. When we need the forecast for a commodity, we need it in a concise and explicit manner.”

Conclusions

Most lending institutions perceived the Ministry’s agricultural information as a relative advantage over other sources of information. Even though all lending institutions received statistical information from the Ministry regularly, the complexity of the Ministry’s information was a barrier for some lending institutions adopting the information. Approximately 86% of the agricultural loan administrators needed individual commodity price forecasts no less than 30 business days before the growing season began for that respective crop. The majority of agricultural loan administrators wanted better communications between the Mexican Ministry of Agriculture and their lending institution. Using social media was recommended by half the participants as a resource to assist the Ministry in disseminating future agricultural statistics information.

Implications

Results from this study build upon Rogers’ (2003) research on rate of adoption

within his diffusion of innovations. Economics were one factor Rogers (2003) cited that will improve an innovation’s relative advantage. Most participants wanted the Ministry’s information at least two weeks before approving an agricultural loan. Adopting this recommendation would provide the Ministry’s agricultural information with an amplified relative advantage over other sources for commodity price analyses. Rogers (2003) indicated innovations with a relative advantage over other sources have a higher rate of adoption among constituents.

Over 50% of the participants believed the Ministry’s information was compatible to their lending institution’s important needs. Rogers (2003) found that the more an innovation is compatible with the existing needs of a potential adopter, the more likely the innovation will be adopted. Some participants felt very familiar with the Ministry’s commodity forecasts. The majority of participants wanted better communication between their lending institution and the Ministry of Agriculture. The potential for improved communication between both entities could increase the compatibility of the Ministry’s information. Groups and individuals will not adopt an innovation without being familiar with the respective innovation (Rogers, 2003).

The complexity of the Ministry’s information was a barrier causing some lending institutions not to adopt the information. Complexity is the most robust barrier for potential adopters (Rogers, 2003). The difficulty understanding the Ministry’s information was reported as influencing complexity and, thus, prohibiting adoption. Implementing social media was revealed as an approach that may decrease complexity. Social media may provide the Ministry a tool to better disseminate their statistics and lending institutions an avenue to review succinct commodity information.

Decreasing the complexity of an innovation will increase the likelihood of the innovation's adoption (Rogers, 2003).

The results indicated that most participants believed the Ministry's information offered trialability. Rogers (2003) identified trialability as the capacity to test an innovation. All participants were provided opportunities to use and experiment with the Ministry's commodity forecasts. Innovations that provide the potential to be used have a higher rate of adoption versus innovations that do not allow for trialability (Rogers, 2003).

Observability was the most challenging persuasion attribute to evaluate. Rogers (2003) suggested particular innovations are less difficult to observe than others. The difficulties for agricultural loan administrators to observe commodity forecasts were apparent from the context of this study and the results provided.

Recommendations

Respective individuals within the Mexican Ministry of Agriculture's Statistics Division should be identified as points of contact for lending institutions. The Ministry of Agriculture should develop a comprehension of each respective lending institution's agricultural loan processing schedule in order to disseminate information more efficiently and, potentially, assist in improving the lives of farmers (Yasmeen & Sarwar, 2011). Ministry officials should work with lending institutions to ensure commodity forecasts and other agricultural statistics is not complex enough to prohibit adoption of the information.

Facebook, Twitter, or other social media tools should be used by the Ministry to disseminate agricultural information to lending institutions. Utilizing social media may assist the Mexican Ministry of Agriculture provide commodity analyses quicker to lending institutions (Copestake,

2007) to accelerate loans for improving food production in communities (Lustig, 2001). Improving the timeframe under which Mexican lending institutions receive commodity analyses from the Ministry may increase the accessible credit to Mexican farmers, as identified by Tetreault (2010).

Results from this study indicate the issues associated with distributing loans to farmers are not solely an educational issue but in addition communication issues. Agricultural and extension education researchers may need to engage agricultural communication researchers to assist in examining the role of social media in agricultural loan distribution. Incorporating social media may prove to accelerate the dissemination of the Ministry's statistics to lending institutions and, thus, broaden the academic knowledge of information dissemination tools that aid in the development of agricultural production.

Further research is needed to examine how Ministries of Agriculture, Extension Services, agricultural education institutions, and non-governmental organizations can collaborate with lending institutions to help ensure farmers receive loans in a timely manner. Agricultural and extension education researchers offer the expertise and connection in examining the dissemination of information from Ministries of Agriculture and other groups to agricultural lending institutions. This holistic collaboration may help in ensuring farmers receive funds to purchase resources in a judicious manner, as recommended by Gravel (2007). Investigating each feature of the loan distribution process may present methods to assist farmers in acquiring loans faster in order to produce food for local communities.

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