
Micro-credit Programs and Land Distribution: A Note

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Abstract

"Micro-credit" has come to refer to a popular extension strategy---usually in the agricultural sector---whereby a government or NGO extends credit at favorable rates to poorer borrowers, with repayment being supported by some kind of mortgage on the borrower's social capital. In the commonest case, eligibility is determined by the borrower's wealth, as indexed by his/her landholding. This note shows that, with an imperfect land market, the response to such a program will be to fragment landholdings which are smaller than a certain threshold, while larger holdings remain unaffected. Thus the pattern of landholding will tend to become more polarized.

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I. INTRODUCTION. “Micro-credit” has come to refer to a popular extension strategy—usually in the agricultural sector—whereby a government or NGO extends credit at favorable rates to poorer borrowers, with repayment being supported by some kind of mortgage on the borrower’s social capital. In the commonest case, eligibility is determined by the borrower’s wealth, as indexed by his/her landholding. The Grameen Bank, for example, has for a long time used the benchmark that agents who own half acre of land or less are eligible for its loans, which are available at interest rates lower than the market.

Intuitively, the existence of such a program provides incentives for the fragmentation of land, leading to a larger number of small holdings. However, in most less-developed agrarian economies the land market is imperfect, implying that a seller cannot recover the full present value of his land by selling it. This in turn provides a disincentive to fragmentation.

This note shows that, with an imperfect land market, the response to such a program will be to fragment landholdings which are smaller than a certain threshold, while larger holdings remain unaffected. Thus the pattern of landholding will tend to become more polarized.

II. HISTORICAL EVIDENCE Land fragmentation is a common feature in poor agrarian countries with high population densities, such as India and Bangladesh. The inheritance customs prevalent in these traditional societies are often invoked as the cause of fragmentation. However, these customs alone are not sufficient to explain the full extent of fragmentation. For example, Qadir (1960) in his study of Dhanishwar in Bangladesh argues that fragmentation occurs at greater pace than can be explained by inheritance customs alone. Heston and Kumar (1983) are also of the opinion that inheritance customs are not a sufficient explanation. There is, however, no doubt that fragmentation has occurred at a great pace in recent times—some data is presented in Muhith (1999, see the table on page 187). One can possibly argue that, in the presence of increasing overpopulation, commercial or financial incentives can trigger increased land fragmentation.

Below we present a simple model which analyses the impact of current micro-credit practices on land fragmentation, and indicate that greater polarisation of landholding occurs as a result.

III. MODEL. There is one farmer/borrower who has x acres of land, and two potential lenders.

Borrower: The farmer initially has no assets other than land. He needs one unit of working capital per unit of land. He uses working capital and land to produce an output y per unit of land.

Lenders: The two lenders are, respectively, an NGO (subscripted 1) and a commercial bank (CB, subscripted 2). Each lender has in place sufficient enforcement mechanisms to ensure that borrower repays a loan. However, the two use different mechanisms, and their enforcement costs vary.

The NGO exploits mortgages on social capital—such as peer monitoring schemes—and can therefore lend at a relatively low rate r_1 .¹

The CB, on the other hand, does not have access to the farmer’s social capital. It operates enforcement schemes that are more costly than that used by the NGO. Thus the CB must charge a higher interest r_2 which is greater than r_1 . However, borrowing is profitable at this rate, i.e.,

$$y > (1 + r_2) \tag{1}$$

We assume the NGO is operating a targeted micro-credit scheme, and its loans are only available to small landholders. In other words:

Assumption 1. *The farmer can only access loans from the NGO if his landholding is no greater than a , which is the threshold used by the NGO to distinguish ‘poor’ borrowers.*

Since we are interested in the question of whether the farmer will fragment his land in order to access loans from the NGO, we assume that his initial landholding is too large for this, i.e.,

$$x > a. \tag{2}$$

Land market: The land market is imperfect, in the sense that the price which a plot of land fetches on the market is less than the discounted value of the future stream of returns produced by the land.

The future stream of returns of course depends upon the rate of interest the farmer can access. Letting δ denote the farmer’s discount factor, the valuation is $q = \frac{1}{1-\delta}[y - (1 + r)]$, where r takes the value r_1 if the farmer can access loans from the NGO, and $r = r_2$ otherwise. We accordingly define

$$q_1 = \frac{1}{1-\delta}[y - (1 + r_1)]$$

¹The NGO can lend at low rate also because it has access to foreign funds with lower interest rate.

$$q_2 = \frac{1}{1 - \delta} [y - (1 + r_2)]$$

Specifically, we make the following assumption:

Assumption 2. : *The imperfection in the land market takes the following form: if p is the price per unit of land on the market, then $p = \alpha q_2$ where $0 < \alpha \leq 1$.*

The closer α is to unity, the smaller is the market imperfection. Such imperfections arise most readily from asymmetric information, where the buyer cannot ascertain the true quality of the land, and must therefore be accorded a discount. In poor agrarian economies, in addition, land may also be less liquid owing to a lack of buyers with ready cash. Further, the value of a plot to its current owner may be higher as a result of convenience in location—proximity to other plots which the owner also cultivates, or to other holdings where the owner may work part of his time for a wage.

Timing: First, the farmer decides whether to fragment his land or not. If he fragments, then he sells $x - a$ units of land at a price p . Next, he obtains a loan from either the NGO or the CB, as appropriate. Then production takes place, output becomes available, and loans are repaid.

Objective function: The farmer's aim is to maximize the sum of his retained harvest, the value of his landholding, and his liquid assets at the end of the period, where land is valued at q_1 or q_2 as appropriate.

IV. ANALYSIS. The farmer's optimisation problem can be simplified in the following manner. Note that the farmer makes only one decision, whether to fragment his land or not. If he does not, then he has x units of land and access to loans at the rate r_2 , and the discounted present value of his property is:

$$V_2 = q_2 x$$

If instead he decides to fragment, then he has a units of land and access to loans at the rate r_1 , so the present value of his land is $q_1 a$. He also has the proceeds from the sale of $(x - a)$ units of land at p per unit, for a total discounted wealth of

$$V_1 = q_1 a + p(x - a)$$

He will fragment his land if $V_1 > V_2$, i.e., if:

$$\begin{aligned} q_1 a + p(x - a) &> q_2 x & (3) \\ \Rightarrow (q_1 - p)a &> (q_2 - p)x \\ \Rightarrow x &< \frac{(q_1 - p)}{(q_2 - p)}a \end{aligned}$$

Define

$$x^* = \frac{(q_1 - p)}{(q_2 - p)}a$$

it follows that farmers who own land in amounts smaller than x^* will fragment their land, retaining holdings of size a and selling the remainder, while farmers who have holdings larger than x^* will retain their original holdings.

If this process continues for long enough, we will find that the size distribution of landholdings is polarised in the following sense: landholdings are either of size a and smaller, or of size x^* and larger.

The degree of imperfection in the land market is critical in determining the pattern of polarisation. If the land market is missing altogether, so that $p = 0$, then we get

$$x^* = \frac{q_1}{q_2}a = \frac{y - (1 + r_1)}{y - (1 + r_2)}a$$

which cannot be too large if the two rates of interest are reasonably close together. In this case only holdings which exceed a by a small margin will be fragmented.

On the other hand, if the land market is perfect so that p equals the full value q_2 of land, then x^* becomes infinitely large, and all holdings larger than a will ultimately be fragmented. The final distribution will then consist of a large number of small holdings.

Highly unequal distributions of holdings will be generated for intermediate degrees of imperfection in the land market, i.e., for values of p between 0 and q_2 . Appropriate values of p , for example, may generate distributions where holdings are either 10, 20, or 50 acres or larger, on the one hand, or of half-acre sizes, on the other.

In most poor agrarian economies, it is difficult to directly measure income inequality. Inequality in asset-ownership is often used as a proxy measure. Land, in turn features prominently in these calculations as the most easily measured asset. This analysis leads to the conclusion that micro-credit—or

other poverty alleviation programmes which use asset-ownership as a measure of poverty—may have the consequence of increasing measured income inequality. If agricultural production is susceptible to scale effects, these programmes may also have consequences for productivity.

V. FURTHER RESEARCH. The following table reveals some on going process of the distribution of land size holding in Bangladesh from year 1977 to 1983-84.

Please see the table 1 in Appendix.²

It is apparent from the table 1 that during 1977-1983/84, the land fragmentation to half-acre has dramatically increased from 2.8% to 17.5% (which is 6.25 times higher). This feature is also present in the groups of landholding size 0.5-0.99 and 1.00-2.49 acres. However, for the group which has landholding size above 2.49 acres, the percentage of land holding decreases. It may be the case that large size of land is subdivided into small pieces of land due to several reasons such as inheritance custom, land reform policy. More interestingly, the percentage of landholding for the group which possesses landholding size 0.5 or less has increased vastly compare to other groups. It indicates that the tendency of land fragmentation to 1/2 acre land -is higher than all other groups. Incidentally, Grameen Bank and other NGOs start their operation (with 1/2 acre land threshold) from 1976. One can certainly make a conjecture that the differentiated credit policy of those organizations have accelerated land fragmentation. However, this is only one possibility and how common this kind of land fragmentation –is essentially an empirical question. Recent studies have shown that the number of dropouts of micro-credit programme has increased and those dropouts neither rose out of poverty nor economically graduated leaving the ultimate objective of poverty alleviation in question (Karim and Osada, 1998). The situation will be worse if those dropouts fragment their lands and left the programme before rising out of poverty. Therefore, the issue of land fragmentation is very important and further research should be carried out in this regard.

²This table is taken from Muhith (1999, page 187).

References

- [1] Heston, A. and D. Kumar (1983). “The Persistence of Land Fragmentation in Peasant Agriculture: An Analysis of South Asian Cases”, *Explorations in Economic History*, Vol 20, page 199-220.
- [2] Muhith, A.M.A. (1999). *Bangladesh in the Twenty-First Century: Towards and Industrial Society*, Dhaka: University Press Limited.
- [3] Qadir, A. (1960). “Village Dhanishwar: Three Generations of Man-Land Adjustment in an East Pakistan Village”, *Working Paper*, Comilla: Pakistan Academy of Rural Development.

Appendix

Table 1: Landholding Size Distribution

Holding size (acre)	Year	% of holding no.	% of total land area
<0.5	1977	2.8	0.5
	1983-84	17.5	2.74
0.5-.99	1977	5.5	2.15
	1983-84	11.8	5.08
1.00-2.49	1977	17	16.1
	1983-84	28.9	21.16
2.50-7.49	1977	21.6	48.9
	1983-84	17.9	45.09
7.5-14.99	1977	3.9	21.16
	1983-84	2.9	17.76
>15	1977	1	11.19
	1983-84	.06	8.17