

Urban Property Rights Project Evaluation

Design Document

Prepared by Innovations for Poverty Action
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LIST OF ACRONYMS

ADB	Asian Development Bank
ALACGaC	Administration of Land Affairs, Construction, Geodesy and Cartography
ASRT	Agency for State Registry and Titles
CORS	Continuously Operating Reference Station
GASR	General Authority for State Registration, a Government Agency of Mongolia
GIS	Geographic Information System
GPS	Global Positioning System
GTZ	German Organization for Technical Cooperation
ILS	International Land Systems, INC (contractor to MCC)
IPA	Innovations for Poverty Action
LRC	Legislative Regulation Committee
MCA-M	Millennium Challenge Account - Mongolia
MCC	Millennium Challenge Corporation
MRTCUD	Ministry of Road, Transportation, Construction and Urban Development
NLIS	National Land Information System
NOAA	National Oceanic & Atmospheric Administration
PIU	Project Implementation Unit
PRP	Property Rights Project
RSPS	Registry System Process Survey
SHPS	Special Hashaa Plot Survey

TABLE OF CONTENTS

Contents

1. INTRODUCTION	5
1.1 Background and Objective of the Report.....	5
1.2 Current status of land in Mongolia.....	6
1.3 Land Issues.....	7
2. OVERVIEW OF THE COMPACT AND THE INTERVENTIONS EVALUATED 8	
2.1 Overview of the project.....	8
2.1.1 Program participants	10
2.1.2 Geographic coverage	11
2.2 Program Logic.....	11
3. LITERATURE REVIEW	12
3.1. Summary of the existing evidence	12
4. EVALUATION DESIGN.....	14
4.1. Registry System Process Survey (RSPS).....	14
4.1.1. Overview of the evaluation.....	14
4.1.2. Aspects of the PRP Activities Being Evaluated	15
4.1.3. Evaluation Questions & Key Outcomes	15
4.1.4. Methodology.....	16
4.1.4.1. Back Office Time Tracking Survey	16
4.1.4.1.1. Alternative Methodology and Sources of Data	18
4.1.4.2. Banking Survey.....	19
4.1.4.3. Informational Interview with GASR Registry Officials	20
4.1.5. Study Sample	21
4.1.5.1. Back Office Time Tracking.....	21
4.1.5.2. Banking Survey.....	21
4.1.5.3. Informational Interview with GASR Registry Officials	21
4.1.6. Analysis Plan	21
4.1.7. Timeframe of Exposure	22
4.1.8. Limitations, Challenges and Risks.....	22
4.2. Special Hashaa Plot Survey (SHPS)	22
4.2.1. Overview of the evaluation.....	22
4.2.2. Evaluation questions	24

4.2.3.	Policy relevance of the evaluation	24
4.2.4.	Methodology/ Impact evaluation design.....	25
4.2.5.	Study Sample	28
4.2.6.	Statistical Power.....	29
4.2.7.	Analysis Plan	29
4.2.8.	Timeframe of exposure	30
4.2.9.	Limitations, Challenges and Risks.....	30
4.2.10.	Identified Risk and Response	30
5.	DATA SOURCES AND COLLECTION.....	31
5.1.	Registry System Process Survey (RSPS).....	31
5.1.1.	Data collection plans.....	31
5.1.1.1.	Back Office Time Tracking Survey	31
5.1.1.2.	Banking Survey	32
5.1.1.3.	Informational Interviews with GASR registry workers	33
5.2.	Special Hashaa Plot Survey (SHPS)	33
5.2.1.	Baseline Survey	34
5.2.2.	Tracking Survey.....	35

1. INTRODUCTION

1.1 Background and Objective of the Report

Mongolia, as a long-standing nomadic society, has a tradition of migrating culture and has historically lacked concept of land or property ownership. However, the dynamics of Mongolian society is changing as the country transitions to a market-driven economy. Scores of rural Mongolians are abandoning traditional nomadic herding lifestyles and migrating to the cities in search of a better future. Herders are managing livestock differently according to market incentives now that pastureland usage is no longer tightly controlled by the state. From 2001 to 2011, 380,000 rural residents moved to Mongolia's three biggest cities, Ulaanbaatar, Erdenet, and Darkhan, many settling in underdeveloped, unplanned urban areas, called ger districts. Herders residing in areas surrounding the three biggest cities have increased the size of their herds by 67%¹ in the same period. Influx of migration to ger areas have highlighted the need for strong and cohesive property rights regulations and more accessible pathway to property ownership. Likewise, heavier use of rangeland surrounding urban areas is prompting consideration of models of rangeland management and usage.

In 2008, the Government of Mongolia entered into its first Millennium Challenge Compact with the Government of United States, acting through the Millennium Challenge Corporation (MCC), a United States government corporation. The Compact had four project objectives, one of which was to increase the security and capitalization of land assets held by lower-income Mongolians, and to increase peri-urban herder productivity and incomes. The Property Rights Project was set up to meet these dual project objectives, but as the objectives were not entirely overlapping in scope, two separate project implementation units were set up to achieve the two objectives. Urban Property Rights Project was set up to increase the security and capitalization of land assets held by lower-income Mongolians and Peri-Urban Rangeland Project was set up to increase peri-urban herder productivity and income. The two projects had separate goals, implementation teams and activities. Innovations for Poverty Action (IPA) was contracted to provide evaluations of both Urban Property Rights Project and Peri-Urban Rangeland Project. This design report is exclusively concerned with the evaluation of Urban Property Rights Project.

The design report provides an overview of Urban Property Rights Project in Section II along with the project logic and the expected outcomes. Section III reviews the existing literature on land rights and economic effects of land rights programs. Section IV discusses the research design in depth by outlining the key research questions and evaluation methodology; Section V details the data collection activities.

¹ According to the Mongolian Statistical Information Service Database, www.1212.mn

1.2 Current status of land in Mongolia

The bulk of migrants are moving to Mongolia's three biggest cities – Ulaanbaatar, Erdenet and Darkhan – where they most often settle in underdeveloped unplanned urban areas, called ger districts. Mongolian law gives migrants the right to claim an unoccupied parcel of land in urban areas as well as the right to obtain full private ownership rights over that land. However, the complexity and the expense of this process often make it difficult to obtain formal private titles and thus use the land as a marketable asset.

Land ownership is governed by the Law on Allocation of Land to Citizens of Mongolia that was passed on June 27, 2002, effective May 1, 2003. This law gave Mongolian citizens the right to own land under two means, for household residential use and for entrepreneurship use. In 2005, amendment to this law was introduced that entitled each household to one parcel of land free of charge. This law was further amended in May 2008 that allowed every citizen, rather than household, to own one parcel of land free of charge. The size of the free parcel of land depends on its location². The legal processing time for the application of land ownership is three months after all application documents have been received by the relevant Governor's office. This free provision of land was set to expire in 2012, but the provision was extended in 2012 to be valid until May 1, 2018.

In addition to legislation governing land ownership, Government of Mongolia (GoM) passed Law on Immovable Property Registration in which regulates activities pertaining to the immovable property, i.e. structure, on top of the land³. Passage of this law was accompanied by a Parliamentary decree that established State Registration Office for Property Ownership, a government office in charge of administrating property rights, under Ministry of Justice. However, this initial law on immovable property that was passed in 1997 was superseded by Law on Property Ownership and National Registration for Ownership of other Related Property on June 19, 2003. This law governs the ownership registration, capitalization of the immovable property and immovable property's relationship to the land (as per the Land Law of Mongolia).

² Section 7.7.1 of The Law on Allocation of Land to Citizens of Mongolia shows the sizes of allowed land titling for each family. The size of land differs depending on location. 1) Within Ulaanbaatar city up to 700m² 2) within aimag centers up to 3500m² 3) within soum centers up to 5000m² 4) land along roads connecting Ulaanbaatar and aimag centers. The 4th item was added as part of the 2008.5.22 amendment. However, the Citizen's Representative's Committee that is in charge of a specific area has the right to declare the land size to be less than the size stated in the law, especially for denser populated districts or smaller sized districts or provinces.

³ According to the Law on Property Ownership and National Registration for Ownership of other Related Property, immovable property is distinguished from land as "structure, building that cannot be used for the purpose it was built for once separated from the land on which it is built on"

In 2003, the State Registration Office for Property and the Agency for Land, Geodesy and Cadastre were merged into Administration of Land Affairs, Construction, Geodesy and Cartography (ALACGaC) under the Ministry of Construction and Urban Development. The combined entity consisted of two departments: Land Affairs and Property Rights Registration. Three year later in July 2006, Property Rights Registration department of ALACGaC was separated from this agency and became an agency in its own right as Agency for State Registry and Titles (ASRT), equivalent in stature to ALACGaC itself.

On June 25, 2009 the Law on National Registration was passed and established the General Authority for State Registration (GASR) which consisted of ASRT, Legal Entity Registration department and Civil Registration department all which are now regulated under the Ministry of Justice. Currently, administration of property rights registration sits with GASR while ALACGaC regulates overall land issues such as land usage, zoning and maintain cadastral and geographical information.

1.3 Land Issues

The nature of ger area's informal settlement means that many of the residents are residing in unregulated or restricted zones. Residents end up settling in near utility corridors, close to high voltage power transmission lines or water supply lines. In addition, the land plots, known as hashaas in Mongolian, are informally settled in by the residents and boundary disputes are common. The lack of uniform address system, and incomplete coordination of agencies oversee property rights, and informal nature of the ger areas give arise to land plot disputes over hashaas with overlapping boundaries and hashaas with same addresses. Some addresses are incomplete, or contain errors.

Complicating this further is the existence of two agencies that have purview over different aspect of property registration. ALACGaC is responsible for land cadastral mapping while GASR handles the land registration process. These two agencies do not have universal platform to share information and are independent agencies. The existing procedure requires citizens to visit ALACGaC to verify that the land they want to register is not already claimed or have existing land conflict. The citizen can apply for title to the land at GASR after this verification occurs at ALACGaC. This requires multiple trips for the citizen to both agencies and in some aimags, the offices for the two agencies are not located near one another which requires even more effort for the citizens to complete the process.

Moreover, prior to decentralization of the property rights registration, the central GASR office were experiencing a large volume of residents visiting GASR to complete various transactions. The central GASR building was dangerously crowded and could not accommodate the number of residents coming to conduct transactions there. In addition to physical congestion, the work was bottlenecked as the last step required in the land titling process required signature of registry

officer and there was not enough registry officers to handle the volume of application.

2. OVERVIEW OF THE COMPACT AND THE INTERVENTIONS EVALUATED

2.1 Overview of the project

In 2007 the Millennium Challenge Corporation signed a Compact with the Government of Mongolia and established the Millennium Challenge Account of Mongolia (MCA-M). The Compact implemented the Property Rights Project to strengthen urban and peri-urban property rights by improving the property registration system and the ability of Mongolians to obtain and utilize and transfer formal land titles from 2008 to 2013. The project was split into two sub-projects – Urban Property Rights and Peri-Urban Rangeland. This report covers the Urban Property Rights component. The Peri-Urban component is being evaluated separately. In addition to improving the formal systems associated with the process of registration of land rights, MCA-M aimed to provide privatization and registration support to approximately 53,000⁴ untitled plots of land in urban areas of Mongolia.

MCA-M's Urban Property Rights Project (PRP) implemented activities in two programmatic components to improve the ability of Mongolians to obtain formal titles and improve the formal registry system. The first component consisted of a series of activities that were meant to strengthen the institutions administering property rights. The second component of PRP provided direct assistance to the residents of ger areas with obtaining titles to their informally occupied land. Specifically, PRP used MCC funds to:

1. Improve the formal system of land privatization and registration:
 - a. Establish 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. Upgrade 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 on the use of each. Create a centralized electronic registration system that is accessible from any registration office in Mongolia.

⁴ Initially, the project aimed to provide titles to 75,000 previously unregistered plots; however this target was reduced in 2011 to 53,000 based on assessment of available number of plots for formalization activity.

- c. Improve the capacity building for land offices, including the creation of Land Market Specialist (LMS) 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. Upgrade 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, (Songinokhairkhan; Bayanzurkh; Chingeltei; and Baganuur), and upgrades for state registry offices in eight regional centers around the country [City of Erdenet (Orkhon aimag); City of Darkhan (Darkhan-Uul aimag); 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)].
2. Privatize and register land plots in ger areas:
- a. Provide active assistance to low and middle income households in completing the steps to privatize and register rights for land plots.
 - b. Identify utility corridors and map public land areas within ger district areas.

This second component of the project aimed to provide direct assistance to approximately 53,000 households seeking to privatize and register land plots in urban ger areas. Assistance included support for both the necessary paperwork as well as the registration fees.

Some of the activities initiated under first component of the project that are more pertinent to this evaluation are briefly described below.

Part of PRP's focus was harmonizing systematic inconsistency and redundancies that may exist in legislative or regulatory realm, correcting inaccuracies in the administrative information and data, and creating larger set of access points for more Mongolians to access formal land systems. To that end, PRP initiated number of activities that are described below, some of which that are most pertinent to this evaluation are briefly described below.

Commission of stakeholders and technical experts, Legislative Regulatory Committee examined legislation, regulations and business processes involving cadastral, geographic information and property information and put forth recommendation that included series of legislative revisions. The legislative revisions that PRP sponsored included correcting for legal inconsistencies, creating a framework to allow sharing of data between GASR and ALACGaC, and new land law. These revised legislation were pending Parliamentary approvals at the end of the Compact.

PRP also invested equipment and infrastructure would improve the accuracy of geographical and cadastral information. Establishment of CORS and provision of GPS allowed for creation of accurate maps that was essential in producing accurate records at ALACGaC. In addition to material investment, PRP provided training that

allowed ALACGaC land officers to use the new equipment and maps accurately and more quickly in services of title registration. The reconnaissance work that was necessary for providing direct assistance with privatization and registration of land plots in ger areas also contributed greatly to GASR and ALACGaC records reflecting on the ground realities.

PRP focused on creating more access to formal land system for Mongolians by decentralizing the registration process. To this end, PRP oversaw the establishment of property right department in district GASR offices and renovation and upgrade of facilities and equipment in GASR property rights offices. Decentralization highlighted the need for secure and online-based property record management system. PRP also reviewed the functionalities required for secure property record management system and worked toward selection and installation of ePRS during the Compact. To complement the transition to digital property records, PRP also began digitization of paper-based property records.

In addition to these activities, PRP conducted public awareness and outreach campaign to promote importance and benefits of land ownership and geared the mass information campaign toward residents of ger areas.

In addition to these two programmatic components, the PRP gave special attention to gender issues by promoting women's participation in land privatization and property ownership registration through educating local hashaa plot residents, training land officers and state registrars as well as nationally raising awareness. It targeted women for participation in registration, included a gender box in the new ePRS system so that it shows gender ratio on property registration, cooperated with the Mongolian Women's Federation in addressing issues of inequality and organized local trainings for aimag and bag women. In addition, a gender and land survey was completed to determine whether women's land tenure and formal property rights are correlated with increase in women's status within the household and a decrease in domestic violence.

2.1.1 Program participants

While the explicit aim of the Property Rights Project was to raise the security and capitalization of land assets of lower-income Mongolians, many of the initiatives enacted as part of the institutional strengthening measures benefited all Mongolians. Because effects of upgrades to physical and geospatial structures are not targeted or restricted to any specific user group, Mongolians of all income groups who accessed services of ALACGaC and GASR Property Rights Division were beneficiaries of these upgrades. Similarly, the recommendations and changes to the amended Law on Allocation of Land to Citizens of Mongolia will benefit all Mongolians who make use of government services related to property rights.

The second component of the project, in which residents of ger areas were targeted to receive assistance with the plot registration process, was more focused on lower-income Mongolians as residents of those informal settlement areas tend to have lower income than residents of planned central urban areas. Subset of residents in Ulaanbaatar and eight regional centers were the planned target beneficiaries of the direct registration assistance. At the onset of the project, the project set target of 75,000 ger areas. This target was revised in 2011 to 53,000.

2.1.2 Geographic coverage

Some activities under the first component of the project did not have specific geographic coverage as many of the institutional strengthening activities were national in scope. Recommendations from LRC were not limited to specific regional areas. Similarly, geospatial equipment (6 Continually Operating Reference Stations and 16 GPS units) and staff that were trained on their usage, would improve the mapping accuracy and durability of geodetic control points, thus assuring accuracy of cadaster maps. This activity would not be limited to specific geographic area but would be applicable for the entire country. PRP also organized several seminars and workshops for GASR and ALACGaC staff as part of the capacity building of state registrars and land officers for the whole country.

Upgrades and establishment of district offices in four districts (Songinokhairkhan; Bayanzurkh; Chingeltei; and Baganuur) impacted residents outside those districts as the volume of work handled by head office decreased with decentralization of functions of Property Rights division of GASR.

The formalization activity was carried out in 3 districts of the capital city of Ulaanbaatar (Bayanzurkh, Chingeltei, and Songinokhairkhan district) and eight other regional centers around the country. The eight regional centers are: Darkhan, Erdenet, Khovd, Choibalsan, Uliastai, Kharkhorin, Zuunmod and Undurkhaan.

2.2 Program Logic

The short term expected outcome of first component of the project, institutional strengthening measures, is reduced time and cost to registering and transacting on land. The four sub activities under the first components were meant to:

- 1) streamline and clarify processes and regulations related to land transactions by issuing recommendations through LRC and training Land Market Specialist who were tasked to assist citizens in issues related to hashaa plot privatization and registration, bank loans, land markets, as well as organizing workshops and answering questions from residents.
- 2) make land related information accurate through updating geospatial and property rights information database infrastructure, and
- 3) decrease wait time and improve the experience of conducting property rights related transaction at GASR offices by creating more access points to conduct

property related transaction with establishment of four new registry offices and refurbishing 11 existing offices.

These activities were also meant to foster confidence in formal land system by strengthening the institutions that are administering property rights. The decrease in time and cost, coupled with increased confidence in formal land system was meant to encourage participation in the formal land system. The project's logic is illustrated in Appendix A.

The short term expected outcomes of the second component, the direct assistance with the land formalization process, are greater participation in formal land system, improved perception of land security, and access to credit by assisting residents with getting formal titles to the land they are residing in, the residents were now interacting with the formal land system. By resolving conflicts and issuing land titles to residents, the project aimed to increase security that residents felt regarding their right to reside on the land. By granting legal rights over the land, residents can use the land as collateral in obtaining credit.

Subsequently, the greater participation in formal land system was meant to spur on investment on the land and formal land transactions such as mortgages and loans resulting in increased capitalization of land assets. The land, with greater security, was expected to rise in value. Increased investment in the land and land values were long-term outcomes of the second component, direct assistance with land formalization, of the project.

3. LITERATURE REVIEW

3.1. Summary of the existing evidence

The relationship between property rights, investment, and productivity is central to many contemporary and historical discussions regarding the foundations of economic development. Researchers from a wide variety of disciplines have emphasized the crucial role that property rights play in establishing the basis of prosperity.

Researchers have proposed any number of theoretical mechanisms through which titles may potentially improve property rights and thus affect productivity and growth.⁵ An exhaustive discussion of all these the mechanisms obviously lies outside the scope of this design document. However, it may be helpful to review some of the major hypotheses that have been formulated regarding the relationship between property rights, productivity and growth:

⁵ De Soto himself has articulated no less than six different mechanisms that allow efficient property rights systems to “generate capital” and promote growth. Timothy Besley and other theorists have proposed yet more mechanisms.

1. By reducing the risk of expropriation and thus increasing the long-term rate of expected returns from investments, security of tenure can be expected to increase an individual's incentive to invest. Secure property rights incentivize productive investment because the owner of the property in question has a guarantee that he or she will reap the full future benefits of any productive investment they make in the present.
2. Secure property rights increase the collateral value of assets by facilitating contractual arrangements surrounding the possession and repossession of property. In the presence of uncertainty, lenders often require collateral as a guarantee for loans and credit. Individuals with informal property rights or no documented proof of ownership may therefore be rationed out of the formal credit market. If official titles could be emitted to document and improve informal property rights, then these individuals may find it easier to use their property as collateral. This in turn should increase lenders' willingness to supply credit and thereby increase investment.
3. Secure property rights can stimulate real estate markets by making it easier for individuals to buy and sell their property rights. Land and other factors of production can then be expected to be allocated more efficiently across individuals.
4. Property rights and asset ownership for women in particular have been in many country contexts associated with greater female economic and social empowerment.

As a result of these theories, aggressive land-titling projects have been undertaken in a large number of developing countries. However, the linkage between property rights, access to credit and increased investments as well as gender difference of these factors have yet to be well-established empirically. Some studies indicate that land titling lead to greater access to credit, increase in income, and land prices though variation the type of land market, type of land, and type of title available where the evidence exists makes it difficult to draw conclusions from this set of data⁶. More recently, a study⁷ on land titles in Peru found national titling program had significant impact on the rate of residential investment in urban slums. The study also found that a title was positively associated with approval from public sector loans though it showed no association with approval for private banks⁸. Other studies⁹, however, showed that investment in land and housing, access to formal credit and municipal revenues showed no significant evidence of poverty reduction.

The impact evaluation study of the MCA-M PRP will be one of the first major studies by MCC to examine the effects of a titling program using a rigorous randomized controlled trial methodology.

⁶ "The Benefits of Land Registration and titling: economic and social perspectives", Gershon Feder and Akihiko Nishio, *Land Use Policy*, Vol.15, No.1, pp. 25-43, 1999

⁷ "Property Rights and Investment in Urban Slums", Erica Field, Harvard University

⁸ "Do Property Titles Increase Credit Access Among the Urban Poor?", Erica Field and Maximo Torero, March 2006

⁹ "Social and Economic Impacts of Land Titling Programmes in Urban and Peri-Urban areas: International Experience and case studies of Senegal and South Africa", Geoffrey Payne, March 2008

4. EVALUATION DESIGN

As noted in the Introduction section of this report, there are separate studies looking at the two components of the Urban Property Rights Project. The remainder of the report discusses the design and data collection activities of the two evaluations separately.

IPA designed an observational study named Registry System Process Survey (RSPS) to measure the changes associated with the various activities that are part of the project's first component. While the nature of the project activity does not allow for a rigorous method of evaluation, the pre-post comparison will provide a quick snapshot of the project's performance against the intended outcomes of the interventions.

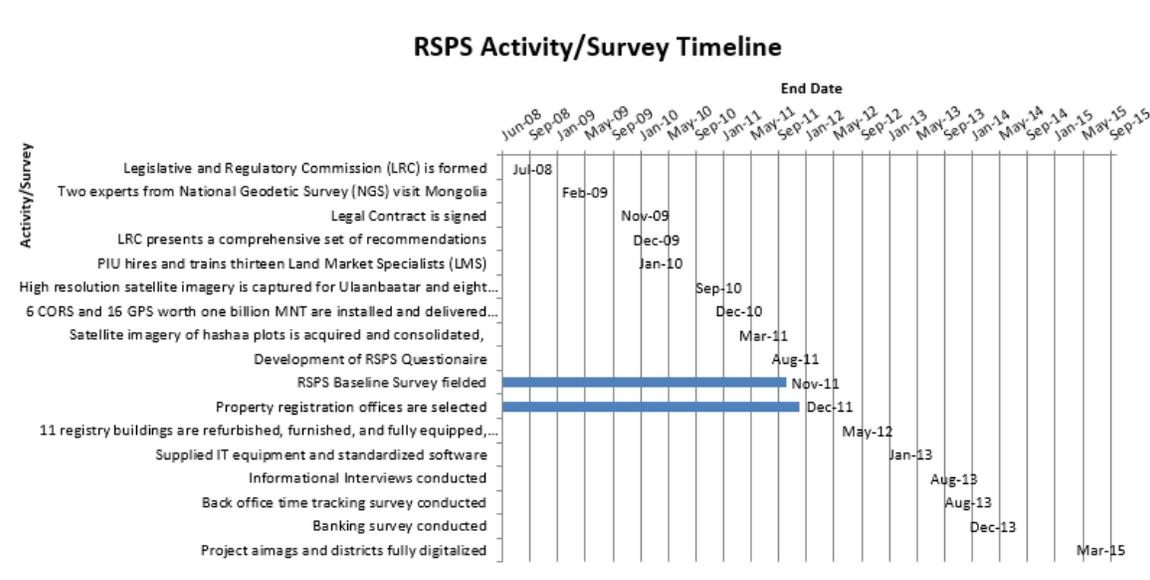
The impact of direct assistance with title process that constitutes the second project component will be assessed through Special Hashaa Plot Survey (SHPS), a study using randomized control trial (RCT) methodology.

4.1. Registry System Process Survey (RSPS)

4.1.1. Overview of the evaluation

Registry System Process Survey (RSPS) was initially designed as a pre-post measurement of conducting real property transactions before and after implementation of some subset of PRP activities, including construction and renovation of GASR district officers. Baseline was fielded from September 2011 to January 2012 and it was designed to capture the average impact of the PRP activities at GASR offices. Survey respondents, who were citizens visiting GASR offices to conduct land related transactions, were interviewed at GASR offices and tracked during the course of the transaction. However, in May 2013, with revised management at IPA and MCC investigation of GASR's administrative practices, it became evident that measuring the time experienced by respondents conducting transactions at GASR would unlikely effectively capture the time savings of the PRP activities. The evaluation design was weak due to lack of full understanding of registry environment GASR procedures and project activities and lack of coordination with PIU. In summer 2013, MCC and IPA agreed to modify the planned RSPS to better capture the potential time savings of institutional strengthening measurements of PRP. The following sections elaborate on the revised evaluation design and data collection activities that was fielded in summer 2013. The original RSPS design and discussion of activities are included as Appendix B.

Figure 1



4.1.2. Aspects of the PRP Activities Being Evaluated

The survey instruments focus on evaluating the implementation of an electronic property registry system (ePRS) at GASR and a new GASR law that grants access to property records to other government agencies and private entities, such as banks and notaries. Currently, property records are not accessible except for property's owner and GASR. The evaluation will also measure the effect of full digitization of the paper-based archive.

Some of the PRP activities had already concluded by the start of the baseline data collection, such as decentralization of GASR by establishing district offices and refurbishment of existing offices (See Figure 1). Those activities which were complete prior to baseline data collection cannot be measured by the evaluation. In addition, because the PRP activities are meant to work in tandem with each other, the effectiveness of the evaluation will be contingent on the implementation of all aspects of the project. For example, digitization of paper-based records will have minimal effect if there is no system that allows access to those digitized records.

4.1.3. Evaluation Questions & Key Outcomes

The current RSPS design is able to support the following evaluation questions:

1. What are the effects of installation of ePRS, the accompanying digitization of property records, and amendment of legislation that govern access to property rights records on time and cost of conducting a property transactions?
 - a. How does this effect differ for different segment of GASR users such as male and female and wealthier or poorer respondents?
2. What are the perceptions of GASR registry workers on the impact of PRP activities on their work?

To answer the first evaluation question, IPA designed two survey instruments, Banking Survey, and Back Office Time Tracking Survey that are measuring the time and cost involved in property transaction. To answer the second evaluation question, IPA conducted informal qualitative interviews with GASR registry workers. The design and survey instruments are described below.

4.1.4. Methodology

The two survey instruments were devised to better measure potential time and cost savings experienced by two “user” groups. Back Office Time Tracking measures the transaction times of the actual paperwork or records. This is the time that is experienced by the GASR registry workers in processing the property related transaction. Banking Survey measures the total time and cost that a mortgage or loan seeker spends in obtaining and registering a mortgage or loan through bank. Included in this time spent is the time that the mortgage or loan seeker spent in interacting with GASR to obtain necessary paperwork or register the mortgage or loan at GASR offices. IPA and MCC decided to field these two survey instrument for a couple different reasons. First, even if installation of ePRS and digitization of paper records expedites the processing time at GASR, if the GASR users are not instructed to return to GASR to pick up processed paperwork within shorter time than prior to installation of ePRS, then the time saving aspect of ePRS will not be captured. During May 2013 visit to GASR, IPA and MCC found out that GASR registry workers were instructing the users to return at regulation appointed time. The paperwork might have been processed much quicker than regulation time, but if regulation is not updated then the GASR users will not be experiencing the time saving. Thus, it was decided that GASR processing time was also necessary to measure, in addition to time experienced by GASR users, and Back Office Time Tracking data collection was designed. Second, the long-term intent with installation of ePRS and digitization of paper records, was to enable electronic access to property records to entities other than citizen owning the land such as banks issuing mortgages and loans. If this intent were to be realized, then the citizens will no longer be required to visit GASR offices when conducting secondary transactions on the land. Thus, it was decided that data should be collected at banks rather than at GASR offices to ensure comparable post-intervention data collection. This point is elaborated in discussion of Banking Survey.

Interview with GASR Registry Workers was conducted to understand GASR workers perception of how PRP activities affected their work. The methodology of the three data collection instruments are described below. The Banking Survey and the template used for Interview with GASR Registry Workers are included as Appendix C and D, respectively.

4.1.4.1. Back Office Time Tracking Survey

The Back Office Time Tracking Survey measures the procedural time at GASR offices for select transactions. This survey focuses on time-saving experienced by GASR workers resulting from the installation of ePRS and the digitization of paper archives.

Installation of ePRS is meant to make GASR procedures more efficient by eliminating visits to paper-based archives and the need for paper-based log books. In addition, it will also eliminate some transactions at GASR entirely because banks or notaries will be able to confirm information via a web-based interface that will grant them access to select property records, reducing the workload at each of the GASR offices. IPA worked with MCA-M and the PIU to determine which registration and transaction processes had the greatest economic significance and would likely see the greatest impact from the implementation of the ePRS. The eight selected processes are listed below in Table 1 below. The table provides a brief description of each transaction¹⁰.

Table 1. Transactions

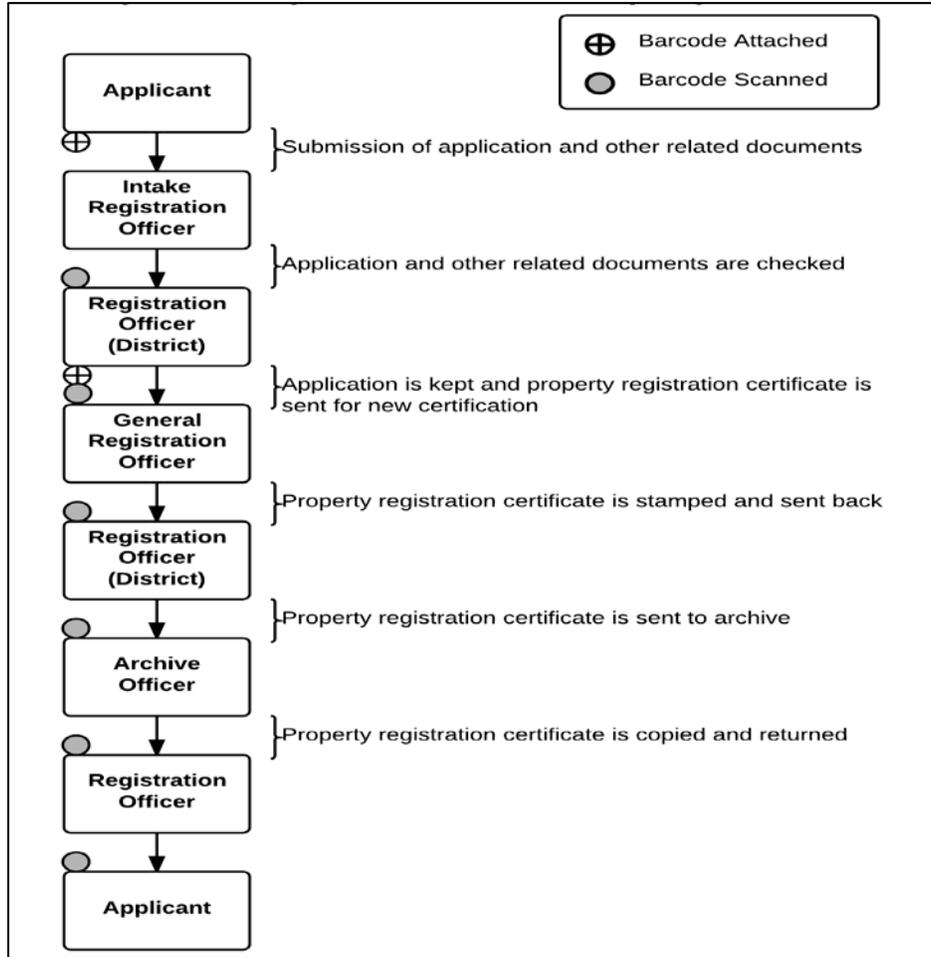
No.	Transaction Type	Description
First Time Registration		
1.	Registration of ownership rights of immovable property	Individuals living in ger district areas undergo this process to obtain property ownership rights for non-land immovable property
2.	Registration of ownership rights of land	Individuals undergo this process to establish proof of land ownership. State-backed registration gives them greater security of title and provides them with better protection against claims of adverse possession.
Secondary Transactions		
3.	Buying, selling, or subdividing property	A buyer can use this process to transfer the ownership of the property from his/her name to the name of the purchaser.
4.	Gifting property	This process allows for a land owner to gift their land title to someone else.
5.	Inheriting property	Individuals use this registration process to claim land they inherited.
6.	Registering a mortgage	When individual obtains mortgage from the bank the contract must be registered at GASR.
7.	Registration of assets as collateral (Land or Property)	Individuals apply for this process to use their land or property as an asset to obtain a bank loan.
8.	Reference letter of immovable property	Individuals apply for this process to obtain reference letter from GASR proving that the individual owns the immovable property. Usually banks require this letter from an individual applying for loan.

The procedural times were tracked by attaching barcodes to documents associated with the key transactions and scanning the barcodes at specific stages to track the paperwork's progress through GASR offices. In order to ensure that all key steps were tracked the survey contractor compiled a step by step diagram for the eight transactions that were to be observed. With these diagrams, they were able to identify where and when barcodes

¹⁰ www.burtgel.gov.mn

were to be attached to the applications and certificates and where those barcodes should be scanned. An example of one of these diagrams can be seen in Figure 2 below.

Figure 2. Diagram of Registration of Ownership Rights of Land¹¹



4.1.4.1.1. Alternative Methodology and Sources of Data

Back Office Time Tracking Survey was developed to capture procedural time for various land-related transactions. At the time of study re-design, in summer 2013, it was believed that there was no other method to obtain average processing time for the various surveys other than to conduct a data collection of a sample of the records that were being processed at GASR. However, subsequent trips to GASR in December 2014 revealed that historical records may be utilized for this purpose. For example, GASR kept log book that recorded intake date of records, date that a transaction was completed at GASR, and the data that respondent picked up the processed paperwork or certificate. By linking the intake log book with transaction records, processing time for various transactions can be

¹¹ Data Collection Completion Report, Urban Registry Systems Process Study Back-Office Tracking Survey (Wave I), MEC LLC, August 21, 2013.

constructed. If this methodology is possible, then it may be feasible to see how activities PRP has completed prior to Back Office Time Tracking Survey baseline affected processing times at GASR.

4.1.4.2. Banking Survey

The second survey instrument, the Banking Survey, measures the time and the cost of completing land or property based transactions, such as mortgages and collateralized loans, at banks. The Banking Survey measures the time experienced by GASR users who must visit GASR multiple times to obtain proper documentation for the property they own and to register the mortgage or the loan they obtain on the property. The Banking Survey is meant to capture the time and cost savings brought on by ePRS, the complete digitization of the paper archive, and the adoption of the updated GASR law. When all the PRP initiated activities are fully realized and working in sync, the time and cost of registering a mortgage or land-based loan at banks should be reduced.

The evaluation design for the Banking Survey is a pre-post design that is meant to capture the time and cost savings of registry system improvements for land-based transactions at the banks. IPA developed the survey to conduct at the banks instead of GASR offices because many of the transactions that are processed by GASR offices are planned to be handled by banks directly accessing GASR records via web-based interface. At the time of the baseline data collection, mortgage applicants had to obtain a reference letter on the property the applicant was trying to acquire that verified that the seller owned the property. This letter was only obtainable by visiting a GASR office in person. With a fully functional ePRS, bank representatives will be able to directly verify ownership through ePRS. This change in procedure would save the individual applying for a collateralized loan from having to make visits to both GASR and the bank. Registration of a mortgage or property-based loan is another transaction that can be handled by banks through a fully functional ePRS rather than at GASR. If these changes take place as expected, it will not be possible to collect analogous post-intervention data if baseline had been collected at GASR rather than banks. Thus, the survey instrument was developed to be fielded at the banks to applicants of mortgage and property-based loans. The Banking Survey collected information on respondent's motivation for applying for a bank loan, the overall time and money spent on completing the loan processes, and the time and cost of specific GASR transactions necessary for a loan or mortgage application.

Four of the largest banks in Mongolia (Khan, Xac, Golomt and Trade and Development Bank (TDB)) were selected to conduct the survey and MCA-M secured permission for enumerators to conduct surveys within these banks. These banks represent most of the consumer banking activities in Mongolia. Of the four banks included in the survey, the survey contractor talked with bank managers to select branches which had a high traffic of individuals applying for loans using land and or property as collateral. In the end, 26 branches from the four selected banks were selected to participate in the Banking Survey.¹²

¹² The bank breakdown of 26 branches were three Golomt Branches, 10 Khan Branches, three Xac Branches, and 10 TDB Branches.

The data collection procedure involved three separate surveys. The first survey was called the Potential Respondent Survey, which was used to identify potential respondents during the early stages of the loan application process. Respondents were approached at bank branches and the Potential Respondent Survey was administered to see if they were obtaining either a land-based loan or a mortgage at the bank. If they were, then the enumerator would immediately administer the Initial Survey which collected information about the early stages of the respondents' loan process and time and costs of GASR related activities. Those that completed these two surveys were provided 7,000 MNT¹³ as an incentive for participating in the study. After approximately two weeks, the enumerators called the respondent to administer the Follow up Survey. If the respondent had completed or canceled the loan process, the enumerator would administer the survey. If they had not, then the enumerator would follow up every few days until the respondent had concluded the loan application process. After completing this survey, respondents were paid 3,000 MNT in phone units.

4.1.4.3. Informational Interview with GASR Registry Officials

The Informational Interviews with GASR Registry Officials collected information about their perception of the GASR process and their awareness of the PRP. IPA conducted the interviews in three GASR offices in Ulaanbaatar in late July and early August 2013. IPA was able to interview a total of twelve GASR registration officers who work directly with customers, nine from Bayanzurkh, Chingeltei and Bayangol districts and three from Darkhan and Erdenet. The selection of GASR registry officers who gave the interviews were at the discretion of GASR, based on their availability and knowledge of ePRS. At the time of the interviews, some of the PRP activities had concluded, including the establishment and refurbishment of GASR offices, public outreach, and HR training for GASR offices. The ePRS was being piloted, but not fully implemented and digitization was still in progress. The heavy workload experienced by GASR at the time of the interviews meant that the officers could only be available for a limited time to give brief interviews. The interviews focused on collecting the following information related to the impact of the PRP activities:

1. Time, cost, and steps associated with transactions
2. Changes in registration rates and the drivers of those changes
3. Changes in GASR office technology
4. Outreach efforts witnessed
5. Building construction, upgrades, or refurbishment of GASR offices
6. Knowledge of the electronic property registration system
7. General knowledge of the PRP activities

¹³ 7000 MNT equaled \$4.16 USD in September 2013, when the survey took place. At the time of the survey it was possible to purchase 100-130 phone calls and 200-300 text messages with it, depending on the mobile phone carrier company.

4.1.5. Study Sample

4.1.5.1. Back Office Time Tracking

The Back Office Time Tracking Survey was completed to capture the time needed associated with eight key transactions at GASR. Initial plan of reaching 900 samples with eight key transactions was created using the logic that 110-150 samples would be required for very common transactions and only 20-30 samples for uncommon transactions such as inheriting property, gifting property, and buying, selling or subdividing property.

4.1.5.2. Banking Survey

The Banking survey consisted of Initial and Follow Up surveys and the target size for the Follow Up survey was 900 of mortgage or loan seeking individuals. Since there was a substantial number of drop-out from the initial survey respondents, the data collection firm aimed to obtain an additional 100 respondents and to keep attrition at a minimum. IPA did not have much discretion on the geographic distribution of the banks as interviewing at bank branch locations required cooperation of banks and the branches. MCA-M facilitated this discussion and the banks provided list of banks they were willing to allow survey activities.

4.1.5.3. Informational Interview with GASR Registry Officials

No specific sampling plan was made for these qualitative interviews as the availability of the GASR officer depended on the workload, schedules, and willingness of the workers to give interviews. The MCA-M and IPA workers interviewed all GASR officers at Chingeltei, Bayanzurkh and Bayangol offices who were willing and had time to give interviews. Each district office typically employs on average seven registry workers and IPA aimed to interview one or two at each locations, but the total number of interviewed workers depended on their availability and workload.

4.1.6. Analysis Plan

Using the data from the RSPS the final analysis will compare means of the outcomes of interest before and after the completion of the improvements to the registration systems. More specifically, we will estimate the following equation:

$$Y_{it} = \alpha + \beta \text{Post}_t + \gamma X_{it} + e_{it}$$

Where Y_{it} is the outcome of interest for individual i in time t , Post is an indicator for after the improvements to the registration systems, and X are controls for characteristics of the individuals. The coefficient of interest is β , where we expect the registration systems to improve the ease of the process of registering land rights.

We will also estimate the following equation:

$$Y_{it} = \alpha + \pi \text{Post}_t * X_{it} + \beta \text{Post}_t + \gamma X_{it} + e_{it}$$

Where we include the interaction between the time indicator and characteristics of the household. This will allow us to examine whether there is any heterogeneity in the impact of the improvements to the registration system. For example, we can test the hypothesis of whether the registration systems saved more time and money for poorer households or for richer households.

4.1.7. Timeframe of Exposure

The timing of the baseline data collection was not ideal and was not chosen to be able to measure specific interventions. Because of the inadequacy of the initial design, many of PRP activities, decentralization of GASR activities through establishment of district offices and GASR officer training, took place earlier than baseline data collection and their effects cannot be captured by the current design. As described above, the current design is meant to capture effect of ePRS, the full digitization of paper records, and the effect of the amendment of GASR law, which MCA-M has supported. The post-intervention data collection for Back Office Time Tracking can occur after ePRS is fully operational while for Banking Survey, the passage of amended GASR law and subsequent development of system and protocol to grant non-government entities to access property records, will greatly expedite the property registration process for Mongolians, thus the post measurement should be collected after those activities have taken place.

4.1.8. Limitations, Challenges and Risks.

Because much of the PRP's institutional strengthening measures were nationwide in scope, the pre-post comparison was the only available design for measurement. However, there are limitations to pre-post design that should be taken into consideration in drawing larger conclusions from this study's findings. Pre-post designs rely on outside factors that may influence outcomes of choice to be relatively similar between the two comparison time periods. However, the time to obtain and registering mortgage or a loan may depend heavily on outside factors unrelated to system improvements that the PRP was attempting to establish. A bank may be processing these mortgage applications at a faster or slower rate because of a bank's own policy or fluctuations in the volume of work that the bank branch is experiencing. These contextual factors that may compromise the findings are discussed in RSPS Baseline report.

4.2. Special Hashaa Plot Survey (SHPS)

4.2.1. Overview of the evaluation

The impact of direct assistance with title process that constitutes the second project component will be assessed through SHPS. PRP conducted formalization activities in 3 districts of the capital city of Ulaanbaatar (Bayanzurkh, Chingeltei, and Songinokhairkhan districts) and eight other regional centers around the country including the cities of Darkhan and Erdenet¹⁴. This component of the project aimed to provide direct assistance to approximately 53,000 households seeking to privatize and register land plots in urban ger areas with 30,000 households being privatized in Ulaanbaatar Assistance provided included support for both the necessary paperwork as well as the registration fees.

IPA worked with PRP to design an evaluation based on randomized control trial (RCT) methodology. RCT isolates the program effect by randomly assigning a subset of the potential participants to treatment group while the random complement is assigned to control group. The methodology ensures that the two groups are as similar as possible with only difference being exposure to the intervention, in this case, exposure to the PRP formalization activity. Baseline characteristics are measured for both groups and after intervention, endline data is collected to measure the difference between the two groups. Since the two groups are identical except for exposure to the intervention and any over-time factors should affect the two groups in the same way, the difference between the two groups can be attributed to the project. The methodology is described more in detail below. SHPS evaluation activities started in the three districts of Ulaanbaatar, and in Darkhan and Erdenet. Table 2 shows the timeline for the SHPS Data Collection and Formalization Contractors.

Table 2. Timeline for Formalization Contractors and SHPS Data Collection

Time	Activities	Status
June-2010	Preliminary satellite image data delivered for UB, Darkhan, Erdenet	Completed
December-2011	Baseline Data Collection Begins	Completed
March-2012	Darkhan and Erdenet Formalization Activities Begins	Completed
August-2012	Baseline Data Collection Ends	Completed
September-2012	Ulaanbaatar Formalization Activities Begins	Completed
November-2012	Darkhan and Erdenet Formalization Activities Ends	Completed
August-2013	Ulaanbaatar Formalization Activities Ends	Completed
August-2013	ePRS fully established in project areas	Completed
March-2014	SHPS Small Scale Tracking Survey Data Collection Begins	Completed
May-2014	SHPS Small Scale Tracking Survey Data Collection Ends	Completed
July-2014	SHPS Large Scale Tracking Survey Data Collection Begins (dependent on results of Tracking Survey)	Has Not Started
October-2014	SHPS Large Scale Tracking Survey Data Collection Ends	Has Not Started
June-2015	SHPS Follow-up Data Collection Begins (dependent on results of Tracking Survey)	Has Not Started
September-2015	SHPS Follow-up Data Collection Ends	Has Not Started

¹⁴ The project scope was reduced from 75,000 plots being privatized covering all areas of UB as well as select regional centers to 53,000 plot in three districts of Ulaanbaatar and select regional centers.

4.2.2. Evaluation questions

The main evaluation questions to consider are whether the project led to changes in investment in the land or property, in the perceived land values, tenure security and prevalence of conflict, and use of property to access credit. The evaluation also looks at the difference between different subset of the target population such as women and men resident and residents with or without title.

To that end, IPA gathered information on the following outcomes in order to measure the projected changes in those 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
- Gender differences on future investment plans, household income and ownership of plots

Gathering detailed information on all of these variables should allow for a detailed comparison of outcomes between the treatment and control groups participating in the study.

4.2.3. Policy relevance of the evaluation

The evaluation question, whether formal rights to land increases the value and investment of the land and allow for residents greater access to capital, has implication in a country without history of property ownership where people have traditionally resided in a land without establishing any formal rights. Additionally, in Mongolia, a traditionally nomadic society, the idea of investing in a permanent residence as rooted in the culture as it is in more sedentary societies. And lastly, as the least densely populated country in the world, Mongolia has abundance of land. It remains to be seen whether Mongolians have less incentive to seek formal rights, whether formal rights are less meaningful than in other context, and whether seeking formal rights to result in expected benefits.

Also, in Mongolia where a rapid transition to market economy from centrally planned state, the incentive to own land has changed dramatically. The real estate market in Ulaanbaatar appreciated considerably in recent years with average per square meter price of residential real estate increasing by 1200% since 2001. General awareness of benefits

of land ownership, very probably also increased greatly, in part due to public education campaigns, but also likely from information sharing among residents and general coverage of real estate and land issues in the media. Question remains whether direct assistance with registration effort was necessary in an environment where development in land market may incentive enough for residents to self-register their land. Related question is whether public awareness campaigns are effective and if so, whether effective public awareness campaigns are sufficient to drive self-registration. Although SHPS evaluation is not specifically designed to answer this question, the evaluation will attempt to look at this question in the data that's collected.

4.2.4. Methodology/ Impact evaluation design

RCT methodology randomly assigns treatment to subset of potential program participant. This random assignment can occur on individual or group level. In this evaluation, IPA randomly assigned treatment to unit akin to neighborhood. The Mongolian capital city of Ulaanbaatar and the regional cities, Darkhan and Erdenet, are divided up into a number of administrative units. The smallest of these units is known as the “kheseg”.¹⁵ Khesegs are somewhat informal in nature as there are no kheseg level elections or social services provided at the kheseg level. Nonetheless, the borders of khesegs are well defined and there is a local functionary, called the kheseg governor, who is appointed to oversee the management of the kheseg unit. Khesegs 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. Randomizing on a larger administrative unit, such as the



Kheseg units from the 21st khoroo of Bayanzurkh district of UB.

khoroos or district, would not have been feasible as there are only a few dozen of these units in Ulaanbaatar. Moreover, these units do not exist at all in the regional cities of Darkhan and Erdenet. Randomizing at the level of the individual plot would, likewise, have been infeasible, as there are 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.

Khesegs are thus the best unit for randomization. However, the initial GIS data from the PIU revealed an extremely high degree of variation in the number of plots per kheseg. 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 was more than two standard deviations above the average would be divided into two or more khesegs along a convenient natural boundary, such as

¹⁵ In Darkhan and Erdenet, khesegs are no longer used as an official administrative unit. Nonetheless, the boundaries of former khesegs are still well known and in some places, kheseg governors continue to operate on an informal basis.

a road or ditch. In a few rare cases, new kheseq units had to be created to incorporate new hashaa plots that had recently been founded outside the previous kheseq boundaries. Table 3 shows the frequency of these changes to the administrative boundaries. Thus a greater degree of uniformity was established among the final units of randomization.

Table 3: Alterations made to Kheseq Units

City	District	Number of Kheseqs Subdivided	Number of Kheseqs Recombined	New Kheseqs Created
Darkhan	.	0	0	2
Erdenet	.	0	14	0
Ulaanbaatar	Bayanzurkh	3	15	16
Ulaanbaatar	Chingeltei	0	19	2
Ulaanbaatar	Songinokhairkhan	8	11	0

Given that there are substantial differences in household characteristics and in administrative characteristics including public amenities across space, IPA stratified the randomization on the district, khoroo, and city. 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 artificially created using natural boundaries, such as streets, ditches, and roads for the border. This assures that all administrative units used for stratification have equally proportional representation within both the treatment and control groups.

Early survey data from the SHPS indicated that there were large pre-existing differences in titling and privatization rates among different kheseqs – even among kheseqs located within the same city, district, and khoroo. To address this issue, researchers added a final matching component to the randomization. The randomization program matched each kheseq unit in the project area to other kheseqs in the same city, district, and khoroo unit with a similar level of fully privatized and registered hashaa plots. The size of the matched groups was determined by the treatment ratios. Within each matched group, kheseqs were randomly assigned to treatment in the ratios agreed upon after discussion with PIU, MCC, and IPA. The ratios of control and treatment plots in each project area was set to allow sufficient number of beneficiary plots in the areas in which the privatization work will take

place. In Darkhan and Erdenet, approximately 65% of eligible plots in the treatment group



Example of how random assignment works. Zeros denote districts in the treatment group while ones denote control

were included in the treatment. In these regional cities, kheseqs in the same larger geographical unit that had similar levels of privatization were formed into matched triplet. Two of the kheseqs in each triplet were then be assigned to treatment using a random number generator while the third relegated to control. In Ulaanbaatar, approximately 50% of eligible plots were included in the treatment group so the randomization matching process used pairs instead of triplets. Kheseqs in the same larger geographical unit that had similar levels of privatization were formed into pairs and one kheseq in each pair was then be assigned to treatment using a random number generator.

Geographic units with a number of kheseqs that did not evenly divide by three (in Darkhan and Erdenet) or by two (in Ulaanbaatar) were dealt with in a straight forward fashion. The unmatched kheseqs - any kheseq that, due to rounding issues, could not be formed into a pair or triplet – were simply be assigned to treatment or control using a random number generator program. Summary information on the number of kheseqs in each district and city as well as some defining features of these kheseqs can be found in Table 4 below.

Table 4: Kheseq Distribution and Rate of Privatization by City and District

City	District	Number of Kheseqs	Number of Kheseqs in Treatment	Average Rate of Privatization*	Average number of plots per Kheseq
Darkhan	.	36	24	81.08%	229
Erdenet	.	78	52	58.97%	457
Ulaanbaatar	Bayanzurkh	118	58	64.31%	352

Ulaanbaatar	Chingeltei	125	63	53.49%	207
Ulaanbaatar	Songinokhairkhan	164	82	75.08%	326

**According to SHPS survey estimates*

The randomization exercises were carried out in Darkhan, Erdenet, and in the three project districts of Ulaanbaatar. Maps with the borders of the treatment and control kheseqs were delivered by IPA to the PRP PIU and other key stakeholders in summer 2012.

4.2.5. Study Sample

The sample frame of plots and households for the study was drawn from the same general framework used in the randomization strategy described above. GIS data on all hashaa plots in the ger areas of the relevant districts of the capital (Bayanzurkh, Chingeltei, and Songinokhairkhan in Ulaanbaatar) and other cities (Darkhan and Erdenet) was 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 in many cases. 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. The researchers noticed that there was a high degree of variation in the number of plots per kheseg. Researchers thus decided to make 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 was more than two standard deviations above the average would be divided in two along a convenient natural boundary, such as a road or ditch.

Once these adjustments were made, the number of plots per kheseg unit was calculated. Plots listed as “fully privatized” 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 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.¹⁶ After the sample size for each kheseg was determined, plots were randomly selected for inclusion in the survey. The target for baseline survey

¹⁶ In reality, the survey had a false start in April of 2010 and had to be cancelled due to unforeseen delays in project implementation. The scope of the project and the areas of implementation changed during the period when the data collection was in hiatus. However, due to the inflexibility of the data collection contract, when data collection resumed in December of 2011, the targeted number of plots had to be reduced by the number of plots and households that had already been contacted and interviewed in 2010. Further adjustments to the sample size also made to account for non-response and other complications. The goal of all these adjustments was to ensure that approximately 8,000 households residing on and/or owning 8,000 different hashaa plots would be interviewed.

was 4,500 households in Ulaanbaatar and 2,000 households in the aimag centers with a total target of 6,500.

4.2.6. Statistical Power

To calculate the necessary sample size, IPA considered 15% increase in land value per square meter increases for both Ulaanbaatar and two regional cities, Darkhan and Erdenet. Power calculation assumed that roughly 53,000 plots will be registered in all project areas, in other words, all eligible households in the project areas will be registered by the project. The power calculation did not factor in significant non-compliance as in, sizable number of households in control areas registering on their own or the project registering much less than the target. More detailed calculation of power can be found in Appendix E.

4.2.7. Analysis Plan

The baseline estimation strategy will be a differences-in-differences approach, where we compare the outcomes of households in the treatment group with the control group as well as before and after the completion of the formalization activities. The equation that we will estimate is:

$$Y_{it} = \alpha + \beta_1 \text{Treat}_i * \text{Post}_t + \beta_2 \text{Treat}_i + \beta_3 \text{Post}_t + \beta_4 X_{it} + \varepsilon_{it}$$

Where Y_{it} is the outcome of interest, Treat_i is an indicator that takes on a value of one if the household was in a treatment khesege, Post_t is an indicator that equals one if the observation is after the formalization intervention. X is a vector of control variables, which should include fixed effects for the pairs (or triplets) from the matching process. Finally, the error term, ε , must be clustered at the khesege level to reflect the fact that the unit of randomization is the khesege.

We are interested in a variety of outcomes, including household income, access to credit, investment in the property, property values and labor market outcomes. The coefficient of interest is β_1 , which yields the impact of the formalization assistance.

It is unclear what the take-up rate of the formalization activities will be in. If it is very high, then the differences-in-differences estimator will be sufficient. If the take-up rate of the formalization activities is not high, then we would also run an instrumental variables estimator where we estimate take-up of the formalization activities in the first stage, and use the indicator for take-up in the second stage regressions with the outcomes of interest as the dependent variables.

An additional set of questions that are interesting for both policy and from a research perspective is how long it takes to observe changes resulting from improved property rights. For many of the outcomes that we are interested in, it is likely that the change will

not occur immediately after a household obtains the formal title to their property but may take place gradually.

Thus, after receiving the endline data, we can examine the following:

$$Y_{it} = \alpha + \beta_1 \text{Treat}_i * \text{PeriodsPost}_t + \beta_2 \text{Treat}_i + \beta_3 \text{PeriodsPost}_t + \beta_4 X_{it} + \varepsilon_{it}$$

Where we examine variation in households' response to the intervention by the length of time since the intervention occurred.

4.2.8. Timeframe of exposure

The first follow-up data collection was initially scheduled to occur in the winter of 2012-2013. However, because of project implementation delays mentioned above, the intervention was not fully rolled out in all project areas by that time. PRP concluded titling activities in Darkhan and Erdenet by November 2012 and in three project district areas of Ulaanbaatar by September 2013. In addition, after a review of project logic and evidence on land from the literature, any interim beneficiary streams predicted would unlikely develop until 2-3 years after treatment. As such, the follow-up survey was re-scheduled to occur 2 years after final implementation in Ulaanbaatar in the winter of 2015-2016.

4.2.9. Limitations, Challenges and Risks

As described briefly in the Analysis Plan section, the main challenge to this evaluation design is an insufficient take-up of the intervention. The ability to detect project effect on perceived property value and investment in the land and changes to other outcomes of interest depends on close to 53,000 hashaa plots becoming titled as result of the project. However, near the close of the Compact, there were concerns that the number of titles that PRP was issuing was far short of the target and that there was a possibility of the study no longer being sufficiently powered. By September of 2013, it became apparent that PRP was going to title roughly 20,000 hashaa plots in all project areas, which falls significantly short of its target of registering 53,000 hashaa plots. The significantly reduced number of registered hashaa plots jeopardized the study's statistical power. In addition to the reduced number of registered plots by the PRP, there was possibility that a non-trivial number of plots in non-project areas were self-registering which would further reduce the statistical power of the study.

4.2.10. Identified Risk and Response

After gathering the final PRP numbers on titling activity, IPA found that the minimum detectable effect sizes in Ulaanbaatar for the current SHPS samples were 57% change in hashaa value and 78% change in increase in investment value. The evaluation design was based on over 150% increase on both outcomes in Darkhan and Erdenet and it was clear that the evaluation could not move forward since we could not observe effect. In order to better inform the final decision on continuing the full scale interim and end line SHPS surveys, IPA recommended incorporating into the evaluation a short tracking survey. In

October 2013, IPA and MCC decided to conduct a small-scale Tracking Survey to understand the feasibility of continuing with the study. There were three goals to the Tracking Survey: to estimate whether changes in implementation and trends in registration affected statistical power, to understand whether rates of mobility were high enough to warrant a large-scale Tracking Survey, and to assess the quality of self-reported measures of registration status. In the event that no follow-up survey was possible due to findings from the Tracking Survey, the data collected could also be analyzed to understand respondents' motivation for registration and any behavioral changes that were observed.

In early 2013, a small-scale Tracking Survey was designed to survey a portion of the original control sample to verify households' land registration documents, collect information on household mobility and gather reasons for household registration.

By comparing rates of titling rates and initial outcomes in the treatment and control areas, the Tracking Survey offered updated information about the statistical power of the SHPS. In addition, the Tracking Survey provided an opportunity to estimate mobility rates. This information was key in determining whether the cost of a full-scale Tracking Survey was needed in order to ensure that we would be able to find households in the subsequent follow-up survey. In addition, the small-scale Tracking Survey helped understand the accuracy of self-reported registration status. During baseline data collection, respondents had self-reported the registration status of their land plot. A household could have no rights to the land, hold a possession certificate on the plot, have a governor's decision on the plot, or have a registration certificate which counts as formal title to the plot. However, during PRP's titling activity, it became clear that many households had inaccurate understanding of their plot's registration status. Finally, the small-scale Tracking Survey would help provide insights into short-term effects like behavior changes and tenure security.

5. DATA SOURCES AND COLLECTION

5.1. Registry System Process Survey (RSPS)

5.1.1. Data collection plans

5.1.1.1. Back Office Time Tracking Survey

Baseline data was collected on the eight key transactions in all six district offices of Ulaanbaatar, Sukhbaatar, Khan-Uul, Songinokhairkhan, Bayanzurkh, Chingeltei and Bayangol districts, from July 15 to August 12, 2013, prior to full implementation of ePRS on December 25, 2013. All paperwork associated with one of these eight transactions was tracked during the data collection period in accordance with methodology described above. The target sample of 900 was surpassed and a total sample of 2,906 transactions was achieved and tracked at GASR offices. The processing times that were captured for

these transactions will serve as the baseline measurements. A breakdown of the number targeted and achieved for each transaction can be seen in Table 5 below.

Table 5. Target and Achieved Sample Size by Transaction¹⁷

No.	Transaction	Targeted Sample Size	Achieved
1	Registration of Ownership Rights of Immovable Property	150	302
2	Registration of Ownership Rights of Land	150	156
3	Buying, Selling or Subdividing Property	30	371
4	Gifting Property	30	140
5	Inheriting Property	20	63
6	Registering a Mortgage (Property)	150	624
7a	Obtaining Collateral Agreement (Land)	110	171
7b	Obtaining Collateral Agreement (Property)	110	345
8	Reference Letter of Immovable Property	150	734
Total Sample Size		900	2906

Follow-up data is planned for after installation of ePRS which was rolled-out in October 2013. Also for the full time saving of the ePRS to be realized for Back Office Time Tracking Survey, digitization of all paper records being referenced at the office is necessary. As of March 2015, GASR had completed digitization of remaining paper archives in project aimags and districts of Ulaanbaatar, but paper archives of 13 non-project aimags had yet to be digitized. However, most of the records being referenced at the project offices are likely coming from other districts of Ulaanbaatar and records that are still paper-based would not affect the measurement of post-intervention in significant way.

The follow-up data collection does not necessary require similar effort as the baseline data collection as the ePRS system itself allows reporting of the average time for transactions. This is discussed in more detail in the RSPS Baseline report.

5.1.1.2. Banking Survey

Baseline data collection for the Banking Survey occurred September 17 to December 15 2013. IPA had contracted out MEC LLC, a local survey firm to collect 900 follow-up surveys from a total of 26 bank branches. The surveys took place in bank branches and took on average 20 minutes to complete. Table 6 gives an overview of the number of respondents who went on to take the Initial Survey, breaking them into the type of collateral they were using at the bank and the number of respondents who went on to complete the Follow-Up Survey.

¹⁷ Data Collection Completion Report, Urban Registry Systems Process Study Back-Office Tracking Survey (Wave I), MEC LLC, August 21, 2013.

Table 6. Respondents That Completed Follow Up Survey by Bank and Collateral Type¹⁸

Bank	Respondents that Completed Follow Up Survey	Initial Survey Respondents	Collateral Types		
			Land	Property	Land and Property
Golomt	238	305	1	286	18
Khan	202	252	5	185	62
Xac	230	259	28	107	124
TDB	230	272	4	258	10
Total	900	1088	38	836	214

The data collection schedule for Banking Survey should follow the proposed change mechanism. Specifically, follow-up data collection should occur when ePRS is fully functional. However, the ePRS will not reach its full potential until relevant legal changes have been completed, property records are made available to approved non-governmental institutions, digitization has been completed throughout Mongolia, and the ePRS works in sync with non-GASR entities such as banks and notaries.

The amended Law on National Registration is under review by Ministry of Justice, but has not been submitted for a parliamentary vote and accordingly, the system for non-GASR entities to access GASR data has not yet been set up. The follow-up data collection is planned for when these activities are complete.

5.1.1.3. Informational Interviews with GASR registry workers

In addition to the Back Office Time Tracking and the Banking Surveys, IPA gathered GASR registry workers' impressions on how those working in GASR offices were impacted by activities of the PRP. IPA conducted semi-structured informational interviews with the workers to understand their perception of how the creation of new district offices, refurbishment of buildings, and upgrades of equipment affected their work processes and work load. These interviews were carried out in July and August 2013, before the ePRS came online in all GASR offices. Interviews lasted 20 minutes on average and 9 registry workers were interviewed in those two months. The results of the interviews are discussed in RSPS Baseline report.

5.2. Special Hashaa Plot Survey (SHPS)

¹⁸ Data Collection Completion Report, Urban Registry Systems Process Study Banking Survey (Wave I), MEC LLC, December 24, 2013.

5.2.1. Baseline Survey

SHPS baseline survey instrument was developed in the first quarter of 2010. The questionnaire was designed to collect basic socio-economic data and detailed information on the outcomes noted in Section III of this report. The instrument was pilot tested and modified until all researchers involved felt confident that the questions were comprehensive and comprehensible, and were accurately capturing the behaviors of theoretical interest. The questionnaire took approximately 90 minutes to complete with each respondent. The survey instrument is included as Appendix F.

In April of 2010, the survey contractor selected by MCA-M began administering the questionnaire to the households residing and/or owning the plots selected during the sampling process described in Section 4.2.5 of this document. This survey effort is known as the Special Hashaa Plot Survey (SHPS) Baseline survey. It was soon realized that, due to errors in the GIS data mentioned above, not all of the hashaa plots selected for the SHPS sample were occupied. Of those that were occupied, the owners did not always reside on the plot. Regardless of occupation and ownership status, 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. This protocol is reproduced in Appendix G..

The plan was to have this initial SHPS survey serve as the baseline data for the evaluation. Unfortunately, the initial SHPS effort had to be cancelled after several weeks of data collection due to unforeseen delays in project implementation. The data collection first commenced in December 2010 and continued until June 2011. The scope of the project was subsequently adjusted and the project implementation areas shifted. The scope of the project was reduced from 75,000 to 53,000 land plots, from covering all districts in Ulaanbaatar to covering the three largest districts, Bayanzurkh, Chingeltei, and Songinokhairkhan. Data collection resumed once again in July 2011 in Darkhan and Erdenet while data collection in the three districts of the city resumed in January 2012. Data collection for all areas concluded in August, 2012. A baseline report for SHPS was finalized in January 2014 and is posted on MCC's evaluation catalogue (<http://data.mcc.gov/evaluations/index.php/catalog>).

Table 7: Distribution of Respondents and Response Rate for the SHPS Baseline

City	District	Sampled	Completed
Darkhan	.	356	286
Erdenet	.	906	643
Ulaanbaatar	Bayanzurkh	2,417	1640
Ulaanbaatar	Chingeltei	1,155	883
Ulaanbaatar	Songinokhairkhan	3,706	2432

5.2.2. Tracking Survey

From March to May 2014, the Tracking Survey collected contact information of the respondent, economic activity of the plot such as whether the plot was sold, rented or used as collateral on a bank loan, and the household's estimate of the plot's value and the household's investment in the plot. The Tracking Survey also asks question regarding perceived security of the land plot, the household's participation in titling activities if any, and reason for titling the plot. The survey instrument is included as Appendix H.

The Tracking Survey was initially administered via phone. For respondents who could not be contacted via phone, attempts were made to locate the respondents in person. The target sample for Tracking Survey was 1000 households and total of 922 households were surveyed. A random 200 of the households surveyed who reported having registration certificate were selected to be visited in person to confirm the accuracy of their registration document and the accuracy of their self-report.

Results of this Tracking Survey will be discussed in the forthcoming Tracking Survey Report.