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## The profits of excludability and transferability in redistributive land reform in central Namibia

Thomas Falk<sup>a</sup>, Michael Kirk<sup>a</sup>, Dirk Lohmann<sup>b</sup>, Bertus Kruger<sup>c</sup>, Christian Hüttich<sup>d</sup> and Richard Kamukuenjandje<sup>e</sup>

<sup>a</sup>Faculty of Business Administration and Economics, Institute for Cooperation in Developing Countries, University of Marburg, Marburg, Germany; <sup>b</sup>Plant Ecology and Nature Conservation, University of Potsdam, Potsdam, Germany; <sup>c</sup>AGRA Co-operative Ltd, ProVision Unit, Windhoek, Namibia; <sup>d</sup>Department for Earth Observation, Friedrich Schiller University – Institute for Geography, Jena, Germany; <sup>e</sup>Department of Agriculture and Natural Resources Sciences, Polytechnic of Namibia, Windhoek, Namibia

### ABSTRACT

Policies which redistribute property rights to land can improve the well-being of rural households and can have overall growth effects. In many cases, however, land reforms are driven mainly by politically justified objectives. Under such circumstances, little emphasis is placed on whether and, if so, how property rights can increase productivity. Following 18 years of land reform implementation in Namibia, we evaluated 65 beneficiaries in Namibia. We assess to which degree land rights affects their farm income. The study focuses on Namibia's two main commercial land reform instruments, namely the Farm Unit Resettlement Scheme and the Affirmative Action Loan Scheme. We find evidence that the majority of land reform projects are not profitable. Further, our study confirms the importance of the right to restrict land access compared with the right to transfer. The long-term leasehold contract seemingly provides sufficient incentives to make productive use of the land.

### KEYWORDS

Redistributive land reform; property rights; farm productivity; pastoralism; Namibia

## 1. Introduction

Policies which redistribute property rights to land, if well planned and strictly implemented, directly improve the well-being of rural households and can have overall growth effects (Kirk, 1999; Deininger, 2003). In many cases, however, land reforms are driven mainly by politically justified redistribution objectives and have been guided by short-term considerations. Under such circumstances, little emphasis is placed on whether and, if so, how property rights can increase productivity, address farm management issues, and develop entrepreneurial skills.

Clear and secure property rights theoretically provide incentives for long-term investments that can potentially improve the productivity of farm businesses (Deininger & Feder, 2009). In addition, individual land titles are under certain conditions accepted as collateral and, in this way, should facilitate access to credit. Formal titling can therefore

promote investment (De Soto, 2000; Quan, 2000). Empirical evidence from around the world, however, is ambiguous, inconsistent, and conflicting regarding how land rights affect agricultural productivity (Place, 2009). Often the registration and titling of rights increase the risk of expropriation and landlessness when smallholders are confronted with powerful players in land and credit markets (Platteau, 2000; Hanan et al., 2002, Manji, 2006).

Our study focuses on commercial land reform in central Namibia,<sup>1</sup> where farmland is redistributed to groups previously subject to discrimination. The objectives to redistribute property rights to land in Namibia have to be seen in a historical context. Prior to colonial rule, pastoralist communities used the land in central Namibia. As a consequence of spatially and temporally highly variable biomass availability, these groups were dispersed widely over the territory in order to manage pastures efficiently. In the late nineteenth century, colonialists acquired practically the whole area used by these communities (Werner, 1993). Linked to this development were the transformation of communal property regimes into private ones and the introduction of formal land titles. After South Africa received the mandate over Namibia in 1919, it established relatively small, communally managed reserves for black Namibians (Werner, 1993). By the time of independence in 1990, approximately 4200 – predominantly white – farming households held 52% of the agricultural land under freehold titles. At the same time, 48% of Namibia's farm land supported 70% of the population (Kaukungua et al., 2004).

The Namibian government intends to achieve a mixture of political, social, and economic goals with land reform (Toulmin & Quan, 2000). The key objective is to increase the income of citizens who were previously discriminated against by apartheid and other colonial policies. Furthermore, land reform is expected to contribute to political stability, poverty alleviation, the stimulation of agricultural and rural development, and growth (Kaukungua et al., 2004; Werner, 2004; LAC, 2005; RoN, 2007, 2010; Werner & Kruger, 2007; Werner & Odendaal, 2010). The Namibian resettlement policy stipulates that the reform is to redress past imbalances in the distribution of economic resources, particularly land; create employment through full-time farming; alleviate human and livestock pressure in the communal areas; and offer previously disadvantaged social groups an opportunity to reintegrate into mainstream society and the economy (RoN, 2001, 2010). In this context it should be noted that the reform's focus shifted in the late 1990s from poverty alleviation towards taking also agricultural productivity into account. The reliance on willing-seller-willing-buyer policies is strongly supported by the international community. It is seen as one factor contributing to peaceful land reform. Others criticised that willing-seller-willing-buyer policies hinder a consequent pro-poor asset redistribution. There is also opposition to elite capture, which pushes poverty groups out of the reform process. Figure 1 summarises the reform process and illustrates the shift towards economic objectives. We refer to publications such as Werner (1993), Kaukungua et al. (2004), Werner (2004), LAC (2005), Werner & Kruger (2007), RoN (2010), and Werner & Odendaal (2010) for more comprehensive information on the historical and political background of the Namibian land reform.

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<sup>1</sup>A communal land reform programme is also under way, which formalises and partly privatises common property rights in communal areas. This process, however, is not the subject of this article.

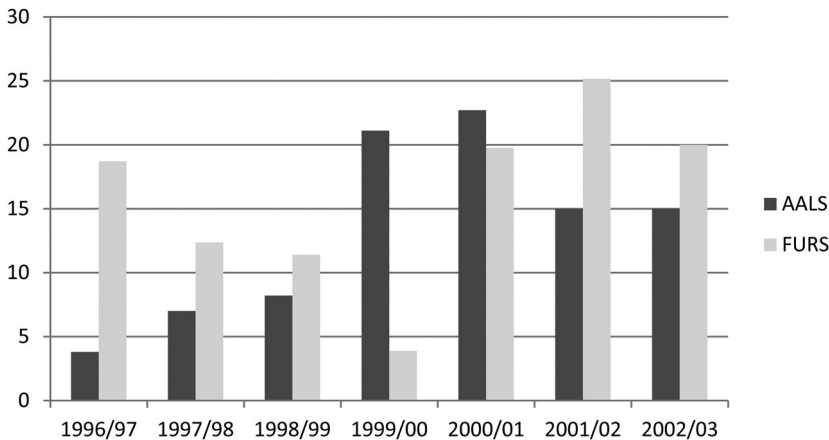


**Figure 1.** Time-line overview of the Namibian land reform process. Note: MLR, Ministry of Lands and Resettlement.

We focus our analyses on Namibia’s two main commercial land reform instruments, namely the Farm Unit Resettlement Scheme (FURS) and the Affirmative Action Loan Scheme (AALS). The FURS targets poor and landless Namibians by redistributing land on state-acquired commercial farms. This acquisition is based on the preferential right of the Namibian state to purchase agricultural land whenever any owner of such land intends to dispose of it (RoN, 1995a). Any Namibian citizen who has been socially, economically, or educationally disadvantaged by past discriminatory laws can apply for an allotment of land acquired for resettlement (e.g. RoN, 2002). Successful applicants are supposed to receive a 99-year lease agreement with the government. The AALS assists so-called emerging commercial farmers to purchase commercial farms by means of loans guaranteed by the state, and subject to state-subsidised interest rates. On the one hand, this instrument aims to empower emerging commercial farmers; on the other, it aims to reduce increasing pressure on communal land (RoN, 1995b; Haring & Odendaal, 2007).

Figure 2 presents the annual budgetary expenditure on both land reform instruments between 1996 and 2003. The figure shows how the priorities between the instruments have repeatedly shifted and that overall spending on land reform has increased since the 1990s.

The main focus of this article is to assess how the definition of property rights affects the economic performance of beneficiaries of the commercial land reform in central



**Figure 2.** Annual budgetary expenditure on the FURS and the AALS between 1996 and 2003. Source: based on Sherbourne (2004).

Namibia. We concentrate on the question of whether holding exclusion and alienation rights increases farm productivity.

## 2. Methods

The research has been carried out in the frame of the Biodiversity Monitoring Transect Analysis in Southern Africa Project ([www.biota-africa.org](http://www.biota-africa.org)) financed by the German Ministry of Education and Research (BMBF). The research team cooperated with the Emerging Commercial Farmers' Support Programme, which provided lists of all land reform farms in the Omaheke Region. By the time of the research there were 196 FURS farms and 108 AALS farms. Of these, 50 FURS farmers (26%) and 15 AALS farmers (14%) were included in the study. The selection of participants was not random but predetermined by the accessibility of beneficiaries. Using a list of beneficiaries provided by the Emerging Commercial Farmers' Support Programme the team tried to make contact with farmers who have been occupying the new land as long as possible ago. Nevertheless, a number of farmers could simply not be reached as they were absent from the farm over a period of at least three months. To avoid a bias towards full-time farmers, we arranged interviews with part-time farmers outside their farms (e.g. in Namibia's capital Windhoek). We tried to make any possible effort to include as many farms as possible, the number of participants was limited, and no random selection has been applied to enable the maximum possible sample size. Hence, it cannot be excluded that the sample is biased due to the way we contacted those remotely living farmers and that those who have been accessible differ from the ones we could not contact.

Empirical data were collected between January and April 2009 using semi-structured interviews. We are aware that the cross-sectional character of our data may hamper the reliability of the results. The natural environment in the studied area is very variable and may affect the results. The value of the 2008 enhanced vegetation index (EVI) was significantly higher than the average value for the years between 2001 and 2009.<sup>2</sup> This indicates that our snapshot was rather a favourable year for the farmers. Quantitative data on the business performance and socio-economic attributes of the land reform beneficiaries were collected between January and April 2009 on the basis of face-to-face semi-structured interviews.

As an indicator for the business performance of land reform beneficiaries, we estimated the total farm income after expenses per hectare. In a first step, we added up all on-farm revenues in 2008 and deducted only variable costs (including taxes), but did not consider investment costs. In a second step, we included investments and shares of fixed costs. All monetary values are given in Namibian dollars with the average exchange rate in 2008 having been US\$1 = N\$8.23.

For the assessment of key determinants of beneficiaries' economic performance, we calculated ordinary least squares models. We calculated variance inflation factors in order to confirm the absence of multi-collinearity. The variance inflation factor was below five in all models for all variables. The Breusch-Pagan/Cook-Weisberg test indicated that heteroscedasticity is no concern in the model for total farm income after running expenses. Heteroscedasticity is observed, however, in the model describing total farm income after total

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<sup>2</sup>t-Test of average EVI for years between 2001 and 2009 and the EVI value for 2008:  $t = -5.9548$ ,  $\text{Pr}(T < t) = 0.000$ .

expenses (including investments). We calculated White's robust standard errors in order to address the concerns of heteroscedasticity. All statistical analyses are conducted using STATA version 13.

### 3. The relation between property rights and farm productivity

Our key question is whether and, if so, how the distribution of the bundle of property rights affects the economic performance of land reform beneficiaries. Property rights narrow or broaden management opportunities and can therefore influence economic performance. They are socially enforced rights determined by legal structures and internalised norms (North, 1990) that define the accepted array of uses of an economic good (Libecap, 2002). Secure property rights support that today's investments will generate future returns (Adams et al., 1999; Meinzen-Dick & Pradhan, 2002; Fenske, 2011) and are therefore long-term incentives for investing in and maintaining resources. Higher levels of investment should theoretically lead to productivity increases (Holden & Yohannes, 2002; Smith, 2004).

Despite very logical theoretical relations, the empirical evidence on the link between property rights and land productivity in African countries is very ambiguous, confusing, and contradictory (Platteau, 2000; Carter & Olinto, 2003; Smith, 2004; Bromley, 2009; Do & Iyer, 2008; Markussen, 2008; Fenske, 2011). In order to gain better understanding of the relation between property rights and farm productivity we describe property rights as systems consisting of a bundle of separate rights (Dekker, 2003; Libecap, 2002; Meinzen-Dick & Pradhan, 2002). We distinguish between the right of management (i.e. the right to regulate internal use patterns and transform the resource); the right of exclusion; and the right of alienation (Schlager & Ostrom, 1992).

In our sample we discovered only three farmers who occupied a farm unit without even an oral agreement. All respondents, irrespective of whether they held a title or not, felt very secure in their management rights. There is, in fact a very low probability that a farmer will be evicted from an allotted farm unit. The perception of rights to manage the land is therefore uniform within our sample.

Differences occur, however, regarding the right of alienation. Only AALS farmers hold a freehold title and can sell or lease all or part of their farm. Demsetz (1967) argues that alienation rights are important to enhance investment incentives (see also Place 2009). Assets which are not fixed in formal property titles are more difficult to move in larger networks of people (De Soto, 2000). Deininger & Jin (2006) assert that greater transferability increases investments (see also Abdulai et al., 2011). Two main effects are commonly associated with the right of alienation: it enables the transfer of land eventually to the most productive user; and it enables the owner to use the land as collateral to access credit (Deininger, 2003; Place, 2009; Fenske, 2011). The second effect is related to the link between alienation rights and the possibility of forfeiture. The risk of losing the asset creates commitment, which helps to take the contracting partner seriously (De Soto, 2000).

Referring to the first effect, for political reasons, the Namibian government purposefully imposes distortions in the farm property market. Redistributing land on the basis of selection criteria and applications is interference in market mechanisms and might prevent the land from being transferred to the most productive user. As stated previously, the objective of the reform is to alleviate poverty by redressing imbalances in land

ownership. In this context, the objective of making the most productive use of land becomes secondary. In the case of the AALS, the market mechanisms can theoretically work freely insofar as the land can be distributed to the most productive previously disadvantaged user.

Referring to the second effect, holding freehold titles in many cases allows using the land as collateral for credit (Platteau, 2000; Quan, 2000; Sjaastad & Cousins, 2009; Place, 2009). Deininger & Jin (2006) show empirically that, under the right conditions, alienation rights can have a positive impact on investment (see also Sjaastad & Cousins, 2009; Galiani & Scharfgrudsky, 2010). Following this argument, AALS farmers should have better access to financial capital, which potentially affects their investment opportunities and, consequently, their economic performance. In the case of the FURS, the farms remain the property of the state. There is a debate as to whether FURS farmers' access to capital can be improved by encouraging banks to accept leasehold titles as collateral. Even though parastatal and private banks reject such debt securities, the Ministry of Lands and Resettlement and the state-owned Agribank began to give out loans to FURS beneficiaries through the Joint Technical Committee on Post-settlement Financing Support Programme in 2010. This shows that capital access can be improved without collateralising land.

There is no clear empirical evidence for the link between holding alienation rights and credit access as well as farm investments (Platteau, 2000; Carter & Olinto, 2003; Smith, 2004; Bromley, 2009; Do & Iyer, 2008; Markussen, 2008). One reason for this is that smallholders hesitate to use their land as collateral because they are afraid to lose it (Platteau, 2000). Manji (2006) takes this argument further and contends that using land as collateral decreases security of tenure. Transferable land rights might allow elites to acquire large portions of land (Quan, 2000; Deininger et al., 2008). Smallholders often do not have the same market power and therefore are vulnerable to losing their tradable assets.

In addition, credit organisations might reject even titled land units if they perceive that it is difficult to foreclose a mortgage (Platteau, 2000; Deininger & Feder, 2009). It is unclear what kind of support Namibian banks expect if they demand the enforcement of a foreclosure on property held by land reform beneficiaries. There are numerous examples worldwide where imperfections in land, capital, and labour markets as well as policy distortions hamper access to credit far more than the limited transferability of land rights do (Deininger, 2003; Bromley, 2009, Place, 2009).

Fenske (2011) presents another argument by stating that stronger property rights provide more freedom to develop innovations. Indeed, in the Namibian context, holding full land ownership reduces the risk of state interference in the farm business. In the case of the FURS, the Namibian government uses its ownership in land to justify land use and investment regulations which are stipulated in the lease contracts. One crucial restriction is the prohibition to sublease the land. There is empirical evidence that well-functioning leasehold markets significantly increase the productivity of agriculture (Deininger, 2003). In comparison, AALS farmers are freer in their business decisions. Based on all these arguments we formulate our first hypothesis:

Hypothesis 1: Holding alienation rights improves farm productivity!



Our indicator for the variable ‘Holding alienation rights’ is a dummy for whether or not the beneficiary holds a freehold land title. There are challenges associated with interpreting our indicator because only AALS farmers hold freehold titles. The indicator therefore separates the schemes, and we cannot clearly separate other scheme effects from the property rights effect on the basis of our available data.

Looking more closely at the distribution of rights, we observe that at the time of research exactly half of the FURS farmers did not receive a lease from the Ministry of Lands and Resettlement. Thus, they hold no written proof of their rights on the allotted land (Falk et al., 2010; Werner & Odendaal, 2010). Capacity constraints on the part of the Ministry and, to a lesser extent, unofficial land occupation were the main reason for this situation. One obstacle is the difficulty in cross-sectoral coordination between the Ministry of Lands and Resettlement and the Ministry of Agriculture, Water and Forestry. It is a formal requirement that the infrastructure of the farm is supposed to be fully functional before the land can be handed over and lease agreements are signed. While the Ministry of Agriculture, Water and Forestry is in general responsible for rural water supply, it is not clear whether this fact also applies to land reform farms. As a consequence, the settlement of lease agreements was delayed.

Kirk (1999) argues that the sanctioned ability to exclude others is the constituting feature of private property ownership. Deininger (2003) claims that holding secure long-term leasehold titles, as intended in the FURS, permits the realisation of very similar benefits associated with full ownership. As such, we formulate the second hypothesis:

Hypothesis 2: Holding exclusion rights improves farm productivity!

Our indicator for the variable ‘Holding exclusion rights’ is a dummy for whether a farmer holds a freehold or a leasehold title.

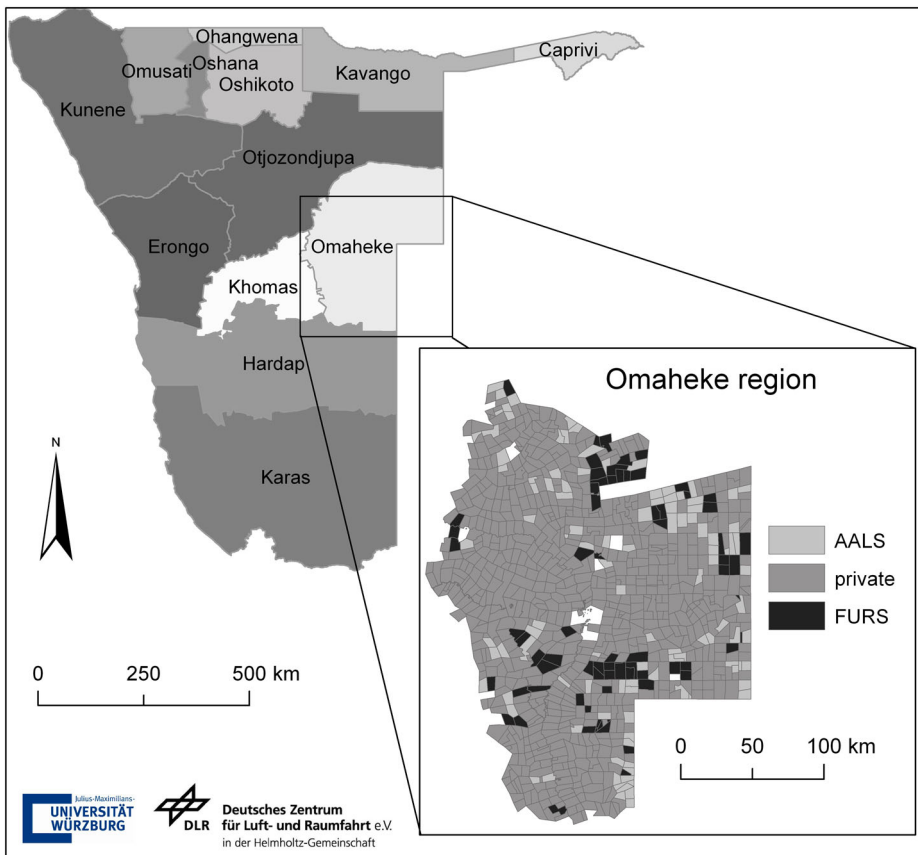
#### 4. Background information on social–ecological features of land reform in central Namibia

We acknowledge that the nature of the relation between property rights and farm productivity crucially depends on the specific context (Holden & Yohannes, 2002; Bromley 2009; Deininger & Feder, 2009; Place, 2009). In this section we therefore provide background information and introduce social and ecological variables to be controlled for in our analysis.

With an annual average rainfall between 300 and 400 mm, the Omaheke Region under study in east-central Namibia (Figure 3) is considered to be a high-potential livestock farming area. The carrying capacity recommended by the Ministry of Agriculture, Water and Forestry is estimated to be between 12 and 18 ha per large stock unit. The vegetation is dominated by the *Acacia–Terminalia* tree-and-shrub savannah of the Central Kalahari (Mendelsohn et al., 2002).

Ecological conditions affect the economic performance of farmers. Different farmers have started their new business with varying natural resource availability. We therefore include the EVI for 2001 as a proxy for initial ecological conditions. The EVI indicates the above-ground biomass production of the pasture. We further control for soil type





**Figure 3.** Map of Namibia and research area. Source: Mendelsohn et al. (2002).

because fluvial sand deposits of the eutric regosols provide higher soil moisture absorption capacity than the deep Kalahari sand deposits of the ferralic arenosols.

Bush encroachment as the result of overuse of the herbaceous vegetation is a typical sign of rangeland degradation in the research area, reducing its palatable biomass (Graz, 2008). The proportion of grass and bush vegetation also impacts the ecological biomass storage characteristics. We include the variable ‘Mean bush cover’ as a proxy for bush encroachment.

AALS farmers bought and FURS farmers were allotted individual, clearly marked sections of land. The size of the farms in our sample varied greatly between 50 and 10 000 ha. Linked to the farm size are economies of scale related to water infrastructure. With few exceptions, the livestock fully depends on boreholes to survive. We control for the indicator ‘Density of working boreholes’ on a farm.

Both land reform instruments target Namibians who were systematically discriminated against prior to the country’s independence in 1990. Nevertheless, AALS farmers belong at least to the middle class, because they need to invest their own capital in the farm. The selection criteria for FURS beneficiaries have repeatedly changed, although the programme generally focuses on the poor. At the time of redistribution, almost half of the

farmers received a monthly income below N\$3500 and 7% received more than N\$70,000 income per month.

Farmers' financial capital at the time of land redistribution affects their investment opportunities, their ability to make full use of the productive capacity of the land, and, consequently, their economic performance. Motivated by the logic of basic production theory, we control for the initial capital endowment of beneficiaries in terms of livestock possession. By the time of research, the majority of farms in our sample were stocked below the rate recommended by the Ministry of Agriculture, Water and Forestry.

There is a debate whether citizens with non-agricultural income should be allowed to benefit from land reform. On the one hand, they can invest their non-farm income in the farming business. On the other, they do not depend on agriculture for their livelihoods. In addition, they cannot spend the main part of their time on farming. We consider non-farm income in our model.

We pay special attention to the role of multiple dimensions of human capital. First, we include the general education level of the household head. Thirty-six per cent of household heads did not finish secondary school and only 23% hold a technical qualification or university degree. Secondly, we considered the household heads' historic farming experience. The majority of land reform beneficiaries had farmed prior to being allocated land, but only a minority of them had done so in a commercial setting. Thirdly, the indicator 'Weeks of farming training' tells us something about the willingness of the beneficiary to learn about innovative farming practices.

Following Arrow's (1962) arguments that productivity increases as the result of the repetition of investments, we control for the effect as to whether land reform beneficiaries needed time to adapt to the new farming situation using the indicator 'Time passed since land redistribution'.

Farmers' human and physical capital is the basis for their application of specific farming practices. Typical management techniques in Namibia are pasture resting, breeding control, and the strategic use of fires (see also Olbrich, 2012). We use the 'Number of camps designated for one livestock herd' as an indicator for the relative frequency of rotation.

Udry (1996) provides evidence that women show a lower agricultural productivity than men. Less than one-third of our sample was female. We control whether gender has an impact on the farm income.

## 5. Economic performance measures of land reform beneficiaries

The progress of land reform efforts is often measured by the amount of land redistributed. By 2010, according to the Ministry of Lands and Resettlement, 1 502 935 ha had been allocated to 3725 FURS farmers and 3 241 352 ha had been bought by 604 AALS farmers (RoN, 2010). This is still far from the government target of 15 000 000 ha of white-owned farmland to change hands by 2020, but it is a great success if compared with other land reform programmes in the world (Deininger, 2003). Nevertheless, these numbers tell us little about the economic success or failure of land reform at the farm level.

In this section we describe our income and productivity indicators. We focus on the 'Annual total farm income after running expenses (excluding investments)', which adds

up all on-farm revenues in 2008 and deducts only variable costs in 2008.<sup>3</sup> The average farm income after running expenses of AALS farmers was N\$17.48 per hectare and N\$87 783 per farm. For the same indicator, FURS farmers experienced average losses of N\$4.91 per hectare and N\$2674 per farm (Figure 4). One-fifth of the AALS farmers and half of the FURS farmers made losses. Our analysis shows far lower profit estimates than those calculated by the Permanent Technical Team in their Land Reform's Resettlement Survey Report 2003/04. The Permanent Technical Team concluded on the basis of hypothetical farm management estimates that FURS farmers generated an average farm profit of approximately N\$5500 per annum (Kaukungua et al., 2004).

If one considers fixed costs and investments, the figures drop. In 2008, two-thirds of the AALS farmers had a positive annual farm income after expenses (including investments).<sup>4</sup> The average income was N\$38 492 per farm, with a maximum of N\$164 103. Slightly more than one-third of the FURS farmers made a profit, amounting to a maximum of N\$111 311. The average loss for this group was N\$17 380, with a maximum of N\$275 659 being recorded (Figure 4). These figures are in contrast to Olbrich's (2012) results: 84% of his sample of commercial livestock farmers earned at least 40% above the average annual national per-capita income in 2004 prices (N\$29 361).

The financial pressure becomes even more severe if one takes indebtedness into account. Especially AALS farmers struggle, who bought their land with subsidised loans. On average, AALS farmers are in debt by N\$1 484 993, with a maximum of N\$3 450 000. In comparison, FURS farmers had average debts of only N\$8527. In 2008, the average liability payment for AALS farmers was N\$117 119 per year. Haring & Odendaal (2007) predict that the parastatal Agribank will repossess most of the AALS farms because farmers will not be able to pay their instalments. Our results provide evidence in support of this concern.

In reference to the argument that property rights potentially affects credit access we took a closer look at liabilities of farmers. Here we exclude the land credits because they would overshadow the picture. In 2008, AALS farmers in our sample held an average amount of liabilities (excluding land credits) of N\$97 130 with a maximum of N\$441 952. FURS farmers were indebted with on average N\$8527 only, with a maximum of N\$170 000.

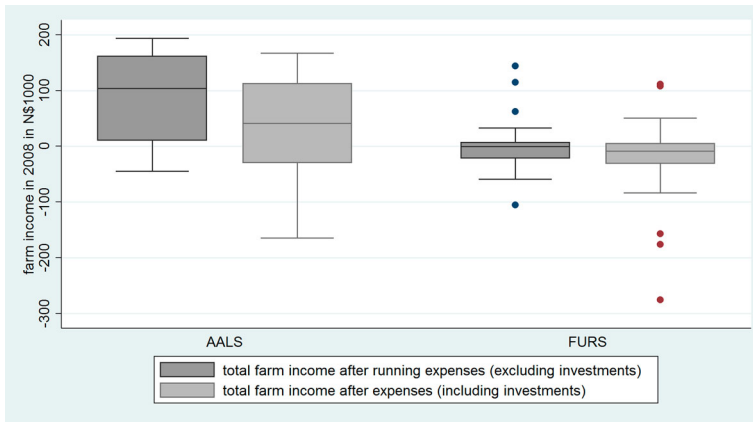
We further looked at the level of investments by land reform beneficiaries. The respondents were asked to record any mayor investments in vehicles, machinery and water points, fences, structures and houses, energy and electricity, tools and implements, breeding animals, and debushing measures. AALS farmers invested on average N\$597 342 with a maximum of N\$1 608 000. FURS farmers had lower investment levels, with on average N\$106 991 and a maximum of N\$668 100.

## 6. Key factors determining business performance

In the next step we estimated regression models in order to analyse the impact of property rights on the economic performance of land reform beneficiaries (Table 1). We used the

<sup>3</sup>Annual farm income after running expenses (excluding investments) = income from livestock offtake + income from value adding activities – bank expenses – fodder expenses – fuel expenses – veterinary expenses – expenses repairs – running vehicle expenses – transport – labourers costs – electricity expenses – land tax – other taxes – other expenses mentioned.

<sup>4</sup>Annual farm income after running and investments = annual farm income after running expenses (excluding investments) – expenses in machinery – expenses in tools – expenses in debushing – expenses in breeding.



**Figure 4.** Farm income after expenses (N\$).

Note: N = 65.

farm income after expenses per hectare as an indicator for farm productivity because it points toward the capability of beneficiaries to generate profit in the day-to-day operation of their farms.

The results of the regression analysis confirm our second hypothesis and provide evidence that the rights to exclude others from the land are of major importance in the context of land reform in the Omaheke Region. Holding either a freehold or a leasehold title improves the annual farm income after running expenses under the ceteris paribus assumption by at least N\$26/ha. This is a notable impact if one bears in mind that AALS farmers generated an average farm income after running expenses of N\$17.48/ha in 2008, while FURS farmers experienced average losses of N\$4.91/ha. The result is stable for the models explaining farm income after expenses including and excluding investment costs.

**Table 1.** Ordinary least squares regression models explaining the individual annual farm income after expenses (N\$ per hectare)

	Excluding investments	Including investments
Holding of freehold title	7.946 (30.33)	51.45 (38.96)
Holding of any title	26.27* (10.94)	35.79** (11.54)
Natural logarithm of the spatial density of boreholes	-8.221 (5.034)	-9.286 (5.814)
Average enhanced vegetation index (EVI) in 2001	-0.0002 (0.0229)	-0.0583 (0.0350)
Eutric regosols vs. ferralic arenosols	9.484 (15.40)	7.182 (18.97)
Share of land covered with bush vegetation in 2007/08	-3.115** (1.071)	-3.105* (1.413)
Sex	-1.233 (8.162)	8.002 (12.24)
Natural logarithm of stocking rate at time of redistribution	-13.51* (5.581)	-20.98* (8.593)
Having non-farm income	-14.26 (9.428)	4.829 (13.72)
Education level of head of household	4.018 (5.644)	-1.447 (8.029)
Farming training received	1.688 (4.228)	-1.829 (4.813)
Expenditure on labour	-0.0001 (0.0008)	-0.0014 (0.0011)
Time passed since land redistribution	-1.829 (1.096)	-0.139 (1.663)
Having previous farming experience	10.85 (8.275)	9.447 (9.660)
Camps per herd	-2.328 (4.782)	-1.953 (6.967)
Constant	131.9* (55.39)	236.6** (84.31)
Adjusted R-squared	0.25	0.30
Probability > F	0.000	0.034

Data presented as coefficients (robust standard errors).

\*\*p < 0.01.

\*p < 0.05.

N = 64.

In contrast, holding in particular freehold titles which include alienation rights had no significant impact on farm income per hectare. In 2008, other factors were more important in explaining the high variance of the economic performance indicators than whether beneficiaries in our sample were able to use a land title as collateral for credit.

Looking at our control variables indicates that farm income increased in accordance with the level of the beneficiary's initial capital endowment. The results showed that, indeed, a smaller herd size at the time of land redistribution resulted in lower farm income (excluding investments) per hectare in 2008. Even in the medium run, it is important that a farmer is able to make good use of the capacity of the land immediately from the start of the new farm business. There is further evidence that land degradation in the form of bush encroachment reduces farm income.

## 7. Discussion and conclusion

Our study confirms that it is much easier to give people access to land than to make them competitive farmers and create sustainable livelihoods (compare with Deininger, 2003; Werner & Kruger, 2007). The majority of land reform in our sample is making losses, which is in sharp contrast to the fact that Namibian commercial cattle farmers earn on average above the country's average per-capita income (Olbrich, 2012). The poor profit estimates should also be seen in the context that the 2008 EVI was significantly higher than the average value for the years between 2001 and 2009.<sup>5</sup> This indicates that our snapshot was rather a favourable year for the farmers. Nevertheless, future research should build up panel data to understand the dynamics even better.

Looking deeper into the reasons for the often poor economic performance by land reform beneficiaries discloses the importance of secure property rights. Holding at least a leasehold title strongly improved the economic performance of beneficiaries in our sample. The Ministry of Lands and Resettlement is aware that, in the absence of any legal proof for the claim to the land, the sense of ownership is reduced, which has a negative impact on sustainable farm management (Kaukungua et al., 2004).

Harring & Odendaal (2007) argue that the government's policy to deny freehold titles to FURS farmers is in contrast to such an awareness and results in reduced self-esteem and sense of ownership. Our data do not allow us to draw conclusions regarding psychological effects. Alienation rights did, however, at least not result in improved farm income after expenses per hectare. Leasehold rights in the specific context of central Namibian land reform seem to be sufficient to provide adequate incentives to make productive use of the land. Our findings confirm Kirk's (1999) and Deininger's (2003) arguments that security of tenure can also be achieved without holding alienation rights, and that the right of exclusion and to claim compensation for damages provided the strongest investment incentives. However, whether alienation rights have a long-term rather than short-term impact on productivity, as Ali et al. (2007) stress, can only be assessed at a later stage of reform implementation.

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<sup>5</sup>t-Test of average EVI for years between 2001 and 2009 and the EVI value for 2008:  $t = -5.9548$ ,  $\Pr(T < t) = 0.000$ .

Our results confirm the importance of the ecological state of land reform farms. Degraded rangelands make it much more difficult for beneficiaries to farm in a profitable way. An increase of bush encroached land cover by only 5% reduces farm income per hectare after expenses by at least N\$15. This is a significant amount taking into account the income figures for 2008 and the fact that the average bush density of the researched farms was 15.8%. Bush encroachment is a slow process and in most cases it can be assumed that the degradation of land was caused by the previous owners' management rather than the land reform beneficiaries. This result highlights the importance to strongly take the ecological condition into account when acquiring land for redistribution.

Our analyses further highlight the importance of the initial capital endowment of land reform beneficiaries. Kaukungua et al. (2004) argue that not utilising the land to its full capacity is one main reason for the low profits of resettlement farmers. Lohmann et al. (2014) observed strong path dependencies in role-plays conducted with the same set of farmers. The relatively low stocking rates of most respondents could be interpreted as a sign that farmers are still in a herd building phase (see also Werner & Kruger, 2007). However, some farmers are selling their herds in order to cover costs or to pay their credit instalments. One-quarter of both the AALS and FURS farmers in our sample had lower livestock numbers in 2008 than at the time of land redistribution. Our results support selection criteria for land reform beneficiaries such as livestock ownership and financial capital. This is in conflict, however, with the idea to let, in particular, the poor benefit from land redistribution. One argument in the Namibian public debate refers to the low poverty reduction impact of land reform to be achieved if people with already well-established income sources and levels are resettled. Our results raise the question of whether resettling people without an established capital basis would have a more positive impact on achieving these goals. Unless urgent measures are taken to improve the business performance of land reform beneficiaries, the land reform programme will merely provide a platform for citizens who subsidise their life dream of managing a farm with alternative income and put less wealthy beneficiaries at risk of even deeper impoverishment. It is unlikely that under such circumstances the ambitious political objectives of land reform can be achieved in the long run.

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