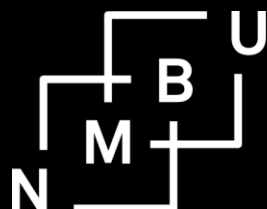


A Land Tenure Module for LSMS

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Abstract

This paper proposes to fill the important gap in reliable and nationally representative land tenure data by including a Land Tenure Module (LTM) to be linked to multi-purpose household surveys such as the Living Standard Measurement Surveys (LSMS). Developing survey standards to generate globally comparable land data is important for generating data to be used in global and regional land governance monitoring initiatives (SDGs; LPI – UNECA; GLTN/ GLII; VGGT). The LTM can be a cost-effective way to provide data for evidence-based analyses that will help identify the areas where policy action can have the most significant and/or immediate impact, and help in sequencing and prioritizing policy interventions. The paper illustrates important issues that may be analyzed based on such a module in order to motivate its implementation and where the current state of knowledge is constrained by limited data access.

To facilitate this integration, a generic LTM is proposed based on an assessment of existing tenure modules and lessons learned from surveys on land tenure. It introduces a basic structure including: (i) ownership and use of agricultural and non-agricultural land and immobile assets on the land, (ii) sources of land acquisition including inheritance, (iii) land transactions, (iv) formal and informal property rights, (v) investments on the land, (vi) land conflicts, (vii) legal knowledge, (viii) gender and property rights, (ix) perceptions of tenure security and (x) trust in land-related institutions.

Key Words: Land Tenure Module (LTM), Living Standard Measurement Surveys (LSMS), generic questionnaire,

1. Introduction: why land is important

The distribution of land and tenure rights have for various reasons been missing in national statistics. The complex and spatial nature of property rights and land markets are among these and making it challenging to collect and organize such data at national scale.

However, this gap can no longer be justified for several reasons. First, land is a fundamental input in agricultural production, which is providing the most important source of livelihood in most of the poorest countries in the world and for the large and poor rural populations in these countries. Second, land has increasingly become a scarce resource including in Africa due to increasing demands and increasing competition for the best land and increasing need for agricultural intensification to reduce the pressure on forests and biodiversity. Urbanization continues to take prime agricultural land out of production while on the other hand urban populations with higher living standards demand diets, which require more land for livestock production thus increasing the demand for land for crop and livestock production. Increasing demand for green energy has made land-based energy production a substitute for fossil fuels, also putting further upward pressure on land prices. Third, land degradation and climate change pose serious threats to the long-term productivity and sustainability of land use. Climate change is expected to cause an increase in agricultural production risk and especially so in the developing world where the average temperatures already are very high. There will be a need to stimulate investment in soil and water conservation in ways that can reduce agricultural production risks and enhance land productivity. Well-defined property rights to land and security of tenure will be essential to stimulate such investments.

Agricultural intensification will require structural transformation through infrastructure and irrigation investments, improvement of factor markets, access to credit, and more market-oriented production to meet the demands of the growing urban populations. Well-functioning land markets, particularly land rental markets, will be essential to facilitate such a transformation. Such markets can facilitate transfer of land to more productive producers without creating tenure insecurity for the owners of land who may benefit by increasing their land rents.

Land and real estate are important everywhere. Land scarcity leads to rapidly increasing land values in urban areas where there is economic growth and population growth. Housing markets are essential for urban livelihood flexibility and quality. On the other hand, unplanned urban population growth combined with poverty, unemployment and slum development represent major challenges and potential threats to social stability in some countries and cities. Development of sustainable and energy efficient urban livelihoods require climate-smart and careful planning and coordination of investments by public and private operators.

Why reliable national data on land are important

Good land governance depends crucially on good information about the status of land resources and what the consequences are of alternative policy interventions. For countries with large rural populations such as in Africa and much of Asia, agriculture remains a main source of income and access to land is a major determinant of welfare/poverty. With food consumption also representing more than 60% of total expenditure of the poor, access to land and land productivity are crucial for food security and poverty reduction. This is also an important reason for the development of agricultural modules linked to the World Bank LSMS surveys in such countries. However, these surveys did not adequately capture many of the land tenure issues that influence investment incentives and thus productivity and structural transformation in agriculture. Few countries therefore have nationally representative data that can tell how certain land policies or tenure reforms affect land rental market activity and indirectly land productivity through technology adoption or changes in the operational farm size distribution.

A study of the land governance structure in 10 African countries (Deininger et al. 2014) revealed many weaknesses in national data such as limited registration of communal lands, limited registration of private land in rural as well as urban areas, limited transparency related to land transfers, and weaknesses in formal land dispute resolution systems.

A recent systematic review of studies of impacts of property rights interventions and agricultural productivity in developing countries (Lawry et al. 2014) started out with 27600 quantitative studies but ended up with only 20 of these giving reliable impact assessments. Five of these studies were in Ethiopia out of 10 studies in Africa, the other countries in Africa being Madagascar, Malawi, Rwanda and Zambia, demonstrating the limited coverage even for the continent with the highest number of studies. Only Nicaragua and Peru were included from Latin-America while Cambodia, China, India and Vietnam were included from Asia. Furthermore, many of these studies are not based on nationally representative data and the external validity of these studies may therefore be questioned. The implication is that few countries can claim that they have evidence-based land policies in place. The actual policies rely on beliefs and theory rather than on facts.

The sharp increase in the demand for land associated with the increase in food and energy prices in 2007 and 2008 revealed many weaknesses in land governance institutions in many countries where this demand increase occurred and the largest increase in land allocation to investors took place in countries with the weakest land governance institutions (Deininger and Byerlee 2012). Many of these allocations, and particularly some of the largest ones (such as the allocation to the Indian company Karuturi Global in Gambella, Ethiopia) were not successful in terms of achieving sustainable productivity-enhancing investments in land and were associated with low utilization of allocated land, conflicts with local ethnic groups that were alienated, and poor management of natural resources. The local governments that allocated the land lacked the experience, resources and legal structures to prevent the many unfortunate outcomes. While this “land grab” or land rush resulted in national and global actions such as the establishment of the Land Governance Assessment Framework (LGAF) (Deininger et al. 2014) and the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests, these international initiatives also revealed that there is a long way to go to get better documented and more clearly specified land rights and land resource inventories in the developing world. Establishment of better nationally representative databases that also link such information with the well-being and resource utilization of landowners and land users is therefore a key to facilitate better land policies that can facilitate measurable sustainable intensification and welfare outcomes.

Why strengthening of property rights to land is important

Tenure insecurity can be a result of public and private sources of risk (Holden et al. 2013). Encroachment may result from unclear property borders, weak rights, enforcement and conflict resolution mechanisms. While the state has an important role to play to strengthen tenure security, the state may also be a source of tenure insecurity in cases where land is expropriated for public purposes such as for infrastructure development, urban development or for redistribution to other agents. Such insecurity may also be enhanced by unclear laws, poor and incomplete records, unreliable enforcement, and violations by corrupt government officials. The tenure insecurity created in such cases may affect the strength of use rights, mortgaging rights and transfer rights, which may affect investment incentives, access to credit and land transaction activity, again with productivity and welfare implications.

Why property markets for land are important

Land markets help to transfer land from less efficient to more efficient users. Land rental markets help to separate the land ownership structure from the operational structure and this enhances the flexibility of land use by reducing transaction costs and financial requirements related to operational farm size adjustments. Likewise, leasing of real estate for business in urban areas plays a similar role. Rental markets for housing are important for people who cannot afford to buy their own housing and land rental markets in rural areas have been found to be pro-poor as they can improve land access for the land-poor and provide food security and income for poor landlord households (Holden et al. 2008).

2. How household surveys fit with other sources of data

Household surveys are an important source of information that in many cases cannot be obtained from other sources. While the LTM expands the usefulness of LSMS household surveys, the value of such surveys can be further strengthened by combining them with other forms of data and analyses.

2.1. Doing Business

A well-functioning legal and regulatory system is important for the creation of an effective market economy while poor contracting and regulatory environments raise the costs of doing business (Besley 2015). The World Bank's Doing Business project started in 2002 and now collects 11 sets of indicators for 189 countries. One of these indicators is "Registering Property" and measures the procedures in terms of time and costs required to register commercial real estate. Other indicators relate to accessing credit and enforcement of contracts. The indicators are based on the national laws but also the custom and actual practice of the law. The situation of a standardized firm is used while the variation in the business environment across firms is collected in the World Bank Enterprise Surveys. The Doing Business and Enterprise Surveys are therefore complementary to the LSMS surveys, which collect data from rural and urban households.

2.2. Administrative data

Various types of administrative data such as land administrative data, public health data, legal records from courts, media records, historical records, land laws and other laws of relevance, can be used for more comprehensive analyses, provide additional background information and to investigate a broader set of causal mechanisms and relations. Such data can be particularly important for more rare phenomena such as land disputes and their handling by the formal (and informal) conflict resolution systems.

2.3. Spatial information on land ownership and use

Spatial data on ownership and land use are available in some countries and for parts of other countries. In countries with land registries it may be possible to obtain the land registry information for the LSMS survey sample to cross-check the reliability of data collected at the household level and/or even to get such information pre-filled before the survey to facilitate easier data collection. However, such access may require bureaucratic processes that are too cumbersome and it may be easier to ask the households during the interviews to see their formal land titles/certificates and copy the relevant information from these.

2.4. Impact evaluation

A strong advantage of the LSMS surveys are that they provide good nationally representative welfare indicators. Inclusion of a land tenure module can facilitate impact evaluation of specific land tenure reforms and policy changes in terms of their welfare impacts on different socioeconomic groups. The comprehensive data collected at household level can also facilitate tracing of the impact pathways through changes in market access and behavioral adjustments of the households. Household panel data are important to control for unobservable household heterogeneity that is time-invariant, and to assess the dynamic effects of such reforms. Staggered reforms facilitate spatial designs that can allow identification of impacts from cross-section data, if such implementation is randomized, or selection bias related to implementation can be controlled for.

3. Analytical issues where LTM and LSMS data will be important

This part illustrates the potential usefulness of a LTM linked to LSMS in terms of provision of data on important land tenure issues where there until today has been a shortage of nationally representative data.

3.1. Welfare impacts of land access and asset distribution

The distribution of land is closely related to the distribution of welfare in countries where land is an important basis for livelihood. Spatially dispersed production, immobility of land, spatially dispersed production, poor

infrastructure, seasonality in rain-fed agriculture, and information asymmetries contribute to imperfections in factor markets although the revolution in information technologies has reduced the information costs and thus lubricated factor markets. Still, many of the fundamental characteristics of production relations in agriculture that dominates rural areas in most developing countries imply pervasive transaction costs and market imperfections (Binswanger and Rosenzweig 1986). These cause non-separability of production, consumption and investment decisions of producer-consumer households (Singh, Squire and Strauss 1986; de Janvry et al. 1991). Seasonality in labor demand in agriculture and moral hazard contribute to imperfections in rural labor markets (Feder 1985). Population growth and economic development are inter-connected with a logical evolution of different types of markets, including land markets (Boserup 1965; Holden and Otsuka 2014). Rapid economic development in many developing countries has created new opportunities outside agriculture and push and pull mechanisms lead to more rapid rural-urban migration and agricultural transformation in a growing number of countries. The distribution of property rights to land and the functioning of land markets are important for the distribution of rents from the land and for the size distribution of operational farm units.

Welfare impacts may be measured in form of per capita consumption expenditure and the LSMS consumption module is particularly well suited to get good measures of consumption expenditure. However, the LSMS may also collect data on nutritional status that can serve as important additional welfare indicators that suffer less from measurement error and can allow intra-household decomposition of welfare effects. The standard approach has been to assess how changes in land access and investments on the land are associated with changes in land productivity, and consequently household income and consumption expenditure. Such an analysis typically builds on the unitary household model and assumes equal sharing of welfare within households. Such an approach allows assessment of inter-household differences in household level “treatment” and outcome variables. The standard land tenure module of the LSMS should facilitate such forms of analyses.

An increasing number of studies have revealed that there is a strong gender bias in the distributions of land ownership in many countries. The gender bias in disfavor of women is strong both in formal land registries and in many customary ownership systems. An exception is the matrilineal systems found in some ethnic groups in some countries.

Various tenure reforms in recent years have aimed to strengthen women’s land rights. We review some studies of gender impacts of tenure reforms before we also have a closer look at how such gender impacts may be identified and measured.

Studies of asset distribution, land reform and welfare

Besley and Burgess (2000), using state-level panel data and an aggregate measure of land reform, find impact of tenure reform on poverty using head-count and poverty gap measures in India. Holden and Ghebru (2013) use household panel data with household fixed effects and assess the impact of low-cost land certification on consumption expenditure of households while Ghebru and Holden (2014) assess the impact of the same reform on child nutrition in Ethiopia. Deininger et al. (2007) for India, Do and Iyer (2007) for Vietnam, Torero and Field (2005) for Peru assess welfare impacts measured as improvement in consumption expenditures.

Ali et al. (2014) assess gender impacts in form of married women’s land access of a pilot land regularization program in Rwanda using a geographical discontinuity design with spatial fixed effects. Holden et al. (2011) assess how the low-cost land certification reform in Ethiopia affected the participation of female-headed and male-headed households in the land rental market. They found that the reform had a relatively stronger effect on female-headed households making them more willing to rent out land because they were poor in the complementary resources needed to farm the land efficiently themselves.

Lawry et al. (2014) carried out a systematic review and found that only 20 studies of impacts of property rights interventions in Latin-America, Africa and Asia satisfied basic impact assessment quality characteristics. The studies that satisfied this quality standard covered only two countries in Latin-America, five countries in Africa and four countries in Asia and most of these studies were not nationally representative. Three of the studies in Latin-America were in Nicaragua (Foltz et al. 2000; Bandiera 2007; Deininger and Chamorro 2004) and the other two in Peru (Fort 2008; Torero and Field 2005). Four of the eight studies in Africa were in Ethiopia (Deininger et al. 2008; 2009; Holden et al. 2009; 2011), one was in Madagascar (Jacoby and Minten 2007), one was in Malawi (Chirwa 2008), one in Rwanda (Ali et al. 2014), and one in Zambia (Smith 2004). In Asia one study was in India (Deininger et al. 2007), one was in Cambodia (Markussen 2008), two were in China (Deininger and Jin 2001; Kung 2006) and three were in Vietnam (Do and Iyer 2007; Van den Brink et al. 2007; Kemper et al. 2011).

Data requirements for assessing welfare impacts of land tenure changes with LSMS

Comprehensive data on land and land tenure linked to LSMS surveys have the potential to provide many new insights and give a better basis for assessment of the links between land distribution, land quality, poverty, inequality and welfare, and how land tenure reforms and land policy impact on poverty and economic development. One may also distinguish ownership holdings and operational holdings and thus compare land productivity on owned and rented land and how land market activity affects welfare distributions. With buildup of panel data one can also assess how the asset distribution and property distribution change over time and may be influenced by various policy measures such as tax policies.

Data on farm size have been collected in earlier LSMS-ISA surveys but the accuracy of the farm size and parcel/plot size data has not been very good in all countries and such measurement errors may lead to biased estimates (Carletto et al. 2013). Data on land quality or investments on the land and how these investments and land quality affect household income, consumption and other welfare indicators have not been investigated with nationally representative data in many countries.

Comprehensive data on land resources of households should include;

- accurate sizes of land of different quality by land use/technology choice/management type,
- measures of land quality such as soil type, slope, soil depth, drainage, fertility, weed infestation level, degradation status,
- detailed investments (intensity) on land including conservation technologies, tree planting, irrigation, other structures on the land (buildings, etc.),
- detailed input use (intensity) by type and quantity by homogenous management unit
- detailed output data from the land,
- parcel-based ownership rights (formal and informal) disaggregated to individuals where appropriate, origin of land, border demarcation,
- indicators of *de jure* and *de facto* tenure security such as recognition and demarcation of plot borders, exposure to encroachment, exposure to expropriation or redistribution, within community recognition and competition for land, exposure to land disputes in the past, exposure to disputes and losses of land for others in the community/surrounding areas, expectations regarding future tenure security,
- land rental arrangements with data of similar detail for rented land as owned land,
- land rental contract information to get accurate information on profitability of land renting

Linked with the standard LSMS, such data will give a good basis for household level analyses.

Sampling for the LSMS surveys will affect the extent to which the surveys can be used to investigate local variation in land ownership and operational distributions and how these relate to local variation in land productivity and welfare distribution. The frequency and placement of certain treatments or phenomena will determine the sample sizes of each of these within an LSMS sample and whether these are large enough to get robust statistical measures of treatments and impacts.

Spatial data linked to the LSMS can be very useful to prepare various types of maps of ownership structures, and welfare levels. Spatial data can also be used in spatial designs to measure welfare effects of reforms that have a gradual rollout. With parcel based repeated surveys it is also possible to use parcel fixed effects as controls for unobserved time-invariant land quality.

Analytical challenges

Identification of impacts based on survey data can be challenging due to issues such as endogeneity and unobserved heterogeneity. Natural and planned experiments may allow identification of random treatments in cross-section as well as panel data. Repeated LSMS surveys including the land tenure module may allow identification of dynamic impacts of land tenure reforms on welfare. Cross-section data may also help to map how the asset and property rights distribution is associated with different types of welfare measures although it may be hard to draw any causal inferences from such analyses. This, however, depends on the possibility of finding good instruments or other ways of isolating exogenous changes across sub-samples while being able to impose a set of controls such that a causal impact is identified. Historical knowledge, recall data, and land reform process data can be very useful and essential for the success of such an approach.

Spatial data linked to reforms with a gradual rollout (pipeline approach) can be a good approach when the reform has a spatial nature such as land registration and titling or certification programs may have.

A concern in such cases will be the extent of spillover effects that can make it difficult to isolate the impacts. Examples of spillover effects include general equilibrium (price) effects, information spillovers, technology spillovers, environmental spillovers, and institutional spillovers. The physical distances, the nature of the reform, and the time period of relevance and the size of its impacts will influence the extent to which information and market activity due to the treatment in treatment areas cross such spatial borders and influence trade, prices, behavior and welfare outcomes in control areas.

3.2. Land transfers and structural transformation

Land markets have existed for a very long time in various parts of the world. However, a certain land scarcity is required to get a land value and a price that attracts potential buyers and sellers. It is important to distinguish between land sales markets and land rental (lease) markets. Land sales markets tend to be thinner or non-existent for several reasons. They are prohibited by statutory law in some countries and by customary laws in other countries or may be limited to sales/purchases within a narrow group with such a purchase right. Land sales prices are often large multiples of the rental prices and making it hard for potential buyers to have enough capital, given that credit markets are not well developed at least in the developing world. Land purchases may therefore only be feasible for the capital-rich. Many have therefore also feared that land sales lead to a concentration of land in the hands of the rich.

Land rental markets are more important than land sales markets for several reasons. First, they can facilitate land access for the land-poor at affordable prices. Second, they may help to transfer land to more efficient producers. Third, they help in the recombination of factors of production where there are imperfections in markets for non-land factors of production and where these factors of production are complements rather than substitutes. Fourth, land rental markets have developed a large variety of contract forms that suit different types of landlords and tenants. Fifth, land rental markets can be important in a process of agricultural transformation where land sales markets are

severely constrained and where technological change can have an important bearing on what are optimal farm sizes. Modern agricultural technologies are usually associated with larger farm sizes. However, increasing farm sizes are also associated with relative factor market price changes with agricultural labor becoming more expensive and leading to substitution of capital for labor. Well-functioning land rental markets can therefore play an important role by facilitation of more optimal operational farm sizes when the ownership structure does not match well with what are more operationally efficient units. Land rental markets can thus facilitate a more rapid rural development process but can also constrain development if they are undermined by policy distortions or other factors that hinder their development.

Land market policy issues

There are many land market related policy research questions that can be of interest to investigate with nationally representative data. Here we give some examples:

Land sales markets:

- How active are land sales markets and how is their spatial variability?
- Do land sales markets worsen or improve the inequality in land distribution?
- Are distress land sales a problem and a reason to intervene?
- How well are land sales markets connected to credit markets and is land used as collateral?
- What are the characteristics do sellers and buyers of land? Are those buying land investing on it and do they make productive use of it?
- How are land sales prices evolving and what is driving them?
- How large share of the population owns its own residence? What are the characteristics of those who do not own their own residence and what are their housing conditions?

Land rental markets:

- Are land rental markets transferring land to more efficient producers?
- Are the poor accessing land through the land rental market?
- What factors determine participation in land rental markets as landlords and tenants?
- What are the characteristics of those renting in and renting out land?
- How efficiently are land rental markets functioning?
- What are the main land rental contract types, and why are these contract forms dominating?
- How long-term are the land rental/lease contracts?
- How efficiently and sustainably is rented land managed?
- Are there land rental market law restrictions that hinder land rental market activity and what is the rationale of such restrictions?
- How does land rights formalization affect the functioning of land rental markets?
- Can better functioning land rental markets facilitate more rapid agricultural transformation and development and what policies could be implemented to achieve this?
- What policies are relevant to improve access to housing for the poor in urban areas?

Good nationally representative data on the functioning of land sales and rental markets can provide the basis for analysis of these types of research questions and many more and can help in the design of better policies that promote rural and urban development through improving the functioning of land markets and facilitating their pro-poor characteristics. A LSMS with a LTM can then help to monitor such policy impacts.

Studies of land markets and their role in development

There are mixed evidences on how land sales markets affect the inequality of land distribution. André and Platteau (1998) found that inequality of land ownership had increased from 1988 to 1993 in Rwanda and that the sales by the land-poor could be classified as distress sales to meet subsistence needs and medical expenses. Dubuisson (1998) found that land sales reduced the inequality in the land distribution in Benin, Place and Migot-Adholla (1998) found the same in Kenya, and Balland et al. (2007) and Deininger and Mpuga (2008) found the same in Uganda as land was purchased by the land-poor from the land-rich. Ali et al. (2014) found that land tenure formalization in Rwanda reduced rather than stimulated the extent of distress land sales in the country. However, there is a scarcity of this kind of studies.

There has been much more research on land rental markets and particularly on land contract related issues. We group these studies in studies on a) land rental market participation and allocation efficiency studies, b) land rental partner and contract choice studies and c) contract choice and productivity studies.

a) Land rental market participation and allocation efficiency studies. Bliss and Stern (1982) studied land rental market participation and the allocation efficiency of the land rental market in Palanpur in India. They found evidence of allocation inefficiency. Skoufias (1995) developed their approach to assessing the allocation efficiency by testing for asymmetries in the land rental market and found evidence of such asymmetries using data from India. Bell and Sussangkarn (1988) suggested that the market for tenancies does not clear in a Walrasian fashion due to adverse selection and moral hazard problems in the market, leading to rationing on the tenant side. Their study was also in India with absentee landlords, a well-functioning labor market and landless tenants.

Studies on allocation efficiency in the land rental market in Africa include; Kevane (1996) who found efficient allocation in the land rental market in Sudan; Lunduka et al. (2008) in Malawi; Yamano et al. (2008) in Kenya; and Deininger et al. (2008) and Ghebru and Holden (2008) in Ethiopia; who all found evidence of significant allocation inefficiency in the land rental markets in these countries. Holden et al. (2011) and Deininger et al. (2011) investigated how tenure security enhancing low-cost land registration and certification in Ethiopia affected land rental market participation. More studies are still needed to see how various forms of policy interventions can help improve the allocative efficiency of the land rental markets and on how land rental markets can be made more pro-poor and facilitate agricultural transformation.

b) Land rental partner and contract choice studies. Studies of partner choice in land rental markets have revealed substantial diversity from the typical land-rich landlords and landless or land-poor tenants that were found in some historical and early studies in Asia. Several African countries have a pattern with poor landlords and wealthier tenants (Holden and Ghebru 2008; Tikabo and Holden 2003; Bellemare 2009). Other studies show that kinship contracts dominate many places (Sadoulet et al. 1997; Kassie and Holden 2007; Holden and Bezabih 2008) while the efficiency implications of kinship contracts are mixed. Studies on contract choice in agriculture go back to the studies trying to explain the dominance sharecropping despite its depicted Marshallian inefficiency implications. The literature on the issue is huge and we refer to Otsuka (2007) for a more recent review. The dominance of sharecropping in many countries while fixed-rent contracts dominate in other countries is still not well understood despite the numerous studies.

Studies have shown that risk, credit constraints, and moral hazard can explain the widespread use of sharecropping contracts (Ackerberg and Botticini 2000; Gebregziabher and Holden 2011; Laffont and Matoussi 1995; Tikabo and Holden 2003). More studies should investigate how agricultural transformation and commercialization affect contract choice and what regulations, or perhaps more relevant; whether and how removal of distorting regulations can facilitate such processes without negatively affecting the poor. Here are issues related to the need for and benefit from formalization of land rental contracts and whether such formalization can enhance overall efficiency through provision of legal support and enhancement of tenure security.

c) Contract choice and land productivity studies. Shaban (1987) compared the productivity on rented-in sharecropped land and owner-operated land of owner-tenant households in India and found significant Marshallian inefficiency with 16% lower productivity on sharecropped plots than on owner-operated plots. Laffont and Matoussi (1995) found significant Marshallian inefficiency in Tunisia. Using matched landlord and tenant data from Ethiopia Deininger et al. (2013) found that tenants' productivity is 17-26% higher than that of landlords, however, Marshallian inefficiency contributed to land productivity on sharecropped land not being significantly higher than that of landlords' owner-operated land.

Sharecropping is associated with Marshallian inefficiency in some countries and locations but not in other places and distortive interventions are proposed to be the reasons for (higher level of) Marshallian inefficiency (Otsuka 2007). It is still an open question whether more land rental market friendly (hands off) policies can eliminate Marshallian inefficiencies where sharecropping continues as a dominant contract form. The spatial nature of the market and political economy factors can affect the level of competition and incentive structure in the market.

Data availability, data quality and analytical challenges

For the survey sample to be nationally representative, it must include all owner and operator categories in a country, as well as the major agro-ecological, market access and population density variation. It must capture a sufficient sample of rental partners to allow statistical inference. It is necessary to have supplementary samples to analyze the matching process in the land rental market and investigate the extent of competition in the market and how land rental markets redistribute land within local communities as such markets to a large extent are spatially limited.

The local heterogeneity and activity level in the land rental market will be important for the sample size and what can be achieved in the analysis. This type of analysis is primarily relevant where the land rental market is relatively active. For countries where the market is inactive, one may investigate why and assess whether some simple interventions could help kick-start the market. Low-cost approaches to formalization of land rights in ways that strengthen tenure security may be sufficient to create a rationale for land rental markets. However, cultural norms, local power structures, social instability and tenure insecurity may hinder their development. Low population density and land abundance may also imply that such markets are of less relevance for development.

High quality data on land sales and land rentals are rare especially at the nationally representative level for developing countries. Land sales are rarer than land rentals but can have stronger long-term impacts. By collection of data on land acquisition from households including the time of such acquisition it is possible to get a picture of the frequency and importance of land sales. The frequency of land sales and the quality of the historical land acquisition data that can be obtained from households in a country will determine whether LSMS-type data will be suitable for analysis of land sales markets. Land rental markets on the other hand tend to be much more active in many countries and can lend themselves to more comprehensive analysis based on LSMS type of survey samples, provided that comprehensive data on land renting are collected. This is where an LSMS tenure module can help lift the analysis of land rental markets up to the nationally representative level.

While the agricultural module of the recent LSMS-ISA surveys have attempted to collect data on land rentals in a number of African countries, it is evident from the data that these surveys in several of the countries failed to collect good data on land rentals and suffer from substantial under-reporting of such activity. This may be more due to the way the survey was implemented such as insufficient knowledge of what it takes to get good data quality on this type of activity than the quality of the survey instruments themselves. This problem may best be remedied with careful training of the staff implementing the survey such that they are able to reveal more accurately the extent of such activity. This requires a very good understanding of the local context.

Analyses of land rental market participation and allocation efficiency can be done fairly easily with good data on areas rented in and out, resource endowments and other data that typically are available in LSMSs. Such surveys

typically contain information only on rented in plots of land while limited information may exist for rented out plots as e.g. detailed input and output data would have to be collected from the tenants. This implies that only one side of the market, the tenant side, can be studied carefully, as the survey will typically exclude possibly relevant information from the landlord side. Additional data on land rental market landlord partners may, however, to some extent be obtained from the main sample households themselves (how the partner was chosen, some basic characteristics of the partner, where the partner is living, eventual kinship association, duration of the contract, etc.). Matched landlord and tenant data are needed for more comprehensive assessment of partner selection/matching in the market which typically is outside the scope of LSMS surveys. Adding such a sub-module could be feasible in some countries where the land rental market plays an important role.

Assessment of productivity on rented and owner-operated land requires detailed data on ownership holdings and rented land in terms of land quality, size, investments, conservation status, input use, output quantity, input and output prices, land rental contract characteristics, and contract partner characteristics. The stochastic nature of production due to weather shocks and other sources of risk and uncertainty may distort the analysis if expected returns and prices are very different from realized returns and prices and these differences vary systematically with some of the variables of interest. E.g. unobserved risk aversion could be correlated with land rental market activity, input use intensity and crop choice. There is a need to complement survey data with field experimental data to get measures of otherwise unobservable preferences. Panel data may, however, help in controlling for time-invariant unobservables.

A land tenure module linked to LSMS surveys can help to investigate variation in land rental market performance over time and space and possibly link such variation to specific policy interventions or other changes such as population growth, environmental shocks and other natural experiments. Although transaction costs are hard to observe and measure, their implications and the extent to which they can be reduced through policy reforms and investments in infrastructure can be studied by assessing their impacts on allocation efficiency for land, land productivity and welfare. While the techniques of doing this are well developed (although establishing causality may be challenging), there hardly exist any nationally representative studies with which such analyses have been comprehensively done.

3.3. Land tenure, land markets and productivity of land use

Analysis of the productivity of land use can be used to investigate variation in land use efficiency and its potential causes and policy implications in terms of changes that may help improve land use efficiency and welfare of users, owners and consumers. There is a large body of literature on agricultural productivity analyses and the question is how LSMS data with a LTM can add to this. Such a module will facilitate better analysis of land productivity with nationally representative data and link the analyses to ownership structures, tenure security, investment incentives, conservation status of the land, land market participation, operational farm distributions, and welfare analyses in ways that have not been done earlier at this scale.

Land productivity and land tenure related policy issues

Important policy research questions related to land productivity and tenure include:

- How is the relationship between farm size and land productivity?
- How well does the ownership structure ensure efficient land use?
- Are land markets ensuring efficient operational farm sizes if the ownership structure is sub-optimal for efficient land use?
- If there is an inverse farm size – land productivity relationship, what are the reasons and what policy implications does it have?

- Under what conditions is large farm development preferable to smallholder agricultural development as an agricultural transformation strategy?
- Do land markets ensure transfer of land to more efficient producers and lead to more efficient use of rented land?
- Are sharecropping contracts' tendency to cause Marshallian inefficiency a good reason for policy concern and intervention?

Studies linking land tenure and land productivity

The farm size-productivity relationship has been subject to a lot of research and an inverse relationship between farm size and productivity has been the dominant finding in these studies (Barrett, 1996; Benjamin, 1995; Berry and Cline, 1979; Bhalla and Roy, 1988; Carter, 1984; Cornia, 1985; Eswaran and Kotwal, 1986; Heltberg, 1998; Kimhi, 2006; Tatwangire and Holden, 2013; Aryal and Holden, 2013). A few studies did not find the IR to be valid (Dorward, 1999; Kevane, 1996; Zaibet and Dunn, 1998). There are reasons to question the quality of many of these studies, however, as most of them have not been able to adequately control for unobserved land quality, endogeneity related to crop choice and input use, and measurement errors in inputs and outputs among which area measurement error may be particularly important (Lamb, 2003; Assunção and Braido, 2007; Barrett et al., 2010). Carletto et al. (2013) used LSMS data from Uganda combined with GPS-measured farm sizes to test whether farm size measurement error could explain the IR. Based on their data and analysis they rejected this hypothesis as they found that the GPS-based measures of farm size to be associated with a stronger IR than the farmers' estimated farm sizes. Tatwangire and Holden (2013) examined the effect of land markets on the IR, using GPS-measured plot-level panel data for Uganda from 2001, 2003, and 2005. They tested the hypothesis that land market imperfections explain the IR by applying their models separately to freehold, *mailo*, and customary tenure systems. The results showed that the IR persisted across the three different tenure systems, but was lower in the freehold system where land markets function better, supporting imperfect land markets as an explanation of the IR. Another limitation in the IR literature is that most of the analyses use data from smallholders or commercial farms separately and this may give biased estimates (Muyanga and Jayne 2014). One exception is Ali and Deininger (2015) who pool data from smallholders and commercial farms in Ethiopia. They find that small commercial farms (10-20 ha) obtain the highest yields for most crops such as maize, sorghum, teff, wheat, sesame and soya beans, while the yields peak at larger farm sizes for coffee, beans and cotton. They also find incidence of fertilizer use and improved seeds to be substantially higher on commercial farms than on smallholder farms for most crops.

The global land rush that followed the commodity price boom in 2007/08 came like lightning from a clear sky in many unprepared countries. The weak land rights structures many places caused "land grabs" that threatened local farmers and communities and resulted in many land disputes between investors, local populations and government authorities (Pearce 2012; Deininger and Byerlee 2012). Poor planning and screening of investors contributed to a high failure rate for such investments (Tyler and Dixie 2013).

Data availability and quality and estimation issues

There was a scarcity of nationally representative data that could provide a good basis for policy formation to guide the allocation of land for investors in agriculture during the global land rush. Still the statistical basis for assessing the performance of these newly formed large farms is weak in most countries. This is an important area where there is need for investment in better data generation processes to reduce damages and enhance development potentials. The issue is whether LSMS surveys in the relevant countries should aim to include samples that would provide representative data for such potential emerging commercial sectors or whether this needs to be covered with specialized surveys.

A basic problem with the most of the earlier LSMS and other large-scale surveys in developing countries is that they have relied on farmers' own estimates of farm and plot sizes. Unfortunately, such estimates are often subject to substantial systematic errors that can lead to biased estimates (Carletto et al. 2013). With unreliable measurement of areas all measures by area size will also be unreliable. While also GPS-measured plot sizes are associated with measurement error, particularly on small plots, such errors are not leading to systematic bias (Carletto et al. 2015). One needs parcel or even plot level land quality, input, output and reliable area measurements to capture the within-farm variation in input use intensity and productivity in a reliable way. Formal land registration and titling programs, where they exist, provide more reliable information on farm sizes and parcel sizes, but with heterogeneous land use within such farms and parcels, additional disaggregated data need to be collected to assess such heterogeneity, its explanations and implications. Such data collection needs to be timed well with the seasonality in agriculture, especially where there is more than one production season per year.

There are numerous estimation issues that must be handled carefully when linking land productivity to land tenure and policy implications. Such analyses should preferably start from clear structural models that appropriately capture the theoretical and institutional characteristics of the contexts under consideration. This implies that there are multiple endogeneity issues to consider and it may be very difficult to identify valid and strong instruments for many of these endogenous variables. Establishing causal relationships and separating impacts from correlations in cross-section data may therefore be difficult or impossible in many cases unless one is willing to impose very strong and questionable assumptions. Looking for natural experiments and randomized interventions will therefore be an important complementary strategy to make good use of these data. This may also be more feasible with repeated LSMS-land tenure surveys in the same country and preferably for the same sample of households. Linking the LSMS-land tenure data to complementary spatial and land registry data, where they exist, may be another approach.

3.4. Land-related investment, land use and planning

Investments in land can also affect land productivity and vice versa. Identification of the direction of causality can be difficult or impossible based on cross-section data.

Studies have shown that tenure insecurity may play a central role related to the success or failure of land tenure reforms (Holden et al. 2013). Land tenure reforms have in some cases unintentionally increased tenure insecurity and this has contributed to their failure. They have in other cases intentionally reduced or increased tenure insecurity of specific stakeholder groups while the spillover effects of these changes in tenure insecurity may have been difficult to predict. Assumptions about tenure insecurity may have affected policy decisions. However, the reality on the ground may have been different and could also show substantial spatial variation and be one of the reasons for variation in the degree of success of tenure reforms.

Policy issues on land-related investment and tenure

Some of the important policy issues and questions related to property rights and investment include:

- How widespread is tenure insecurity and to what extent does it undermine investment?
- To what extent do customary land rights provide tenure security to different stakeholder groups?
- To what extent does formalization of customary land rights through recognition in statutory law strengthen tenure security and enhance land-related investment?
- To what extent does tenure insecurity stimulate investment as a mechanism to establish property rights and more secure land rights?
- Under what conditions does registration and formalization of individual land rights stimulate investment?

- How is investment on rented land as compared to owner-operated land?
- Is there a need to regulate land rental contracts to ensure investment and sustainable use of rented land e.g. by promoting longer-term contracts?

Studies of tenure insecurity and investment

Besley (1995) used data from Ghana and found, after controlling for endogeneity of property rights, positive impacts of tenure security on investment in one area but not in another. Quisumbing et al. (2001) found that planting of cocoa trees in Ghana strengthened the property rights and that this was also the case for women who traditionally did not have ownership rights to land. Goldstein and Udry (2008), also in Ghana, found that tenure security was closely correlated with the position in the community and those with more influence also invested more on the land, and intensity of investment was higher on plots where the tenure security was higher.

Place and Otsuka (2001) found that men living with their wives in matrilineal villages in Malawi established property rights to the trees they had planted but not to the land or the naturally growing trees on the land of their wives in cases when the wives passed away. In a study in Uganda, Baland et al. (1991) found that investment enhanced tenure security but not vice versa.

Several studies have found that land rights formalization (land titling) programs in Africa have not increased tenure security but rather have had the opposite effect for large groups as many such programs have been subject to elite capture (Atwood 1990; Braselle et al. 2002; Deininger and Jin 2006; Benjaminsen et al. 2009). Jacoby and Minten (2007) found no significant difference between investments and land values on titled and untitled land in Madagascar. Typically no studies were made of the level of tenure insecurity before such reforms were introduced but scattered evidence indicate that the level of tenure security was high in many cases and this could possibly be one explanation for limited effects of the reform (Place and Hazell 1993).

There are also examples of land tenure reforms that have stimulated investment. In Latin-America studies by Alston et al. (1995) in Brazil, Deininger and Chamorro (2004) in Nicaragua and Lanjouw and Levy (2002) in Ecuador found significant effects of titling on investment.

Holden et al. (2009) used three rounds of household and farm plot panel data to assess the effect of low-cost land certification on investment in conservation and tree planting in Tigray region in Ethiopia. After controlling for endogeneity in certification, they found that receipt of land certificates contributed to better maintenance of conservation structures and more planting of trees on certified plots. Their data covered the period up to eight years after certification. Holden et al. (2011) provided more evidence on the enhancement of tenure security by the low-cost land registration and certification. Another study by Deininger et al. (2011) in the Amhara region in Ethiopia found that land certification has enhanced tenure security and investment there.

Deininger et al. (2013), using cross-section data from 2008/09 investigated the level of investment on rented (sharecropped) and owner-operated land of tenants in West Bengal in India. The tenancy reform enhanced tenure security of tenants by prohibiting evictions and thus enhanced the tenure security of tenants while the possibility of landlords to use threats of eviction to enhance efficiency on sharecropped land were eliminated. They found that rented plots of owner-tenants were 26% less likely to have received investments to improve or maintain land quality and they were 22% less likely to have used their family labor for such investment during the eight last years than on their own plots. They also found that rented plots were 7% less likely to have received private irrigation investments. They therefore conclude that sharecropping tenancy in this region is affected by Marshallian inefficiency as well as dynamic inefficiency due to the negative effects on investment on rented land.

Data availability and quality

There are few good studies of tenure insecurity and none of the good ones have been carried out at a national level. Collection of better data on variation in degree of tenure security can therefore provide insights about the need for reforms to enhance tenure security and to assess tenure security implications of tenure reforms. Given that repeated measures of tenure (in-)security can be made before and after such reforms, or recall data can be used to get an estimate of the change in tenure security due to the reform, these changes should then also be linked to changes in land-related investments.

Most studies on land-related investments look only at the probability of investment and not on the intensity of investment. It is more demanding to quantify such investments at the farm plot level but at the same time doing this in some targeted studies that allow good identification strategies should be encouraged. Another issue is the time it will take from an intervention until an effect on investment becomes visible in the form of a change in the distribution of such an effect over time and space in a population of farmers and landscape of farms. This will also differ among different types of investments and possibly depend on the different types of spillover effects that may enhance or reduce the investment impacts through spatial, intertemporal and pecuniary links.

The “chicken-egg” relationships between property rights and investments, property rights and tenure security, and between investments and productivity require careful identification strategies to establish the direction of causality and find unbiased estimates of the causal effects. Exogenous treatments through natural and planned experiments are important approaches to achieve this but few good data sets exist until today that allow such solid impact assessments (Lawry 2014). LSMS data backed up with a LTM may contribute towards filling this gap.

3.5. Land and financial market development

The links between formalized property rights and credit markets have been given strong emphasis by some authors such as de Soto (2000). The immobility of land and its low maintenance requirement makes it an ideal asset for use as collateral (Binswanger and Rosenzweig 1986). Private property is an important source of collateral in Western countries. Formalization of property rights was therefore thought by de Soto (2000) to be a simple way to also stimulate economic development in developing countries. Loans could then be provided with land as security for lenders who would then become more willing to provide loans that could increase investments and this could again enhance land productivity and welfare of owners of land.

This is most relevant in urban areas and more developed countries with well-functioning banks and property markets, and institutional structures that open for using investments on the land based on loans using the land as collateral. Most developing countries still have a long way to go before this becomes a reality.

Policy issues related to land tenure and financial markets

Some relevant issues related to the links between property rights and financial markets:

- At what stage of development is it realistic and conducive to introduce land as a source of collateral to stimulate investment and development?
- Is use of land as collateral mainly relevant in urban areas of developing countries where transaction costs in land sales markets are lower?
- Could market-assisted land redistribution programs be made more successful by providing additional credit and training to such resettled households?

Studies linking financial markets and land tenure

We are not aware of any studies that find a significant effect of formalization of land rights on access to credit in Africa. Foltz et al. (2000) found that the amount of credit accessed was positively associated with households having formal land rights documents in Nicaragua based on cross-section data from 1997-98. This was the only study with

such a significant effect in the systematic review of Lawry et al. (2014). Field and Torero (2006) assessed whether property titles enhanced credit access for housing to urban poor in Peru. They were able to utilize the staggered implementation to identify the impacts of titling on credit access. They were also able to separate the demand side and supply side effects in the credit market through getting detailed data from the banks that provided the loans, and whether property titles affected the loan approvals. They found mixed evidence in the nation-wide titling program that distributed titles to 1.2 million house owners in the home country of de Soto who has been such a strong advocate of this link as a silver bullet for economic development. They found no effects of formal titles on approval rates of loans by banks but those with title who got a loan obtained lower interest rates on their loans than those without titles.

Credit markets are generally functioning poorly in rural areas in developing countries and so are sales markets for land. It is not realistic to think of using land as collateral in areas where land sales markets do not function well. Housing markets in urban areas hold more potential in this regard than agricultural land in rural areas in developing countries. Group lending and implicit credit in sharecropping contracts are alternative ways to reduce the need for up-front capital in agricultural production. It is possible that the financial benefits of sharecropping even play a more important role than the risk-reducing or risk-sharing benefits of such contracts.

Data availability and estimation issues

LSMS studies with good data on housing issues in urban areas may be the most interesting to use for analysis of tenure and credit market effects. Such data will need to be complemented with good data from the financial markets providing loans for housing such that the demand side and supply side issues can be separated. Likewise, the endogeneity of property rights and land values has to be dealt with in order to establish causal effects and get unbiased estimates of impacts of property rights formalization on credit access.

Another area of interest could be to do nation-wide studies of the importance of land rental markets and contract choice in alleviating credit constraints in agricultural production, which may explain a part of the potential productivity-enhancing effects of such markets. Here it will also be econometrically challenging to isolate the credit effect from other effects.

3.6. Land ownership, gender and women's empowerment: Looking inside the household

There is a lot of evidence of gender discrimination in statutory law as well as in the *de facto* way it is practiced (Deere and Doss, 2006). Likewise, customary tenure systems are mostly biased against women with matrilineal systems as an exception. However, in recent years there has been an expansion of tenure reforms that have emphasized more equal tenure rights within the family through joint titling or certification of husbands and wives.

Inheritance rights are often gender specific such as in patrilineal and matrilineal systems. In patrilineal systems women typically get access to land through marriage and by moving to the household and village of their husband and similarly for men in matrilineal systems. One may question whether it is appropriate and will work well to introduce equal property rights, including inheritance rights, to men and women in these systems. There can be various ways to strengthen the land rights of women such as in cases of divorce or death of the husband but also related to their position within marriage. LSMS data with a gender-focused LTM can help to investigate the effects of several types of reforms that aim to reduce gender discrimination.

Relevant policy issues

Some of the relevant research questions are:

- How much of the private land is owned by men and women separately and how much is under joint ownership?

- How much of the land owned by men and women separately and jointly has legal documentation to confirm ownership?
- Are men and women equally tenure secure related to their land? Are female-headed households as tenure secure as male-headed households?
- How much of the land of households were brought to marriage by the husband and wife separately, and how much was acquired after marriage?
- How is land shared and the decision-power over land within marriage? Who are responsible for land renting and crop choice decisions, who are responsible for input purchases, providing labor, and disposal of the output? How are the returns shared within the family?
- How are gender-specific differences handled in cases where customary tenure rights are integrated in statutory law?
- How is increasing land scarcity and land fragmentation affecting the gender-specific land distribution through inheritance and marriage?
- What is the gender-specific division and sharing of property rights in urban areas?

Studies of gender and land rights

There is a huge and rapidly growing literature on gender and land rights, see Doss (2013) for a review. At the same time, there are few nationally representative studies and some oversimplified narratives have been long-lived in international documents due to weak data (Doss et al. 2015). Models of intra-household decision-making include cooperative and non-cooperative bargaining models and these can be used as a starting point for intra-household property rights and gender-focused analyses (Manser and Brown 1980; McElroy and Horney 1981; Lundberg and Pollak 1993). Agarwal (1997; 2003) addresses many complex issues that are not adequately captured in earlier bargaining models, such as gender asymmetries, the roles of social norms, subjective perceptions and opinions, and voice. Udry (1996) assessed the efficiency of farming in Burkina Faso in areas where husbands and wives operate separate plots within households, finding substantial inefficiencies in the intra-household use of resources in farming.

Deere et al. (2013) assessed the property rights and gender distribution of wealth in Ecuador, Ghana and the state of Karnataka in India. They found that married women in Ecuador owned 44%, in Ghana 19% and in Karnataka 9% of the couple's wealth. The study demonstrates the importance of marital regimes (sharing of property related to marriage) and inheritance rules for the gender distribution of wealth, and that such an intra-household assessment of inequality is important in an overall assessment of inequality.

Holden et al. (2011) assessed whether low-cost land certification strengthened the tenure security of female-headed households in Ethiopia and found that this was the case and to a larger extent than for male-headed households. This made particularly female-headed households more willing to rent out land. Holden and Ghebru (2013) found that household welfare measured as consumption expenditure per capita increased more for female-headed households, as a consequence of the same reform, and Ghebru and Holden (2013) found that this effect also showed up in stronger improvement of child nutrition in female-headed households.

Reforms that emphasize joint ownership of land for husbands and wives have been implemented in various developing countries in recent years, including in Ethiopia, Peru and Vietnam (Holden and Tefera 2008; Holden and Bezu 2014; Wiig 2013; Newman et al. 2015). While Holden and Tefera (2008) found that only 5% of the households expected any significant impacts of the joint land certification in Southern Ethiopia at the time they received the certificates. Holden and Bezu (2014), resurveying the same households five years later, found evidence of awareness effects, intra-household bargaining effects and intra-village social process effects that jointly contributed to strengthen the involvement of women in land-related decisions beyond the expectations of the

respondents five years earlier. Wiig (2013) assessed the impacts of joint titling in Peru utilizing random variation in the introduction of the reform as a natural experiment. He found significant empowerment effects for some types of decisions on an aggregate empowerment index constructed from the decision variables. Newman et al. (2015) investigated whether joint land titling is affecting land productivity in Vietnam. They found that there is no trade-off between joint titling and productivity. Joint titles were therefore potentially an effective way to improve women's bargaining power within the household without any associated efficiency losses.

The LSMS-ISA data have been used to study gender differences in land productivity in Ethiopia, Malawi, Mozambique, Nigeria, Tanzania and Uganda (Kilic et al. 2015). The studies revealed substantial variation in gender differences in productivity as well as disaggregated "explanations" in form of endowment and structural components to explain the differences. Policies aiming to reduce gender gaps therefore need to be tailored to the specific contexts in each country.

Doss et al. (2015) review nationally representative data from different sources to assess gender differences in land ownership for African countries. They express that it is surprising that there is such a lack of evidence regarding women's landownership given the strong emphasis on this in development objectives. Many flawed and inaccurate statements have therefore survived without being documented with data. They emphasize the need to standardize data collection to obtain data that give meaningful comparisons and a stronger basis for guidance of policy formation. Using LSMS-ISA data they document large variation in women's ownership of land across six African countries with Nigeria being one extreme where a very small share of the land is owned or controlled by women and Malawi being at the other end where women own about the same share of land as men do. The study also reveals large variation in the extent of documentation of land rights.

Data availability and analysis

A gender-specific LTM linked to LSMS can give a lot of relevant information on gender and land rights. There are many issues that can be included in the standard LTM and that are not too demanding to collect. Information on land acquisition by different persons in the household can identify who brought land into a household and give this a gender dimension. Including the birth rank of the person who brought land into the household may also provide insights about who in the family are more likely to inherit land. Where there are formal documents on land ownership the names recorded on the formal documents can provide a gender dimension to the formalization of land rights. The sex of household head is easy to use to compare the land ownership situation of male- and female-headed households and it may be possible to identify different categories of households that are female-headed such as divorced, widowed, never-married, wives with absent (migrated) husbands, and polygamous wives living separate from their husband and having own land. At the broader level one can identify households in matrilineal versus patrilineal systems and further sub-divide households in matri-local and patri-local where this is relevant. The *de jure* versus *de facto* division of land upon divorce and what happens to the land when one of the spouses dies should also be quite easy to investigate with good land acquisition data.

When it comes to who makes different types of decisions regarding the land such as crop choice, land renting decisions, input use, who actually do the different types of work, the control and sharing out outputs, part of this information may be obtained from the agricultural module. Other parts require a more elaborate land and production module that goes beyond what it is feasible to include in the standard module, with data disaggregation by person and parcel within the household-farm. The actual gender division of labor, decision-power and outputs need to be taken into account in the design of the parcel-based questionnaires in such cases. E.g. it is in West Africa common that husbands and wives operate separate plots while in East Africa it is more common with joint plots but a with a gender division of labor for different operations on the plot.

Variables assumed to affect the bargaining power of spouses include; assets brought into marriage; laws and regulations that affect how resources are distributed among parties in case of divorce; the opportunities (reservation

utility) each party has outside or within marriage; the cultural norms of behaviour within marriage; legal and informal protection in cases of abuse; cognitive and other human capital abilities of spouses; and social networks of spouses (Pollak 2005; Fafchamps et al. 2009).

3.7. Land institutions: Knowledge, trust, demand for their services, and informality

There are few studies of how knowledge about land laws is disseminated in developing countries, the extent to which such laws are implemented and how they are enforced. The degree of knowledge of the law may vary among government officials in land administrations and in other government institutions at different levels. There may also be variation in the interpretation of the laws and emphasis on different elements of the law by different government officials. The law may potentially be a tool for pursuing personal gains and power positions in the system. The extent to which the statutory law is contradicting customary law and practice may also affect the extent to which it is obeyed or enforced. There is substantial variation across countries in the extent to which there is a gap between statutory laws and customary law and practice on the ground. Attempts have been made in some countries to incorporate customary tenure rules into statutory law on land. In other countries statutory laws apply to some parts of the land while customary laws rule over other parts of the land. And in other cases these are in conflict and a consensus has not been reached. Different ethnic groups may also compete over the same land and each have a separate set of customary rules that they fight for. Some countries have a mixture of matrilineal and patrilineal inheritance systems and finding a “one-size-fits-all” statutory law is challenging. Agriculturalists and (agro)-pastoralists may have opposing interests due to different needs. The former want to protect their crops from damage by animals while the latter need a flexible access to grazing lands that require seasonal mobility of their animals. This complexity makes it challenging to find simple solutions in form of formalized land rights. However, more systematic collection of data from different stakeholder groups in nationally representative data can provide a stronger basis for interventions that can help to protect weak groups, reduce non-sustainable and enhance sustainable land use, and facilitate compromise solutions that reduce the extent of land use conflicts.

There are many ways of circumventing laws and the influential may find smarter ways of doing so. However, the extent to which this is possible depends on rules of conduct and practice, cultural norms, transparency, accountability and enforcement.

A LSMS-LTM may collect data on the knowledge of land tenure laws, their interpretations, compliance, perceptions and opinions about them. This can provide a better basis for judging the rule of law and the potential of law. It may also capture how customary tenure rules are practiced in a country.

Relevant policy issues

Some important and policy relevant research question include:

- What is the general knowledge of land laws in the population?
- To what extent do people agree with and obey the land laws?
- To what extent are land laws enforced?
- Who are more likely to ignore the land laws, what are the risks, and what are the potential costs and benefits?
- Are land institutions and the government officials working in land institutions trusted by the people?
- What are the perceptions regarding the performance of government officials working in land institutions?
- To what extent is elite capture a threat towards the success of specific land tenure reforms?
- How transparent and well documented are the processes in local land institutions?

- What changes in laws and institutions are needed to get better land governance?
- Are there certain ethnic groups or stakeholder groups that are losing out in land rights formalization processes? How can the rights of minority groups better be taken into account and protected?
- How well do customary land rights protect the rights of poor and vulnerable groups?
- What are the distributional implications of incorporating customary tenure rights into statutory law? Does it lead to better protection of the rights of the poor and vulnerable?

Studies of the performance of land institutions, power structures and legal knowledge

Goldstein and Udry (2008) studied how the position in traditional local power hierarchies affected land use intensity in Ghana where fallowing of land was considered an investment in land value. The powerful were able to fallow their land longer than others because they were more tenure secure. Markussen and Tarp (2014) assessed the extent of nepotism in local governments in Vietnam and found that households with a relative in a position with political and bureaucratic power invested more in land improvements than others lacking such connections. They suggested that this was because such ties strengthened their *de facto* property rights to land and their access to credit and transfers. The probability of losing land through expropriation was substantially lower for those having a relative with a public office. They also found that such households had better access to informal credit and that they were more likely to receive public and private transfers and these could also enhance investment.

How do local land institutions work in the process of incorporating customary land rights into statutory law? Mozambique is one of the countries that was attempting this through the 1997 Land Law, which aimed at protecting the land rights of the local communities, at giving women equal land rights and at facilitating the land access for investors. The rights of the former were to be clarified through a “delimiting process”. A case study in Manica indicates that powerful men *de facto* took control of this process and women were losing out (Kaarhus and Dondeyne 2015).

Data requirement, sampling and analysis

This will require data collection on the detailed customary tenure systems where these still are important as a basis for land use and claims by local people. This will require careful testing of the survey instrument to make it flexible enough to allow incorporation of important customary rules that may contain substantial local variation even within countries such as mix of matrilineal and patrilineal systems, agricultural, agro-pastoral and pastoral systems. Key informant (stakeholder) interviews may be used to complement the household survey to get valuable additional information about the institutional structure and functioning. While focus group discussions may be helpful in some settings there is also a risk that the powerful dominate such groups while the weak and less influential fear to express their opinions.

The survey sample may also limit what can be analyzed. The question is how well the LSMS sample in a country captures local heterogeneity given the limited sample size. There is some room for oversampling but further adjustment may not be feasible. Ideally, it will be important to include a sufficient sample size from each of the relevant domains or local stakeholder groups and this may require careful stratification in some cases where there are some stakeholder groups that are few in number and may be less permanently settled (such as pastoralists).

3.8. Land conflict: Incidence and implications

Conflicts over territory and resources are among the root causes of social unrest and war. Unclear and overlapping land property rights and property borders are the most common sources of conflicts over land. Unequally distributed land and land scarcity have been blamed for severe conflicts such as the genocide in Rwanda (André and Platteau

1998). There are, however, few nationally representative studies providing information on the frequency of local land disputes. Likewise, the access to informal and formal conflict resolution mechanisms and the level of trust in these mechanisms can be important for land-related decisions also among those who themselves have not experienced land disputes. Households may also respond significantly to small probability phenomena such as the risk of exposure to land disputes are in most countries. While there are some studies that find that land-related conflicts have large effects on productivity, efficiency and market activity, such studies are scarce and more and broader studies are needed to get a better idea about their incidence and severity, the need for interventions, and assessments of the impacts of alternative forms of interventions that aim to reduce land-related disputes.

Relevant policy issues

Research questions of importance to study related to land conflicts include:

- What is the incidence of land disputes, who are more exposed and more likely to lose out from such disputes?
- To what extent are land disputes caused by violations of the law due to lack of enforcement or by unclear laws?
- What are the economic and poverty implications of land-related disputes?
- Which types of land-related disputes are more common?
- What kind of conflict resolution mechanisms exist and how accessible and costly are these in use?
- What policy interventions are used to reduce land-related disputes and how efficient are these measures?

Review of studies

Baland and Platteau (2001) found evidence of increasing within-family disputes when land scarcity becomes very high in a system with a tradition of equal sharing of land within the family. Deininger and Castagnini (2006) used household level data from Uganda to investigate economic implications of land-related disputes, their incidence and the extent to which certain legal measures aimed to reduce such disputes have been successful. They found that land disputes particularly affected female-headed households and widows and there were strong negative effects on land productivity while the legal measures introduced had not significant effects.

Jansen and Roquas (1998) found that land titling in Honduras had exacerbated land conflicts by introducing multiple claims to land and by undermining existing institutions for conflict resolution. Alston et al. (2000) found that land redistribution of land from land-rich owners to squatters in the Brazilian Amazon enhanced land-related disputes. On the other hand, Holden et al. (2011b) found that low-cost participatory land registration and certification in Ethiopia reduced the extent of farm plot border disputes, the most common form of land-related dispute there.

In Côte d'Ivoire land scarcity had triggered acute tensions which resulted in expulsions of immigrants from Burkina Faso and Mali. A law was introduced in 1998 that declared all land of immigrants as state land but then leased the land to these immigrants for 99 years (Aldashev et al. 2012). This appears to have dampened the conflict between immigrants and the local population.

Customary and informal conflict resolution mechanisms are usually perceived to be cheaper and more accessible than formal conflict resolution through courts. Holden et al. (2011b) found that only 7% of the land-related disputes went to the formal courts while the large majority of disputes were resolved with the help of local informal conflict mediators in Ethiopia. On the other hand, Henrysson and Joireman (2009) assessed customary dispute resolution

mechanisms in Kisii region in Kenya, and found that also informal customary conflict resolution mechanisms were expensive and too expensive for poor and vulnerable households.

Data requirements and estimation issues

Relatively few households in a random sample are likely to have personally experienced land conflicts. However, a larger share may have seen or heard about such incidents in their communities or neighboring areas and such non-personal experiences may also have substantial impacts on the feeling of tenure security and the fear of being exposed to such conflicts. Information about how such issues are handled by local authorities including land administrations may also affect the trust in institutions and the feeling of tenure security. It may also affect the extent of opportunistic behavior and affect the probability that potential land grabbers believe they can succeed with their efforts to obtain land illegally. Knowledge and perception data in addition to own personal experiences with land disputes should therefore be collected.

Measures of tenure security can include; perception data regarding fears of losing land for various reasons in the future (e.g. due to state expropriation or private encroachment/land grabbing); the degree of *de jure* and *de facto* protection against such land losses; personal and community experiences of land losses in the past; the legal support or restrictions on land transactions including the extent of enforcement of the law (e.g. expropriation and compensation laws and practices); changes in laws and regulations that potentially may threaten certain stakeholder groups; extent of local land disputes and personal experiences with such disputes; the performance and reliability of local land administrations (transparency, accountability); trust in land administrations and other government officials; stability and reliability of the policy regime and implications for the investment climate (willingness to make long-term investments on the land).

The local context can be very important for the identification of good indicators of tenure (in-)security. The LTM needs to include systematic collection of good tenure (in-)security indicators jointly with good data on land use (land quality, areas, input use, investments, outputs), ownership and rental/sales activity to link variation in tenure (in-)security with input use, investments, productivity and land rental market activity.

A LSMS-LTM can be used to obtain nationally representative data on the incidence of land-related disputes, the knowledge of such local incidences, and the perceptions of such risks. The degree of trust in informal and formal conflict resolution mechanisms may be assessed from the households themselves. This can also be assessed with data from such institutions e.g. through interviews of local conflict mediators or judges, and the consistency of court rulings with the law may be assessed through reviews of court records if these are available and sufficiently detailed.

For rare events such as exposure to land disputes the sub-sample of exposed households may be too small to provide accurate estimates of variables collected through follow-up questions to those exposed. Deeper investigation of such issues will require different sampling strategies and/or additional approaches. Local conflicts may often happen in areas with multiple stakeholder groups and it is not obvious that the standard two-stage sampling approach with 10-16 households within each enumeration area/primary sampling unit will be sufficient to reveal local heterogeneity and interactions in a good way. More location-specific targeted surveys may be needed for the study of such land tenure issues.

4. Questionnaire module

4.1. Local Administrative/Community level information

While LSMS surveys have households as their primary sampling units for data collection, data collection at other levels is also important. For land tenure system data it is crucial to first get a good national overview of the systems in place and how they are distributed and how this matches with the distribution of Enumeration Areas

(EAs)/Primary Sampling Units (PSUs). There is also valuable information that can be obtained at the community level regarding the tenure systems and that can help make the household level collection simpler, such as elimination of irrelevant questions and questions where there is no local variation in the responses. EAs/PSUs may not coincide with local administrative units as households in one EA/PSU may belong to different communities. In relation to this it is important to identify the most reliable sources of community/administrative level information about tenure systems. It is likely that different persons sit with different types or land-related knowledge. In countries with formalized land rights systems local land administrations may provide relevant overview information while in countries with informal tenure systems traditional leaders or other respected persons may be the best sources of overview information. It will always be important to cross-check the reliability of information from such sources also. An example from Malawi can illustrate this. In an interview with a local chief, when asked about whether there is any renting of land in his area, he denied this and explained that according to their tradition land could only be borrowed and should not be paid for. However, parallel interviews with a group of farmers in the village of the chief revealed that land renting has become common in the village. This also illustrates that customary systems may change as land pressure increases and this is likely to affect the individualization of land rights, land values and the extent of land transactions. Verification of information obtained at the community level down at the household level is therefore also important and it may be a mistake to generalize from one EA/PSU to another. Local heterogeneity can sometimes have unexpected patterns.

A review of national land laws can form the basis for important land tenure related questions that can be asked at community/local administrative level as well as at household level. The level of knowledge of the laws and their acceptance in the population can be an important part of the LTM. If the laws are fairly new, the knowledge of them may also be limited in local administrations and among local leaders, not only among the households. Assessment of such information at the community/local administrative level can be important for the understanding of how knowledge of the law is trickling down and possibly affecting behavior within local institutions and the extent to which they implement or ignore such laws.

Perceptions of ownership may be a bit vague in customary tenure systems. It may be better there to identify the rights that people perceive to have regarding land. Their perceived bundle of land rights may then be understood and analyzed in a “continuum of land rights” perspective.

What are the local perceptions of “formal” versus “informal” land rights? One may distinguish these by stating that the first are integrated into statutory law while the second are not. Alternatively, some draw the line between written and oral agreements and perceive only written documentation as “formal”. However, it is possible that the written contracts among parties are illegal according to the law and they may therefore not be considered formal in the meaning of being legal. To avoid such confusion it may be best to leave out unclear concepts or, when they are introduced, they must be clearly defined.

A set of key institutional issues that should be carefully investigated when framing the Standard LSMS-LTM follow:

- Identification of the main tenure systems in the country with their key characteristics
- Obtain the land related laws that govern land ownership, inheritance, transactions, use, conservation, expropriation and compensation
- Obtain overview of key government organizations at different levels that are responsible for land administration, regulation and dispute resolution
- Obtain overview of land policies and land reforms and their form and degree of implementation

- Obtain an overview of customary tenure norms, their relation to statutory law and government land administrations, their influence, key stakeholders in charge of maintaining and enforcing them.

This information should be used to develop a village/community level questionnaire that forms part of the Standard and Extended LSMS-LTM. This questionnaire will be used to collect additional institutional information from the key stakeholder persons in the community. The information will also be used to specify good institutional questions in the household level LTM.

4.2. From generic to specific questionnaire

Basic codes in the questionnaire

All codes in the questionnaire should be represented by a unique number for a specific variable. Skip codes in the Excel version of the LSMS-LTM are used (automated with use of the CAPIs) such that given a specific answer in one question irrelevant questions are skipped. In the adjustment of the questionnaire it is important to ensure that the skip codes are kept in the same consistent way: >>17 means that next relevant question is question no. 17. A renumbering of questions before that will also require a renumbering of the questions after the >> signs. This will also have to be taken into account in the programming of the questionnaire for the use of CAPIs.

Development of local codes

Development of local codes is perhaps the most important aspect of the adaptation of the generic LTM to the local environment. This will be more challenging in countries with more ethnic, language and agro-ecological variation. It is important that the codes are consistent with or take into account the local conceptual understanding and terminology. An example can be used to also illustrate this. A recent LSMS survey in Ethiopia aimed to collect some land tenure data such as the extent of land renting. Households were therefore asked about the extent to which they rented in and out land. Comparing the data to smaller specialized surveys in Ethiopia indicates that land renting was substantially under-reported in the survey. One reason for this could be that households did not perceive sharecropping as a form of land renting and therefore did not report sharecropping contracts when they were asked about land renting.

It is also important to clarify the difference between terms such as “land rent” and “lease fee”. When land renting is in form of sharecropping, there is no clearly identified “price” for the land and payment needs to be specified through collection of sharecropping contract information such as input and output sharing rates and mechanisms, with specification of inputs and outputs and their prices. This requires careful elicitation by the enumerators to avoid mistakes and under-reporting or double counting.

The example codes used in the “generic version” are used as illustrations. There is no other way of doing this work than by carefully going through and translating all the relevant general and local concepts and terms used and replace the example codes in the questionnaires with the appropriate local terms. Questionnaires used in earlier land tenure studies in the country may help and so may such studies themselves as well even though they may not be nationally representative. A “land tenure map” may be helpful even if it is rough in terms of identification of the approximate borders for the different systems. A community-level survey up-front of the household survey may also be used to develop the set of appropriate local codes through combining it also with some pilot-testing and adjustment of the questionnaire to areas where less accurate land tenure information is available.

In areas with formal land rights and written documents such as land titles and land certificates it is good practice to ask politely to see such documents and copy the important information stated on these documents such as the names included on the documents, and the land-related information specified there such as size of the land (by parcel), name of area, location, land type/quality, etc. With parcel-level documentation this information should be organized in the same order (by parcel number) in the questionnaire as on the written document. With parcel-level IDs in the

formal documents these should be specified for each plot/parcel in the questionnaire to ensure accurate matching with other data collected at the parcel/plot level. If formal documents include maps and photos of owners such information should also be recorded, especially whose photos are listed on the formal documents. Some documents may also have names of neighbors or witnesses. Such persons may still serve a role that strengthens tenure security and it may be worth investigating this or whether they no longer are available and the documents are outdated for that purpose. Such persons may have died or left the household or community.

Land sales are not legal in all countries and may also not be common in some customary tenure systems. Questions on land sales may therefore be left out in such countries. However, even in countries where land sales are illegal such sales may take place. A basic question is whether a household survey would capture such illegal sales which both may be rare and unlikely to be revealed. This is an empirical question which may be investigated in relation to testing of the prototype module.

4.3. The Standard LSMS Land Tenure Module

Justification. The Standard LSMS Land Tenure Module (Standard LSMS-LTM) contains the most basic land tenure-related questions that should be asked in most countries where the LSMS is used. It aims to provide reliable data on the most important land tenure issues. It is closely related to the Agricultural Module for agricultural land. It also has a non-agricultural land module that will be the major component in urban areas.

The Standard LSMS-LTM has parcels as the basic land units. A parcel is defined as a single connected land unit linked to a specific owner and/or user of the land unit. The unit will be under a single tenure system but parts of it may be in different tenure categories such as owner-operated or rented parts. The owner may be a person, a group, an organization or the state. The user may typically be a household, an individual, a group or a firm. The use right may be permanent or temporary, may be exclusive or non-exclusive. Non-exclusive access may also imply rivalry over utilization of the resources on the land such as on communal land exposed to deforestation or overgrazing. Agricultural land is usually controlled by individual households and farmers but much agricultural land in low population density areas is fallowed to regain fertility. Such fallow land may or may not remain under the control of individual households/farmers. Fallow land may have been under fallow for a varying number of years and be covered by grass, bushes and/or trees. Household farms with substantial amounts of fallow land may not have a good idea about the size of their fallow land. They may, however, know how long the land has been fallow and how long time ago they last cultivated that land they clear in a specific year. With measurement of the area cleared and left fallow in a year and the number of years of fallow that the cleared land has been through, it may be possible to obtain an estimate of the total farm size including fallow. Farmers with land under such more extensive farming systems are less likely to have formal land rights and are also not likely to know very accurately how much land they cultivate in a year. Dependence on their own estimates of land sizes are therefore likely to be associated with a large measurement error. Measurement of areas with GPS or with other means will be important to get accurate measures of land productivity in such areas. The fallow land controlled by the individual households represent a substantial land value for such households and should not be ignored in the survey. When preparing a roster of land for the household one should therefore include such fallow land, how much land was cleared and how much land was left fallow during the last year. Such data may also help to estimate the rate of deforestation in an area. If only land clearing is included without taking into account land put into fallow one risks substantially overestimating the rate of deforestation, however. For the cultivated land it is also useful to know how many years the land has been cultivated and divide in parcels based on the number of years the land has been cultivated.

With higher population density the share of fallow land will be reduced and disappear almost completely in the most densely populated areas where the remaining uncultivated land may be more or less protected from utilization. In such areas the survey will focus primarily on the cultivated land controlled by the individual households. However, access to resources from public lands can also be relevant. The extent to which formal property rights exist in such areas can vary from country to country. Land allocation may still be determined through customary tenure systems,

where land is owned by the clan/ethnic group, while more or less permanent user rights are allocated to individual households. There is evidence that even in more land-scarce environments farmers may not be able to estimate their farm and parcel sizes without substantial measurement error. Use of GPS is therefore also in such areas important to get reliable estimates of land productivity.

Ideally, we would have liked to collect gender and farm plot level disaggregated data but budget constraints and capacity constraints in most of the countries where LSMS is implemented imply that this is not possible. Such more ambitious Extended LSMS-LTM surveys may be implemented in a few countries where there is larger interest and more resources available. However, even without that the Standard LSMS-LTM will be a big step forward in terms of providing new and better nationally representative land tenure data that have not existed before for most countries. In the future it may be possible to also expand the Extended LSMS-LTM to more countries.

Each element of the Standard LSMS-LTM is introduced below.

Parcel roster

Households are asked to provide an overview of the parcels belonging to the household, including cultivated, rented and fallowed land. The roster should also include non-agricultural parcels of land. Households should be asked about their estimated size of each parcel and parcels may also be measured by GPS where that is needed. The households may use their own units for area measurement and codes for such units and their approximate conversion rates to square meters need to be identified. In some countries the households may have formal documents with accurate information on parcel sizes and this information should be inspected and used in such cases and there is not a need then for measuring the parcels. A GPS can also be used to help the identification of the location of a parcel which can be important for matching parcels over time in household panel surveys. This will be particularly important in locations with fragmented land holdings. Using names for the parcels or the locations of the parcels may also help in such matching of parcels.

It is important that the same system for parcel identification is used in the agricultural module to ensure parcel level matching of the land tenure data with the parcel level agricultural input, output and investment data collected in the agricultural module.

Part A: Inheritance

Justification: How land is transferred between generations and distributed among children within families has large implications for the future land distribution, the extent of concentration of land including by gender. Inheritance may be guided by statutory law in some countries and by customary norms in other countries. With increasing population pressure customary norms that favor an equal distribution of land among children will lead to excessive land fragmentation and may also be associated with intra-household competition for land. The extent and the efficiency of the land market will also affect whether land sales and rentals lead to efficient operational units of land use. Inheritance systems also relate to residence and marriage systems in important ways. Women's rights to land can be weak in systems where they do not inherit land themselves but move to the husband's village and live on his land. What rights to the land do they have in case the husband dies or they divorce? And also what happens to their house in such cases? Are such outcomes guided by statutory law or by customary norms? Here can be a need to adjust the questions to local circumstances. If all the land and the house are inherited jointly by the same person(s), these questions can also be asked only at the household level. If, however, different persons brought land to marriage and ownership for different parts of the land remain individual within marriage, there is a need to disaggregate the questions to the parcel level.

A.2: Who in the household or family are expected to inherit the land of the household? This may be a single person, or several persons jointly, or the land may be divided among some persons. The coding will need adjustment to the specific conditions in each country. Some countries have a combination of matrilineal and patrilineal systems and

within such systems there are matrilineal, patrilineal and neolocal residences that affect the gendered land rights including inheritance rights.

A.3 – A.6: Who will inherit the land in cases of death of the husband or divorce? This may depend on who brought the land to marriage but also on the number and age of the children. It may also depend on statutory law and the legal knowledge and acceptance of such laws and whether they are contradicting traditional customary norms. In some countries joint ownership of land and houses may be established upon marriage and these may be shared upon a divorce but such rules also vary greatly. A separate question is asked for the house but this may only be relevant in some countries.

A.7: A question about the basis for settling inheritance disputes is also asked as this may vary particularly when statutory laws and customary norms contradict each other. This will tell something about the relative positions of the statutory law versus customary norms.

Part B: Non-agricultural land holdings

Justification: Many of the key policy issues in the area of land (e.g. the need to regularize informal settlements, the scope for converting land from agricultural to non-agricultural use, the ability to use land as a collateral for credit, the level of tenure security, the extent of compensation in case of expropriation, or biased access to land) are at least as relevant in the case of non-agricultural land as they are for agricultural land. Non-agricultural land is more important in urban and peri-urban areas. It is often investments on that land and the specific location of that land that determine its value and use. Non-agricultural use values can be large multiples of the agricultural land value. In areas where agricultural land is transformed to non-agricultural land property rights are also often transferred and the institutional characteristics are crucial for how the large property value increments are shared between previous and new owners. It is therefore critical to collect good information on this type of land. This part collects information on non-agricultural land owned by both agricultural and non-agricultural households. Information has to be collected on non-agricultural land owned by the household irrespective of its current user.

Non-agricultural land refers to land devoted to the use of non-agricultural purposes such as private commercial construction, owner's dwelling site, brick fields, etc. Homestead parcels in rural areas also include non-agricultural uses and an assessment needs to be done on the relevance of the questions in the non-agricultural land questionnaire for such homestead parcels. Homestead parcels in urban/peri-urban areas may mostly be used for non-agricultural purposes but they may also contain a garden used for agricultural production. If that is the case, such homestead parcels should be included as the first parcel in the agricultural module (**C.1**). Most households may have only one non-agricultural parcel which is also their residence. However, there will be some households with more than one non-agricultural parcel that also may be used for various commercial purposes. The questionnaire is therefore constructed to allow for multiple such parcels.

Most households with non-agricultural land may not have any agricultural activity meaning that they need not be exposed to all the agricultural land related questions. This gives room for exposing them to a more elaborate questionnaire for the non-agricultural part also in the Standard LSMS-LTM.

B.2 – B.3: The size of non-agricultural land would normally be known with a high level of accuracy. An exception may be in informal settlements where there could be a need for measurement based on GPS or satellite data.

B.4 – B.12: These questions collect basic characteristics of non-agricultural land owned by the household: the size of plots, their tenure status, time of acquisition, whether there were any buildings on the land at the time of acquisition, mode of acquisition, whether any documents were received confirming ownership, who in the household acquired the land, whether there has been a rearrangement in the household regarding the co-ownership of the land with eventual persons involved in this (such as due to marriage), whether the names of recognized co-owners appear on any formal documents of ownership and whose name(s) were on such eventual documents.

B.13 – B.14: The eventual cost of acquisition, and how it was financed is collected for purchased land and other acquisition that had cost implications.

B.15 – B.16: Information on who the land was acquired from, and where relevant, the relationship (social distance) to the head of the household is recorded, including the gender of the previous owner of the land. This can give insights into how land has been transferred back in time (acquisition history) and give indications of important social change aspects of land transactions.

B.17 – B.19: The existence of transfer/sales documents related to the transfer and whether these were registered in local, district or national offices and registries identifies the extent to which the transfers were formalized. This is only relevant in countries which have such systems available.

B.20 – B.21: The cost of formal registration in form of official and unofficial payments at the time of acquisition and registration in cases when this applies give an indication of the cost of this and may also explain why some did not do it because the cost may have been prohibitive, cumbersome, not required, considered unimportant, or impossible. This will depend on the specific conditions in each country at that time. The responses can therefore yield historical insights.

B.22 – B.23: If the land was not formally registered at the time of acquisition, or the formal document at that time is outdated, the current legal formal document of ownership should be specified, and when it was obtained for the property. If it is the same as at the time of acquisition the information should be the same as that already obtained, including the year it was obtained.

B.24: For time-limited documents such as leases or time-limited certificates the length of their validity should be recorded.

B.25 – B.30: The name(s) listed on the currently valid formal documents should be recorded and whether these are current members of the household. It is possible that the documents are not up-to-date and contain names of dead persons or persons that have left the household. The relation of such non-member persons with the current household head should also be recorded. This information gives an indication of the eventual need to update this kind of information. It is also possible that other household members should have been included on the formal documents e.g. due to marriage. There may also be constraints to such updating related to tax or dispute irregularities that should be recorded.

B.31: What are the reasons for lack of legal documents of ownership rights? The codes have to be adjusted to the local conditions. In some countries such documentation is not available such as where customary rights still apply also to non-agricultural land, or in unregulated settlements or slum areas that have not been formalized or where such documents are not provided at the individual household level. Where individual documents should be available, it is useful to know why some households do not have them or only have them for parts of their non-agricultural land. The codes may need adjustment to local circumstances.

B.32 – B.34: For those not having any formal documentation of their land rights it may be interesting to know their demand. These questions aim to obtain information on households' demand for titling and their willingness to pay for it. Such willingness to pay may be compared with the actual cost of providing such formal documents and whether a fee can be used to fund such formalization.

B.35 – B.36: In cases where lesser formal documentation (e.g. occupancy certificates, certificate of customary ownership, etc.) is legally recognized and widely practiced, information on these may be added or substituted for that on formal title.

B.13 - B.18. Obtaining information on hypothetical sales and rental values of the land owned or occupied can be very useful for comparison with official valuations of similar land (e.g. for tax or expropriation purposes). Also, comparing rental and sales prices can provide an estimate of the implicit discount rate. In cases where land sales are not allowed, “sales” may need to be replaced by a long-term rental of given duration (e.g. 15 or 25 years) in line with the applicable regulations. The rental price is asked for 12 months, but this can be customized taking the normal practices of each country.

B.19 - B.20. These questions collect information on the households’ perceptions of the rights and restrictions regarding transfer through rental, sale, bequest, as well as the ability to change use, erect permanent structures, or use it as collateral. Collecting this information separately will allow assessment of the extent to which possession of different types of formal and informal documents reduces restrictions on land use, and identification of whether formal or perceived rights will have an impact on land-related investment as well as land values. If gender issues are germane to the country under consideration, these questions can be administered separately to male and female adults of the household and should explicitly ask about the rights of these individuals on each parcel.

B.21 - B.33. These questions address issues related to actual land conflicts or the threat thereof and, in the case of actual conflict, the duration and mechanisms for conflict resolution applied. This will allow analysis of the incidence of such conflicts as well as the impact they have on land values and the productivity of land use.

B.34 – B.41: Any payments of lease fees, land rent or taxes for each unit of non-agricultural land property should be recorded.

B.42: The current uses of the non-agricultural land is registered. Multiple uses should be included where this applies.

B.43 – B.50: Renting out arrangements are recorded for tenants on the property where applicable, including their number, whether this is for a specific number of rooms, buildings or the whole property, the rental income, the contractual arrangement, and tax payment on rental income during the last year.

B.51 – B.54: Whether there is an active property market in the area is identified, and whether the household is aware of the going prices if such a market is active, is investigated. This is an indication of reliability of the answers to the follow-up question on the perceived/estimated sales value for the non-agricultural property if it can be sold. This question is also followed up by assessing the cost of constructing a similar property today and purchase the land on which it is built. This facilitates a decomposition into the value of the land and the value of the buildings on the land.

B.55 – B.57: These questions investigate whether there is an active rental market in the area and whether the household is informed about the prices in the rental market and whether therefore they can give a realistic estimate of the rental value of the property. For those already renting out the property or part of it as identified with the information on tenants these question may still add value in terms of possible rental value if the whole property were to be rented out (if that is currently not the case).

B.58 – B.67: The linkage between the credit market and the non-agricultural property as collateral is investigated. This is complemented with information on the extent of use of the property as collateral, the purpose of the loan(s), the source(s) of the loan(s), the person(s) taking the loan(s), the person(s) giving their consent, the loan amount(s), the current outstanding loan, and the interest rate on the loan(s).

B.68 – B.71: The right to sell and the right to mortgage the non-agricultural property and also who has these rights if such rights exist, are recorded. These rights are closely related to the previous questions regarding whether the property is used as collateral. It is highly likely that there must be both rights to sell and mortgage land before some lenders are willing to accept land as collateral for loans.

B.72 – B.75: The rights to bequeath and the rights to rent out land and who have these rights in the household provide insights into the intra-household distribution of rights. This may also be compared to the names of household members included in formal documents of the property rights. E.g. to what extent does renting out of the property require the consent of other household members or is this a decision the head of the household can make alone? This may depend on legal rules as well as customary norms.

In the agricultural part the rights questions are asked both to husbands and wives. One have to judge whether it is important to disaggregate these data by gender also for the non-agricultural land. This may be determined after an assessment of the institutional characteristics and the gender roles in each country.

Part C: Agricultural land holdings

Justification: In most countries farmers undertake agricultural activities on different parcels of land. Parcels can differ in terms of types of tenure (e.g. leasehold, freehold, customary, with or without any certificate) under which they are held, the mode of acquisition (e.g. purchased, inherited, cleared, etc.), types of ownership rights (title, sales deeds, tax receipts, etc.), land quality, the degree of land degradation and erosion, and other physical characterizes. Especially if the possession of title is exogenous or a valid instrument for it can be found, hedonic regressions can be used to provide an estimate of the potential benefits of title or other documents aimed to increase tenure security.

To avoid confusion between perennial and annual crops, it will be desirable to adopt a reference period of 12 months for agricultural production. In cases where annual crops are grown in 2 or 3 seasons, the quality of the information obtained can be significantly improved if information on these is collected by season rather than in the aggregate and if in the questionnaire the months for the start and end of these seasons are clearly identified. Also, as land is a key asset, changes in a households' land endowment (through inheritance, purchase, or sale) are normally remembered well with an extended (flexible) reference period.

Part C1: Land holding: Land owned and farmed by the household

Justification. This part identifies the type of land tenure system on each parcel of land owned and operated by the household. It also identifies the mode and time of acquisition, the perceived land value, current land use, and basic land characteristics (such as soil type, slope, soil depth, land quality). It is an essential part to link land tenure to land use and productivity analyses.

C1.2: The size of parcels should be identified, based on a reliable source such as a formal document or GPS in a standard unit such as square meters or hectares. While a GPS gives more inaccurate measures of small plots, complementary use of measuring tape could be used for such plots.

C1.4: The tenure system for each parcel should be specified based on codes for all relevant land tenure systems in the country. The types of land tenure systems may be based on variations in customary systems as well as statutory law. Examples of customary systems include patrilineal and matrilineal systems, which also give an indication of gender-specific inheritance rights. Statutory law and colonial systems may divide land in freehold and leasehold land. Land may also be divided in private and communal land.

C1.5 - C.1.6: When and how was the land acquired? The time of land acquisition is identified by the year. This will often require a long recall period but it is believed that the ability to recall such important events is good. The source of the land is also likely to be known such as whether it was inherited, purchased, allocated through administrative distribution or allocation by the chief within the customary system. Land may also have been obtained through homesteading/squatting where claim is established through cultivation of unused land.

C1.7 - C.1.8: Estimates of land values in form of potential sale value and annual rental value can be obtained most easily where sales and rental markets for land are well developed. Land sales can be rare and prohibited in some countries and then it may be harder to get reliable estimates of sales values of land. However, also in such cases one

may obtain acceptable compensation values for land in cases of land expropriation. Rental values of land can also be hard to obtain where rental markets do not work or where sharecropping is the dominant form of land renting. The value of the output received by the landlord may be used as an estimate of the rental value in the latter case if the landlord do not provide any inputs other than the land. Hypothetical questions may give biased estimates of land values and it is therefore important to critically assess the quality of such estimates and the basis for the valuation.

C1.9 - C.1.10: Current (last year) primary use of the parcel establishes what is grown or invested/built on the parcel. Such land use may include growing of annual crops, perennial crops, fallowing, forest, fish pond, grazing land, or degraded, barren or unused land.

Investments in irrigation, types of irrigation system and drainage on the land are important determinants of intensity and productivity of land use. Such investments are particularly important in areas with limited or more unreliable rainfall. Proper codes have to be developed to classify such technologies and characteristics.

C1.11 - C.1.13: Parcel soil characteristics such as soil type, soil color, soil depth, slope and weed infestation can be important indicators of land productivity and susceptibility to land degradation. Farmers' perception of relative soil fertility of plots may also provide an indicator on local relative soil fertility variation. Soil type or texture combined with soil color may be used to classify the soil in scientific terms and this can also give indications of the properties of the soils in terms of their nutrient contents and ability to hold moisture and how easy they are to cultivate under different moisture levels. Combined with topographic characteristics and rainfall pattern the erodibility and erosivity threats and the need for soil and water conservation measures to ensure more sustainable land use can be assessed. Such information can provide insights about the sensitivity to climate risks and shocks in form of droughts and floods.

C1.14: Distance from homestead to the parcel and the number of parcels are good indicators of the degree of land fragmentation and the cost of operating fragmented plots in terms of time it takes to travel to and from plots with inputs and outputs and for work and monitoring of plots. The time spent on the travel to and from plots may be estimated in minutes walk or travel time with another means of transport if that is relevant. The distance to and from a plot may also affect land use on the plot, input use intensity as well as investments on the plot. It is harder to monitor more distant plots and such plots may also be exposed to higher risks of theft of output or encroachment or grabbing of the land. The inconvenience associated with long distance to plots may also result in such plots being rented out if their tenure security is high. Land consolidation may also be a remedy to excessive land fragmentation and may be investigated with such data.

One may alternatively rely on geo-references for the plot locations but they may not be a very good indicator of travel time in locations where the topography and infrastructure imply that travel time is not well correlated with the shortest distance between two points.

Part C2: Land holdings: Rented or borrowed in parcels

Justification: This part provides information on the extent of land renting in and borrowing and can give indications of the level of activity in the land rental market, who participates in the market and what contractual arrangements are used. This may also be used to analyze factors associated with land rental market participation, access, partner choice, rental contract choice and production efficiency.

C2.1- C2.3: Unique parcel codes should also be given to rented in and borrowed parcels and reliable estimates should be obtained for the size of these parcels through measurement or from reliable documents.

C2.4: It is important to know for how long (in years) rented in or borrowed parcels have been used by the household. This tells something about the duration of such contracts although it does not indicate how far into the future it will continue to be used by the household.

C2.5: See C1.4. The primary use of the parcel should be classified in the same way as for owned parcels.

C.2.6: The annual rent paid per year in monetary value provides an indication of the cost and income from rented land. The value should be estimated also when payment is in kind such as in sharecropping contracts. The market value of the crop share going to the landlords should then be used subtracting eventual input costs that the landlord has contributed to paying.

C.2.7: Investments in irrigation, types of irrigation system and drainage on the land are important determinants of intensity and productivity of land use. Such investments are particularly important in areas with limited or more unreliable rainfall.

C.2.8-2.10: See **C1.11 - C.1.13:** Same system of soil classification should be used for rented and owned parcels.

C.2.11: See **C.1.14:** Same system for distance rented plots should be used as for owned parcels.

C.2.12: Who is the owner of the rented or borrowed land? Appropriate codes have to be established to categorize the types of owners that provide land in the rental market or lend out land.

C.2.13- C.2.15: What is the contractual arrangement between the tenant (this household) and the landlord (owner) of the land. Appropriate codes have to be developed to capture the variation in contractual arrangements whether it is rented or borrowed land. In case of output sharing (sharecropping), the share (percentage) of the output given to the landlord should be recorded. In case the landlord also provides inputs or services from the landlord, this should be indicated with a YES/NO response.

Part C3: Land holdings: Rented or lent out parcels

Justification: This part will identify which types of households are renting out or lending out their land. Such data may potentially be used to assess factors affecting the willingness to rent out land and how much is rented out. Security of tenure is one such possibly important factor. It may help to examine whether secure property rights encourage households to supply more land for rental purposes. It also provides additional information on the scope and nature of the rental market.

C.3.1-C.3.3: The unique parcel codes for rented or lent out parcels need to be identified and be consistent with parcel codes in C.1. The parcel sizes should be obtained from documents or be based on the owner's estimate. It may not be possible to measure rented out parcels.

C.3.4: See **C.1.4** and use the same codes for tenure system.

C.3.5 - C.3.6: See **C1.5 - C.1.6:** Land acquisition information for rented out and lent out land should be obtained in the same way as for owned owner-operated land.

C.3.7: See **C1.7 - C.1.8.** Precision of land valuation will depend on the existence and activity in the land market.

C.3.8: Investments in irrigation, types of irrigation system and drainage on the land are important determinants of intensity and productivity of land use. Such investments are particularly important in areas with limited or more unreliable rainfall. Proper codes have to be developed to classify such technologies and characteristics.

C.3.9 – C.3.11: See **C1.11 - C.1.13:** Same system of soil classification should be used for rented and owned parcels.

C.3.12: See **C.1.14:** Same system for distance rented parcels should be used as for owned parcels.

C.3.13 – C.3.14: Renting out history is recorded for the two last years in C.3.13 which should be easy to remember. An issue which might come up is that only part of a parcel is rented out but that may be a rare case. In areas with

more than one production season in a year, such as on irrigated land it is also possible that land is rented out for part of the year. Coding should be adjusted to facilitate recording of such information where relevant. The number of years the parcel has been continuously rented out to any partner is captured in C.3.14 and households would normally also remember this.

C.3.15: The number of remaining years of the rental contract from the time of the survey indicates how long the land unavailable to the household. However, some contracts can be open-ended and either party can decide at any point in time to terminate the contract. A code for contracts being open-ended is therefore included.

C.3.16 – C.3.19: The type of tenant or relationship to the tenant can give insights about how the rental market operates. Classification codes may have to be adjusted to the local context. Tenure insecurity may cause many only to rent out their land to relatives or other people they trust. The gender of the tenant may also be of interest and may indicate something about access and demand in the market. The distance to where the tenant lives tells something about the degree of spatial integration of this market. The degree of spatial integration can often be very limited.

C.3.20 – C.3.24: See **C.2.13- C.2.15** for the rental contract arrangements that apply both to rented in and rented out land. In addition it is asked whether the rental contract is formally registered for land rented out. In some countries such registration is a requirement and in others it is not. Some may prefer to have such a system which may help ensure the tenure security of landlords who otherwise may fear that their rented out land will be grabbed by the tenant.

Part D: Land title or certificate for agricultural land

Justification: This part gathers information on the existence of formal documents that confirm ownership or user rights to land. It also assesses the demand for a formal title or certificate and the households' willingness to pay for the document of their choice. It allows us to assess differences in the willingness to pay between different groups of the population. It may also indicate something about the ability to pay in countries where it is very expensive to get such documents. The demand for instruments that provide stronger property rights, and the willingness and ability to pay can give an insight on (i) the feasibility and sustainability of titling and certification programs; and (ii) the level of existing tenure insecurity of the country under study. The data can also be used to examine the effect of being poor on the demand for formal documents, as poor people may not have alternative means of establishing property rights as compared to their richer counterparts.

D.1 - D.2: The parcel roster should include all owned parcels of the household including owner-operated and rented out parcels.

D.3 – D.4: The type(s) of formal documents available should be coded such as title for the whole farm, parcel-level title, farm level certificate, parcel level certificate, etc. The time of receiving the title or certificate should also be stated.

D.5: The names listed on the formal documents tell who the official owners are. There may be more than one name there and this may signal joint ownership such as for husbands and wives. In other cases only one of the household members is listed as an owner and this may have implications for the ownership status of other household members. Sometimes the name on the document is a person who has died and there may be a need to update the document to include the name of the current owner. The names on the documents can also tell a gender story about the extent of female ownership or inclusion of the names of the wives on such documents. This may also be important for their rights in cases of divorce and death of their husband, and therefore their tenure security.

D.6 – D.7: For those who do not have such formal documentation of land ownership it is useful to know whether they would like to have it and in case, how much they would be willing and able to pay for it. The willingness to pay can vary for the different parcels of land that households have.

D.8: Knowledge of where to go to obtain such formal documents where that is possible may be limited and the actual possibility of getting the documents can indicate something about access.

D.9: The cost of obtaining a formal land ownership document varies a lot in countries where such documents can be obtained. There may be a need to pay extra money unofficially in some countries where land administrations or those responsible utilize their positions for rent-seeking. It is possible that the payment for such documentation also depends on the land size. This should be investigated in each country before the finalization of the questionnaire. In some countries it may also take very long time to obtain such documents and perceptions about how long time it would take may also be a relevant question. Knowledge of this information may vary across households and the reliability of the responses needs to be critically assessed.

Part E: Investments on agricultural land

Justification: The conventional reason for making land rights more secure has been to enhance investment incentives and efficient use of resources. This causal relationship has been questioned in recent research works, as land related investment can also be used to establish tenure security especially in an environment where state enforcement mechanisms are considered to be ineffective.

Therefore, the questions in this part should be designed aiming at quantifying the impact of tenure security on different types of investments and the possibility of reverse causality through the use of instruments that are exogenous to households' investment decision. Doing this requires knowledge of the local practices, as the types of land-related investments to be considered should be customized to the circumstances of the country. Information should be collected parcel-by-parcel because the investment decision of households would vary across parcels depending upon parcel level tenure and other physical characteristics.

Five basic categories of investments on the land are considered; namely, buildings, soil and water conservation improvements, irrigation related investments, permanent and semi-permanent structures and trees/perennials. Each of these investment categories are further subdivided to get more detailed information about the types of investments at each parcel. The coding for each of these investment types need to be carefully adapted to the circumstances in each country.

E.1 – E.2: We include all owned and rented in parcels in the roster for land-related investments. It is also important to consider the extent of investments on rented land and the incentives that tenants have to invest on such land given the contract conditions such as the duration of contracts and the types of investments that are relevant and the need to maintain such investment, e.g. soil and water conservation structures.

E.3 – E.8: A three-step approach is used to first identify whether there are any investments on the parcel, next what the main category/ies of investment(s) there are, and finally the more specific type of each category of investments that are found on each parcel. Multiple types of investments may have occurred on each parcel and it is therefore important to allow multiple codes in relation to each question.

E.9 – E.18: These questions aim to get indicators for more recent investment incentives on each parcel for different investment types. These may be used to tease out impacts from more recent policy changes and exposures to shocks.

E.19 – E.21: Fallowing is common in many countries in areas with lower population density and is an important way to ensure that soil fertility is regenerated and weed infestation reduced. In such fallow systems typically land is cultivated for a number of years till yields become too low and the land is then left fallow for a number of years till it again is cleared for a new cultivation period. Such fallowing may therefore be seen as a form on investment in regeneration of soil fertility. The length of the cultivation period (in years) and the length of the fallow period (in years) can be used to get the R-value for the intensity of cultivation. It is important to take into account all the fallow land available to the household. Tenure insecurity may also limit the ability of households to leave land fallow.

E.22 – E.23: How well parcel borders are demarcated is likely to be an important indicator of tenure security in areas with land scarcity. Unclear borders can facilitate area encroachment by neighbors and can lead to a lot of boundary disputes. Investment in demarcation of boundaries may therefore be one way to protect oneself against such tenure insecurity. Fencing and tree planting are common investment responses. However, there may also be other reasons for such investments such as controlling the movement of animals.

E.24 – E.25: Tenure insecurity related to fallowing of land can prevent use of fallowing to regain soil fertility. Perceptions of such tenure insecurity may therefore affect such fallowing. These questions can be included in such countries. Further questions on tenure insecurity follow in Part H below.

Part F: Land rights on owned and rented in agricultural land and knowledge of the law

Justification: It is worthwhile to analyze whether land rights that provide tenure security will provide an important incentive for households to make long-term investments that enhance the productive capacity of land or to transfer land from the less to the more productive users. It is therefore critical to collect data on the perceived land rights parcel-by-parcel to examine their impacts on the households' production and input allocation decisions.

There may be systematic differences in the perceptions of these rights between men and women/husbands and wives in many countries. These questions should therefore be asked separately to each of them. It is important to collect this information directly from the individual in question in private, i.e. from women in the absence of men and vice-versa. It is also critical to consider the gender composition of the interview team in order to avoid serious measurement errors.

F3: A question regarding who is the parcel manager is used to find out whether this varies across parcels on the farm. In some countries it is common that husbands and wives farm separate parcels while in other countries the gender division is more related to specific operations on the parcels. The rights may vary more systematically by gender in countries where males and females operate different parcels.

F.4 – F.21: A bundle of rights approach is used and questions are asked for a range of rights but this list can be modified depending on the circumstances of each country. The initial review of land tenure systems and land laws in the country provides the essential basis for modifying this part in terms of the relevant types of land-related rights to include.

F.24 – F.27: The last set of questions collects information about women's and men's knowledge of the land law in comparison with actual practices concerning specific female rights with respect to inheritance and asset division at the time of divorce. It can be used as a consistency check between the law and the normal practices regarding women's land rights. The questions need to be adapted to the circumstances of the country taking the land law, customs and cultural practices into account.

Part G: Land conflicts on non-agricultural and agricultural land

Justification: These questions seek to establish (i) the relationship between land conflict and productivity at the plot level as well as its impact on the value of land; and (ii) households' choice between the available institutions for conflict resolutions. Land conflicts are quite rare phenomena and may only affect directly a small share of the sample who are personally involved in such disputes. There may also be within-family competition for land that leads to intra-household/family disputes. Conflicts in the neighborhood or external threats may, however, affect perceptions and the feeling of tenure security and this may need to be taken into account where relevant. This also relates to the next part on tenure security.

This module has two sets of questions. If it is believed or found that there is very little variation across parcels within households it is sufficient to ask this part at household level.

G.3 – G.5: These questions are about perceptions of households as to whether they are concerned about land conflict at the parcel level, concerning what and with whom. Certain parcels may be at higher risk of being expropriated or there may be more competition for certain parcels among those who want to inherit the land.

G.6 – G.17: This set of questions is about personal experiences with land disputes related to each parcel. This relates to past and ongoing conflicts. Additional information on the nature of the conflict, with whom, when it started, whether it is resolved, how it was resolved or remains unresolved (through formal or informal means), when it was resolved, who resolved it, whether the household is satisfied with the outcome and how much expenses the household had in relation to the dispute resolution. It is important that the codes on the nature of the conflict and the list of institutions involved in conflict resolution are adjusted to the country specific conditions.

Part H: Tenure security on non-agricultural and agricultural land

Justification: Perceptions of tenure security can have strong effects on land use as well as investments and land transactions. There can be both private and public sources of tenure insecurity and perceptions of such (in-)security may vary across parcels of land that households own or rent. There may also be within-household variation in such perceptions and threats and women may often be more tenure insecure than men. The parcel manager/owner should be asked these questions for each parcel (info from **F.3**).

H.3: The parcel manager/owner is asked about the perceived likelihood that they will still keep the parcel in ten years. The time horizon may be adjusted depending on the circumstances but a ten year perspective may be a reasonable horizon in most cases.

H.4: The agents/sources that potentially are the threats to parcel tenure security should be identified and the codes may need adjustment to local circumstances. More than one source of insecurity may be operating in an area and for each parcel.

H.5: The ways in which respondents respond to such tenure insecurity is recorded where relevant. Codes here may also need to be adjusted to the local conditions.

H.6 – H.7: The expectations regarding compensation in relation to expropriation and the expected size of such compensations may also affect how people respond to such insecurity. National expropriation and compensation rules, knowledge about these and the way they are practiced may affect the expectations. In cases where compensations are low or uncertain, insecure owners may prefer to sell the land before expropriation occurs and they may have to sell at a low price to people who are better positioned to protect themselves against such tenure insecurity. Such issues are particularly relevant in relation to urban expansion.

H.8: The extent of legal support in cases of land expropriation depends on laws and how these are practiced and also the costs involved and the social capital and personal connections that households have. Other parts of the LSMS survey may collect important information on such social capital issues.

4.4. The Extended LSMS Land Tenure Module

The two most important extensions in the Extended LSMS-LTM is that more disaggregated data are collected on land use. This includes dividing parcels into plots with uniform land management, and collecting detailed gender-disaggregated data that allow deeper intra-household analyses of decision-making that do not rely on the unitary household model but opens for competition and conflicts over resources within households and that may cause within-household inefficiencies. This type of analysis is particularly relevant in countries with large gender inequities in land rights and where there have been land tenure reforms aiming to reduce these gender inequities. An Extended LSMS-LTM can also be expanded in other directions where relevant and where there are more resources for detailed data collection. One should, however, be careful not to overstretch the households that have to respond to all the detailed interviews. It may be particularly relevant to collect panel data from such households and it is then

particularly important to maintain a good relationship with them such that attrition rates do not blow up due to respondent fatigue and refusal to cooperate. Some ways of compensating the households given their opportunity cost of time will be important. Splitting the interviews in more and shorter visits over a period of time and involving more household members in the interviews will be crucial to succeed in getting good data.

Extended plot roster

By dividing parcels into plots with uniform land management (same land type, crop, variety, input use, etc.) and collecting detailed disaggregated data on plot characteristics, input use, output and accurate measures of plot size, it is possible to do better land productivity analyses. Such analyses can include issues such as land fragmentation, land degradation and conservation investments, link tenure issues more closely with technology choice and input use and investment intensity, including gender effects on these. While many studies in the past only have recorded whether certain investments have taken place on a parcel or not, the expanded module should also collect data on the intensity of such investments e.g. by measuring the length and width of conservation structures, the number of trees, types of trees, their age, and planting pattern on the plots. The maintenance status of conservation structures and the extent of effort and frequency of such maintenance likewise give important indications of motivations for sustainable land management.

With repeated surveys of the same households with this module it will be possible to control for parcel-level fixed effects while plots may change from year to year. The gender focus of the analysis makes it relevant to identify who is the plot manager or whether there is joint management and how this varies across plots within parcels and across parcels within the household. This may allow investigation of gender-differentiated input use and productivity where that is relevant.

The detailed plot level data collection requires careful timing in relation to the agricultural season. In areas with more than one production season per year collection of data twice or more in a year is preferable to obtain higher data quality.

In order to get good plot level data it will be important not only to collect plot level data at the households' homesteads but also to visit the plots and make observations there to measure plot sizes and verify land characteristics and investments on the plots. If conservation investments are a crucial concern the intensity of such investments as well as their quality with respect to maintenance may also be assessed.

To get the whole farm perspective on land use, all parcels and plots on the farm should be covered through the interviews, plot measurements and observations. Such data collection is very demanding and costly and may only be feasible for a sub-sample of plots within farms or for a sub-sample of households within a country that is of special interest e.g. for an impact evaluation. The collection of complete farm plot data for a smaller sample may have some advantages over collection of incomplete data from a larger sample of households. The objectives of the survey will determine what is most preferable. E.g. if the interest is to assess the impact of a climate shock within an area, collection of complete farm data may be most useful as impact may vary across plots and crops, while if the interest is the performance of a specific crop such as maize or certain varieties of maize, one may focus on the maize plots on the farms. If one wants to compare the differences between male-managed and female-managed plots and assess the intra-household efficiency implications, it will be preferable to collect complete data for all male and female managed plots within households.

Gender-disaggregated land tenure data

The gender-disaggregated land tenure data should be combined with gender-disaggregated data on movable assets, incomes, expenditure, responsibilities, preferences, perceptions and decision-power. This involves many challenges in the data collection, organization and analyses. Who controls the income/cash resources in the household may affect whether and how much cash are used to buy inputs, food or other things and this will also depend on the preferences of that person. The preferences are not directly observable and this is one of the challenges. Data on who makes what decisions and who controls which resources combined with data on the outcome of those decisions can reveal some information about preferences or differences in preferences. If decisions involve intra-household bargaining it may be difficult to get exact measures on bargaining power but it may be possible to use a variety of

methods to get proxy measures of such bargaining power and empowerment of women vs. men. Empowerment indices developed by IFPRI among others may be used for this. However, it is far from simple to investigate impacts of certain gender-related policies on women's empowerment and the underlying mechanisms explaining such impacts.

5. Key operational aspects of survey implementation

It is crucial that the questionnaire is fine-tuned to the land tenure structure and policy issues of particular relevance and interest.

5.1 Characterizing the local environment & fine-tuning the questionnaire

In order to adjust the land tenure module one may be able to utilize specialized surveys on land tenure issues in the country that have been implemented before even though such surveys may only have covered part of the country and part of the variation in such systems. This will be more demanding in countries with more heterogeneity in land tenure systems, ethnicity and languages. How well the survey will be able to cover such variation depends on the sizes of more homogenous subpopulations and also becomes a sample size issue and depends on the ambition level and budget available such as to facilitate oversampling of minority groups/specific land tenure domains.

Implementation of the land tenure module will be easier if the LSMS in the country already has a detailed agricultural module with parcel-level information. The fine-tuning can also be easier if it is possible to use past data and households from earlier survey rounds to characterize domains in which the prototype land tenure module may be tested.

5.2 Enumerator training

It is a very demanding task to collect all the detailed information from the respondent households. Non-sampling errors may therefore be the most important source of error of concern. Respondent fatigue can be a substantial challenge. Respondents may also be busy and their motivation may be low to answer all the questions. There are also issues they may want to hide for reasons such as taxation or if they are doing illegal things. In other cases, they may want to show off and pretend they do better than they actually are doing or they may respond strategically, thinking that this may have an influence on policy. Such responses easily result in inconsistencies across answers from the same households that may trigger alarms that can facilitate correction. Well-trained and observant enumerators may also detect such things during the interviews that help them to make corrections in the data.

There is a fine line between what is acceptable help that enumerators can provide to respondents when completing the questionnaires and fabrication of data to get the work done (enumerator guesstimates). Enumerators may feel sorry for respondents that have a hard time answering all the questions, and therefore become too helpful in the completion of the answers. Others may want to minimize their own drudgery and therefore fill in the data in clever ways from their own head and without asking respondents that are unwilling or unable to answer. It is important to minimize these types of moral hazard problems that can lead to substantial enumerator bias.

Enumerator training and motivation can partly help to reduce the problem. Systems for enumerator monitoring and use of CAPIs to investigate the extent of the problem can help enhance data quality and reduce these types of moral hazard problems. Careful supervision and double-checking help to reduce the problem. Inclusion of enumerator and enumerator team dummy variables in the data can provide an additional checking opportunity for such biases, which also can vary a lot across variables.

Respondent fatigue/limited motivation/time constraint: What can be done:

- Find acceptable times for the interviews

- Use several shorter interviews rather than one long and distribute the interviews over the period the survey team is in the enumeration area
- Use several enumerators on the same household to facilitate cross-checking
- Reshuffle enumerator teams to reduce team biases.

CAPIs open for much tighter monitoring of the fieldwork through daily uploading of the data for inspection from a distance. This can also facilitate checking that farm parcels and plots are really visited and measured and possibly also photographed to provide documentation of e.g. plot-level investments.

Specialization of enumerators within the team can be beneficial. It is best to have farm parcel plot level enumerators with agricultural and land tenure skills/education as they will be able to make more accurate observations when visiting the plots. In countries with fragmented plots and parcels there may be a need for substantial walking to and from plots and to measure plots. It is therefore important that enumerators employed for this activity are physically very fit and motivated for such physically tiring work.

Collection of detailed within-household gender-disaggregated data will require collection of data from several persons in the household. In many countries it may be important to have female enumerators to do the interviews of female household members, especially if privacy is sought in these interviews to avoid that the answers are biased by the presence of other household members. One way to achieve this may be through interviewing e.g. the husband and wife in parallel interviews in separate locations closer to the areas of domain for each of them.

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