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LAND TITLE, TENURE SECURITY, CREDIT AND INVESTMENT
IN THE LOWER SHABELLE REGION, SOMALIA

by

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Introduction

Interactions among various macroeconomic forces and donor interventions over the past decade have sharply increased the demand for land and land value in Somalia's river valleys. Price inflation in excess of 45 percent per annum between 1980-6 (World Bank 1988) and banking disruptions have shifted incentives away from financial assets toward land or commodities (e.g. gold) in investment portfolios. Saudi Arabia's import embargo on live animals from Somalia (pending vaccination and quarantine measures) has severely curtailed animal exports and foreign exchange earnings and lowered economic incentives in the livestock sector. Official development assistance, which averaged \$80/capita and 21.2 percent of GNP in 1985-86 (World Bank 1987, 1988), has increased the supply of irrigated land and increased investors' expectations of economic returns in the river valleys. The 100 percent real increase in official maize prices between 1980 and 1985, the recent cut in food aid imports by donors, and market liberalization policies have sharply increased both private and official market incentives.

The interplay among these factors has influenced rural land markets in three principal ways: (1) rising demand for land, particularly for irrigable land in Somalia's river valleys, has led to rising land value and to mounting claims of counter-productive land speculation and land grabbing; (2) urban

residents, traders and civil servants have been important actors behind this land acquisition; and (3) rising land values and land speculation are raising concerns of inadequate tenure security and incentives for farm investment.

Economists using a narrowly defined neoclassical model have derived hypotheses that individualized tenure, typically leasehold or freehold tenure, is superior to traditional tenure systems because it increases security of property rights, enhances credit access, and increases credit and investment demand. This paper examines the linkages between leasehold registration, tenure security, credit and investment in the context of irrigated agriculture on the Lower Shabelle river. It further examines the self-selection biases of households and parcels associated with title status under a sporadic system of registration. Policy implications of the research are then discussed along with some of the proposals for reforms in land policy and land registration that are now being considered by the Government of Somalia based on this research.

Agricultural Land Legislation

The Agricultural Land Law of 1975 and subsequent decrees are the principal statutes governing statutory tenure. The Law asserts state ownership over all agricultural land, but provides for the issuing of concessions to cooperatives, state farms, autonomous agencies, municipal governments and private farmers, whether an individual, family or company. Concessions are limited to one per family or individual. The duration of a concession for private farmers is 50 years renewable, but cooperatives, state farms, and other agencies have no time limits. An individual or family can obtain a concession up to 30 ha of irrigated land and 60 ha of rainfed land. The ceiling increases to 100 ha for an individual or family with a banana

plantation. State farms, cooperatives, private companies and other official agencies, are exempted from these ceilings. Concessions cannot be bought, sold, or rented, although these restrictions have been relaxed in recent government circulars. A concession may be revoked if it exceeds the size restriction, is used for non-agricultural purposes, is not used productively, is unnecessarily fragmented, is transferred to another, or is not farmed for two successive years. However, weak enforcement of these provisions results in wide disparities in practice between statutory tenure and land use and allocation under customary practice.

The Law and various circulars also lay out the procedures for registering land to acquire a concession. The process is supposed to start with an application at the local district office of the Ministry of Agriculture (MOA), and end at the central land registry in Mogadishu with the signing of the land certificate by the Minister of Agriculture. However, in practice the registration process is sometimes initiated at the national level with a letter written to district or regional MOA offices directing officials to find unregistered land for an applicant. The latter process has been the source of many of the disputes between "outsiders" and local residents in the river valleys.

By 1988, 13 years after passage of the Land Law, GSDR registry offices had cumulatively issued 13,340 titles for concessions covering 380.5 thousand ha nationwide (GSDR 1989). This area represents roughly 0.6 percent of Somalia's total land surface. Over 75 percent of all registered land is listed as irrigable, meaning it is within close proximity of a river, but is not necessarily irrigated.

In June 1989, a random sample of 722 entries was drawn from the central land registry in Mogadishu (10 percent sampling frame) covering the period

from about 1981 to present (Roth et. al. 1989). The survey revealed several interesting characteristics about the profile of registered farms:

1. A large proportion of concessions are registered by private companies. Land may be registered by an individual, private company (Shirkadda), cooperative (Iskaashatadda), or religious commune (Xerta). Results from the survey show that 76.3 percent of concessions had been registered by individuals, and 23.5 percent by private companies. Land registered in an individual's name may either indicate an individual holding or a company. Thus, the percentage reported for private companies is underestimated.
2. Sizes of concessions for private companies are considerably larger than for individual concessions. Private companies in the sample average 194.0 ha per concession compared with 26.4 ha for individual concessions. Both of these mean farm sizes are considerably in excess of 3.8 ha, the average farm size in Somalia (MOA 1988).
3. A large proportion of the concessions recorded in the land registry are round figures of 30, 60 or 100 ha. Measurement of a parcel during adjudication would generally result in an odd fraction for area recorded in the register unless land is delineated by survey prior to acquisition as in the case of opening new lands. But, as noted earlier the registration process can be reversed. A directive from Mogadishu may be issued to find land for an applicant, an area of land equal to the ceiling is requested, and that area is mapped out by field survey and recorded in the register. While not a precise measure of land registered in this manner, the data suggest widespread use of land registration as a means to gain access to land. Out of the 722 entries, 23.3 percent are precisely 30, 60 or

100 ha in size. When broken down by type of ownership, 35.8 percent of private companies registered land in round lots compared with 19.4 percent for individual concessions.

4. A number of concessions greatly exceed the 100 ha ceiling in the Land Law. Out of the total of approximately 7,220 registrations, 54 concessions exceeded 500 ha in size. Of this total, 40 concessions fell in the range of 500-1,000 ha, 8 in the range of 1,001-2,500 ha, 5 in the range of 2,501-5,000 ha, and 1 farm 7,000 ha. Further, 50 of these 54 concessions were registered as private companies, 1 cooperative, 1 religious organization, and 2 as individual concessions. With the possible exception of the individual concessions (an individual name can either mean a company or a personal holding), all the above are exempt from land ceilings in the Law.
5. The vast majority of concession holders are men. Out of the total number of individual concessions, 92.7 percent are registered in the names of men, and 7.3 percent in the names of women.

Research Methodology

Research Site

The Shalambood research site consists of an 8,500 ha rectangle on the Lower Shabelle river near Merca at the heart of Somalia's most important food and export crop producing region. Boundaries of the site mark the area of the Shalambood irrigation scheme which was developed by the Italians starting in 1926. The Genale dam and reservoir rest at one corner of the site. The town of Shalambood with a population of 22,240 is located at the opposite corner. Its boundaries enclose 63 former Italian Aziendas. The majority of the

Italian owners departed in the 1960s and 1970s, leaving the land to the government, to the farm workers, or to private Somali investors. Water for irrigation comes from the Genale reservoir on the Shabelle river, and flows by gravity through the Dhamme Yassin primary canal, and a web of secondary and tertiary canals to farmers' fields. The irrigation scheme has fallen into a poor state of disrepair and is badly in need of rehabilitation. Poor water control due to broken gates and small reservoir size combine to cause water shortages over wide areas in the dry season and excessive flooding on parts of the scheme during the rainy season.

The research site contains a complex matrix of farms with different tenure rights and widely varying access to land and water resources. Larger private, state and cooperative farms, growing mainly bananas for export, tend to be located close to the Dhamme Yassin canal and river. These farms tend to be large-scale enterprises which are normally registered, are commercially oriented, have the best access to irrigation water, and provide an important source of employment for permanent and temporary workers from surrounding towns. Extending outwards from the Dhamme Yassin and large commercial plantations are the smaller holdings. Parcels in small holder areas adjacent to the secondary canals have relatively good access to water, while those on the scheme's outer periphery have little or no access. Registration by these small holder households is less frequent, and registration of parcels is more spotty.

Survey Design

The Land Tenure Center undertook an in-depth survey of unregistered and registered farmers in the Shalambod area from May 1987 to January 1989. Stratified random sampling techniques were used to identify three strata of land holders: (I) 77 unregistered small holders; (II) 36 registered small

holders (less than 25 ha); and (III) 35 registered large holders (greater than 25 ha). The larger sample size for category (I) was intended to permit further identification of households with "secure" and "insecure" access to land, separate from the influence of registration. Categories (II) and (III) were formed to distinguish between the agrarian characteristics of plantation agriculture and registration status. Registered small holders under (II) tend to have similar cropping patterns (maize, sesame and vegetables) and face similar technological possibilities as unregistered small holders. Large registered farms because of their preferential access to resources, colonial roots, and organizational structure are more geared to plantation agriculture and commercial exports. Twenty-five ha is the point at which farms begin to move into commercial banana cultivation.

Following reconnaissance visits to the area in January and May, meetings were held with the head of the Small Farmers Association in Shalambod as well as with the heads of small farmer Aziendas to apprise them of research objectives and plan of action.¹ Heads of the Aziendas were asked to prepare population lists of all farmers holding parcels within their Azienda. In all, 17 such lists were prepared, including 11 from the small farmer Aziendas, 5 from the small farmer agricultural cooperatives, and 1 from the CRASH program area.² A list of 179 registered landholders was also obtained from the land registry records at Genale. SOMALFRUIT, Somalia's banana production and

1. A pilot study of tenure security, land registration and resource access, including a household survey and key informant interviews, was conducted by the Land Tenure Center in January and February 1987 as part of the project design of the USAID Shabelle Water Management Project.

2. The CRASH program was established by the Government to give civil servants and students from agricultural training colleges access to land on a temporary basis. Its mandate has weakened considerably over time, but CRASH program offices are still in operation, and controversy remains concerning the political nature of the land allocations, and who has rights to the land.

exporting parastatal, provided a list of plantations within the site. In all, the lists contained 2,165 farmers.

Two groups of households were excluded from the population to purge the sampling pool of extraneous and confounding influences. First, farmers belonging to agricultural cooperatives were excluded because of differences in opinion between the coop management and coop members over who has control of the land. Second, farmers in CRASH program areas were excluded because of the political nature of land allocations and the tenure insecurity resulting from program rules. After excluding these sub-populations and the plantations, and cross checking and cleaning to remove multiple entries of farmers with parcels in more than one Azienda, 1,237 households remained. The sample of unregistered farmers were randomly drawn from this small holder population.

Farmers in the registered small holder category were randomly selected from the Genale land registry list after eliminating companies, cooperatives and those households with registered parcels greater than 25 ha in size. Very few registered farmers were identified during the process of selecting unregistered small holders from the Azienda lists. Many of the farmers that claimed to have registered land were later found to be mistaken because they confused registration with land tax receipts or with past court records resolving a land dispute. In the case of each interview, respondents were asked a preliminary set of questions to identify and exclude those households belonging to a cooperative, CRASH program area, or to this "confused" group.

While registered land holders on the whole were cooperative, they were much more difficult to locate than unregistered farmers. Registered farmers were frequently engaged in other economic activities, both in Shalambod and elsewhere in the country. Often the owners live and work in Mogadishu; many are civil servants. The necessity of interviewing, and the difficulty in

finding, household head's knowledgeable about the farm's operations and investment activities required frequent resampling to meet the small sample requirements (i.e. greater than 32) of the survey design.

Locating owners of the large private farms was particularly difficult. Many of the large land holders are absentee land lords, who leave the day-to-day management decisions to the foreman. While the foreman is usually very knowledgeable about the farm's operations, s/he may have little knowledge about investment decisions, details about registration, land histories or financial transactions. Essentially a non-random approach was used to resolve this problem. Pre-established contacts were used to identify those large farmers living in the proximity of Shalambood who would be willing to cooperate in the study.

A three-round questionnaire was administered to each head of household in the registered and unregistered small holder samples. Questionnaires were translated into Somali and field tested prior to the study. Interviewing of large farmers was limited to a separate one-round questionnaire, due to the difficulty of locating farm owners and to constraints on their time. Less data were thus collected for the large registered group. After all three rounds were completed, questionnaires were meticulously reviewed for inconsistencies or missing data. In the event that such were found, respondents were contacted and asked to verify information, a situation which was experienced in the case of 26 farmers.

Area measurements were calculated for all small holder parcels using a compass, counter and programmable calculator. However, respondents' estimates of land area, instead of actual measurements, were taken in the large farmer case, because their parcels had to be surveyed prior to registration and areas recorded in the register. Even identifying parcels proved to be problematic

in some cases. Land grabbing in the project area and restrictions in the Land Law against multiple parcel ownership resulted in farmers being very reluctant to report the location, number and size of all their holdings. An analysis of cross checks on land holdings in rounds 1 and 2 of the questionnaire along with discussions with Azienda heads revealed 30 small holders that had reported inaccurate parcel information. When inconsistencies were found, the land holder was re-interviewed with the Azienda head present. In few cases were the Azienda heads mistaken.

Sample Household and Parcel Indicators

A comparison of household and parcel characteristics in Tables 1 and 2 reveal a number of similarities and dissimilarities among registered and unregistered groups. Between the small holder samples, households tend to have similar family size and composition (male adults, female adults and children), age of household head, and number of parcels. However, a number of important differences are also evident between registered and unregistered households:

1. A large proportion of household heads in the registered categories either now hold or have held official positions in state or national government. Of the 77 household heads in the unregistered small holder category, 72.0 percent have never held an official position, 12.0 percent have held one or more official positions in the community, 5.3 percent have been employed in the military, while only 1.3 percent have worked in government. By contrast, 25.0 percent of registered small holders have held previous positions in government, and for registered large holders, 37.1 percent.

2. Size of registered farms in the small holder sample (9.3 ha) are larger than for households without registered title (2.3 ha), significant at

Table 1:
Household Characteristics

	Small holder Unregistered	Small holder Registered	Large holder Registered
Demographics:			
Adult males	2.2	2.5	-
Adult females	2.5	2.8	-
Children (less than 15)	3.3	4.2	-
Male headed households (%)	83.1	97.2	-
Female headed households (%)	16.9	2.8	-
Age of household head (years)	49.7	50.4	44.0
Public education (HH head; years)	.95	2.6	-
Public education (family; years)	.83	1.9	-
Always lived in this area (% yes)	69.3	33.3	-
Always a farmer (% yes)	77.3	58.3	-
Official positions held (% HH):			
None	72.0	61.1	45.7
Community	12.0	5.6	5.7
State and local government	1.3	25.0	37.1
Religious sheikh	6.7	-	-
Committees and/or associations	2.7	8.3	11.4
Military	5.3	-	-
Land:			
Total farm size (ha/farm)	2.3	9.3	82.6
Number of parcels	1.7	1.4	1.4
Off-farm dependence:			
Days of off-farm work by family	111.4	134.2	231.1
Family income ('000 SSh.)	35.0	10.0	30.6
Sample size	77	36	35

Mean of ranking: 1=Never; 2=Rarely; 3=Occasionally; 4=Frequently.

Table 2:
Parcel Characteristics

	Small holder Unregistered	Small holder Registered	Large holder Registered
Means of acquisition (% of parcels):			
Given by government*	12.0	37.8	22.2
Given by foreman*	25.4	27.0	2.2
Inherited	14.8	8.1	13.3
Bought	31.0	8.1	35.6
Rented-in	7.0	8.1	-
Claimed	4.2	8.1	22.2
Gift	5.6	-	2.2
Claimed from CRASH program area	-	2.7	2.2
Size of land holding (ha/parcel)	1.4	8.3	59.4
Term of land holding (years):			
Between acquisition and 1987	16.2	16.6	13.9
Between registration and 1987	-	3.8	6.8
Parcel use:			
Fallowed	3.6	-	-
Cultivated	95.7	100.0	-
Idle	.7	-	-
Land rental (% of total)			
Parcels rented-in (1987)	7.0	7.9	0
Parcels rented-out (1987)	0	0	0
Sample size (no. of parcels)	142	38	46

* After Italians departed.

the 1 percent level. The average size of large registered farms is substantially larger.

3. Heads of registered households tend to be better educated (2.6 years of public education) than unregistered households (0.95 years). Further, mean years of public education by family members (total years of education/family size) is higher for the registered group (1.9 years) compared with the unregistered group (0.83). Both findings are significant at the 1 percent level.

4. The share of women household heads with title is disproportionately low. While 16.9 percent of heads in the unregistered group are women, only 2.8 percent of the household heads in the registered small holder group are women.

5. The majority (69.3 percent) of heads of households in the unregistered category tend to have been born and raised in the area compared with only 33.3 percent of unregistered household heads. Yet, farmers in all categories appear to have been settled in the area a long time. On average, parcels in the small holder unregistered category have been held 16.2 years, small holder registered (16.6 years) and large holder registered (13.9 years). Although the large registered group appears to be slightly younger with parcels more recently acquired, results are not statistically significant.

6. Mechanisms used to gain access to land also vary among groups. Farmers in the unregistered category acquired their holdings primarily through purchase (31.0 percent), allocation by the foreman of the Azienda following the departure of the Italians (25.4 percent), inheritance (14.8 percent) and from the government (12.0 percent). Registered small holders have acquired their holdings primarily through the government (37.8 percent) or foreman of the Aziendas (27.0 percent), while larger registered land holders have tended

to purchase farms (35.6 percent), claim land (22.2 percent), obtain land from the government (22.2 percent), or through inheritance (13.3 percent).

7. Two means of acquisition--allocation by the government and claimed land--are especially vulnerable to land conflicts. In the first case, land appropriated by the government following the departure of the Italians and then later reallocated increases the risk of disputes if land is settled in the interim. In the second case, claiming of land, even apparently idle land may have latent claims. Data on disputes support these hypotheses. While only 9.1 percent of households in the unregistered category reported ever having had a dispute over land, 25.0 percent of households in the registered small holder category and 25.7 percent in the registered large holder category reported having experienced land disputes sometime in the past.

8. Registered farmers on average spend more time on off-farm activities, although the amount of non-farm income earned by the unregistered group is higher than for both registered categories.

Overall, families of registered households tend to be better educated, have greater access to land resources, have greater knowledge of government administration and bureaucracy, came from outside the area, and the majority have male household heads.

Systematic vs Sporadic Registration

Land registration is not homogenous. Systems vary from fully systematic registration, where all parcels are registered by the state irrespective of farmer preferences, to purposeful or sporadic registration, where the individual landholder is responsible for seeking title and bearing the costs of registration.

Under systematic registration, initial capital investment by the state is high since all land within an adjudication area is registered, but the cost/parcel and cost to the individual tend to be low. Because the objectives of the registration program require mandatory registration, the link between demand for title and titling benefits may be weak and is empirically untestable within the registration area. Once the titling campaign is completed, however, the decision to renew titles following land acquisition or succession, converts to purposeful registration.

In sporadic systems, title ownership is determined by individual choice. Normally, the state maintains a system of land registration offices, but landholders must bear the transactions cost of acquiring title. Transactions costs include application fees, time and travel to the registry offices, and unofficial gratuities. Whereas title in systematic systems is supply determined, selected according to state criteria, title holders and specific parcels under purposeful or sporadic systems are self-selected, and thus are influenced to a greater degree by household and parcel attributes.

Costs of Registration

Registration in Somalia is based on a sporadic system. The government has established a local and regional registry office in Genale within relatively close distance of most farmers in the area. However, registry operations are hampered by tight budget constraints and lack of facilities. Shortages of paper, filing cabinets, fuel and low salaries place severe constraints on registry operations. While registration is in principle free, applicants in reality must pay the costs of site visits, surveys, maps, etc. to obtain title. Trips must be made to the Genale land registry office. Frequently, because of delays in processing applications, applicants feel

obligated to visit the National registry in Mogadishu as well to finalize the process. Based on the experiences of both small and large registered farmers, respondents on average made 7.2 trips to Genale and 5.9 trips to Mogadishu (2 hours by car, 8 hours by bus).

Information on registration costs were obtained from two sources: respondents who cited "high" costs as the main reason for not registering their land were asked to provide an estimate; and actual costs paid by those land holders who registered their land. The first estimate is biased toward small parcels (title is negatively correlated with farm size), but estimates are for a constant year (1987). The second is biased toward large parcels, and involves the problem that payments were made over the period 1975-1987 and thus need to be adjusted for price inflation. According to the first group, land holders perceive the cost of title as SSh. 7,107/parcel (\$1=SSh. 100, 1987). Nominal costs paid for registration reported by the second group were adjusted with the GDP price deflator of 11.3 percent for the period 1975-79, and 45.4 percent for 1980-87 (World Bank). After adjusting for inflation, registration costs in 1987 real shillings averaged SSh. 129,512. Such costs greatly exceed the cash income of most small holders.

Equation (1) estimates the relationship between parcel size and registration costs per parcel:

$$(1) \quad \text{LCOST}_j = \begin{matrix} 9.03 & + & .661 \text{ LAREA}_j \\ (.287) & & (.099) \end{matrix} \quad \begin{matrix} R^2 & = & .437 \\ n & = & 60 \end{matrix}$$

LCOST = Logarithm of the actual cost of registering parcel j in 1987 constant Shillings; and

LAREA = Logarithm of area of parcel j.

Since both cost and area are in logarithmic terms, the coefficient for area (.661) represents the cost elasticity of title associated with parcel

size. For every 10 percent increase in land area, cost increases 6.6 percent, indicating economies to scale in registering land. Farms with larger parcels thus have a significant comparative advantage in registration.

Despite the high costs of registration, the 77 unregistered landholders gave various other reasons as the primary motive for not registering their land: application was made but no title received (32.3 percent), registration is too costly (24.4 percent), procedures too complicated (18.9 percent), unfamiliar with registration (11.0 percent), and various other responses including not wanting the government involved, registration would upset the family, parcel is too small, no time, or no need to register (cumulatively 13.4 percent). The fact that applications were made but title was not granted itself reflects imperfect information and the high cost of registration. This point is returned to shortly.

Perceptions of Titling Benefits

Benefits from land registration are assessed in two ways in this study: by simply asking farmers to state using a weighted scale whether land registration has specific benefits; and by comparing observed differences among groups. The first scale is highly subjective, and subject to exaggeration. The second set of benefits or lack of benefits are real, in that benefits either have or have not yet been realized, but suffer from two problems. First, the time between registration and the present may have been insufficient to make intermediate and long term investments. As indicated in Table 2, the average parcel in the small holder registered group had been registered only 3.8 years, and the large holder group, 6.8 years. Second, investment depends not only on investment incentives but also on access to credit, inputs, and on the market environment. The two measures combined give

a broader picture of titling impacts and possibilities, than either individually. This section focuses on perceptions of benefits.

Land holders were asked to evaluate the impact of 5 theoretical benefits of holding land title using a 5 point scale. Respondents were asked whether title makes s/he (1) more or less secure in their tenure; (2) more or less inclined to lease out land; (3) more or less inclined to sell land; (4) more or less certain about getting credit from banks; and (5) more or less disposed to invest in land. Possible responses included: a lot more, more, no difference, less, and a lot less. Results are presented in Table 3.

Registration appears to most strongly affect tenure security. Unregistered farmers felt that land registration would greatly increase their security of tenure, while registered farmers felt that having title does greatly increase their tenure security. Results also suggest that title would or does increase small holders inclination to lease or sell land. In both cases however, the large registered group was strongly inclined to engage in these transfers, in part because of the greater land holdings at their disposal. Large registered farms also perceive greatly increased access to credit and are lot more disposed to invest in land. However, the fact that the responses of the small holder registered and unregistered groups are not perceptibly different suggests that larger farms probably have greater market access and investment options.

Observed Titling Impacts

In theory, economic benefits of land registration are derived from three primary sources: increased incentives for investment and credit demand resulting from enhanced tenure security; expansion of credit supply through land mortgage and from increased security to lenders; and lower transaction

Table 3:
Perceptions of Titling Benefits

	Small holder Unregistered	Small holder Registered	Large holder Registered
<hr/>			
More or less secure in land?			
A lot more	97.1	100.0	100.0
More	2.2	-	-
No difference	.7	-	-
More or less inclined to lease land?			
A lot more	67.2	65.8	97.1
More	19.1	31.6	2.9
No difference	13.7	2.6	-
More or less inclined to sell land?			
A lot more	73.7	73.7	100.0
More	19.5	23.7	-
No difference	6.8	2.6	-
More or less certain about getting credit from banks?			
A lot more	85.6	75.8	97.1
More	11.9	18.2	2.9
No difference	2.5	6.1	-
More or less disposed to invest?			
A lot more	75.0	71.1	97.1
More	22.7	28.9	2.9
No difference	2.3	-	-

costs in land transfers stemming from greater certainty in land rights (Ault and Rutman 1979; Johnson 1972). Impacts of title on tenure security, credit and investment are treated in turn.

Tenure Security³

General Model of Tenure Security

A general model of land title and tenure security requires careful consideration of the household and parcel characteristics that determine which households acquire title, and which parcels are registered. The following model proposes a causal link between tenure security and these characteristics:

$$(2) \quad TS = TS (PQ, HC, TITLE)$$

where, TS is an index of the household head's land tenure security at the farm level, PQ refers to the matrix of land attributes computed from parcel level characteristics weighted by parcel size, HC is the matrix of household characteristics, and TITLE refers to registration status.

Parcel Characteristics and Title Status

A large amount of parcel level information was collected in the in-depth surveys. The fourteen questions in Annex 1 proved to be particularly important and consistent indicators of parcel quality: (a) the respondent's assessment of the frequency and severity of water logging problems on the parcel; (b) frequency and severity of drainage problems; (c) frequency and

3. Data for the large registered farms were excluded from this analysis for two reasons: certain household and parcel data are incomplete (as explained earlier, time constraints permitted only a reduced one-round questionnaire for the large registered group); and differences in organization and structure of small and large farms are extreme. Including the two groups would be analogous to comparing small family farms with companies and in some case corporations.

severity of flooding problems; (d) soil topography; (e) soil texture; (f) soil color; (g) ease of tillage; (h) frequency and severity of compaction problems; (i) soil fertility; (j) parcel quality relative to others on the scheme; (k) duration of the first irrigation during the Gu (heavy or primary rainy) season; (l) duration of the first irrigation during the Deyr (light or secondary rainy) season; (m) frequency and severity of lack of water; and (n) effectiveness of the local Water Users Association in distributing water. Indicators of market access or nearness to a road, which would normally affect land value, are unimportant in the Shalambood case because of the tight configuration of parcels within the narrow confines of the scheme.

Ranked responses to these fourteen questions were incorporated in a factor analysis model to identify common factors. Six clusters of variables with common factor loadings were identified by the factor model:

(3) PQ = PQ (SLOPE, TEXTURE, TILLAGE, FERTILITY, IRRIG, IRRDIST) .

Variables (a) to (d) form one cluster identifying general slope characteristics, SLOPE. The cluster of variables (e) and (f) appear to be capturing texture characteristics, TEXTURE. Variables (g) and (h) appear to be associated with ease of tillage, TILLAGE. The grouping of variables (i) and (j) identify fertility characteristics, FERTILITY. Variables (k) and (l) are associated with access to irrigation water, IRRIG. And, the grouping of variables (m) and (n) appear to be identifying equity of water distribution, IRRDIST.

The factor loadings enable the computation of factor scores or indices for slope, texture, tillage, fertility, irrigation, and equity of water distribution, to reduce the original set of fourteen parcel characteristics to a manageable number for subsequent regression analysis. These indices along with measurements for parcel area (AREA), the parcel's distance from the

household (DIST), and title status (TITLE) are incorporated into a land value regression model to help validate the parcel quality indices and to examine the impact of title status at the parcel level:

$$(4) \text{ LVALUE} = \text{LVALUE} (\text{PQ}, \text{AREA}, \text{DIST}, \text{TITLE})$$

where,

LVALUE = Logarithm of respondent's assessment of parcel value ('000 SSh.);

AREA = Area of the parcel in ha;

DIST = Walking distance to the parcel in minutes; and

TITLE = 1 if registered, 0 otherwise.

Mean, minimum and maximum values for variables included in the land value regressions are included in Table 4. Indices for the six indicators of parcel quality have a mean of 0 and generally range from -4.0 to 2.0. The average parcel is 2.81 ha and is 41 minutes walk from the household. Parcels range in size from 0.2 to 39.2 ha.

Pearson correlation coefficients are presented in Table 5. By nature of factor analysis, correlations between factor scores are zero, hence coefficients have been omitted. Land title is highly correlated with size of parcel (.504), distance (.203), slope (-.190) and access to irrigation water (.376), all significant to at least the .01 level. Parcels larger in size with the best access to irrigation water are the most likely to be registered under the current situation of self-selection and title rationing. The distance variable is picking up the influence of the primary canal which runs along the border of the scheme opposite Shalambood. The negative coefficient for slope is difficult to interpret. As the frequency and severity of water logging, flooding and drainage problems decline, the parcel is less likely to be registered. But, parcels with these characteristics also tend to be

Table 4:
Descriptive Statistics of Variables in the Land Value Regressions

	Mean	Minimum	Maximum
Land value ('000 SSh.; log)	3.56	0.92	8.01
Size of parcel (ha)	2.81	0.21	39.20
Distance (minutes walking)	41.19	5.00	150.00
Slope index	.00	-4.26	1.28
Color and texture index	.00	-2.91	1.91
Ease of tillage and compaction index	.00	-3.57	1.65
Fertility and parcel quality index	.00	-3.92	2.82
Access to irrigation water index	.00	-1.47	5.94
Irrigation equity index	.00	-2.31	1.85

Table 5:
Pearson Correlation Coefficients^a

	Land Value	Size of Parcel	Distance	Title to Land
Land Value ('000; log)	1.000			
Size of parcel	.542**	1.000		
Distance	.123	.072	1.000	
Title to land	.580**	.504**	.203*	1.000
Slope	-.166	-.135	-.136	-.190*
Color and texture	.112	-.069	-.086	-.045
Ease of tillage	.159	.111	.007	.013
Fertility	.079	-.123	.029	.090
Access to irrigation water	.342**	.623**	.071	.376**
Irrigation equity	-.038	-.095	.095	.034

a. By nature of factor analysis, correlations between the indices for slope, color and texture, ease of tillage, fertility, access to irrigation water, and equity of irrigation are zero.

* = Significant at the .01 level (one-tailed significance).

** = Significant at the .001 level (one-tailed significance).

further away from the irrigation canals on the periphery of the scheme nearer to Shalambood (indicated by the negative correlation of $-.136$ between slope and distance), and thus are normally considered to be lower in value.

Three alternative models for land value are presented in Table 6. Model I is the complete model, including a title dummy variable for tenure status. In model II, parcel size is excluded because of its high correlation with title status. In model III, both title and land size are omitted to determine the validity of the parcel quality indices.

Results from models I and II suggest that title has a highly significant positive impact on farmers' assessment of land value. Land title increases the log of parcel value (in '000 SSh.) by 1.3-1.6 shillings. Based on these estimates, the mean value for land in Table 4, and appropriate manipulation of derivatives, the marginal value of holding title to land is 44.3 to 57.3 thousand SSh.⁴ The cost of title can be estimated from equation (1). Based on the mean size of registered parcel (12.7 ha), the cost of title in 1987 adjusted terms is 44.8 thousand SSh.⁵ The equality between marginal value and cost has two important implications. First, there does not appear to be any systematic rationing of titles by the registry. Price seems to provide the main rationing mechanism, and high costs are primarily determining the low volume of registration activity. Second, substantial improvements in the efficiency of the registration process and cost reductions will be necessary if registration volume is to increase significantly. And, until greater

4. For model 1, manipulation of derivatives results in the expression:
 $d \text{ LANDVAL} / d \text{ TITLE} = \text{LANDVAL} * d \text{ LVALUE} / d \text{ TITLE} = e^{3.56} * 1.26$

5. From equation 1, the cost of title based on the mean registered parcel size of 12.69 ha is:

$$d \text{ COSTITLE} / d \text{ AREA} = e^{9.03} * 12.69^{.661}$$

numbers of land holders are able to participate in the registry process, disputes associated with sporadic registration will remain a serious concern.

After removing title and land area from the analysis in Model III, coefficients for the parcel quality indicators exhibit the right signs and are generally significant to at least the 10 percent level. Land values rise as the soil grows darker reflecting a higher proportion of clay or sediment, as tillage gets easier and problems of compaction become less severe, as fertility increases, and as access to irrigation water improves. The slope index is negative for reasons stated earlier. Equity of irrigation has an unexpected sign but is not significant.

A number of points stand out in the analysis. First, in the context of self-selection and title rationing in the Shalambood area, the parcels that tend to be registered are larger in size with the best soils (e.g. best access to irrigation water and highest fertility). Second, because of the high collinearity between title, size, and soil quality, the study of titling impacts requires careful control of parcel characteristics to avoid spurious correlations concerning titling benefits. Third, the high economic premium observed for title suggests that title holders perceive substantial benefits from title acquisition. Clearly, some of this benefit may reflect differences in education, wealth, official position or status in the community between titled and non-titled groups. These characteristics are linked with title and land quality indicators in the following household analysis.

Household Analysis of Title and Tenure Security

Direct questions about tenure security were made prohibitively difficult because of the extreme sensitivity of the population toward certain land disputes in the area. Preceding and throughout the research period, outsiders

Table 6:
Regression of Land Value^a

	Land Value Variant I	Land Value Variant II	Land Value Variant III
Constant	2.972 (20.6)	3.167 (21.8)	3.384 (20.5)
Slope index	-.051 (.662)	-.089 (1.11)	-.206 (2.25)
Color and texture index	.210 (2.82)	.183 (2.33)	.160 (1.77)
Ease of tillage and compaction index	.150 (2.01)	.203 (2.60)	.211 (2.34)
Fertility and parcel quality index	.117 (1.53)	.043 (.552)	.102 (1.13)
Access to irrigation index	-.048 (.499)	.199 (2.35)	.449 (4.95)
Equity of irrigation index	-.026 (.346)	-.076 (.969)	-.063 (.689)
Distance from household (minutes)	.001 (.459)	.001 (.248)	.004 (1.30)
Title dummy	1.26 (5.86)	1.63 (7.77)	- -
Size of parcel (ha)	.091 (4.54)	- -	- -
F-value	16.9	14.8	6.18
R ²	.468	.405	.198
Number of parcels/observations	183	183	183

a. Land value ('000 SSh.) is in logarithmic terms.

Figures in parentheses indicate t-values. A t-value equal to or greater than 1.64 is significant to at least the 10 percent level, equal to or greater than 1.96 is significant to at least the 5 percent level, and equal to or greater than 2.58 is significant to at least the 1 percent level.

grabbing land through the registration process was strongly asserted by many small farmers. Several instances of well-connected individuals attempting to claim land with certificates issued by the government resulted in small farmers taking cases to court. It was decided instead to phrase questions in the second person (i.e. whether farmers in the area were concerned about losing their land), the working hypothesis being that responses would reflect the personal biases and views of the respondent.

Respondents were asked various questions dealing with different aspects of tenure security. The nine questions in Annex 2 proved particularly revealing and consistent when incorporated in a factor analysis model: (a) the extent to which small farmers today are losing land more or less frequently than in the past; (b) the extent to which farmers in the area are more or less worried about losing land; (c) whether disputes over land ownership now are more or less serious than in the past; (d) the extent to which outsiders taking land is a problem; (e) the likelihood that some farmers in the area will lose land in the next 10 years; (f) the extent to which living in the area a long time helps guard against loss of land; (g) the extent to which permanent use of land guards against loss of land; (h) the risk of losing land if it is rented-out only one year; and (i) the risk of losing land if it is rented-out over a long period of time.

Ranked responses for these questions were incorporated in a factor analysis model. Three clusters of variables with common factor loadings were identified:

(5) TS = TS (TSOWN, TSUSE, TSRNTL).

Variables (a) to (e) exhibited one cluster identifying a general measure of tenure security or concern over loss of land, TSOWN. The clustering of

variables (f) and (g) appear to be capturing the effect of residency and use, TSUSE. The remaining two variables, (h) and (i), obviously reflect the tenure security associated with land rentals, TSRNTL.

As with the parcel level analysis, the factor loadings enable the derivation of factor scores or indices of ownership security, security contingent on residency and use, and land rental security. The remainder of this section will examine the impact of title, and household and parcel characteristics on the most important of these, ownership security.

Three alternative models of ownership security are presented in Table 7. In model I, land title is the proportion of registered land held by the household (0=no registered land; 1=all parcels and land area are registered). In model II, those households who have inquired about registration and actually paid for land surveys as part of the registration process are considered to be registered even though they may not have legally completed the registration process. Because of imperfect information, many landholders believe that these steps alone are sufficient for registration. Even if landholders know the process is incomplete, the very fact that surveys are undertaken affords some legal recognition by the local registry. In model III, both measures of title are excluded, because of the highly collinear relationship between title and certain household and parcel characteristics.

A comparison of regression estimates in models I, II and III is revealing. As age of household head increases, ownership security tends to decline perhaps for reasons of uncertain social security in old age, or concerns over future land access for children. Men household heads tend to have much lower perceptions of tenure security than women household heads, consistent with researcher observations that women are not as aware as men of land issues, the land registration process, or disputes in the study area. Women household heads when asked questions on issues related to land would

Table 7:
Regression of Tenure Security^a

	Ownership Security Variant I	Ownership Security Variant II	Ownership Security Variant III
Constant	2.207 (5.47)	2.290 (5.87)	2.250 (5.55)
Age of household head	-.011 (1.64)	-.013 (2.06)	-.012 (1.88)
Sex of household head (1=male)	-1.34 (5.01)	-1.28 (4.92)	-1.39 (5.19)
Government official (1=yes)	-.437 (1.72)	-.454 (1.87)	-.499 (1.98)
Military official (1=yes)	-1.11 (3.14)	-1.25 (3.60)	-1.10 (3.08)
Years public education of family	.064 (1.03)	.056 (.943)	.046 (.755)
Non-land wealth ('000 SSh.; log)	-.009 (.206)	-.008 (.183)	-.017 (.371)
Number of cattle	-.014 (1.07)	-.007 (.552)	-.016 (1.28)
Non-farm income ('000 SSh.; log)	.022 (.483)	.013 (.294)	.038 (.843)
Land per resident	.053 (.819)	.066 (1.06)	.031 (.481)
Number of parcels	-.158 (1.62)	-.085 (.889)	-.136 (1.40)
Fertility and parcel quality index	.038 (.452)	.084 (1.00)	.026 (.303)
Access to irrigation index	-.049 (.596)	-.027 (.346)	-.092 (1.19)
Maize purchases (Qx)	-.061 (1.58)	-.052 (1.38)	-.060 (1.55)
Title (proportion of land registered)	-.349 (1.55)	- -	- -
Title (respondents who paid for surveys)	-	-.548 (2.96)	- -
F-value	4.95	5.71	5.07
R ²	.414	.449	.400
Number of household/observations	113	113	113

a. Figures in parentheses indicate t-values. A t-value equal to or greater than 1.66 is significant to at least the 10 percent level, equal to or greater than 1.98 is significant to at least the 5 percent level, and equal to or greater than 2.62 is significant to at least the 1 percent level.

often refer interviewers to brothers or sons, rather than answering questions themselves. Households with family members who were government officials or in the military exhibited lower tenure security than others in the sample. This finding is consistent with correlations showing that households holding official government positions were negatively correlated with number of years the household head has been in the area ($p=-.239$) or number of years in farming ($p=-.208$). Further, official position is not strongly correlated with title status ($p=.238$ for government officials; $p=-.103$ for military). Without the traditional security mechanisms of customary tenure (i.e. community recognition of rights based on long term residency and use), outsiders experience lower security.

With regard to land characteristics, tenure security tends to decline as the number of parcels and access to irrigation water increases. The negative effect of number of parcels partially reflects the concern over the one-parcel provision in the Land Law and greater exposure to disputes with neighbors. The irrigation index picks up the higher expected loss of higher valued irrigated land, although estimates are not highly significant. Purchases of maize by the household were included as a measure of food security. Land tenure security tends to decline as food security decreases, consistent with expectations. Conversely, tenure security tends to increase with education, non-farm income and land per resident, although estimates are not highly significant. As wealth (value of non-land assets, number of cattle) increases, tenure security tends to decline, although an alternative interpretation might be that lower tenure security leads to a shift in assets to non-farm activities. However, like official status, the value of non-land assets tends to be negatively correlated with years of residency in the area ($-.135$) or years in farming ($-.081$).

The effects of land title are perplexing. While title was shown to have a high economic premium in the land value equations in Table 6, title in the tenure security equations shows a significant negative effect on perceptions of tenure security in Table 7. There are several possible explanations. The most plausible is that the tenure insecurity that resulted in households acquiring title biased the perceptions of registered respondents in their assessment of the tenure security of other land holders in the area. Alternatively, results may indeed be indicating that registered farmers are more insecure. Title is negatively correlated with years of residency (-.255), negatively correlated with whether the household head has always lived in the area ($p=-.340$), and positively correlated with incidence of disputes ($p=.181$). These phenomena combined with restrictions on multiple parcel holdings and transfers in the Land Law, may simply suggest that land registration in the current framework of statutory law provides only a tenuous basis for tenure security. This latter suggestion would imply that land registration has permitted some members of the small holder registered group the means to gain access to land, but title is only an imperfect substitute for the traditional system in granting tenure security.

Credit Supply and Demand Effects

The Somali Development Bank, which provides most of the agricultural credit in Somalia, now requires registered land as collateral.⁶ Not all

6. Because of the restrictions in the Land Law on land transfers, the Courts have been turning to the 'Law Relating to the Transfer of Immovable Property' of 15 December 1986 as the legal basis for deciding on transfers of land. These effects reflect the outcome of current Law with restrictions in place. With changes in transferability of land, its suitability as collateral would change accordingly.

land is of equal value, however. The Bank prefers land under perennial crops (mango, grapefruit and lemon); land under bananas is said to provide reasonable security only as long as the area is large. Land under cereals may be suitable as security as long as the season is good; ironically, credit is normally required early in the season before crop success is known with certainty. Most of the credit in agriculture goes to plantations and to farms greater than 30 ha in size.

More important than the land itself is the value of investment in the land. For perennial crops like mango, grapefruit and lemon trees with life spans of 50-100 years, the trees or production potential of the trees offer high security value. In the event that the Bank forecloses, there is reasonable security that the loan can be repaid from the income of current investments. Conversely, the mortgage value of land cultivated in vegetables and cereal crops is said to be quite low; in case of crop failure, the bank incurs much higher costs in assuming management responsibilities of the farm. Restrictions in the Land Law on land transfers have increased the costs of converting land as a fixed asset to a more liquid financial asset, reducing the value of land as collateral. Banks have thus chosen to assess the collateral value of land in terms of their efficiency in managing investments on the property rather than on the real estate value of the property itself.

Respondents were asked two sets of questions concerning their borrowing patterns: how much money they still owed to Banks, money lenders and traders at the end of the Jilaal (dry season) before the onset of the main agricultural season (Gu); and how much money was borrowed during the Gu season from these sources.⁷ Both measures exclude borrowing that may have taken

7. Enquiries on credit were made following the Gu season harvest.

place in the informal sector ("tontines"), but where land as collateral is much less important as a "guarantee" than family relations and peer-group pressure. Between small holder categories, registered farmers tend to have slightly higher borrowing rates (Table 8), but results are not significant. Of the 4 loans taken out by registered and unregistered small holders, 3 were from family and friends and 1 from a moneylender. When asked why loans were not taken out, responses among registered and unregistered small holders varied: wish to avoid debt (31.2 percent), credit not needed (25.7 percent), have loan (11.0 percent),⁸ insufficient collateral (10.1 percent), do not know where to go (8.3 percent), have not repaid previous loans (7.3 percent), tried but could not obtain credit (4.6 percent), and procedures are too difficult (1.8 percent).

Only the large farm registered group indicated an important level of borrowing activity. One-fourth (8 farms) of these farms borrowed money during the 1987 Gu season, 5 from banks, 3 from family and friends, and 1 from an agricultural extension agent. The average loan value was SSh. 1,423,750. Collateral included the farm (land and fixed investment) in all instances where banks were involved. Of the 8 farms that borrowed money, the average farm size was 115.7 ha with an average of 3,387 fruit trees per farm. Clearly, registration has increased the access of these farms to formal credit, but farm size and presence of productive trees were important factors as well.

8. The fact that 11.0 percent of these households report having loans but only 3-6 percent took out loans from Banks, money lenders and traders in the Gu season suggests that other informal sector lending activities (e.g. tontines) are perhaps going on as well.

Table 8:
Credit and Investment Demand

	Small holder Unregistered	Small holder Registered	Large holder Registered
Credit:			
HH owing money to banks at the end of the dry season (<u>Jilaal</u>) (%)	0.0	2.9	11.8
HH owing money to money lenders or traders at the end of the dry season (%)	6.7	.0	5.9
HH borrowing money since the end of the dry season (%)	2.7	5.7	24.2
Investments (% of HH with or using)			
Pumps	.0	.0	21.2
Tractors	.0	.0	32.4
Wells	.0	.0	14.7
Fertilizer	3.8	3.9	22.4
Parcel Investments (% of parcels with)			
Levelling by Hand	18.3	.0	.0
Levelling with Equipment	28.9	47.4	34.8
Fencing	0.7	2.6	39.1
Drainage	0.7	.0	32.6
Bunding	64.1	81.6	91.3
Fruit Trees	2.8	13.2	43.5
Fertilizer (kg/parcel)	1.6	0.3	654.4
Fertilizer (kg/ha)	.7	0.4	2.8

Investment Demand

Investment impacts of title may occur through two mechanisms: through the linkage between title and credit increasing access to capital; and by increasing investment incentives through enhanced tenure security. As shown in the previous section, the first link is weak given the current financial situation in Somalia, unless a borrower is a large land holder with valuable fixed place investment on the land. The second mechanism is examined in this section.

The empirical results in Table 8 distinguish investments at two levels, the household and parcel. At the household level, no differences are observed between small holder registered and unregistered groups. Neither group owns pumps, tractors or wells. Similar percentages of households in both groups use minimal amounts of fertilizer (3.8 vs 3.9 percent). Investments of large registered farms are significantly larger: 21.2 percent of this group owns at least one pump, tractor(s) (32.4 percent), well(s) (14.7 percent), and fertilizer (22.4 percent).

Parcel level investments are more intriguing. Parcels of the registered small holder group show a higher percentage of households with investments in equipment levelling (47.4 vs 28.9 percent), bunding (81.6 vs 64.1 percent) and fruit trees (13.2 vs 2.8 percent). The unregistered group shows a higher propensity to invest in levelling by hand, due probably to their smaller size of parcels. No significant differences are observed between the two small holder groups concerning fencing, drainage and fertilizer use. Data for the large farm group again shows substantially higher investment. Compared with the small holder registered group, large farms are more inclined to invest in

Table 8:
Pearson Correlation Coefficients^a

	Land Title	Bunding	Fruit Trees	Hand Leveling	Equip. Leveling
Bunding	.153	1.000			
Fruit Trees	.198*	.076	1.000		
Hand Leveling	-.213*	.047	-.047	1.000	
Equipment Leveling	.161	-.101	.114	-.119	1.000
Title to land	1.000	.153	.198*	-.213*	.161
Size of parcel	.527**	.175*	.319**	-.145	.094
Slope	-.216*	-.076	-.090	.125	.143
Color and texture	-.024	-.026	-.032	-.120	.006
Ease of tillage	.001	.195*	.001	-.018	-.101
Fertility	.083	-.047	.145	.021	.147
Access to irr. water	.406**	.075	.284**	-.056	.100

* = Significant at the .01 level (one-tailed significance).
 ** = Significant at the .001 level (one-tailed significance).

Table 9:
Access to Capital Inputs

	Small holder Unregistered	Small holder Registered	Large holder Registered
Ease of Access to:			
Fertilizer	2.53	2.88	2.26
Pesticides	1.75	2.06	2.35
Improved seed varieties	1.67	1.90	1.97
Hand tools	1.01	1.06	1.00
Wheel barrows	1.20	1.28	1.09
Diesel pumps and irr. equipment	4.59	4.56	2.70

Mean of ranking: 1=no problem, 2=a little difficult, 3=difficult, 4=very difficult, 5=impossible.

fencing (39.1 vs 2.6 percent), drainage (32.6 vs 0 percent), bunding (91.3 vs 81.6 percent), fruit trees (43.5 vs 13.2 percent) and fertilizer (2.8 vs 0.4 kg/ha).

The relationship between title status and investment is confounded by the relationship between technology and location. Fruit trees, particularly bananas, require year-round irrigation and larger plots to achieve economies of scale. Hence numbers of fruit trees per parcel are strongly correlated with parcel size ($p=.319$) and access to irrigation water ($p=.284$), as is title.

Ease of access to capital inputs for investment is also important. Respondents were asked to comment on the accessibility of specific capital inputs given that they had money available and the desire to purchase them. Possible responses included: no problem (1), a little difficult (2), difficult (3), very difficult (4), and impossible (5). Mean responses are shown in Table 9. In general, inputs such as hand tools and wheel barrows are relatively easy to acquire, pesticides and improved seed varieties are a little difficult, fertilizer is difficult, while irrigation equipment is very difficult to obtain. While the larger group of registered farms found fertilizers and irrigation equipment more accessible, compared with small holders, they still reported these investments as difficult to very difficult to acquire (2.26 and 2.70 respectively).

While it appears that title does increase tenure security and investment incentives, at least for the largest farms, technology in the area is highly resource specific, and capital inputs are difficult to obtain. While registration could potentially increase the tenure security of small holders, their investment response will likely remain limited until access to water is improved, technology (fruit trees) is made more scale neutral, and farmers are given greater access to capital inputs to take advantage of existing technology.

Conclusions and Policy Implications

Land registration has largely been of a sporadic nature in Somalia; the government has provided a network of registry offices, but registration is left to individual choice. Due to low salaries, limited funds, and critical shortages of paper, fuel and equipment to run the registries, the volume of registration activity is low. While registration is in principle free, applicants must pay the costs of site visits, surveys, maps, etc. to obtain land title. Registration is expensive and poor knowledge of registry procedures is pervasive. Systematic rationing does not appear to be influencing the supply of titles. Rather, price seems to provide the main rationing mechanism, and high costs are primarily determining the low volume of registration activity. Substantial improvements in the efficiency of the registration process and cost reductions will be necessary if registration volume is to measurably increase.

Under sporadic registration, self-selection biases are important in determining which households acquire title, and which parcels are titled. Parcel selection is most crucial for multiple-parcel households which according to the Law are able to register only one concession. Those obtaining title tend to hold or have held government positions, are better educated, have larger holdings, come from outside the area, and/or are heavily engaged in non-farm activities. Registered parcels tend to be larger in size with better access to irrigation water.

Provisions in the Law that give all citizens the right to hold and register a concession have provided "outsiders," often urbanites, with the mechanism to obtain land in rural areas. Directives are sometimes handed down to regional coordinators to find land for applicants. Sometimes displacement

of existing land holders has ensued. Conflicts have been most intense in frontier areas where use rights are imperfectly defined. Problems of land displacement were quite severe in the Shabelle from 1975 to the early 1980s. While the granting of concessions still results in occasional disputes, land scarcity has begun to curb this process, and small holders now appear to be taking disputes to the courts.

Problems of tenure security are particularly important for women. Only 3 percent of registered household heads are women. There is no evidence that women are systematically kept from registration. Rather conventions of one name per concession in the register, the tendency of women to defer all decisions related to land and farming to the husband or brother(s), and women's general lack of unawareness of land access and government bureaucracy, impose more subtle barriers to registration.

With few exceptions, increased tenure security was listed as a major benefit of land registration. However, this finding is somewhat confounded by the past tendency of the registration program to increase the insecurity of non-title holders. During the research, farmers constantly confronted researchers to assist them in registering their land. The majority (over 90 percent) of farmers, registered and unregistered, also stated that registration does or would greatly increase their access to credit, and does or would increase their incentives to invest in the land. These benefits, however, are weak in practice. Only 6 percent of the small holder registered sample and 3 percent of the unregistered sample had borrowed money in 1987, but most of this credit was from money lenders and traders rather than banks. A comparison of small holder untitled and titled farms shows little difference in investment in equipment, fencing, drainage, bunding, irrigation pumps or wells. Differences in fruit trees can be attributed to location-specific

factors. Large farms tend to invest heavily in land, but this partially reflects the organization and structure of plantation agriculture and their preferential access to inputs, investment technologies and commercial markets.

In June 1989, the Land Tenure Center in conjunction with the second phase of a World Bank Structural Adjustment program, assisted the Ministry of Agriculture (MOA) in the design of land policy reforms. An Action Plan was formulated recommending the following legislative and administrative changes:

1. Make usufructuary rights the basis for determining concession rights to strengthen the tenure security of existing landholders.
2. Replace sporadic land registration with systematic (involuntary) registration to curb the use of land registration as a mechanism for land appropriation and to permit more efficient use of the MOA's scarce resources for registration.
3. Increase taxes on all land, registered and unregistered, to increase the costs of idle or unproductive holdings, and to discourage land grabbing, but implement this on a progressive basis to avoid oppressing land holders.
4. Grant concession holders exclusive rights of occupancy for an unlimited term (rather than the 50 years now stipulated) to strengthen long term security of land rights.
5. Eliminate restrictions on the number of parcel holdings, allowing the family to cultivate as many parcels as it wishes to reduce concerns over loss of land beyond the one parcel limit.
6. Eliminate all restrictions on transfers and leases in land and all restrictions on partitioning of land.

The above provisions imply that fundamental changes in the Land code may be necessary to increase tenure security and to ensure that reforms in land

administration are effective. They also imply that the Land Code has not been conducive to strengthening rights under customary tenure, or providing flexible transfer rights under statutory tenure. Isolating titling impacts will require more economically dynamic environments than were present in the Somalia case. Fundamental improvements in the market environment (access to credit, inputs, and investment technologies) will be required if farmers are to make optimal use of their increased tenure security from registration. Conversely, an improved market environment without tenure security runs the risk of inadequate incentives for investment, particularly in areas of rapid economic development (e.g. Shabelle) or in areas of rapid settlement (e.g. the Jubba).

The legislative and administrative changes, should they proceed, are now scheduled for completion in 1990. Many of the macro forces that brought about the current land problems--population growth, settlement programs, inflation, an insecure banking system, donor interventions, and the urban push toward agriculture--remain unabated. Certainly, there are factions who stand much to gain by maintaining the status quo, and by opposing policy change. However, compared with three years ago at the inception of this research, the government today is much more willing to discuss land tenure and resettlement issues openly, and is seeking guidance on policy action. It stands to be commended for supporting this research and actively moving forward with the reforms.

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ANNEX 1

FACTOR DECOMPOSITION OF PARCEL LEVEL CHARACTERISTICS

General Model:

$$PQ = a(\text{SLOPE}) + b(\text{TEXTURE}) + c(\text{TILLAGE}) + d(\text{FERTILITY}) + e(\text{IRRIG}) + f(\text{IRRDIST})$$

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .564
 Bartlett Test of Sphericity = 459 Significance = .000

PQ: Index of parcel quality.

1. SLOPE: Index of slope characteristics.

WATERLOG: Frequency and severity of water logging problems on the parcel.

0 = always an extremely 8 = not a problem
 serious problem

DRAIN: Frequency and severity of water drainage problems on the parcel.

0 = always an extremely 8 = not a problem
 serious problem

FLOOD: Frequency and severity of flooding problems on the parcel.

0 = always an extremely 8 = not a problem
 serious problem

LNDTOPOG: Topography of the parcel.

1 = none is flat 4 = all is flat.

2. TEXTURE: Index of color and texture characteristics.

LNDTEXTR: Texture of soil.

0 = mostly sand 4 = mostly clay

(continued)

ANNEX 1 (continued)

LNDCOLOR: Color of soil.

0 = very light in color 4 = very dark in color

3. **TILLAGE:** Index of soil structure and compaction.

LNDTILL: Ease of tillage of soils on the parcel.

0 = very difficult to till 4 = very easy to till

COMPACTN: Frequency and severity of compaction problems on the parcel.

0 = always an extremely 8 = not a problem
serious problem

4. **FERTILITY:** Index of fertility and general parcel quality.

LNDFERTL: Fertility of soils on the parcel.

0 = very infertile 4 = very fertile

PQUALITY: Quality of the parcel relative to other land in the area.

0 = much worse in quality 5 = much better in quality

5. **IRRIG:** Index of access to irrigation water.

IRIGUDUR: Duration of 1st irrigation during the Gu (heavy rain) season.

IDIDYDUR: Duration of 1st irrigation during the Deyr (light rain) season.

6. **IRRDIST:** Index of equitable water distribution on the scheme.

LACKWATR: Frequency and severity of lack of water problems on the parcel.

0 = always an extremely 8 = not a problem
serious problem

WASSDIST: Assessment of effectiveness of the Waters Users Association
in distributing water.

1 = unfair and inequitable 3 = fair and equitable

ANNEX 2

FACTOR DECOMPOSITION OF TENURE SECURITY CHARACTERISTICS

General Model:

$$TS = a(TSOWN) + b(TSUSE) + c(TSRNTL)$$

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .753
Bartlett Test of Sphericity = 345 Significance = .000

TS: Index of tenure security.

1. TSOWN: Index of ownership security.

ASFLOSNG: Are small farmers today losing land more or less frequently than in the past?

1 = a lot more frequently 4 = seldom lose land

AWORRIED: How worried are farmers in this area about losing land?

1 = not worried at all 4 = extremely worried

ALANDOWN: Disputes over land ownership now are more or less serious than in the past?

1 = a lot more serious 5 = not a problem

AOUSIDR: Outsiders coming here and taking peoples land is:

1 = a very serious problem 4 = not a problem

ALOSS10Y: How likely is it that some of the farmers you know will lose land in the next 10 years?

1 = extremely likely 6 = extremely unlikely

(continued)

ANNEX 2 (continued)

2. TSUSE: Index of residency and long term land use.

ALONGLIV: Likelihood that people who live in the area a very long time will lose some or all their land.

1 = can possibly lose it 4 = definitely will not lose it

LPERMUSE: Likelihood that people who use their land every year will lose some or all their land.

1 = can possibly lose it 4 = definitely will not lose it

3. TSRNTL: Index of land rental security.

ARENTLYR: Risk of farmer losing land if parcel is rented only one year.

1 = very high risk 4 = little or no risk

ARNTLTRM: Risk of farmer losing land if it is rented-out for a very long time.

1 = very high risk 4 = little or no risk
