

Essays on Resource Policy, Gender and Land rights

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Abstract

This thesis consists of four papers. Articles I-III address gender aspects of land formalization and the role of land ownership for intra-household bargaining power. They draw on evidence from a land tenure reform in Madagascar implemented in 2005, a key component of which was to grant land certificates, i.e. private property rights to landholders. During fieldwork in Madagascar in 2011, I collected household survey data and conducted focus group interviews, mainly in the rural municipality Soavinandriana. In Articles I and II I assess the outcome of the reform in terms of securing women's land rights, using a combination of econometric and qualitative methods. The analyses suggest that the certification program has strengthened both men's and women's formal claims to individually held land. However, there is bias for men's land certificates. Policy makers presumed the land legislation to be gender-neutral and therefore no gender equality principles and no mechanisms to ensure joint ownership were enforced. Problems of access, long waiting times, and high costs of the land administration were given priority over gender issues. The political crisis in Madagascar in 2009, resulting in underfunding and weak implementation of the reform, further weakened efforts to promote women's rights to land. In Article III we investigate analytically and through numerical simulations how the intra-household bargaining positions of a couple are affected by the opportunity to title agricultural land, and how the couple's titling choice is determined. Results suggest that when land registration is offered to couples as a discrete choice between individual or joint titles there is a risk that women with weak initial bargaining positions will be further weakened following the reform. A joint title will only be chosen if the spouses start off with relatively equal bargaining positions; otherwise a male title will be chosen.

In Article IV we compare the costs of livestock depredation by carnivores across different carnivore species – brown bear, wolf and lynx – and regions. We estimate the government's compensation cost function, using Swedish data on county level in the years 2001–2013. Results indicate that costs are determined by the densities of predators, livestock, and alternative prey, the share of forest pasture, and the unit compensation level granted by authorities. Considerable differences in marginal costs between predator species and counties are estimated, accentuating the challenges facing policy makers trying to reconcile different policy objectives.

Keywords: Gender, Land Tenure, Land Reform, Madagascar, Intra-household Bargaining, Large Carnivores, Wildlife Damage Compensation.

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Dedication

To Francis

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List of Publications

This thesis is based on the work contained in the following papers, referred to by Roman numerals in the text:

- I Widman, M. (2014). Land Tenure Insecurity and Formalizing Land Tenure in Madagascar: A Gender Perspective on the Certification Program. *Feminist Economics* 20(1), 130-154.
- II Widman, M. (2015). Joint Land Certification in Madagascar: The Gendered Outcome of a “Gender-neutral” Policy. In: Archambault, C.S. and Zoomers, A. (Eds). *Global Trends in Land Tenure Reform: Gender Impacts*. Routledge, pp. 110-126.
- III Widman, M. and Hart, R. Joint Land Titling and Gender Biased Development (manuscript)
- IV Widman, M. and Elofsson, K. Livestock Depredation and Costs of Large Carnivores in Sweden (manuscript).

Papers I and II are reproduced with the permission of the publishers.

1 Introduction

This thesis addresses various aspects of resource policy, gender and land rights. In Papers I–III I analyse – theoretically and empirically – the gender aspects of a recent land tenure reform in Madagascar, which has important implications for the livelihood of farmers. In Paper IV I shift focus to Sweden and a policy affecting Swedish farmers; a governmental policy on compensation for carnivore depredation of livestock.

In the remainder of this section I give a background to the literature on gender, land rights and intra-household bargaining. I also present the case of Madagascar and my fieldwork and data collection. In section 2 I summarize the four papers, and in section 3 I make some concluding remarks.

1.1 Background to the study of gender and land

The introduction of gender analysis in the study of households in general, and of farm households in particular, has challenged and enriched many standard assumptions and concepts (Agarwal 1994; Deere, 1995; Kevane and Gray, 1999; Razavi, 2009). In this section I address three standard assumptions that have been questioned in gender analysis, and their relevance to the study of land and land rights.

First, the assumption of a male-headed family farm as the basic unit of production, with a male primary farmer is challenged. Gender studies show that, besides the fact that there are female-headed households, women contribute to the farm work and can be the primary farmer in couple-headed households (Deere, 1995; Razavi, 2009). Women hence play a more important role in farm work than accredited for in mainstream research, and in many cultures there are female and male farming systems, implying that women take care of some crops, men of other (Udry, 1996; Kevane and Gray, 1999).

Second, the assumption that the household acts as a single decision-making unit with common preferences, and a common household strategy rarely holds empirically. This common-preference, or unitary, model of the household was put forward in studies of households by for instance Becker (1981). Empirically, this model of the household is rejected in studies showing that there are negotiations and disagreement within households, and that power relations within the household matter for the decision the household takes (Alderman et al., 1994; Agarwal, 1997; Deere, 1995; McPeak and Doss, 2003; Lundberg et al., 1997; Vermeulen, 2002).

Third, the assumption that the household pools all resources, and distribute them equally among its members is questioned. Numerous empirical studies reject the income pooling hypothesis (Deere, 1995; Attanasio and Lechene, 2002), and show that the allocation of resources within the household impacts the expenditure patterns of the household (Thomas, 1990; Deere, 1995). Consumption is in general not equally distributed within households, but women typically consume less than men, and there is evidence that if a woman's share of income increases this benefits the children to a larger extent than if the husband's income increases (Folbre, 1986; Lundberg et al., 1997; Fafchamps et al., 2009).

Land reforms are implemented across the developing world. The important contributions to the understanding of household dynamics summarized in this section all have implications for the study of land rights and land reforms, not least in Sub-Saharan Africa. First, the fact that both men and women are typically involved in agricultural work implies that women's control over and access to land cannot be ignored (Agarwal, 1994; Deere and Doss, 2006). Second, in relation to the study of land, differences in preferences of household members imply that the control over land matters. Individual land rights have been in focus in the study of women's land rights, but women's access to co-owned property and joint ownership is also crucial in many places (Deere and Leon, 2003; Walker, 2003). Third, the differences in allocation of resources indicate that the power over the most important productive asset – land – can have important implications for the welfare of the household members. The impacts of reforms depend to a large extent on the inclusion of both women and men, and the role of co-owned property (Razavi, 2007; Deere and Leon, 2003; Deininger et al., 2008).

1.2 Intra-household bargaining models and the role of land rights

The empirical evidence of different preferences of household members and their implications for household decisions has motivated the development of intra-household bargaining models. In this section household models and the role of land rights are discussed.

The most prominent theoretical alternative to the unitary model is the collective bargaining model first proposed by Manser and Brown (1980) and McElroy and Horney (1981), in which a Nash bargaining process takes place between the household members. In contrast to the unitary model, this approach allows individual household members to have different preferences on the allocation of household resources. The Nash bargaining process hinges on the exit options, or threat points, of the agents. In a Nash bargaining game the parties maximize the Nash product, which is the product of the utility differences between the cooperative solution and the threat points for the respective agents. An agent's threat point therefore determines her bargaining power. In intra-household bargaining models an agent's threat point is typically his or her outside option if he or she would leave the household, as in for instance Manser and Brown (1980); alternatively, as in the Lundberg and Pollak (1993) separate-spheres model, the agents resort to non-cooperation within the household. This means that the household is not dissolved, but the agents create "separate spheres" within the households which constitute the threat points. Whitehead (1981) introduced interdependence between household members: the so called conjugal contract. This refers to the terms under which the household members exchange goods, income and services among themselves. Carter and Katz (1997) develop a conjugal contract model in which the spouses bargain over a monetary transfer from the husband to the wife, and labour time devoted to production of a household good, which gives utility to both spouses. The model is developed to represent a peasant household where the material basis for the interdependence in form of a fixed asset (land) is introduced. However, the authors do not elaborate on this specification of the theoretical model, and only consider individual land holdings in the production functions, not joint land holdings.

The factors influencing the bargaining power of the individuals in the household have been investigated with a particular focus on the potential for empowerment of women. Some of these factors are wage rates, unearned income, shares of income, inherited assets, (for a summary see Quisumbing and de la Brière, 2000; Quisumbing and Maluccio, 2003). A few empirical studies use land rights explicitly as an indicator for bargaining power, and there is growing interest in the role of the rights to co-owned property. In her study

of land rights Allendorf (2005) shows that the promotion of women's land rights empowers women and benefit young children's health in Nepal.¹ Wiig (2013) focus on the role of joint land rights in a study of Peru, and shows that joint land rights contributed to women's ability to participate in household decision making.

There is however a gap in the literature between the theoretical intra-household bargaining models and growing empirical evidence of the importance of women's land rights for their empowerment, which we attempt to address in Paper III.

1.3 Land, law and custom in Madagascar

In this section, a broad introduction to the complexities of interests in land in Madagascar is given. Land acquisition strategies and regulations of relevance for individuals and companies are discussed. Inheritance and marital regimes are crucial for the allocation of land within households, and are also discussed.

Madagascar is the fourth-largest island in the world, with a surface area of 587 000 km², and a population of approximately 20 million. It is one of the poorest countries in the world, and three-quarters of the population live below the national poverty line (World Bank, 2010). About 80 percent of the households rely on agriculture for their livelihoods, mainly rice production and raising livestock. Madagascar was famous internationally in 2009 when news were spread about the protests against what was described as land-grabbing by the international agribusiness investors Daewoo and Varun International, (Borras and Franco 2010; Andrianarinina-Ratsionalanana, 2011). The contracts included almost half of all agricultural land in Madagascar and spanned over 50 years, with seemingly unrealistic production goals. This risked leaving the contract farmers in poverty, and has been seen as the trigger of the political crises in 2009, when the president was forced to resign. Madagascar was for years to come governed by a transition regime, not recognized by the international community.

Commercial interest in land from foreign investors is not a new phenomenon in Madagascar; during the French colonial period 1896–1960 the most fertile lands were expropriated by the colonial state. There has also been an interest in mineral resources for a long time. Recently however, attracting

1. The results depend on the context, and should thus be interpreted within current gender roles where women take greater responsibility for the welfare of the children. The emphasis on empowerment of women is a phase in striving for gender equality.

foreign investors has become an important policy priority and since 2005 over 50 agricultural projects have been announced, as well as several forestry and large-scale mining projects. The crisis of 2009 led to many international donors and investors leaving the country, but there are indications that large-scale investments in land are increasing again (Andrianarinina-Ratsialonana et al., 2011). The land deals have been seen as a sell-out of “tanindraza”, the ancestors land, to foreign investors; the rent for leasing land is about 1 USD/hectare and year (United Nations, 2011). Andrianarinina-Ratsialonana et al. (2011) describe how land acquisitions have so far been non-transparent and top down processes, which have in general excluded local people; in particular people with weak land rights, such as women and people belonging to certain ethnic groups. There is a resistance movement requesting an immediate halt to evictions of the Malagasy people from their land, and that the authorities protect the land rights of families who have been living on their land for many years (Collectif pour la défense des terres Malgache, 2011).

As discussed in Andrianarinina-Ratsialonana et al. (2011) it is difficult to verify land ownership due to technical problems such as the absence of a national level database, or map, showing the legal status of land. Across all of Madagascar, the state system and customary land management co-exist to some degree. The titling system, giving private property rights to land, was introduced by the French colonial state in 1896. At independence in 1960, most of the French colonial settlers left Madagascar but their land titles were still valid and often the land itself continued to be cultivated by former workers (Brès, 2007). As described in Teyssier et al. (2008) the procedure to get a land title is long and complicated. It involves 24 administrative steps, the average cost was about 1 400 000 Ariary (500 USD), and the average waiting time 6 years. 400 000 titles were issued until 2005, on a total area of 170 000 ha, corresponding to only about 10 percent of concerned land. The title registers are rarely updated, and colonial titles remains an important problem for many Malagasy small-holder farmers, who cultivate land which might have been in the family since pre-colonial times, but to which they do not have the legal right.

Customary tenure systems in which local leaders governed land allocation have evolved due to increasing pressure on land, new rules, and new actors (Jacoby and Minten, 2007). By tradition, land in Madagascar belongs to the ancestors, and the main mechanism for allocation of land in the customary system is still through inheritance (Evers et al., 2006). Another important mechanism to acquire land rights originates in the use of land (*mise en valeur*). As unused land is becoming scarce, purchase of land is becoming more important. The formal arrangements of land markets are poorly developed, and

strategies to secure land in response to the titling system evolved, most notably a quasi-formal system with sales acts, called “petits papiers”, issued by local authorities. The “petits papiers” have uncertain legal value, but have been widely used (Teyssier et al., 2008).

Regarding allocation of land within the household, as discussed by Giovarelli (2006) and Ramaroson et al. (2010) women have social and cultural rights to own land, primarily land inherited from their father. However, women are inferior in status to men, and in general follow their husbands to work on his land. This makes widows a particularly vulnerable group, having no legal right to land inherited or purchased by the husband before the marriage. Women, in particular in rural areas, have a higher illiteracy rate than men, and less access to information. The heavy workload at home and traditional gender roles prevent women from participation in community activities, and from speaking up in public. It is even stated in the marriage legislation that the husband is the household head. Assets, including land, acquired during the marriage are common property, whereas assets acquired before the marriage or as inheritance is individual property. In case of divorce, which is only possible if one of the spouses commit a fault, common property should be equally divided between the spouses, or according to a sharing rule decided upon at marriage; whereas all personal assets are kept by the spouses respectively (Government of Madagascar, 2007-022). Civil marriage is common in the central highlands of Madagascar, whereas in the southern and coastal regions traditional marriage is dominant (ROR, 2008). The traditional partition in case of separation is two thirds to the man, and one third to the wife (Ramaroson et al., 2010); but under some circumstances women cannot keep any assets.

1.4 The Madagascar land tenure reform

The weaknesses of the land-titling system, not least the problems with low capacity and elite capture, in combination with an increasing number of disputes over land, motivated the comprehensive land tenure reform adopted in Madagascar in 2005. In this section the reform is briefly presented.

The Madagascar land tenure reform aimed at improving access to formal property rights to land for the rural population, modernizing land services, and reforming the land legislation. A key element was the establishment of local land offices assigned to issue land certificates to applicants, against a fee. The land certificates can be individual, joint for couples, or so called consortium certificates which are issued to a group of land holders not forming a couple, such as a group of siblings.

No gender equality principles were adopted in the reform and no reference was made to intra-household allocation of land rights. In order to secure women's rights to jointly held land, the Millennium Challenge Corporation (MCC), acting as donor, advocated mandatory joint certification for couples' co-owned property. However, joint certification remained a voluntary measure and few couples have used the opportunity; the majority of land certificates on jointly held land are issued to men individually. There are no national statistics on joint certificates but case study data indicates that only a few percent of certificates are joint.

In total approximately 80 percent of all land certificates have been issued to men, and 20 percent to women. Women typically certify land that is inherited or purchased by the woman individually. The political crisis and withdraw of funding in 2009 was unforeseen by many communes that could not finance the local land offices. Typically, households do not certify all their plots, mainly due to lack of financial resources. Another important constraint is that much of the land titled during the colonial period is still registered in the name of French colonizers. These financial and institutional obstacles to certification are common for men and women, even though economic constraints tend to be more important for female-headed households.

1.5 Field work and data collection

In order to investigate gender dimensions of the land tenure reform I conducted fieldwork in Madagascar from December 2010 to May 2011. As a first step, interviews were undertaken with key informants at the National Land Program, and persons who had been drafting the policy (André Teyssier in particular). Also, local land office (LLO) agents and users were interviewed during visits at about 15 LLOs in different parts of the country.

Based on the information retrieved in this first stage of the fieldwork, a case study site was chosen: the commune of Soavinandriana. It has one of the very first LLOs, and has received the highest number of applications for certificates. It was installed with the support of the FAO which had identified the need for secure land rights in order for other agricultural extension services to be successful (Brès, 2007). Soavinandriana is located in the Itasy region in the central highlands of Madagascar, see map. The fertile land, with its volcanic soils, and the relative proximity to the capital, attracted colonial settlers and migrants. Soavinandriana consists of 33 fokontany and has about 50 000 inhabitants. The population density is comparatively high, 180 inhabitants/km² and the population grows at a relatively high rate, thanks to relatively high fertility and a continuing migration to the area. 85 percent of the population is

involved in agricultural production. The most important crops are rice, manioc, maize, and some cash crops such as coffee, tomatoes and beans. Fishing is another important activity (Brès, 2007). Both men and women participate in agricultural production and the work on the fields, although there is a gendered division of tasks. Men typically work with cattle and preparation of soils. Women's tasks are typically weeding and transplanting as well as household work and child care (Jarosz, 1997). In Soavinandriana, as in most of the central highlands, women's literacy rates are higher, women are better informed about their rights to common property (Ramaroson et al., 2010), inheritance regimes are more gender equal and civil marriage is more common as compared to other regions (ROR, 2008).

The fieldwork and data collection in Soavinandriana took place in March and April 2011. First, the information about the applications for certificates at the LLO was registered in what is called the Soavinandriana Land Certificate Database 2011. It includes 2 237 applications made by 1 207 different persons, of which a random selection of 360 persons, including both men and women were drawn. The sampling procedure used to select 148 households without certificates, used as counterfactual, was random walk (United Nations, 2005; Martin, 2005). In addition, all households with a joint certificate were interviewed. Deere and Doss (2006) stress that individual-level data is necessary to capture gender differences in asset ownership within households, therefore both spouses in a couple were interviewed separately. In total 455 men and 514 women in 511 households were interviewed.

The household survey instrument included questions about all members of the households, the individual and household inheritance, assets and livelihoods. Furthermore, there were land related questions about the characteristics of the plots, the rights to sell, rent etc., as well as questions about motivations and facts about land certification. The survey was held by the enumerators in Malagasy, and translated to French.

Moreover, focus group interviews were conducted with women and men respectively, as well as local leaders and village elders (ray aman-drena), in two different villages with different characteristics with regards to pressure on land, distance to the commune center etc. There was also one focus group with local leaders from different fokontany. The discussions were held in Malagasy.

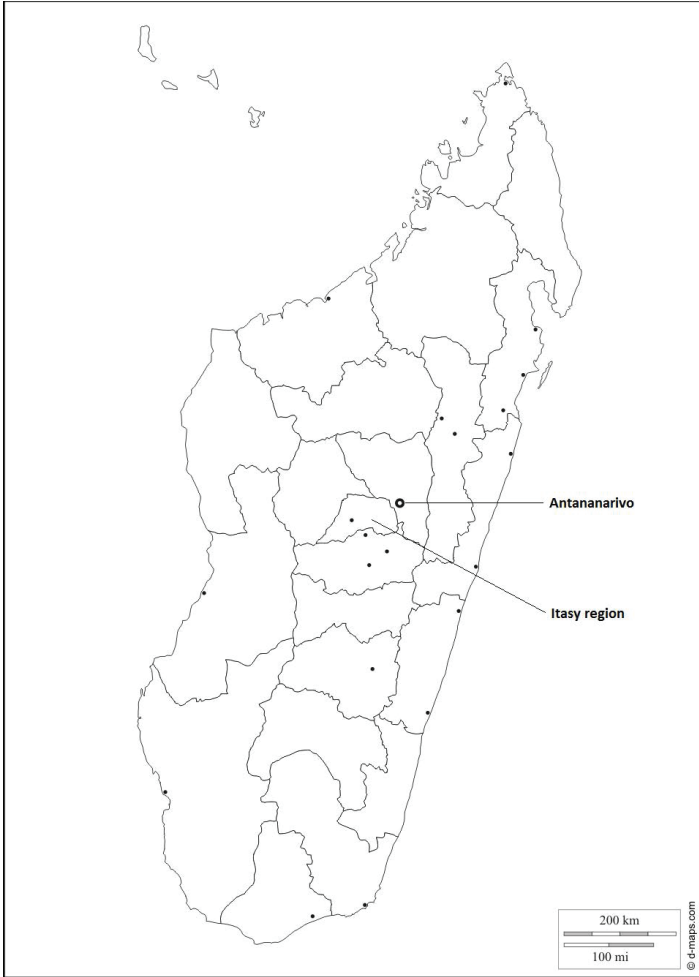


Figure 1. Map of Madagascar.²

2. Source: d-maps.com http://d-maps.com/carte.php?num_car=35061&lang=en edited by the author

2 Summaries of the appended papers

2.1 Summary of Paper I

The purpose of Paper I is to examine the land tenure reform from a gender perspective. In particular, I analyse the certification program issuing formal land certificates to landholders. Does the presumed gender neutrality of the certification program result in a gender-neutral outcome? This study is the first to make a quantitative analysis of land tenure in Madagascar from a gender perspective. Using case study data collected in the rural municipality Soavinandriana, I investigate the demand for and expectations on land certificates. The majority of the certificates are registered in the name of a man, about 20 percent are registered in the name of a woman, and very few are jointly registered by couples. I use a binary probit model to identify determinants for applying for a land certificate for men and women, respectively. The results show that women use the possibility to formalize their land rights, albeit not to the same extent as men. Women typically certify land that they have inherited individually, and female heads of households are more likely than married women to obtain land certificates. On the other hand, among couples there is a tendency to register jointly held land only in the name of the husband. Therefore, a probit model with selection is used to study the dynamics within couple-headed household. The results indicate that households where wives actually certify jointly held land have characteristics typically associated with women's bargaining power.

The aim of the land tenure reform in Madagascar is to reduce tenure insecurity; however, it is beyond the scope of this contribution to establish whether the reform has been efficient in this regard. Nevertheless, I discuss the potential links between the patterns of certification and women and men's land tenure security. Land tenure insecurity is an important obstacle for smallholder farmers, who constitute the majority of the population in Madagascar, which is

exacerbated by the current trend of commercial pressure on land (“land grabbing”). An underlying problem is the discrepancy between statutory legislation and customary land management. These two factors affect land rights from outside the community/household and are referred to as external threats. An additional layer of tenure insecurity is facing women through gender inequalities in inheritance and marital regimes (internal threats).

The paper specifically considers intra-household relations using the classifications by Stephen Leisz, Andrea Robles, and James Gage (1994) in primary and secondary landowners. A male household head typically has primary land rights (he can transfer rights by selling, bequeathing, or gifting, as well as having use rights), whereas women tend to have secondary rights (user rights, but limited transfer rights, often conditioned on someone else’s rights). The analysis suggests that the certification program has strengthened primary landholders’ formal claims to certain types of land, sometimes at the expense of secondary holders. From a gender perspective, the certification process was flawed; women are less likely to obtain land certificates in their name. Furthermore, the land tenure reform does not address some of the most important obstacles to land tenure security such as colonial titles or communal grazing land in relation to commercial pressure on land.

2.2 Summary of Paper II

In Paper II I investigate the reasons for the low number of joint certificates during the first years of the Malagasy land tenure reform. The analysis builds on fieldwork conducted in Madagascar in 2011. The rural municipality Soavinandriana is studied in detail, using survey data and focus group interviews. The analysis points out three main factors contributing to the weak role of joint certification. First, it has not been a political priority. The problems of access, long waiting times, high costs etc. in the titling system were considered more important to address in the reform process than gender issues. The land legislation was considered to be gender-neutral, and there was no strong national women’s movement to push the agenda of joint certificates. Second, the political crisis in 2009 resulted in underfunding and weak implementation. Since the donor most concerned with gender issues – MCC – left the project there has been little information and efforts to promote joint certificates. Third, a “traditional view” of the household, where the husband represents the household, dominates both among civil servants and rural households.

Securing shared property rights for women is crucial, particularly since widows do not have the legal right to keep land that is certified in their husbands' names only. In 2013 Madagascar held the first general election since the 2009 coup d'état, and the new government may take the opportunity to address the weaknesses in the land tenure reform.

This study serves as an important reminder that without effective measures to secure women's land rights, men will be the holders of formal rights.

2.3 Summary of Paper III

In Paper III we make an attempt to bridge the gap between the growing empirical evidence of the impact of formal land ownership on women's empowerment and theoretical bargaining models. We present a theoretical household bargaining model building on the conjugal contract model formulated by Carter and Katz (1997). In our model couples work on their jointly held land producing agricultural goods, and also derive utility from being in the household. The spouses bargain over the division of income generated from agricultural production. Contrary to the separate spheres model of Carter and Katz (1997) the threat points in our model are divorce, in case of which the spouses keep a certain share of the land each. This share of land determines their respective bargaining power, in combination with labour market opportunities or the cost of hiring labour to work on the land. In the next step, we introduce an opportunity to formalize land rights through land titles, either an individual title or a joint title for the couple. The choice of land title affects the threat points. We investigate – both analytically and through numerical simulations – how the couple's choice is affected by different parameter values. Finally, the theoretical results are applied to the situation of Madagascar where a land tenure reform is ongoing.

The key intuition from the theoretical model is that if the option of a joint title strengthens the female's position too much, then it will not be chosen by the couple, even if it leads to the highest total utility for the couple. In practice this means that if a couple is offered the options of either joint titling or individual titling they will only choose joint if the spouses start off with relatively equal bargaining positions; otherwise all the land will be titled in the male's name, thus weakening the female's position compared to the initial situation. The application to empirical data on land suggests that the theoretical model gives accurate predictions for the Madagascar context. Case study data from the rural commune Soavinandriana collected in 2011 shows that the majority of land certificates were issued to men – also land that is jointly held by couples – whereas very few couples have opted for joint certificates. The

few couples with joint certificates are all civilly married, which implies that the wives can expect to keep more land in case of separation than if the couples would have been traditionally married. Hence, with a voluntary mechanism for joint land certification only women with strong bargaining power seem to be able to acquire joint ownership to household land. The article concludes that land tenure reforms need to take gendered patterns of ownership and decision-making into account in order to guarantee equal rights for men and women to co-owned property.

2.4 Summary of Paper IV

The aim of Paper IV is to compare the costs of livestock depredation by carnivores across different carnivore species and regions. To this end, we estimate the government's compensation cost function, taking into account the role that the populations of carnivores, livestock and wild prey play for depredation. We recognize that not only the population numbers as such, but also the physical possibilities for carnivores to actually get close to the livestock matters for the magnitude of depredation and hence for the compensation cost. We therefore account for the role of grazing on forest pasture with no fencing, as well as the stock of electrical fencing, for the costs of depredation. Finally, the design of the compensation scheme itself is considered, taking into account the development of the unit compensation of livestock losses over time.

The study is applied using Swedish data on county level over the years 2001–2013. Compensation costs due to depredation by three large carnivores are considered: brown bear (*Ursus arctos*), wolf (*Canis lupus*) and lynx (*Lynx lynx*). We limit the analysis to costs for depredation of farm animals, thereby excluding damages to reindeer herders, for which the compensation system has a fundamentally different design, see, e.g., Zabel et al. (2011). Among the farm animals, sheep is by far the most commonly attacked species, and therefore the focus of this paper (Elofsson et al., 2015). Costs for attacks by wolverines are excluded from the analysis as the wolverine primarily preys on reindeer, and very few attacks on sheep have been reported.

We use a mixed model approach with panel data in order to estimate a constant elasticity cost function. Possible differences in compensation level between counties are dealt with using Best Linear Unbiased Predictors, which give estimates of random effects for each county. The major contribution of the study, compared to Boman (1995) and Bostedt and Grahn (2008), is the consideration of landscape, county specific, and policy design factors for the analysis of the compensation cost function. Further, we contribute by

comparing marginal costs for predators, and livestock, across regions, which allows us to contrast national cost-effectiveness and farmers' perspectives. Results indicate that the costs of compensation for depredation of wolf, lynx and brown bear are determined by the densities of predators, livestock, and wild prey, as well as the share of forest pasture, and the unit compensation level granted by authorities. There are considerable differences in marginal costs between predator species and counties. The results accentuate the challenges facing policy makers trying to reconcile the policy objectives of cost-effectiveness, conservation of large carnivores, and enabling pasture-based farming across the country.

3 Concluding remarks

In this thesis I analyse resource policies in various contexts. Papers I–III address the privatization process of land in Madagascar, from a gender perspective. The results indicate that the concerns about the neglect of gender analysis in agricultural research, raised 30 years ago, are still relevant. Note that there are parallels between the design of a policy reform, and the study of such a reform. While doing my research I was questioned by some of the staff administering the reform, about my choice of perspective. It was argued that there was no need to study gender, since the land legislation was “gender neutral”, i.e. allows for ownership by both men and women. However, as my research shows, this presumed gender neutrality resulted in a skewed outcome, where men benefited more than women from the reform. As highlighted in Paper II the gender bias of the land certification program was reinforced by the weaknesses of the implementation process. Lack of funding and an unstable political environment impeded the advancement of the certification program, and contributed to the neglect of, not least, the efforts to secure joint ownership for married women. In Paper III this observation is analysed in terms of an intra-household bargaining model; the first to explicitly model the effect of joint land titles on intra-household bargaining power.

In Paper IV I shift focus to Sweden, where farmers face different challenges. Increasing numbers of Swedish farmers are affected by the presence of large carnivores, and the associated risks of livestock depredation. The state allocates funds to the county administrative boards, which are responsible for administering compensation to livestock depredation and subsidies for preventive measures against carnivore attacks. The results in Paper IV indicate that the compensation costs for livestock depredation by wolf, lynx and brown bear are determined by the densities of predators, livestock, and wild prey, as well as the share of forest pasture, and the unit compensation level granted by authorities. There are considerable differences

in marginal costs between predator species and counties. Part of the variation can be attributed to differences in implementation across county boards, due to availability of funds as well as interpretation of the regulations. For instance, it seems to matter how the application form for receiving compensation is formulated for the amount paid in compensation. The design of the application form was also an important factor for the outcome of joint certification in the Madagascar land tenure reform. Hence, seemingly neutral national policies might in their local implementation result in different outcomes for beneficiaries. Application forms might seem a trivial aspect of a policy, but for the beneficiaries/users their design can have life-long consequences. Overall, the results in this thesis point to the importance of the design and implementation of a policy in order to achieve the objectives of the policy. Furthermore, the results reflect the challenges facing policy makers trying to reconcile different policy objectives.

With regard to future research, Paper I was the first study to make a quantitative analysis of the recent land tenure reform in Madagascar from a gender perspective. It was not possible to analyse implications of the reform for outcomes such as income distribution within couples or outcomes related to children's health, which was my original ambition, due to the limitation in data. These kinds of analyses would be valuable for a deeper understanding of the role of land ownership in Madagascar today. In terms of analytical advancements, the intra-household bargaining model presented in Paper III could be adjusted and applied to different country contexts. The results in Paper IV, indicating that there are large differences in marginal costs across the different carnivore species and regions would be interesting to explore in more detail.

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