



**Millennium Challenge Account of Mongolia (MCA-M) Urban
Property Rights Project (PRP)**

**Baseline Report for the Special Hashaa
Plot Survey**

Prepared by:

Innovations for Poverty Action

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List of Acronyms

Acronym	Definition
BZ	Bayanzurkh District
CH	Chingeltei District
CORS	Continually Operating Reference Station
GASR	General Authority on State Registration
GIS	Geographic Information System
GPS	Global Positioning System
IPA	Innovations for Poverty Action
LLC	Limited Liability Company
MCA	Millennium Challenge Account - Mongolia
MCC	Millennium Challenge Corporation
MCDS	Mongolian Center for Development Studies
MNT	Mongolian Tugrik (Currency)
NBFI	Non-Banking Financial Institution
NGO	Non-governmental Organization
NLIS	National Land Information System
PIU	MCA-M Project Implementation Unit
PRP	MCA-M Urban Property Rights Project
RCT	Randomized Control Trial
SCC	Savings and Credit Cooperative
SHPS	Special Hashaa Plot Survey
SKH	Songinokhairkhan District
USD	United States Dollar (Currency)

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I. Executive Summary

The Millennium Challenge Corporation (MCC) funded the Urban Property Rights Project (PRP) to increase the privatization and registration of land in urban areas. This baseline report for the Millennium Challenge Account-Mongolia (MCA-M) has two primary objectives:

1. To describe the data collection instrument and data collection processes associated with the Special Hashaa¹ Plot Survey (SHPS).
2. To summarize the first wave of data collected through the survey.

A. Project Background

In recent years, large numbers of rural Mongolians have migrated to Mongolia's urban centers, primarily its three biggest cities – Ulaanbaatar, Erdenet and Darkhan – where they tend to settle in underdeveloped urban areas known as ger districts.² The majority of these migrants occupy plots of land (called hashaas) for long periods of time, typically erecting fences to mark off the plots and lay claim to them. Only in the last 10 years, however, has there been a formal mechanism by which migrants could obtain legally recognized rights to the land they occupy. Nevertheless, the current complexity of registering land and the associated expenses make it difficult for many citizens to obtain formal private titles.

The MCA-M PRP aims to improve the efficiency and transparency of the formal system for privatizing and registering land rights in Mongolia and thereby provide all Mongolians with greater access to private land titles. Project funding will support the following two activities:

1. Improvement of the land privatization and registration system by:
 - a. Establishing a commission of stakeholders and technical experts to make recommendations on how to decrease legal and institutional barriers;
 - b. Upgrading the geospatial infrastructure used by Mongolian government agencies to survey and manage land;
 - c. Capacity-building for land offices; and,
 - d. Refurbishing the State Registry's central office space and establishing new offices in four districts of Ulaanbaatar, as well as eight regional centers around the country.
2. Privatization and registration of ger³ area land plots by providing direct assistance to citizens who wish to privatize their land plots in low and middle income ger district areas.

The SHPS Baseline Report describes data that was collected in conjunction with an experimental evaluation of the second activity related to privatizing and registering land plots in ger areas.

¹ A hashaa plot is a small area of land in the city with a fence around it and is roughly 665 m² in size.

² A comparison of these three cities can be found in Appendix C.

³ A ger is a circular tent of felt on a collapsible framework, which is used by nomads in Mongolia. However, today they can be found in and around urban centers in low income areas.

B. Study Design

In order to best detect the effects of the registration outreach efforts associated with the registration assistance project, the evaluation uses a randomized controlled design. Khesegs, the equivalent of a neighborhood, were randomly selected to be targeted by the project in three districts of Ulaanbaatar, and in the cities of Darkhan and Erdenet. The random selection of khesegs ensures that there is a group of households (the “control group”) that is similar to the households that receive project assistance (the “treatment group”) in every respect, except for the project assistance. It allows the evaluation to assess the project’s contribution to key outcomes while controlling for outside factors. This randomization process took place after the SHPS baseline survey was completed.

For the endline estimation strategy, this design will also allow us to achieve two objectives. First, it will allow us to observe changes in outcomes for both the treatment and control group during the period between the baseline and endline surveys, which are scheduled to occur before and after the implementation of formalization activities associated with the PRP, respectively. Second, it will allow us to compare these changes between treatment and control groups, which will give an estimate of the causal effect of the registration assistance.

C. Sampling Strategy and Data Collection

The sampling strategy parallels the randomization strategy by stratifying by khesegs. GIS data on all hashaa plots in the ger areas of the relevant districts of Ulaanbaatar (Bayanzurkh, Chingeltei, and Songinokhairkhan) and in Darkhan and Erdenet, were obtained from the PRP Implementation Unit (PIU). The ownership status of many of these plots was recorded in this GIS data set, though the ownership status information was known to be out of date and inaccurate. Once the GIS and administrative cadastral datasets⁴ were integrated, the number of program-eligible plots⁵ per kheseg unit was calculated. Plots listed as “fully registered”⁶ in the GIS data were not included in this calculation since they would not be eligible for project assistance. The number of plots to be sampled from each kheseg was determined by multiplying the proportion of all eligible plots that resided in that kheseg by 8000, the targeted survey sample size. After the sample size for each kheseg was determined, that same number of plots was randomly selected from the list of plots in each kheseg to be administered the survey.

After the SHPS questionnaire was developed, the survey contractor, MEC and Mongolian Center for Development Studies (MCDS), selected by MCA-M began administering the questionnaire to

⁴ Administrative cadastral datasets is a comprehensive register of the real property boundaries of a country.

⁵ Criteria to be program-eligible (1) the plot should be located in an area where it is eligible for privatization; (2) the plot should be properly measured with no boundary disputes ; (3) the owner of the plot should be decided; and (4) the plot shouldn’t be located in an area considered as utility corridors.

⁶ Fully registered refers to plots which have an ownership certificate, meaning they have registered for the land they are residing on.

the households residing on and/or owning the plots in the survey sample. Baseline data collection began in December of 2011 and was completed in all areas on August 13, 2012.⁷

D. Summary of Baseline Data

This section provides a brief tabulation of the collected data to demonstrate the information available from the survey.

1. Economic Status and Activities of the Household

The majority of household heads were married males with an average age of 45 and average household size of 4 members. Household heads looked similar across the five geographic areas included in the study (the three districts of Ulaanbaatar -- Chingeltei district, Bayanzurkh district, and Songinokhairkhan district -- and the cities of Darkhan and Erdenet). Overall average household income was 8.3 million MNT annually (6,000 USD)⁸, while the three districts in Ulaanbaatar had an average household income of 8.7 million MNT and Darkhan and Erdenet had an average household income of 7.4 million MNT. The average expenditure for households was 9.5 million MNT (6,714 USD) in the last year across all areas.⁹ It should be noted that these income numbers were all self-reported.

Overall, 16 percent of all respondent households were engaged in some form of business¹⁰. Darkhan had the highest rate of business activity, with approximately 30 percent of respondent households engaged in business. The three districts in Ulaanbaatar had the lowest rate of business activity, though higher average profit per business. This is most likely the result of the higher population density in Ulaanbaatar than Darkhan and Erdenet.

2. Land Investment Activity

Across the five areas of interest, 21 percent of respondent households knew someone on their street who attempted to sell their hashaa plot over the last year. The overall average number of sold hashaa plots on a respondent's street was 0.3 plots. This number was very similar for all five areas of interest.

Investment rates across the five areas varied substantially but followed no particular pattern. Overall, households invested on average 514,000 MNT on land in the last five years and 4.7

⁷ The initial SHPS effort had to be cancelled after several weeks of data collection due to unforeseen delays in project implementation. The scope of the project was subsequently adjusted and the project implementation areas shifted. The scope of the project was reduced from covering all districts in Ulaanbaatar to covering the 3 largest districts, Bayanzurkh, Chingeltei, and Songinokhairkhan. Data collection resumed once again in December of 2011 in Darkhan and Erdenet. Data has since been collected in Darkhan, Erdenet, and Chingeltei as well as Bayanzurkh districts of the capital city. The data collection was supposed to be completed in June of 2011. But due to the high dropout rate (large number of targeted plots were empty, refused to be interviewed or absent) it was decided to target additional 400 plots for successful interview. MEC carried out the data collection with additional funding and it was concluded in August of 2012.

⁸ Currency conversion 1415 MNT = 1 USD (January 2012).

⁹ One explanation for why households on average spent more than they made could be that expenditure numbers are typically more inflated than income numbers. This is because household income tends to be more stable and better documented than household expenditure, which can be erratic and seasonal.

¹⁰ Business types varied, examples are: auto shop, hairdressers, grocery, craftsmen, transportation, seller, and sewing.

million MNT on structures¹¹ in the last year. Households in Bayanzurkh district had the highest average level of investment in land¹² over the last five years, while Erdenet had the highest average level of investment in structures over the last five year.

There was a clearer pattern when it came to loan disbursement amongst the five areas with an overall rate of 44 percent of respondent households obtaining at least one loan in the last five years. Darkhan and Erdenet had a higher proportion of households which had procured a loan than the three districts in Ulaanbaatar. However, the types and sources of loans, and the types of collateral backing the loans were quite similar across all locations, such as using their hashaa land and contracts¹³ as collateral.

3. Land Registration Activities

The overall average price for a hashaa plot was 20.1 million MNT (14,200 USD). Hashaa plots in the three Ulaanbaatar districts were worth significantly more than those in Darkhan and Erdenet, which had an average of 9.6 million MNT. However, the largest hashaa plots on average were located in Darkhan and Erdenet at 969 m² and 839 m², respectively. Plots of land in the three Ulaanbaatar districts measured on average less than 660 m². This is the result of the Mongolian Law on Allocation of Land to Mongolian Citizens for Ownership, which limits the amount of land that Ulaanbaatar residents can receive free from the government to no more than 700 m².

Overall, 16 percent of properties had completed no steps of the registration process, while 37 percent of properties in the sample were partially registered¹⁴ and 31 percent were fully registered. The project was targeting any households that had not been fully registered yet, meaning all households other than the 31 percent that were fully registered. The most common type of ownership status was an ownership certificate (overall 31%). This proportion was particularly high in Darkhan (59%) and Erdenet (50%). The Ulaanbaatar districts had a much more even distribution across the four options¹⁵ than Darkhan and Erdenet. The four types of certificates are described in Table ES 1 below.

Table ES 1. Description of Certificates

Certificates	Description
Certificate of Possession:	When a resident holds certificate of possession he or she has the right to use or possess the land. But the land is still state-owned.
Governor's Decision but no Ownership Certificate :	A letter from the governor in the specific district proving that the holder has the right to own the land. However, this is not an official title until they register at GASR and obtain an ownership certificate.
Ownership Certificate	A certificate proving that the holder has the right to own the land.
Property Registration Certificate:	A certificate proving that the holder owns immovable property on the land.

¹¹ Structures could be the households' home, shack/shed, or any other structures they have on their property.

¹² Investment in land refers to land maintenance and investing in land infrastructure, including fencing.

¹³ Contracts could have been either assets backed by financial securities or that the respondent household had someone outside the household to co-sign the loan, acting as the guarantor.

¹⁴ Partially registered refers to plots which have a certificate of possession or governors decisions, meaning they have the right to use the land they are residing on, however, they do not own the land.

¹⁵ (1) Occupy, but no Certificate, (2) Certificate of Possession, (3) Household with Governor's Decision but no Ownership Certificate, and (4) Ownership Certificate.

On average, households with an ownership certificate in the sample spent 91,800 MNT and less than 14 days obtaining their ownership certificate. Households in the three Ulaanbaatar districts spent considerably more time and money on average obtaining an ownership certificate than in Darkhan or Erdenet. In Ulaanbaatar, the average money spent on obtaining an ownership certificate was 103,000 MNT while in Darkhan and Erdenet it was roughly 64,000 MNT. For time spent obtaining the ownership certificate, 30 percent of households in the Ulaanbaatar districts spent beyond the legal time obtaining the certificate, while less than 21 percent of households did the same in Darkhan and Erdenet.

E. Conclusion and Next Steps

Despite several logistical challenges, the SHPS baselines survey was successfully completed. Overall, the survey contractor was able to collect data on 5,844 respondents, and the data include extensive information on many characteristics of responding households. This data should be of great use to other researchers and officials interested in issues related to property ownership in the ger districts. In addition, the data was used to assess the efficacy of the randomization used as the basis of the randomized control trial (RCT), and the results suggest that the randomization did successfully create similar treatment and control groups of households. The studies next steps are demonstrated in Table ES 2 below. The current primary activity is the actual registration assistance process which should continue through July 2013. Once this process is complete, IPA will conduct a follow-up survey.

Table ES 2. Timeline for Formalization Activities and SHPS Data Collection¹⁶

Time	Activities	Status
December-11	Baseline Data Collection Begins	Completed
March-12	Darkhan and Erdenet Formalization Activities Begins	Completed
August-12	Baseline Data Collection Ends	Completed
September-12	Ulaanbaatar Formalization Activities Begins	Completed
November-12	Darkhan and Erdenet Formalization Activities Ends	Completed
August-13	Ulaanbaatar Formalization Activities Ends	In Progress
June-14	SHPS Follow-up Data Collection Begins	Has Not Started
September-14	SHPS Follow-up Data Collection Ends	Has Not Started

¹⁶ The five locations (Bayanzurkh district, Chingeltei district, and Songinokhairkhan district, Darkhan, and Erdenet) were each broken down into three packages with the goal of the contractor being that they completed one package approximately every three months.

I. Introduction

In recent years, large numbers of rural Mongolians have migrated to Mongolia's urban centers, primarily its three biggest cities – Ulaanbaatar, Erdenet and Darkhan – where they tend to settle in underdeveloped urban areas known as ger districts.¹⁷ The majority of these migrants occupy plots of land (called hashaas) for long periods of time, typically erecting fences to mark off the plots and lay claim to them. Only in the last 10 years, however, has there been a formal mechanism by which migrants could obtain legally recognized rights to the land they occupy. Nevertheless, the current complexity of registering land and the associated expenses make it difficult for many citizens to obtain formal private titles.

In response to this, the government of Mongolia, together with the Millennium Challenge Account-Mongolia (MCA-M) and the Millennium Challenge Corporation (MCC) is implementing a property rights project (PRP) to improve the ability of Mongolians to obtain formal land titles. In addition to improving the formal systems associated with the process of registering land rights, MCC is providing direct support to privatize and register untitled plots of land in urban areas of Mongolia. The original target was providing land titles to approximately 53,000 untitled hashaa plots. However, this actual number will be much smaller as the result of there being fewer untitled plots to register as expected and a decision being made not to title any plots that had boundary disputes. The new estimated number is 20,000. This support, referred to as formalization activities, include direct assistance with the paperwork and processes associated with titling, as well as financial support for the registration costs.

To assess the effects of the registration support program, MCC contracted Innovations for Poverty Action (IPA) to design and conduct an impact evaluation. The goal of the evaluation is to estimate the social and economic impacts of providing property titles through the assistance program within a context of stronger property rights institutions. In consultation with project implementers and stakeholders, the evaluation was designed as a randomized controlled trial (RCT). Data for the evaluation is being collected in a household-level survey, called the Special Hashaa Plot Survey (SHPS), in three waves between 2011 and 2015.

This report summarizes the collection and results of the first wave of data collection from 2011-2012, which serves as a baseline survey for the RCT. The survey collects detailed information on plot- and household-level outcomes, including land ownership status, property values, investment, access to financial services, and land transactions. In what follows, we provide a detailed description of the data collection activities, provide an overall summary of the collected data, and then use that data to provide an initial assessment of the strength of the current evaluation design. This is a rich data set which while collected for the evaluation, could be of great use to other researchers and officials interested in information about property rights in Mongolia.

The report is organized as follows. Section II provides a brief description of the project as well as an overview of the registration process. Section III describes the sampling strategy and data

¹⁷ A comparison of these three cities can be found in Appendix C.

collection activities. A summary of the data collected is found in Section IV. Section V looks at the treatment and control groups to see if randomization was successfully accomplished. Section VI summarizes the report's conclusions and the study's next steps. The appendix, which contains the data collection instruments as well as other important documents, is found in Section VIII.

II. Project Background

A. Overview of Project Components and Activities

The MCA-M PRP aims to improve the efficiency of the formal system for privatizing and registering land rights in Mongolia, thereby allowing lower-income Mongolians easier access to fully marketable private land titles.

Under the PRP, the MCC funding addresses this issue in several ways. First, the formal system of land privatization and registration will be improved. Second, citizens will receive direct assistance in privatizing and registering their land. Specifically, funds will be utilized for the following two sets of activities:

1. Improving the formal system of land privatization and registration:¹⁸
 - a. Establishing a commission of stakeholders and technical experts to: 1) identify obstacles to Mongolian citizens' ability to privatize and register land efficiently and cost effectively; 2) make recommendations on how to reduce such obstacles; and 3) work with government agencies to implement these recommendations.
 - b. Upgrading the geospatial infrastructure used by Mongolian government agencies, including the provision of Continually Operating Reference Stations (CORS) and Global Positioning System (GPS) equipment to regional land offices, and training in the use of each. Create a centralized electronic registration system that is accessible from any registration office in Mongolia.
 - c. Capacity building for land offices, including the creation of land market specialist positions to help citizens resolve issues related to land privatization and the training of land office staff in land law and the use of satellite imagery.
 - d. Upgrading the physical infrastructure of state registry offices, including improvements to the State Registry's Central Office space, the establishment of new offices in four districts of Ulaanbaatar (UB) and upgrades for state registry offices in eight regional centers around the country.
2. Privatizing and registering land plots in urban squatter communities called ger areas:
 - a. Providing direct assistance to 53,000¹⁹ low and middle income households in completing the steps to privatize and register rights for land plots in nine different locations; three districts in Ulaanbaatar and the eight regional centers around the country [City of Erdenet (Orkhon aimag); City of Darkhan (Darkhan-Uul aimag);

¹⁸ As noted above, this activity is not covered by this baseline survey.

¹⁹ As noted in the Introduction Section, this target number of 53,000 will not be able to be reached as the result of having higher registration rates than anticipated and the decision not to register disputed plots. As a result the new estimate is 20,000.

City of Arvaikheer (Uvurkhangai aimag); City of Uliastai (Zavkhan aimag); City of Khovd (Khovd aimag); City of Zuunmod (Tuv aimag); City of Undurkhaan (Khentii aimag); and City of Choibalsan (Dornod aimag)].

The overall PRP logic framework can be found in Appendix D at the end of this report. The SHPS Baseline Report focuses solely on examining the effects of the second activity related to privatizing and registering land plots in ger areas.

B. Registration Support Program

1. Formal Registration Process²⁰

The support program is designed to assist households in completing the registration process. Without external support, citizens that want to obtain the land privatization and registration certificates for the first time have to go through three different stages. The first stage is to obtain a possession certificate from land office, which requires citizens to submit an application with supporting documentation. The second stage of privatization is to obtain a district governor's decision/ ownership approval. At this stage, the hashaa plot cadastral map boundaries are also entered into the cadastral database. Finally, the citizen can obtain an ownership certificate processed by the General Authority for State Registry (GASR). This requires submission of an application letter with all of the other documents from the earlier stages of the process. The details of each of the three steps are described below:

a. Possession certificate from land office

Under the law, aimag²¹ governors have the legal authority to transfer ownership of a parcel of land to a citizen through the privatization process. A citizen who wishes to privatize must submit an Application for Land Privatization to the governor's office through the corresponding land office. This is a request for ownership of a certain land plot along with a cadastral map of the specific land plot to insure that the hashaa plot requested is within the allowed size limit.²² The following documents must be attached to the application:

- Cadastral map of hashaa plot.
- Notarized copy of citizen ID card or birth's certificate of the applicant that confirms the Mongolian citizenship.
- Reference letter from bagh²³/khoroo²⁴ governor, which confirms that the applicant resides in the bagh/khoroo.
- Original Land Possession Certificate and Contract of Land Possession, if the applicant currently possesses a land plot in accordance with the Land Law. The

²⁰ Information comes from: Terms of Reference for Privatization and Registration of Hashaa Plots in Ulaanbaatar

²¹ Aimags are the Mongolian equivalent of provinces or states.

²² The maximum size of land that will be privatized to citizen once free of charge is 700 m² for Ulaanbaatar, 3500 m² for aimag centers and 5000 m² for soum centers according to the law; however, local parliaments approves the size within the limit depending on available land resources.

²³ Bagh is an administrative subdivision in the Mongolian countryside

²⁴ Khoroo is an administrative subdivision of Ulaanbaatar

applicant must have capital city (Ulaanbaatar) resident's registration, if the hashaa plot is located within the boundary of the capital city.

b. District governor's decision/ ownership approval by District governor

The governor reviews the citizen's application and either approves or rejects it. If the governor approves the citizen's request, the governor's decision on privatization is then processed and issued, and the hashaa plot cadastral map showing specific boundaries is entered into the cadastral database. The hashaa plot boundaries are then incorporated into the cadastral database with copies of the following supporting documentation:

- Citizen ID card
- Governor's decision to possess or own the hashaa plot
- Land possession certificate
- Agreement for land possession

c. Registration by GASR /Ownership Certificate

The land office requires an applicant to bring a declaration from the rural land office to show that the applicant does not own any land in the rural provinces. The land office then verifies this through its own registry. Once verified, the Property Rights Registration Department of GASR registers the applicant's plot and issues the final land title certificate. This formally confers ownership rights over the plot to the applicant. To complete this last step the applicant must file a formal letter of application along with the following documentation:

- Copy of Citizen ID card or Birth Certificate
- Assessment report of verification of land quality from land office²⁵
- Cadastral map issued from the National Land Information System (NLIS)²⁶ database, original copy
- Governor's ownership decision
- A registration declaration sheet for the right to own property and to assume the other property rights related to it.

2. Registration Process by Formalization Contractor

Within this structure, contractors were tasked with providing assistance to program-eligible households²⁷ that wished to obtain a private land ownership certificate for their property. Before starting, the contractor verifies that the applicant has not already received assistance registering another plot by inquiring with the land office and the Property Rights Registration department. If the individual has already received assistance, the consultant excludes the individual's plot from

²⁵ The land office provides free of charge.

²⁶ The NLIS is a centralized computer network system that is composed of servers located at the ALACGaC Headquarter.

²⁷ Criteria to be program-eligible (1) the plot should be located in an area where it is eligible for privatization; (2) the plot should be properly measured with no boundary disputes ; (3) the owner of the plot should be decided; and (4) the plot shouldn't be located in an area considered as utility corridors.

the project activity. For those individuals that had not already received assistance, the contractor then determines how far they have proceeded through the registration process on their own. The applicant then proceeds through all of the previous steps in the same process, except that the contractor takes responsibility for obtaining the required documents from the respective government offices and all application fees for the household are waived. The contractor's activities are also facilitated by specialized procedures for interacting with the each government office. Once the process is complete, the contractor collects the ownership certificate from the State Registration office and presents it to the household.

C. Overview of the Research Design

The evaluation designed by IPA will assess the effects of the registration outreach efforts. The project is a randomized control trial (RCT) in which a subset of eligible households is randomly chosen to be offered the registration assistance. Because receipt of the program is random, the only differences between those household receiving the offer and those who do not should be the receipt of the registration assistance offer. In other words, on average, these two groups should be similar along all demographic characteristics. This similarity in all other characteristics then allows the attribution of any differences in the households that emerge after receipt of the assistance to the assistance itself. Without the randomization, for example, households would be required to apply for assistance, and as a result, those receiving assistance would likely be much more motivated to register their plots. Later difference between those receiving assistance and those not receiving assistance could then be due either to the registration assistance or to the underlying motivation of the two groups. The random assignment of the assistance eliminates this “selection bias”, and ensures that the two groups are similar except that one group was offered assistance in registration.

The evaluation comprises six steps. First, a sampling strategy is developed and a list of households to be targeted is created. Next, a baseline survey of all target households is conducted to provide an initial assessment of the sample and provide data for the randomization process. Based on this data, households are randomly assigned to either a treatment group, which receives the registration assistance, or a control group, which does not. Once the assistance is assigned, the contractor provides assistance to the indicated households. Then a follow-up survey is conducted after the registration activities to assess any short-term differences between those households that received assistance and those that did not. Lastly, an endline survey will be conducted a year after the follow up survey to identify longer-term project benefits.

At this point, the baseline survey, which is described in this report, and the randomization, which is described in more detail in Section V.A, has been completed. The registration activities are ongoing. A follow-up survey is planned for the summer of 2014.

III. Sampling Strategy and Data Collection

A. Sampling Strategy

GIS data on all hashaa plots in the ger areas of the relevant districts of the capital (Bayanzurkh, Chingeltei, and Songinokhairkhan districts) and in Darkhan and Erdenet, were obtained from the PRP PIU. This GIS data was constructed using satellite imagery and administrative/cadastral data from various government ministries. The ownership status of many of these plots was recorded in this GIS data set, though the ownership status information was known to be out of

date and inaccurate. The boundaries of administrative units such as city, district, khoroo, and kheseg were also included. IPA processed the GIS data using ArcGIS and Stata computer software.

Once the GIS and administrative cadastral data sets were integrated, sample selection was stratified by kheseg, a geographical unit roughly equivalent to a neighborhood in the United States. First, the number of program-eligible plots per kheseg was calculated. Plots listed as “fully registered”²⁸ in the GIS data were not included in this calculation since they would not be eligible for project assistance. Weights were then calculated for each kheseg unit that measured the proportion of the total number of eligible plots located in this unit. These weights were then multiplied by 8,000, the total number of plots it was deemed desirable and feasible to include in survey activities, to determine the number of plots to be sampled from each kheseg. After the sample size for each kheseg was determined, plots were randomly selected for inclusion in the survey. The target number in each kheseg was then rounded up to the nearest whole plot, yielding a total of 8,540 plots identified for surveying.

B. Data Collection

A survey instrument was developed in the first quarter of 2011. The questionnaire was designed to collect basic socio-economic data and detailed information on the following outcomes:

- Ownership and registration status of hashaa plots
- Cost and time needed to register plots
- Land market transactions including sales, gifts, and secondary transactions
- Access to credit and loans, borrowing behavior, terms of credit
- Access to municipal services (electricity, water, waste disposal, etc.)
- Investment in land, housing, and business
- Future investment plans and attitudes towards investment
- Property values
- Labor market outcomes, including employment status and business investment
- Household income and consumption patterns

The instrument was pilot tested and modified until all researchers involved felt confident that the questions were comprehensive, comprehensible, and were accurately capturing the behaviors of interest. This questionnaire can be found in Appendix A.

C. Completion Rates

In November of 2010, the survey contractor selected by MCA-M began administering the questionnaire to the households residing on and/or owning the plots selected during the sampling process. Due to the anticipated errors in the GIS data mentioned above, not all of the hashaa

²⁸ Fully registered refers to plots which have an ownership certificate, meaning they have registered for the land they are residing on.

plots selected for the SHPS sample were occupied.²⁹ In addition, Mongolian households are extremely mobile. To minimize these challenges, the survey teams were required to make four attempts to locate the hashaa plot to determine the registration status and an additional four attempts to complete the survey questionnaire. These attempts were to be conducted at different times during the day (morning, afternoon, evening) and spread out over at least a two week period with a minimum of three days between visits. Households were also incentivized 1,500 tugriks in mobile phone credits to encourage participation.

Unfortunately, the SHPS had to be suspended after several weeks of data collection due to unforeseen delays in project implementation. The scope of the project was subsequently adjusted and the project implementation areas shifted due to the inflexibility of the data collection contract. The scope of the project was reduced from covering all districts in Ulaanbaatar to covering only the three largest districts, Bayanzurkh, Chingeltei, and Songinokhairkhan. Data collection resumed once again in December of 2011 in Darkhan and Erdenet. Data collection in all areas was completed on August 13, 2012.

Plots found to be unoccupied or to be owned or occupied by a business or state entities were deemed unsuitable for the survey and were dropped from the sample. In situations where the surveyor found multiple resident households and the owner of the property did not reside on the plot, they interviewed the household that had lived there the longest. To do this, the survey team needed to prepare a list of all households that resided on the hashaa plot, including each member of the household, and to record the length of time they had lived on the property. Of the plots in which a household could be contacted, a small number of the occupying or owning households refused to participate in the survey. Table 1 shows the details of the survey attempts. The “Targeted Number” column shows the number of plots that were originally sampled from the GIS data. The “Actual Survey Number” column shows the number of sampled plots whose associated owning and/or residing households were successfully interviewed.

Table 1. Targeted and Actual Sample³⁰

City	District	Targeted Number	Actual Survey Number	Reasons for unsuccessful attempts				Response Rate (%)
				Empty or Unoccupied Hashaa	No One Present at Hashaa	Invalid Plot ¹	Refused	
Ulaanbaatar	SKH	3,734	2,432	833	173	63	233	65.1
Ulaanbaatar	BZ	2,458	1,638	416	161	63	180	66.6
Ulaanbaatar	CH	1,179	883	167	34	14	81	74.9
Erdenet		856	608	89	140	0	19	71.0
Darkhan		325	255	20	35	0	15	78.5
Total		8,552	5,816	1,525	543	140	528	68.0

¹Invalid plots include plots that were double-sampled and those that are owned by companies

²⁹ It was very difficult to locate and interview the households associated with some plots due to their migration patterns and work habits. For this reason, a detailed tracking and interview protocol was developed with the aim of assuring that all plots and household were tracked in a consistent way that would assure a high response rate.

³⁰ Source: "Special Hashaa Plot Survey (SHPS) Project Completion Report for MCA-M and IPA." MEC LLC, and Mongolian Center for Development Studies LLC. N.p., 25 Sept. 2012. 2 Nov. 2012.

The overall target in the five areas was to interview 8,552 households residing in hashaa plots. Of these, 5,816 households completed a full interview, while 528 households refused to participate in the survey and 2,068 plots were unoccupied, had no one present at the time of any of the survey attempts, or were not valid plots for the household survey. Note that there were 5,816 households interviewed, but when the owner of a plot was not a resident; the owner was also interviewed, so some plots are represented by multiple households. The actual number of plots with complete interviews was 5,722. The overall response rate, which is the number of completed interviews divided by the number of eligible reported units in the sample, was 68 percent – on par with other studies that conducted household surveys.

IV. Summary of Baseline Data

A. Economic Status and Activities of the Household

This section examines characteristics of the household heads participating in the study including: basic demographic information, education level, and residential status. These variables are presented by the five areas of interest including the three districts of Ulaanbaatar, Chingeltei district, Bayanzurkh district, and Songinokhairkhan district, as well as the cities of Darkhan and Erdenet.

1. Basic Respondent Characteristics

Table 2 presents basic demographic information of the household heads. The majority of household heads (over 80%) were male. For all five areas of interest, at least 60 percent of household heads were married, while the average age of household heads was 45 years old. The average household size was slightly over four people in all locations. Just over 1 percent of household heads lived at their current hashaa plot since birth. These low numbers are indicative of the very recent rise of the ger districts, which have grown rapidly in the last 12 years.

Table 2. Basic Demographic Information on Heads of Households

	Overall
Female (%)	17.4
Male (%)	82.6
Married (%)	61.6
Lived at Hashaa Since Birth (%)	1.1
Average Age	44.9
Average Household Size	4.2

Table 3 summarizes the education level by percent of household heads in each of the areas of interest. Overall, the education level was about the same across the three districts in Ulaanbaatar and the two cities, with between 15 percent and 20 percent of household heads possessing a diploma or bachelor's degree. Erdenet contained the highest percentage of household heads with a diploma or bachelor degree (31%), while Darkhan had the lowest percentage (10%). However, Darkhan had the second most household heads who had obtained a master's degree or above (0.8%) after Erdenet (1%). Overall, about 43 percent of household heads had completed upper secondary school, while less than 2 percent of household heads had not received any education.

Table 3. Highest Education-Level Achieved by Heads of Households (%)

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Not Educated	2.0	1.0	1.2	2.5	2.4	1.6
Primary School	3.2	3.8	3.8	7.0	4.9	3.9
Compulsory Lower Secondary School	17.3	18.1	19.0	21.0	23.0	18.9
Complete Upper Secondary School	43.0	45.9	45.6	36.6	34.8	43.4
Vocational and Technical Education	6.1	4.4	5.1	13.6	11.4	6.3
Technical Professional School	8.7	8.2	9.3	8.6	10.2	9.0
Diploma and Bachelor	19.2	18.0	15.4	9.9	13.0	16.4
Master and Above	0.5	0.5	0.5	0.8	0.3	0.5
Total (%)	100	100	100	100	100	100

Table 4 summarizes the residential status of the household heads. “Permanent residency” included people who resided for six consecutive months or more in a district or in an administrative unit during the last twelve months. Most heads of households (93%) had been a permanent resident for six months or more. “Temporary Residency” means a person who had multiple administrative residencies and resided up to six months in the different residences. Darkhan had the highest rate of household heads with temporary residency (7%), while Chingeltei district had the lowest rate (2%). “Temporarily Absent” included people who were away from their administrative residence for up to six months or more. Erdenet had the highest rate of temporary absent status, at about 6 percent of households, while Chingeltei district had the lowest rate at about 1 percent. From this information we learn that people living in Darkhan and Erdenet appear to be more mobile than in the Ulaanbaatar districts.

Table 4. Household Head's Residential Status (%)

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Permanent Residency 6 Months or More	94.5	96.3	93.2	88.5	88.9	93.4
Temporary Residency	2.6	2.3	4.5	7.0	5.5	3.8
Temporarily Absent	2.9	1.4	2.3	4.5	5.6	2.8
Total (%)	100	100	100	100	100	100

2. Household Income and Employment

Table 5 summarizes the average household income over the last twelve months. The table is organized by income source across the five areas of interest. The average household income for the three districts in Ulaanbaatar, was around eight million MNT (5653 USD)³¹ and was greater than the average household income in Darkhan and Erdenet, which were both around seven and a half million MNT. These incomes were on average greater than the national yearly income in Mongolia for that time, which was 5.1 million MNT. Most of the income came from job-related activities, accounting for 72 percent of all income. The second highest source of income was from government transfers which made up 25 percent of all income across the five areas of interest. The remaining amount of income came from financial assets (3%).

Table 5. Average Household Income in Last 12 Months

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Job-related Income (% of Total)	71	73	75	65	68	72
Government Transfers (% of Total)	27	23	24	32	28	25
Income from Financial Assets (% of Total)	2	4	1	3	4	3
Total Income from All Sources (1000's of MNT)	7883	8956	8648	7268	7543	8306

³¹ Currency conversion 1415 MNT = 1 USD (January 2012).

Table 6 presents the average number of employed household members by area of interest. On average, 1.6 household members were employed in each of the five areas.

Table 6. Average Number of Household Members Employed

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Average	1.5	1.6	1.6	1.6	1.6	1.6

3. Household Assets

Table 7 summarizes the average number of vehicles owned and their total value per household by area of interest. Overall, households on average owned 0.49 vehicles. The average value of all vehicles per household was between 2.8 million MNT in Darkhan and 4.4 million MNT in Songinokhairkhan district of Ulaanbaatar.

Table 7. Household Vehicle Ownership

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Average Number of Vehicles Owned	0.49	0.47	0.52	0.37	0.41	0.49
Average Value of All Vehicles by HH (1,000 MNT)	3679	3440	4380	2811	2832	3810

Table 8 summarizes the types of livestock owned by each household in each of the five areas of interest. The most abundant type of animal owned on average by households were sheep (2) and goats (1.9). The area of interest with the most sheep was Darkhan, which had on average almost four sheep per household, while the least amount of sheep per household was in Chingeltei district, which had on average less than one sheep per household. The total number of sheep per household had the highest average value in Erdenet (250,000 MNT) and lowest in Chingeltei district (50,000 MNT). The area with the most goats was Darkhan with on average almost four goats, while the least amount of goats was in Chingeltei district with on average less than one goat per household. The total number of goats per household was valued highest in Darkhan (217,000 MNT) and lowest in Chingeltei district (25,000 MNT). Darkhan households also had the most cattle with over one cow per household with an average value of 437,000 MNT. Interestingly though, while Bayanzurkh district had less than one cow per household (0.65 cows), cows were valued higher, with an average value of all cows per household at 457,000 MNT. This meant that even though Darkhan households averaged 0.42 more cows per household, the value of all their cows were 47,000 MNT less than in Bayanzurkh district. This shows that cows in Ulaanbaatar fetch a higher price than cows in Darkhan.

Table 8. Household Livestock Ownership

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Number of Cattle per HH	0.64	0.12	0.49	1.06	0.72	0.53
Average Value of All Cattle per HH (1,000 MNT)	457	55	375	437	410	355
Number of Sheep per HH	2.00	0.75	1.87	3.95	3.64	2.01
Average Value of All Sheep per HH (1,000 MNT)	148	50	171	231	250	158
Number of Goats per HH	2.01	0.67	1.62	3.94	3.31	1.86
Average Value of all Goats per HH(1,000 MNT)	119	25	110	217	170	111
Number of Horses per HH	0.25	0.16	0.27	0.40	0.61	0.29
Average Value of All Horses per HH(1,000 MNT)	164	323	157	141	289	197

Table 9 presents the market value of appliances by the area of interest. Overall, the average value of appliances per household was 1.4 million MNT. Darkhan household's appliances were valued at 1.3 million MNT which was over 100,000 MNT less than the next location.

Table 9. Market Value of Household Appliances Owned (1,000 MNT)

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Average	1,455	1,465	1,422	1,298	1,440	1,434

4. Household Expenditures

Table 10 summarizes the average total amount of money spent by households in the last year across the five areas. Overall, the average expenditures for households were 9.5 million MNT in the last year. Households in Songinokhairkhan district spent the most money in the last year on average (9.7 million MNT or 6,680 USD), while households in Darkhan spent the least amount of money in the last year on average (8 million MNT). In general, Ulaanbaatar households had higher yearly expenditures than households in Darkhan or Erdenet, except for in Chingeltei district.

Table 10. Average Household Expenditure (1,000 MNT)

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Total HH Expenditure in Last Year	9687	8986	9756	8129	9453	9520

Table 11 presents the types of infrastructure that existed in the hashaa plots in each of the five areas of interest. Overall, 97.5 percent of hashaa plots had a pit toilet outside their household structure. In Darkhan and Erdenet, 62 percent and 56 percent of hashaa plots, respectively, had a sewage point,³² as opposed to less than 50 percent average in the three districts of Ulaanbaatar. In Darkhan, only about 25 percent of households had a latrine in the hashaa plot while in the other four areas, more than 40 percent of households used a latrine as the sewage point. Overall, about 85 percent of hashaa plots had their garbage collected by a truck, with the lowest proportion in Darkhan (74%) and the highest in Erdenet (89%). Most households (89%) used regular coal and wood to heat their homes, and most households (about 99%) also had access to a centralized system of electricity in their house. About 67 percent of households used a mobile water distribution³³ as their main drinking water source while 30 percent used a deep well, which means a majority of households get their water from outside their plot. In Darkhan, however, 45 percent of households used a mobile water distribution and 42 percent used a deep well for their drinking water source. Most households (about 96%) used a mobile telephone.

³² Sewage point is a dedicatory sewage point or hole.

³³ Mobile water distribution is a facility that connects to the central water supply system of a ger district in a city or settled areas.

Table 11. Types of Infrastructure (%)^{*}

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Latrine: Pit Toilet outside a Household Structure	97.5	98.5	97.6	93.0	96.9	97.4
Sewage System: Hashaa has Sewage Point	50.0	47.2	49.0	61.5	55.8	50.4
Sewage System: Use Latrine in the Hashaa as Sewage Point	41.2	45.2	42.1	25.0	40.4	41.4
Solid Waste System: Collection by a Garbage Truck	83.1	86.0	85.4	73.8	88.8	84.7
Main Heating System : Regular Coal and Wood Heating	88.3	90.4	87.5	85.6	94.4	88.9
Main Electrical System: Centralized System	98.6	99.1	98.4	99.2	99.5	98.7
Main Drinking Water Source: Mobile Water Distribution	70.5	64.4	67.0	45.1	67.2	66.7
Main Drinking Water Source: Deep Well	28.0	28.2	30.3	42.2	30.7	29.9
Telephone Network: Mobile Telephone	96.5	95.4	95.8	97.1	93.7	95.8

^{*}These are percentages of the most common responses. They will not add up to 100%.

5. Business Activity

Table 12 examines the percentage of households in each area involved in business. In Darkhan, the largest proportion of respondents, 30 percent, were engaged in business.³⁴ The three districts in Ulaanbaatar had the lowest proportion of respondents engaged in business with Bayanzurkh district at 16 percent and Chingeltei and Songinokhairkhan Districts at 14 percent.

Table 12. Household Business Engagement

	BZ	CH	SKH	Darkhan	Erdenet	Total
Percent Engaged in Business (%)	15.7	14.2	14.4	30.3	22.9	16.3

Table 13 shows the average revenue, cost and profit from the last year of business in each of the five areas of interest. In total, 1.9 million MNT was generated in business revenues on average over the last year for each household, with two of the three districts in Ulaanbaatar making on average much more than the businesses in Darkhan and Erdenet. On average, the most revenue per household was generated in Chingeltei district at 2.3 million MNT, while the least was in Darkhan at 1.4 million MNT. In total, the average household accrued total business costs of 837,000 MNT. On average, Songinokhairkhan district had the lowest business cost per household (754,000 MNT), while Darkhan had the highest (936,000 MNT). The businesses in Ulaanbaatar districts had higher level of profits than businesses in Darkhan and Erdenet.

Table 13. Summary Statistics on Average Business Revenue, Costs, and Profit per Household from the Last Year of Business

	BZ	CH	SKH	Darkhan	Erdenet	Total
Average Revenue (1,000 MNT)	2188	2357	1680	1461	1782	1927
Average Costs (1,000 MNT)	879	857	754	936	985	837
Average Profit (1,000 MNT)	1308	1499	926	525	797	1090

³⁴ Business types varied, examples are: auto shop, hairdressers, grocery, craftsmen, transportation, seller, and sewing.

B. Land Investment Activity

This section examines household land investment activities including real estate transactions, savings, loans, and investments, and land disputes across the five areas of interest.

1. Real Estate Transactions

Table 14 outlines the percentage of respondents, by area of interest, who knew someone who tried to sell their hashaa plots on their street. Overall, 21 percent of those surveyed, knew someone on their street who tried to sell their hashaa plot. Darkhan had the highest proportion of respondents (27%) who knew someone on their street that tried to sell their hashaa plot and Chingeltei had the lowest (18%).

Of those respondents who know someone trying to sell on their street, Table 14 also includes the average number of households on their streets who attempted to sell their hashaa plot in the last year. Overall, respondents knew of 0.4 households that attempted to sell their hashaa plot in the last year on their streets. The highest average of households on respondents' streets who attempted to sell their hashaa plot in the last year was in Darkhan and was roughly 0.5 households.

In addition, Table 14 shows the average number of households on the respondents' streets that were successful at selling their hashaa plot in the last year. Overall, on average 0.3 households on the same street as survey respondents successfully sold their hashaa plot in the last year. The largest average of households who successfully sold their hashaa plot was in Darkhan (0.4), while the lowest number was in Chingeltei district (0.25).

Table 14. Real Estate Transactions

	BZ	CH	SKH	Darkhan	Erdenet	Total
Respondents' Who Knew Someone on Their Street Who Tried to Sell a Hashaa Plot						
Percentage	21.7	17.9	21.6	26.9	20.3	21.1
Households on a Respondents' Street Who Attempted to Sell Their Hashaa Plot during the Last Year						
Average	0.41	0.33	0.40	0.53	0.35	0.39
Households on Respondents Street Who Sold Their Hashaa Plot during the Last Year						
Average	0.33	0.25	0.31	0.43	0.29	0.31

2. Investments, Loans and Savings

Table 15 demonstrates the average amount households invested in their hashaa plot over the last five years for land and structures. Households in the Bayanzurkh district invested the most in land (792,000 MNT), while households in Chingeltei district invested the least (276,000 MNT). Darkhan, Erdenet and Songinokhairkhan district had approximately similar average land investments (around 400,000 MNT). The average investment in structures was lowest in Darkhan (3.4 million MNT) with Chingeltei district a distant second lowest (4 million MNT). Erdenet had the largest average investment in structures (5.9 million MNT), while investments in structures in Bayanzurkh district and Songinokhairkhan district were both around 6 million MNT.

Table 15 also depicts the average values of all planned future investments for each household over the next five years. Overall, the average planned future investment for each household was 5.8 million MNT. Songinokhairkhan district had the highest average planned future investment by households (6.1 million MNT), while Darkhan had the lowest (3.85 million MNT).

Table 15. Households Average Investment in Hashaa Plots (1,000 MNT)

	BZ	CH	SKH	Darkhan	Erdenet	Total
Investment in Land (last 5 years)	792	276	446	406	446	514
Investment in Structures (last 5 year)	4746	3990	4946	3366	5885	4776
All Planned Investments by HH (next 5 years)*	5955	5407	6129	3856	5691	5829

*"Planned investments" include any investment a household expects to make in either their land or structures over the next five years.

Table 16 summarizes the percent of households who took loans over the last five years in the areas of interest. Households receiving loans, on average, received about one loan in the last five years. Darkhan and Erdenet were the only place where households on average received more than one loan, and households in Chingeltei district received the fewest loans on average (0.7). Overall, the highest proportion of surveyed households who received loans was in Erdenet (59.4%), while the lowest percentage was in Chingeltei district (37.3%). The higher percentage of loans in Darkhan and Erdenet households could have been the result of those two places having a higher percentage of registered plots than households in the three Ulaanbaatar districts.

Table 16 also breaks down the average principal on loans by area of interest. The overall average was 6.2 million MNT, with Chingeltei district having the highest average principal at 8.7 million MNT and Songinokhairkhan district the lowest at 4.9 million MNT.

Table 16. Households with Loans in the Last 5 Years

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Households with Loans in the Last 5 Years (%)	42.4	37.3	42.9	54.7	59.4	44.1
Average Number of Loans in Last 5 Years	0.78	0.66	0.73	1.22	1.20	0.80
Average Principal on Loans in Last 5 Years (1,000 MNT)	5968	8713	4992	5426	8188	6199

Table 17 depicts the purpose of loans by area. Overall, most loans were used for consumption and/or livelihood purposes (68%). Chingeltei district used the most loans for this reason (72%), while Darkhan used the least amount (55%). Overall, 14 percent of loans were used for business activities, with Darkhan having the highest overall percentage (24%), which is not surprising because Darkhan also had the highest percentage of households engaged in business activities.

Table 17. Loan Purpose

		BZ	CH	SKH	Darkhan	Erdenet	Total
Business Activities	Frequency	210	80	198	71	91	650
	Percentage	17.0	14.1	11.4	24.2	13	14.4
Building or Purchasing of a Dwelling Unit	Frequency	101	35	130	24	73	363
	Percentage	8.2	6.1	7.5	8.2	10.5	8.0
Consumption/Livelihood Purposes	Frequency	806	410	1246	163	445	3070
	Percentage	65.3	72.1	71.9	55.6	63.8	67.8
Educational Purposes	Frequency	100	41	133	22	74	370
	Percentage	8.1	7.2	7.7	7.5	10.6	8.2
Other	Frequency	18	3	26	13	15	75
	Percentage	1.5	0.5	1.5	4.4	2.2	1.7
Total Freq.		1235	569	1733	293	689	4528

Table 18 presents the sources of the loans by the five areas of interest. The largest percentage of loans borrowed from a bank (86%) and was borrowed in Erdenet (92%). Songinokhairkhan district had the least percentage of loans borrowed from a bank with 83 percent. The second most

popular source of loans was from Non-Banking Financial Institutions (NBFI)³⁵ making up 9.5 percent of loans taken. The location with the highest percentage borrowed from NBFI was Chingeltei district (12%) and the lowest was in Erdenet (5%). The third most visited source to borrow loans was from non-family members. The least used sources to procure loans were from a family member outside the household and other sources, with three loans total across all areas of interest.

Table 18. Loan Sources (%)

Loan Sources	BZ	CH	SKH	Darkhan	Erdenet	Total
Bank	85.7	83.8	83.6	87.1	91.7	85.7
SCC¹	0.6	1.4	1.4	1.0	0.7	1.1
NBFI	9.1	11.9	11.0	8.8	5.0	9.5
NGO/Donor Organization	0.4	0	1.0	2.0	0.1	0.7
Respondents Company	0.6	0.7	0.8	0.3	0.3	0.6
Pawn Shop	0.6	0.2	0.1	0.3	1.0	0.4
Family Member Outside the Household	0.2	0	0	0	0.1	0.1
Non-Family Individual	2.8	1.9	2.0	0	0.7	1.9
Other	0	0	0	0.3	0.3	0.1
Total	100	100	100	100	100	100

¹ Savings and Credit Cooperatives are when individuals create an organization to pool their resources in order to provide savings and loans to their members.

Table 19 summarizes the proportion of types of collateral used to procure loans. Overall, the most widely used type of collateral, at 63 percent, was contracts³⁶. The second most used type of collateral to back loans was using the hashaa of interest (16.6%), followed by other (6%). The least used type of collateral used by households was using a house or structure (2.3%).

Table 19. Types of Loan Collateral (%)

Loan Sources	BZ	CH	SKH	Darkhan	Erdenet	Total
Hashaa of Interest	17.2	15.7	14.9	28.1	15.9	16.6
Land that is not the Hashaa of Interest	1.5	3.0	2.3	0.7	4.5	2.4
House/ Structure	1.6	2.6	1.7	2.7	4.5	2.3
Vehicle	7.2	7.6	4.7	2.0	1.6	5.1
Contracts	60.9	62.7	65.4	52.0	65.0	62.9
No Collateral Required	5.2	3.1	5.5	4.1	3.3	4.7
Other	6.3	5.3	5.6	10.3	5.2	6.0
Total	100	100	100	100	100	100

Table 20 depicts the average households minimum loan payment required per month, summed over all loans and across the five different areas of interest. Overall, the average minimum monthly payment was 152,000 MNT. Households in Chingeltei district had the highest minimum monthly payment at 238,000 MNT and households in Songinokhairkhan district had the lowest minimum monthly loan payment at 117,000 MNT.

³⁵ Non-Banking Financial Institutions is a financial institution that does not have a banking license or is not supervised by a regulatory agency.

³⁶ Contracts could have been either assets backed by an employment contract or that the respondent household had someone outside the household to co-sign the loan, acting as the guarantor.

Table 20. Average Monthly Minimum Payments Required per Household, Summed Over All Loans (1,000s of MNT)

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Average	132	238	117	155	226	152

Table 21 presents the percentage of households that were unsuccessful at obtaining a loan in the past, and examines reasons why they were not successful. Overall, 13 percent of households across the five areas of interest were unsuccessful at obtaining loans. This statistic does not vary much across the five areas; however, the Ulaanbaatar districts had a slightly higher rate than Darkhan and Erdenet. The main reason for why people were unsuccessful at procuring a loan was that they did not have collateral (41%). However, in Darkhan, the main reason they were unsuccessful at procuring a loan was that they had no job security (37%). This could mean that unemployment is higher in Darkhan than other districts. The least likely reasons why a respondent did not successfully obtain a loan were that they did not supply a sufficient amount of the required documentation for the loan (16%).

Table 21. Households that were Unsuccessful at Obtaining a Loan in the Past and the Reasons Why they were Unsuccessful (%)

	BZ	CH	SKH	Darkhan	Erdenet	Total
Households that Were Unsuccessful at Obtaining a Loan in the Past	13.6	13.0	13.5	11.1	12.6	13.2
Main Reason the Attempt was Unsuccessful						
No Collateral	43.1	39.3	41.9	14.8	46.0	41.3
No Job Secured	17.4	18.7	16.8	37.0	20.3	18.3
Insufficient Household Income	16.1	17.0	19.2	29.6	14.9	17.9
Insufficient Documentation was Provided	17.0	18.8	16.5	11.1	12.2	16.3
Other	6.4	6.2	5.6	7.4	6.8	6.1
Total	100	100	100	100	100	100

Table 22 shows the average total value of financial assets per household across the five areas of interest. Bayanzurkh district had the highest average value per household (407,000 MNT), followed by Darkhan (379,000 MNT), and Erdenet (368,000 MNT). The lowest average total financial assets per household were in Songinokhairkhan district (297,000 MNT). The overall average was 340,000 MNT.

Table 22. Financial Assets*

	BZ	CH	SKH	Darkhan	Erdenet	Total
Average Financial Assets (1,000 MNT)	407	305	297	379	368	340

*Note: Financial assets are made up of the following items; Bank savings, stock, cash, investment funds, securities, other and contracts

3. Land Disputes

Table 23 shows the proportion of households with land disputes in each area of interest. Overall, about 5 percent of people were involved in a land dispute. The highest percentage of land disputes were experienced by people living in Bayanzurkh district at 6 percent in the given area, while the lowest was in Chingeltei district (3% in the given area).

In addition, Table 23 shows a breakdown of those households that had land disputes since 2003 by those households with a title (ownership certificate), those partially register (have at least a possession certificate), and those not registered (have no certificate). It shows that those households not registered had a much higher percentage chance of having a land dispute since

2003 (10.5%), having a percentage that was twice as high as those fully (3.2%) and partially registered (4.7%).

Table 23. Land Disputes

	BZ	CH	SKH	Darkhan	Erdenet	Total
Household with Land Disputes (%)	6.1	2.9	5.4	4.9	3.4	5.0
	Title		Partially Registered		Not Registered	
Had Land Dispute Since 2003 (%)	3.2		4.7		10.5	

Table 24 looks at the reasons for why land disputes occurred. Overall, the boundary issue category was the most common reason why land disputes occurred (42%). The second main reason was “Other Issues” (34%).³⁷ The least likely reasons for a land dispute were that the land was sold illegally to someone or purchased illegally from someone. Overall, 7 percent of respondent households stated this reason for why a land dispute occurred.

Table 24. Nature of Land Dispute for Households with Disputes (%)

	BZ	CH	SKH	Darkhan	Erdenet	Total
Boundary Issue*	47.9	44.0	39.7	33.3	30.0	41.9
Information Error (Name or Address)	17.3	20.0	19.1	16.7	20.0	18.5
Sold or Bought Illegally	6.1	4.0	6.1	16.7	15.0	7.0
Other Issue	33.7	32.0	35.1	33.3	35.0	34.3

*Mapping error or boundary conflict, illegal extension or subdivision (border issue)

C. Land Registration Activities

This section analyzes household land registration activities, as well as the quality and efficiency of the land registration process.

1. Land Registration Activities

Table 25 presents the average hashaa plot value and size. Hashaa plots in the three Ulaanbaatar districts are worth significantly more than those in Darkhan and Erdenet at 26 million MNT in Bayanzurkh district, 25 million MNT in Chingeltei district, and about 19.0 million MNT in Songinokhairkhan district. Hashaa plots in Erdenet are worth an average of 7 million MNT and 12.3 million MNT in Darkhan. The largest hashaa plots on average were located in Darkhan and Erdenet at 969 m² and 839 m², respectively. Plots of land in the three Ulaanbaatar districts measured on average less than 640 m². This is the result of the Mongolian Law on Allocation of Land to Mongolian Citizens for Ownership, which limits the amount of land that Ulaanbaatar residents can receive free from the government to no more than 700 m². Based on these numbers, the most expensive plots of hashaa land on average were located in Chingeltei district (56,200 MNT per m²) followed by Bayanzurkh district (51,200 MNT per m²). The least expensive hashaa plots were located in Erdenet and Darkhan (9,600 MNT per m² and 16,900 MNT per m²,

³⁷ Other contains: Another family gave application to take it, Neighbors arguing without document, Because it is close to railway, Built road in our half of field, Couldn't get land wanted, Didn't have cadastral map, Exclusion zone, Fence side too overloaded, Fence sold to a person, but didn't transfer the license name, It was unpermitted area, Address issue, License registered on someone's name, Military owned field, Moved without authorization, Neighbor uses a part of the respondent's land without permission, Plot in flood area, Other person buying, Other person tried to rob, Owner of the area of yard is uncertain, Put fence in according to cadastral map photo, Sold it to two people, Special protected area, They have a contract with another company, Residing near high voltage.

respectively). These numbers are not surprising because land is in much higher demand in Ulaanbaatar as people continue to migrate there at higher rates than in Darkhan and Erdenet.

Table 25 also gives hashaa value details broken down by those households with a title (ownership certificate), those partially register (have at least a possession certificate), and those not registered (have no certificate). It shows that those households that are either fully or partially registered felt that they had much more valuable plots in terms of total value and value per square meter than those that did not have certificates.

Table 25. Average Hashaa Plot Value and Size

	BZ	CH	SKH	Darkhan	Erdenet	Total
Average Hashaa Plot Value (1,000 MNT)	26,057	24,937	19,100	12,369	7,173	20,062
Hashaa Area (m ²)	605	556	639	969	839	660
Hashaa Price (1,000 MNT/m ²)	51.2	56.2	32.2	16.9	9.6	37.5
	Title	Partially Registered		Not Registered		
Average Hashaa Plot Value (1,000 MNT)	22,306	20,918		12,021		
Hashaa Price (1,000 MNT/m ²)	42.5	38.7		23.7		

*Means exclude plots with price/m²>700,000 MNT

Table 26 looks at the acquisition method of the hashaa plots across the five areas of interest. At over 40 percent, most respondents purchased the land in all five locations. After that, the majority of respondent households had either lived in their hashaa plot before 2003 or obtained empty land after 2003 (19% and 17% respectively).

Table 26. Acquisition Method of Hashaa Plot (%)

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Lived Here Before 2003	18.8	20.5	19.9	17.4	12.0	18.8
Inherited	3.5	9.5	4.3	5.4	3.9	4.9
Received as a Gift	2.8	4.2	3.1	2.9	3.1	3.2
Purchased	43.7	41.3	40.8	45.9	48.5	42.7
Obtained Empty Land After 2003	16.7	12.5	16.9	24.0	20.2	16.8
Other	14.3	12.1	15.0	4.5	12.3	13.6

Table 27 portrays the average plots of land owned by households at the time of the survey. Overall, surveyed households owned about one plot of land at the time of the survey. In Erdenet, this average was the highest with 1.18 plots of land per household, which was followed by Darkhan with 1.14 plots of land.

Table 27. Average Plots of Land Owned by Household at Time of Survey

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Average	1.07	1.07	1.09	1.14	1.18	1.09

Table 28 summarizes each household's hashaa plot ownership status across the five areas of interest. The most common type of ownership status was an ownership certificate³⁸ (overall 31%). This proportion was particularly high in Darkhan (59%) and Erdenet (51%). The Ulaanbaatar districts had a much more even distribution across the four options than Darkhan

³⁸ When a resident holds certificate of possession he or she has the right to use or possess the land. But the land is still state-owned. An ownership certificate indicates that the holder has the right to own the land and as a result has a title for that land. A property registration certificate indicates that the holder owns immovable property on the land and so has a title for the property on the land.

and Erdenet. They had comparatively higher levels of households with a certificate of possession at about 22 percent. Bayanzurkh district had the highest percentage of households who occupy but do not have documentation (19%), while Darkhan had the lowest percentage (14%).

Table 28. Hashaa Plot Ownership Status (%)

	BZ	CH	SKH	Darkhan	Erdenet	Total
Non-owner Resident	16.1	12.5	16.3	8.2	13.8	15.1
Occupy, but No Certificate¹	19.2	14.6	15.3	14.0	17.3	16.4
Certificate of Possession	21.8	22.1	23.8	9.0	5.6	20.5
Governor's Decision²	15.7	24.6	16.1	9.5	12.5	16.6
Ownership Certificate	27.1	26.2	28.5	59.2	50.8	31.4
Total	100	100	100	100	100	100

¹ This means that there were no land or property certificates for the plot resided on by the household interviewed.

² The household has the governor's decision which is needed to get an ownership certificate, but does not yet have the ownership certificate.

Table 29 shows who would inherit the hashaa plot after the owner passed away. In all five areas of interest, the majority of respondents (between about 62% and 72%) stated that a household member would inherit the land. In Chingeltei district, the highest proportion of respondents stated that a household member would inherit the hashaa plot (72%). The second highest proportion was in Darkhan (69%). Erdenet had the most respondent households of the five areas of interest who stated that another male family member outside the current household would inherit the hashaa plot (9%). The second highest percentage was in Darkhan (6%). In Darkhan and Erdenet, about 3 percent of households stated that another female family member outside the current household was going to inherit the hashaa plot. In the three Ulaanbaatar districts, however, less than 2.1 percent of respondents stated that a female family member outside the current household would inherit the hashaa plot.

Table 29. Inheritor of Hashaa Plot (%)

	BZ	CH	SKH	Darkhan	Erdenet	Overall
HH Member	70.1	73.8	67.6	72.5	62.9	69.2
Other Male Family Member Outside Current Household	4.4	4.3	4.8	6.0	9.6	5.2
Other Female Family Member Outside Current Household	1.8	1.8	2.1	3.9	3.1	2.1
Other Non-Family Member Outside Household	1.6	1.2	1.4	2.6	3.6	1.7
Other	0.6	0.9	0.1	5.6	6.9	1.7

Table 30 depicts the average money spent on the registration process for those who occupy a hashaa plot and hold a possession certificate. Overall, 85,400 MNT was spent on average across all five areas of interest during registration. The most costly activity overall was the cadastral mapping which cost on average 33,400 MNT. Households in the three Ulaanbaatar districts spent considerably more on average for cadastral mapping than in Darkhan or Erdenet. Households in the Songinokhairkhan district spent the most on cadastral mapping at on average 37,300 MNT and households in Erdenet spent the least at on average 6,400 MNT. The second most costly registration activity was transportation costs related to getting the possession certificate which cost overall on average 19,700 MNT. In Darkhan, households spent the most money on transportation, spending an average of 26,800 MNT, while in Erdenet they spent the least at on average 6,200 MNT. Overall, about 14,000 MNT was spent on average at the GASR office to obtain the certificate of possession.

Table 30. Average Money Spent on Possession Certificate by Process (1,000 MNT)

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Get Notaries Service	11.2	8.2	11.2	7.6	6.0	10.4
Cadastral Mapping	33.6	28.9	37.3	7.1	6.4	33.4
Transportation	20.3	15.7	20.6	26.8	6.2	19.7
Obtain the Certificate of Possession	20.4	11.2	11.7	9.1	13.9	14.0
Other*	1.5	1.5	4.3	2.0	0.0	2.8
Total	94.3	71.6	89.6	50.4	36.2	85.4

*Other costs: Bank Fee, Bring Someone for Cadastral Photo Service, Changed Name on Cadastral Photo, Expense on Copying the Documents, Field Fee (most common), Food, For Land Fee, Gave Someone, Gave Tax Money, Need To Copy Description, Sold Person Paid Everything.

Table 31 looks at the average money spent on obtaining the ownership certificate for those households with one. On average, 91,700 MNT was spent across all registration activities. Households in Chingeltei district spent the most money on average at 108,000 MNT and those in Bayanzurkh district spent the second largest amount of money at 102,500 MNT. Darkhan and Erdenet spent substantially less overall than the Ulaanbaatar districts (59,100 MNT and 66,000 MNT, respectively). The most expensive activity was related to cadastral mapping of the hashaa plot, which on average cost 26,000 MNT. Obtaining the ownership certificate from GASR was the second most expensive activity at 17,200 MNT.

Table 31. Average Money Spent on Obtaining Ownership Certificate (1,000 MNT)

	BZ	CH	SKH	Darkhan	Erdenet	Total
Get Notaries Service	20.1	14.6	18.2	13.5	10.5	16.0
Cadastral Mapping	37.5	28.1	31.4	10.6	9.9	26.0
Transportation	20.0	13.1	21.8	9.0	9.5	16.4
Obtain the Ownership Certificate	20.3	19.9	16.3	17.2	14.5	17.2
Other*	2.1	4.1	1.6	8.2	2.6	3.1
Total	102.5	108.0	102.0	59.1	66.0	91.7

*Other costs: Photo, Additional Price for Land, Bank Paid Separately, Change Ownership, Deregister and Register, Copy Center, Field Tax, Field Fee, Field for Valuation, Food Cost, For Arranging Documents, For Changing Name, For Copying and For Taking Reference Letter, For Filling out An Application, For Review of Field Office Information, For Valuation, Forgot, Gave To Person, Had Meal, Had the Certificate Issued Urgently, It Was Valued By Dalai Van Auditing, Land Price, Land Tax (most common), Meal, Money for Urgent Service, Need to Certify Again, Painting, Previous Owner Gave Us Not Full Document, Reference of Land, Sign, Tax, Tax for Using Field, Tax on Purchasing Yard and House, Took Again After Losing Passport

Table 32 depicts the percentage of time needed to obtain the ownership certificate among households with this certificate. Overall, most respondents received it in less than or equal to 14 days, which was within the legal time limit set by the government for obtaining the registration certificate. In Erdenet, a vast majority of respondents, 83 percent, spent 14 days or less on obtaining their registration, while in Bayanzurkh and Chingeltei districts, only 64 percent spent 14 days or less obtaining their certificates. Overall, for 25 percent of respondents it took more time than legally allowed to obtain their certificates. In Bayanzurkh district, about 33 percent of respondents obtained their certificate beyond the legal time frame. In Erdenet, only 14 percent of respondents took more than the legal time to obtain their certificate.

Table 32. Time Needed to Obtain Ownership Certificate (%)

	BZ	CH	SKH	Darkhan	Erdenet	Total
Within Legal Time or 14 Days	63.8	63.6	72.2	75.0	82.5	71.0
Beyond Legal Time	33.2	30.2	24.6	20.8	14.1	25.3
Other	3.0	6.2	3.3	4.2	3.4	3.7
Total	100	100	100	100	100	100

Table 33 presents the households who paid money to speed up the registration process for obtaining the ownership certificate. Overall, about 12 percent of respondents with an ownership certificate across the five areas of interest paid to speed up the registration process. Those payments were on average about 36,400 MNT, which is equal to about 40 percent of the total cost (92,000 MNT) for those households that went through the process. Erdenet had the highest proportion of households that paid to quicken the procedure (15%) and Songinokhairkhan district had the second highest proportion (14%). Darkhan had the lowest proportion of households which paid to quicken the procedure (8%). On average, households in Songinokhairkhan district and Bayanzurkh district paid the most money in bribes (46,900 MNT and 39,400 MNT, respectively).

Table 33. Paying to Speed up Process for Obtaining Ownership Certificate

	BZ	CH	SKH	Darkhan	Erdenet	Total
Percent who Paid to Speed Up Process* (%)	10.5	10.3	13.5	7.9	15.1	12.2
Amount Spent on Average (1,000 MNT)	39.4	27.3	46.9	15.4	21.7	36.4

*Reasons for payments: Already Give a Transfer License Request, Bribery, Corruption, Don't Know, For An Expense on Transportation, For Archival Checking, For Documenting, For Making It Ready Urgently, For Taking a License from District, For Urgent Service, Gave a Person, Got a License by Urgent Service, Got New License, Had Meal, Immediate Service, Need To Claim a Request, Pull Closer the Duration, Rented, Service Payment, Spent On Demands by Telephone, To Offer Lunch, Urgent Service (most common).

Table 34 displays the percentage of households who believed that land security increased after receiving the ownership certificate. Overall, 72 percent of households perceived increased security with the possession of the property registration. In Bayanzurkh district, the perception of security was the highest with 77 percent of households feeling more secure, followed by Chingeltei district at 74 percent. In Darkhan, the perception of security was the lowest at about 63 percent of households feeling more secure.

In addition, Table 34 shows a breakdown of other perceptions dealing with ownership certificates by those households with a title (ownership certificate), those partially register (have at least a possession certificate), and those not registered (have no certificate). Those with titles (82%) felt more secure from expropriation than those only partially registered (72%) or not registered (37%).

Table 34. Households' Perceptions of Security with Ownership Certificate (%)

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Increased Security Perception by Having Certificate	77.2	74.2	72.5	62.5	65.3	71.9
	Title		Partially Registered		Not Registered	
Percent of Households that feel Secure Against Expropriation of their Land	82.1		72.5		36.8	

Table 35 portrays the percentage of households whose land fees, or property tax, increased after they obtained the ownership certificate. In addition, it examines the percentage of households with ownership certificate that used their land as collateral. Overall, 13 percent of households

paid more land fees. In Darkhan and Songinokhairkhan district, more households faced increased land fees than in the other three locations (26% and about 30% respectively). In Chingeltei district, the least amount of households, at about 6 percent, faced higher land fees. Overall, about 34 percent of households used their land as collateral after obtaining their ownership certificate. Darkhan had the highest proportion of households with ownership certificates who used their land as collateral for loans (43%). The second highest proportion of households who used their land as collateral was in Bayanzurkh district (35%).

Table 35. Land Fee and Collateral with Ownership Certificate of those with Titles (%)

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Increased Level of Land Fees	6.7	6.1	10.8	29.8	26.3	13.4
Used as Collateral	35.4	27.6	33.2	43.0	31.0	33.5

2. Availability of Information about Registration

Table 36 analyzes whether households believed that sufficient information was available for specific processes including certificate of possession, governor's decision, and property registration. This was ranked on a scale from one to four, one being that the information was very sufficient, two being that the information was sufficient, three being that the information was not very sufficient, and four being that the information was not sufficient. For all areas of interest, households felt that all processes were between "sufficient" and "not sufficient". Households in the Ulaanbaatar districts, on average, felt that there was less sufficient information for the certificate of possession, the governor's decision, and ownership certificate than in Darkhan or Erdenet. Overall, the responses of households ranged between 2.6 and 2.9, meaning that for the most part, households in all areas felt that the information was less than sufficient for all three processes.

Table 36. Sufficient Information on the Following Processes

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Certificate of Possession	2.88	2.91	2.86	2.58	2.64	2.84
Governor's Decision	2.92	2.94	2.90	2.69	2.67	2.88
Ownership Certificate	2.95	2.96	2.94	2.57	2.65	2.90

1=Very sufficient→ 4=Not very sufficient

D. Social Capital

Table 37 summarizes the attitudes toward government effectiveness and markets specifically in regards to the implementation of the 2003 Land Privatization Law. Overall, at least 85 percent of all households in the five areas of interest believed that the 2003 Land Privatization Law was beneficial for Mongolian development. However, households were mixed on whether they believed that the law was implemented effectively or fairly. While in Darkhan and Erdenet over 70 percent believed that the government implemented the law effectively, in the three Ulaanbaatar districts only about 55 percent to 56 percent of respondents believed the same. In addition, Darkhan and Erdenet had over 50 percent of respondent households believe that the government implemented the law fairly, while in the three Ulaanbaatar districts less than 40 percent of households felt the same. This trend continued with more households in Darkhan (51%) and Erdenet (55%) who believed that they could trust the government to fairly and effectively implement laws than in the three Ulaanbaatar districts. Bayanzurkh district had the lowest percentage of households who trusted the government to implement laws (36%) fairly and effectively; followed by Songinokhairkhan district (42%) and Chingeltei district (38%).

Table 37. Attitudes toward Government Effectiveness

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Felt 2003 Land Privatization Law was Beneficial for Mongolian Development (%)	85.8	87.6	89.4	90.0	89.7	88.2
Felt the Government was Implementing the 2003 Land Privatization Law Effectively (%)	55.3	56.1	55.8	73.1	75.3	58.7
Felt the Government was Implementing the 2003 Land Privatization Law Fairly (%)	35.4	39.8	36.9	53.0	56.0	39.6
Trusted the Government to Fairly and Effectively Implement Laws (%)	36.4	38.2	42.1	50.8	55.1	41.7

E. Other

1. Insurance

Table 38 portrays the percent of people who had medical insurance, social insurance, and/or other types of insurance. Almost all respondents (over 94%) had health insurance in all five areas of interest. In Erdenet, more people (66%) had social insurance³⁹ than in any of the other areas of interest. This is followed by Songinokhairkhan district and Bayanzurkh district with 59 percent and 58 percent, respectively. Most households did not have housing insurance, with Darkhan having the highest percentage (3%). In addition, most households did not have theft insurance or livestock insurance. Between 12 percent and 27 percent of households had driver's responsibility insurance, with Erdenet at 13 percent and Songinokhairkhan district at 27 percent.

Table 38. Percent of People Who Have Medical, Social and Other Insurances (%)¹

	BZ	CH	SKH	Darkhan	Erdenet	Overall
Social Insurance	58.5	55.3	58.7	55.7	66.5	58.8
Health Insurance	97.5	98.3	98.1	94.3	98.8	97.9
Housing Insurance	1.3	1.4	1.1	3.3	1.0	1.3
Life Insurance	2.8	2.7	4.2	3.7	8.0	3.9
Theft Insurance	0.0	0.0	0.0	0.0	0.2	0.0
Vehicle Insurance	25.2	25.2	26.4	16.0	17.7	24.5
Driver's Responsibility Insurance	22.2	26.1	27.1	16.4	13.5	23.7
Livestock Insurance	0.7	0.1	0.8	1.6	0.7	0.7

¹ Defined as: at least one member of the HH has this type of insurance, or the household as a whole.

2. Gender Analysis

Table 39 shows the household demographic breakdown by gender of household head. It shows there were a much higher percentage of respondent households that were male headed households (82%) than female headed households (18%). The large majority of those male heads of household were married (74%). In stark contrast, almost all female heads of household are not married (3%). At 51 years old, female heads of household were also seven years older on average than male heads of house at 44 years old, perhaps indicating that most of the female headed households were the result of widowhood.

³⁹ Social Insurance is made up of the following: Pension insurance, Benefit insurance, Health insurance, Unemployment insurance and Industrial accident and occupational disease insurance.

Female headed households had only 0.3 people less on average than male headed households, suggesting that female and male headed households are similarly sized at about four people. On average, male household heads had a half year more schooling at 10 years than females at 9.5 years. Female headed households resided on slightly larger plots (690 m²) than male headed households (660 m²), though the difference was small at about 30 square meters. However, male headed households were more likely to be engaged in business activities, at 17 percent compared with 11 percent for female headed households.

Table 39. Demographics of Household Heads by Gender

	Female Head of HH	Male Head of HH	Overall
Number (%)	17.4	82.6	100
Married (%)	3.3	73.5	61.3
Live on hashaa since birth (%)	1.1	1.1	1.1
Age	50.5	43.7	44.8
Household size	3.9	4.2	4.2
Years of education	9.5	10.0	9.9
Size of Hashaa plot (m²)	689.5	659.2	664.2
Household is Engaged in Business (%)	10.9	17.4	16.2

Despite the large majority of the households surveyed having male heads, the interview participants were heavily female, as can be seen in Table 40. Of those that were interviewed, about 60 percent of respondents were female, which was consistent for both the main respondent⁴⁰ and secondary respondents⁴¹.

Table 40. Gender of Interview Participant

	Female	Male	Total
Main Respondent (%)	60.0	40.1	100
Secondary Respondent (%)	58.6	41.5	100
Total (%)	59.6	40.4	100
Main Respondent (Freq.)	3427	2289	5716
Secondary Respondent (Freq.)	1151	815	1966
Total (Freq.)	4578	3104	7682

Table 41 demonstrates the number and percentage of individuals on the ownership certificate by gender. For those hashaa plots registered, 30 percent were in the name of a female household member, while 60 percent were in the name of a male household member. The remaining 10 percent had both male and female household member's names on the ownership certificate. This percentage of female ownership was significantly lower than what was described in a recent report by MCA,⁴² which used General Authority on State Registration (GASR) registration data to estimate that 49 percent of registrations were in the name of a female in Ulaanbaatar, with the figure dropping to 36 percent in outlying aimag centers. One possible explanation for this discrepancy between the number of existing registered plots, and the number of recent registrations occurring at GASR, is that women are currently very active at registering their

⁴⁰ Main respondent refers to an individual who provided the most responses to the questionnaire.

⁴¹ Secondary respondent refers to an individual who was present at the interview but only gave a limited number of responses.

⁴² Source: "Women Gain Ground through MCA-Mongolia Property Rights Project." *Мсa.mn - Тулхтай хөгжил, чанартай амьдрал*. MILLENNIUM CHALLENGE ACCOUNT MONGOLIA, n.d. Web. 02 Nov. 2012. <http://www.mca.mn/en/images/upload/PRP_Gender_newsletter_20%20June.pdf>.

family's second plot of land, while past registration activity was predominantly undertaken by men, and thus overall more plots have male owners than what would be suggested if recent registration rates were extrapolated back in time.

Table 41. Name on Ownership Certificate¹

	Male	Female	Both	Total
Number	2052	1018	329	3399
Percent (%)	60.4	30.0	9.7	100

¹This is for anyone that has at least a possession certificate.

Table 42 gives the breakdown of how hashaas were acquired, by the gender of the title holder. Males and female title holders followed very similar patterns in how they acquired their hashaa plot. The majority of both (50%) acquired their hashaa plot by purchasing it. The second highest was living on it prior to 2003 (25%).

Table 42. How Hashaa was acquired, by Gender of Title Holder

	Female	Male	Both	Total
Lived on Land Before 2003	22.7	25.4	25.2	24.6
Obtained Empty Land After 2003	19.2	17.4	14.9	17.7
Purchased	50.7	48.8	52.9	49.8
Inherited	4.2	5.0	4.0	4.7
Received as a Gift	3.1	3.3	2.7	3.2
Other	0.1	0.2	0.3	0.2
Total	100	100	100	100

Table 43 shows the percentage breakdown of the gender of survey respondents that inherited their hashaa plot. Although the number of inheritances was relatively small, there was a clear bias towards males inheriting plots, as 65 percent of all inherited plots went to males.

Table 43. Gender of the Inheriting Hashaa Owner (%)

	Male	Female	Both	Total
Percent (%)	64.6	27.2	8.2	100

As can be seen in Table 44, female and male headed households differed greatly in the gender of the individual who was responsible for property registration activities. In female headed households, women were in charge of these activities for 94 percent of households, while the duties were split much more evenly among the sexes within male headed households, even though males were responsible slightly more often at 57 percent.

Table 44. Gender of Individual in Charge of Registration for Households Registering (%)

	Female Head of HH	Male Head of HH	Total
Female in Charge of Registration	94.2	42.9	51.9
Male in Charge of Registration	5.8	57.1	48.1
Total	100	100	100

Table 45 shows the breakdown of control over loans by gender. Not surprisingly, in female headed households, women had more loans in their name (.65 loans), controlled the spending of more loans (.51 loans), and the repayment of more loans (.52 loans) than they did in male headed households (.34, .25, and .25 loans respectively). The number of loans controlled by women was in fact slightly higher among female headed households than the number controlled by men in male headed households. However, males in female headed households controlled fewer loans than women in male headed households, most likely because there was typically only a single

responsible adult in female headed households. As a result, this may have caused male headed households to have more loans overall.

Table 45. Control of Loans by Gender (Number of Loans)

	Female Head of HH	Male Head of HH	Total
Loan in Female's Name	0.65	0.34	0.40
Female in Control of Spending	0.51	0.25	0.29
Female in Control of Paying	0.51	0.25	0.29
Loan in Male's Name	0.07	0.45	0.38
Male in Control of Spending	0.12	0.51	0.44
Male in Control of Paying	0.12	0.51	0.45
Average Number of Loans	0.74	0.81	0.80

Table 46 shows the percent of households, by household head gender, which was unsuccessful at obtaining a loan. With an unsuccessful rate of 11 percent for female headed households versus 14 percent for male headed households, female headed households had more success on average at obtaining loans. This contradicts the general pattern of access to credit that has been noted in numerous other countries.

Table 46 also displays the breakdown by gender of the types of difficulties encountered when family members attempted to take out loans. The biggest barrier for both genders was lack of collateral, which was the situation in 42 percent of all cases. After this, the sexes diverge. Females were most likely to indicate that their household income was insufficient to obtain a loan (24%). This could be reflecting the lack of a second income earner in most of these households. Men, on the other hand, cited having no job as the second most common reason for being denied a loan (19%).

Table 46. Unsuccessful Attempt at Obtaining a Loan by Gender (%)

	Female Headed Household	Male Headed Household	Total
Percent Unsuccessful	11.3	13.7	13.2
Main Reason the Attempt was Unsuccessful for those Respondents that were Unsuccessful			
No collateral	41.1	41.5	41.5
No job secured for the loan	16.1	18.6	18.3
Insufficient Household income	24.1	16.8	17.9
Insufficient Documentation	13.4	16.9	16.4
Other	5.4	6.1	6.0
Total	100	100	100

Table 47 shows how respondent households' assets differed by the gender of the household head. Female headed households were on average much poorer than male headed households in terms of major asset ownership. Male headed households were ten percentage points more likely to have more than one structure on their plot, and the total value of their structures exceeded that of female headed households by 4 million MNT (2,840 USD). Male headed households were also more likely to own a vehicle, by 30 percentage points (45% compared with 15%).

Table 47. Household Assets, by Gender of Household Head

	Female	Male	Total
Value of All Structures on Hashaa (1000s of MNT)	9238	13682	12908
Household Owns >1 Structure on Hashaa (%)	17.5	27.1	25.4
Household Owns a Vehicle (%)	15.0	45.3	40.0

Table 48 displays the differences in expenditure patterns between male and female headed households. Female headed households spent on average 200,000 MNT (142 USD) less per month than male headed households. Moreover, female headed households allocated spending differently. In particular, they spent 1.5 percentage point more of their total expenditure on food, 1 percentage point more on educational expenses, and 0.5 percentage points more on medical expenses, all of which are consistent with previous studies from various countries. Male headed households spent two percentage points more on alcohol and cigarettes, which is also consistent with most prior research. It is notable that even for male headed households, only 3.6 percent of total expenditures were on alcohol and cigarettes, though this could be a case of underreporting.

Table 48. Household Expenditures, by Gender of Household Head

	Female	Male	Total
Total Monthly Expenditure (1000s of MNT)	627	827	793
Expenditure Categories			
Food (%)	32.1	30.6	30.9
Medical Expenses (%)	3.1	2.5	2.6
Clothing (%)	9.9	10.7	10.5
Educational Expenses (%)	4.7	3.9	3.9
Alcohol and Cigarettes (%)	1.7	3.6	3.3

Table 49 is on the satisfaction levels of services received during the registration process. After removing the not applicable category from the options, the vast majority of respondents from both male and female headed households felt either “happy” or “neither happy nor unhappy” with the services they received for the three processes listed.

Table 49. Satisfaction Level with Services Received during the Registration Process by Gender (%)

	Female Head of HH	Male Head of HH	Total
Satisfaction Level with Services Received while Applying for the Possession Certificate			
Happy	37.2	34.4	34.8
Neither happy, nor unhappy	37.7	38.8	38.6
Unhappy	25.1	26.9	26.6
Total	100	100	100
Satisfaction Level with Services Received while Applying for the Governors Decision			
Happy	41.5	38.3	38.8
Neither happy, nor unhappy	37.7	37.9	37.9
Unhappy	20.8	23.8	23.3
Total	100	100	100
Satisfaction Level with Services Received while Applying for the Ownership Certificate			
Happy	44.2	41.7	42.1
Neither happy, nor unhappy	33.0	34.7	34.4
Unhappy	22.7	23.7	23.5
Total	100	100	100

V. Balance Tests

A. Randomization Strategy for the Formalization Activities

In order to determine the causal effects of the registration outreach efforts, the evaluation utilized a RCT research design. Its goal is to allow the evaluation to assess the project's contribution to key outcomes while experimentally holding other factors constant. The key to the design is that assignment to the registration assistance is randomly assigned. The randomization process took place after the SHPS baseline survey was administered to all respondent households. This allowed for the utilization of the baseline data in the randomization, and it ensured that the respondents would not be influenced by the outcome of the randomization when completing the survey.

Randomization occurred by kheseeg, the unit of stratification for the sampling strategy described in Section III. Ulaanbaatar, the capital city of Mongolia, and the regional cities, Darkhan and Erdenet, are all divided into these units.⁴³ Kheseqs are somewhat informal in nature as there are no elections or social services provided at the kheseq level. However, the borders of kheseqs are well defined, and there is a local appointed functionary, called the kheseq governor, who oversees the management of the area. Kheseqs were chosen as the unit of randomization for the study because they are a well-defined unit that is small and numerous enough to allow for sufficient statistical power.⁴⁴ Table 50 below summarizes the information on the number of kheseqs in each district and city as well as some defining features of these kheseqs.

Table 50. Kheseq Distribution and Rate of Privatization by City and District*

City	District	Number of Kheseqs	Average Rate of Privatization (%) ¹	Average number of plots per Kheseq ²
Ulaanbaatar	BZ	118	32	13.7
Ulaanbaatar	CH	125	30	6.9
Ulaanbaatar	SKH	164	34	14.7
Darkhan		36	64	6.8
Erdenet		78	59	7.6
Overall		521	37	11.0

¹According to SHPS survey estimates

²Only counting plots in the SHPS sample

Other strategies would not have been feasible. Randomizing on a larger administrative unit, such as the khoroo or district, would not have been possible as there are only a few dozen of these units in Ulaanbaatar, and they do not exist at all in Darkhan and Erdenet. Randomizing at the level of the individual plot would have been too expensive, as there is substantial cost savings associated with registering larger sections of a neighborhood at the same time. Furthermore, existing plot level information is often inaccurate as boundaries have shifted over time or new plots have been established.

Kheseqs were thus the best unit for randomization. However, the initial GIS data from the PRP PIU revealed an extremely high degree of variation in the number of plots per kheseq. As a

⁴³ In Darkhan and Erdenet, kheseqs are no longer used as an official administrative unit. Nonetheless, the boundaries of former kheseqs are still well known and in some places, kheseq governors continue to operate on an informal basis.

⁴⁴ See appendix B for an explanation of statistical power.

result, researchers made minor adjustments to some of the kheseg boundaries. Any kheseg with a total number of plots that was less than two standard deviations below the average was combined with the smallest adjacent kheseg to form a single unit. Similarly, any kheseg with a total number of plots that were more than two standard deviations above the average was divided into two or more geographical units along a convenient natural boundary, such as a road or ditch. In a few rare cases, new kheseg units had to be created to incorporate new hashaa plots that had recently been founded outside the previous kheseg boundaries. Table 51 shows the frequency of these changes to the administrative boundaries.

Table 51. Alterations Made to Kheseg Units

City	District	Number of Khesegs Subdivided	Number of Khesegs Combined	New Khesegs Created	Average Number of Khesegs after Alterations
Ulaanbaatar	BZ	3	15	16	120
Ulaanbaatar	CH	0	19	2	125
Ulaanbaatar	SKH	8	11	0	167
Darkhan		0	0	2	36
Erdenet		0	14	0	78

Given that there are substantial differences in household and administrative characteristics, including public amenities, IPA researchers stratified the randomization by the city, district, and khoroo. In addition to ensuring balance across treatment and control groups, stratifying random assignment at this larger geographic area improves statistical power. In Darkhan and Erdenet, where district and khoroo units do not exist, similarly sized units were again artificially created using natural boundaries. This assured that all administrative units used for stratification had equally proportional representation within both the treatment and control groups.

In Darkhan and Erdenet, the PRP PIU wanted to include approximately 66 percent of eligible plots in the treatment group.⁴⁵ In these regional cities, khesegs in the same larger geographical unit that had similar levels of privatization rates were formed into matched triplets. From each triplet, two of the khesegs were assigned to receive the registration assistance using a random number generator while the third was relegated to a control group that did not receive assistance. In Ulaanbaatar, the PRP PIU wanted to include approximately 50 percent of eligible plots in the treatment group. So, the random matching process used pairs instead of triplets with one kheseg from each group assigned to receive the program and one to be in the control group.⁴⁶

Table 52 below presents the outcome of the randomization. In total, 3,003 households were assigned to the treatment group which received the registration assistance, and 2,719 households were assigned to the control group where they would receive no assistance. As planned, about half of the households in each group were assigned to the treatment in Ulaanbaatar and approximately two-thirds in Darkhan and Erdenet.

⁴⁵ The 66% treatment ratio was chosen because the PIU could not reach their target number of total plots registered through the assistance program in Darkhan and Erdenet at the 50% ratio used in Ulaanbaatar.

⁴⁶ In some khorooos, the number of khesegs was not a multiple of the number of khesegs in each group. In other words, there were a few remainders left after dividing the khesegs into the groups. These unmatched khesegs were also randomly assigned using a random number generator, but were assigned individually such that the probability of being assigned to the treatment group was the same as it would have been if they had been grouped with other khesegs. The total number of unmatched khesegs in UB districts was thirteen. There were five unmatched khesegs in Bayanzurkh, one unmatched kheseg in Songinokhairkhan, and seven unmatched kheseg in Chingeltei.

Table 52. Distribution of Treatment and Control Plots

City	Control		Treatment		Total
	Number	Percent ¹	Number	Percent	Number
Ulaanbaatar	2,435	49.8	2,454	50.2	4,889
Darkhan	79	32.4	165	67.6	244
Erdenet	205	34.8	384	65.2	589
Overall	2,719	47.5	3,003	52.5	5,722 ²

¹The percent columns give the percent of all plots in a given area that are in the specified treatment group

² There is a difference with the completion rates tables (Table 1) because it is counting all surveys administered, while this number is removing surveys that were done on the same plot, counting only the household that owned the plot.

B. Balance Test

As described above, the purpose of the randomization strategy is to ensure that households targeted by the outreach and those that were not are very similar on average. If these two groups are similar in all respects, except that one group was targeted by the PRP outreach activities, then we can conclude that any differences that emerge between the two groups are then the result of the outreach. In practice, however, random differences, although unlikely, can result from the randomization process. And while we cannot compare the treatment and control households along all dimensions, we can use the information from the SHPS to assess the similarities of the two groups using the answers provided by the respondents. If these two groups are similar along these dimensions, it suggests that the randomization worked as intended.

The SHPS baseline data provides an opportunity to assess the similarity of these two groups. Since the survey was taken before kheseqs were assigned to the treatment or control group, there should be no relationship between their answers on the survey and the outcome of the randomization. To test the effectiveness of the randomization process at creating a control group with the same characteristics as the treatment group, a series of tests using linear regression were conducted on the key socioeconomic and demographic variables collected in the SHPS baseline survey. The results are shown in Table 53. The first column of the table gives the mean level of the variable for the control group. The second column gives the average difference of the variable between the treatment and control groups.⁴⁷

Of the 23 variables tested, there are four variables that display differences between the treatment and control groups at conventional levels of significance. Three of them are related to demographics, and specifically the gender, marital status and education of the household head. The fourth variable is the likelihood of having partial registration over their land, meaning the household owns a possession certificate or governor's decision but not the title. Other important outcome variables such as planned investment, plot size and value, and likelihood of holding a property title, do not display any differences. Heads of treatment households are 2.3 percentage points more likely to be female. They are also 3.4 percentage points less likely to be married,

⁴⁷ Formally, the difference was estimated via Ordinary Least Squares. The respective characteristics were regressed on an indicator variable for assignment to the treatment group and an indicator variable for whether or not the plot was located in Ulaanbaatar. The latter variable was necessary to account for the difference in treatment assignment ratios between Ulaanbaatar and the other locations. Standard errors were clustered at the unit of randomization, the kheseq level.

which was found in the gender analysis section above to be correlated with the household head's gender. Finally, household heads in the treatment group have on average 0.14 fewer years of education. All three of these differences are statistically significant at the 90 percent significance level, and the first two at the 95 percent level. Treatment households are also 3.6 percentage points less likely to hold partial property registration, and this is significant at the 99 percent significance level. Most importantly, however, these differences are practically small -- in other words, none of them are large enough to suggest that the two groups are meaningfully different from each other. And the number of statistically significant results is consistent with what one would expect from such a random assignment procedure. Overall the evidence suggests that the randomization process functioned as expected within the chosen the research design.

Table 53. Balance Test

Variables	Mean: Control Group	Difference: Treatment – Control (std. error)
Male Household Head (%)	82.59	-2.28** 0.96
Household Head is Married (%)	61.56	-3.41** 1.32
Education of Household Head (Years)	9.91	-0.14* 0.07
Household Head is a Permanent Resident (6 Months or Longer) at the Hashaa (%)	93.11	0.91 0.73
A Household on the Same Street Attempted to Sell Their Hashaa in Last Twelve Months (%)	21.16	-1.73 1.14
Has Full Title over Land (%)	31.14	-0.41 1.48
Holds Possession Certificate or Governor's Decision (%)	36.81	-3.61*** 1.35
Age of Household Head (Years)	44.88	-0.13 0.43
Number of Household Members	4.17	0.04 0.05
Household Yearly Income (1000s of MNT)	8306.38	-53.42 219.89
Number of Household Members that are Employed	1.61	0.01 0.03
Value of Hashaa Plot (1000s of MNT)	20170.69	-748.14 1593.72
Area of Hashaa Plot (m ²)	663.97	15.16 15.81
Hashaa Price per Square Meter (1000s of MNT)	39.06	-2.08 3.77
Value of Structures on Hashaa Plot (1000s of MNT)	12914.98	692.24 949.61
Amount Invested in Structures in Last 12 Months (1000s of MNT)	955.21	141.73 114.01
Amount Invested in Land in Last 5 Years (1000s of MNT)	514.43	107.28 107.41
Total Amount Planned to Invest in Hashaa in Next 5 Years (1000s of MNT)	5829.79	532.84 719.24
Total Number of Loans Received in Last Five Years	0.8	0.01 0.03
Total Minimum Monthly Payment on All Loans (1000s of MNT)	152.7	-43.73 37.41
Total Expenditures in Last 12 Months (1000s of MNT)	9520.34	57.13 215.13
Number of Land Disputes Since 2003	0.06	0 0.01
Percent of Households that Hold an Ownership Certificate in Kheseg of Residence (%)	36.86	-0.29 1.69

*** = p<0.01, ** = p<0.05, * = p<0.1

VI. Conclusion and Next Steps

Despite several logistical challenges, the SHPS baselines survey was successfully completed. Overall, the survey contractor was able to collect data on 5,844 respondents, and the data include extensive information on many characteristics of responding households. These data are representative of the ger districts in many parts of Mongolia. As a result, this data set could be of significant use to researchers interested in property issues as well as questions related to other characteristics such as asset ownership, land investments and holdings, and loan activity.

Using the baseline data set, we conducted a series of tests comparing the households that were assigned to the treatment and control groups. These test showed no significant differences between the two groups, allowing us to conclude that the randomization succeeded. The success of the randomization is one key component to the success of the program evaluation that the SHPS is targeting.

One area of concern is that the SHPS data reveals that the registration rates are higher than anticipated in both the treatment and control areas. As a result of inaccurate and outdated information on registration used in sampling, a much greater fraction of the households in the sample had been previously registered than initially expected. This will reduce the number of households in the sample that can be used to measure the project impact.

The next steps for the project are outlined in Figure 3. The registration assistance has already started. Geomaster LLC was chosen as the formalization contractor for the hashaa plot privatization and registration activity in Darkhan and Erdenet. Their reconnaissance work started in March of 2012. Since then, they have performed extensive reconnaissance work on 5,395 households in Darkhan, and 6,703 households in Erdenet respectively. The reconnaissance work consisted of visiting hashaa plots to determine how many plots were properly registered and had no issues surrounding their registration, determine how many plots were not registered or had issues surrounding their registration, and identify the issues that each specific plots face. The contractor has now finished assisting households in obtaining land titles, having assisted 702 households in in Darkhan and 1,006 households in Erdenet respectively.

For the three districts of Ulaanbaatar (Chingeltei, Bayanzurkh and Songinokhairkhan), ASME MON LLC was selected as the formalization contractor. The project area of each district was divided into three packages, as it was in Darkhan and Erdenet. The reconnaissance work started in September of 2012 and the contractor is planning to complete one package every three months and finish in July of 2013. Once the registration activities are complete, a follow up survey will be conducted a year later. An overview of the project and evaluation timeline can be found in Table 54 below.

Table 54. Timeline for Formalization Contractors and SHPS Data Collection⁴⁸

Time	Activities	Status
December-11	Baseline Data Collection Begins	Completed
March-12	Darkhan and Erdenet Formalization Activities Begins	Completed
August-12	Baseline Data Collection Ends	Completed
September-12	Ulaanbaatar Formalization Activities Begins	Completed
November-12	Darkhan and Erdenet Formalization Activities Ends	Completed
August-13	Ulaanbaatar Formalization Activities Ends	Completed
June-14	SHPS Follow-up Data Collection Begins	Has Not Started
September-14	SHPS Follow-up Data Collection Ends	Has Not Started

⁴⁸ The five locations (Bayanzurkh district, Chingeltei district, and Songinokhairkhan district, Darkhan, and Erdenet) were each broken down into 3 packages with the goal of the contractor being that they completed one package approximately every 3 months.

VII. Bibliography

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VIII. Appendices

A. SHPS Questionnaire

B. Sample Size and Power Calculations for the Special Hashaa Plot Survey

From: IPA

To: Marc Shapiro and MCA-Mongolia

Introduction to Power Calculations

All statistical tests use data from existing samples to determine whether two groups in a population are significantly different from one another. The ease with which a statistical test can make this determination depends crucially on the size of the sample from which the data is drawn – i.e. the number of individual observations (people, neighborhoods, villages) in the data set. If the data does not contain enough observations, then it will be difficult for statisticians to see a difference between the groups being studied, even when such a difference exists.

For example, in the case of the Special Hashaa Plot Survey (SHPS), one might suspect that the households in the treatment group, which have had their plots registered and privatized, might invest more resources in their homes than households in the control group. However, it would be difficult to pick up such a difference and generalize it to all ger district households if the number of households in our sample data set were very small. Imagine that we only had 10 household in our data set, 5 treatment households and 5 control households. In this case, it would be difficult to argue that either set of 5 households accurately represents its respective sub-population. For the same reason, it would be difficult to argue that any difference in outcome indicators between these two samples accurately reflects a real difference that exists in the general population.

So, how big of a sample do we need to pick up the impact that we think our program is having on outcomes? Fortunately, there is a precise statistical answer to this question. The parameters that determine the ability of a test to detect a real difference in outcomes between different groups in a population are well understood. **I)** The most important of these parameters is the actual size of the effect (Δ). If our program is having a large effect on household outcomes, then it will be easier to pick up this effect in the data set. On the other hand, if our program is having a very weak effect on household outcomes, it will be harder to detect. **II)** A second parameter of importance is the amount of variation or noise in the data. This parameter is usually referred to as the standard deviation (Σ or SD). The SD will be different for every single outcome indicator in the SHPS. For some variables the SD will be high, for others it will be low. The larger the SD the more difficult it is to pick up a given effect and thus the larger the required sample size. Among outcome indicators, household income usually has the highest SD. For this reason, it will be used as a conservative estimator of the overall power calculation. The SD of income may differ significantly between different sub-populations, however. For example, households that have registered their land may exhibit a wider range of incomes than unregistered households. If this is the case, it is crucial that these separate SDs be captured or the resulting power calculations will be incorrect. **III)** A third parameter of importance is the “significance level” of the test. The significance level is simply the probability of committing a type I error. In the case of the SHPS, a type I error (A) would mean detecting a significant effect of the program when, in fact, such an effect does not exist. The significance level is set at 0.95 in rigorous impact

evaluations. **IV)** A fourth parameter of importance is the “power” of the test. Similar to the significance level, the power is equal to one minus the probability of committing a type II error ($1 - \beta$). In the case of the SHPS, a type II error would consist of NOT detecting a significant effect of the program when, in fact, such an effect does exist. Power is always set at 0.80 or 0.90 in rigorous impact evaluations. **V)** A fifth parameter of importance in determining sample size is the “intracluster correlation” (ρ). The intracluster correlation is simply a measure of the degree to which outcome variables of interest are correlated among observations in the primary randomization units. In the SHPS, intracluster correlation would be a measure of the extent to which households in the same geographic unit experience similar outcomes. If households in the same neighborhood experience very similar outcomes due simply to geographic proximity, then the intracluster correlation will be very high. A higher intracluster correlation tends to increase the sample size and the cost of conducting a survey because it requires the surveyors to draw more observations (households) from more clusters (neighborhoods). **VI)** A final parameter of importance is the proportion of observations in the treatment group. In most impact evaluations, half of the households are assigned to treatment, so the value of this parameter is usually 0.5

Once all these parameters have been determined, one simply plugs them into a formula that will give the number of observations required. In the case of the SHPS, this calculation will determine the number of households and neighborhoods needed to determine the impact of registration. Household income will be used as the base indicator for the power calculations as it generally has the largest standard deviation and will thus require the largest sample size.

Bounds

At this point in time, IPA believes that the overall sample size will include somewhere between 3,000 and 8,000 households. These bounds are based on our past experience working with similar projects. Generally, with this type of project a minimum of 2,000 household is required to achieve standard power levels of 0.80 to 0.90 in a given population. Realistically, we believe that the SHPS will require a sample of approximately 4,500 household in Ulaanbaatar and an additional 2,000 households in the aimag centers – a total of 6,500 overall. The aimag centers will essentially be treated as a separate sub-sample because we have reason to believe that their property rights environment is quite different from that of Ulaanbaatar. However, as will be explained below, in the absence of adequate data, it is impossible to know in advance how many household we will actually have to survey.

Key Variables for the Power Calculation

Unfortunately, at this time it is impossible to determine the necessary sample size for the SHPS because several of the parameters described above are unavailable. Most of the parameters can be assumed at their standard levels. However, we currently have little or no information on the standard deviation or the intracluster correlation of income in the khesege neighborhoods. Furthermore, we have no information regarding the registration status of households in these neighborhoods so we cannot determine the respective standard deviations of income for the registered and unregistered sub-populations. We lack this same representative information on income and registration status in the aimag centers outside of Ulaanbaatar. Without all of this information, it is impossible to determine the number of households that will need to be included in the study in order to credibly determine the impact of privatization activities.

The Solution: Two Stages with Five Option Periods

Given the constraints mentioned above, IPA recommends adopting a 2 stage approach to determining the sample size for SHPS. The first stage will involve conducting the survey with an initial representative base group of 3,000 households in both Ulaanbaatar and the aimag centers. Once the data from at least 2,000 of the 3,000 base period households has been received, we will be able to estimate the standard deviations and intracluster correlations for household income. Power calculations will be conducted and a final sample size determined. The IPA team will then advise MCA and the survey contractor regarding the number of additional households that will need to be surveyed. We will provide an overall number as well as a breakdown by registration status, aimag center, kheseg neighborhood, etc.

Then the second stage will begin. The survey contractor will need to collect the remaining data from the additional households. The contractor will need to plan this work very carefully, far in advance so as not to interfere with the implementation of the project. However, because we cannot know in advance the total number of additional household that will be required, data collection will be planned around 5 “option period” blocks of 1,000 households each. After the initial base period and sample size calculation, IPA will immediately be able to tell the contractor the total number of households to be surveyed (between 3,000 and 8,000) and the total number of the option periods to be exercised (between 0 and 5).

Some Examples

In order to illustrate more clearly how this process will work, it may be helpful to go through a few quick step by step examples showing how the option periods might work.

Example 1:

1. The initial base period survey is conducted with 3,000 households and data on household income is delivered to IPA. We assume that the effect (Δ) of the program is to raise household income by 5% and we assume standard levels for the other key parameters.
2. IPA conducts a power analysis on the data received.
3. We find that the SD of income is 41.66% and the intracluster correlation is 0.1
4. It is determined that approximately 6,500 households (325 clusters with 20 observations per cluster) will be required to reach standard power levels of 0.80 – 0.90
5. This number is rounded up to 7,000 and 4 of the option periods are exercised
6. The contractor will gather data on an additional 4,000 households – 1,000 in option period 1 and an additional 1,000 in option periods 2, 3, and 4.

Example 2:

1. The initial survey is conducted and we repeat the assumptions made in example 1.
2. IPA conducts a power analysis on the data received
3. We find that the SD of income is only 27.77% and the intracluster correlation is only 0.05
4. It is determined that approximately 2,000 households (100 clusters with 20 observations per cluster) will be required to reach standard power levels of 0.80 – 0.90
5. We have sufficient baseline data with the initial base sample.
6. None of the option periods are exercised and the contractors work is done for now.

These examples should make it clear that relatively small changes in the SD and intra-cluster correlation can require large changes in the needed sample size. If MCA-Mongolia wishes to responsibly minimize its costs, it must wait for the data to come in from the initial base period survey so that it can utilize the smallest sample size feasibly possible for a rigorous study

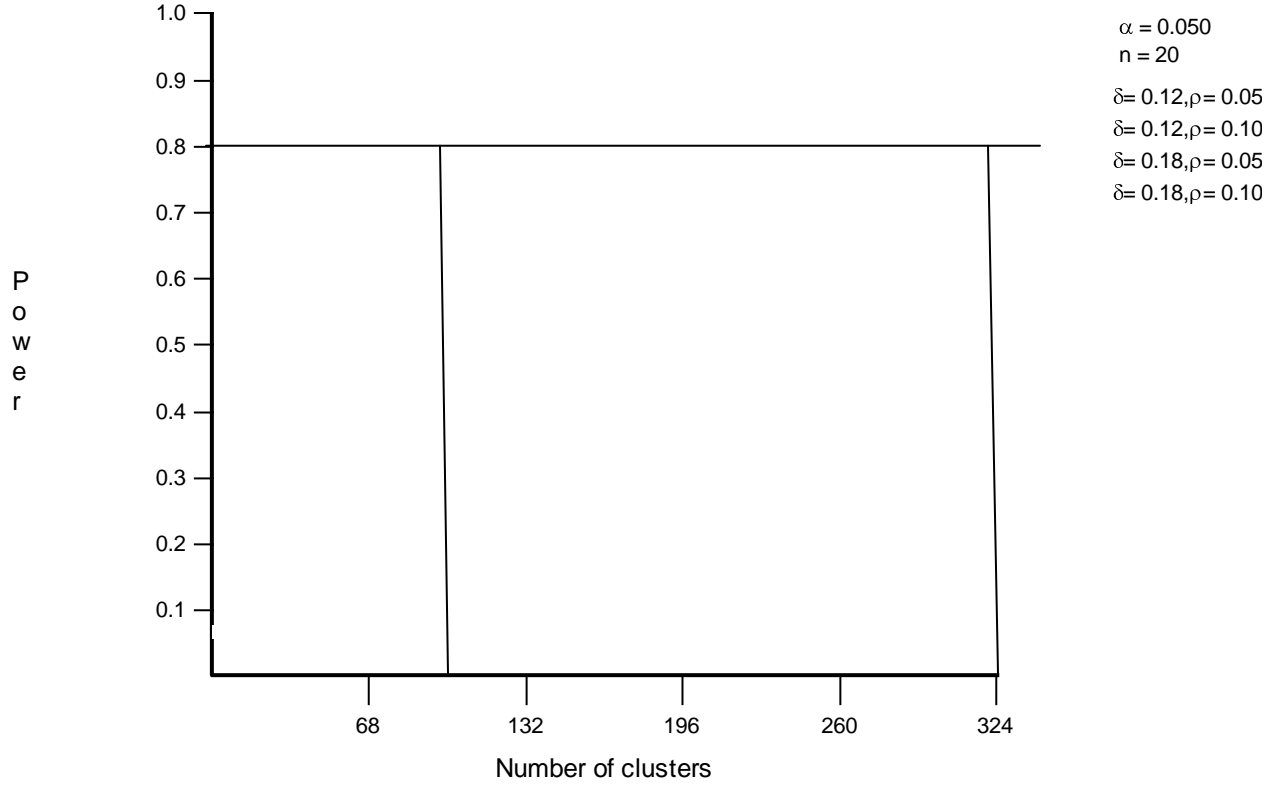
Appendix

This appendix provides some graphical and mathematical illustrations of the concepts and examples used above.

Key Parameters for Sample Size Calculations

Parameter Name	Symbol	Description
Effect Size	Δ	The size of the impact the program generates
Standard Deviation	Σ	The level of variation or noise in the data. This parameter will differ for every variable of interest and may also differ among particular subpopulations.
Significance Level	α	The probability of detecting a significant impact of the program when, in fact, such an impact does not exist. Usually set at 0.05
Power	$(1 - \beta)$	The probability of NOT detecting a significant impact of the program when, in fact, such an impact does exist. Usually set at 0.80 or 0.90
Intracluster Correlation	ρ	A measure of the extent to which observations (households) in the same cluster (geographic unit) experience similar outcomes
Proportion in Treatment	P	Proportion of households in the treatment group

Power as a Function of Standard Deviation and Intracluster Correlation

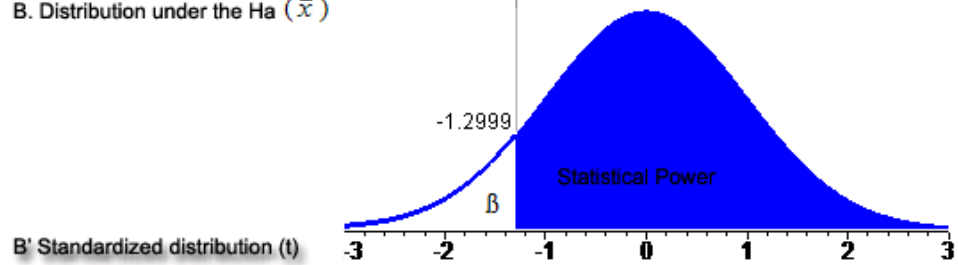
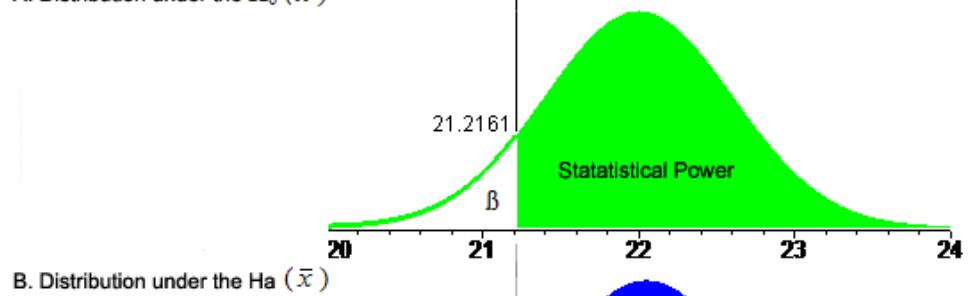
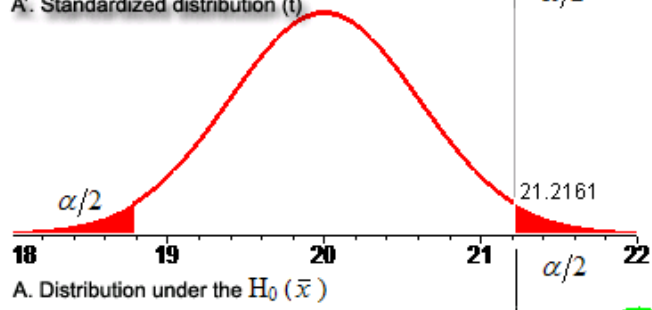
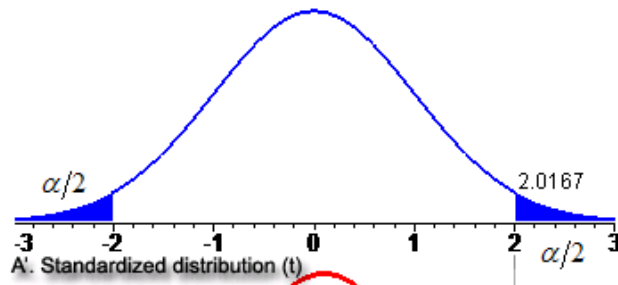


**Note: In the SHPS, clusters will be neighborhoods. In this graph, it is assumed that 20 households will be surveyed in each neighborhood*

Mathematical formula

$$N = \left(\frac{(\sqrt{1 + (n-1)\rho}) * SD * (t_{(1-\kappa)} + t_{\alpha}) * \sqrt{\frac{1}{P(1-P)}}}{\Delta} \right)^2$$

The equation shown above is the standard formula used above is used to generate estimations of sample size. All of the parameters used in this formula, except for $t_{(1-\kappa)}$ and t_{α} , have been explained above. $t_{(1-\kappa)}$ is itself a function of the significance level and other parameters. t_{α} is likewise a function of power and other parameters.



C. Ulaanbaatar, Erdenet and Darkhan Comparison

Ulaanbaatar is the capital city and by far the largest city of Mongolia with a population of 1,340,000. The second largest city Erdenet has a population of 86,866, while Darkhan has a population of 74,300.

Ulaanbaatar is the cultural, financial, educational and industrial center of the country and was founded in 1639. Around 700,000 people live in ger districts on the outskirts of the city while the rest of the city's population lives in residential apartments. The capital city today produces 40 percent of the gross domestic product. The Ulaanbaatar real estate market is extremely varied with purchase prices ranging from \$350 to \$8,000 m². According to purchase prices surveys, residential property prices have risen by as much as 20-35 percent from 2010-2011. In the same period, average rental prices across the city have risen by 18.5 percent, indicative of a strong rebound from the impact of the global financial crisis. The crisis itself hit the property market unevenly. Outside of the city center, average sale prices dropped by as much as 26.5 percent from 2009-2010 and Ulaanbaatar's construction industry was briefly hobbled by a withdrawal of investment. The end of 2010 saw rapid recovery in residential prices and by the first quarter of 2011 they surpassed the pre-crisis levels.

Built by the soviets in the 70's and 80's, Erdenet has the largest purchasing power per capita as it is the center for Mongolia's largest company and thus largest contributor to the state budget, Erdenet copper mines. In addition to the mine, the Erdenet carpet factory is the largest carpet manufacturer in Mongolia. Around 50 percent of the total inhabitants of the city still live in ger districts while the rest live in residential apartments. Real estate prices fluctuate according to location, not necessarily quality.

Darkhan was built with extensive economic assistance from the Soviet Union. As its name implies, the city was originally conceived to be a manufacturing site for Mongolia's northern territory. The city remains a mostly industrial region with a cement factory and a steel plant which were built in 1990. In recent years small and medium sized enterprises have been rapidly expanding. Eighty-six percent of the city's population lives in residential apartments, with the remaining population living in ger districts on the outskirts of the city.

Darkhan is the second largest educational center in Mongolia, making the educational level of the city's population very high. Hundreds of students go to Darkhan from other parts of Mongolia to study.

D. Logic Framework: Registration Program

